

**2018 ANNUAL REPORT FOR THE
BIG TUJUNGA WASH MITIGATION AREA
LOS ANGELES COUNTY, CALIFORNIA**

Prepared for:

**LOS ANGELES COUNTY
PUBLIC WORKS**
900 S. Fremont Avenue
Alhambra, CA 91803-1331

Prepared by:

CHAMBERS GROUP, INC.
5 Hutton Centre Drive, Suite 750
Santa Ana, California 92707
(949) 261-5414

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TABLE OF CONTENTS

GUIDE TO COMPLIANCE WITH STREAMBED ALTERATION AGREEMENT.....1

SECTION 1.0 – INTRODUCTION5

1.1 PURPOSE..... 5

1.2 LOCATION AND SETTING 5

1.3 SUMMARY OF THE ANNUAL REPORT 8

1.3.1 Continuation of Brown-headed Cowbird Trapping Program..... 9

1.3.2 Continuation of Exotic Plant Eradication Program 9

1.3.3 Water Lettuce Control Program..... 10

1.3.4 Continuation of Exotic Wildlife Eradication Program 10

1.3.5 Water Quality Monitoring Program..... 10

1.3.6 Trails Monitoring Program..... 10

1.3.7 Community Awareness Program 11

1.3.8 Public Outreach Program 11

1.3.9 Special Assessments..... 11

1.3.10 Preparation and Submittal of Annual Report 12

1.3.11 Attendance at Meetings with Agencies, Public, and Consultants 12

1.3.12 Coordination with LACDPR..... 12

SECTION 2.0 – CONTINUATION OF BROWN-HEADED COWBIRD TRAPPING PROGRAM 13

SECTION 3.0 – HABITAT RESTORATION PROGRAM 14

3.1 SUMMARY OF THE ORIGINAL HABITAT RESTORATION EFFORTS 14

3.2 CURRENT STATUS OF THE HABITAT RESTORATION PROGRAM..... 14

SECTION 4.0 – CONTINUATION OF EXOTIC PLANT ERADICATION AND MAINTENANCE PROGRAM 15

4.1 METHODS 17

4.2 NON-NATIVE EXOTIC PLANT ERADICATION EFFORTS IN 2018 19

SECTION 5.0 – WATER LETTUCE CONTROL PROGRAM 21

SECTION 6.0 – CONTINUATION OF EXOTIC WILDLIFE ERADICATION PROGRAM 22

6.1 METHODS 23

6.2 RESULTS 23

SECTION 7.0 – WATER QUALITY MONITORING PROGRAM..... 26

7.1 BASELINE WATER QUALITY..... 26

7.2 WATER QUALITY SAMPLING RESULTS FOR 2018..... 27

7.2.1 Comparison of Results with Aquatic Life Criteria 28

SECTION 8.0 – TRAILS MONITORING PROGRAM..... 30

8.1 TRAILS SYSTEM MAINTENANCE 30

8.2 POST-CREEK FIRE TREE ASSESSMENT 32

8.3 TRAIL CLEANUP DAY 33

SECTION 9.0 – COMMUNITY AWARENESS PROGRAM..... 36

9.1 NEWSLETTERS (SPRING, FALL) 36

9.2 CAC MEETING 36

SECTION 10.0 – PUBLIC OUTREACH PROGRAM..... 39

SECTION 11.0 – SPECIAL ASSESSMENTS..... 42

11.1 POST CREEK FIRE ASSESSMENT 42

SECTION 12.0 – ATTENDANCE AT MEETINGS WITH AGENCIES, PUBLIC, AND CONSULTANTS 47

SECTION 13.0 – REFERENCES 48

LIST OF FIGURES

Figure 1-1. Project Location 6

Figure 1-2. Big Tujunga Wash Mitigation Area 7

Figure 4-1. High Priority Exotic Plant Removal Locations 18

Figure 6-1. Exotic Aquatic Wildlife Survey Locations 24

Figure 8-1. Trails in the Mitigation Area 31

Figure 8-2. Trail Clean-up Day Flyer for 2018 34

Figure 8-3. Trail Cleanup Day 2018 Photographs..... 35

Figure 9-1. Big Tujunga Wash Mitigation Area Incident Map, May 2017 to December 2017 37

Figure 11-1 Fire Severity Map with Aerial Imagery Pre-Creek Fire..... 43

Figure 11-2 Fire Severity Map with Aerial Imagery February 2018 44

LIST OF TABLES

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2018..... 8

Table 4-1. Target Non-Native Weed Species 15

Table 4-2. Additional Exotic Plant Species Observed in the Mitigation Area in 2018 16

Table 4-3. Targeted Invasive Exotic Tree Species 17

Table 6-1. Species Captured During the Exotic Aquatic Species Removal Efforts, 2018 23

Table 6-2. Summary of Species Captured by Month, 2018 25

Table 7-1. Baseline Water Quality Sampling Results (2000)..... 26

Table 7-2. Summary of Water Quality (December 17, 2018) 27

Table 7-3. Discussion of December 2018 Big Tujunga Wash Sampling Results..... 28

LIST OF APPENDICES

APPENDIX A – Streambed Alteration Agreement #1600-2008-0253-R5

APPENDIX B – Public Outreach and Worker Education Brochure

APPENDIX C – Plant and Wildlife Compendia

APPENDIX D – Exotic Plant Removal Memos and CDFW Notifications

APPENDIX E – Water Lettuce Inspection Memo

APPENDIX F – Exotic Wildlife Removal Memos

APPENDIX G – 2017 Water Quality Monitoring Report

APPENDIX H – Trails Maintenance and Monitoring Memos

APPENDIX I – Post Creek Fire Tree Assessment Memo

APPENDIX J – Stakeholder Mailing List

APPENDIX K – Newsletters

APPENDIX L – Community Advisory Committee Meeting Agendas and Minutes

APPENDIX M – Public Outreach Memo

APPENDIX N – Post Fire Assessment Report

GUIDE TO COMPLIANCE WITH STREAMBED ALTERATION AGREEMENT

Guide to Compliance with the Terms and Conditions in the California Department of Fish and Wildlife Streambed Alteration Agreement #1600-2008-0253-R5 for the Big Tujunga Wash Mitigation Area, Dated January 29, 2009; Expired March 31, 2014

A draft Streambed Alteration Agreement (SAA) (#1600-2008-0253-R5) was issued to Los Angeles County Public Works (Public Works) from California Department of Fish and Wildlife (CDFW) on January 29, 2009 (Appendix A). The SAA remained in effect through March 31, 2014. Since the expiration of the SAA, activities conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) have been under the direct supervision of CDFW Biologist Matthew Chirdon. The following key provides a quick reference as to how the conditions were addressed and where the explanations of activities associated with the conditions are located in this document.

Resource Protection

Condition 1: Vegetation removal activities occurred between the dates of May 1 and December 27, and breeding bird pre-activity surveys were conducted prior to each exotic vegetation removal activity occurring within nesting bird breeding season (March 1 through September 15) in 2018. In addition, a qualified biological monitor was present during all exotic vegetation removal activities during the breeding season to ensure that no impacts to nesting birds occurred (see Section 4.0). As a result, no negative impacts occurred to breeding/nesting birds within the Mitigation Area.

Condition 2: Nesting raptor surveys were conducted prior to all vegetation removal activities occurring within the Mitigation Area in 2018. No active raptor nests were identified within the active work areas; therefore, no negative impacts occurred to nesting raptors, and fencing of nests was not required (see Section 4.0).

Condition 3: Active bird nests were neither destroyed nor disturbed during the 2018 breeding season, in accordance with the Migratory Bird Treaty Act (MBTA) of 1918. Appropriate measures, such as pre-activity surveys and biological monitoring, were taken to prevent impacts to breeding/nesting birds protected under the MBTA.

Condition 4: Pre-activity surveys for sensitive species potentially occurring in the Mitigation Area were conducted prior to exotic vegetation removal activities (see Section 4.0).

Condition 5: CDFW was notified of the presence of all listed and sensitive species occurring within the Mitigation Area.

Condition 6: A qualified biological monitor was on site during clearing, enhancement, and restoration activities (see Section 8.0). The biological monitor conducted the appropriate pre-activity surveys on site prior to each activity occurring in an area.

Condition 7: All native vertebrate species encountered during clearing, enhancement, and restoration activities were safely relocated, as necessary. No native wildlife vertebrate species were harmed as a result of activities occurring in the Mitigation Area. No wildlife exclusionary devices were necessary; thus, none were constructed. Repairs were made to the existing exotic fish exclusionary screens on September

7, 2018. No work was conducted on site without the presence of a biological monitor (see Sections 4.0, 6.0, and 8.0).

Condition 8: A Contractor Education Brochure was created in both English and Spanish and was distributed to all contractors and subcontractors working on the site. This brochure also served as an informational brochure that was handed out to recreational user groups as part of the public outreach program (see Section 10.0). In addition, the biological monitor conducted tailgate worker education sessions prior to exotic vegetation activities occurring on the site. A copy of the Contractor Education Brochure is included as Appendix B.

Condition 9: A copy of the 2018 annual report will be submitted to CDFW.

Condition 10: CDFW did not determine that any threatened or endangered species will be affected by the implementation of the Master Mitigation Plan (MMP); therefore, an application for a State Incidental Take Permit was not prepared.

Condition 11: One wildlife-proof trash receptacle at the northwest corner of the Mitigation Area near the 210 Freeway was burned during the Creek Fire but was replaced.

Condition 12: Hunting was neither permitted nor authorized within the Mitigation Area in 2018.

Work Areas and Vegetation Removal

Condition 13: Disturbance and removal of non-native vegetation did not exceed the limits approved by CDFW, as stated in the MMP (see Section 4.0).

Condition 14: All personnel who conducted activities within site boundaries were provided maps, and no native vegetation was removed within the boundaries of the site. The work areas were clearly delineated, and unnecessary impacts did not occur to ephemeral streams or riparian habitats. Activities conducted at the site did not result in any permanent adverse impacts to Haines Canyon Creek and/or Big Tujunga Wash.

Condition 15: Vegetation with a diameter at breast height (dbh) larger than 3 inches was not removed, except as stated in the MMP and approved by CDFW.

Condition 16: Native vegetation was not removed from the channel, bed, or banks of the stream except as provided for in the SAA or as proposed in the MMP.

Equipment and Access

Condition 17: Vehicles and equipment were neither operated within nor driven through water-covered portions of the stream.

Condition 18: Access to the site occurred solely via existing roads and established trails for all site maintenance and monitoring activities.

Fill and Spoil

Condition 19: Fill was not placed in any area of the Mitigation Area as it is not authorized per the SAA.

Structures

Condition 20: Materials associated with the MMP activities were not placed in any seasonally dry portions of the stream in 2018.

Condition 21: Installation of erosion control structures was not conducted during 2018, nor was there a need for such structures.

Condition 22: Bridges, culverts, and other structures were not constructed in 2018 as part of activities associated with the MMP.

Condition 23: No construction of any temporary or permanent dams, structures, or flow restrictions occurred as part of the activities associated with the MMP. However, recreational users of the site periodically built rock dams in the creek to create pools. Chambers Group biologists or properly trained Public Works Flood Maintenance workers carefully removed them when encountered to restore the natural flow in Haines Canyon Creek (see Section 10.0)

Pollution, Sedimentation, and Litter

Condition 24: All litter and pollution laws were adhered to by the contractors, subcontractors, and employees of Public Works. Trash pickup was conducted regularly by the site users, the landscape contractor, and volunteers during an organized Trail Cleanup Day (see Section 8.2).

Condition 25: Equipment maintenance was not conducted in the Mitigation Area.

Condition 26: No hazardous spills of any kind occurred in the Mitigation Area during 2018.

Condition 27: Activities conducted within the Mitigation Area in 2018 did not result in any turbid water (from dewatering or other activities) entering existing water courses.

Condition 28: Activities involving equipment washing (or other similar activities) that would have resulted in the production of water containing mud, silt, or other pollutants were not conducted in the Mitigation Area in 2018.

Condition 29: Alteration to the stream's low-flow channel, bed, or banks was not conducted as a result of the implementation of activities in the Mitigation Area.

Condition 30: As stated under Condition 24, the only movement of rocks within the bed or banks of the stream occurred during the removal of rock dams created by recreational site users. Removal of the rock dams was conducted by biologists who are familiar with the sensitive fishes in the stream or by properly trained Public Works Flood Maintenance workers (see Section 10.0). These activities were conducted with as little silt generation as possible, and the rocks were placed back into the stream in a natural arrangement. Removal of the rock dams is critical for the federally listed (threatened) and California Species of Special Concern (SSC) Santa Ana sucker (*Catostomus santaanae*) that occurs in Haines Canyon Creek. Rock dam removal eliminates habitat that is better suited for exotic wildlife (e.g., American bullfrogs [*Lithobates catesbeianus*], largemouth bass [*Micropterus salmoides*]) that pose a threat to this species.

Permitting and Safeguards

Condition 31: The CDFW, United States Army Corps of Engineers (USACE), and Regional Water Quality Control Board (RWQCB) were consulted very early in the development of the implementation plan for the Mitigation Area (referred to as the Big Tujunga Conservation Area in the SAA). The USACE stated that they did not need to issue a permit because there would not be any fill within their jurisdiction. The continued implementation of the MMP and the Long-term Maintenance and Monitoring Plan (LTMMMP) for the Mitigation Area is not expected to have any impact on USACE jurisdiction, nor will it have any water quality impacts. No additional permits or certifications are required from the RWQCB or the USACE.

Condition 32: Public Works submitted the Conservation Easement (CE) on December 23, 2010. Additional work on the CE was not conducted in 2018.

Administrative and Miscellaneous

Condition 33: No amendments to the SAA were submitted to CDFW during the 2018 reporting period. CDFW did not identify any breaches of the SAA during the 2018 period.

Condition 34: No violations of any terms or conditions of the SAA occurred during the 2018 period.

Condition 35: Copies of the SAA were provided to all the biologists, subcontractors, and workers who conducted activities in the Mitigation Area in 2018.

Condition 36: A pre-enhancement restoration meeting/briefing was held on November 11, 2009, prior to any exotic vegetation removal activities occurring in the Mitigation Area. Additional meetings were not necessary during 2018.

Condition 37: CDFW was notified prior to the start of exotic vegetation removal activities occurring within the Mitigation Area during the breeding bird season in 2018 (see Section 4.0).

Conditions 38 and 39: No CDFW department employees conducted visits to the site in 2018.

Conditions 40 through 42: CDFW did not issue a suspension or cancellation of the SAA in 2018.

SECTION 1.0 – INTRODUCTION

1.1 PURPOSE

The purpose of this report is to provide a summary of the management activities conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) from January to December 2018. These activities were conducted in accordance with the Master Mitigation Plan (MMP) for the Mitigation Area (Chambers Group 2000). The MMP was first created in 2000 to serve as a five-year guide for implementation of various enhancement programs and to fulfill the California Department of Fish and Wildlife (CDFW) requirement for the preparation of a management plan for the site. The ultimate goal of the Mitigation Area is to provide for long-term preservation, management, and enhancement of biological resources for the benefit of the state's fish and wildlife resources. The MMP encompasses strategies to enhance and protect existing habitat for wildlife and to create additional natural areas that could be used by native wildlife and numerous user (recreational) groups. In addition, the MMP includes programs for the removal of exotic fishes and reptiles, American bullfrogs (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*) from the Tujunga Ponds; removal of exotic and invasive plants; trapping to control brown-headed cowbirds (*Molothrus ater*); development of a formal trails system; and development of a public awareness and education program at the site. Implementation of the MMP began in August 2000 and was completed five years later. An additional year of limited maintenance and surveys was added between late summer 2006 and late summer 2007. ECORP Consulting, Inc. (ECORP) was contracted by the Los Angeles County Public Works (Public Works) in July 2007 to continue MMP activities as part of implementation of the Long-term Maintenance and Monitoring Plan (LTMMMP; Chambers Group 2006). In June of 2017 Chambers Group, Inc. (Chambers Group) was again contracted by Public Works to continue MMP activities in accordance with the LTMMMP. This report summarizes all activities conducted in the Mitigation Area by Chambers Group between January and December 2018.

1.2 LOCATION AND SETTING

The Mitigation Area is located in Big Tujunga Wash, just downstream of the Interstate (I-) 210 Freeway overcrossing, near the City of Los Angeles' Sunland community in the San Fernando Valley, Los Angeles County. The site is bordered on the north by I-210, on the east by I-210 and the County of Los Angeles Department of Parks and Recreation (LACDPR) Tujunga Ponds, and on the south by Wentworth Street (Figure 1-1). The west side of the site is contiguous with the downstream portion of Big Tujunga Wash. The Mitigation Area supports two watercourses: Big Tujunga Wash and Haines Canyon Creek. Big Tujunga Wash, in the northern portion of the site, is partially controlled by Big Tujunga Dam (Dam). Flow is intermittent based on rainfall amounts and water releases from the Dam. Haines Canyon Creek, located in the southern portion of the site, is a tributary that conveys water flow from Haines Canyon to Big Tujunga Wash. Flow is perennial and may be fed by groundwater and/or runoff from adjacent residential areas. The two drainages merge near the western boundary of the property and continue into the Hansen Dam Flood Control Basin, located approximately one-half mile downstream of the site. The site is located within a state-designated Significant Natural Area (LAX-018) and a Los Angeles County Significant Ecological Area (Designation No. 25, Tujunga Valley/Hansen Dam), and the biological resources found on the site are of local, regional, and statewide significance (Safford and Quinn 1998; CDFW 2016). The Mitigation Area also falls within designated Critical Habitat for the federally listed Santa Ana sucker and the federally and state listed southwestern willow flycatcher (*Empidonax traillii extimus*). The nearby Tujunga Ponds and surrounding habitat are located adjacent to the northeast corner of the site. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds, and other geographic features as well as designated Critical Habitat in the Mitigation Area can be found in Figure 1-2.

Figure 1-1. Project Location

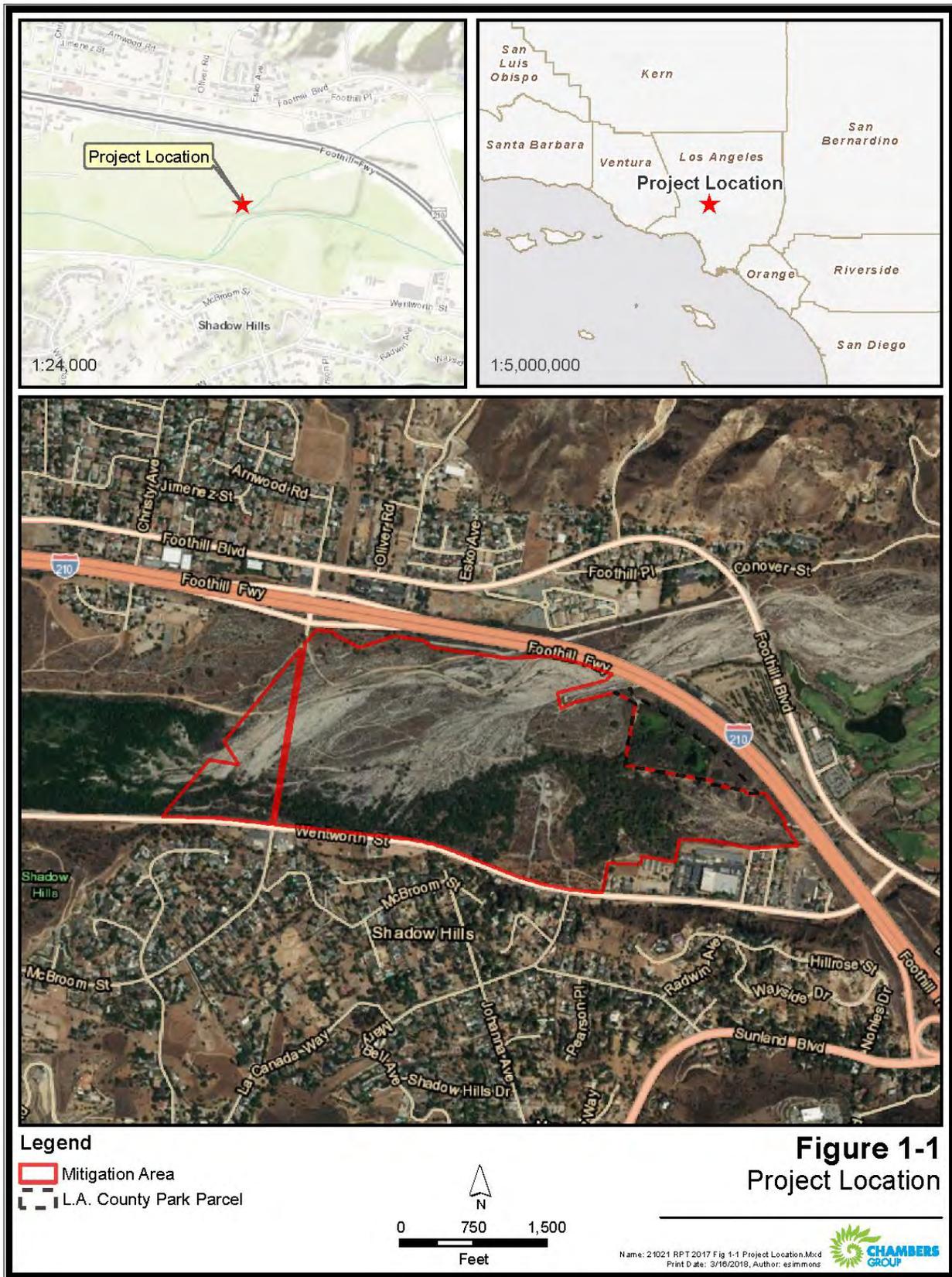
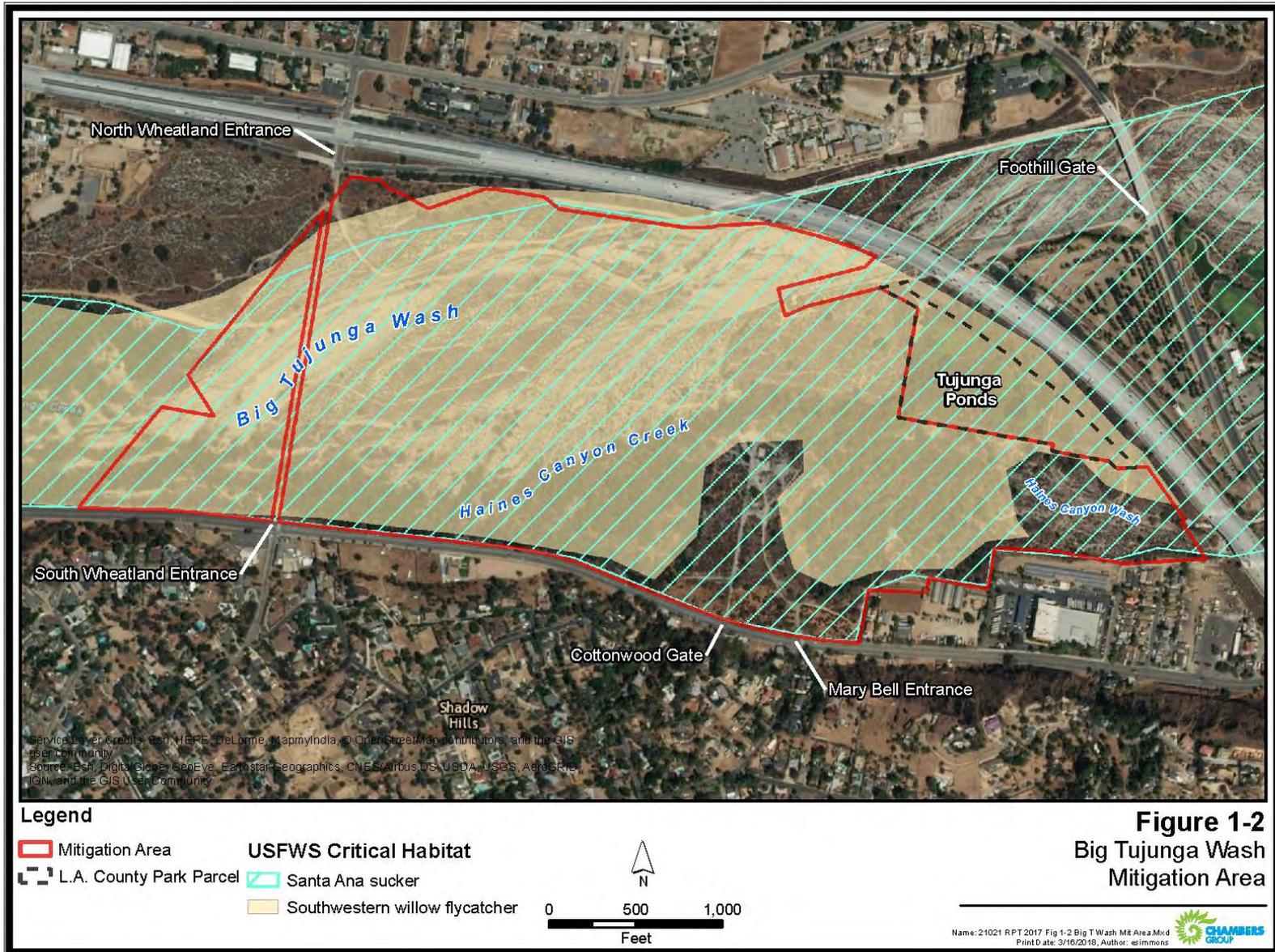


Figure 1-2. Big Tujunga Wash Mitigation Area



1.3 SUMMARY OF THE ANNUAL REPORT

Table 1-1 provides a list of the tasks described in the MMP that were implemented between January and December 2018. Certain tasks in the MMP were not conducted in 2018 because the scope of work requires that they be done once during a three-year period and that they be conducted during an average or better than average rainfall year. Examples of these include the focused surveys for sensitive native fishes, arroyo toad (*Anaxyrus californicus*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher. This suite of surveys was last conducted in 2015; however, due to the loss of habitat for these species following the Creek Fire which occurred in December of 2017, the schedule for these surveys remains tentative. A post Creek Fire assessment was conducted in February 2018 in order to assess and map the extent and severity of fire damage within the Mitigation Area after the Creek Fire. Similarly, a post-fire tree assessment was conducted in December 2018 as part of the Trails Maintenance and Monitoring task, to assess the damage caused to native trees along existing and proposed new trail alignments. No water lettuce (*Pistia stratiotes*) was observed in the Mitigation Area during 2018, and thus, no Water Lettuce Control Program tasks were conducted in 2018. No additional tasks were conducted under the Special Assessment task in 2018. Compendia of all plant and wildlife species observed in the Mitigation Area in 2018 are included as Appendix C.

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2018

Implemented and/or Continued in 2018	Task
	TASK 1 – Continue Brown-headed Cowbird Trapping Program
-	Brown-headed Cowbird Trapping Program
-	Final Trapping Report
	TASK 2 – Continue Exotic Plant Eradication Program
✓	Combined Exotic Plant Removal and Maintenance Program
✓	Exotic Plant Memos
	TASK 3 – Water Lettuce Control Program
-	Water Lettuce Herbicide Application
✓	Follow-up Inspections and Memos
	TASK 4 – Continue Exotic Wildlife Eradication Program
✓	Exotic Wildlife Removal Efforts
✓	Exotic Wildlife Memos
	TASK 5 – Water Quality Monitoring Program
✓	Water Quality Monitoring
✓	Water Quality Results Report
	TASK 6 – Trails Monitoring Program
✓	Trails Maintenance and Monitoring Site Visits
✓	Trails Maintenance and Monitoring Memos
✓	Post-Fire Tree Assessment (as part of the Trails Monitoring task)
✓	Post-Fire Tree Assessment Memo (as part of the Trails Monitoring task)
✓	Trails Cleanup Day Announcement Flyer
✓	Trail Cleanup Day

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2018

Implemented and/or Continued in 2018	Task
	TASK 7 – Community Awareness Program
✓	Spring and Fall Newsletters
✓	Community Advisory Committee Meeting Agenda
✓	Community Advisory Committee Meeting
✓	Community Advisory Committee Meeting Minutes
✓	Mitigation Area Incident Map, May 2017 through December 2017
	TASK 8 – Public Outreach Program
✓	Public Outreach Weekend Site Visits
✓	Distribute Educational Brochures
✓	Public Outreach Memo
	TASK 9 – Special Assessment
✓	Post-Fire Assessment
✓	Post-Fire Assessment Memo Report
	TASK 10 – Annual Report
✓	2018 Draft Annual Report
-	2018 Final Annual Report
	TASK 11 – Meetings
✓	Meetings with Public Works, Agencies, the Public, and Consultants
	TASK 12 – Coordination with LACDPR
✓	Coordination with LACDPR

1.3.1 Continuation of Brown-headed Cowbird Trapping Program

Brown-headed cowbird trapping was not conducted for the Mitigation Area during 2018 due to lack of suitable nesting habitat after the Creek Fire. This program is outlined in the MMP as a method to enhance the ecological value of the site by reducing and ultimately eliminating the occurrence of brood parasitism of native riparian bird species. The continuation of this program will be commensurate with the reestablishment of suitable nesting habitat as determined by qualified Chambers Group avian biologists or as required by CDFW. Details of the brown-headed cowbird trapping program are found in Section 2.0.

1.3.2 Continuation of Exotic Plant Eradication Program

This task consists of ongoing monitoring of past exotic plant removal efforts and continued removal of exotic and invasive vegetation. Periodic site visits were conducted to determine the locations of exotic plant species removal efforts, to strategize the best course of action, and to determine if and where additional treatments were necessary. The removal of exotic plants was conducted at various times throughout the year to ensure that removal techniques would coincide with the exotic plant species' growth cycles. The major focus of this task for the 2018 period was treating exotic plants such as mustard species, castor bean (*Ricinus communis*), non-native thistles, and non-native brome grasses with CDFW-

approved herbicides. The exotic plant species eradication activities that were conducted in 2018 are summarized in Section 4.0.

1.3.3 Water Lettuce Control Program

Water lettuce removal was added to the Exotic Plant Eradication Program in 2011 due to an infestation of this aquatic, non-native plant in the Tujunga Ponds. Following manual removal in early January 2012, remaining patches of water lettuce were treated with CDFW-approved herbicide in January, July, August, and September 2012 and again in July and August 2013. A small amount of water lettuce was observed on site in June and August 2016 but was manually removed from the ponds by biologists and maintenance crews and did not require herbicide treatments. No water lettuce was observed at the Tujunga Ponds during any of the site visits conducted in 2017. The Tujunga Ponds were again searched for water lettuce in February and May of 2018 and during 2018 exotic plant eradication efforts, and no water lettuce was observed. Details of the water lettuce program are summarized in Section 5.0.

1.3.4 Continuation of Exotic Wildlife Eradication Program

This task consists of the continued removal of non-native, invasive wildlife species. Efforts were focused on removal of exotic aquatic wildlife species, primarily, bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), red swamp crayfish, Mozambique tilapia (*Oreochromis mossambicus*), and western mosquitofish (*Gambusia affinis*) from perennial waters at the Tujunga Ponds and Haines Canyon Creek. Exotic wildlife removal efforts target all life stages of exotic fishes and amphibians (such as American bullfrogs) in an effort to maximize the efficiency of the removal program. Exotic wildlife removal methods were revised in 2016 to increase effectiveness through the addition of removal efforts. A total of nine exotic wildlife removal efforts occurred during the 2018 reporting period. Exotic wildlife removal tasks implemented in 2018 are summarized in Section 6.0.

1.3.5 Water Quality Monitoring Program

Water quality sampling for the Mitigation Area was conducted by Chambers Group on December 17, 2018. All samples were tested by Enthalpy Analytical, LLC and Test America. This task is discussed in Section 7.0.

1.3.6 Trails Monitoring Program

The Trails Monitoring Program aims to allow recreational use of the Mitigation Area while still preserving sensitive wildlife and their habitats. Three trail maintenance efforts were conducted in June, November, and December of 2018 to look for areas that might qualify for trail closures, identify and clear areas where trails were blocked by fallen trees, branches, trash or other debris, and identify and clear locations of extensive stands of poison oak (*Toxicodendron diversilobum*) and other vegetation overgrowing the trails. Substantially more trail maintenance work was required this year due to the damage from the Creek Fire that burned through the Mitigation Area in December 2017. More extensive problem areas were mapped and reported to Public Works for maintenance or repair at a later time, if needed. The Twelfth Annual Trail Cleanup Day was held on Saturday, November 3, 2018. Trail maintenance tasks implemented in 2018 and further information about the Trail Cleanup Day are summarized in Section 8.0.

Post Creek Fire Tree Assessment

A post Creek Fire tree assessment for the Mitigation Area was conducted in December 2018, as part of the Trail Maintenance and Monitoring task. The field survey was conducted on December 14, 2018, to assess and map burned native trees (burned during the Creek Fire in December 2017), located along or in close proximity to the existing authorized trail system and the anticipated alternative trail system, that may pose potential public safety concerns due to the compromised integrity of the burned trees and the continuing deterioration of these trees over time. This task is discussed in Section 8.2.

1.3.7 Community Awareness Program

This program consists of the continued implementation of the Community Advisory Committee (CAC) meeting. The meetings were previously held semiannually, in spring and fall of each year, but changed in 2014 to only be held in the spring. Chambers Group continues to assist Public Works with development of meeting agendas and any supporting handouts (such as Mitigation Area Incident Maps), summarizing CAC meeting minutes, and producing the spring and fall newsletters for distribution by Public Works. The status of the Community Awareness Program and activities conducted in 2018 are summarized in Section 9.0.

1.3.8 Public Outreach Program

The community outreach program was implemented in 2009 to educate the various types of recreational user groups about the sensitivity of plant communities and wildlife species present in the Mitigation Area. This program was continued in 2018 due to its past success. On-site interviews and education about the Mitigation Area were conducted on three occasions by Chambers Group's bilingual biologists in 2018. The biologists handed out bilingual brochures describing the ecological purpose of the Mitigation Area, the importance of protecting sensitive biological resources, and approved recreational uses and prohibited activities within the Mitigation Area. While on site, the biologists documented any unusual observations or circumstances such as the presence of rock dams or unauthorized activities within the Mitigation Area. A full description of the outreach efforts, and notable incidents documented in 2018, are included in Section 10.0.

1.3.9 Special Assessments

Chambers Group staff are available to provide special assessments on an on-call basis. Special assessments include damage assessments (e.g., fire damage, vandalism) and other site issue assessments, and the subsequent coordination and response.

Post Creek Fire Assessment

A post Creek Fire site assessment was conducted in February 2018 to assess the extent and severity of fire damage caused by the Creek Fire that burned through the Mitigation Area in December 2017. A memo report detailing the results of the assessment including recommendations for site enhancement was submitted to Public Works in May 2018. This task is discussed in Section 11.0.

1.3.10 Preparation and Submittal of Annual Report

This task refers to the preparation of the annual report and the individual task reports that are included as appendices to the annual report.

1.3.11 Attendance at Meetings with Agencies, Public, and Consultants

Chambers Group attended meetings with Public Works, agencies, the general public, and consultants as necessary regarding various aspects of the MMP implementation. Details of meetings attended in 2018 are discussed in Section 12.0.

1.3.12 Coordination with LACDPR

Chambers Group staff informed and coordinated with Los Angeles County Department of Parks and Recreation (LACDPR) concerning activities that took place within the Mitigation Area and the Tujunga Ponds LACDPR parcel. On September 7, 2018 Chambers Group biologists coordinated and worked with LACDPR employees to repair the fish exclusionary screens located in Haines Canyon Creek just downstream from the Tujunga Ponds.

SECTION 2.0 – CONTINUATION OF BROWN-HEADED COWBIRD TRAPPING PROGRAM

The brown-headed cowbird trapping program was established at the Mitigation Area to decrease and ultimately eliminate nest parasitism on sensitive songbird species present or potentially present in the Mitigation Area, such as least Bell's vireo and southwestern willow flycatcher. Trapping and eradicating brown-headed cowbirds increases the ecological value of the site by enhancing the reproductive success of these sensitive riparian songbirds and promoting general breeding activity within the Mitigation Area. Trapping was initiated in the Mitigation Area in 2001 and was conducted yearly between 2001 and 2006 and again between 2009 and 2017. Trapping was not conducted in 2007 and 2008, as it was one of the tasks originally scheduled to occur once every three years. CDFW requested that this task be completed every year in the most recent Streambed Alteration Agreement (SAA) issued for the site (dated January 29, 2009). Brown-headed cowbird trapping was not conducted for the Mitigation Area during 2018 due to lack of suitable nesting habitat after the Creek Fire. The continuation of this program will be commensurate with the reestablishment of suitable nesting habitat as determined by qualified Chambers Group avian biologists or as required by CDFW.

SECTION 3.0 – HABITAT RESTORATION PROGRAM

The habitat restoration program was originally established to preserve, improve, and create habitat for Santa Ana sucker, Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), arroyo chub (*Gila orcuttii*), arroyo toad, least Bell's vireo, and southwestern willow flycatcher; all are sensitive and/or listed species either known to occur or that have a high potential to occur on site. These species are associated with aquatic and/or riparian habitats; therefore, the habitat restoration program focused on the restoration of cottonwood-willow riparian habitat. The goal of the initial habitat restoration plan was to remove invasive, non-native, and weedy species, such as giant reed (*Arundo donax*), and to replant these areas with native riparian species. The enhancement plan consisted of various tasks designed to remove the non-native species, prepare the areas prior to planting, install cuttings and container plant materials, and monitor the success of the plantings. Initial installation of cottonwood-willow riparian habitat along Haines Canyon Creek occurred in 2000 and 2001. The habitat restoration program was ongoing through the first part of 2007, when the last plantings were installed. Failure of the plantings due to environmental conditions and vandalism initiated a reevaluation of the restoration program in late 2007.

When ECORP took over the contract for the implementation of the MMP in mid-2007, the habitat restoration plan was revised to address the changing needs of the Mitigation Area and to address the long-term maintenance needs of the restoration areas. The habitat restoration plan was updated in 2009 (ECORP 2009) and is included in Appendix C of the 2009 Annual Report for the Mitigation Area (ECORP 2010).

3.1 SUMMARY OF THE ORIGINAL HABITAT RESTORATION EFFORTS

The original habitat restoration efforts conducted in the Mitigation Area are addressed in detail in Section 2.2 of the 2009 Annual Report for the Big Tujunga Wash Mitigation Area (ECORP 2010). During the first five years following implementation of the original MMP, habitat restoration efforts within the Mitigation Area focused on planting new riparian woodland overstory and understory plants in existing canopy openings or in openings that were created after extensive stands of invasive exotic species were removed. Container plantings and cuttings of native plant species were placed throughout the Mitigation Area and watered on a regular basis to promote survival. In 2004, the cuttings and container plantings were found to have a low survival rate, presumably due to the lack of naturally available water. It was concluded at that time that natural recruitment was more effective at filling openings in the riparian canopy than the active planting program, so no new planting efforts were conducted until 2007.

Additional planting efforts occurred in 2007; however, 2007 was a severe drought year and none of the native plant cuttings survived. A watering program was immediately implemented to promote survival, and the planted container plants did survive. No additional losses of these container plants were noted following the watering program.

3.2 CURRENT STATUS OF THE HABITAT RESTORATION PROGRAM

The planting and maintenance portions of the habitat restoration program were terminated in 2010 (ECORP 2011); however, the exotic plant removal component of the habitat restoration program was continued, and the exotic plant removal task was absorbed into the new exotic plant eradication and maintenance program during the contract revision in 2012. The exotic plant eradication and maintenance program activities conducted in 2018 are discussed in Section 4.0.

SECTION 4.0 – CONTINUATION OF EXOTIC PLANT ERADICATION AND MAINTENANCE PROGRAM

The purpose of the exotic plant eradication and maintenance program at the Mitigation Area is to increase the ecological value of the existing native vegetation communities. The original exotic plant removal program targeted the riparian communities in and around Haines Canyon Creek, Big Tujunga Wash, and the Tujunga Ponds. This program was expanded in 2012 due to a contract revision and now encompasses the cottonwood-willow restoration area maintenance and oak-sycamore woodland weeding activities. By removing exotic plant species and continually performing maintenance in restoration areas throughout the Mitigation Area, native plant species are able to flourish due to reduced competition for resources, such as light and water. This ultimately allows for natural recovery of native plant communities and increased chances of success within the restoration areas, which results in an improvement in the ecological function of the entire area. Improved habitat function benefits both common and sensitive species of plants and wildlife that either occur or have the potential to occur at the Mitigation Area. Table 4-1 lists the exotic plant species targeted for eradication.

Table 4-1. Target Non-Native Weed Species

Common Name	Scientific Name
sticky snakeroot	<i>Ageratina adenophora</i>
palm species*	<i>Arecastrum</i> sp., <i>Washingtonia</i> sp., etc.
giant reed*	<i>Arundo donax</i>
mustard species*	<i>Brassica</i> sp., <i>Hirschfeldia incana</i> , <i>Sisymbrium</i> sp.
Italian thistle	<i>Carduus pycnocephalus</i>
non-native thistle*	<i>Cirsium</i> sp.
umbrella-plant*	<i>Cyperus involucratus</i>
water hyacinth	<i>Eichhornia crassipes</i>
gum tree*	<i>Eucalyptus</i> sp.
fennel*	<i>Foeniculum vulgare</i>
white sweetclover*	<i>Melilotus albus</i>
tree tobacco*	<i>Nicotiana glauca</i>
common plantain*	<i>Plantago major</i>
castor-bean*	<i>Ricinus communis</i>
pepper tree	<i>Schinus terebinthifolius</i> , <i>S. molle</i>
milk thistle*	<i>Silybum marianum</i>
Mediterranean tamarisk*	<i>Tamarix ramosissima</i>
Non-Native Annual Grasses	
wild oat*	<i>Avena fatua</i>
slender wild oat*	<i>Avena barbata</i>
foxtail chess*	<i>Bromus madritensis</i> subsp. <i>madritensis</i>
ripgut grass*	<i>Bromus diandrus</i>
soft chess*	<i>Bromus hordeaceus</i>
glaucous foxtail barley*	<i>Hordeum murinum</i>
annual beard grass*	<i>Polypogon monspeliensis</i>
Non-Native Perennial Grasses	
pampas grass*	<i>Cortaderia selloana</i>
Bermuda grass*	<i>Cynodon dactylon</i>
Italian ryegrass*	<i>Festuca perennis</i>
fountain grass*	<i>Pennisetum setaceum</i>
smilo grass*	<i>Stipa miliacea</i> var. <i>miliacea</i>

*Observed in 2018

Table 4-2 lists all the additional exotic plant species observed within the Mitigation Area.

Table 4-2. Additional Exotic Plant Species Observed in the Mitigation Area in 2018

Common Name	Scientific Name
tree of heaven	<i>Ailanthus altissima</i>
black mustard	<i>Brassica nigra</i>
totalote	<i>Centaurea melitensis</i>
spotted spurge	<i>Chamaesyce maculata</i>
lamb's quarters	<i>Chenopodium album</i>
taro root	<i>Colocasia esculenta</i>
poison hemlock	<i>Conium maculatum</i>
bindweed	<i>Convolvulus arvensis</i>
flax-leaved horseweed	<i>Erigeron bonariensis</i>
red-stemmed filaree	<i>Erodium cicutarium</i>
petty spurge	<i>Euphorbia peplus</i>
shortpod mustard	<i>Hirschfeldia incana</i>
prickly lettuce	<i>Lactuca serriola</i>
sweet-alyssum	<i>Lobularia maritima</i>
scarlet pimpernel	<i>Lysimachia arvensis</i>
cheeseweed	<i>Malva parviflora</i>
horehound	<i>Marrubium vulgare</i>
marvel of Peru	<i>Mirabilis jalapa</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
wild radish	<i>Raphanus sativus</i>
Himalayan blackberry	<i>Rubus armeniacus</i>
London rocket	<i>Sisymbrium irio</i>
prickly sow thistle	<i>Sonchus asper</i>
common sow thistle	<i>Sonchus oleraceus</i>
tamarisk	<i>Tamarix</i> sp.
feverfew	<i>Tanacetum parthenium</i>
puncture vine	<i>Tribulus terrestris</i>
greater periwinkle	<i>Vinca major</i>
Non-Native Annual Grasses	
barnyard grass	<i>Echinochloa crus-galli</i>
goose grass	<i>Eleusine indica</i>
fall panicgrass	<i>Panicum dichotomiflorum</i> subsp. <i>dichotomiflorum</i>
Non-Native Perennial Grasses	
redtop	<i>Agrostis stolonifera</i>

The revised approach to the exotic plant eradication and maintenance program also includes a more aggressive program for targeting and eliminating the large, non-native trees that create the dense overstory within the Mitigation Area. Removal of these exotic tree species will create a more open canopy within the Mitigation Area, which will allow more sunlight to reach the native plant species growing beneath the canopy. The tree species targeted under the exotic plant eradication and maintenance program are listed in Table 4-3.

Table 4-3. Target Invasive Exotic Tree Species

Common Name	Scientific Name
acacia species*	<i>Acacia dealbata</i> and <i>Acacia</i> spp.
southern catalpa*	<i>Catalpa bignonioides</i>
gum tree*	<i>Eucalyptus</i> spp.
edible fig*	<i>Ficus carica</i>
shamel ash	<i>Fraxinus uhdei</i>
Japanese privet	<i>Ligustrum japonicum</i>
sweetgum	<i>Liquidambar styraciflua</i>
white mulberry	<i>Morus alba</i>
tree tobacco*	<i>Nicotiana glauca</i>
castor-bean*	<i>Ricinus communis</i>
Peruvian pepper tree	<i>Schinus molle</i>
Brazilian pepper tree	<i>Schinus terebinthifolius</i>
Chinese elm*	<i>Ulmus parvifolia</i>
palm species*	<i>Washingtonia</i> sp., <i>Phoenix canariensis</i> , etc.

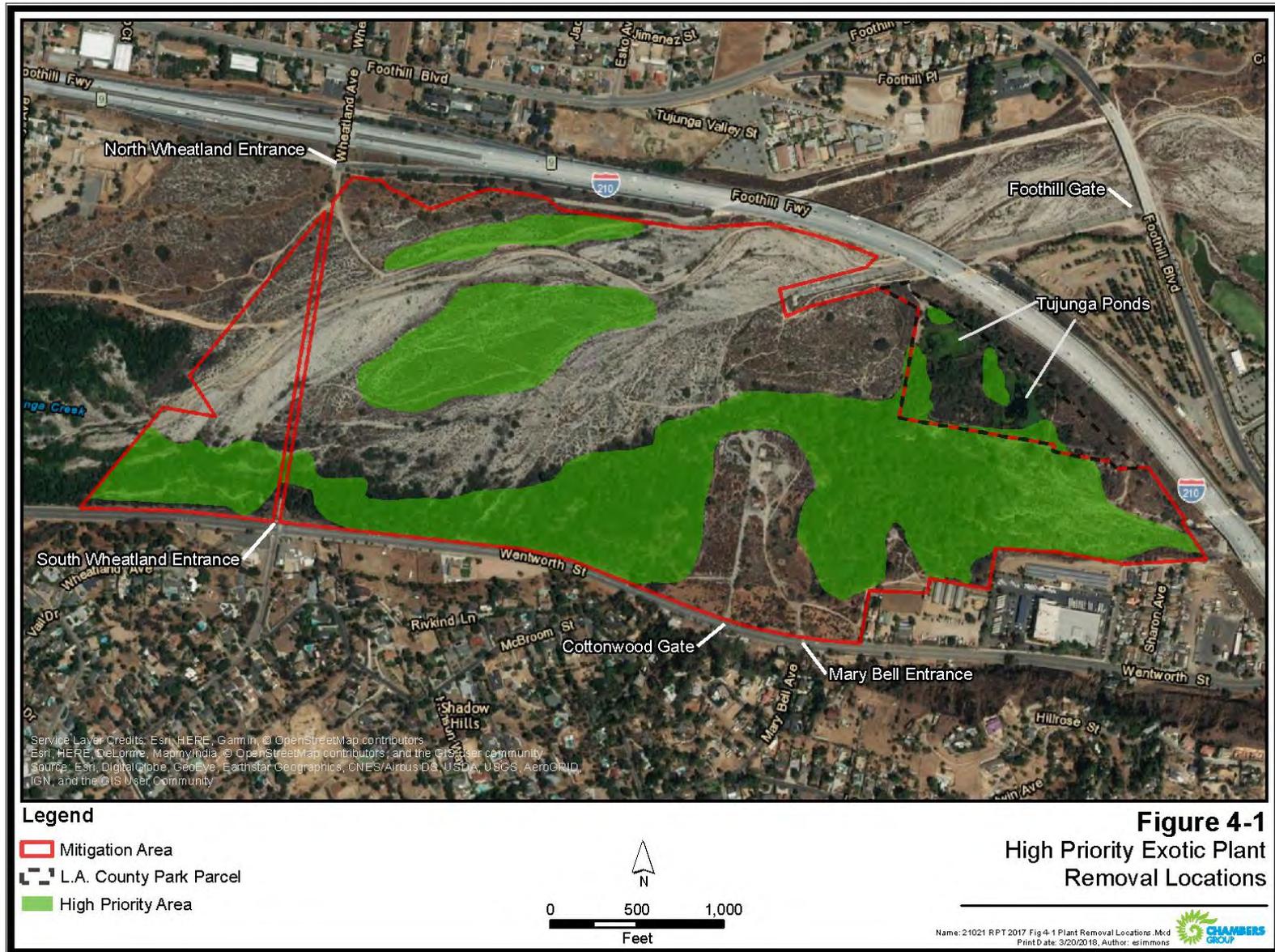
*Observed in 2018

4.1 METHODS

Exotic plant eradication activities took place throughout the riparian and upland portions of the Mitigation Area. These eradication activities also included weeding in the upland area between Big Tujunga Wash and the northern boundary of the Mitigation Area. Before 2012, this area was not part of the sections that were actively weeded on a regular basis, but infestations of invasive exotic plant species (fountain grass [*Pennisetum setaceum*]) and weedy species (thistle [*Cirsium* spp.] and mustard [*Brassica* spp.]) reached levels that needed to be controlled and are now included in regular exotic plant removal efforts. Although exotic plant eradication efforts were conducted throughout the entire Mitigation Area in 2018, Figure 4-1 shows the areas that are considered high priority for targeting exotic plant species.

Pre-activity surveys were conducted by qualified biologists prior to each exotic plant eradication effort to document exotic plant locations and any sensitive biological resources to avoid during the removal efforts. During the pre-activity surveys, the biologists conducted a walkthrough of all trails in the riparian and upland areas. Coordinates of new exotic plant species locations or sensitive biological resources (such as active bird nests) were recorded with Collector for ArcGIS mobile application (Collector; an Esri-based application) on either a tablet or personal smart phone. All captured points, including but not limited to, sensitive species observations, nesting bird locations, boundaries of environmentally sensitive areas, authorized and unauthorized trails, and photographs, are geo-referenced (GPS coordinate associated with a point), time stamped for accurate inventory, and catalogued. The data is automatically posted to the server and is available for all field crew to review throughout the eradication efforts. CDFW was notified prior to the commencement of removal activities, in accordance with the Mitigation Area's SAA.

Figure 4-1. High Priority Exotic Plant Removal Locations



During the exotic plant eradication efforts, a biological monitor was present to monitor that crews conducted work within the appropriate pre-defined work areas and that the removal activities did not result in negative impacts to sensitive biological resources, such as nesting birds. The biological monitor also participated in morning tailgate sessions to remind the crews about the sensitive biological resources present in the Mitigation Area. A bilingual worker education brochure that contained general information and guidelines pertaining to the site was distributed to all new workers entering the site (Appendix B). The biological monitor was responsible for showing crew members locations of exotic plant species that had been recorded during previous site visits and pre-activity surveys. Newly identified stands of exotic vegetation were treated as they were discovered or were mapped with Collector for treatment on a subsequent day when necessary. All treated areas were documented by the biological monitor, the Director of Restoration Construction, Steven Reinoehl, or the Restoration Foreman, Tim Wood, and digital photographs were taken to document removal efforts. Following the completion of each eradication effort, a memo was prepared that documented the date, locations, and details of eradication activities conducted, and the presence and locations of any sensitive biological resources. All exotic plant removal efforts were conducted according to the terms and conditions of the SAA.

Exotic plants and trees were either removed manually (by cutting, sawing, or hand digging) or by herbicide treatment. Hand-saws and hand tools (e.g., machetes) were used for cutting small exotic trees. All herbicides used during exotic plant eradication efforts were California-approved aquatic herbicides approved for use within 15 feet of any water source, including permanent (Haines Canyon Creek, Tujunga Ponds) and temporary (Big Tujunga Wash, ephemeral ponds from rains) sources. Woody exotic species such as castor bean, tree tobacco (*Nicotiana glauca*) and tree of heaven (*Ailanthus altissima*) were treated with the cut-stump method using an herbicide mixture of 25 percent Garlon® 4 Ultra (a triclopyr-based herbicide), 5 percent Activator 90 (a penetrant, deposition, and drift control agent), and Turf Trax® (a blue indicator dye) or 25 percent Garlon® 4 Ultra, 5 percent Liberate® (a penetrant, deposition, and drift control agent) and Turf Trax®. Smaller exotic plants and non-native grasses were treated with a foliar herbicide application when possible or were hand-pulled where herbicides had the potential to damage nearby native vegetation. The foliar herbicide mixture contained 2.5 percent Roundup Custom™ (a glyphosate-based herbicide), 1 percent Activator 90, and Turf Trax®. Cuttings of large exotic plant species were not removed from the site but were arranged in a manner that would prevent re-growth or establishment of new stands. The cuttings were placed in areas that would not impede visitor traffic, pose a safety hazard, or affect the aesthetics of the site.

4.2 NON-NATIVE EXOTIC PLANT ERADICATION EFFORTS IN 2018

Chambers Group conducted site-wide exotic plant eradication during four different efforts in 2018: May 1 through 30, July 24 through August 31, November 8 through 30, and December 3 through 27. Chambers Group biologists Jacob Lloyd Davies, Cynthia Chavez, Kaelin McAtee, and Jeremy Smith and the Director of Restoration Construction, Steven Reinoehl, or the Restoration Foreman, Tim Wood, conducted the pre-activity surveys and/or the biological monitoring for all exotic plant eradication efforts.

Substantially more effort was required to remove exotic plant species from the site in 2018 due to an increase of exotic weeds after the Creek Fire in December 2017. With very few native plants remaining on site after the Creek Fire, weedy species were left with little competition for resources (e.g., light, water) and were able to establish rapidly and in greater numbers than in previous years. Exotic plant and tree eradication efforts were conducted throughout the entire Mitigation Area. The eradication activities did not result in impacts to any sensitive biological resources. During the first effort, active bird nests, potential bird nests, and/or birds behaving territorially or exhibiting nesting behaviors were discovered at

8 locations during exotic plant removal activities. Active nests were determined to belong to Bewick's wren (*Thryomanes bewickii*), mourning dove (*Zenaida macroura*), and western bluebird (*Sialia mexicana*) and were flagged for avoidance by the biologists. Potential nests were also recorded in areas where birds were observed carrying nesting materials (e.g., grass, twigs) into shrubs or trees or where pairing or territorial behaviors were observed. Bird species observed displaying pairing and/or territorial behaviors included California towhee (*Melospiza crissalis*), California scrub jay (*Aphelocoma californica*), and house finch (*Haemorrhous mexicanus*). No-work buffers were established around all active and potential bird nests until it could be determined that the nestlings had fledged and the nest was no longer being used (active nests) or that no nest was present (potential nests). The biological monitors were present during all work activities occurring outside of the buffers to monitor that the adults and young associated with each nest were not affected. No active bird nests were identified, and no breeding or nesting behaviors were observed prior to or during the second exotic plant eradication effort. The third and fourth exotic plant eradication efforts took place outside of the nesting bird season.

Notes and representative site photographs were taken, and the coordinates of additional exotic plant locations were recorded using Collector on either smart phones or tablets.

Copies of all memos documenting pre-activity surveys, exotic plant removal, CDFW notifications, and photographs taken during removal efforts can be found in Appendix D.

SECTION 5.0 – WATER LETTUCE CONTROL PROGRAM

During an exotic wildlife removal effort in March 2011, aquatic biologists noticed that the Tujunga Ponds were becoming infested with water lettuce, an invasive plant commonly used in aquariums and ponds. Within one month of the initial observation, the entire East Tujunga Pond was completely covered with the surface-growing plant. Within two months the entire West Tujunga Pond was covered. The infestation was so great that the waterways between the ponds and Haines Canyon Creek became suffocated. Water lettuce is listed under the United States Department of Agriculture’s Plant Database as an invasive and noxious weed, and it is thought to spread via dumping of aquariums (USDA NRCS 2011). Without management, water lettuce at the Tujunga Ponds has the potential to threaten the habitat and endangered species in Haines Canyon Creek, such as the Santa Ana sucker, as well as negatively impact the native turtle and bird species that use the ponds as habitat. ECORP and Public Works created a plan for water lettuce removal from the Mitigation Area waterways.

Intensive water lettuce removal efforts were immediately initiated to control the infestation. Physical removal efforts were conducted between June and December 2011 and between January and September 2012. Detailed descriptions of the physical removal efforts can be found in the 2011 and 2012 Annual Reports for the Big Tujunga Wash Mitigation Area (ECORP 2012, 2013).

Following the initial physical removal of the water lettuce, a monitoring and maintenance program was established in 2012 to keep the water lettuce populations in check and prevent another infestation from occurring in the Tujunga Ponds and the channel that connects the ponds. The program consisted of monthly herbicide applications conducted on an as-needed basis paired with follow-up site inspections to monitor the success of the herbicide application. Four herbicide application efforts were conducted in 2012 after the physical removal effort, and two additional applications were conducted in 2013 (ECORP 2013, 2014). Renovate®, an herbicide designed for use within aquatic environments and approved by CDFW for use within the Mitigation Area, was applied to patches of hard-to-reach water lettuce within southern cattails (*Typha domingensis*) and other vegetation around the pond perimeters. During regular site visits following the treatments, biologists did not observe any evidence of water lettuce. The absence of water lettuce during the site visit provided evidence that the herbicide applications to the water lettuce were successful. Water lettuce was again observed in the East Tujunga Pond on two occasions during 2016. On both occasions, onsite biologists and exotic plant removal crews were able to remove the small patches of water lettuce by hand. The area was monitored during each subsequent site visit in 2016 and 2017, and no other water lettuce was observed.

A search for water lettuce was conducted by Chambers Group’s Director of Restoration Construction, Steven Reinoehl, on five occasions in 2018. These searches occurred on February 19 during a visit to check on the post-fire recovery of the Tujunga Ponds, on May 11 during exotic plant eradication efforts, and during each subsequent site visit to conduct exotic plant eradication in July, August, November, and December. The Tujunga ponds were searched extensively for water lettuce during these visits, and no water lettuce was observed. The Tujunga Ponds will continue to be monitored for any reoccurrence of water lettuce in 2019. A memo summarizing the water lettuce inspections for 2017, and for winter and spring of 2018, can be found in Appendix E.

SECTION 6.0 – CONTINUATION OF EXOTIC WILDLIFE ERADICATION PROGRAM

The purpose of the exotic wildlife removal program is to restore, create, and maintain suitable habitat for native aquatic species and to remove and eliminate ecological pressures resulting from the presence of exotic species. The program consists of the removal of non-native fishes, turtles, American bullfrogs, and red swamp crayfish from the Tujunga Ponds (East Pond and West Pond) and Haines Canyon Creek.

In an ongoing effort to protect and enhance the existing habitat at the Mitigation Area for native wildlife species, Chambers Group continued the exotic aquatic species removal effort as described in the MMP. The MMP provides direction for the eradication of exotic wildlife from the Tujunga Ponds and Haines Canyon Creek to relieve some of the potentially negative impacts to native species. Due to the fecund nature of exotic species and their ability to inhabit various habitat types while tolerating extreme environmental conditions, exotic species can outcompete natives for available space and food resources. Exotics can also directly affect native species through predation of adults and their young, or indirectly through the transmission of pathogens or parasites.

During the 2015 Native Fishes Survey in Haines Canyon Creek, the number of Santa Ana sucker was observed to have declined from 119 to 17 individuals between May and October 2015. The decline during this period was largely attributed to the absence of juveniles. During the previous Native Fishes Survey in Haines Canyon Creek in 2012, 592 Santa Ana sucker (502 adults and 90 juveniles) were detected. Despite ongoing exotic wildlife removal efforts, the exotic, aquatic species remain widespread throughout Haines Canyon Creek with source populations located both upstream (Tujunga Ponds) and downstream (Hansen Dam). The 2015 Native Fishes report noted a greater abundance of exotic wildlife species nearest the Tujunga Ponds with fewer individuals detected further away from the Tujunga Ponds. At the time, the distribution of Santa Ana sucker in Haines Canyon Creek was patchy and restricted to the lower half of the Mitigation Area below the Cottonwood Avenue equestrian trail crossing.

Based on declining numbers of native species and increasing number of exotic species, the exotic wildlife removal program was reevaluated and modified in 2016. The modification of the exotic wildlife removal program increased the level of effort with fewer days between each visit. Other than the increase in frequency, the methods and techniques of exotic wildlife removal remained the same as in previous efforts.

In addition, a Santa Ana Sucker Working Group was formed which included representatives from CDFW and USFWS. The goal of this group is to discuss issues pertaining to the Santa Ana sucker in Haines Canyon Creek and brainstorm on solutions to better aid in the species' recovery. After some discussion within the group, a decision was made to allow electrofishing as a removal method for capturing exotic aquatic species in Haines Canyon Creek in 2016, a technique which had not been previously allowed for exotic wildlife removal in the Mitigation Area.

In June 2016, a fish screen was installed downstream of the Tujunga Ponds to limit the potential for migration of exotic aquatic species from the Tujunga Ponds into Haines Canyon Creek. The fish screen was funded through a USFWS grant (Cooperative Agreement F15AC 00800).

The data presented in this section of the annual report summarize the results of the exotic wildlife removal efforts conducted in 2018.

6.1 METHODS

The 2018 removal of exotic aquatic species from the Mitigation Area was conducted monthly by Chambers Group from February through December (with the exception of October and November) 2018 under the direction of Chambers Group Biologist Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1). Each effort consisted of one to four days for each month. Removal methods used in the Tujunga Ponds included dip-netting, hand capture, two-person seining (most often seines were deployed from an inflatable raft), and rod-and-reel. Dip-netting, two-person seining, and rod-and-reel fishing were conducted at the confluence with Haines Canyon Creek and the West Tujunga Pond. Hand capturing was conducted when necessary in conjunction with other methods. Removal efforts in Haines Canyon Creek included dip-netting, hand capturing, and two-person seining. The electrofishing removal method was not used during wildlife removal efforts in 2018. Prior to using any specific gear types, reconnaissance surveys (visual surveys from banks and snorkel surveys) were conducted to identify the locations and relative abundance of both target and non-target species.

Exotic species removal did not occur in occupied Santa Ana sucker reaches between March 1 and July 31, 2018, in order to avoid disturbances during the breeding season and potential negative impacts to juvenile individuals. After July 31, when Santa Ana sucker were absent within a reach, or were present with non-native species within a reach, the less invasive seining and dip-netting removal methods were used. Any native species that was incidentally captured during exotic species removal efforts, was immediately released unharmed. All wetted portions of the Mitigation Area were surveyed to locate and remove exotic wildlife during 2018 (Figure 6-1).

6.2 RESULTS

A total of 9,156 individuals consisting of 6 exotic aquatic species (five fishes and one invertebrate) were captured and removed from the site during the 2018 removal efforts (Table 6-1). Of the total, 53.8 percent (number of individuals [n]=4,929) of the individuals captured were red swamp crawfish, 19.8 percent (n=1,814) were largemouth bass, 13.9 percent (n=1,271) were bluegill, 8.0 percent (n=737) were green sunfish, 4.5 percent (N=404) were western mosquitofish, and less than 0.1 percent (n=1) were Mozambique tilapia. Haines Canyon Creek accounted for 53.7 percent of the total exotic species captured (n=4,918), while the remaining 46.3 percent of exotic species were captured in other water features: West Pond (n=2,036) and East Pond (n=2,202). Table 6-2 shows the taxonomic groups of individuals captured by month.

Table 6-1. Species Captured During the Exotic Aquatic Species Removal Efforts, 2017

Exotic Species		
Common Name	Scientific Name	Total
red swamp crayfish	<i>Procambarus clarkii</i>	4,929
western mosquitofish	<i>Gambusia affinis</i>	404
green sunfish	<i>Lepomis macrochirus</i>	737
bluegill	<i>Lepomis macrochirus</i>	1,271
largemouth bass	<i>Micropterus salmoides</i>	1,814
Mozambique tilapia	<i>Oreochromis mossambicus</i>	1
TOTAL		9,156

Figure 6-1. Exotic Aquatic Wildlife Survey Locations



Table 6-2. Summary of Species Captured by Month, 2018

Species Captured	Feb.	March	April	May	June	July	Aug.	Sept.	Dec.	Total
red swamp crayfish	3	0	1,007	2,247	900	1	71	641	59	4,929
western mosquitofish	0	10	107	22	144	4	117	0	0	404
green sunfish	0	0	0	0	181	24	532	0	0	737
bluegill	0	2	0	0	316	806	145	0	2	1,271
largemouth bass	0	3	2	1	897	559	224	106	22	1,814
Mozambique tilapia	0	1	0	0	0	0	0	0	0	1
TOTAL	3	16	1,116	2,270	2,438	1,394	1,089	747	83	9,156

The removal efforts resulted in the capture and removal of 4,929 red swamp crayfish, 404 western mosquitofish, 737 green sunfish, 1,814 largemouth bass, 1,271 bluegill, and 1 Mozambique tilapia.

In addition, three native fish species were observed during the exotic removal efforts, including Santa Ana sucker, arroyo chub, and Santa Ana speckled dace. Few native aquatic species were encountered during the February, March, and September exotic removal efforts; however, young-of-the-year Santa Ana sucker and arroyo chub were encountered during the February effort approximately 300 feet downstream from the western boundary of the Mitigation Area while investigating Haines Canyon Creek for exotics. Between the months of April and August thousands of Santa Ana sucker and arroyo chub were observed during exotic wildlife removal efforts. Removal efforts were ceased and rescheduled for a later date in areas of the creek where high volumes of natives were observed in order to avoid potential negative impacts to the species. During the August exotic wildlife removal effort, biologists removed a rock dam that had created a large, stagnate, ponded area in which native fishes were observed displaying “flashing” behavior in an attempt to remove parasites from their gills. Details regarding the rock dam can be found in Section 10.0 Public Outreach.

Algal growth was observed in the creek during the April and June exotic wildlife removal efforts. The large algal mats that formed in the creek are known to harbor exotics that are detrimental to natives, and the biologists targeted these areas to prevent the continual spread of exotics. The algal mats were removed by the biologists during the June removal effort. On September 7, 2018, Chambers Group biologists worked with LACDPR employees to repair and improve the fish exclusionary screens that serve to reduce the migration of exotics species from the Tujunga Ponds to downstream native species habitat. Copies of memos and photographs documenting each exotic species removal effort can be found in Appendix F.

SECTION 7.0 – WATER QUALITY MONITORING PROGRAM

Chambers Group qualified biologists conducted the annual water quality sampling for the Mitigation Area in 2018. The monitoring program has been designed to specifically address inputs to the site from upstream land uses such as the Angeles National Golf Club (previously named Canyon Trails Golf Club). Potential impacts to aquatic species from run-on to the site that contains excessive nutrients or pesticides are of primary concern. A series of sampling parameters were collected in the field from three sampling locations (one sampling location in the Tujunga Wash was dry, and therefore was not sampled) using a YSI 556-01 Multi Probe System. Samples were taken at mid-depth, along a transect perpendicular to the stream channel alignment. All analyses were either performed by Enthalpy Analytical, LLC, located in Orange, California, or Test America, located in Savannah, Georgia. Quality assurance/quality control (QA/QC) procedures followed the methods described in their respective Quality Assurance Manuals.

7.1 BASELINE WATER QUALITY

Sampling and analysis conducted by Public Works prior to implementation of the MMP is considered the baseline for water quality conditions at the site. The results of baseline analyses conducted in April 2000 are listed in Table 7-1 Baseline Water Quality Sampling Results (2000) and are provided in the 2018 Water Quality Monitoring Report that is included as Appendix G. Higher bacteria and turbidity observed in the April 18, 2000 baseline samples were attributed to a rain event. Phosphorus levels were also high in the April 18, 2000 samples, perhaps due to release from sediments.

Table 7-1. Baseline Water Quality Sampling Results (2000)

Parameter	Units	Date	Haines Canyon Creek, inflow to Tujunga Ponds	Haines Canyon Creek, outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
pH	std units	4/12/00	7.78	7.68	7.96	7.91
		4/18/00	7.18	7.47	7.45	7.06
Ammonia-N	mg/L	4/12/00	0	0	0	0
		4/18/00	0	0	0	0
Kjeldahl-N	mg/L	4/12/00	0	0.1062	0.163	0
		4/18/00	0	0.848	0.42	0.428
Nitrite-N	mg/L	4/12/00	0.061	0	0	0
		4/18/00	0.055	0	0	0
Nitrate-N	mg/L	4/12/00	8.38	5.19	0	3.73
		4/18/00	8.2	3.91	0.253	0.438
Dissolved phosphorus	mg/L	4/12/00	0.078	0.056	0	0.063
		4/18/00	0.089	0.148	0.111	0.163
Total phosphorus	mg/L	4/12/00	0.086	0.062	0	0.066
		4/18/00	0.113	0.153	0.134	0.211
Turbidity	NTU	4/12/00	1.83	0.38	1.75	0.6
		4/18/00	4.24	323	4070	737

Table 7-1. Baseline Water Quality Sampling Results (2000)

Parameter	Units	Date	Haines Canyon Creek, inflow to Tujunga Ponds	Haines Canyon Creek, outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
Fecal coliform	MPN/100 ml	4/12/00	500	300	40	80
		4/18/00	500	30,000	2,400	50,000
Total coliform	MPN/100 ml	4/12/00	3,000	5,000	170	1,700
		4/18/00	2,200	170,000	2,400	70,000

NA – data not available NTU – nephelometric turbidity units

7.2 WATER QUALITY SAMPLING RESULTS FOR 2018

Results of laboratory analyses conducted by Enthalpy Analytical are summarized in Table 7-2 and are provided in the 2018 Water Quality Monitoring Report that is included as Appendix G. Note that the yields (percent recoveries) of quality control samples were within acceptable limits (percentages) for all samples. In addition, some of the water quality constituents that are tested on an annual basis after the implementation of the MMP were not included in the baseline water quality sampling. Tests for herbicides and pesticides were added to determine whether or not these chemicals were being transported downstream to the Mitigation Area.

Table 7-2. Summary of Water Quality (December 17, 2018)

Parameter	Units	Haines Canyon Creek, Inflow to Tujunga Ponds	Haines Canyon Creek, Outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
Dissolved Oxygen	mg/L	9.3†	6.8†	NA	10.8†
pH	std units	6.49	6.3	NA	6.4
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	ND	ND	NA	ND
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	9.00	6.91	NA	5.48
Orthophosphate-P	mg/L	ND	ND	NA	ND
Total phosphorus-P	mg/L	0.03	0.03	NA	0.04
Glyphosate	µg/L	ND	ND	NA	ND
Chloropyrifos*	µg/L	ND	ND	NA	ND
Pesticides (EPA 608)**	µg/L	ND	ND	NA	ND
Turbidity	NTU	0.79	1.05	NA	0.33
Fecal Coliform Bacteria	(MPN/100 ml)	13	33	NA	20
Total Coliform Bacteria	(MPN/100 ml)	920	540	NA	>1600

Table 7-2. Summary of Water Quality (December 17, 2018)

NA – data not available; station dry on the sample date **ND** – non-detect
NTU – nephelometric turbidity units **MPN** – most probable number

* The analytical method used for chloropyrifos (EPA 8141A) also tests for the following chemicals: azinphos- methyl, bolster, coumaphos, diazinon, demeton, dichlorvos, disulfoton, ethoprop, fensulfothion, fenthion, mevinphos, naled, phorate, runnel, stirophos, parathion-methyl, tokuthion, and trichloronate.

**EPA method 608 tests for aldrin, BHC, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, and toxaphene.

† Due to equipment calibration errors on December 17, 2018, dissolved oxygen readings were retaken on March 1, 2019.

7.2.1 Comparison of Results with Aquatic Life Criteria

Table 7-3 provides the results of the December 2018 water quality sampling when compared to objectives established by the Los Angeles Regional Water Quality Control Board for protection of beneficial uses in Big Tujunga Wash (including wildlife habitat) and the Environmental Protection Agency (EPA) criteria for freshwater aquatic life.

Table 7-3. Discussion of December 2018 Big Tujunga Wash Sampling Results

Parameter	Discussion
Dissolved oxygen (DO)	<ul style="list-style-type: none"> ▪ Due to equipment calibration errors on December 17, 2018, dissolved oxygen (DO) readings were retaken on March 1, 2019, and reflect the conditions present at the sampling locations on that day. DO levels at all three sample stations were above the minimum recommended level (5.0 mg/L) for warmwater fish species.
pH	<ul style="list-style-type: none"> ▪ The lowest pH was observed in the Haines Canyon Creek outflow from the Tujunga Ponds (6.30), with the highest pH observed in the Tujunga Ponds (6.49). On this date, pH readings in all three stations were below the 6.5 to 8.5 range identified in the Basin Plan.
Total residual chlorine	<ul style="list-style-type: none"> ▪ No residual chlorine was detected at any station.
Nitrogen	<ul style="list-style-type: none"> ▪ Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. ▪ Ammonia was not detected at any of the station.
Phosphorus	<ul style="list-style-type: none"> ▪ The observed concentration at the ponds (0.04 mg/L) and in the outflow from the ponds (0.03 mg/L) is below the lower end of the EPA’s recommended range. (recommended range is <0.05 – 0.1 mg/L). Phosphorus was not detected at Haines Canyon Creek leaving the site.
Glyphosate	<ul style="list-style-type: none"> ▪ Glyphosate was not detected at any station.
Chloropyrifos and Organophosphorous Pesticides	<ul style="list-style-type: none"> ▪ Chloropyrifos and the other pesticides tested using EPA’s analytical method 8141A were not detected at any station.
Organochlorine Pesticides	<ul style="list-style-type: none"> ▪ Pesticides analyzed by EPA Method 608 were not detected at any station.
Turbidity	<ul style="list-style-type: none"> ▪ Turbidity levels were very low (<2.5 NTU) at all stations.

Table 7-3. Discussion of December 2018 Big Tujunga Wash Sampling Results

Parameter	Discussion
Bacteria	<ul style="list-style-type: none"> <li>▪ The fresh water bacteria standard for water contact recreation is for <i>E. coli</i> (126 MPN/100 ml geometric mean, 235 MPN/100 ml single sample limits). Observed fecal coliform levels were below the standard in the outflow from the ponds and Haines Canyon Creek leaving the site. On this date, fecal coliform levels in the ponds were 13 MPN/100 ml. Sampling specifically for <i>E. coli</i> was not conducted. <li>▪ Total coliform levels ranged from 540 MPN/100 ml at the outflow from the ponds to >1,600 MPN/100 ml in Haines Canyon Creek leaving the site. [Note that recreation standards are for <i>E. coli</i>. Total coliform standards apply to marine waters and waterbodies where shellfish can be harvested for human consumption.]

mg/L – milligrams per liter

NTU – nephelometric turbidity units

MPN – most probable number

SECTION 8.0 – TRAILS MONITORING PROGRAM

8.1 TRAILS SYSTEM MAINTENANCE

The goal of maintaining a formal trails system at the Mitigation Area is to allow recreational use of the Mitigation Area while still preserving sensitive wildlife and their habitats. The Mitigation Area contains both equestrian and hiking trails (**Error! Reference source not found.**). The preservation of authorized trails is an essential component in the success of the original restoration and enhancement of the site. This program has been continued in order to discourage the establishment of any new trails in the Mitigation Area. By ensuring that the authorized trails are kept clear and can be readily used by equestrians and hikers, unauthorized creation of new trails and illegal use of the Mitigation Area (e.g., camping, making fires) will be reduced. The maintenance and monitoring of the trail system are necessary components of the overall restoration and enhancement program.

Three regular trails maintenance efforts were conducted in 2018. These efforts occurred on June 12 through 26, November 14 through 28, and December 4 through 21. All pre-activity site sweeps were conducted by Chambers Group Biologist Jacob Llyod Davies. Subsequent trail maintenance was conducted by Chambers Group’s restoration department and was supervised by Director of Restoration Construction Steven Reinoehl, Restoration Foreman Tim Wood, and biologists who were on site during all maintenance efforts.

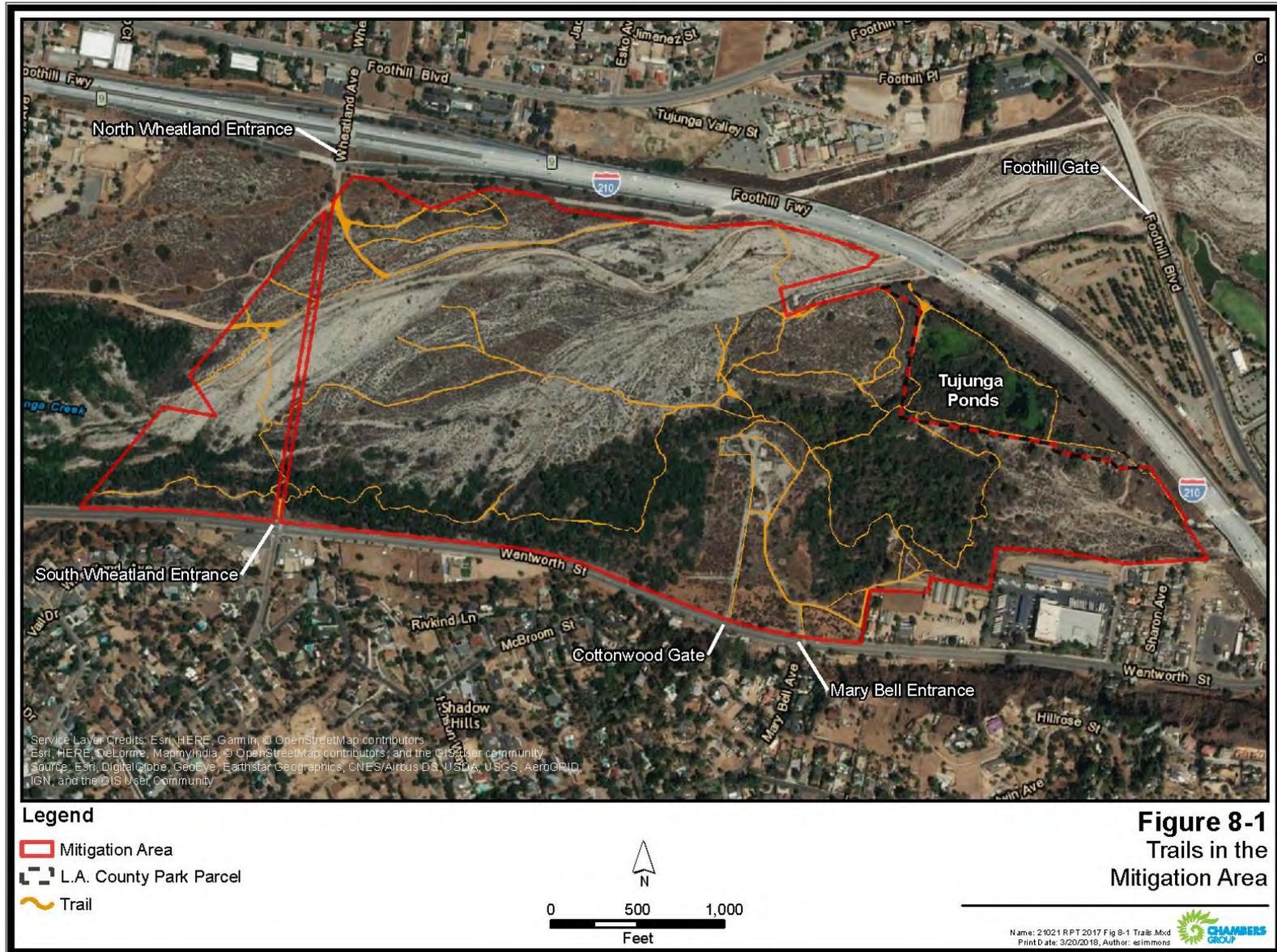
Substantially more trail maintenance work was required in 2018 than in previous efforts due to the Creek Fire that burned through the Mitigation Area in December 2017. Debris from the fire including burned and fallen trees and branches blocked portions of the authorized trail system and created hazards (e.g. loose and hanging branches, trip hazards) for site users. The focus of these site visits was to look for areas that might qualify for trail closure, identify areas where trails were blocked by trash or debris and restore them to pre-fire conditions, block off new unauthorized trails, and trim back extensive stands of poison oak found in close proximity to the trails. Assessment of trail signs, portable toilets, site fencing, and gated entrances was included in each effort. Areas that required minor repairs were remedied during the site visits or in combination with site visits for other maintenance tasks. More extensive problem areas were mapped for repair at a later time or were reported to Public Works for repair if necessary.

During the site visits, the restoration specialists and biologists assessed trail conditions and identified locations that were in need of maintenance. Examples of maintenance issues identified during these site visits included:

- Fallen trees and branches obstructing trails
- Overhanging tree branches at hiker and equestrian-height
- Dense native and non-native vegetation crowding trails
- Erosion
- Large dead trees or loose branches with the potential to fall on the trail
- Safety concerns
- Rock dams and walls constructed in Haines Canyon Creek
- Poison oak overgrowth
- Unauthorized trail establishment by recreational users

The restoration specialists and biologists immediately reported any homeless encampments they encountered during the site visits to Public Works.

Figure 8-1. Trails in the Mitigation Area



Maintenance activities to address the trail issues were monitored by Chambers Group biologists during each effort. Prior to any work, all members of the trail maintenance crew received onsite orientation and instruction on the Mitigation Area's regulations and concerns relating to the area's sensitive species and habitats by a qualified Chambers Group biologist. These efforts were summarized in memo reports following each of the trail maintenance efforts and are included as Appendix H.

8.2 POST-CREEK FIRE TREE ASSESSMENT

The post-Creek Fire tree assessment for the Mitigation Area was conducted in December 2018, as part of the Trail Maintenance and Monitoring task. The field survey was conducted on December 14, 2018, to assess and map burned native trees (burned during the Creek Fire in December 2017), located along or in close proximity to the existing authorized trail system and the anticipated alternative trail system, that may pose potential public safety concerns due to the compromised integrity of the burned trees and the continuing deterioration of these trees over time. This effort served to supplement and aid in the Snag Removal Project that occurred in April 2019 as part of a larger 2017 Creek Fire cleanup project paid for by a National Dislocated Worker's Grant. San Gabriel Valley Conservation Corps (SGVCC), LA Conservation Corps (LACC), Northern California Construction Training (NCCT), and Chambers Group collaborated with Public Works staff to facilitate the safe removal of the designated pre-approved snag trees.

Tree Assessment

Methods

As part of the Trail Maintenance and Monitoring task, the post-Creek Fire tree assessment was conducted by Chambers Group's Restoration Foreman, Tim Wood. The assessment focused on identifying burned native tree species along the existing authorized trail system that may pose a public safety concern, and prescribing a recommended action based on the tree species (soft-hardwood versus hard-hardwood species) and the current condition of each tree. Soft-hardwood species that were assessed included Fremont cottonwood (*Populus fremontii*), California boxelder (*Acer negundo*), western sycamore (*Platanus racemosa*), white alder (*Alnus rhombifolia*), and willow species (*Salix* spp.). Hard-hardwood species that were assessed included coast live oak (*Quercus agrifolia*), California black walnut (*Juglans californica*), and velvet ash (*Fraxinus velutina*). In general, the softer-wood tree species tend to burn more severely compromising the overall integrity of the tree, whereas the harder-wood tree species, being stronger and denser, tend to burn less severely under the same fire conditions. Each tree was assessed on an individual basis and according to the current site use conditions at the time of the assessment.

Results

Based on the current authorized trail alignment, remedial actions were recommended for approximately 60 trees including either cutting down the tree completely or reducing the crown of the tree (i.e., removing any weak or compromised branches) to a degree that would be determined safe. Of the approximately 60 trees recommended for remedial action, 17 trees were recommended for crown reduction, and 43 trees were recommended to be cut down completely.

Discussion and Recommendations

It was recommended that compromised trees along sections of authorized trails that were not planned to be rerouted during trail realignment be addressed as soon as possible so that cut trunks and branches

could be collected and used as vertical mulch along the new trail realignment route once the approval for trail realignment work was received from the agencies. Adding vertical mulch along the newly established route would help guide visitors and equestrian users to stay on the authorized trails and would also be used to block off access to old or unauthorized trails. Details of tree species assessed, locations, recommended actions, and photos of each tree location can be found Appendix I Post-Fire Tree Assessment Memo.

8.3 TRAIL CLEANUP DAY

In 2012, the official name of the annual volunteer event held at the Mitigation Area changed to Trail Cleanup Day (previously named Trail Maintenance Day). The Twelfth Annual Trail Cleanup Day was held on Saturday, November 3, 2018. Chambers Group worked together with Public Works to modify the flyers that provided the information for the Twelfth Annual Trail Cleanup Day. The flyer was posted on Public Works' website and was also distributed to other interested parties. The flyer was mailed to the individuals and organizations on the mailing list that is used for the CAC meetings and spring and fall newsletters. A copy of the flyer that was distributed to the public is included as Figure 8-2.

The Trail Cleanup Day event was attended by approximately 17 volunteers including 2 project managers from Public Works. Three biologists and two restoration specialists from Chambers Group attended the event to ensure that sensitive resources were not negatively affected by the activities. Various portions of the site were targeted for trash removal during the event, including Haines Canyon Creek and all trails throughout the Mitigation Area. A large amount of trash was removed throughout the Mitigation Area, including approximately 10 shopping carts, several mattresses, suitcases/duffle bags, sleeping bags, clothing items, tarps, tires, several large pieces of scrap metal including a rusty 50-gallon drum, and approximately 25 large bags of smaller trash items. Photographs taken during the event are included as Figure 8-3.

Figure 8-2. Trail Clean-up Day Flyer for 2018



County of Los Angeles Department of Public Works
and

Los Angeles County Flood Control District



Big Tujunga Wash Mitigation Area

Join us for the 12th Annual

Trail Cleanup Day

November 3, 2018 at 8am

Water, snacks, and trash bags will be provided

Please Bring:

- Comfortable clothes
- Closed-toe shoes
 - Gloves
 - Hat
- Sun block
- Bug repellent



If there is rain or poor weather on the 3rd, the event will be rescheduled to the 4th.

For more information contact Yi Sak Kim at (626) 458-6327 or btwma@dpw.lacounty.gov

Figure 8-3. Trail Cleanup Day 2018 Photographs



Photo 1: Volunteers work together to unearth mattress springs from cottonwood-willow riparian habitat along Haines Canyon Creek on November 3, 2018.



Photo 2: Group photo of a Public Works project manager and Chambers Group volunteers with some of the collected debris items from the cleanup effort on November 3, 2018.

SECTION 9.0 – COMMUNITY AWARENESS PROGRAM

The CAC was formed in early 2001 as part of MMP requirements for a community awareness program. Between 2001 and 2013, the CAC met semiannually to update the community on the progress of ongoing restoration activities, ongoing exotic eradication activities, upcoming scheduled activities at the Mitigation Area, and to discuss any issues that the community would like to see addressed. In 2014, the CAC meetings changed from being held on a semiannual basis to being held annually in the spring. In July 2007 ECORP assumed the responsibilities of preparing the spring and fall newsletters, assisting with preparation of meeting agendas and handouts, and recording meeting minutes. In June of 2017 Chambers Group assumed these responsibilities once again and continued this role in 2018. All deliverables were submitted to Public Works electronically for posting on the Public Works web page (<http://dpw.lacounty.gov/wrd/Projects/BTWMA>).

Community residents and representatives from local community organizations serve as the major components of the CAC, but the committee also includes law enforcement, agency, and elected official representatives from various local, state, and federal organizations. A list of the key stakeholders included as part of the most recent mailing is included in Appendix J.

9.1 NEWSLETTERS (SPRING, FALL)

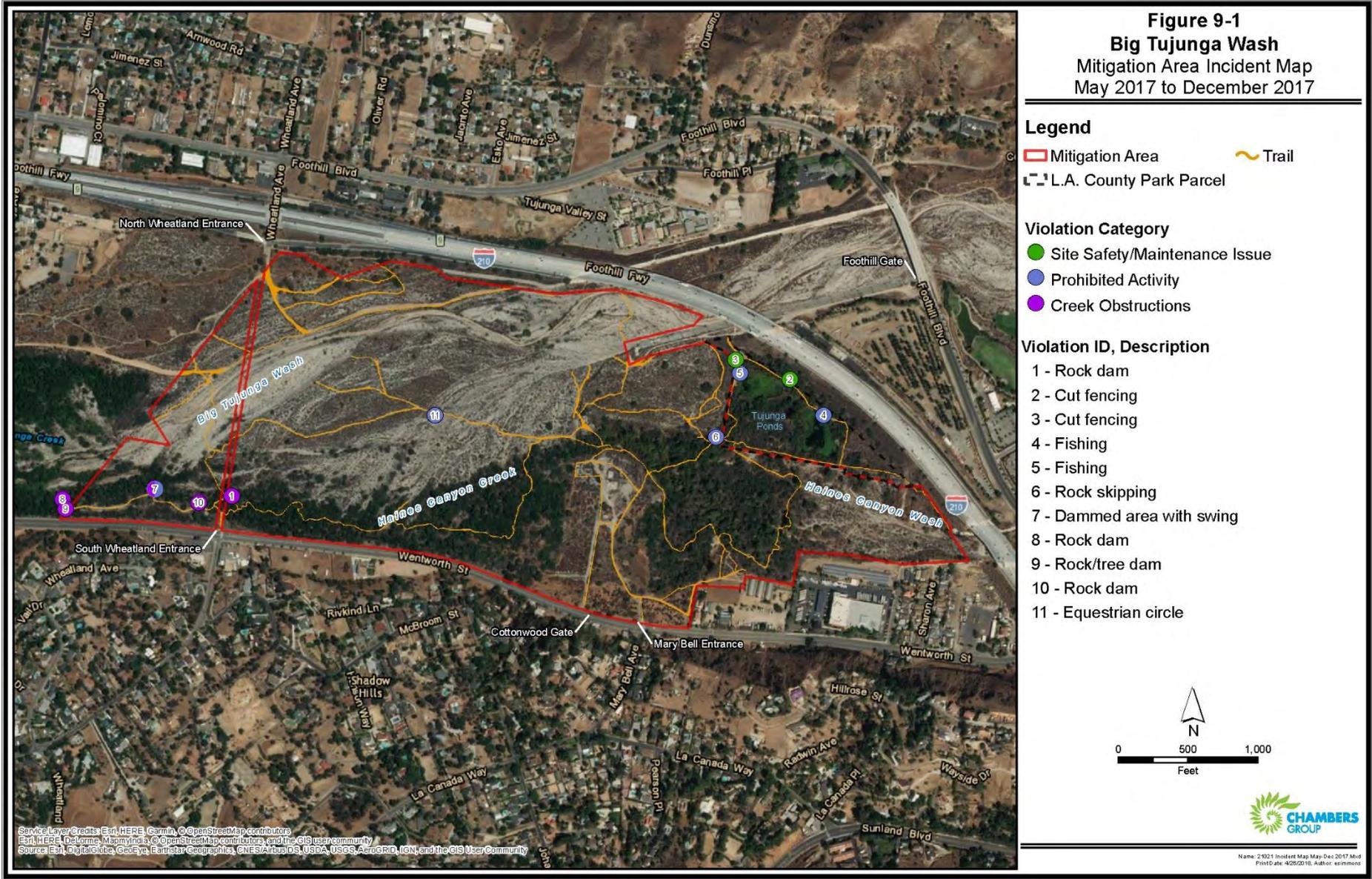
Two newsletters were drafted by Chambers Group during 2018. The spring edition was drafted in April, and the fall edition was drafted in November. Electronic versions of these newsletters were submitted to Public Works for distribution to the public and stakeholders, and to incorporate on their web page. Hard copies of the newsletters were also mailed to stakeholders and organizations. Copies of the newsletters are included in Appendix K.

9.2 CAC MEETING

The CAC meeting was held on Thursday, April 26, 2018. The meeting was held from 6:30 to 8:30 p.m. at Public Works' Hansen Yard, 10179 Glenoaks Boulevard, Sun Valley, California 91352. The meeting reminder/invitation, meeting agenda, and minutes from the previous meeting were mailed to the most recent CAC mailing list approximately two weeks prior to the scheduled meeting. In addition, the meeting agenda and the minutes from the previous CAC meeting were posted to the Mitigation Area website. One week prior to the CAC meeting, a final meeting reminder was sent via email that included a link to the materials posted on the Mitigation Area web page.

Chambers Group representatives Paul Morrissey, Mike McEntee, and Christiana Conser attended the meeting and provided a sign-in sheet for all attendees. A PowerPoint presentation was provided by Chambers Group Biologist Paul Morrissey, detailing the current status and implementation of the various enhancement programs. Notes were recorded by Public Works representative David Belicki during the meeting in order to prepare the official meeting minutes summarizing the general proceedings. Chambers Group distributed a map that documented the location and nature of all incidents that occurred within the Mitigation Area between May and December 2017 (Figure 9-1). The map included locations of rock dams, prohibited activities observed (such as fishing and swimming), vandalism, and public safety concerns. Chambers Group submitted draft meeting minutes to Public Works for review and commenting prior to posting on the Public Works web page. The proceedings at the 2018 CAC meeting were summarized in the meeting minutes, which were submitted to Public Works in draft form on June 5, 2018, and are included as Appendix L.

Figure 9-1. Big Tujunga Wash Mitigation Area Incident Map, May 2017 to December 2017



Below is a list of items discussed during the 2018 CAC meeting.

- **Site and Security Issues**
 - Map of incidents reported within the Mitigation Area
 - The use of ATU/ATVs on site to perform maintenance work
 - The need to replace trashcans by the north Wheatland Avenue and Cottonwood Avenue entrances
 - The need to remove the fire-melted portable toilet at the Cottonwood Avenue entrance.

- **Public Concerns**
 - Residents asked for help with removing a bathtub that was present onsite, possibly within the Caltrans right-of-way
 - Residents inquired about the possibility of replacing and extending wooden barriers at the Cottonwood Avenue entrance to keep horses safe and on the authorized trail

- **Volunteer Opportunities**
 - Residents expressed interest in coordinating with Public Works and Chambers Group on volunteer opportunities as they arise
 - Residents will help identify large, bulky debris items to be removed from the Mitigation Area and will contact Chambers Group/Public Works for removal

- **Updates on MMP Programs**
 - Creek Fire assessment and post-fire recovery including fire severity map, post-fire invasive plant emergence, and native plant recovery
 - Exotic plant and wildlife eradication including removal methods, potential use of AUV/ATVs for more site coverage, and targeted exotic species and importance of eradication
 - Water quality analysis including reasons for analysis and sampling locations
 - Trails and restoration/maintenance including damaged trees near trails, the creation of new unauthorized trails due to debris blocking authorized trails, trail reestablishment, and a summary of the 2017 Trail Cleanup Day
 - Public outreach efforts and distribution of bilingual educational brochures during public outreach visits

- **Sensitive species found in the Mitigation Areas**
 - Santa Ana sucker and arroyo chub fish
 - Crossing Haines Canyon Creeks in a perpendicular fashion to minimize negative impacts to native fish species
 - Least Bell's vireo habitat emergence and future habitat stability
 - Post-fire effects on sensitive species
 - The importance of informing equestrian riders about the sensitivity of Haines Canyon Creek and associated riparian habitat

SECTION 10.0 – PUBLIC OUTREACH PROGRAM

In an ongoing effort to enhance and protect existing wildlife and habitats at the Mitigation Area, the Public Outreach Program was developed and implemented during the 2009 contract year and was continued in 2018. This task was the direct result of increasing evidence of problematic areas associated with recreational use throughout the Mitigation Area. ECORP and Public Works developed new public outreach efforts to educate all types of recreational user groups about the importance of the Mitigation Area as a conservation area as well as to inform users of approved and prohibited types of recreational activities. This task was continued into the 2018 contract year because of its success in the years from 2009 to 2017.

During site visits in the spring and summer of 2009, ECORP biologists observed increasing problems with visitors using the waterways (Haines Canyon Creek and the Tujunga Ponds) in the Mitigation Area for recreational activities such as picnicking, fishing, swimming, and wading. In rare cases, cooking, barbequing, and alcohol consumption were observed. In areas popular for swimming, recreational users were using rocks, large boulders, and branches from nearby dead trees to dam the creek to create larger and deeper pools for swimming. Not only are these types of recreational activities prohibited on site, but they can result in damage to the waterways and native riparian habitats, which has the potential to reduce the ecological value of the site as a Mitigation Area. After observing and understanding the various problems associated with the recreational user groups in the Mitigation Area, ECORP and Public Works created and implemented a bilingual recreational user education program to expand public outreach for the Mitigation Area. The program consisted of site visits conducted by a bilingual biologist on peak use weekends in the spring and summer to educate the various user groups about the approved and prohibited activities within the Mitigation Area. A bilingual educational brochure was developed and distributed to the various user groups during the weekend site visits (Appendix B).

Onsite interviews and education about the Mitigation Area were conducted on three separate occasions in 2018 by Chambers Group bilingual biologists Erik Olmos, Cindy Chavez, and Jacob Lloyd Davies. These efforts occurred in August and September 2018. All outreach efforts took place on weekends during peak site use hours between 9 a.m. and 1 p.m. During these outreach efforts, the biologists handed out bilingual brochures describing the ecological purpose of the Mitigation Area, the sensitive species found on site, and permitted and prohibited activities within the Mitigation Area. The brochure also outlines Public Works' conservation goals, regulations regarding use of the site, and how the appropriate behavior and conduct of recreational visitors can further contribute to these goals.

Chambers Group biologists walked the established trails system and popular swimming/wading locations in the Haines Canyon Creek and Tujunga Ponds areas and spoke with visitors they encountered. Most outreach visits consisted of short question-and-answer sessions and informal interviews. Question topics included rules and regulations and the types of sensitive resources found in the Mitigation Area.

Visitors that were interviewed fell into one of two groups: non-equestrian user groups or equestrian user groups. A total of three non-equestrian site users were encountered during the three outreach visits. Issues such as fishing and an individual building dams and swimming in Haines Canyon Creek were observed during the visits. Groups and individuals encountered during the outreach visits were generally receptive after receiving information about the Mitigation Area.

On August 19, an individual was encountered sitting near a rock dam in Haines Canyon Creek, northwest of the south Wheatland Avenue entrance. The biologists were approaching the dam to photograph it when the individual explained that she had constructed it so that she could swim. The biologists gave her an educational brochure and explained that damming the creek and swimming in the Mitigation Area is prohibited. The individual was receptive to the biologists when they discussed how altering the streambed in any way can adversely affect sensitive resources. The individual explained that she had previously been approached by others over the years who provided her the same information, but that she has been building dams along Haines Canyon creek every year (in order to swim) for more than 30 years and that she doesn't understand what the issue is with swimming and building dams. She added that she doesn't understand how her actions adversely affect the sensitive fish species as she has never directly harmed them. The biologists reiterated how any change to the streambed (e.g., sedimentation) can adversely affect sensitive resources, at which point the individual thanked the biologists and wished them a good day. The individual was again encountered at the dam on August 25. When the biologists, once again, tried to explain to the individual why building dams and swimming are prohibited in the Mitigation Area, the individual explained that she didn't see the harm she was doing to the sensitive resources, and rather, that she was taking care of them as she regularly fed algae-based fish food to the Santa Ana sucker and arroyo chub in the dammed area. The fish in the dammed area were observed displaying flashing behavior in an attempt to remove parasites from their gills. On September 1, the same individual was encountered sitting on rocks beside where the dam had been removed days prior. During the interaction with the individual the biologists reminded her of the importance of not feeding the fish and damming the creek.

On September 1, an individual was encountered fishing at the Tujunga Ponds. The biologists approached the individual and gave him an educational brochure and explained that fishing within the Mitigation Area is prohibited. He explained that he occasionally fishes at the Tujunga Ponds since designated fishing areas like Hansen Dam are not well stocked and that the Tujunga Ponds are convenient to fish at since they are close to his home. The individual was receptive to the biologists and ceased fishing after being informed about the sensitive resources within the Mitigation Area.

A total of 12 equestrian site users were approached and interviewed along the established trails of the Mitigation Area along Haines Canyon Creek and near the Tujunga Ponds. Outreach interactions with equestrian users were usually brief, as most of the equestrian site visitors were frequent users of the Mitigation Area and were receptive to the outreach efforts. Equestrian users were not observed off-trail or breaking other rules during the 2018 outreach efforts. Equestrian users reported observations of individuals camping in the Mitigation Area, illegal camp fires, and illegal dumping. The biologists asked the equestrian users to contact local law enforcement and Public Works if suspicious or illegal activities are observed in the Mitigation Area. Equestrian users that had called law enforcement in the past expressed disappointment in the fact that by the time law enforcement arrives, often over an hour after the call was made, the offending individual(s) have usually already left the area and hence, issues go unresolved.

Chambers Group biologists have documented several effects of visitors on sensitive habitats in the Mitigation Area. The largest negative impacts by non-equestrian user groups are caused by swimming and rock dam construction within Haines Canyon Creek. Rock dams are constructed by individuals to make swimming areas deeper. A few unauthorized swimming areas have become popular spots for non-equestrian users to congregate, picnic, and swim. The most popular location is the unauthorized swimming area situated approximately 280 feet northwest of the south Wheatland Avenue entrance. This area had a large rock dam that required multiple people to remove.

Several large rock dams were encountered in the creek and were removed during 2018 public outreach and exotic wildlife removal efforts. Rock dams are usually constructed with boulders and tree branches and were often found reinforced with tarps and other materials that reduce the natural flow of the creek and create a buildup of water. The changes to the natural flow of the creek can be detrimental to the sensitive fish species within the creek. The rock dams reduce the flow of the creek and create large pools of water that are favorable habitat for the exotic, invasive aquatic species such as the red swamp crayfish and American bullfrog. Exotic species prey on native species such as the federally listed (threatened) Santa Ana sucker. These pools reduce suitable breeding habitat for sensitive fish species as well. In an effort to reduce these effects, non-equestrian user groups were approached and educated during the outreach site visits. All rock dams encountered during site visits were documented, and the larger rock dams were reported to Public Works for removal.

Equestrian site visitors have affected sensitive habitat by traveling off the established trail system. The creation of new trails and traveling off established trails can be avoided with continued trail maintenance and equestrian site visitor education. Riders were reminded to cross the creek single-file to minimize erosion along the banks, and to stay on the authorized trails. A memo documenting the results of all outreach efforts in 2018 is included in Appendix M.

SECTION 11.0 – SPECIAL ASSESSMENTS

Chambers Group staff is available to provide special assessments on an on-call basis. Special assessments include damage assessments (e.g., fire damage, vandalism) and other site issue assessments, and the subsequent coordination and response. A post-Creek Fire site assessment was conducted in February 2018 to assess the damage caused by the Creek Fire that burned through the Mitigation Area in December 2017. Details of the post-Creek Fire site assessment are summarized below. The memo report and photographs for the post-Creek Fire assessment are included as Appendix N.

11.1 POST CREEK FIRE ASSESSMENT

The post-Creek Fire assessment for the Mitigation Area was conducted in February 2018. Field surveys were conducted on February 20, 23, and 27, 2018, to map the severity of the fire, record current conditions of the Mitigation Area (photos and aerial imagery), assess the potential survival of vegetation (identify re-sprouting vegetation and germinating seedlings), map the currently existing trails, and identify potential public safety concerns (i.e., woody debris that should be cut down for safe access through site). The site assessment for the fire damage was performed by the Director of Restoration Construction, Steven Reinoehl, and Biologists Paul Morrissey, Heather Clayton, Heather Franklin, Clark Austin, and Jeremy Smith. The assessment focused on the fire damaged area within the Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds, and all authorized trails as well as areas that had been previously treated during exotic plant eradication efforts.

Assessment

Fire severity was mapped within the Mitigation Area and is provided below in two figures: Figure 11-1 Fire Severity Map with aerial imagery pre-Creek Fire; and Figure 11-2 Fire Severity Map with aerial imagery February 2018. The key for fire severity was adapted from Keeley 2009, and is as follows:

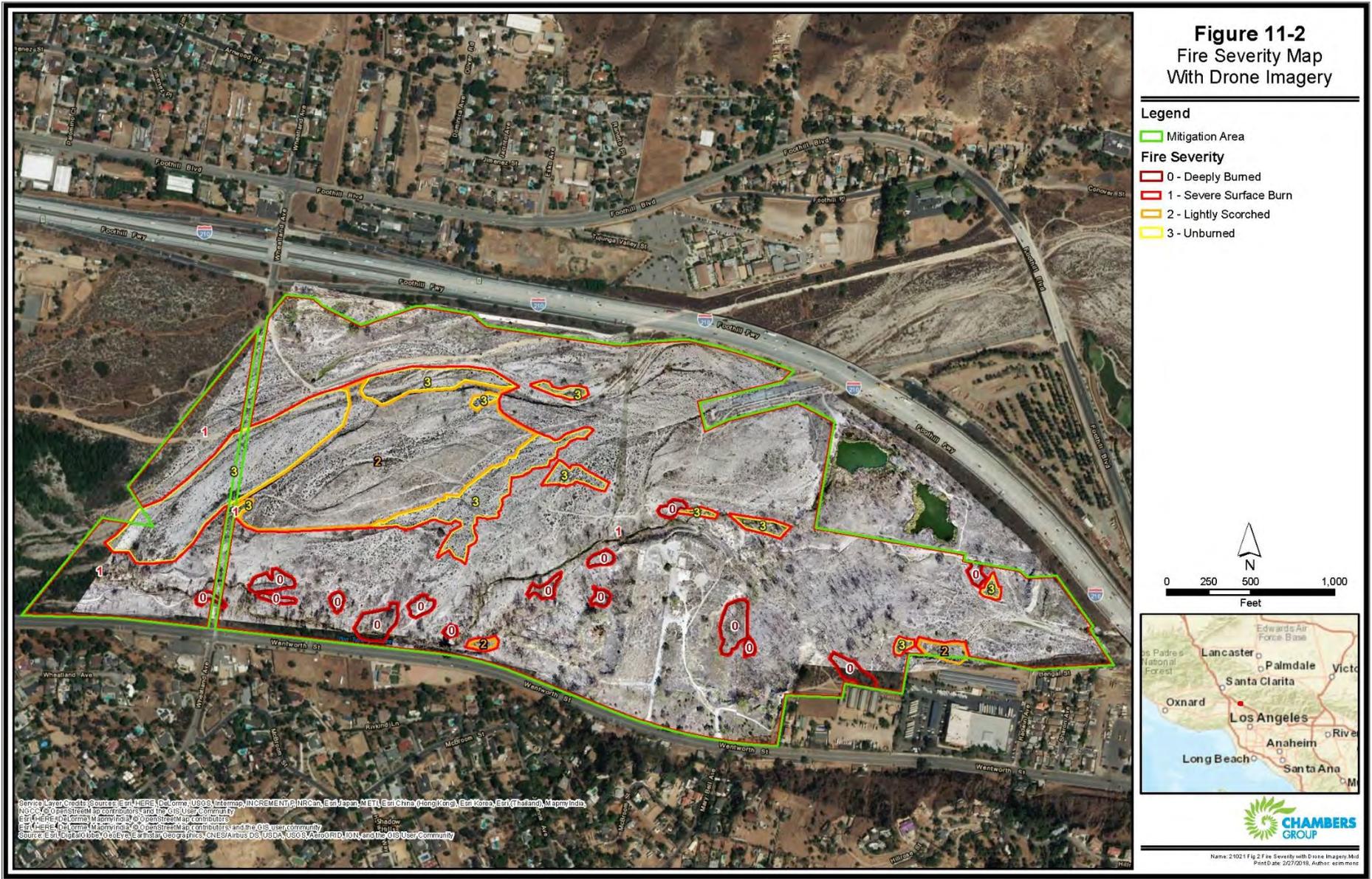
0. Deeply Burned (all above-ground vegetation consumed, <1% resprouts observed, thick ash layer on soil surface several centimeters deep with organic layer largely consumed, very limited seedling regeneration, greatest potential for restoration).
1. Severe Surface Burn (parts of the woody vegetation layer consumed, all understory plants charred or consumed, resprouting observed on 1-25% of the woody vegetation, ash layer thin, patchy).
2. Lightly Scorched (some vegetation scorched or exhibiting leaf loss from radiant heat, resprouting observed on 26-75% of the woody vegetation with a high potential for natural community regeneration, soil organic layer largely intact).
3. Unburned (vegetation untouched by fire, no direct effect from heat).

Based on the conditions documented in February 2018, it was determined that almost all the vegetation was damaged or destroyed by the fire (see Figure 11-2 and photos in Appendix N). Areas with the highest density of plants, mostly along Haines Canyon Creek, were deeply burned or showed signs of severe surface burns. Deeply burned areas were identified in areas along Haines Canyon Creek within the southern cottonwood – willow riparian habitat communities. Almost 75 percent of the entire site

Figure 11-1 Fire Severity Map with Aerial Imagery Pre-Creek Fire



Figure 11-2 Fire Severity Map with Aerial Imagery February 2018



exhibited signs of severe surface burns, including approximately all of the riparian communities found along Haines Canyon Creek, and more than half of the vegetation within the Big Tujunga Wash area. In some of the riparian areas, the fire burned intensely enough to sterilize the soil (destroy the seed bank in the topsoil).

The majority of the riparian areas and much of the transitional zones were completely burned (severe surface burn); however, the amount of regrowth and seed germination was relatively high, demonstrating that the burned areas were surface burns, and that the vegetation was not completely destroyed. The larger shrubs and trees showed signs of resprouting near the crown of the vegetation. Seedlings were observed carpeting much of the open areas; however, most of those seedlings were exotic and invasive species. The fire created ideal conditions for germinating weeds: an open canopy, alkaline soil, and ash which soaks up and holds rainfall.

Lightly scorched and unburned areas were found along Big Tujunga Wash, likely due to less dense vegetation present to spread the fire. Portions of the Mitigation Area that had lower densities of vegetation prior to the fire have a greater number of individual plants that survived the fire. The vegetation around the Tujunga Ponds was also damaged but appeared to be recovering quickly compared to other portions of the Mitigation Area. Some areas of upland sage scrub had patches that completely burned adjacent to patches that survived with little damage. Prior to the fire, the scrub areas had lower exotic species coverage than the other communities with non-native grasses as the main concern.

Recovery Efforts

Trails

Trails through the ash were re-established in approximately their original locations, although small deviations to the trails were observed. Trees and branches that fell into Haines Canyon Creek and onto the trails during the fire did not burn completely, leaving some parts of the trails tangled with branches and blocked with fallen debris. Other parts of the trails contained burnt overhead branches which compromised and discouraged safe passage for trail users. Hikers and equestrian riders had deviated off from authorized trails where the trails were blocked with debris or covered with deep ash, creating new, unauthorized trails as a result of these conditions.

Recruitment of non-native species was also observed alongside the trails. Treatment of exotic species with herbicides, and hand cutting to suppress vegetation from encroaching on the trails was conducted to maintain the trails and suppress exotic weed growth. In order to prevent hikers and equestrian riders from creating new trails through restored areas, Chambers Group conducted trail maintenance activities in the summer and fall of 2018. Trail maintenance efforts are summarized in Section 8.0 and details on each trail maintenance effort can be found in Appendix H Trail Maintenance and Monitoring Memos.

Vegetation

Recruitment of non-native species will limit the success of native species reestablishment. Native pioneer species that continue to emerge after the fire will have a higher reestablishment (success) rate without competition from the invasive species. Unfortunately, after the fire the Mitigation Area was dominated by invasive plant species that were prevalent pre-fire such as castor bean, non-native annual grasses, *Erodium* spp., and mustards.

Exotic plant control efforts began in early May 2018 and continued throughout the summer and fall focusing on Haines Canyon Creek, the Tujunga Ponds, Big Tujunga Wash, all authorized trails, and areas

that were treated during previous weed control efforts. Exotic plant removal efforts are summarized in Section 4.0 and details on each removal effort can be found in Appendix D Exotic Plant Removal Memos.

Wildlife

Negative impacts to native aquatic species have the potential to occur due to exotic wildlife within the creek and ponds. These potential negative impacts include, but are not limited to: resource competition, predation, and the transmission of harmful pathogens and parasites.

To reduce the potential negative impacts to sensitive, native, aquatic species, Chambers Group performed exotic wildlife eradication throughout 2018. The areas of focus included Haines Canyon Creek and the Tujunga Ponds (over the past two years, Big Tujunga Wash has not had a consistent surface flow to warrant exotic species removal from the wash Tujunga Wash area). Exotic wildlife eradication efforts are summarized in Section 6.0, and details on each eradication effort can be found in Appendix F Exotic Wildlife Removal Memos.

SECTION 12.0 – ATTENDANCE AT MEETINGS WITH AGENCIES, PUBLIC, AND CONSULTANTS

Chambers Group was available on an on-call basis to attend meetings with agencies, the general public, and other consultants as a representative of Public Works. Additional conference calls, meetings, and email correspondence were held on an as-needed basis throughout the year between Public Works and Chambers Group.

On May 8, 2018, a Chambers Group representatives Paul Morrissey and Mike McEntee joined representatives from Public Works and CDFW on a site visit of the Mitigation Area to assess damage from the Creek Fire and to discuss the results of the post-Creek Fire assessment (field surveys and aerial image analysis) conducted by Chambers Group in February 2018.

SECTION 13.0 – REFERENCES

California Department of Fish and Wildlife (CDFW)

- 2016 California Fish and Game Code, Chapter 12, Section 1930-1940. Available at: https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=FGC&division=2.&title=&part=&chapter=12.&article=.

Chambers Group, Inc. (Chambers Group)

- 2000 Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank. Unpublished Report prepared for County of Los Angeles, Department of Public Works. April 2000.
- 2006 Long Term Monitoring and Maintenance Plan for Big Tujunga Wash, Los Angeles California. Unpublished Report prepared for County of Los Angeles, Department of Public Works. October 2006.
- 2018 2017 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. May 2017.

ECORP Consulting, Inc. (ECORP)

- 2009 Revised Habitat Restoration Plan for the Big Tujunga Wash Mitigation Area. Unpublished Report submitted to Los Angeles County Department of Public Works. September 2009.
- 2010 2009 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. November 2010.
- 2011 2010 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. October 2011.
- 2012 2011 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. April 2012.
- 2013 2012 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. March 2013.
- 2014 2013 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. April 2014.
- 2016 2015 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. March 2016.

2017 2016 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. April 2017.

Keeley J. E.

2009 Fire intensity, fire severity and burn severity: a brief review and suggested usage. *International Journal of Wildland Fire* 18, 116-126.

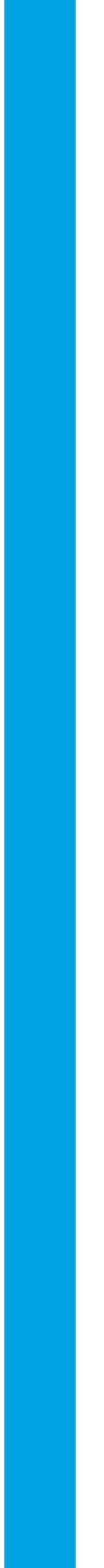
Safford, J. M., and R. Quinn

1998 Conservation Plan for the Etiwanda-Day Canyon Drainage System Supporting the Rare Natural Community of Alluvial Fan Sage Scrub. Report prepared for California Department of Fish and Game, Region 5.

United States Department of Agriculture, Natural Resources Conservation Service (USDA NRCS)

2011 The PLANTS Database. National Plant Data Team, Greensboro, NC 27401-4901 USA. Accessed at <http://plants.usda.gov>.

APPENDIX A – STREAMBED ALTERATION AGREEMENT #1600-2008-0253-R5



Big T Draft 1600

CALIFORNIA DEPARTMENT OF FISH AND GAME
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

January 29, 2009

Notification No. 1600-2008-0253-R5
Page 1 of 11

AGREEMENT REGARDING PROPOSED STREAM OR LAKE ALTERATION

THIS AGREEMENT, entered into between the State of California, Department of Fish and Game, hereinafter called the Department, and County of Los Angeles, Department of Public Works Water Resources Division (LACoDPWWRD), represented by Mr. Christopher Stone, 900 S. Fremont Avenue, Alhambra, California, 91803, (626) 458-6102, hereinafter called the Applicant or LACoDPWWRD, is as follows:

WHEREAS, pursuant to Section 1602 of California Fish and Game Code, the Applicant, on the 23rd day of July, 2008, notified the Department that they intend to divert or obstruct the natural flow of, or change the bed, channel, or bank of, or use material from: Big Tujunga Wash and Haines Canyon Creek, named tributaries to Hansen Dam Flood Control Basin, in Los Angeles County, to conduct extensive invasive species management and routine maintenance activities within the approximately 247-acre Big Tujunga Conservation Area. Jurisdictional streambeds and waters of the state regulated under Department authority which are to be impacted as a result of the Applicant's project-related activities include: Haines Canyon Creek, wash and ephemeral streambed(s), and wetlands, including vegetated riparian habitats. The portion of Haines Canyon Creek, wash and unnamed ephemeral streambed(s), and wetland to be impacted as a result of the Applicant's project-related activities can be located using the following resources: 1) United States Geological Survey 7.5 Minute Quad Map, Sunland, Township 2 N, Range 14 W, Los Angeles County; 2) Latitude: 34.16.80 North Longitude: 118.20.53 West 3) County Assessor's Parcel Number(s): MR 29-51-52, MB 16-166-167, MB 662-44, and MB 198-8-10

WHEREAS, the Department (represented by Jamie Jackson) during a site visit conducted on August 05, 2007, and based on information received by the Applicant, has determined that such operations may substantially adversely affect those existing fish and wildlife resources within the Haines Canyon Creek and Big Tujunga Wash watershed(s), the project site, and the vicinity of the project site, specifically identified as follows: **Fishes:** arroyo chub (*Gila Orcutti*), Santa Ana speckled dace (*Rhinichthys osculus*), Santa Ana sucker (*Catostomus santaanae*); **Amphibians:** arroyo southwestern toad (*Bufo microscaphus californicus*), California red-legged frog (*Rana aurora*), mountain yellow-legged frog (*Rana muscosa*), western toad (*Bufo boreas*); **Reptiles:** southwestern pond turtle (*Emys marmorata pallida*), San Diego horned lizard (*Phrynosoma coronatum blainvillii*), western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*); **Birds:** California gnatcatcher (*Polioptila californica californica*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*bellii pusillus*), black-crowned night heron (*Nycticorax nycticorax*), mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), black-headed grosbeak (*Pheucticus melanocephalus*), great blue heron (*Ardea Herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), black-chinned hummingbird (*Archilochus californica*), rufous hummingbird (*Selasphorus rufus*), western scrub jay (*Aphelocoma californica*), Bullock's oriole (*Icterus bullockii*), California quail (*Callipepla californica*), loggerhead shrike (*Lanius ludovicianus*), barn swallow (*Hirundo rustica*), California towhee (*Pipilo crissalis*), Wilson's warbler (*Wilsonia pusilla*), Bewick's wren (*Thryomanes ludovicianus*), Cooper's hawk (*Accipiter cooperii*); **Mammals:** coyote (*Canis latrans*), brush rabbit (*Sylvilagus Bachmani*), muledeer (*Odocoileus hemionus*), California ground squirrel (*Spermophilus beecheyi*); **Native Plants:** slender-horned spineflower (*Dodecahema leptoceras*), Nevin's barberry (*Berberis nevinii*), Plummer's mariposa lily (*Calochortus plummerae*), Mt. Gleason Indian paintbrush (*Castilleja gleasonii*), San Fernando Valley spineflower (*Chorizanthe parryi* var.

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 2 of 11

fernandina), Davidson's bush mallow (*Malacothamnus davidsonii*), Orcutt's linanthuis (*Linanthus orcuttii*), California sycamore (*Platanus racemosa*), white alder (*Alnus rhombifolia*), Fremont cottonwood (*Populus fremontii*), mulefat (*Baccharis salicifolia*), Scale-broom (*Lepidospartum squamatum*), cattails (*Typha latifolia*), California sagebrush (*Artemisia californica*), willow (*Salix* sp.), Southern Sycamore-Alder Riparian Woodland; and all other aquatic and wildlife resources in the area, including the riparian vegetation which provides habitat for such species in the area.

These resources are further detailed and more particularly described in the reports entitled "California Department of Fish and Game Streambed Alteration Application Big Tujunga Wash Mitigation Bank" dated July 2008, prepared by Gonzales Environmental Consulting, LLC, prepared for County of Los Angeles, Department of Public Works Water Resources Division; "The Final Master Mitigation Plan for the Big Tujunga Wash Conservation Area (FMMP)", dated April 2000, prepared by Chambers Group, prepared for the County of Los Angeles Department of Public Works, and shall be implemented as proposed, complete with all attachments and exhibits.

THEREFORE, the Department hereby proposes measures to protect fish and wildlife resources during the Applicant's work. The Applicant hereby agrees to accept and implement the following measures/conditions as part of the proposed work. The following provisions constitute the limit of activities agreed to and resolved by this Agreement. The signing of this Agreement does not imply that the Operator is precluded from doing other activities at the site. However, activities not specifically agreed to and resolved by this Agreement shall be subject to separate notification pursuant to Fish and Game Code Sections 1600 *et seq.*

If the Applicant's work changes from that stated in the notification specified above, this Agreement is no longer valid and a new notification shall be submitted to the Department of Fish and Game. Failure to comply with the provisions of this Agreement and with other pertinent code sections, including but not limited to Fish and Game Code Sections 5650, 5652, 5901, 5931, 5937, and 5948, may result in prosecution.

Nothing in this Agreement authorizes the Applicant to trespass on any land or property, nor does it relieve the Applicant of responsibility for compliance with applicable federal, state, or local laws or ordinances. A consummated Agreement does not constitute Department of Fish and Game endorsement of the proposed operation, or assure the Department's concurrence with permits required from other agencies.

This Agreement becomes effective the date of the Department's signature and the restoration and enhancement portion terminates on 03/31/2014. This Agreement shall remain in effect to satisfy the terms/conditions of this Agreement and all mitigation obligations associated with the FMMP. Any provisions of the Agreement may be amended at any time provided such amendment is agreed to in writing by both parties. Mutually approved amendments become part of the original agreement and are subject to all previously negotiated provisions.

Pursuant to Section 1600 *et seq.*, the Applicant may request one extension of the Agreement; the Applicant shall request the extension of this Agreement prior to its termination. The one extension may be granted for up to five years from the date of termination of the Agreement and is subject to Departmental approval. The extension request and fees shall be submitted to the Department's South Coast Office at the above address. If the Applicant fails to request the extension prior to the Agreement's termination, then the Applicant shall submit a new notification with fees and required information to the Department. Any construction/impacts conducted under an expired Agreement are a violation of Fish and Game Code Section 1600 *et seq.* For complete information see Fish and Game Code Section 1600 *et seq.*

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 3 of 11

Project Location:

The approximately 247-acre project site is located within the Big Tujunga Wash, just downstream of the 210 Freeway over-crossing, near the City of Los Angeles' Sunland community in the San Gabriel Valley in Los Angeles County. The site is bordered on the north and east by the I-210 freeway and on the south by Wentworth Street. The west side of the site is contiguous with the downstream portion of the Big Tujunga Wash (2007 Thomas Brothers Guide page 503-B2:C2:D2).

Project Description:

The Final Master Mitigation Plan for the Big Tujunga Wash Conservation Area (FMMP), dated April 2000, prepared for the County of Los Angeles Department of Public Works, prepared by Chambers Group, shall be implemented as proposed. The FMMP proposes the long-term mitigation and management guidelines for the 247 acre Big Tujunga Site. Proposed works described within the FMMP includes elements designed to restore and enhance existing habitats on the Big Tujunga Wash site by removing non-native plant, fish, amphibian, and reptile species. In addition, the FMMP includes future plans to create a diverse coast live oak-California sycamore woodland and coastal sage scrub habitat in an area that is currently heavily disturbed.

The FMMP proposes to target the Haines Canyon Creek and Big Tujunga Wash for removal of invasive plant (*Arundo (Arundo donax)*, tamarisk (*Tamarix spp.*), eucalyptus (*Eucalyptus spp.*), pepper tree (*Schinus molle*), castor bean (*Ricinus communis*), umbrella sedge (*Cyperus eragrostis Nutsetge*), mustards (*Brassica spp.*), tree tobacco (*Nicotiana glauca*), water hyacinth (*Eichornia crassipes*), cape ivy (*Delairea odorata*), etc.) and animal (brown-headed cowbird (*Molothrus ater*), bull frog (*Rana catesbeiana*), crayfish (*Theragra Chalcormma*)) species, management, enhancement, and reclamation of existing equestrian and hiking trails, brown-headed cowbird eradication, water quality monitoring, riparian habitat enhancement, site inspection and maintenance, and success monitoring (fish and wildlife) for the Big Tujunga Conservation Area. Contact: Mr. Christopher Stone at Phone: (626) 458-6102 for additional information.

The Department believes that a newer FMMP exists for the Big Tujunga Wash Conservation Area (BTWCA), prepared by Chambers Group for Los Angeles County Department of Public Works Water Resources Division (LACoDPWWRD), dated October 2006, which was not included with the Streambed Notification. The Department is in receipt of a FMMP dated April 2000. The Department requests a copy of the FMMP dated October 2006.

The Applicant shall provide clarification for the following items, as found in the FMMP dated October 2006, PRIOR to the Execution of this Agreement. If the following items are already adequately addressed within the FMMP the Applicant shall identify the location of the items within the FMMP. The Department shall determine if they have been adequately addressed or require further information. Once these items have been verified within the FMMP they may be removed from this draft document PRIOR to its execution.

- Conservation Credits Remaining.

Listed below is a table summarizing the mitigation acres already used within the BTWCA by LACoDPWWRD projects.

100 Channel Clearing	Friendly Wood Drain	Thompson Creek Dam Seismic Rehab	Puddingstone Diversion Cleanout	San Dimas Cleanout	Big Dalton Cleanout	Burro Canyon Debris Basins	Live Oak	Big Tujunga Dam Seismic Rehab	Devil's Gate Cleanout
62.7	1.6	1.7	5.1	5.1	3.34	0.3	2.0	0.43	2.68

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 4 of 11

The Department has not yet finalized the total number of credits available for use by LACoDPWWRD in the BTWCA. The Applicant estimates a total of 247 acres including both jurisdictional and upland areas. The total acreage for the BTWCA that the Department currently acknowledges is 207 acres with 122.05 remaining for credit. It has been determined that 84.95 acres have already been used. The Department requests that LACoDPWWRD provide detailed maps depicting total acres, acres remaining for mitigation purposes, additional acres utilized not accounted for in the above table, acres representing areas that are not, or will not, be restored to functional habitat. The primary area of concern is found in and around the Cottonwood entrance, where the old gravel mining pad occurred. Some of this area is not going to be restored and will remain in use as parking.

- Existing Public Use

The number of horse trails remains a concern to the Department. The density of trails, side loops, and duplication is a concern, as these areas do not support habitat and reduce wildlife's ability to utilize adjacent habitat. The trail running parallel to Haines Creek, the only perennial water source in this area is also a concern. Acreage for trails used by equestrian groups in the area, particularly wider trails in the alluvial scrub, shall be explicitly identified. Areas beyond five feet in width that are being impacted by trail use shall be calculated and deducted from the total remaining acres as determined by the Applicant available for future mitigation credit. Trail widths in alluvial areas could be narrowed. The LACoDPWWRD shall define and restrict use on pre-determined paths for equestrian uses. Similarly, continued public access to the two large ponds found adjacent to the BTWCA, owned by the Army Corps of Engineers, but maintained by LACoDPWWRD, create an ongoing management problem. Since the ponds were mitigation for wetland impacts to the 210 freeway, the continued presence of visitors disrupting the ecology and the introduction of exotic animals is a concern. Further efforts to explore whether this area can be closed to public access other than special uses, education visits, and similar types of activities need to be addressed.

- Functional Analysis Ratings

Page 10, Sec 2.3.1- indicates the functional condition of alluvial scrub increased from .79 to .88 (although it is unclear if this is the whole area, or just alluvial scrub, and the last paragraph discusses riparian habitat despite an alluvial scrub header). Please clarify what changed to account for this increase in functional condition of alluvial scrub? In addition, please describe the method that was used to determine the functional values of the habitat.

- Invasive Plants

Table 3-1 shows the list of targeted weeds for control. Please add eupatory (*Ageratina adenophora*) to this list (note on page 7 that control of this species is occurring).

- Patrolling

This section does not contain much information. The Department requests LACoDPWWRD provide the following information: What will be the patrol frequency? Who is anticipated to do patrolling? Will they have authority to write tickets? How do they access the site? How much of the site is anticipated to be viewed during a two-hour visit? The Department would like a commitment to regular patrols within the BTWCA.

- Water Quality Monitoring

If conducted annually, the most optimum time of year or hydrologic condition should be specified to maximize the effectiveness of the monitoring.

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 5 of 11

- Section 3.4- Contingency Measures-wildfire related

A pro-active Wildfire Emergency Response Plan should be included. Wildfire suppression (bulldozing, backfires, firelines, and retardants) can cause substantial damage to resources. This Plan could take the form of a good map that is provided to the local fire stations, with legends indicating: access points, areas of high sensitivity, contacts, request to minimize any ground disturbance, etc. A meeting with the Fire Department to refine the strategy should also occur.

- Site Maintenance Issues:

There is little or no information on maintenance of infrastructure, particularly fencing and gates. Please include this information.

- Arroyo toad surveys:

We suggest these occur ONLY in years of relatively normal rainfall, or wetter. If surveys are conducted every third year as proposed in the plan, and that year happens to be very dry, too much time could pass between surveys. The Department recommends a more flexible plan.

- Santa Ana Sucker

We suggest these occur ONLY in years of relatively normal rainfall, or wetter. If surveys are conducted every third year as proposed in the plan, and that year happens to be very dry, too much time could pass between surveys. The Department recommends a more flexible plan.

- Cowbird trapping

Cowbird trapping should continue each year. The cowbird trapping program was instituted to restore the BTWCA as potential habitat for least Bell's vireo and southwestern flycatcher. The Department requests a detailed analysis of the Applicant's proposed cowbird trapping and reporting program. The Department also requests the report due date for the brown-headed cowbird trapping reports be adjusted to eliminate two separately dated reports. Currently, the due dates are different for the Department versus the United States Fish and Wildlife Service (USFWS).

- Reporting

There are a number of reports that are shown as being sent only to the USFWS. The Department would also like to receive copies of these reports.

- Costs

There is no information on costs contained within the FMMP. Normally, this type of plan would include an operation and maintenance budget estimate. The Department requests that LACoDPWWRD provide a detailed cost analysis and budget outline for funding all future long-term maintenance and restoration efforts within the BTWCA.

IMPACTS

Temporary Impacts:

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 6 of 11

Temporary, minor impacts are anticipated in Department jurisdictional areas as a result of the Applicant's activities. The FMMP will improve the habitat quality of approximately 60 acres of southern willow woodlands along Haines Canyon Creek and the Big Tujunga Ponds. The Department shall be notified immediately if unforeseen temporary impacts occur within Department jurisdictional areas not previously considered as part of this Agreement or the FMMP as a result of the Applicants project-related activities. Conditions may need to be added or revised, based on new information, to prevent further temporary impacts from occurring in Department jurisdictional areas.

MITIGATION

Mitigation for all Temporary Impacts:

The Applicant shall implement the FMMP as proposed.

CONDITIONS

Resource Protection:

1. The Applicant shall not remove, or otherwise disturb vegetation or conduct any other project-related activities on the project site, to avoid impacts to breeding/nesting birds from March 1st to September 1st, the recognized breeding, nesting and fledging season for most bird species in the San Gabriel Valley.
2. Prior to any project-related activities during the raptor nesting season, January 31st to August 1st, a qualified biologist shall conduct a site survey for active nests two weeks prior to any scheduled project-related activities. If breeding activities and/or an active bird nest(s) are located and concurrence has been received from the Department, the breeding habitat/nest site shall be fenced a minimum of 500 feet in all directions, and this area shall not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the project.
3. Be advised, migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918(50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). This Agreement therefore does not allow the Applicant, any employees, or agents to destroy or disturb any active bird nest (§3503 Fish and Game Code) or any raptor nest (§3503.5) at any time of the year.
4. Due to the potential presence of arroyo chub, Santa Ana speckled dace, Santa Ana sucker, arroyo southwestern toad, California red-legged frog, mountain yellow-legged frog, southwestern pond turtle, San Diego horned lizard, black-crowned night heron, great blue heron, great egret, snowy egret, Cooper's hawk, southwestern willow flycatcher, California gnatcatcher loggerhead shrike, and least Bell's vireo, pre-restoration and enhancement field surveys for these species must be concluded no sooner than three-days prior to any site preparation, clearing, or other project-related activities. Findings, including negative findings, shall be submitted to the Department in written format prior to any site preparation activities.
5. If any of the species identified in condition 4 of this Agreement, any other threatened or endangered species or species of special concern are found within 150 feet of the Haines Canyon Creek or Big Tujunga Wash, the Applicant shall contact the Department immediately of the sighting and shall request an on-site inspection by Department representatives (to be done at the discretion of the Department) to determine if work shall begin/proceed. If work is in progress when sightings are made,

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 7 of 11

the Applicant shall cease all work within 500 feet of the area in which the sighting(s) occurred and shall contact the Department immediately, to determine if work shall recommence.

6. A qualified biological monitor, with all required collection permits, shall be required on site during clearing, enhancement and restoration activities, and shall conduct surveys sufficient to determine presence/absence for species identified as occurring, or potentially occurring, on site and immediately adjacent to the project location.

7. If any life stages of any native vertebrate species are encountered during clearing, enhancement or restoration activities, the monitor shall make every reasonable effort to relocate the species to a safe location. Exclusionary devices shall be erected to prevent the migration into or the return of species into the work site. If no biological monitor is available, project-related activities shall not begin, or shall be halted, until the biological monitor is present.

8. The Applicant shall have a qualified wildlife biologist and qualified botanists prepare for distribution to all Applicants contractors, subcontractors, project supervisors, and consignees a "Contractor Education Brochure" with pictures and descriptions of all sensitive, threatened, and endangered plant and animal species, known to occur, or potentially occurring, on the project site. Applicant's contractors and consignees shall be instructed to bring to the attention of the project biological monitor any sightings of species described in the brochure. A copy of this brochure shall submit to the Department for approval prior to any site preparation activities.

9. Electronic and written annual reports shall be required. An annual report shall be submitted to the Department by Jan. 1st of each year for 5 years after implementation of the FMMP for all plantings associated with the Applicants mitigation. This report shall include the survival, % cover, and height by species of both trees and shrubs. The number by species of plants replaced, an overview of the revegetation and exotic plant control efforts, and the method used to assess these parameters shall also be included. Photos from designated photo stations shall be included. If after several years it becomes apparent that plants are not surviving, additional mitigation shall be determined at that time, and Applicant shall be responsible for implementation and costs of additional mitigation. Annual reports shall include site enhancement and restoration progress, species encountered during biological surveys, and current conditions of all trails and trail activities. The Annual Report shall include graphics for vegetation communities and trails systems. Electronic reports shall be submitted to the Department no later than January 1st of each year and should be submitted to the following email address: jjackson@dfg.ca.gov. Hard copies shall be submitted to the address that appears on the header of this Agreement with the same deadline as electronic version.

10. If the Department determines that any threatened or endangered species will be impacted by the implementation of the FMMP, the Applicant shall contact Environmental Scientist Scott Harris at (626) 797-3170 to obtain information on applying for the State Take Permit for state-listed species, or contact the San Diego Regional office for the current point of contact. The Applicant certifies by signing this Agreement that the project site has been surveyed and shall not impact any state-listed rare, threatened or endangered species.

11. The Applicant shall install and use fully covered trash receptacles with secure lids (wildlife proof) in all work areas that may contain food, food scrapes, food wrappers, beverage containers, and other miscellaneous trash.

12. No hunting shall be authorized/permitted within the Big Tujunga Wash Conservation Area.

Work Areas and Vegetation Removal:

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 8 of 11

13. Disturbance or removal of vegetation shall not exceed the limits approved by the Department as stated in the FMMP.

14. The work area shall be flagged to identify its limits within the project footprint to avoid unnecessary impact to ephemeral streams and riparian habitat not included in the FMMP. Vegetation shall not be removed or intentionally damaged beyond these limits.

15. No vegetation with a diameter at breast height (DBH) in excess of three (3) inches, not previously described in the FMMP shall be removed or damaged without prior consultation and Department approval.

16. No living native vegetation shall be removed from the channel, bed, or banks of the stream outside the project footprint, except as otherwise provided for in this Agreement or as proposed in the FMMP.

Equipment and Access:

17. Vehicles shall not be driven or equipment operated in water covered portions of a stream or lake, or where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as otherwise provided for in the Agreement or as described in the FMMP, and as necessary to complete authorized work. It is understood that conditions may need to be revised or added based on new information, if the Department becomes aware of activities outside the FMMP.

18. Access to the work site shall be via existing roads and access ramps. If no ramps are available in the immediate area, the Applicant may construct a ramp in the footprint of the project. Any ramp shall be removed upon completion of the project.

Fill and Spoil:

19. This Agreement does not authorize the use of any fill.

Structures:

20. Any materials placed in seasonally dry portions of a stream or lake that could be washed downstream or could be deleterious to aquatic life shall be removed from the project site prior to inundation by high flows.

21. Areas of disturbed soils with slopes toward a stream or lake shall be stabilized to reduce erosion potential. Planting, seeding and mulching is conditionally acceptable. Where suitable vegetation cannot reasonably be expected to become established, non-erodible materials, such as coconut fiber matting, shall be used for such stabilization. Any installation of non-erodible materials not described in the original project description shall be coordinated with the Department. Coordination may include the negotiation of additional Agreement provisions for this activity.

22. Installation of bridges, culverts, or other structures shall be such that water flow (velocity and low flow channel width) is not impaired. Bottoms of temporary culverts shall be placed at or below stream channel grade. Bottoms of permanent culverts shall be placed below stream channel grade.

23. This Agreement does not authorize the construction of any temporary or permanent dam, structure, flow restriction except as described in the FMMP.

Pollution, Sedimentation, and Litter:

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 9 of 11

24. The Applicant shall comply with all litter and pollution laws. All contractors, subcontractors and employees shall also obey these laws and it shall be the responsibility of the Applicant to insure compliance.

25. No equipment maintenance shall be done within or near any stream channel or lake margin where petroleum products or other pollutants from the equipment may enter these areas under any flow.

26. The clean-up of all spills shall begin immediately. The Department shall be notified immediately by the Applicant of any spills and shall be consulted regarding clean-up procedures.

27. Silty/turbid water from dewatering or other activities shall not be discharged into the stream. Such water shall be settled, filtered, or otherwise treated prior to discharge. The Applicant's ability to minimize turbidity/siltation shall be the subject of pre-construction planning and implementation of the FMMP.

28. Water containing mud, silt, or other pollutants from equipment washing or other activities, shall not be allowed to enter an ephemeral stream or flowing stream or placed in locations that may be subjected to high storm flows.

29. If a stream channel offsite or its low flow channel has been altered it shall be returned, as nearly as possible, to pre-project conditions without creating a possible future bank erosion problem, or a flat wide channel or sluice-like area. The gradient of the streambed shall be returned to pre-project grade unless such operation is part of a restoration project, in which case, the change in grade must be approved by the Department prior to project commencement.

30. Rock, gravel, and/or other materials shall not be imported to, taken from or moved within the bed or banks of the stream, except as otherwise addressed in this Agreement.

Permitting and Safeguards:

31. The Department believes that permits/certification may be required from the Regional Water Quality Control Board and the Army Corp of Engineers for this project, should such permits/certification is required, and a copy shall be submitted to the Department.

32. The Department requires that the 247-acre Big Tujunga Wash Conservation Area be preserved in perpetuity by way of a conservation easement (CE). The Department shall be listed as the sole third party beneficiary, if the Applicant retains fee title, on mitigation lands. The Applicant shall arrange to obtain the CE. Current templates for the Department's approved CE format, along with mitigation banking templates, can be downloaded from the Department's website, www.dfg.ca.gov. The legal advisors can be contacted at (916) 654-3821. The Conservation Easement process must be completed prior to December 31, 2010, or as extended by the Department, or the Applicant shall be in violation of the terms and conditions of this Agreement.

Administrative:

33. All provisions of this Agreement remain in force throughout the term of the Agreement. Any provisions of the Agreement may be amended or the Agreement may be terminated at any time provided such amendment and/or termination are agreed to in writing by both parties. Mutually approved amendments become part of the original Agreement and are subject to all previously negotiated provisions.

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 10 of 11

34. If the Applicant or any employees, agents, contractors and/or subcontractors violate any of the terms or conditions of this Agreement, all work shall terminate immediately and shall not proceed until the Department has taken all of its legal actions.
35. The Applicant shall provide a copy of this Agreement, and all required permits and supporting documents provided with the notification or required by this Agreement, to all contractors, subcontractors, and the Applicant's project supervisors. Copies of this Agreement and all required permits and supporting documents, shall be readily available at work site at all times during periods of active work and must be presented to any Department personnel, or personnel from another agency upon demand. All contractors shall read and become familiar with the contents of this Agreement.
36. A pre-enhancement restoration meeting/briefing shall be held involving all the contractors and subcontractors, concerning the conditions in this Agreement.
37. The Applicant shall notify the Department, in writing, at least five (5) days prior to initiation of restoration enhancement (project) activities and at least five (5) days prior to completion of enhancement and restoration (project) activities. Notification shall be sent to the Department at PO Box 92890, Pasadena, California, 91109. Attn: Jamie Jackson. FAX Number (626) 296-3430, Reference # 1600-2008-0253-R5.
38. The Applicant herein grants to Department employees and/or their consultants (accompanied by a Department employee) the right to enter the project site at any time, to ensure compliance with the terms and conditions of this Agreement and/or to determine the impacts of the project on wildlife and aquatic resources and/or their habitats.
39. The Department reserves the right to enter the project site at any time to ensure compliance with terms/conditions of this Agreement.
40. The Department reserves the right to cancel this Agreement, after giving notice to the Applicant, if the Department determines that the Applicant has breached any of the terms or conditions of the Agreement.
41. The Department reserves the right to suspend or cancel this Agreement for other reasons, including but not limited to, the following:
- a. The Department determines that the information provided by the Applicant in support of this Agreement/Notification is incomplete or inaccurate;
 - b. The Department obtains new information that was not known to it in preparing the terms and conditions of this Agreement;
 - c. The condition of, or affecting fish and wildlife resources change; and
 - d. The Department determines that project activities have resulted in a substantial adverse effect on the environment.
42. Before any suspension or cancellation of the Agreement, the Department will notify the Applicant in writing of the circumstances which the Department believes warrant suspension or cancellation. The Applicant will have seven (7) working days from the date of receipt of the notification to respond in writing to the circumstances described in the Department's notification. During the seven (7) day response period, the Applicant shall immediately cease any project activities which the Department specified in its notification as resulting in a substantial adverse effect on the environment and which will

Streambed Alteration Conditions For Notification Number: 1600-2008-0253-R5

Page 11 of 11

continue to substantially adversely affect the environment during the response period. The Applicant may continue the specified activities if the Department and the Applicant agree on a method to adequately mitigate or eliminate the substantial adverse effect.

CONCURRENCE

County of Los Angeles
Department of Public Works Water Resources Division
Represented by Mr. Christopher Stone
900 S. Fremont Avenue
Alhambra, California, 91803
(626) 458-6102

Name (signature)

Date

Name (printed)

Title

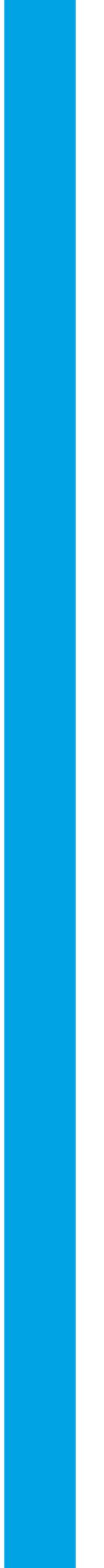
California Department of Fish and Game

Helen R. Birss
Environmental Program Manager
South Coast Region

Date

This Agreement was prepared by Jamie Jackson, Environmental Scientist, South Coast Region.

APPENDIX B – PUBLIC OUTREACH AND WORKER EDUCATION BROCHURE





All visitors must obey these regulations or a citation will be given:

- a. Hours of Operation: Sunrise to Sunset
- b. No fires of any kind
- c. No swimming
- d. No wheeled vehicles
- e. No camping
- f. Dogs must be on leashes.

Todos los visitantes del Big-T deben obedecer todas las reglas, los que no observan las reglas serán multados.

- a. Horas de visita: Salida del sol al Atardecer
- b. No fogatas de ningún tipo
- c. No nadar
- d. No vehículos
- e. No acampar
- f. Los perros deben estar con correas.

¿Preguntas? / Questions?

LADPW: Valerie De La Cruz
 (626) 458-6126
 Water Resources Division
 County of Los Angeles
 Department of Public Works
 P.O. Box 1460
 Alhambra, CA 91802



Big-T's future depends on you!

Over time, small changes add up. Changing the Big-T habitat – making new trails, swimming in the stream, or leaving behind litter – adds up over time. In many cases, the changes are irreversible or require a great deal of time and money to return habitat to what it was like before. These are changes that harm Big-T's animals.

Protect Big-T for Future generations.

When people who visit Big-T act to protect its animals and their habitat, everyone wins. Help safeguard Big-T's future by sharing this information with a friend or becoming involved in community projects to preserve Big-T.

¡El futuro de Big-T depende de usted!

Con el tiempo, pequeños cambios se acumulan modificando el hábitat de Big-T por ejemplo: haciendo nuevos caminos, nadando en el arroyo, o dejando basura, la cual se acumula a lo largo del tiempo. En muchos casos, los cambios son irreversibles o requieren una gran inversión de tiempo y dinero para regresar el hábitat original. Estos son los cambios que perjudican a los animales de Big-T.

Proteja Big-T para las futuras generaciones.

¡Cuando las personas que visitan Big-T siguen las regulaciones que lo protegen, les comunican a otros acerca de la importancia de las regulaciones, o participan en proyectos comunitarios para preservar este lugar, los animales que viven en Big-T y la gente que lo visita ganan!

Did you know that the Big Tujunga Wash is a protected "forest"?

Big-T, as we like to call it is maintained by the County of Los Angeles Department of Public Works (LADPW). Big-T is so unique that there are regulations to protect it from destruction and abuse. We hope that by learning more about Big-T, you'll agree that these regulations make sense.

¿Sabía usted que el Big Tujunga Wash es un "bosque" protegido?

Big-T, como nos gusta llamarlo, es mantenido por el Departamento de Obras Públicas del Condado Los Angeles (LADPW). Big-T es tan único que hay regulaciones para protegerlo de la destrucción y el abuso. Estas regulaciones provienen del Gobierno Federal, el Estado de California, y del gobierno local. Esperamos que al aprender más sobre Big-T, estará de acuerdo en que estas regulaciones tienen sentido.

<http://dpw.lacounty.gov/wrd/facilities/>

Big-T is like a small island

It is surrounded by a large city. Roads, highways, and houses can be found just outside of Big-T that are not suitable habitat for Big-T's animals.

The plants and many of the animals that live here stay here. For several species of birds, Big-T is an important resting place during their migration. For fish, Big-T is their only home.

Over time the island has gotten smaller and smaller. Big-T is sensitive to changes that come from altering or changing habitat. These changes can cause important habitat to disappear. When habitat disappears, animals disappear.

Big-T es como una isla pequeña

Está rodeado de una ciudad grande. Caminos, carreteras, y casas se pueden encontrar a los alrededores de Big-T que no ofrecen hábitat adecuado para los animales de Big-T.

Las plantas y muchos de los animales que habitan este lugar se quedan aquí. Para varias especies de aves, Big-T es un importante lugar de descanso durante su migración. Para los peces, Big-T es su único hogar.

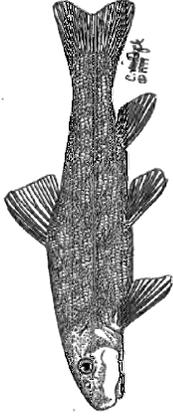
Con el tiempo la isla se ha hecho más pequeña. Big-T es sensible a los cambios de su hábitat. Estos cambios pueden causar que un hábitat tan importante desaparezca. Cuando esto sucede los animales y las plantas también pueden desaparecer.

There is no place like Big-T

Big-T is unique because of the plants and animals that live here. Several of these animals are so rare that regulations have been made to protect where they live. This means that the plants, water, soil, and rocks that make up their homes (or habitat) must not be disturbed or altered.

No hay lugar como Big-T

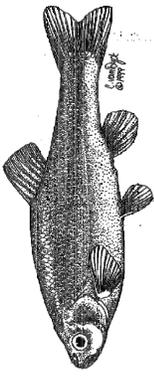
Big-T es único por las plantas y los animales que viven aquí. Varios de estos animales son tan únicos que se han hecho regulaciones para proteger el lugar donde viven. Esto significa que las plantas, el agua, la tierra, y las piedras que componen sus hogares (o hábitat) no debe ser dañado.



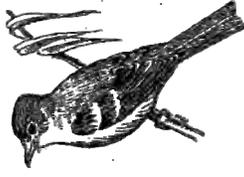
Santa Ana sucker
(*Catostomus santaanae*)



Santa Ana speckled dace /
Carpita pinta
(*Rhinichthys osculus*)



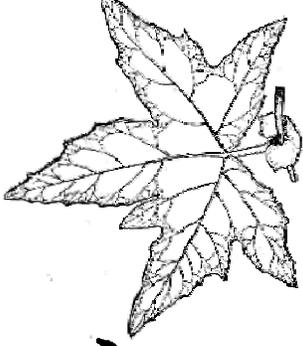
Arroyo chub
(*Gila orcutti*)



Southwestern
willow flycatcher
(*Empidonax traillii extimus*)



Bell's vireo
(*Vireo bellii*)



California Sycamore
(*Platanus racemosa*)

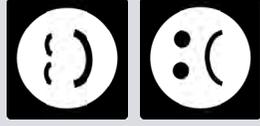
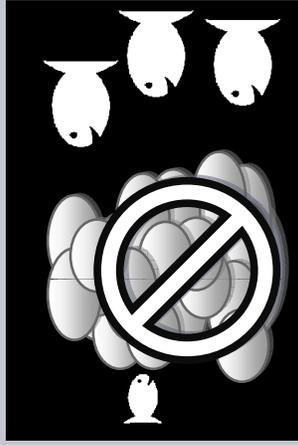


Black willow (*Salix nigra*)

Did you know that these plants and animals rely on each other to survive? And did you know that this community could one day disappear if we don't protect it?

¿Sabía usted que estas plantas y animales dependen de unos a otros para sobrevivir? ¿Y sabía usted que un día esta comunidad podría desaparecer si no la protegemos?

No dams/No presas



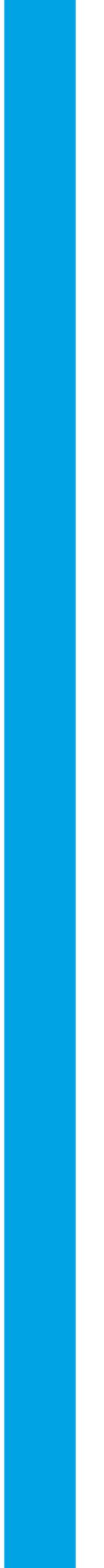
YES/SI



NO!



APPENDIX C – PLANT AND WILDLIFE COMPENDIA



APPENDIX C – PLANT SPECIES LIST

Scientific Name	Common Name
GYMNOSPERMS	
CUPRESSACEAE	CYPRESS FAMILY
<i>Cedrus deodara*</i>	deodar cedar
PINACEAE	PINE FAMILY
<i>Pinus halepensis*</i>	Aleppo pine
ANGIOSPERMS (EUDICOTS)	
ADOXACEAE	MUSKROOT FAMILY
<i>Sambucus nigra</i> subsp. <i>caerulea</i>	blue elderberry
AMARANTHACEAE	AMARANTH FAMILY
<i>Amaranthus albus*</i>	tumbling pigweed
ANACARDIACEAE	SUMAC OR CASHEW FAMILY
<i>Malosma laurina</i>	laurel sumac
<i>Rhus integrifolia</i>	lemonadeberry
<i>Schinus molle*</i>	Peruvian pepper tree
<i>Schinus terebinthifolius*</i>	Brazilian pepper tree
<i>Toxicodendron diversilobum</i>	poison oak
APIACEAE	CARROT FAMILY
<i>Conium maculatum*</i>	poison hemlock
<i>Foeniculum vulgare*</i>	Fennel
APOCYNACEAE	DOGBANE FAMILY
<i>Vinca major*</i>	greater periwinkle
ARALIACEAE	GINSENG FAMILY
<i>Hedera helix*</i>	English ivy
ASTERACEAE	SUNFLOWER FAMILY
<i>Ageratina adenophora*</i>	eupatory
<i>Ambrosia acanthicarpa</i>	annual bur-sage
<i>Ambrosia artemisiifolia</i>	common ragweed
<i>Artemisia californica</i>	California sagebrush
<i>Artemisia douglasiana</i>	mugwort
<i>Artemisia dracunculus</i>	tarragon
<i>Baccharis salicifolia</i> subsp. <i>salicifolia</i>	mule fat
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus*</i>	Italian thistle
<i>Centaurea melitensis*</i>	totalote
<i>Cirsium occidentale</i> var. <i>occidentale</i>	cobwebby thistle
<i>Cirsium</i> sp.*	non-native thistle
<i>Erigeron bonariensis*</i>	flax-leaved horseweed
<i>Erigeron canadensis</i>	horseweed
<i>Heterotheca grandiflora</i>	telegraph weed
<i>Heterotheca sessiliflora</i>	hairy golden-aster
<i>Hypochaeris glabra*</i>	smooth cat's-ear

Scientific Name	Common Name
<i>Lactuca serriola</i> *	prickly lettuce
<i>Lactuca virosa</i> *	poison wild lettuce
<i>Lepidospartum squamatum</i>	scale-broom
<i>Malacothrix saxatilis</i>	cliff malacothrix
<i>Pluchea odorata</i> var. <i>odorata</i>	salt marsh fleabane
<i>Pseudognaphalium biolettii</i>	bicolored cudweed
<i>Pseudognaphalium canescens</i>	felty everlasting
<i>Rafinesquia californica</i>	California chicory
<i>Senecio flaccidus</i> var. <i>douglasii</i>	sand-wash butterweed
<i>Silybum marianum</i> *	milk thistle
<i>Sonchus asper</i> subsp. <i>asper</i> *	prickly sow thistle
<i>Sonchus oleraceus</i> *	common sow thistle
<i>Stephanomeria pauciflora</i>	wire lettuce
<i>Tanacetum parthenium</i> *	feverfew
<i>Taraxacum officinale</i> *	common dandelion
BETULACEAE	BIRCH FAMILY
<i>Alnus rhombifolia</i>	white alder
BIGNONIACEAE	BIGNONIA FAMILY
<i>Catalpa bignonioides</i> *	southern catalpa
BORAGINACEAE	BORAGE FAMILY
<i>Echium candicans</i> *	pride of Madeira
<i>Eriodictyon crassifolium</i>	thick-leaved yerba santa
<i>Phacelia ramosissima</i>	branching phacelia
BRASSICACEAE	MUSTARD FAMILY
<i>Brassica nigra</i> *	black mustard
<i>Hirschfeldia incana</i> *	shortpod mustard
<i>Lepidium latifolium</i> *	peppergrass
<i>Lobularia maritima</i> *	sweet-alyssum
<i>Nasturtium officinale</i>	water-cress
<i>Raphanus sativus</i> *	radish
<i>Sisymbrium altissimum</i> *	tumble mustard
<i>Sisymbrium irio</i> *	London rocket
CACTACEAE	CACTUS FAMILY
<i>Opuntia littoralis</i>	coastal prickly pear
CARYOPHYLLACEAE	PINK FAMILY
<i>Stellaria media</i> *	common chickweed
CHENOPODIACEAE	GOOSEFOOT FAMILY
<i>Chenopodium album</i> *	lamb's quarters
<i>Chenopodium</i> sp.	goosefoot
CONVOLVULACEAE	MORNING-GLORY FAMILY
<i>Convolvulus arvensis</i> *	bindweed
<i>Cuscuta</i> sp.	dodder

Scientific Name	Common Name
CRASSULACEAE	STONECROP FAMILY
<i>Dudleya lanceolata</i>	lance-leaved dudleya
CUCURBITACEAE	GOURD FAMILY
<i>Cucurbita pepo*</i>	pumpkin
<i>Cucurbita sp.*</i>	squash
<i>Marah macrocarpa</i>	wild cucumber
EUPHORBIACEAE	SPURGE FAMILY
<i>Croton californicus</i>	California croton
<i>Euphorbia maculata*</i>	spotted spurge
<i>Euphorbia peplus*</i>	petty spurge
<i>Ricinus communis*</i>	castor-bean
FABACEAE	LEGUME FAMILY
<i>Acmispon glaber</i>	deerweed
<i>Medicago sativa*</i>	alfalfa
<i>Melilotus albus*</i>	white sweetclover
<i>Parkinsonia aculeate*</i>	Mexican palo verde
<i>Spartium junceum*</i>	Spanish broom
FAGACEAE	OAK FAMILY
<i>Quercus agrifolia</i>	coast live oak
<i>Quercus berberidifolia</i>	scrub oak
GERANIACEAE	GERANIUM FAMILY
<i>Erodium cicutarium*</i>	red-stemmed filaree
<i>Geranium rotundifolium*</i>	roundleaf geranium
GROSSULARIACEAE	GOOSEBERRY FAMILY
<i>Ribes aureum</i>	golden currant
HALORAGACEAE	WATER-MILFOIL FAMILY
<i>Myriophyllum spicatum*</i>	Eurasian milfoil
HAMAMELIDACEAE	WITCH-HAZEL FAMILY
<i>Liquidambar styraciflua*</i>	sweet gum
JUGLANDACEAE	WALNUT FAMILY
<i>Juglans californica</i>	California black walnut
LAMIACEAE	MINT FAMILY
<i>Marrubium vulgare*</i>	horehound
<i>Salvia apiana</i>	white sage
<i>Salvia mellifera</i>	black sage
<i>Stachys sp.</i>	hedge-nettle
LOASACEAE	LOASA FAMILY
<i>Mentzelia laevicaulis</i>	smoothstem blazingstar
MALVACEAE	MALLOW FAMILY
<i>Malacothamnus davidsonii</i>	Davidson's bush mallow
<i>Malva parviflora*</i>	cheeseweed
<i>Malva sylvestris*</i>	high mallow

Scientific Name	Common Name
MORACEAE	MULBERRY FAMILY
<i>Ficus carica</i> *	edible fig
<i>Ficus nitida</i> *	Indian fig
<i>Ficus sp.</i> *	fig
<i>Morus alba</i> *	white mulberry
MYRSINACEAE	MYRSINE FAMILY
<i>Lysimachia arvensis</i> *	scarlet pimpernel
MYRTACEAE	MYRTLE FAMILY
<i>Eucalyptus sp.</i> *	gum tree
NYCTAGINACEAE	FOUR O'CLOCK FAMILY
<i>Mirabilis jalapa</i> *	marvel of Peru
OLEACEAE	OLIVE FAMILY
<i>Fraxinus uhdei</i> *	shamel ash
<i>Fraxinus velutina</i>	velvet ash
<i>Ligustrum japonicum</i> *	Japanese privet
<i>Ligustrum lucidum</i> *	glossy privet
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Camissoniopsis bistorta</i>	California sun cup
<i>Clarkia unguiculata</i>	elegant clarkia
<i>Epilobium brachycarpum</i>	parched fireweed
<i>Eulobus californicus</i>	California evening primrose
<i>Oenothera elata</i>	evening primrose
PAPAVERACEAE	POPPY FAMILY
<i>Argemone munita</i>	prickly poppy
<i>Eschscholzia californica</i>	California poppy
PASSIFLORACEAE	PASSION FLOWER FAMILY
<i>Passiflora caerulea</i> *	bluecrown passionflower
PHRYMACEAE	LOPSEED FAMILY
<i>Mimulus guttatus</i>	common monkey-flower
PLANTAGINACEAE	PLANTAIN FAMILY
<i>Plantago arenaria</i> *	Indian plantain
<i>Plantago major</i> *	common plantain
<i>Veronica anagallis-aquatica</i> *	water speedwell
PLATANACEAE	SYCAMORE FAMILY
<i>Platanus racemosa</i>	western sycamore
POLYGONACEAE	BUCKWHEAT FAMILY
<i>Eriogonum fasciculatum</i>	California buckwheat
<i>Eriogonum gracile</i>	slender woolly buckwheat
<i>Persicaria hydropiperoides</i>	water pepper
<i>Pterostegia drymarioides</i>	California thread-stem
<i>Rumex crispus</i> *	curly dock
<i>Rumex pulcher</i>	fiddle dock

Scientific Name	Common Name
<i>Rumex</i> sp.	dock
RANUNCULACEAE	BUTTERCUP FAMILY
<i>Delphinium cardinale</i>	scarlet larkspur
RHAMNACEAE	BUCKTHORN FAMILY
<i>Ceanothus</i> sp.	ceanothus
ROSACEAE	ROSE FAMILY
<i>Heteromeles arbutifolia</i>	toyon
<i>Prunus ilicifolia</i> subsp. <i>ilicifolia</i>	islay, holly-leaf cherry
<i>Rosa californica</i>	California wild rose
<i>Rubus armeniacus</i> *	Himalayan blackberry
<i>Rubus ursinus</i>	California blackberry
SALICACEAE	WILLOW FAMILY
<i>Populus fremontii</i> subsp. <i>fremontii</i>	Fremont cottonwood
<i>Salix exigua</i>	narrow-leaved willow
<i>Salix gooddingii</i>	black willow
<i>Salix laevigata</i>	red willow
<i>Salix lasiolepis</i>	arroyo willow
SAPINDACEAE	SOAPBERRY FAMILY
<i>Acer negundo</i>	California box-elder
SCROPHULARIACEAE	FIGWORT FAMILY
<i>Verbascum virgatum</i> *	wand mullein
SIMAROUBACEAE	QUASSIA FAMILY
<i>Ailanthus altissima</i> *	tree of heaven
SOLANACEAE	NIGHTSHADE FAMILY
<i>Datura wrightii</i>	jimson weed
<i>Lycopersicon esculentum</i> *	tomato
<i>Nicotiana attenuata</i>	coyote tobacco
<i>Nicotiana glauca</i> *	tree tobacco
<i>Solanum americanum</i>	small-flowered nightshade
TAMARICACEAE	TAMARISK FAMILY
<i>Tamarix ramosissima</i> *	Mediterranean tamarisk
<i>Tamarix</i> sp.*	tamarisk
ULMACEAE	ELM FAMILY
<i>Ulmus parvifolia</i> *	Chinese elm
URTICACEAE	NETTLE FAMILY
<i>Urtica dioica</i>	stinging nettle
VITACEAE	GRAPE FAMILY
<i>Parthenocissus quinquefolia</i> *	Virginia creeper
<i>Vitis girdiana</i>	desert wild grape
ZYGOPHYLLACEAE	CALTROP FAMILY
<i>Tribulus terrestris</i> *	puncture vine
ANGIOSPERMS (MONOCOTS)	

Scientific Name	Common Name
AGAVACEAE	AGAVE FAMILY
<i>Agave americana</i> *	century plant
<i>Hesperoyucca whipplei</i>	our Lord's candle
AMARYLLIDACEAE	AMARYLLIS FAMILY
<i>Amaryllis belladonna</i> *	belladonna-lily
ARACEAE	PHILODENDRON FAMILY
<i>Colocasia gigantea</i> *	giant elephant ear
<i>Pistia stratiotes</i> *	water lettuce
ARECACEAE	PALM FAMILY
<i>Arecastrum romanzoffianum</i> *	queen palm
<i>Phoenix canariensis</i> *	Canary Island date palm
<i>Washingtonia</i> sp.	fan palm
ASPHODELACEAE	ASPHODEL FAMILY
<i>Aloe</i> sp.*	aloe
CYPERACEAE	SEDGE FAMILY
<i>Cyperus involucratus</i> *	umbrella-plant
<i>Cyperus</i> sp.	sedge
POACEAE	GRASS FAMILY
<i>Agrostis stolonifera</i> *	redtop
<i>Agrostis viridis</i> *	water bentgrass
<i>Arundo donax</i> *	giant reed
<i>Avena barbata</i> *	slender wild oat
<i>Avena fatua</i> *	wild oat
<i>Bromus diandrus</i> *	ripgut grass
<i>Bromus hordeaceus</i> *	soft chess
<i>Bromus madritensis</i> subsp. <i>madritensis</i> *	foxtail chess
<i>Bromus madritensis</i> subsp. <i>rubens</i> *	red brome
<i>Cortaderia selloana</i> *	pampas grass
<i>Cynodon dactylon</i> *	Bermuda grass
<i>Echinochloa crus-galli</i> *	barnyard grass
<i>Ehrharta calycina</i> *	perennial veldt grass
<i>Eleusine indica</i> *	goose grass
<i>Festuca myuros</i> *	rattail sixweeks grass
<i>Festuca perennis</i> *	Italian ryegrass
<i>Hordeum vulgare</i> *	barley
<i>Panicum dichotomiflorum</i> subsp. <i>dichotomiflorum</i> *	fall panicgrass
<i>Pennisetum setaceum</i> *	fountain grass
<i>Polypogon monspeliensis</i> *	annual beard grass
<i>Polypogon viridis</i> *	water beard grass
<i>Schismus barbatus</i> *	Mediterranean schismus
<i>Stipa miliacea</i> var. <i>miliacea</i> *	smilo grass
<i>Triticum aestivum</i> *	wheat

Scientific Name	Common Name
PONTEDERIACEAE	PICKEREL-WEED FAMILY
<i>Eichhornia crassipes</i> *	water hyacinth
TYPHACEAE	CATTAIL FAMILY
<i>Typha domingensis</i>	slender cattail
*Non-Native Species	

APPENDIX C – WILDLIFE SPECIES LIST

Scientific Name	Common Name
CLASS MALACOSTRACA	CRUSTACEANS
CAMBARIDAE <i>Procambarus clarkii</i>	CRAYFISH red swamp crawfish
CLASS INSECTA	INSECTS
DIPTERA <i>Culicidae family</i>	FLIES mosquito sp.
HYMENOPTERA <i>Apis mellifera</i>	ANTS, BEES, AND WASPS honey bee
ODONATA <i>Anisoptera suborder</i>	DRAGONFLIES AND DAMSELFLIES dragonfly sp.
PAPILIONIDAE <i>Papilio rutulus</i>	PARNASSIANS, SWALLOWTAILS western tiger swallowtail
PIERIDAE <i>Pieris rapae</i>	WHITES & SULPHURS cabbage white
CLASS OSTEICHTHYES	BONY FISH
ATHERINOPSIDAE <i>Menidia beryllina</i>	SILVERSIDES inland silverside
CYPRINIDAE <i>Carassius auratus</i> <i>Cyprinus carpio</i> <i>Gila orcutti</i> <i>Micropterus salmoides</i> <i>Rhinichthys osculus</i> ssp. 3	CARPS AND MINNOWS goldfish common carp arroyo chub largemouth bass Santa Ana speckled dace
CATOSTOMIDAE <i>Catostomus santaanae</i>	SUCKERS Santa Ana sucker
CENTRARCHIDAE <i>Lepomis cyanellus</i> <i>Lepomis macrochirus</i>	SUNFISHES green sunfish bluegill
CICHLIDAE <i>Oreochromis mossambicus</i> <i>Tilapia sp.</i>	CICHLIDS Mozambique tilapia tilapia
ICTALURIDAE <i>Ameiurus natalis</i>	BULLHEAD CATFISHES yellow bullhead
POECILIIDAE <i>Gambusia affinis</i>	TOOTH-CARPS western mosquitofish
CLASS AMPHIBIA	AMPHIBIANS
BUFONIDAE <i>Anaxyrus boreas</i>	TRUE TOADS western toad
HYLIDAE <i>Pseudacris hypochondriaca</i>	TREEFROGS Baja California chorus frog

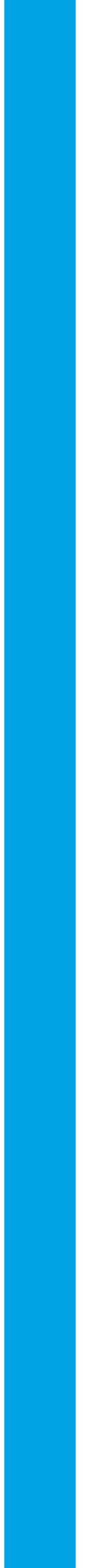
Scientific Name	Common Name
<i>Pseudacris regilla</i>	Pacific chorus frog
RANIDAE	TRUE FROGS
<i>Lithobates catesbeianus</i>	bullfrog
CLASS REPTILIA	REPTILES
CHELYDRIDAE	SNAPPING TURTLES
<i>Chelydra serpentina</i>	common snapping turtle
EMYDIDAE	BOX AND WATER TURTLES
<i>Trachemys scripta elegans</i>	red-eared slider
PHRYNOSOMATIDAE	ZEBRA-TAILED, EARLESS, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS
<i>Sceloporus occidentalis</i>	western fence lizard
<i>Uta stansburiana</i>	side-blotched lizard
TEIIDAE	WHIPTAIL LIZARDS
<i>Aspidoscelis tigris</i>	western whiptail
COLUBRIDAE	COLUBRID SNAKES
<i>Lampropeltis getula californiae</i>	California kingsnake
<i>Masticophis flagellum piceus</i>	red coachwhip
<i>Pituophis catenifer annectens</i>	San Diego gopher snake
<i>Thamnophis hammondi</i>	two-striped garter snake
CLASS AVES	BIRDS
PODICIPEDIDAE	GREBES
<i>Podilymbus podiceps</i>	pie-billed grebe
ARDEIDAE	HERONS, BITTERNs
<i>Ardea herodias</i>	great blue heron
<i>Butorides virescens</i>	green heron
<i>Ardea alba</i>	great egret
<i>Egretta thula</i>	snowy egret
ANATIDAE	DUCKs, GEESE, SWANS
<i>Anas platyrhynchos</i>	mallard
<i>Branta canadensis</i>	Canada goose
<i>Oxyura jamaicensis</i>	ruddy duck
CATHARTIDAE	NEW WORLD VULTURES
<i>Cathartes aura</i>	turkey vulture
ACCIPITRIDAE	HAWKS, KITES, EAGLES
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo jamaicensis</i>	red-tailed hawk
<i>Buteo lineatus</i>	red-shouldered hawk
FALCONIDAE	FALCONS
<i>Falco peregrinus</i>	peregrine falcon
ODONTOPHORIDAE	NEW WORLD QUAIL
<i>Callipepla californica</i>	California quail

Scientific Name	Common Name
RALLIDAE <i>Fulica americana</i>	RAILS, GALLINULES, COOTS American coot
COLUMBIDAE <i>Columba fasciata</i> <i>Columba livia</i> <i>Zenaida macroura</i>	PIGEONS & DOVES band-tailed pigeon rock pigeon mourning dove
CAPRIMULGIDAE <i>Chordeiles acutipennis</i>	NIGHTHAWKS lesser nighthawk
APODIDAE <i>Aeronautes saxatalis</i>	SWIFTS white-throated swift
TROCHILIDAE <i>Calypte anna</i> <i>Selasphorus sasin</i>	HUMMINGBIRDS Anna's hummingbird Allen's hummingbird
ALCEDINIDAE <i>Megaceryle alcyon</i>	KINGFISHERS belted kingfisher
PICIDAE <i>Colaptes auratus</i> <i>Melanerpes formicivorus</i> <i>Picoides nuttallii</i> <i>Picoides pubescens</i>	WOODPECKERS northern flicker acorn woodpecker Nuttall's woodpecker downy woodpecker
TYRANNIDAE <i>Myiarchus cinerascens</i> <i>Sayornis nigricans</i> <i>Tyrannus vociferans</i>	TYRANT FLYCATCHERS ash-throated flycatcher black phoebe Cassin's kingbird
HIRUNDINIDAE <i>Petrochelidon pyrrhonota</i> <i>Hirundo rustica</i> <i>Stelgidopteryx serripennis</i> <i>Tachycineta bicolor</i>	SWALLOWS cliff swallow barn swallow northern rough-winged swallow tree swallow
CORVIDAE <i>Aphelocoma californica</i> <i>Corvus brachyrhynchos</i> <i>Corvus corax</i>	JAYS & CROWS California scrub-jay American crow common raven
PARIDAE <i>Baeolophus inornatus</i>	CHICKADEES, TITMICE oak titmouse
AEGITHALIDAE <i>Psaltriparus minimus</i>	BUSHTITS bushtit
TROGLODYTIDAE <i>Campylorhynchus brunneicapillus</i> <i>Thryomanes bewickii</i>	WRENS cactus wren Bewick's wren
SYLVIIDAE	OLD WORLD WARBLERS

Scientific Name	Common Name
<i>Chamaea fasciata</i>	wrentit
POLIOPTILIDAE	GNATCATCHERS
<i>Polioptila californica</i>	California gnatcatcher
TURDIDAE	THRUSHES
<i>Sialia mexicana</i>	western bluebird
MIMIDAE	MOCKINGBIRDS, THRASHERS
<i>Mimus polyglottos</i>	northern mockingbird
<i>Toxostoma redivivum</i>	California thrasher
PTILOGONATIDAE	SILKY-FLYCATCHERS
<i>Phainopepla nitens</i>	phainopepla
STURNIDAE	STARLINGS
<i>Sturnus vulgaris</i>	European starling
VIREONIDAE	VIREOS
<i>Vireo huttoni</i>	Hutton's vireo
PARULIDAE	WOOD WARBLERS
<i>Setophaga coronata</i>	yellow-rumped warbler
<i>Cardellina pusilla</i>	Wilson's warbler
<i>Geothlypis trichas</i>	common yellowthroat
ICTERIDAE	BLACKBIRDS
<i>Agelaius phoeniceus</i>	red-winged blackbird
<i>Icterus cucullatus</i>	hooded oriole
<i>Icterus bullockii</i>	Bullock's oriole
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird
<i>Quiscalus mexicanus</i>	great-tailed grackle
<i>Molothrus ater</i>	brown-headed cowbird
EMBERIZIDAE	EMBERIZIDS
<i>Melospiza lincolnii</i>	Lincoln's sparrow
<i>Melospiza melodia</i>	song sparrow
<i>Melospiza crissalis</i>	California towhee
<i>Pipilo maculatus</i>	spotted towhee
<i>Zonotrichia leucophrys</i>	white-crowned sparrow
CARDINALIDAE	CARDINALS
<i>Piranga ludoviciana</i>	western tanager
FRINGILLIDAE	FINCHES
<i>Spinus psaltria</i>	lesser goldfinch
<i>Spinus tristis</i>	American goldfinch
<i>Carpodacus mexicanus</i>	house finch
PASSERIDAE	OLD WORLD SPARROWS
<i>Passer domesticus</i>	house sparrow
CLASS MAMMALIA	MAMMALS
LEPORIDAE	HARES & RABBITS

Scientific Name	Common Name
<i>Sylvilagus audubonii</i>	desert cottontail
SCIURIDAE	SQUIRRELS
<i>Spermophilus beecheyi</i>	California ground squirrel
MURIDAE	MICE, RATS, AND VOLES
<i>Neotoma fuscipes</i>	dusky-footed woodrat
CANIDAE	WOLVES & FOXES
<i>Canis familiaris</i>	domestic dog
<i>Canis latrans</i>	coyote
EQUIDAE	HORSES & BURROS
<i>Equus caballus</i>	horse

APPENDIX D – EXOTIC PLANT REMOVAL MEMOS AND CDFW NOTIFICATIONS





April 30, 2018

Mr. Matthew Chirdon
California Department of Fish and Wildlife
P.O. Box 1797
Ojai, CA 93024

RE: Notification No. 1600-2008-0253-R5 – Big Tujunga Wash Mitigation Area Exotic Plant Removal and Maintenance Activities

Dear Mr. Chirdon:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning May 2018 at the Los Angeles County Department of Public Works' Big Tujunga Wash Mitigation Area near the City of Sunland in Los Angeles County. The activities will begin with the biologists conducting a pre-activity survey for nesting birds and to identify the areas where weeds, non-native grasses, and invasive exotic plants species will need to be removed. The pre-activity survey will take place on May 1, 2018. The biologists will also walk the trails to identify potential trail maintenance issues that will be addressed during scheduled trail maintenance with a tentative start date of May 28, 2018. The locations of all sensitive biological resources that are found will be recorded using a Global Positioning System (GPS) unit. If active bird nests are identified, then an appropriately-sized buffer will be established as a "no work" zone. Areas that will require maintenance will also be recorded using a GPS unit. A biological monitor will be on site during all site maintenance and exotic plant removal activities.

Please do not hesitate to contact me at (949) 261-5414 ext. 7288 to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.

Paul Morrissey
Principal | Director of Biology

June 20, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for May 2018 Exotic Plant Eradication Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the exotic plant eradication effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) during May 2018. This memo shows the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to the Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in exotic plant removal efforts within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of this exotic plant eradication effort including, dates, names of participants, locations and descriptions of eradication activities performed, sensitive resources encountered, and mitigation actions taken are discussed below.

METHODS

The exotic plant eradication team focused on designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, Tujunga Ponds and all authorized trails as well as areas that had been treated during previous eradication efforts. High-density areas of exotic plants that were previously mapped with Collector for ArcGIS (Collector), a Geographic Information System (GIS) application, were inspected and treatments were applied to new or re-sprouting exotic plants.

All herbicides used during exotic plant eradication efforts were California-approved aquatic herbicides approved for use within 15 feet of any water source. Exotic plants measuring more than 5 feet in height were treated with the cut-stump method using an herbicide mixture of 50 percent Polaris (an aquatically-approved, imazapyr-based herbicide), 2 percent Activator 90 (an aquatically-approved penetrant, deposition, drift control agent), and Turf Trax (a blue indicator dye). Exotic plants measuring less than 5 feet in height were treated with a foliar herbicide application when possible, or were hand pulled when herbicides might damage nearby native vegetation. The foliar herbicide mixture contained 2.5 percent Roundup Custom (an aquatically-approved, glyphosate-based herbicide), 2.5 percent Scythe, a contact herbicide, 2.5 percent Activator 90, and Turf Trax. Large stands of exotic grasses were treated with a monocot-specific herbicide mixture that contained 0.5 percent Fusilade II, 2 percent Activator 90, and Turf Trax.

RESULTS

Substantially more weeds were present this year due to the damage from the Creek Fire that burned through the BTWMA in December 2017. Treatment of the exotic plant species was performed from May 1 through May 30, 2018. The crew averaged five members per day during exotic plant eradication efforts and included, the Director of Restoration Construction (Restoration Specialist) Steven Reinoehl, Branden Cox, Alfredo Figueroa, Jose Jimenez, Steve Hansen, and Biologists Cynthia Chavez, Kealin McAtee, Jeremy Smith, and Jacob Llyod Davies. Pre-activity sweeps for sensitive plant and wildlife species including nesting birds, were conducted each work day by the onsite biologists. Prior to the start of work each day, the crew received onsite orientation and instruction regarding safety, permit and



mitigation regulations, and sensitive species that may be encountered in work areas. The meetings were conducted by Restoration Specialist Steven Reinoehl and one or more of the onsite biologists.

Exotic plants continued to be encountered in the high priority areas around Hanes Canyon Creek. The exotic plant removal effort began on May 1 in the high priority areas just east of Cottonwood Avenue and continued east and south throughout the riparian area to the boundary with the 210 Freeway. Mustard species (*Hirschfeldia incana*, *Brassica* spp., *Sisymbrium* spp.) were dominant in this area. Large stands of mustard species were treated with the foliar herbicide mixture. Areas with high concentrations of mixed, exotic grasses interspersed with native shrubs were treated with the monocot-specific herbicide mixture. Cut castor bean (*Ricinus communis*) was stacked in the clearings from where it had been removed. Viable seed heads were removed from the castor bean plants, bagged, and hauled off site for disposal. Other exotic plant species that were encountered and treated included, tree of heaven (*Ailanthus altissima*), Virginia creeper (*Parthenocissus quinquefolia*), greater periwinkle (*Vinca major*), various mustards (*Hirschfeldia incana* and *Brassica* sp.), white sweet clover (*Melilotus albus*), tree tobacco (*Nicotiana glauca*), giant reed (*Arundo donax*), pampas grass (*Cortaderia selloana*), poison hemlock (*Conium maculatum*), barnyard grass (*Echinochloa crus-galli*), creeping bent grass (*Agrostis stolonifera*), Himalayan blackberry (*Rubus armeniacus*), rabbitfoot grass (*Polypogon monspeliensis*), fountain grass (*Pennisetum setaceum*), sweet alyssum (*Lobularia maritima*), and milk thistle (*Silybum marianum*). No active bird nests or sensitive wildlife species were observed within the work areas. Work areas where high bird activity was observed during pre-activity sweeps, were documented and continually surveyed and monitored during all exotic plant removal activities. No homeless encampments were encountered in or near the work areas; however, homeless encampments were observed in increased quantities under the 210 Freeway and Foothill Boulevard bridges just north and east of the BTWMA.

The exotic plant removal effort continued on May 18, in the area west of Cottonwood Avenue. The crew continued exotic plant removal activities working west from Cottonwood Avenue and covering most of the high priority area that extends towards the powerlines at the western boundary of the BTWMA. Mustard species remained the primary focus of removal efforts, and the few remaining large stands of mature plants were cut down and stacked. Additional exotic plant species encountered and treated included, prickly lettuce (*Lactuca serriola*), common sow thistle (*Sonchus oleraceus*), spotted spurge (*Euphorbia maculate*), Mexican fan palm (*Washingtonia robusta*), Bermuda grass (*Cynodon dactylon*), giant reed (*Arundo donax*) and scarlet pimpernel (*Lysimachia arvensis*). These species were most commonly treated with foliar applications of herbicides; however, some were hand pulled in areas where herbicides might damage nearby native vegetation.

On May 23, the crew shifted the removal effort to the Big Tujunga Wash. They continued working north of Hanes Canyon Creek toward the boundary with the 210 Freeway. The previously treated five clumps of giant reed, were inspected and showed no signs of re-sprouting. Additional exotic plants that were treated with herbicides included, umbrella plant (*Cyperus involucratus*), artichoke thistle (*Cynara cardunculus*), common plantain (*Plantago major*), cheeseweed (*Malva parviflora*), horehound (*Marrubium vulgare*), and marvel of Peru (*Mirabilis jalapa*). No active bird nests or homeless encampments were encountered in or near the work areas.

SUMMARY

All exotic plant eradication activities were supervised by the Restoration Specialist Steven Reinoehl, to ensure regulations and requirements were closely followed. Biologists inspected work areas prior to the start of each workday and then traveled with the crew to ensure that native species were not disturbed. No birds showed signs of stress during the effort. Only California-approved aquatic herbicides were used within 15 feet of any water source. Crew members used established trails and creek crossings as much as feasible, to minimize disturbance to sensitive stream habitat and species residing in the creek. Exotic plant removal efforts were completed on May 28, and the crew was completely demobilized by May 30.

The next exotic plant removal effort is projected for mid-summer of 2018.



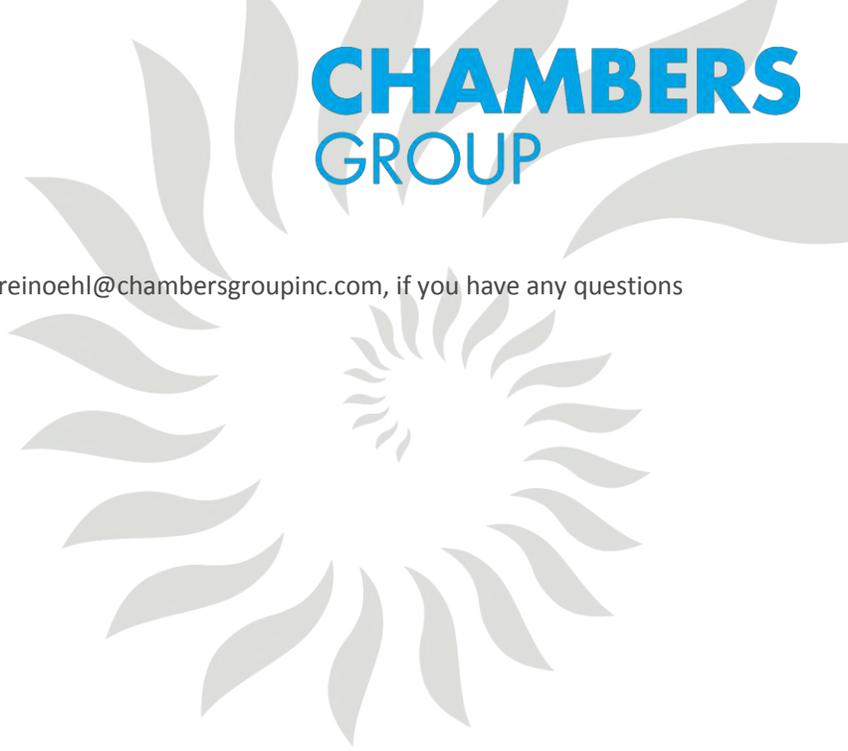
Please feel free to contact me at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like further information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Exotic mustard species dominated area east of the Cottonwood Avenue entrance.



Photo 2: Exotic weeds north of the Cottonwood Avenue entrance, adjacent to Haines Canyon Creek.





Photo 3: View of BTWMA west of Cottonwood Avenue entrance.



Photo 4: Returning stands of giant reed in the BTWMA prior to treatment.



September 19, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for July and August 2018 Exotic Plant Eradication Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the exotic plant eradication effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) during July and August 2018. This memo shows the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to the Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in exotic plant removal efforts within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of the second exotic plant eradication effort including, dates, names of participants, locations and descriptions of eradication activities performed, sensitive resources encountered, and mitigation actions taken are discussed below.

METHODS

The exotic plant eradication team focused on designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds and all authorized trails as well as areas that had been treated during the previous eradication efforts. High-density areas of exotic plants that were previously mapped with Collector for ArcGIS (Collector), a Geographic Information Systems (GIS) application, were inspected and herbicide treatments were applied to new or re-sprouting exotic plants.

All herbicides used during exotic plant eradication efforts were California-approved aquatic herbicides approved for use within 15 feet of any water source. Exotic plants were treated with a foliar herbicide application when possible or were hand-pulled when herbicides might damage nearby native vegetation. The foliar herbicide mixture contained 2.5 percent Roundup Custom (an aquatically-approved, glyphosate-based herbicide), 1 percent Activator 90 (an aquatically-approved penetrant, deposition, and drift control agent), and Turf Trax (a blue indicator dye). Large stands of exotic grasses were treated with a monocot-specific herbicide mixture that contained 0.5 percent Fusilade II, 2 percent Activator 90, and Turf Trax.

RESULTS

Substantially more weeds were present this year due to the destruction of native vegetation from the Creek Fire that burned through the BTWMA in December 2017. The availability of open space has increased for the establishment of weedy species. Treatment of the exotic plant species was performed from July 24 through August 31, 2018. The crew averaged two to three members per day during exotic plant eradication efforts and included, the Director of Restoration Construction (Restoration Specialist) Steven Reinoehl, Branden Cox, and Biologists Cynthia Chavez and Jacob Lloyd Davies. Pre-activity sweeps for sensitive plant and wildlife species including nesting birds, were conducted each work day by Biologist Jacob Lloyd Davies or Cynthia Chavez prior to the start of exotic plant removal activities. Prior to the start of work each day, the crew received onsite orientation and instruction regarding safety, permit and



mitigation regulations, and sensitive species that may be encountered in work areas. The meetings were conducted by Restoration Specialist Steven Reinoehl and Biologist Jacob Lloyd Davies.

Exotic plants continued to be encountered in the high priority areas around Haines Canyon Creek. The exotic plant removal effort began on July 24 in the area around Cottonwood Avenue and continued east and south throughout the riparian area along Haines Canyon Creek to the boundary to the with the properties along Wentworth Street. The removal effort continued in this area until August 15, 2018. Mustard species (*Hirschfeldia incana*), *Brassica* spp., *Sisymbrium* spp.) remained dominant in this area. Large stands of mustard species and castor bean (*Ricinus communis*) were treated with the foliar herbicide mixture. Taller castor bean plants were bent down when applying herbicide to reduce the risk of herbicide drift to non-target species. Viable seed heads were removed from the castor bean plants, bagged, and hauled off site for disposal. Areas with high concentrations of mixed, exotic grasses interspersed with native shrubs were treated with the monocot-specific herbicide mixture. Other exotic plant species that were encountered and treated included, lamb's quarters (*Chenopodium album*), tree of heaven (*Ailanthus altissima*), Virginia creeper (*Parthenocissus quinquefolia*), greater periwinkle (*Vinca major*), white sweet clover (*Melilotus albus*), tree tobacco (*Nicotiana glauca*), giant reed (*Arundo donax*), pampas grass (*Cortaderia selloana*), poison hemlock (*Conium maculatum*), barnyard grass (*Echinochloa crus-galli*), creeping bent grass (*Agrostis stolonifera*), Himalayan blackberry (*Rubus armeniacus*), rabbitfoot grass (*Polypogon monspeliensis*), fountain grass (*Pennisetum setaceum*), sweet alyssum (*Lobularia maritima*), and milk thistle (*Silybum marianum*). Work areas where high bird activity was observed during pre-activity sweeps, were documented and continually surveyed and monitored during all exotic plant removal activities. No active bird nests or homeless encampments were encountered in or near the work areas; however, homeless encampments were observed in increased quantities under the 210 Freeway and Foothill Boulevard bridges just north and east of the BTWMA.

The exotic plant removal effort continued on August 16, in the area west of Cottonwood Avenue. The crew continued exotic plant removal activities working west from Cottonwood Avenue and covering most of the high priority area that extends towards the powerlines at the western boundary of the BTWMA. The crew continued the treatment in this area until it was completed on August 24, 2018. Mustard species remained the primary focus of removal efforts and some large stands of maturing plants were treated with the foliar herbicide mixture. Additional exotic plant species encountered and treated included, prickly lettuce (*Lactuca serriola*), common sow thistle (*Sonchus oleraceus*), spotted spurge (*Euphorbia maculate*), Mexican fan palm (*Washingtonia robusta*), Bermuda grass (*Cynodon dactylon*), giant reed (*Arundo donax*) and scarlet pimpernel (*Lysimachia arvensis*). These species were most commonly treated with the foliar applications of herbicides; however, some were hand pulled in areas where herbicides might damage nearby native vegetation. No active bird nests or homeless encampments were encountered in or near the work areas.

The crew continued the removal effort in the open areas of Big Tujunga Wash, north of Haines Canyon Creek to the boundary with the 210 Freeway, starting on August 27 and continuing through August 30. The previously treated five stands of giant reed, were inspected and showed no signs of re-sprouting. Additional exotic plants that were treated with herbicide included, umbrella plant (*Cyperus involucreatus*), field bindweed (*Convolvulus arvensis*), common plantain (*Plantago major*), cheeseweed (*Malva parviflora*), horehound (*Marrubium vulgare*), and marvel of Peru (*Mirabilis jalapa*). No active bird nests or homeless encampments were encountered in or near the work areas.

SUMMARY

All exotic plant eradication activities were supervised by the Restoration Specialist Steven Reinoehl, to ensure regulations and requirements were closely followed. Biologists inspected work areas prior to the start of each workday and then traveled with the crew to ensure that native species were not disturbed. No birds showed signs of stress during the effort. Only California-approved aquatic herbicides were used within 15 feet of any water source. Crew members used established trails and creek crossings as much as feasible to minimize disturbance to sensitive



stream habitat and species residing in the creek. Exotic plant removal efforts were completed on August 30, and the crew was completely demobilized by August 31.

The next exotic plant removal effort is projected for mid-fall of 2018.

Please feel free to contact me at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like further information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Tree tobacco sprouting among native willows, horseweed, and poison oak.



Photo 2: Castor bean behind returning poison oak.





Photo 3: Castor bean plants pulled from an area of returning yerba santa and poison oak.



Photo 4: A cluster of mustard along the trail near the west entrance.





Photo 5: Marvel of Peru was removed from the Tujunga Wash.



December 11, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for November 2018 Exotic Plant Eradication Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the exotic plant eradication effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) during November 2018. This memo shows the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to the Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in exotic plant removal efforts within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of this exotic plant eradication effort including, dates, names of participants, locations and descriptions of eradication activities performed, sensitive resources encountered, and mitigation actions taken are discussed below.

METHODS

The exotic plant eradication team focused on designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds and all authorized trails as well as areas that had been treated during the previous eradication efforts. Herbicide treatments were applied to new or re-sprouting exotic plants.

All herbicides used within 15 feet of any water source during exotic plant eradication efforts were California-approved aquatic herbicides. Targeted exotic weed species included, castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), and other woody species. The larger exotic weed species were treated with cut-stump herbicide applications when possible. The cut-stump herbicide mixture contained 25 percent Garlon 4 Ultra (a Triclopyr-based herbicide), 5 percent Activator 90 (an aquatically-approved penetrant, deposition, and drift control agent), and Turf Trax (a blue indicator dye). Smaller exotic weed species, weeds close to water, or weeds in areas where the cut-stump herbicide applications might damage nearby native vegetation, were hand pulled.

RESULTS

Treatment of the exotic plant species was performed from November 8 through November 30, 2018. The crew averaged two members per day during exotic plant eradication efforts and included, Restoration Foreman Tim Wood, and Biologist Jacob Lloyd Davies. Pre-activity sweeps for sensitive plant and wildlife species were conducted each work day by the biologist prior to the start of exotic plant removal activities. Prior to the start of work each day, the crew received onsite orientation and instruction regarding safety, permit and mitigation regulations, and sensitive species that may be encountered in work areas. The meetings were conducted by Biologist Jacob Lloyd Davies.

The exotic plant removal effort began on November 8 in the area around Cottonwood Avenue and continued east throughout the riparian area along Haines Canyon Creek to the boundary with the properties along Wentworth Street. The removal effort continued intermittently in this area until November 27, 2018. High winds and rain prevented the crew from working continuously on exotic weed removal as it became necessary for the crew to switch



to trail clearing on the days following high winds to reestablish the blocked trails. During exotic weed removal, the crew specifically targeted woody species such as castor bean, tree tobacco, and tree of paradise (*Ailanthus altissima*) but other species were encountered and treated as well. The crew carried tools and herbicides specific for cut-stump treatments, so the ability to treat smaller, non-woody weed species and non-native grasses was limited. Smaller weeds were opportunistically pulled by hand while performing cut-stump treatments on nearby weeds. Viable seed heads were removed from the castor bean plants, bagged, and hauled off site for disposal. Other exotic plant species that were encountered and hand pulled, or noted for upcoming foliar herbicide treatments included, umbrella plant (*Cyperus involucreatus*), lamb's quarters (*Chenopodium album*), Virginia creeper (*Parthenocissus quinquefolia*), greater periwinkle (*Vinca major*), white sweet clover (*Melilotus albus*), pampas grass (*Cortaderia selloana*), poison hemlock (*Conium maculatum*), barnyard grass (*Echinochloa crus-galli*), creeping bent grass (*Agrostis stolonifera*), Himalayan blackberry (*Rubus armeniacus*), rabbitfoot grass (*Polypogon monspeliensis*), fountain grass (*Pennisetum setaceum*), sweet alyssum (*Lobularia maritima*), and milk thistle (*Silybum marianum*). No sensitive plant or wildlife species were encountered in or near the work areas. Homeless encampments were observed in two locations in the BTWMA during the effort, and LADPW was notified on November 27, 2018. The locations of the camps were provided on a map and pictures of the camps were taken.

The exotic plant removal effort continued on the afternoon of November 27, in the area west of Cottonwood Avenue. The crew continued exotic plant removal activities working west from Cottonwood Avenue and covering most of the high priority area that extends towards the powerlines at the western boundary of the BTWMA. The crew continued to target castor bean and tree tobacco with cut-stump herbicide applications. Other non-woody weed species and grasses that will be treated with foliar herbicide applications this winter include, mustard species, prickly lettuce (*Lactuca serriola*), common sow thistle (*Sonchus oleraceus*), spotted spurge (*Euphorbia maculate*), Mexican fan palm (*Washingtonia robusta*), Bermuda grass (*Cynodon dactylon*), giant reed (*Arundo donax*), and scarlet pimpernel (*Lysimachia arvensis*).

SUMMARY

Due to the destruction of native vegetation from the Creek Fire that burned through the BTWMA in December 2017, castor bean, tree tobacco and other woody species are rapidly germinating and growing due to the reduced competition for resources. The availability of open space has increased allowing for the rapid establishment of these weedy species.

All exotic plant eradication activities were supervised by Biologist Jacob Lloyd Davies, to ensure regulations and requirements were closely followed. The biologist inspected work areas prior to the start of each workday and then traveled with the crew to ensure that sensitive plant and wildlife species were not disturbed. No wildlife showed signs of stress during the effort. All herbicide mixing and applications were supervised by Restoration Foremen and Licensed Qualified Applicator, Tim Wood. Only California-approved aquatic herbicides were used within 15 feet of any water source. No herbicides were applied to plants in any body of water. Crew members used established trails and creek crossings as much as feasible to minimize disturbance to sensitive stream habitat and species residing in the creek. Exotic plant removal efforts are ongoing and are planned to be completed before December 24.

Please feel free to contact me at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like further information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Hand pulling castor bean.



Photo 2: Cut-stump treatment on castor bean.





Photo 3: Hand pulled tree tobacco.



Photo 4: One of two homeless encampments encountered during the weed treatment.





Photo 5: Second homeless encampment located between the Tujung Ponds.



Photo 6: Trash at the homeless camp area.



January 23, 2019

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for December 2018 Exotic Plant Eradication Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the exotic plant eradication effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) during December 2018. This memo shows the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to the Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in exotic plant removal efforts within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of this exotic plant eradication effort including, dates, names of participants, locations and descriptions of eradication activities performed, sensitive resources encountered, and mitigation actions taken are discussed below.

METHODS

The exotic plant eradication team focused on designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds and all authorized trails as well as areas that had been treated during the previous eradication efforts. Herbicide treatments were applied to new or re-sprouting exotic plants.

All herbicides used within 15 feet of any water source during exotic plant eradication efforts were California-approved aquatic herbicides. Targeted exotic weed species included, castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), giant reed (*Arundo donax*), tree of heaven (*Ailanthus altissima*), edible fig (*Ficus carica*) taro root (*Colocasia esculenta*) and other woody species. Larger exotic weed species (with the exception of large weeds located within a water source) were treated with cut-stump herbicide applications when possible. The cut-stump herbicide mixture contained 25 percent Garlon 4 Ultra (a Triclopyr-based herbicide), 5 percent Liberate (an aquatically-approved penetrant, deposition, and drift control agent), and Turf Trax (a blue indicator dye). Smaller exotic weed species, weeds close to water, or weeds in areas where the cut-stump herbicide applications might damage nearby native vegetation, were dug out or hand pulled.

RESULTS

Treatment of the exotic plant species was performed from December 3 through December 27, 2018. The crew averaged two members per day during exotic plant eradication efforts and included, Restoration Foreman Tim Wood, Biologist Jacob Lloyd Davies, and crew member Corey Neal. Pre-activity sweeps for sensitive plant and wildlife species were conducted each work day by the biologist prior to the start of exotic plant removal activities. Prior to the start of work each day, the crew received onsite orientation and instruction regarding safety, permit and mitigation regulations, and sensitive species that may be encountered in work areas. The meetings were conducted by Biologist Jacob Lloyd Davies.



The exotic plant removal effort began on December 3 west of the Cottonwood Avenue bluff, and continued west throughout the riparian area along Haines Canyon Creek to the powerlines at the western boundary of the BTWMA. The removal effort continued intermittently in this area until December 27, 2018. As had occurred in November, high winds and rain prevented the crew from working continuously on exotic weed removal and it became necessary for the crew to switch to trail clearing on the days following high winds to reestablish the blocked trails. During exotic weed removal, the crew specifically targeted woody species such as castor bean, tree tobacco, giant reed, edible fig, and tree of heaven but other species were encountered and treated as well. The crew carried tools and herbicides specific for cut-stump treatments, so the ability to treat smaller, non-woody weed species and non-native grasses was limited. Smaller weeds were opportunistically pulled by hand while performing cut-stump treatments on nearby weeds. Other exotic plant species that were encountered and hand pulled, or noted for upcoming foliar herbicide treatments included, umbrella plant (*Cyperus involucratus*), lamb's quarters (*Chenopodium album*), greater periwinkle (*Vinca major*), white sweet clover (*Melilotus albus*), pampas grass (*Cortaderia selloana*), poison hemlock (*Conium maculatum*), barnyard grass (*Echinochloa crus-galli*), creeping bent grass (*Agrostis stolonifera*), Himalayan blackberry (*Rubus armeniacus*), rabbitfoot grass (*Polypogon monspeliensis*), fountain grass (*Pennisetum setaceum*), sweet alyssum (*Lobularia maritima*), scarlet pimpernel (*Lysimachia arvensis*) and milk thistle (*Silybum marianum*). No sensitive plant or wildlife species were encountered in or near the work areas. No homeless encampments were observed within the BTWMA during the December effort.

Two incidents occurred on the site during the exotic plant eradication effort. The first incident occurred on December 14, 2018. At approximately 1:30 in the afternoon, Restoration Foreman Tim Wood encountered a man outfitted with a backpack sprayer who was spraying weeds along Haines Canyon Creek at the west end of the site. His name is William "Bill" Neill and he has a Category C (right-of-ways), Qualified Applicator License (QAL) #104787. He was spraying Garlon (it is unknown whether it was Garlon 3A or 4 Ultra) to treat castor bean along the creek. Tim informed him that he wasn't authorized to spray herbicides within the BTWMA and he left the site without incident. Although Bill was not authorized to spray herbicides within the BTWMA, he could still be a helpful resource for the trail cleanup day events. His contact information was collected and provided to LACDPW for their records and future outreach.

The second incident occurred in morning on December 17, 2018. Restoration Foreman Tim Wood arrived at the site and discovered that the Cottonwood Avenue entrance gate was open and a lock had been cut. The LACDPW CAT30 lock and the Chambers Group locks were undamaged. The storage container lock had also been cut but the only item missing was a round-point shovel. Tim secured the gate and put a new lock on the storage container. Both incidents were reported to LACDPW on December 17, 2018.

SUMMARY

It has been one year since the Creek Fire burned through the BTWMA, destroying much of the native vegetation. Castor bean, tree tobacco, and other woody species continue to germinate and grow rapidly due to the reduced competition for resources. The native plant canopy is still in the early stages of recovery and the availability of open space continues to allow for the rapid establishment of exotic species.

All exotic plant eradication activities were supervised by Biologist Jacob Lloyd Davies, to ensure regulations and requirements were closely followed. The biologist inspected work areas prior to the start of each workday and then traveled with the crew to ensure that sensitive plant and wildlife species were not disturbed. No wildlife showed signs of stress during the effort. All herbicide mixing and applications were supervised by Restoration Foremen and licensed Qualified Applicator, Tim Wood. Only California-approved aquatic herbicides were used within 15 feet of any water source. No herbicides were applied to plants in any body of water. Crew members used established trails and creek crossings as much as feasible to minimize disturbance to sensitive stream habitat and species residing in the creek. Exotic plant removal efforts are ongoing and are anticipated to resume in February 2019.



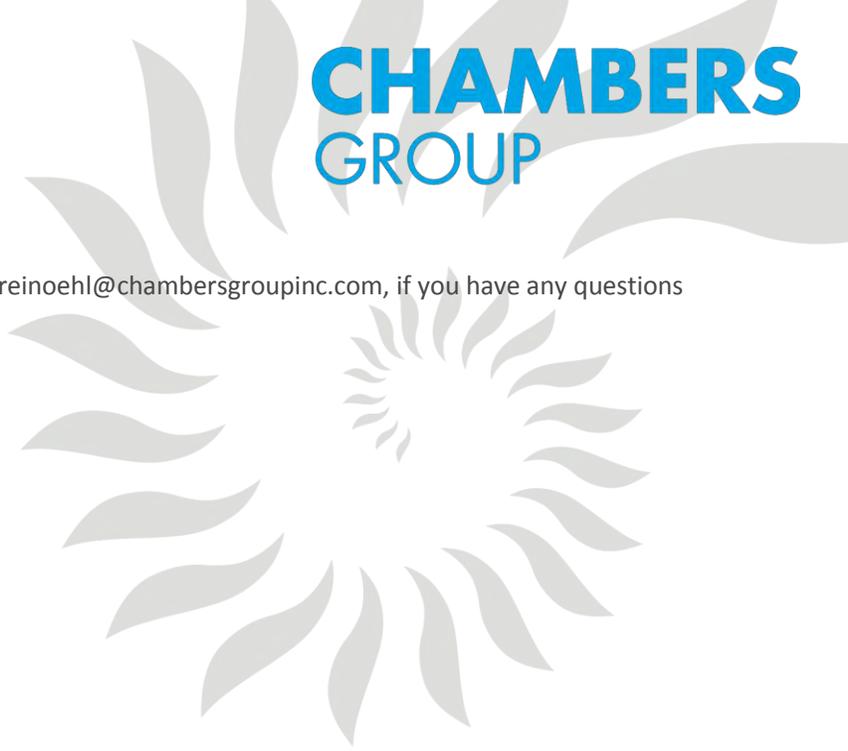
Please feel free to contact me at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like further information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Cut-stump treatment for castor bean and tree tobacco among recovering prickly pear, located at the west end of the Cottonwood-Wentworth bluffs.



Photo 2: A field of castor bean after cut-stump treatment, located in a seasonal seep below the west end of the Cottonwood-Wentworth bluffs.



Photo 3: Castor bean, Mexican fan palm and an edible fig tree located on the north bank of Haines Canyon Creek.



Photo 4: Fountain grass located on the north bank of Haines Canyon Creek on the west side of the BTWMA.





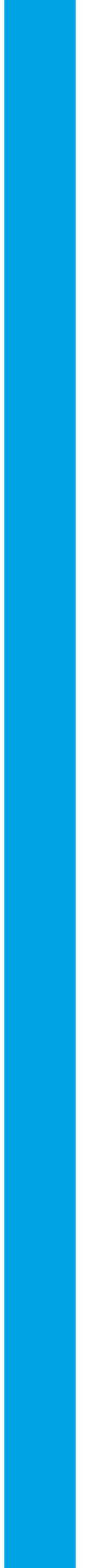
Photo 5: Hand digging fountain grass in Haines Canyon Creek.



Photo 6: Hand digging a small stand of giant reed located in transitional habitat between shrub-scrub and riparian areas on the west side of the BTWMA.



APPENDIX E – WATER LETTUCE INSPECTION MEMO



May 16, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the Water Lettuce Control Program in the Tujunga Ponds at Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Yi Sak Kim,

This memorandum summarizes the site reviews of the Tujunga Ponds (Ponds) at the Big Tujunga Wash Mitigation Area (BTWMA) in Los Angeles County, California. The purpose of the site reviews is to survey the vegetation in and around the Ponds for invasive plant species, most notably water lettuce (*Pistia stratiotes*) and water hyacinth (*Eichhornia crassipes*). In the past, both species have been observed in the Ponds and a substantial effort was required to remove them. If an invasive plant species is discovered in the Ponds, eradication techniques will be developed and implemented as quickly as possible. A summary of the site reviews including, dates, names of participants, and the status of Ponds at the time of each review may be found below.

All reviews of the Ponds were conducted by the Director of Restoration Construction Steven Reinoehl. The initial site review of the Ponds occurred on July 21, 2017. The second review of the Ponds occurred on August 8, 2017, during the trail maintenance effort. The third review of the Ponds occurred during the exotic plant eradication effort on November 22, 2017. An additional review of the Ponds occurred on December 18, 2017 to assess the damage from the Creek Fire which had burned through the BTWMA earlier that month. The post-fire recovery of the Ponds was assessed on February 19, 2018. The most recent review of the Ponds was conducted on May 11, 2018. During each of the visits, native aquatic plant species such as coon's tail (*Ceratophyllum demersum*), duckweed (*Lemna* ssp.), and phytoplanktonic algae species were observed. Invasive plant species were not observed during any of the visits. As a result of the Creek Fire, an influx of nutrients and dead vegetation have accumulated in the Ponds. The tree canopy that would normally provide shade to the Ponds has been removed resulting in increased exposure to wind and sunlight; this has increased the water temperature and evaporation rates of the Ponds. The results of increased exposure to evaporative elements seem to be reduced by the steady inflow and outflow of water that feeds Haines Canyon Creek. The ponds will continue to be monitored for invasive plants for the duration of 2018.

Please feel free to contact me at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like any further information.

Sincerely,

CHAMBERS GROUP, INC.

A handwritten signature in blue ink, appearing to read "Steven Reinoehl".

Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Overview of the Tujunga Ponds on July 21, 2017.



Photo 2: Overview of the Tujunga Ponds on November 22, 2017.





Photo 3. Overview of the Tujunga Ponds, post-Creek Fire, on December 18, 2017



Photo 4: Overview of the Tujunga Ponds on February 20, 2018.

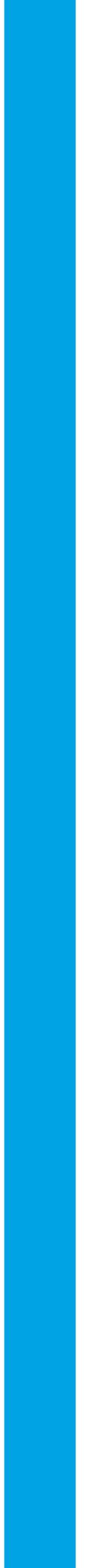




Photo 5: Overview of the Tujunga Ponds on May 11, 2018



APPENDIX F – EXOTIC WILDLIFE REMOVAL MEMOS



March 16, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the February 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the February exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the February exotic wildlife removal effort are provided below.

METHODS

The February exotic wildlife removal effort was a one-day effort conducted on February 28, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Colin Durkin, Leslie Rivas, and Lisa Zumwalde (biologists). During the effort the biologists investigated the lower reaches of the Creek for exotic aquatic species and were prepared to employ hand-capture and dip-netting capture methods for any target species observed. The primary species targeted within the Creek included, red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*). Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All dip nets and other field equipment were thoroughly washed both prior-to and after the day's effort.

RESULTS

The exotic, aquatic species captured and removed from the Creek during the February effort included, three red swamp crayfish. Native, aquatic species observed during the investigation of the Creek included, young-of-the-year (YOY) arroyo chub (*Gila orcutti*) and YOY Santa Ana sucker (*Catostomus santaanae*) which were found approximately 300 feet downstream of the western boundary of the BTWMA.

DISCUSSION AND CONCLUSIONS

Very few native fish and exotic aquatic species were observed within the Creek during the first removal effort. As a result, the February removal effort was limited to one day. The few arroyo chub that were encountered just downstream of the BTWMA were observed displaying "flashing" behavior in an effort to remove parasites from their gills.



Heavy sedimentation was evident throughout the majority of Haines Canyon Creek, covering much of the cobble bottom portions of the creek. However, water quality of the stream was clear and appeared to be of good quality. Trash was also prominent in and along the banks of Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, and various plastic containers.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic wildlife removal effort is planned for March 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS

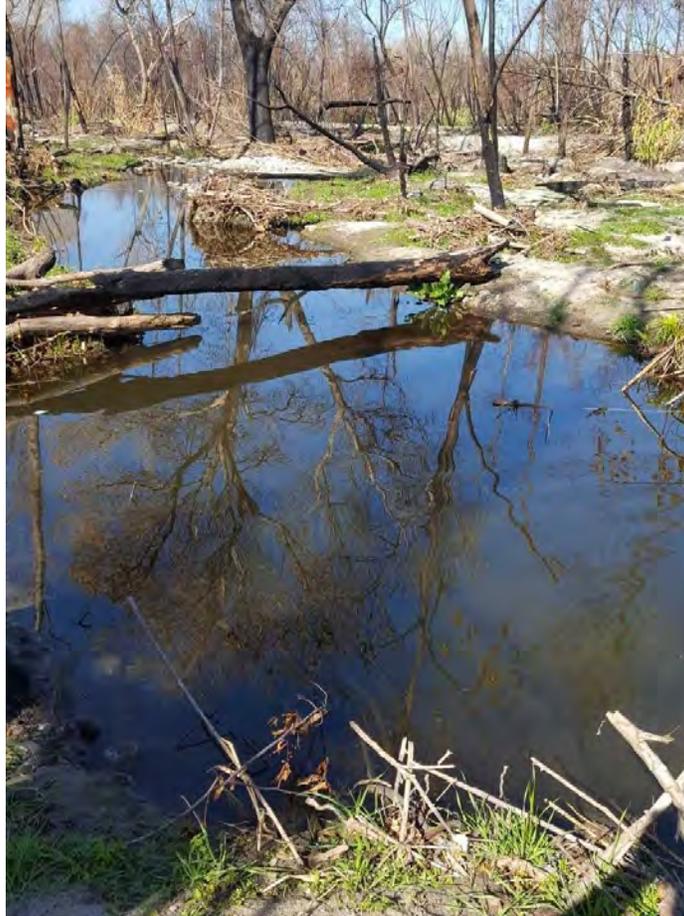


Photo 1: Ponded area of Haines Canyon Creek approximately 300 feet west of the western boundary of the BTWMA where YOY Santa Ana sucker and arroyo chub were observed during exotic species removal efforts on February 28, 2018.



April 17, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the March 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the exotic wildlife removal efforts conducted during the month of March by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the March exotic wildlife removal effort are provided below.

METHODS

The March exotic wildlife removal effort was a two-day effort conducted on March 1 and March 28, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Colin Durkin, Leslie Rivas, and Lisa Zumwalde (biologists). During the first day of the effort the biologists investigated the upper reaches of the Creek for exotic aquatic species and were prepared to employ hand-capture and dip-netting capture methods for any target species observed. The primary species targeted within the Creek included, red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*). During the second day of the effort the biologists investigated both the lower and upper reaches of the Creek for exotic aquatic species; however, very few exotics were observed in the Creek. As a result, the biologists focused their efforts on removing larger exotic species from the Ponds for the remainder of the day, targeting largemouth bass, bluegill (*Lepomis macrochirus*), and tilapia (*Tilapia* spp.) with seines deployed from a small inflatable raft, rod-and-reel, snorkeling and fish-netting methods. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All fish nets and other field equipment were thoroughly washed both prior-to and after the day's effort.

RESULTS

The exotic, aquatic species captured and removed from the Creek during the March effort included, 10 juvenile western mosquitofish and 3 largemouth bass (1 juvenile, 2 adults). The exotic, aquatic species captured and removed from the Ponds during the March effort included, two adult bluegills and one adult tilapia. Very few native aquatic species were observed during the investigation of the Creek. The exotic species in the ponds were in the deeper areas which could not be accessed by the seines.



DISCUSSION AND CONCLUSIONS

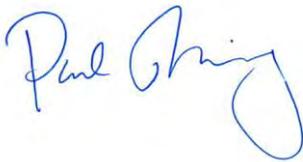
Very few exotic aquatic species were observed within the Creek during the March removal effort. As a result, the March removal effort was limited to two days. In addition, very few native aquatic species were observed in the Creek during the effort and no Santa Ana sucker (*Catostomus santaanae*) or arroyo chub (*Gila orcutti*) were observed in the upper reaches of the Creek where habitat tends to be sandier/siltier and where there is very little cover (e.g., undercut banks, rocks) for the species. During the investigation of the Creek it was observed that the fish exclusionary screen had developed gaps and would require repairs in order to effectively prevent the downstream migration of exotic aquatic species from the Ponds. Plans were made to conduct the screen maintenance during a future removal effort.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic wildlife removal effort is planned for April 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



May 20, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the April 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the April exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include, but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the April exotic wildlife removal effort are provided below.

METHODS

The April exotic wildlife removal effort occurred over two days on April 24 and 25, 2018, and was conducted by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Corey Jacobs, and Cynthia Chavez (biologists). During the first day of the effort the biologists focused on removing exotic aquatic species from the Creek using dip-netting and hand-capture methods. The primary species targeted within the Creek included, red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*). Removal efforts continued in the lower reaches of Creek the following day, again targeting red swamp crayfish, western mosquitofish, and largemouth bass. Particular attention was given to deeper, ponded areas of the Creek that are known to host high volumes of red swamp crayfish. All dip nets and equipment were thoroughly washed both prior-to and after each day's effort. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal efforts were recorded on data sheets.

RESULTS

The exotic, aquatic species captured and removed from the Creek during the April effort included 2 juvenile largemouth bass, 1,007 red swamp crayfish (965 young-of-the-year [YOY], 42 adults), and 107 western mosquitofish (85 YOY, 22 juveniles). Large numbers of juvenile red swamp crayfish and a few adult crayfish were found in mats of algae near the deeper, ponded areas of the Creek.



DISCUSSION AND CONCLUSIONS

Native, aquatic species including, YOY Santa Ana sucker (*Catostomus santaanae*) and YOY Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3) were observed in the Creek during April removal efforts. A majority of the Santa Ana sucker and Santa Ana speckled dace observed were found in a deep pool with undercut banks which also contained exotic largemouth bass. These particular bass were not targeted since they were in close proximity to the Santa Ana sucker. Juvenile red swamp crayfish were found in mats of algae and under the bark of fallen branches near the deeper, ponded areas of the Creek. The biologists targeted these areas to prevent continual spread of exotics through the Creek.

The water quality of the stream appeared to be a bit more turbid than in previous months but appeared to be of good quality. Trash continued to be an issue within and along the banks of Haines Canyon Creek.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic wildlife removal effort is planned for May 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS



Photo 1: Example of a YOY Santa Ana speckled dace encountered in Haines Canyon Creek during exotic wildlife removal efforts on April 25, 2018.



Photo 2: Example of a YOY Santa Ana sucker encountered in Haines Canyon Creek during exotic wildlife removal efforts on April 25, 2018.





Photo 3: Ponded area of Haines Canyon Creek where YOY Santa Ana sucker were observed with exotics including largemouth bass and mosquito fish on April 25, 2018.



May 21, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the May 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the May exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the May exotic wildlife removal effort are provided below.

METHODS

The May exotic wildlife removal effort was a one-day effort conducted on May 9, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Corey Jacobs, Cynthia Chavez, and Kaelin McAtee (biologists). During the removal effort biologists focused on removing exotic, aquatic species from the Creek using dip-netting and hand-capture methods. The primary species targeted within the Creek included, red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*). Large algae mats that were previously observed harboring large numbers of juvenile red swamp crayfish were removed from the deeper, ponded areas of the Creek. The Ponds were also investigated during the removal effort. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All dip nets and other field equipment were thoroughly washed both prior-to and after the day's effort.

RESULTS

The exotic, aquatic species captured and removed from the Creek during the May effort included 2,247 red swamp crayfish (2,185 young-of-the-year [YOY], 62 adults), and 22 juvenile western mosquitofish. The exotic, aquatic species captured and removed from the Ponds included one adult largemouth bass.



DISCUSSION AND CONCLUSIONS

Juvenile red swamp crayfish were found in mats of algae and under the bark of fallen branches near the deeper, ponded areas of the Creek. The biologists targeted these areas to prevent continual spread of exotics through the Creek. Native, aquatic species observed during removal efforts in the Creek included thousands YOY arroyo chub (*Gila arcutti*) and Santa Ana sucker (*Catostomus santaanae*) hatchlings. Due to the large number of young, native fish observed in the Creek on May 9, efforts to remove exotic aquatic species ceased for the remainder of the month in order to avoid potential negative impacts to native fish species. Non-native species within the Ponds appeared to be more active than in previous months. As temperatures rise, efforts to remove exotics within the Ponds will increase.

The water in the Creek was clear and appeared to be of good quality. Trash continued to be an issue within and along the banks of the Creek.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic, aquatic species removal effort is planned for June 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS



Photo 1: Pondered area of Haines Canyon Creek where YOY arroyo chub were observed during exotic wildlife removal efforts on May 9, 2018.



Photo 2: A sandy run along Haines Canyon Creek where YOY Santa Ana Sucker were observed during exotic wildlife removal efforts on May 9, 2018.



July 17, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the June 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the June exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the June exotic wildlife removal effort are provided below.

METHODS

The June exotic wildlife removal effort was a four-day effort conducted on June 12 and 13, and June 21 and 22, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Heather Franklin, Corey Jacobs, Cynthia Chavez, and Jacob Davies (biologists). During the first day of the removal effort the biologists focused on removing exotic aquatic species from the Creek using dip-netting and hand-capture methods. The primary species targeted within the Creek included, red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*). The biologists also removed large algae mats that are known to harbor large numbers of juvenile red swamp crayfish from the deeper, ponded areas of the Creek. During removal efforts, large numbers of young-of-the-year (YOY) largemouth bass were observed below the fish exclusionary screen and plans were made to target the bass the following day. During the second day of the removal effort the biologists focused on removing the YOY largemouth bass from Creek where they were observed congregating below the fish exclusionary screen using dip nets and beach seines. During the third and fourth days of the effort, the focus transitioned to the East and West Tujunga Ponds respectively. The biologists used fish nets, seines deployed from a small raft, snorkel, and rod-and-reel methods to target largemouth bass, bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*) within the Ponds. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All fish nets, seines and other field equipment were thoroughly washed both prior-to and after each day's effort.



RESULTS

The exotic, aquatic species captured and removed from the Creek during the June effort included, 64 largemouth bass (62 young-of-the-year [YOY], 2 adults), and 458 red swamp crayfish (130 YOY, 328 adults). The exotic, aquatic species captured and removed from the Ponds during the June effort included, 833 largemouth bass (788 YOY, 20 juveniles, 25 adults), 442 adult red swamp crayfish, 144 western mosquitofish (142 YOY, 2 adults), 316 bluegills (253 YOY, 9 juveniles, 54 adults), and 181 green sunfish (150 YOY, 2 juveniles, 29 adults).

DISCUSSION AND CONCLUSIONS

Native, aquatic species observed during removal efforts in the Creek included thousands of YOY arroyo chub (*Gila arcutti*) and Santa Ana sucker (*Catostomus santaanae*). These native fish were observed in large numbers throughout all areas of the Creek and appeared healthy. No great blue herons (*Ardea herodias*) or other avian predators were observed in the Creek. The majority of the exotic removal efforts occurred in the Ponds where the exotics were more active and found along the banks of the ponds and in the upper water column where they were more easily captured by seines.

The water in the Creek was clear and appeared to be of good quality. Trash continues to be prevalent in Creek and included numerous golf balls, cans, bottles, Styrofoam, and various plastic containers. During the removal effort the biologist encountered an individual who had been observed recreating in the Mitigation Area on several occasions. The individual had constructed a rock dam in the Creek near the Wheatland Avenue entrance, creating a stagnate, ponded area for swimming. The biologists removed the dam, as rock dams are prohibited and are detrimental to the health of native, aquatic species including the federally threatened Santa Ana sucker.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic, aquatic species removal effort is planned for July 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS



Photo 1: Seine nets deployed near banks and areas where exotic bass and sunfish were observed. The seines were pulled in from the banks in a purse shape to capture fish. No native fish were caught.



Photo 2: Seine nets deployed throughout the ponds by inflatable boat.





Photo 3: Seine nets deployed by inflatable boat and by swimming. The seines were pulled in from the banks in a purse shape to capture fish. No native fish were caught.



Photo 4: The seine nets tended to get stuck on debris such as branches and logs in the water and required several biologists located in the water (diving to release nets) and at the banks to effectively pull in the net to capture fish.



Photo 5: Adult largemouth bass captured by seine at the southeast pond. Several hundred smaller fish were also captured by seine.



Photo 6: Adult bluegills, green sunfish, and largemouth bass captured by seine at the northwest pond.





Photo 7: Bluegills, green sunfish, and largemouth bass captured by seine at the southeast pond.



Photo 8: Adult green sunfish captured by seine at the southeast pond.





Photo 9: Adult largemouth bass and sunfish were also targeted in both ponds using lures and plastic worm rigs in areas where seine nets would not be effective.



August 23, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the July 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the July exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the July exotic wildlife removal effort are provided below.

METHODS

The July exotic wildlife removal effort was a two-day effort conducted on July 24 and 25, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Erik Olmos, Kaelin McAtee, Corey Jacobs, Brian Cropper, Jacob Llyod Davies, Scott Batchelder, and Austin Burke (biologists). During the first day of the effort, the biologists focused on removing exotic aquatic species from the West Tujunga Pond using seines deployed from a small raft, and rod-and-reel methods to target largemouth bass (*Micropterus salmoides*), western mosquitofish (*Gambusia affinis*), bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*). The following day the biologists focused on removing largemouth bass, western mosquitofish, red swamp crayfish (*Procambarus clarkii*), and bluegill from the Creek and East Tujunga Pond using dip-netting, hand-capture, and seining methods. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All fish nets, and other field equipment were thoroughly washed both prior-to and after each day's effort.

RESULTS

The exotic, aquatic species captured and removed from the West Tujunga Pond during the July effort included, 299 largemouth bass (184 young-of-the-year [YOY], 25 juveniles, 90 adults), 1 adult western mosquitofish, 684 bluegills (641 YOY, 33 juveniles, 10 adults), and 24 green sunfish (8 YOY, 6 juveniles, 10 adults). The exotic, aquatic species captured and removed from the Creek and East Tujunga Pond during the July effort included, 260 largemouth bass (213 YOY, 3 juveniles, 44adults), 3 adult western mosquitofish, 122 bluegills (109 YOY, 2 juveniles, 11 adults), and 1 red swamp crayfish.



DISCUSSION AND CONCLUSIONS

Removal efforts within the Creek were focused on areas where native, aquatic species such as arroyo chub (*Gila arcutti*) and Santa Ana sucker (*Catostomus santaanae*) were not located in order to avoid potential negative impacts to the species. The majority of the exotic removal efforts occurred in the Ponds where the exotics were more active and found along the banks of the ponds and in the upper water column where they were more easily captured by seines.

The water in the Creek was clear and appeared to be of good quality. Very little sediments were observed flowing within the Creek, except for areas where pedestrian/equestrian Creek crossings occurred.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic, aquatic species removal effort is planned for August 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS



Photo 1: Example of a sein swim conducted in the Creek on July 25, 2018.



Photo 2: Largemouth bass captured in the Creek during a sein swim on July 25, 2018.





Photo 3: A sunfish caught in the Ponds by rod-and-reel on July 25, 2018.



Photo 4: A largemouth bass caught in the Ponds by rod-and-reel on July 24, 2018.



September 13, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the August 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the August exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the August exotic wildlife removal effort are provided below.

METHODS

The August exotic wildlife removal effort was a two-day effort conducted on August 30 and 31, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Kaelin McAtee, Corey Jacobs, Brian Cropper, Jacob Lloyd Davies, and Cynthia Chavez (biologists). During the first day of the effort, the biologists focused on removing exotic, aquatic species from the Ponds using seines deployed from a small raft, snorkel, and rod-and-reel methods to target, largemouth bass (*Micropterus salmoides*), western mosquitofish (*Gambusia affinis*), bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*). The biologists also investigated the Creek targeting red swamp crayfish (*Procambarus clarkii*) with dip-netting and hand-capture methods along the banks. The following day the biologists focused on removing largemouth bass and red swamp crayfish from the Creek using dip-netting and hand-capture methods. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All fish nets, and other field equipment were thoroughly washed both prior-to and after each day's effort.

RESULTS

The exotic, aquatic species captured and removed from the Creek during the August effort included, 2 juvenile largemouth bass, and 39 red swamp crayfish (7 young-of-the-year [YOY], 32 adults). The exotic, aquatic species captured and removed from the Ponds during the August effort included, 222 largemouth bass (210 YOY, 10 juveniles, 2 adults), 117 YOY western mosquitofish, 145 bluegills (143 YOY, 2 juveniles), 532 green sunfish (519 YOY, 8 juveniles, 5 adults), and 32 red swamp crayfish (31 YOY, 1 adult).



DISCUSSION AND CONCLUSIONS

Removal efforts within the Creek were focused on areas where native, aquatic species such as arroyo chub (*Gila orcutti*) and Santa Ana sucker (*Catostomus santaanae*) were not located in order to avoid potential negative impacts to the species. The majority of the exotic removal efforts occurred in the Ponds where the exotics were more active and found along the banks of the ponds and in the upper water column where they were more easily captured by seines.

During removal efforts on August 31, biologists removed a rock dam along Haines Canyon Creek that had been constructed by two individuals that were observed recreating nearby on multiple occasions. The dam had created a large, stagnate, ponded area and native fishes were observed displaying “flashing” behavior in an attempt to remove parasites from their gills. The rock dam was observed by biologists conducting Public Outreach on August 19 and 25, and was reported to the Los Angeles County Department of Public Works on August 29.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area’s native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic, aquatic species removal effort is planned for September 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS



Photo 1: A rock dam encountered along Haines Canyon Creek near the south Wheatland Avenue entrance during exotic wildlife removal efforts on August 31, 2018, prior to removal.



Photo 2: The rock dam was removed by biologists the same day, allowing the water to flow through unobstructed.



October 9, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the September 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the September exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the September exotic wildlife removal effort are provided below.

METHODS

The September exotic wildlife removal effort was a four-day effort conducted on September 6 and 7, September 26, and September 28, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Heather Franklin, Erik Olmos, Kaelin McAtee, Corey Jacobs, and Brian Cropper (biologists). The biologists focused on removing exotic, aquatic species from the Creek during all four days of the effort. Dip-netting, seining, and hand-capture methods were used to target red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*) within the Creek. During the first day of the effort the biologists used a sein to remove largemouth bass from a Creek crossing where the bass are known to congregate. Dip-netting and hand-capture methods were used to remove red swamp crayfish from other areas of the Creek. During the second day of the effort, the biologists focused on removing largemouth bass from Creek crossings where they had been previously observed, working towards the fish exclusionary screens. Once the biologists reached the exclusionary nets they made the necessary repairs to the metal mesh screens where damage had been observed during previous efforts. The biologists investigated the Ponds for exotics on the third day of the effort; however, due to high vegetative growth within the Ponds, the Ponds were unable to be fished effectively. The biologists returned to the Creek and continued to target largemouth bass and red swamp crayfish for the third and fourth days of the effort. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All fish nets, seines and other field equipment were thoroughly washed both prior-to and after each day's effort.



RESULTS

The exotic, aquatic species captured and removed from the Creek during the September effort included, 106 largemouth bass (82 juveniles, 24 adults), and 641 red swamp crayfish (362 young-of-the-year, 279 adults).

DISCUSSION AND CONCLUSIONS

Fewer native, aquatic species were observed during the September removal efforts in the Creek than in the months preceding. Native fish species observed included arroyo chub (*Gila orcutti*) and Santa Ana sucker (*Catostomus santaanae*). During the effort it was observed that the largemouth bass were migrating upstream towards the Ponds. During the last day of the effort 4 adult, and 10 juvenile largemouth bass were observed below the fish exclusionary screens and were removed. The fish exclusionary nets were repaired on September 7 with Parks and Recreation staff. The old metal mesh screens were replaced with new mesh screens. Approximately 8 to 10 inches of extra mesh screen was allowed to lay on the floor of the creek and was covered with small rocks to fix the mesh screen to the ground. No gaps were present after the replacement of the mesh screens. Several small bass on the downstream side of the screens were captured and removed from Haines Canyon Creek.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic, aquatic species removal effort is planned for October 2018.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



SITE PHOTOS



Photo 1: Example of biologists using fish nets to capture small exotic fishes and red swamp crayfish from Haines Canyon Creek on September 6, 2018.



Photo 2: Example of a young-of-the-year Santa Ana sucker encountered in Haines Canyon Creek on September 7, 2018.



December 21, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the December 2018 Exotic Wildlife Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the December exotic wildlife removal effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA), and the compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Chambers Group biologists participating in exotic wildlife removal efforts were approved prior to the initiation of eradication activities within the BTWMA. The purpose of the Exotic Wildlife Removal Program is to remove exotic, aquatic wildlife from Big Tujunga Wash (Wash), Haines Canyon Creek (Creek), Eastern Tujunga Pond and Western Tujunga Pond (Ponds), thereby reducing negative impacts on sensitive native species. Potential negative impacts to sensitive native species include but are not limited to, resource competition, predation, and the transmission of harmful pathogens and parasites. Details of the December exotic wildlife removal effort are provided below.

METHODS

The December exotic wildlife removal effort was a one-day effort conducted on December 3, 2018, by Chambers Group Wildlife Biologists Paul Morrissey (Santa Ana sucker specialist; USFWS permit 182550-1), Heather Franklin, Kaelin McAtee, Corey Jacobs, and Jacob Lloyd Davies (biologists). During the effort the biologists focused on removing exotic aquatic species from the Creek. Dip-netting, seining, and hand-capture methods were used to target largemouth bass (*Micropterus salmoides*), red swamp crayfish (*Procambarus clarkii*), and bluegill (*Lepomis macrochirus*) within the Creek. The biologists also investigated the Ponds and focused their efforts on capturing larger fish in the center of the Ponds and smaller fish along the banks. Any target species captured during the effort was immediately euthanized and detailed notes documenting each day's removal effort were recorded on data sheets. All fish nets, seines, and other field equipment were thoroughly washed both prior-to and after each day's effort.

RESULTS

The exotic, aquatic species captured and removed from the Creek during the December effort included, 21 largemouth bass (3 young-of-the-year [YOY], 10 juveniles, 8 adults), and 59 red swamp crayfish (50 YOY, 9 adults). The exotic, aquatic species captured and removed from the Ponds during the December effort included, one adult largemouth bass, and two YOY bluegills.



DISCUSSION AND CONCLUSIONS

During the effort it was observed that the largemouth bass were migrating upstream towards the Ponds. The majority of the largemouth bass captured were located below the fish exclusionary screens and were removed. The exclusionary screens were in good condition, and no gaps were present within the screens. The exclusionary nets were also inspected after the high rains that occurred; the nets remained intact with no gaps present. Vegetation growth at the Ponds had died down; however, very little exotic fish activity was identified as many of the exotics remained in the deeper areas of the ponds.

The water within the Creek remained in good quality. High flows from the recent rains were evident; vegetation was pushed down well beyond the ordinary high-water marks reaching widths of close to 40 feet in some areas. Heavy ponding in areas outside the Creek boundaries were also found within the BTWMA. The majority of the high inflow into the BTWMA was observed to enter the site from the southeast overpass of Big Tujunga Wash near the golf course area.

Chambers Group biologists will continue the ongoing effort to protect and enhance the Mitigation Area's native wildlife species by removing exotic, aquatic species such as non-native fishes, frogs, turtles, and red swamp crayfish on a monthly basis. Chambers Group biologists will continually assess the efficacy of exotic wildlife removal methods and adjust these methods as needed to best support mitigation goals. The next exotic, aquatic species removal effort is planned February 2019.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



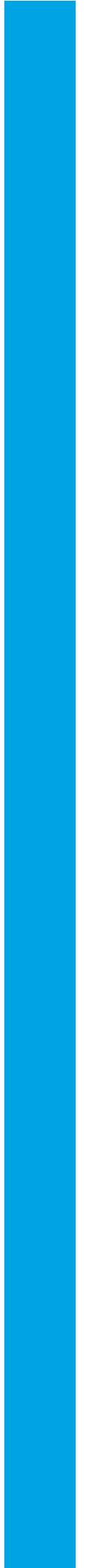
SITE PHOTOS



Photo 1: Example of largemouth bass captured and removed from the Creek on December 3, 2018.



APPENDIX G – 2018 WATER QUALITY MONITORING REPORT



**2018 WATER QUALITY MONITORING
REPORT FOR THE BIG TUJUNGA WASH
MITIGATION AREA**

Prepared for:

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
900 Fremont Avenue, 2nd Floor Annex
Alhambra, CA 91802

Prepared by:

CHAMBERS GROUP, INC.
5 Hutton Centre Drive, Suite 750
Santa Ana, California 92707
(949) 261-5414

April 2019

TABLE OF CONTENTS

	<u>Page</u>
SECTION 1.0 – EXECUTIVE SUMMARY	1
SECTION 2.0 – BACKGROUND	2
SECTION 3.0 – MATERIALS AND METHODS.....	6
SECTION 4.0 – RESULTS	10
SECTION 5.0 – DISCUSSION.....	18
SECTION 6.0 – GLOSSARY	20
 LIST OF FIGURES	
Figure 1: Mitigation Area Water Quality Sampling Stations.....	6
 LIST OF TABLES	
Table 1: Major Activities to Date at the Big Tujunga Wash Mitigation Area	2
Table 2: Pesticides Potentially Used at the Angeles National Golf Club.....	4
Table 3: Water Quality Sampling Locations and Conditions for December 2018.....	8
Table 4: Water Quality Sampling Parameters.....	9
Table 5: Baseline Water Quality (2000)	10
Table 6: Summary of Water Quality Results – December 17, 2018.....	11
Table 7: National and Local Recommended Water Quality Criteria - Freshwaters	12
Table 8: Temperature and pH-Dependent Values of the CMC (Acute Criterion) Mussels Absent.....	13
Table 9: Temperature and pH-Dependent Values of the CCC (Chronic Criterion) Mussels Absent and Early Fish Life Stages Present.....	15
Table 10: 30-Day Average Objective for Ammonia-N for Freshwaters Applicable to Waters Subject to the “Early Life Stage Present” Condition (mg N/L).....	16
Table 11: One-Hour Average Objective for Ammonia-N for Freshwaters (mg N/L).....	17
Table 12: Example Calculated Values for Maximum Weekly Average Temperature for Growth and Short-Term Maxima for Survival of Juvenile and Adult Fishes During the Summer.....	17

Table 13: Discussion of November 2018 Water Quality Sampling Results..... 18

LIST OF APPENDICES

APPENDIX A - 2018 Big Tujunga Wash Mitigation Area Water Quality Monitoring Program Laboratory Results

Distribution

Water quality monitoring reports are distributed to the following agencies:

Los Angeles County Public Works
Ms. Melanie Morita
900 South Fremont Avenue
Alhambra, California 91803-1331

California Department of Fish and Wildlife
Mr. Steve Gibson
Senior Environmental Scientist (Specialist)
CA Dept. of Fish and Wildlife
4665 Lampson Ave. suite C
Los Alamitos, CA 90720

Regional Water Quality Control Board, Los Angeles Region (4)
Ms. Valerie Carrillo Zara
320 West 4th Street, Suite 200 Los Angeles, California 90013

U.S. Fish and Wildlife Service
Ms. Christine Medak
2117 Salk Avenue, Suite 250
Carlsbad, California 92008

U.S. Army Corps of Engineers
Mr. Aaron Allen
P.O. Box 532711
Los Angeles, California 90053-2325

Interested Party
Mr. William Eick
2604 Foothill Boulevard, Suite C La Crescenta, California 91214

SECTION 1.0 – EXECUTIVE SUMMARY

As part of a water quality monitoring program on-going since 2000, sampling of the Big Tujunga Ponds and Haines Canyon Creek was conducted on December 17, 2018. The results of the water quality sample are summarized below:

- Dissolved oxygen levels were below the recommended minimum (5.0 mg/L) at all three stations.
- Observed pH levels were within Basin Plan recommendations for aquatic life at one station (Haines Canyon Creek leaving the site). Observed pH levels were below the Basin Plan recommendations at the remaining two sites.
- Nutrient levels were low with one exception; the total phosphorus level was slightly above EPA's recommendations for streams in the outflow from the Tujunga Ponds and slightly below the EPA's recommendations at the remaining two sites.
- No pesticides or residual chlorine were observed.
- Turbidity levels were low.
- Bacteria levels were above the freshwater bacteria standard at two stations (in the ponds and at the outflow from the ponds). However, the standards are for *E.coli* and the water quality results are for fecal coliform and total coliform.

SECTION 2.0 – BACKGROUND

The County of Los Angeles Department of Public Works (LACDPW) purchased an approximately 210-acre parcel in Big Tujunga Wash as a mitigation area for Los Angeles County Flood Control District (LACFCD) projects throughout Los Angeles County. In coordination with local agencies, the LACDPW defined a number of measures to improve habitat quality at the site. A Final Master Mitigation Plan (FMMP) was prepared to guide the implementation of these enhancements. The FMMP also includes a monitoring program to gather data on conditions at the site during implementation of the improvements. The FMMP was prepared and is currently being implemented by Chambers Group, Inc. (Chambers Group). Water quality monitoring was conducted on a quarterly basis from the fourth quarter of 2000 through the fourth quarter of 2005. In 2006, monitoring was conducted on a semi-annual basis. In 2007 through 2009 monitoring was conducted annually, in December. In 2010, monitoring was conducted in November; pesticide sampling was conducted in early December. In 2012, monitoring was conducted in February and November. Since that time, monitoring has been conducted once per year in the fall. This report presents the results of the water quality sampling for December 2018.

The project site is located just east of Hansen Dam in the Shadow Hills area of the City of Los Angeles. Both Big Tujunga Wash, an intermittent stream, and Haines Canyon Creek, a perennial stream, traverse the project site in an east-to-west direction. The two Tujunga Ponds are located outside of the site boundary, at the far eastern side of the site.

2.1 PROJECT SITE ACTIVITIES

A timeline of project-related activities including water quality sampling events is presented in Table 1.

Table 1: Major Activities to Date at the Big Tujunga Wash Mitigation Area

Date	Activity
2000, April	Baseline water quality sampling
2000, November to 2001, November	Arundo, tamarisk, and pepper tree removal Chemical (Rodeo®) application
2000, December to 2000, November	Water hyacinth removal
2000, December	Fish Sampling at Haines Canyon Creek
2000, December	Water quality sampling
2001, January to present	Exotic aquatic wildlife (non-native fish, crayfish, bullfrog, and turtle) removal – conducted quarterly
2001, February	Partial riparian planting
2001, March	Selective clearing at Canyon Trails Golf Club
2001, March	Water quality sampling
2001, June	Water quality sampling
2001, July	Fish Sampling at Haines Canyon Creek
2001, September	Water quality sampling
2001, October to 2001, November	Fish Sampling at Haines Canyon Creek
2001, December	Water quality sampling

Date	Activity
2002, January	Final riparian planting
2002, July	Upland replacement planting
2002, March	Water quality sampling
2002, June	Water quality sampling
2002, July	Fish Sampling at Haines Canyon Creek
2002, September	Water quality sampling
2002, October	Grading at Canyon Trails Golf Club begins
2002, November	Fish Sampling at Haines Canyon Creek
2002, December	Water quality sampling
2003, March	Water quality sampling
2003, April	Meeting with Canyon Trails Golf Club to discuss future use of herbicides and fertilizers
2003, June	Water quality sampling
2003, August	Fish Sampling at Haines Canyon Creek
2003, September	Water quality sampling
2003, fall	Completion of the golf course construction
2003, December	Water quality sampling
2004, January	Fish Sampling at Haines Canyon Creek
2004, April	Water quality sampling
2004, April	Rock Dam Removal Day
2004, June	Angeles National Golf Club (previously named Canyon Trails) opens to the public
2004, July	Water quality sampling
2004, October	Water quality sampling
2004, December	Water quality sampling
2005, April	Water quality sampling
2005, June	Water quality sampling
2005, October	Water quality sampling
2005, December	Water quality sampling
2006, July	Water quality sampling
2006, December	Water quality sampling
2007, December	Water quality sampling
2008, December	Water quality sampling
2009, August to October	The Station Fire was the largest fire in the recorded history of Angeles National Forest and the 10th largest fire in California since 1933. The fire burned a total of 160,577 acres. The fire was fully contained on October 16, 2009. (Source: Angeles National Forest Incident Update available - http://www.inciweb.org/incident/1856/)
2009, December	Water quality sampling
2010, November	Water quality sampling
2010, December	Water quality sampling for pesticides
2011, September to 2012, January	Water lettuce removal
2012, February	Water quality sampling
2012, November	Water quality sampling

Date	Activity
2013, October	Water quality sampling
2014, October	Water quality sampling
2015, November	Water quality sampling
2016, November 7	Water quality sampling
2017, December	The Creek Fire began on December 5, 2017, approximately 4 miles east of Sylmar, California. The Creek Fire burned a total of 15,619. Much of the Mitigation Area burned, and close to 75 percent of the entire site exhibited signs of severe surface burns, including approximately all of the riparian communities found along Haines Canyon Creek, and more than half of the vegetation within the Big Tujunga Wash area. The fire was fully contained on January 9, 2018. (Sources: Angeles National Forest Incident Update available - https://inciweb.nwccg.gov/incident/5669/ ; Chambers Group 2018 Post Fire Assessment Report)
2017, December 21	Water quality sampling
2018, December 17	Water quality sampling

2.2 UPSTREAM LAND USES

The monitoring program has been designed to specifically address inputs to the site from upstream land uses such as the Angeles National Golf Club (previously named Canyon Trails Golf Club). The golf course has been operating since June 2004. Potential impacts to aquatic species from run-on to the site that contains excessive nutrients or pesticides are of primary concern. Pesticides potentially used at the Angeles National Golf Course include herbicides, insecticides, fungicides, and grass growth inhibitors (Table 2).

Actual use of pesticides is based on golf course maintenance needs. Based on the pesticide use information from the Golf Club, analysis of water samples for glyphosate, chlorpyrifos, other organophosphorous pesticides, and organochlorine pesticides is included in the sampling program for the Big Tujunga Wash Mitigation Area.

Table 2: Pesticides Potentially Used at the Angeles National Golf Club

Manufacturer and Product Name	Active Ingredient	Use
Syngenta Primo Maxx	trinexapac-ethyl	grass growth inhibitor used for turf management
Syngenta Reward	diquat dibromide	landscape and aquatic herbicide
Syngenta Barricade	prodiamine	pre-emergent herbicide
Bayer Prostar 70 WP	flutolanil	fungicide
Monsanto QuikPRO	ammonium salt of glyphosphate and diquat dibromide	herbicide
Monsanto Rodeo® Verdicon Kleenup® Pro Lesco Prosecutor	glyphosate	emerged aquatic weed and brush herbicide
Valent ProGibb T&O	gibberellic acid	plant growth regulator
BASF Insignia 20 WG	pyraclostrobin	fungicide

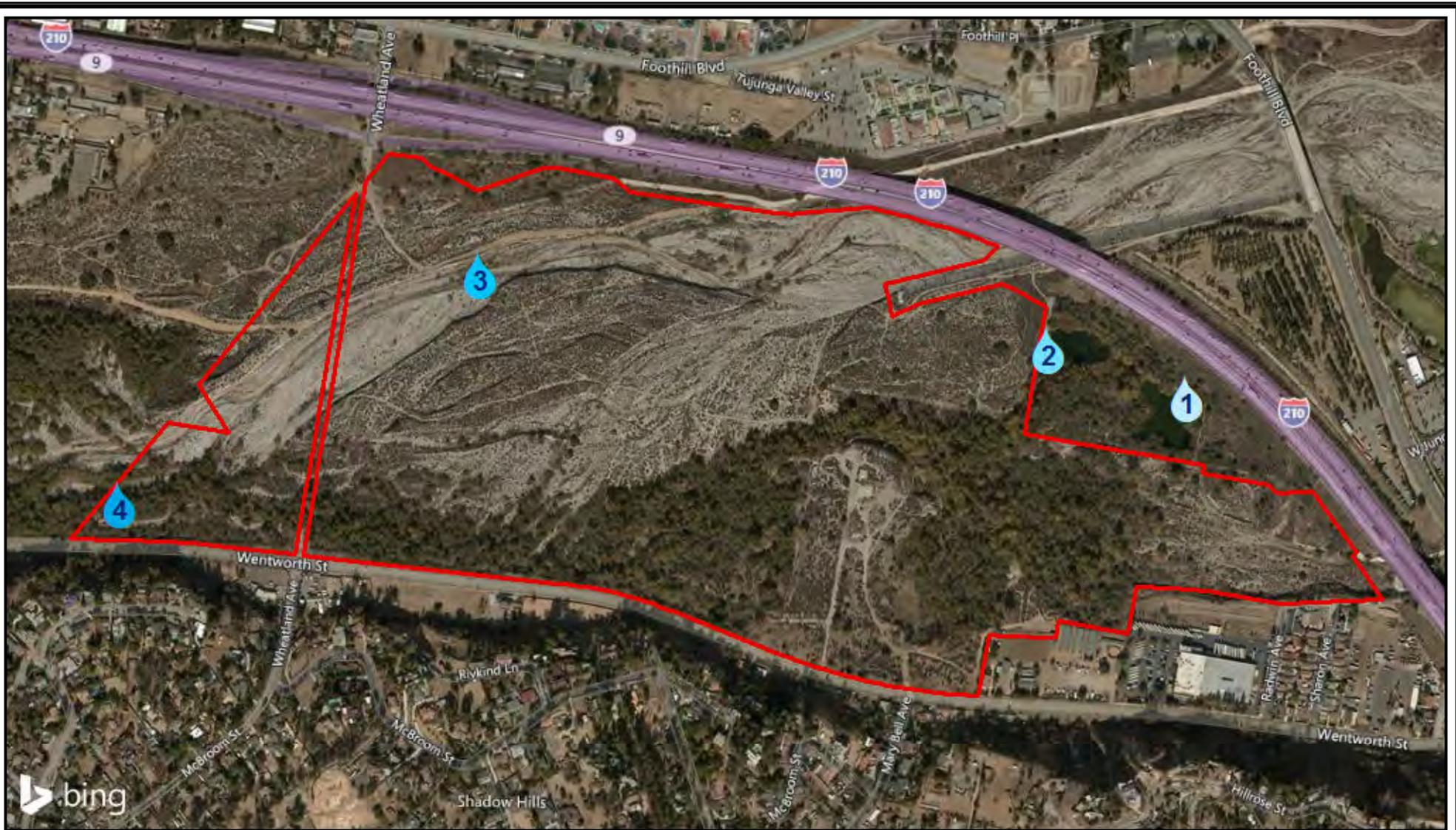
BASF Stalker	Isopropylamine salt of Imazapyr	herbicide
Dow Agrosciences Surflan A.S.	oryzalin	herbicide
Dow Agrosciences Dursban Pro	chlorpyrifos	insecticide
Mycogen Scythe	pelargonic acid	herbicide

Sources: J. Reidinger, Angeles National Golf Club, pers. comm. to M. Chimienti, LACDPW, March 18, 2004 and Angeles National Golf Club Monthly Summary Pesticide Use Reports (December 2004, February 2005 and April 2007).

SECTION 3.0 – MATERIALS AND METHODS

3.1 SAMPLING STATIONS

Four sampling locations have been identified for the monitoring program for the Big Tujunga Wash Mitigation Area (Figure 1). Table 3 summarizes sampling locations and the conditions observed on December 17, 2018.



Legend

- Mitigation Area
- 💧 **Water Quality Sampling Station**
- 💧 1 - Inflow to Tujunga Ponds
- 💧 2 - Outflow from Tujunga Ponds
- 💧 3 - Big Tujunga Wash
- 💧 4 - Haines Canyon Creek, just before exit from site

Figure 1
Water Quality
Sampling Stations

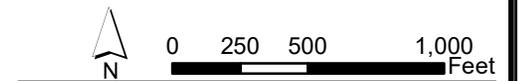


Table 3: Water Quality Sampling Locations and Conditions for December 2018

Date	December 17, 2018		
Air Temperature	Approximately 14.4 (°Celsius) during sample collection period		
Skies	Cloudy		
Observations	Water clear at all locations		
Sampling Locations	Latitude	Longitude	Time of sample
Haines Canyon Creek	34 16' 0.092" N	118 21' 25.716' W	1230
Haines Canyon Creek, inflow to Tujunga Ponds	34 16' 6.040" N	118 20' 22.616" W	1050
Haines Canyon Creek, outflow from Tujunga Ponds	34 16' 8.263" N	118 20' 30.824" W	1130
Big Tujunga Wash	34 16' 11.615" N	118 21' 4.519" W	station dry

3.2 SAMPLING PARAMETERS

Water Quality. Table 4 summarizes the sampling parameters included in the water quality monitoring program. The following meter was used in the field:

- Dissolved oxygen, pH and temperature – YSI 556-01 Multi Probe System

Analytical results were performed at Enthalpy Analytical, LLC, located in Orange, California and Test America, located in Savannah, Georgia. Samples were taken at mid-depth, along a transect perpendicular to the stream channel alignment. Quality assurance/quality control (QA/QC) procedures in each laboratory followed the methods described in their respective Quality Assurance Manuals.

Table 4: Water Quality Sampling Parameters

Parameter	Analysis Location	Analytical Method
total Kjeldahl nitrogen (TKN)	laboratory	EPA 351.2
nitrite - nitrogen (NO ₂ -N)	laboratory	EPA 300.0 by IC
nitrate-nitrogen (NO ₃ -N)	laboratory	EPA 300.0 by IC
ammonia (NH ₄)	laboratory	EPA 350.1
orthophosphate - P	laboratory	Standard Methods 4500PE/EPA 365.1
total phosphorus - P	laboratory	Standard Methods 4500PE/EPA 365.1
total coliform	laboratory	Standard Methods 9221B
fecal coliform	laboratory	Standard Methods 9221C
turbidity	field	EPA 180.1
glyphosate (Roundup/Rodeo) ¹	laboratory	EPA 547
chlorpyrifos and organophosphorous pesticides ²	laboratory	EPA 8141A
organochlorine pesticides ³	laboratory	EPA 608
dissolved oxygen	field	Standard Methods 4500-O G
total residual chlorine	laboratory	Standard Methods 4500-Cl
temperature	field	Standard Methods 2550
pH	field	Standard Methods 4500-H+

Sources for analytical methods:

EPA. Method and Guidance for Analysis of Water.

American Public Health Association, American Waterworks Association, and Water Environment Federation. 1998. Standard Methods for the Examination of Water and Wastewater, 20th Edition. Washington D.C.

1 First analysis completed in the first quarter of 2004

2 First analysis completed in the fourth quarter of 2004. This analytical method tests for the following chemicals: azinphos- methyl, bolster, coumaphos, diazinon, chlorpyrifos, demeton, dichlorvos, disulfoton, ethoprop, fensulfothion, fenthion, mevinphos, naled, phorate, runnel, stiropfos, parathion-methyl, tokuthion, and trichloronate.

3 First analysis completed in December 2007. EPA method 608 tests for aldrin, BHC, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, toxaphene and PCB.

SECTION 4.0 – RESULTS

4.1 BASELINE WATER QUALITY

Sampling and analysis conducted by LACDPW prior to implementation of the FMMP is considered the baseline for water quality conditions at the site. The results of baseline analyses conducted in April 2000 are presented in Table 5. Higher bacteria and turbidity observed in the 4/18/2000 samples are attributable to a rain event. Phosphorus levels were also high in the 4/18/2000 samples, due to release from sediments.

4.2 DECEMBER 2018 RESULTS

Water Quality. Results of analyses conducted by Enthalpy Analytical and Test America are appended to this report (Appendix A) and summarized in Table 6.

Table 5: Baseline Water Quality (2000)

Parameter	Units	Date (2000)	Haines Canyon Creek, Inflow to Tujunga Ponds	Haines Canyon Creek, Outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
Total coliform	MPN/100 ml	4/12	3,000	5,000	170	1,700
		4/18	2,200	170,000	2,400	70,000
Fecal coliform	MPN/100 ml	4/12	500	300	40	80
		4/18	500	30,000	2,400	50,000
Ammonia-N	mg/L	4/12	0	0	0	0
		4/18	0	0	0	0
Nitrate-N	mg/L	4/12	8.38	5.19	0	3.73
		4/18	8.2	3.91	0.253	0.438
Nitrite-N	mg/L	4/12	0.061	0	0	0
		4/18	0.055	0	0	0
Kjeldahl-N	mg/L	4/12	0	0.1062	0.163	0
		4/18	0	0.848	0.42	0.428
Dissolved phosphorus	mg/L	4/12	0.078	0.056	0	0.063
		4/18	0.089	0.148	0.111	0.163
Total phosphorus	mg/L	4/12	0.086	0.062	0	0.066
		4/18	0.113	0.153	0.134	0.211
pH	std units	4/12	7.78	7.68	7.96	7.91
		4/18	7.18	7.47	7.45	7.06
Turbidity	NTU	4/12	1.83	0.38	1.75	0.6
		4/18	4.24	323	4070	737

MPN – most probable number NTU – nephelometric turbidity units

Table 6: Summary of Water Quality Results – December 17, 2018

Parameter	Units	Haines Canyon Creek, Inflow to Tujunga Ponds	Haines Canyon Creek, Outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
Dissolved Oxygen	mg/L	9.3†	6.8†	NA	10.8†
pH	std units	6.49	6.3	NA	6.4
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	ND	ND	NA	ND
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	9.00	6.91	NA	5.48
Orthophosphate-P	mg/L	ND	ND	NA	ND
Total phosphorus-P	mg/L	0.03	0.03	NA	ND
Glyphosate	µg/L	ND	ND	NA	ND
Chloropyrifos*	µg/L	ND	ND	NA	ND
Pesticides (EPA 608)**	µg/L	ND	ND	NA	ND
Turbidity	NTU	0.79	1.05	NA	0.33
Fecal Coliform Bacteria	(MPN/100 ml)	13	33	NA	20
Total Coliform Bacteria	(MPN/100 ml)	920	540	NA	>1600

NA – data not available; station dry on the sample date **NTU** – nephelometric turbidity units

MPN – most probable number

ND – non-detect

* The analytical method used for chloropyrifos (EPA 8141A) also tests for the following chemicals: azinphos-methyl, bolster, coumaphos, diazinon, demeton, dichlorvos, disulfoton, ethoprop, fensulfothion, fenthion, mevinphos, naled, phorate, runnel, stiropfos, parathion-methyl, tokuthion, and trichloronate.

** EPA method 608 tests for aldrin, BHC, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, and toxaphene

† Due to equipment calibration errors on December 17, 2018, dissolved oxygen readings were retaken on March 1, 2019.

4.3 COMPARISON OF RESULTS WITH AQUATIC LIFE CRITERIA

Tables 7 through 12 present objectives established by the United States Environmental Protection Agency (USEPA) and the Los Angeles Regional Water Quality Control Board (Regional Board) for protection of beneficial uses including freshwater aquatic life.

Table 7: National and Local Recommended Water Quality Criteria - Freshwaters

Parameter	Basin Plan Objectives ^a	EPA Criteria		
		CMC	CCC	Human Health
Temperature (°C)	b	See Table 13	See Table 13	--
Dissolved oxygen (mg/L)	>7.0 mean >5.0 min	5.0 ^c (warmwater, early life stages, 1-day minimum)	6.0 ^c (warmwater, early life stages, 7-day mean)	--
pH	6.5 - 8.5	--	6.5-9.0 ^{d,e}	5.0-9.0 ^{d,e}
Total residual chlorine (mg/L)	0.1	0.019 ^{d,e}	0.011 ^{d,e}	4.0 (maximum residual disinfectant level goal)
Fecal coliform (MPN/100 ml)	126 ^f (geometric mean for <i>E. coli</i>) (water contact recreation)	--	--	Swimming stds: 33 ^g (geometric mean for enterococci) 126 ^g (geometric mean for <i>E. coli</i>)
Ammonia-nitrogen (mg/L)	See Tables 11 and 12	See Table 9	See Table 10	--
Nitrite-nitrogen (mg/L)	1	--	--	1 (primary drinking water std.)
Nitrate-nitrogen (mg/L)	10	--	--	10 (primary drinking water std.)
Total phosphorus (mg/L)	--	<0.05 – 0.1 ^e (recommendation for streams, no criterion)		--
Turbidity (NTU)	h	i	i	5 (secondary drinking water standard) 0.5 – 1.0 (std. for systems that filter)

Notes:

-- No criterion

CMC Criteria Maximum Concentration or acute criterion

CCC Criteria Continuous Concentration or chronic criterion

a Source: California Regional Water Quality Control Board, Los Angeles Region. 1994. Water Quality Control Plan (Basin Plan). As amended.

- b** Narrative criterion: “The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses.”
- c** Source: USEPA. 1986. Ambient Water Quality Criteria for Dissolved Oxygen. EPA 440-5-86-003. Washington, D.C. d Source: USEPA. 1999. National Recommended Water Quality Criteria – Correction. EPA 822-Z-99-001. Washington, D.C.
- e** Source: USEPA. 1986. Quality Criteria for Water. EPA 440/5-86-001. Washington, D.C.
- f** Single sample limits – E. coli density shall not exceed 235/100 ml.
- g** Source: USEPA. 1986. Ambient Water Quality Criteria for Bacteria – 1986. EPA 440-5-84-002. Washington, D.C.
- h** Narrative criterion: “Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.”
- i** Narrative criterion for freshwater fish and other aquatic life: “Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life.”

Table 8: Temperature and pH-Dependent Values of the CMC (Acute Criterion) Mussels Absent

CMC: Mussels Absent, mg N/L										
pH	Temperature (°Celsius)									
	0	14	16	18	20	22	24	26	28	30
6.5	58.0	58.0	58.0	58.0	43.7	37.0	31.4	26.6	22.5	19.1
6.6	55.7	55.7	55.7	55.7	41.9	35.5	30.1	25.5	21.6	18.3
6.7	53.0	53.0	53.0	53.0	39.9	33.8	28.6	24.3	20.6	17.4
6.8	49.9	49.9	49.9	49.9	37.6	31.9	27.0	22.9	19.4	16.4
6.9	46.5	46.5	46.5	46.5	35.1	29.7	25.2	21.3	18.1	15.3
7.0	42.9	42.9	42.9	42.9	32.3	27.4	23.2	19.7	16.7	14.1
7.1	39.1	39.1	39.1	39.1	29.4	24.9	21.1	17.9	15.2	12.8
7.2	35.1	35.1	35.1	35.1	26.4	22.4	19.0	16.1	13.6	11.5
7.3	31.2	31.2	31.2	31.2	23.5	19.9	16.8	14.3	12.1	10.2
7.4	27.3	27.3	27.3	27.3	20.6	17.4	14.8	12.5	10.6	8.98
7.5	23.6	23.6	23.6	23.6	17.8	15.1	12.8	10.8	9.18	7.77
7.6	20.2	20.2	20.2	20.2	15.3	12.9	10.9	9.27	7.86	6.66
7.7	17.2	17.2	17.2	17.2	12.9	11.0	9.28	7.86	6.66	5.64
7.8	14.4	14.4	14.4	14.4	10.9	9.21	7.80	6.61	5.60	4.74
7.9	12.0	12.0	12.0	12.0	9.07	7.69	6.51	5.52	4.67	3.96
8.0	9.99	9.99	9.99	9.99	7.53	6.38	5.40	4.58	3.88	3.29
8.1	8.26	8.26	8.26	8.26	6.22	5.27	4.47	3.78	3.21	2.72
8.2	6.81	6.81	6.81	6.81	5.13	4.34	3.68	3.12	2.64	2.24
8.3	5.60	5.60	5.60	5.60	4.22	3.58	3.03	2.57	2.18	1.84
8.4	4.61	4.61	4.61	4.61	3.48	2.95	2.50	2.11	1.79	1.52
8.5	3.81	3.81	3.81	3.81	2.87	2.43	2.06	1.74	1.48	1.25
8.6	3.15	3.15	3.15	3.15	2.37	2.01	1.70	1.44	1.22	1.04
8.7	2.62	2.62	2.62	2.62	1.97	1.67	1.42	1.20	1.02	0.862

CMC: Mussels Absent, mg N/L										
pH	Temperature (°Celsius)									
	0	14	16	18	20	22	24	26	28	30
8.8	2.19	2.19	2.19	2.19	1.65	1.40	1.19	1.00	0.851	0.721
8.9	1.85	1.85	1.85	1.85	1.39	1.18	1.00	0.847	0.718	0.608
9.0	1.57	1.57	1.57	1.57	1.19	1.00	0.851	0.721	0.611	0.517

Note: Native species of freshwater mussels are not known for Big Tujunga Wash or Haines Canyon Creek. CMC – Criteria Maximum Concentration (ammonia)

Source: USEPA. 2009. Draft 2009 Update Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater. EPA 822-D-09-001. Washington, D.C

Table 9: Temperature and pH-Dependent Values of the CCC (Chronic Criterion) Mussels Absent and Early Fish Life Stages Present

CCC: Mussels Absent and Early Fish Life Stages Present, mg N/L										
pH	Temperature (°Celsius)									
	0	14	16	18	20	22	24	26	28	30
6.5	6.36	6.36	6.36	6.36	6.36	6.11	5.37	4.72	4.15	3.65
6.6	6.26	6.26	6.26	6.26	6.26	6.02	5.29	4.65	4.09	3.60
6.7	6.15	6.15	6.15	6.15	6.15	5.91	5.19	4.57	4.01	3.53
6.8	6.00	6.00	6.00	6.00	6.00	5.77	5.08	4.46	3.92	3.45
6.9	5.84	5.84	5.84	5.84	5.84	5.61	4.93	4.34	3.81	3.35
7.0	5.64	5.64	5.64	5.64	5.64	5.42	4.76	4.19	3.68	3.24
7.1	5.41	5.41	5.41	5.41	5.41	5.20	4.57	4.02	3.53	3.10
7.2	5.14	5.14	5.14	5.14	5.14	4.94	4.35	3.82	3.36	2.95
7.3	4.84	4.84	4.84	4.84	4.84	4.66	4.09	3.60	3.16	2.78
7.4	4.52	4.52	4.52	4.52	4.52	4.34	3.82	3.36	2.95	2.59
7.5	4.16	4.16	4.16	4.16	4.16	4.00	3.52	3.09	2.72	2.39
7.6	3.79	3.79	3.79	3.79	3.79	3.65	3.21	2.82	2.48	2.18
7.7	3.41	3.41	3.41	3.41	3.41	3.28	2.89	2.54	2.23	1.96
7.8	3.04	3.04	3.04	3.04	3.04	2.92	2.57	2.26	1.98	1.74
7.9	2.67	2.67	2.67	2.67	2.67	2.57	2.26	1.98	1.74	1.53
8.0	2.32	2.32	2.32	2.32	2.32	2.23	1.96	1.72	1.52	1.33
8.1	2.00	2.00	2.00	2.00	2.00	1.92	1.69	1.49	1.31	1.15
8.2	1.71	1.71	1.71	1.71	1.71	1.64	1.45	1.27	1.12	0.982
8.3	1.45	1.45	1.45	1.45	1.45	1.40	1.23	1.08	0.949	0.835
8.4	1.23	1.23	1.23	1.23	1.23	1.18	1.04	0.914	0.804	0.706
8.5	1.04	1.04	1.04	1.04	1.04	0.999	0.878	0.772	0.679	0.597
8.6	0.878	0.878	0.878	0.878	0.878	0.844	0.742	0.652	0.573	0.504
8.7	0.742	0.742	0.742	0.742	0.742	0.714	0.628	0.552	0.485	0.426
8.8	0.631	0.631	0.631	0.631	0.631	0.606	0.533	0.469	0.412	0.362
8.9	0.539	0.539	0.539	0.539	0.539	0.518	0.455	0.400	0.352	0.309
9.0	0.464	0.464	0.464	0.464	0.464	0.446	0.392	0.345	0.303	0.266

Note: Native species of freshwater mussels are not known for Big Tujunga Wash or Haines Canyon Creek. CCC – Criteria Continuous Concentration (ammonia)

Source: USEPA. 2009. Draft 2009 Update Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater. EPA 822-D-09-001. Washington, D.C.

Table 10: 30-Day Average Objective for Ammonia-N for Freshwaters Applicable to Waters Subject to the “Early Life Stage Present” Condition (mg N/L)

pH	Temperature (°Celsius)								
	14	16	18	20	22	24	26	28	30
6.5	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Source: California Regional Water Quality Control Board, Los Angeles Region. 2005. Amendments to the Water Quality Control Plan – Los Angeles Region with Respect to Early Life Stage Implementation Provisions of the Inland Surface Water Ammonia Objectives for Freshwaters. Taken from USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

Table 11: One-Hour Average Objective for Ammonia-N for Freshwaters (mg N/L)

pH	Waters Designated COLD and/or MIGR	Waters Not Designated COLD and/or MIGR
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

COLD – Beneficial use designation of Cold Freshwater Habitat

MIGR – Beneficial use designation of Migration of Aquatic Organisms

Source: California Regional Water Quality Control Board, Los Angeles Region. 2002. Amendments to the Water Quality Control Plan – Los Angeles Region with Respect to Inland Surface Water Ammonia Objectives. Taken from USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

Table 12: Example Calculated Values for Maximum Weekly Average Temperature for Growth and Short-Term Maxima for Survival of Juvenile and Adult Fishes During the Summer

Species	Growth (°Celsius)	Maxima (°Celsius)
Black crappie	27	--
Bluegill	32	35
Channel catfish	32	35
Emerald shiner	30	--
Largemouth bass	32	34
Brook trout	19	24

Source: USEPA. 1986. Quality Criteria for Water. EPA 440/5-86-001. Washington, D.C.

SECTION 5.0 – DISCUSSION

Results from the December 2018 sampling are described by parameter in Table 13.

Table 13: Discussion of November 2018 Water Quality Sampling Results

Parameter	Discussion
Dissolved oxygen	<ul style="list-style-type: none"> Due to equipment calibration errors on December 17, 2018, dissolved oxygen (DO) readings were retaken on March 1, 2019, and reflect the conditions present at the sampling locations on that day. DO levels ranged from 6.8 mg/L in the Haines Canyon Creek outflow from the Tujunga Ponds to 10.8 mg/L in Haines Canyon Creek leaving the site. DO levels at all three sample stations were above the minimum recommended level (5.0 mg/L) for warmwater fish species.
pH	<ul style="list-style-type: none"> The lowest pH was observed in the Haines Canyon Creek outflow from the Tujunga Ponds (6.30), with highest pH observed in the Tujunga Ponds (6.49). On this date, pH readings in all three stations were below the 6.5 to 8.5 range identified in the Basin Plan.
Total residual chlorine	<ul style="list-style-type: none"> No residual chlorine was detected at any station.
Nitrogen	<ul style="list-style-type: none"> Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. Ammonia was not detected at all stations.
Phosphorus	<ul style="list-style-type: none"> The observed concentration at the ponds (0.04) and in the outflow from the ponds (0.03) is below the lower end of the EPA's recommended range. Phosphorus was not detected at Haines Canyon Creek leaving the site.
Glyphosate	<ul style="list-style-type: none"> Glyphosate was not detected at any station.
Chloropyrifos and Organophosphorous Pesticides	<ul style="list-style-type: none"> Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.
Organochlorine Pesticides	<ul style="list-style-type: none"> Pesticides analyzed by EPA Method 608 were not detected at any station.
Turbidity	<ul style="list-style-type: none"> Turbidity levels were very low (<2.5 NTU) at all stations.

Parameter	Discussion
Bacteria	<ul style="list-style-type: none"> The fresh water bacteria standard for water contact recreation is for <i>E. coli</i> (126 MPN/100 ml geometric mean, 235 MPN/100 ml single sample limits). Observed fecal coliform levels were below the standard at all three stations. Sampling specifically for <i>E. coli</i> was not conducted. Total coliform levels ranged from 540 MPN/100 ml at the outflow from the ponds to >1,600 MPN/100 ml in Haines Canyon Creek leaving the site. [Note that recreation standards are for <i>E. coli</i>. Total coliform standards apply to marine waters and waterbodies where shellfish can be harvested for human consumption.]

mg/L – milligrams per liter NTU – nephelometric turbidity units MPN – most probable number

SECTION 6.0 – GLOSSARY

Ammonia-Nitrogen – $\text{NH}_3\text{-N}$ is a gaseous alkaline compound of nitrogen and hydrogen that is highly soluble in water. Un-ionized ammonia (NH_3) is toxic to aquatic organisms. The proportions of NH_3 and ammonium (NH_4^+) and hydroxide (OH^-) ions are dependent on temperature, pH, and salinity.

Chlorine, residual – The chlorination of water supplies and wastewaters serves to destroy or deactivate disease-producing organisms. Residual chlorine in natural waters is an aquatic toxicant.

Chloropyrifos - white crystal-like solid insecticide widely used in homes and on farms. Used to control cockroaches, fleas, termites, ticks crop pests.

Coliform Bacteria – several genera of bacteria belonging to the family Enterobacteriaceae. Based on the method of detection, the coliform group is historically defined as facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within 48 hours at 35 C.

Fecal Coliform Bacteria – part of the intestinal flora of warm-blooded animals. Presence in surface waters is considered an indication of pollution.

Glyphosate - white compound broad-spectrum herbicide used to kill weeds.

Kjeldahl Nitrogen – Named for the laboratory technique used for detection, Kjeldahl nitrogen includes organic nitrogen and ammonia nitrogen.

Nitrate-Nitrogen – $\text{NO}_3\text{-N}$ is an essential nutrient for many photosynthetic autotrophs.

Nitrite-Nitrogen – $\text{NO}_2\text{-N}$ is an intermediate oxidation state of nitrogen, both in the oxidation of ammonia to nitrate and in the reduction of nitrate.

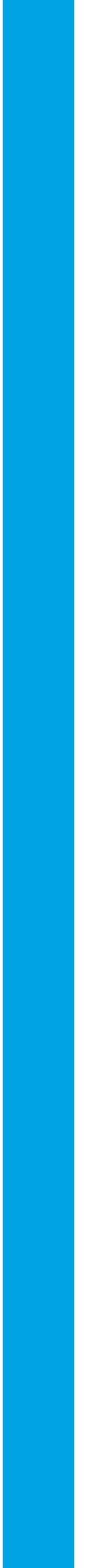
Orthophosphorus – the reactive form of phosphorus, commonly used as fertilizer.

pH – the hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. The pH of “pure” water at 25°C is 7.0 (neutral). Low pH is acidic; high pH is basic or alkaline.

Total Phosphorus – In natural waters, phosphorus occurs almost solely as orthophosphates, condensed phosphates, and organically bound phosphate. Phosphorus is essential to the growth of organisms.

Turbidity – attributable to the suspended and colloidal matter in water, including clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms. The reduction of clearness in turbid waters diminishes the penetration of light and therefore can adversely affect photosynthesis.

APPENDIX A – 2018 LABORATORY RESULTS





Enthalpy Analytical, LLC

931 W. Barkley Ave - Orange, CA 92868
Tel: (714)771-6900 Fax: (714)538-1209
www.enthalpy.com
info-sc@enthalpy.com



Client: Chambers Group
Address: 5 Hutton Centre Drive
Suite 750
Santa Ana, CA 92707
Attn: Heather Franklin

Lab Request: 410049
Report Date: 01/03/2019
Date Received: 12/17/2018
Client ID: 14294

Comments: Big Tujunga

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

Sample # **Client Sample ID**

410049-001 Ponds Inlet
410049-002 Ponds Outlet
410049-003 Haines Creek Exit

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

Diane M. Galvan

Report Review performed by: Diane Galvan, Project Manager

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 60 days from date received.

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Matrix: Water	Client: Chambers Group	Collector: client
Sampled: 12/17/2018 10:50	Site:	
Sample #: <u>410049-001</u>	Client Sample #: Ponds Inlet	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed By	Notes
Method: ALCH 4025	Prep Method: None		QCBatchID:				
Total Nitrogen	9.00	1	0.5	mg/L		01/02/19	SLL
Method: EPA 300.0	Prep Method: Method		QCBatchID: QC1199064				
Nitrate, as Nitrogen	9.00	1	0.1	mg/L	12/17/18	12/17/18 18:19	JP
Nitrite, as Nitrogen	ND	1	0.1	mg/L	12/17/18	12/17/18 18:19	JP
Method: EPA 350.1	Prep Method: Method		QCBatchID: QC1199346				
Ammonia, as Nitrogen	ND	1	0.1	mg/L	12/21/18	12/26/18	TP
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1199236				
Total Kjeldahl Nitrogen	ND	1	0.4	mg/L	12/19/18	12/20/18	TP
Method: EPA 547	Prep Method: Method		QCBatchID:				
See Attached		1					
Method: EPA 8141A <i>NELAC</i>	Prep Method: EPA 3510C		QCBatchID:				
See Attached		1					
Method: SM 4500-Cl	Prep Method: Method		QCBatchID: QC1199015				
Chlorine, Total Residual	ND	1	0.1	mg/L		12/17/18 18:31	WW T2
Method: SM 4500-P-B-5-E	Prep Method: 4500-P-B-5		QCBatchID: QC1199447				
Total Phosphorous as P	0.031	1	0.02	mg/L	12/27/18	12/28/18	TP
Total Phosphorous as PO4	0.095	1	0.06	mg/L	12/27/18	12/28/18	TP
Method: SM 4500-P-E	Prep Method: Method		QCBatchID: QC1199452				
Orthophosphate, as P	ND	1	0.02	mg/L	12/18/18 12:15	12/18/18 12:15	TP
Orthophosphate, as PO4	ND	1	0.06	mg/L	12/18/18 12:15	12/18/18 12:15	TP
Method: SM 9221-B	Prep Method: Method		QCBatchID: QC1198987				
Coliform, Total	920	1		MPN/100ml	12/17/18 14:10	12/21/18 11:45	CO
Method: SM 9221-E	Prep Method: Method		QCBatchID: QC1198987				
Coliform, Fecal	13	1		MPN/100ml	12/17/18 14:10	12/20/18 12:08	SEM

Matrix: Water	Client: Chambers Group	Collector: client
Sampled: 12/17/2018 11:30	Site:	
Sample #: <u>410049-002</u>	Client Sample #: Ponds Outlet	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed By	Notes
Method: ALCH 4025	Prep Method: None		QCBatchID:				
Total Nitrogen	6.91	1	0.5	mg/L		01/02/19	SLL
Method: EPA 300.0	Prep Method: Method		QCBatchID: QC1199064				
Nitrate, as Nitrogen	6.91	1	0.1	mg/L	12/17/18	12/17/18 18:41	JP
Nitrite, as Nitrogen	ND	1	0.1	mg/L	12/17/18	12/17/18 18:41	JP
Method: EPA 350.1	Prep Method: Method		QCBatchID: QC1199346				
Ammonia, as Nitrogen	ND	1	0.1	mg/L	12/21/18	12/26/18	TP
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1199236				
Total Kjeldahl Nitrogen	ND	1	0.4	mg/L	12/19/18	12/20/18	TP
Method: EPA 547	Prep Method: Method		QCBatchID:				
See Attached		1					
Method: EPA 8141A <i>NELAC</i>	Prep Method: EPA 3510C		QCBatchID:				
See Attached		1					
Method: SM 4500-Cl	Prep Method: Method		QCBatchID: QC1199015				
Chlorine, Total Residual	ND	1	0.1	mg/L		12/17/18 18:31	WW T2
Method: SM 4500-P-B-5-E	Prep Method: 4500-P-B-5		QCBatchID: QC1199447				
Total Phosphorous as P	0.030	1	0.02	mg/L	12/27/18	12/28/18	TP
Total Phosphorous as PO4	0.092	1	0.06	mg/L	12/27/18	12/28/18	TP
Method: SM 4500-P-E	Prep Method: Method		QCBatchID: QC1199452				
Orthophosphate, as P	ND	1	0.02	mg/L	12/18/18 12:15	12/18/18 12:15	TP
Orthophosphate, as PO4	ND	1	0.06	mg/L	12/18/18 12:15	12/18/18 12:15	TP
Method: SM 9221-B	Prep Method: Method		QCBatchID: QC1198987				
Coliform, Total	540	1		MPN/100ml	12/17/18 14:10	12/21/18 11:45	CO
Method: SM 9221-E	Prep Method: Method		QCBatchID: QC1198987				
Coliform, Fecal	33	1		MPN/100ml	12/17/18 14:10	12/20/18 12:08	SEM

Matrix: Water	Client: Chambers Group	Collector: client
Sampled: 12/17/2018 12:30	Site:	
Sample #: <u>410049-003</u>	Client Sample #: Haines Creek Exit	Sample Type:

Analyte	Result	DF	RDL	Units	Prepared	Analyzed By	Notes
Method: ALCH 4025	Prep Method: None					QCBatchID:	
Total Nitrogen	5.48	1	0.5	mg/L		01/02/19	SLL
Method: EPA 300.0	Prep Method: Method					QCBatchID: QC1199064	
Nitrate, as Nitrogen	5.48	1	0.1	mg/L	12/17/18	12/17/18 19:02	JP
Nitrite, as Nitrogen	ND	1	0.1	mg/L	12/17/18	12/17/18 19:02	JP
Method: EPA 350.1	Prep Method: Method					QCBatchID: QC1199346	
Ammonia, as Nitrogen	ND	1	0.1	mg/L	12/21/18	12/26/18	TP
Method: EPA 351.2	Prep Method: Method					QCBatchID: QC1199236	
Total Kjeldahl Nitrogen	ND	1	0.4	mg/L	12/19/18	12/20/18	TP
Method: EPA 547	Prep Method: Method					QCBatchID:	
See Attached		1					
Method: EPA 8141A <i>NELAC</i>	Prep Method: EPA 3510C					QCBatchID:	
See Attached		1					
Method: SM 4500-Cl	Prep Method: Method					QCBatchID: QC1199015	
Chlorine, Total Residual	ND	1	0.1	mg/L	12/17/18 18:31	WW	T2
Method: SM 4500-P-B-5-E	Prep Method: 4500-P-B-5					QCBatchID: QC1199447	
Total Phosphorous as P	ND	1	0.02	mg/L	12/27/18	12/28/18	TP
Total Phosphorous as PO4	ND	1	0.06	mg/L	12/27/18	12/28/18	TP
Method: SM 4500-P-E	Prep Method: Method					QCBatchID: QC1199452	
Orthophosphate, as P	ND	1	0.02	mg/L	12/18/18 12:15	12/18/18 12:15	TP
Orthophosphate, as PO4	ND	1	0.06	mg/L	12/18/18 12:15	12/18/18 12:15	TP
Method: SM 9221-B	Prep Method: Method					QCBatchID: QC1198987	
Coliform, Total	>1600	1		MPN/100ml	12/17/18 14:10	12/20/18 12:01	SEM
Method: SM 9221-E	Prep Method: Method					QCBatchID: QC1198987	
Coliform, Fecal	20	1		MPN/100ml	12/17/18 14:10	12/20/18 12:08	SEM

QCBatchID: QC1199015	Analyst: wei	Method: SM 4500-Cl
Matrix: Water	Analyzed: 12/17/2018	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1199015MB1				
Chlorine, Total Residual	ND	mg/L	0.1	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1199015LCS1											
Chlorine, Total Residual	1		0.98		mg/L	98			80-120		

Duplicate Summary

Analyte	Sample Amount	Duplicate Amount	Units	RPD	Limits RPD	Notes
QC1199015DUP1						
Chlorine, Total Residual	ND	ND	mg/L	0.0	20	Source: 410049-002

QCBatchID: <u>QC1199064</u>	Analyst: JParedes	Method: EPA 300.0
Matrix: Water	Analyzed: 12/17/2018	Instrument: AAICP (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1199064MB1				
Nitrate, as Nitrogen	ND	mg/L	0.1	
Nitrite, as Nitrogen	ND	mg/L	0.1	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1199064LCS1, QC1199064LCSD1											
Nitrate, as Nitrogen	9.03	9.03	9.37	9.28	mg/L	104	103	1	90-110	20	
Nitrite, as Nitrogen	9.15	9.15	9.94	9.83	mg/L	109	107	1	90-110	20	

QCBatchID: QC1199236	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 12/20/2018	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1199236MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1199236LCS1											
Total Kjeldahl Nitrogen	2.5		2.6		mg/L	104			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1199236MS1, QC1199236MSD1												
Total Kjeldahl Nitrogen	0.389	12.5	12.5	13	13	mg/L	101	101	0.0	80-120	20	Source: 410093-008

QCBatchID: QC1199346	Analyst: trinh	Method: EPA 350.1
Matrix: Water	Analyzed: 12/26/2018	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1199346MB1				
Ammonia, as Nitrogen	ND	mg/L	0.1	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1199346LCS1											
Ammonia, as Nitrogen	5		4.98		mg/L	100			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1199346MS1, QC1199346MSD1 Source: 410049-001												
Ammonia, as Nitrogen	ND	5	5	5.87	5.95	mg/L	117	119	1.4	80-120	20	

QCBatchID: <u>QC1199447</u>	Analyst: trinh	Method: SM 4500-P-B-5-E
Matrix: Water	Analyzed: 12/28/2018	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1199447MB1				
Total Phosphorous as P	ND	mg/L	0.02	
Total Phosphorous as PO4	ND	mg/L	0.06	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1199447LCS1											
Total Phosphorous as P	0.4		0.425		mg/L	106			80-120		
Total Phosphorous as PO4	1.23		1.303		mg/L	106			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1199447MS1, QC1199447MSD1												
Total Phosphorous as P	0.237	1	1	1.175	1.165	mg/L	94	93	0.9	75-125	20	
Total Phosphorous as PO4	0.727	3.066	3.066	3.60	3.57	mg/L	94	93	0.8	75-125	20	

Source: 410093-008

QCBatchID: QC1199452	Analyst: trinh	Method: SM 4500-P-E
Matrix: Water	Analyzed: 12/18/2018	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1199452MB1				
Orthophosphate, as P	ND	mg/L	0.02	
Orthophosphate, as PO4	ND	mg/L	0.06	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1199452LCS1											
Orthophosphate, as P	0.4		0.4090		mg/L	102			80-120		
Orthophosphate, as PO4	1.2264		1.25		mg/L	102			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1199452MS1, QC1199452MSD1												
Orthophosphate, as P	ND	0.4	0.4	0.4150	0.4130	mg/L	104	103	0.5	75-125	20	
Orthophosphate, as PO4	ND	1.2264	1.2264	1.27	1.27	mg/L	104	104	0.0	75-125	20	

Source: 410049-003

Data Qualifiers and Definitions

Qualifiers

A	See Report Comments.
B	Analyte was present in an associated method blank.
B1	Analyte was present in a sample and associated method blank greater than MDL but less than RDL.
BQ1	No valid test replicates. Sample Toxicity is possible. Best result was reported.
BQ2	No valid test replicates.
BQ3	No valid test replicates. Final DO is less than 1.0 mg/L. Result may be greater.
BQ4	Minor Dissolved Oxygen loss was observed in the blank water check, however, the LCS was within criteria, validating the batch.
BQ5	Minor Dissolved Oxygen loss was observed in the blank water check.
C	Possible laboratory contamination.
D	RPD was not within control limits. The sample data was reported without further clarification.
D1	Lesser amount of sample was used due to insufficient amount of sample supplied.
D2	Reporting limit is elevated due to sample matrix. Target analyte was not detected above the elevated reporting limit.
D3	Insufficient sample was supplied for TCLP. Client was notified. TCLP was performed per the Client's instructions.
DW	Sample result is calculated on a dry weigh basis.
E	Concentration is estimated because it exceeds the quantification limits of the method.
I	The sample was read outside of the method required incubation period.
IR	Inconclusive Result. Legionella is present, however, there is possible non-specific agglutination preventing specific identification.
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
L2	LCS did not meet recovery criteria, however, the MS and/or MSD met LCS recovery criteria, validating the batch.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
M1	The matrix spike (MS) or matrix spike duplicate (MSD) is not within control limits due to matrix interference.
M2	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits. The associated LCS and/or LCSD was not within control limits. Sample result is estimated.
N1	Sample chromatography does not match the specified TPH standard pattern.
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
P	Sample was received without proper preservation according to EPA guidelines.
P1	Temperature of sample storage refrigerator was out of acceptance limits.
P2	The sample was preserved within 24 hours of collection in accordance with EPA 218.6.
P3	Per Client request, sample was composited for volatile analysis. Sample compositing for volatile analysis is not recommended due to potential loss of target analytes. Results may be biased low.
Q1	Analyte Calibration Verification exceeds criteria. The result is estimated.
Q2	Analyte calibration was not verified and the result was estimated.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated.
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
S1	The associated surrogate recovery was out of control limits; result is estimated.
S2	The surrogate was diluted out due to the presence of high concentrations of target and/or non-target compounds. Surrogate recoveries in the associated batch QC met recovery criteria.
S3	Internal Standard did not meet recovery limits. Analyte concentration is estimated.
T	Sample was extracted/analyzed past the holding time.
T1	Reanalysis was reported past hold time due to failing replicates in the original analysis (BOD only).
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
T3	Sample received and analyzed out of hold time per client's request.
T4	Sample was analyzed out of hold time per client's request.
T5	Reanalysis was reported past hold time. The original analysis was within hold time, but not reportable.
T6	Hold time is indeterminable due to unspecified sampling time.
T7	Sample was analyzed past hold time due to insufficient time remaining at time of receipt.

Definitions

DF	Dilution Factor
MDL	Method Detection Limit. Result is reported ND when it is less than or equal to MDL.
ND	Analyte was not detected or was less than the detection limit.
NR	Not Reported. See Report Comments.
RDL	Reporting Detection Limit
TIC	Tentatively Identified Compounds



ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: Chambers Project: Big Tajunga
 Date Received: 12/17/19 Sampler's Name Present: Yes No

Section 2
 Sample(s) received in a cooler? Yes, How many? 1 No (skip section 2) Sample Temp (°C) (No Cooler): _____
 Sample Temp (°C), One from each cooler: #1: 4.1 #2: _____ #3: _____ #4: _____
(Acceptance range is < 6°C but not frozen [for Microbiology samples, acceptance range is < 10°C but not frozen]. It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)
 Shipping Information: _____

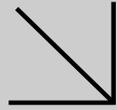
Section 3
 Was the cooler packed with: Ice Ice Packs Bubble Wrap Styrofoam
 Paper None Other _____
 Cooler Temp (°C): #1: 0.0 #2: _____ #3: _____ #4: _____

Section 4	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>		
Are sample IDs present?	<input checked="" type="checkbox"/>		
Are sampling dates & times present?	<input checked="" type="checkbox"/>		
Is a relinquished signature present?	<input checked="" type="checkbox"/>		
Are the tests required clearly indicated on the COC?	<input checked="" type="checkbox"/>		
Are custody seals present?		<input checked="" type="checkbox"/>	
If custody seals are present, were they intact?			<input checked="" type="checkbox"/>
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			<input checked="" type="checkbox"/>
Did all samples arrive intact? If no, indicate in Section 4 below.	<input checked="" type="checkbox"/>		
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>		
Were the samples collected in the correct containers for the required tests?	<input checked="" type="checkbox"/>		
Are the containers labeled with the correct preservatives?	<input checked="" type="checkbox"/>		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			<input checked="" type="checkbox"/>
Was a sufficient amount of sample submitted for the requested tests?	<input checked="" type="checkbox"/>		

Section 5 Explanations/Comments

Section 6
 For discrepancies, how was the Project Manager notified? Verbal PM Initials: _____ Date/Time _____
 Email (email sent to/on): _____ / _____
 Project Manager's response:

Completed By: [Signature] Date: 12/17/19



WORK ORDER NUMBER: 18-12-1642

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Enthalpy Analytical, Inc.

Client Project Name: 410049

Attention: Diane Galvan
931 W. Barkley Avenue
Orange, CA 92868-1208

Sheila Lau for

Approved for release on 01/03/2019 by:
Xuan Dang
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: 410049
Work Order Number: 18-12-1642

1	Work Order Narrative.	3
2	Sample Summary.	4
3	Client Sample Data.	5
	3.1 EPA 8141A Organophosphorus Pesticides (Aqueous).	5
4	Quality Control Sample Data.	9
	4.1 LCS/LCSD.	9
5	Glossary of Terms and Qualifiers.	10
6	Chain-of-Custody/Sample Receipt Form.	11

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 12/18/18. They were assigned to Work Order 18-12-1642.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of \leq 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

Sample Summary

Client: Enthalpy Analytical, Inc.	Work Order:	18-12-1642
931 W. Barkley Avenue	Project Name:	410049
Orange, CA 92868-1208	PO Number:	1028964
	Date/Time Received:	12/18/18 16:55
	Number of Containers:	3

Attn: Diane Galvan

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
Ponds Inlet (410049-001)	18-12-1642-1	12/17/18 10:50	1	Aqueous
Ponds Outlet (410049-002)	18-12-1642-2	12/17/18 11:30	1	Aqueous
Haines Creek Exit (410049-003)	18-12-1642-3	12/17/18 12:30	1	Aqueous

Analytical Report

Enthalpy Analytical, Inc.
931 W. Barkley Avenue
Orange, CA 92868-1208

Date Received: 12/18/18
Work Order: 18-12-1642
Preparation: EPA 3510C
Method: EPA 8141A
Units: mg/L

Project: 410049

Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Ponds Inlet (410049-001)	18-12-1642-1-A	12/17/18 10:50	Aqueous	GC 68	12/18/18	12/28/18 17:40	181218L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Azinphos Methyl	ND	0.0051	1.00	
Bolstar	ND	0.0051	1.00	
Chlorpyrifos	ND	0.0051	1.00	
Coumaphos	ND	0.0051	1.00	
Diazinon	ND	0.0051	1.00	
Dichlorvos	ND	0.0051	1.00	
Disulfoton	ND	0.010	1.00	
Ethoprop	ND	0.0051	1.00	
Fensulfothion	ND	0.0051	1.00	
Fenthion	ND	0.0051	1.00	
Merphos	ND	0.0051	1.00	
Methyl Parathion	ND	0.0051	1.00	
Mevinphos	ND	0.0051	1.00	
Naled	ND	0.041	1.00	
Phorate	ND	0.0051	1.00	
Ronnel	ND	0.0051	1.00	
Stirophos	ND	0.020	1.00	
Tokuthion	ND	0.0051	1.00	
Trichloronate	ND	0.0051	1.00	
Demeton-o/s	ND	0.0051	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Tributylphosphate	59	30-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

Enthalpy Analytical, Inc.
931 W. Barkley Avenue
Orange, CA 92868-1208

Date Received: 12/18/18
Work Order: 18-12-1642
Preparation: EPA 3510C
Method: EPA 8141A
Units: mg/L

Project: 410049

Page 2 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Ponds Outlet (410049-002)	18-12-1642-2-A	12/17/18 11:30	Aqueous	GC 68	12/18/18	12/28/18 18:28	181218L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Azinphos Methyl	ND	0.0052	1.00	
Bolstar	ND	0.0052	1.00	
Chlorpyrifos	ND	0.0052	1.00	
Coumaphos	ND	0.0052	1.00	
Diazinon	ND	0.0052	1.00	
Dichlorvos	ND	0.0052	1.00	
Disulfoton	ND	0.010	1.00	
Ethoprop	ND	0.0052	1.00	
Fensulfothion	ND	0.0052	1.00	
Fenthion	ND	0.0052	1.00	
Merphos	ND	0.0052	1.00	
Methyl Parathion	ND	0.0052	1.00	
Mevinphos	ND	0.0052	1.00	
Naled	ND	0.042	1.00	
Phorate	ND	0.0052	1.00	
Ronnel	ND	0.0052	1.00	
Stirophos	ND	0.021	1.00	
Tokuthion	ND	0.0052	1.00	
Trichloronate	ND	0.0052	1.00	
Demeton-o/s	ND	0.0052	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Tributylphosphate	85	30-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

Enthalpy Analytical, Inc.
931 W. Barkley Avenue
Orange, CA 92868-1208

Date Received: 12/18/18
Work Order: 18-12-1642
Preparation: EPA 3510C
Method: EPA 8141A
Units: mg/L

Project: 410049

Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Haines Creek Exit (410049-003)	18-12-1642-3-A	12/17/18 12:30	Aqueous	GC 68	12/18/18	12/28/18 19:16	181218L01

Parameter	Result	RL	DF	Qualifiers
Azinphos Methyl	ND	0.0050	1.00	
Bolstar	ND	0.0050	1.00	
Chlorpyrifos	ND	0.0050	1.00	
Coumaphos	ND	0.0050	1.00	
Diazinon	ND	0.0050	1.00	
Dichlorvos	ND	0.0050	1.00	
Disulfoton	ND	0.010	1.00	
Ethoprop	ND	0.0050	1.00	
Fensulfothion	ND	0.0050	1.00	
Fenthion	ND	0.0050	1.00	
Merphos	ND	0.0050	1.00	
Methyl Parathion	ND	0.0050	1.00	
Mevinphos	ND	0.0050	1.00	
Naled	ND	0.040	1.00	
Phorate	ND	0.0050	1.00	
Ronnel	ND	0.0050	1.00	
Stirophos	ND	0.020	1.00	
Tokuthion	ND	0.0050	1.00	
Trichloronate	ND	0.0050	1.00	
Demeton-o/s	ND	0.0050	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Tributylphosphate	98	30-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

Enthalpy Analytical, Inc.
931 W. Barkley Avenue
Orange, CA 92868-1208

Date Received: 12/18/18
Work Order: 18-12-1642
Preparation: EPA 3510C
Method: EPA 8141A
Units: mg/L

Project: 410049

Page 4 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-15-963-272	N/A	Aqueous	GC 68	12/18/18	12/28/18 16:05	181218L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Azinphos Methyl	ND	0.0050	1.00	
Bolstar	ND	0.0050	1.00	
Chlorpyrifos	ND	0.0050	1.00	
Coumaphos	ND	0.0050	1.00	
Diazinon	ND	0.0050	1.00	
Dichlorvos	ND	0.0050	1.00	
Disulfoton	ND	0.010	1.00	
Ethoprop	ND	0.0050	1.00	
Fensulfothion	ND	0.0050	1.00	
Fenthion	ND	0.0050	1.00	
Merphos	ND	0.0050	1.00	
Methyl Parathion	ND	0.0050	1.00	
Mevinphos	ND	0.0050	1.00	
Naled	ND	0.040	1.00	
Phorate	ND	0.0050	1.00	
Ronnel	ND	0.0050	1.00	
Stirophos	ND	0.020	1.00	
Tokuthion	ND	0.0050	1.00	
Trichloronate	ND	0.0050	1.00	
Demeton-o/s	ND	0.0050	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Tributylphosphate	106	30-130	



Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Quality Control - LCS/LCSD

Enthalpy Analytical, Inc.
 931 W. Barkley Avenue
 Orange, CA 92868-1208

Date Received: 12/18/18
 Work Order: 18-12-1642
 Preparation: EPA 3510C
 Method: EPA 8141A

Project: 410049

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number				
099-15-963-272	LCS	Aqueous	GC 68	12/18/18	12/28/18 14:29	181218L01				
099-15-963-272	LCSD	Aqueous	GC 68	12/18/18	12/28/18 15:17	181218L01				
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Azinphos Methyl	0.04000	0.04427	111	0.04508	113	30-130	13-147	2	0-30	
Bolstar	0.04000	0.04606	115	0.04781	120	30-130	13-147	4	0-30	
Chlorpyrifos	0.04000	0.04442	111	0.04524	113	30-130	13-147	2	0-30	
Coumaphos	0.04000	0.04007	100	0.04421	111	30-130	13-147	10	0-30	
Diazinon	0.04000	0.04388	110	0.04916	123	30-130	13-147	11	0-30	
Disulfoton	0.04000	0.04722	118	0.05009	125	30-130	13-147	6	0-30	
Ethoprop	0.04000	0.04585	115	0.04782	120	30-130	13-147	4	0-30	
Fensulfothion	0.04000	0.04801	120	0.05055	126	30-130	13-147	5	0-30	
Fenthion	0.04000	0.04630	116	0.04800	120	30-130	13-147	4	0-30	
Merphos	0.04000	0.03928	98	0.04127	103	30-130	13-147	5	0-30	
Methyl Parathion	0.04000	0.04640	116	0.04904	123	30-130	13-147	6	0-30	
Phorate	0.04000	0.04647	116	0.04902	123	30-130	13-147	5	0-30	
Ronnel	0.04000	0.04107	103	0.04263	107	30-130	13-147	4	0-30	
Stirophos	0.04000	0.04095	102	0.04293	107	30-130	13-147	5	0-30	
Tokuthion	0.04000	0.04210	105	0.04374	109	30-130	13-147	4	0-30	
Trichloronate	0.04000	0.04582	115	0.04392	110	30-130	13-147	4	0-30	

Total number of LCS compounds: 16

Total number of ME compounds: 0

Total number of ME compounds allowed: 1

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Glossary of Terms and Qualifiers

Work Order: 18-12-1642

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



Enthalpy Analytical
 Formerly Associated Labs
 1 Park Plaza, Suite 1000
 Irvine, CA 92614
 Tel: 714.771.6900 Fax: 714.538.1209
 info-sc@enthalpy.com

18-12-1642



Subcontract Laboratory:

Eurofins CalScience - Sub
 7440 Lincoln Way
 Garden Grove, CA 92841

ATTN: Xuan Dang
 PO# 1028964

Project: 410049 Due:

PM: Diane Galvan

Email: diane.galvan@enthalpy.com

CC: incomingreports@enthalpy.com

Require: EDD EDF EDT

Report To: MDL

Note:

Matrix	Sampled	Sample ID	Analysis	Comment
Water	12/17/18 10:50	Ponds Inlet (410049-001)	8141_Out	Organophosphorus Pesticides
Water	12/17/18 11:30	Ponds Outlet (410049-002)	8141_Out	Organophosphorus Pesticides
Water	12/17/18 12:30	Haines Creek Exit (410049-003)	8141_Out	Organophosphorus Pesticides

Note:

Standard TAT.

Relinquished By	Received By:
Date/Time	Date/Time 12/18/18 1620
Date/Time 12/18/18	Date/Time 12/18/18 1655
1655	

Return to Contents

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: Enthalpy

DATE: 12/18/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)
 Thermometer ID: SC6 (CF: 0.0°C); Temperature (w/o CF): 3.6 °C (w/ CF): 3.6 °C; Blank Sample
 Sample(s) outside temperature criteria (PM/APM contacted by: _____)
 Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling
 Sample(s) received at ambient temperature; placed on ice for transport by courier
 Ambient Temperature: Air Filter Checked by: UJ6P

CUSTODY SEAL:
 Cooler Present and Intact Present but Not Intact Not Present N/A Checked by: UJ6P
 Sample(s) Present and Intact Present but Not Intact Not Present N/A Checked by: 1163

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample container label(s) consistent with COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE: (Trip Blank Lot Number: _____)
Aqueous: VOA VOA_h VOA_{na2} 100PJ 100PJ_{na2} 125AGB 125AGB_h 125AGB_p 125PB 125PB_{zanna} (pH__9)
 250AGB 250CGB 250CGBs (pH__2) 250PB 250PB_n (pH__2) 500AGB 500AGJ 500AGJs (pH__2) 500PB
 1AGB 1AGB_{na2} 1AGBs (pH__2) 1AGBs (O&G) 1PB 1PB_{na} (pH__12) _____ _____ _____
Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve (____) EnCores® (____) TerraCores® (____) _____ _____ _____
Air: Tedlar™ Canister Sorbent Tube PUF _____ **Other Matrix** (____): _____ _____ _____
 Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag
 Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO₃, **na** = NaOH, **na₂** = Na₂S₂O₃, **p** = H₃PO₄, **s** = H₂SO₄, **u** = ultra-pure, **x** = Na₂SO₃+NaHSO₄.H₂O, **zanna** = Zn (CH₃CO₂)₂ + NaOH Labeled/Checked by: 1163
Reviewed by: UJ6P

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

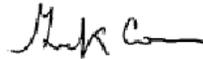
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-162390-1
Client Project/Site: 410049

For:
Enthalpy Analytical, Inc
931 W. Barkley Ave
Orange, California 92868

Attn: Diane Galvan



Authorized for release by:
12/27/2018 2:06:11 PM
Keaton Conner, Project Manager I
(813)885-7427
keaton.conner@testamericainc.com

Designee for
Kathryn Smith, Manager of Project Management
(912)250-0275
kathy.smith@testamericainc.com

LINKS

Review your project
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Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-162390-1	Ponds Inlet (410049-001)	Water	12/17/18 10:50	12/19/18 10:11
680-162390-2	Ponds Outlet (410049-002)	Water	12/17/18 11:30	12/19/18 10:11
680-162390-3	Haines Creek Exit (410049-003)	Water	12/17/18 12:30	12/19/18 10:11

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Case Narrative

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Job ID: 680-162390-1

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE

Client: Enthalpy Analytical, Inc

Project: 410049

Report Number: 680-162390-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 12/19/2018 10:11 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9° C.

GLYPHOSATE

Samples Ponds Inlet (410049-001) (680-162390-1), Ponds Outlet (410049-002) (680-162390-2) and Haines Creek Exit (410049-003) (680-162390-3) were analyzed for Glyphosate in accordance with EPA Method 547. The samples were analyzed on 12/21/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client Sample Results

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Client Sample ID: Ponds Inlet (410049-001)

Date Collected: 12/17/18 10:50

Date Received: 12/19/18 10:11

Lab Sample ID: 680-162390-1

Matrix: Water

Method: 547 LL - Glyphosate (DAI HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Glyphosate	ND		6.0		ug/L			12/21/18 17:52	1

Client Sample ID: Ponds Outlet (410049-002)

Date Collected: 12/17/18 11:30

Date Received: 12/19/18 10:11

Lab Sample ID: 680-162390-2

Matrix: Water

Method: 547 LL - Glyphosate (DAI HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Glyphosate	ND		6.0		ug/L			12/21/18 18:11	1

Client Sample ID: Haines Creek Exit (410049-003)

Date Collected: 12/17/18 12:30

Date Received: 12/19/18 10:11

Lab Sample ID: 680-162390-3

Matrix: Water

Method: 547 LL - Glyphosate (DAI HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Glyphosate	ND		6.0		ug/L			12/21/18 18:31	1

QC Sample Results

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Method: 547 LL - Glyphosate (DAI HPLC)

Lab Sample ID: MB 680-552804/2
Matrix: Water
Analysis Batch: 552804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Glyphosate	ND		6.0		ug/L			12/21/18 13:44	1

Lab Sample ID: LCS 680-552804/3
Matrix: Water
Analysis Batch: 552804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Glyphosate	200	238		ug/L		119	80 - 120

Lab Sample ID: LCSD 680-552804/4
Matrix: Water
Analysis Batch: 552804

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Glyphosate	200	238		ug/L		119	80 - 120	0	20

QC Association Summary

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

HPLC/IC

Analysis Batch: 552804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-162390-1	Ponds Inlet (410049-001)	Total/NA	Water	547 LL	
680-162390-2	Ponds Outlet (410049-002)	Total/NA	Water	547 LL	
680-162390-3	Haines Creek Exit (410049-003)	Total/NA	Water	547 LL	
MB 680-552804/2	Method Blank	Total/NA	Water	547 LL	
LCS 680-552804/3	Lab Control Sample	Total/NA	Water	547 LL	
LCSD 680-552804/4	Lab Control Sample Dup	Total/NA	Water	547 LL	

Lab Chronicle

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Client Sample ID: Ponds Inlet (410049-001)

Lab Sample ID: 680-162390-1

Date Collected: 12/17/18 10:50

Matrix: Water

Date Received: 12/19/18 10:11

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	547 LL		1	1 mL	1 mL	552804	12/21/18 17:52	CJM	TAL SAV
Instrument ID: CLCR										

Client Sample ID: Ponds Outlet (410049-002)

Lab Sample ID: 680-162390-2

Date Collected: 12/17/18 11:30

Matrix: Water

Date Received: 12/19/18 10:11

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	547 LL		1	1 mL	1 mL	552804	12/21/18 18:11	CJM	TAL SAV
Instrument ID: CLCR										

Client Sample ID: Haines Creek Exit (410049-003)

Lab Sample ID: 680-162390-3

Date Collected: 12/17/18 12:30

Matrix: Water

Date Received: 12/19/18 10:11

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	547 LL		1	1 mL	1 mL	552804	12/21/18 18:31	CJM	TAL SAV
Instrument ID: CLCR										

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		SAVLAB	
Alabama	State Program	4	41450	06-30-19
Alaska	State Program	10		06-30-19
Alaska (UST)	State Program	10	UST-104	09-22-19
ANAB	DoD ELAP		L2463	09-22-19
ANAB	ISO/IEC 17025		L2463.01	09-22-19
Arkansas DEQ	State Program	6	88-0692	02-01-19
California	State Program	9	2939	06-30-19
Colorado	State Program	8	N/A	12-31-18 *
Connecticut	State Program	1	PH-0161	03-31-19
Florida	NELAP	4	E87052	06-30-19
GA Dept. of Agriculture	State Program	4	N/A	06-12-19
Georgia	State Program	4	N/A	06-30-19
Georgia	State Program	4	803	06-30-19
Guam	State Program	9	15-005r	04-17-19
Hawaii	State Program	9	N/A	06-30-19
Illinois	NELAP	5	200022	11-30-18 *
Indiana	State Program	5	N/A	06-30-19
Iowa	State Program	7	353	06-30-19
Kentucky (DW)	State Program	4	90084	12-31-18 *
Kentucky (UST)	State Program	4	18	06-30-19
Kentucky (WW)	State Program	4	90084	12-31-18 *
Louisiana	NELAP	6	30690	06-30-19
Louisiana (DW)	NELAP	6	LA160019	12-31-18 *
Maine	State Program	1	GA00006	09-25-20
Maryland	State Program	3	250	12-31-19
Massachusetts	State Program	1	M-GA006	06-30-19
Michigan	State Program	5	9925	03-05-19
Mississippi	State Program	4	N/A	06-30-19
Nebraska	State Program	7	TestAmerica-Savannah	06-30-19
New Jersey	NELAP	2	GA769	06-30-19
New Mexico	State Program	6	N/A	06-30-19
New York	NELAP	2	10842	03-31-19
North Carolina (DW)	State Program	4	13701	07-31-19
North Carolina (WW/SW)	State Program	4	269	12-31-18 *
Oklahoma	State Program	6	9984	08-31-19
Pennsylvania	NELAP	3	68-00474	06-30-19
Puerto Rico	State Program	2	GA00006	12-31-18 *
South Carolina	State Program	4	98001	06-30-18 *
Tennessee	State Program	4	TN02961	06-30-19
Texas	NELAP	6	T104704185-16-9	11-30-18 *
Texas (DW)	State Program	1	T104704185	06-30-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
Virginia	NELAP	3	460161	06-14-19
Washington	State Program	10	C805	06-10-19
West Virginia (DW)	State Program	3	9950C	12-31-18 *
West Virginia DEP	State Program	3	094	06-30-19
Wisconsin	State Program	5	999819810	08-31-19
Wyoming	State Program	8	8TMS-L	06-30-16 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Savannah

Method Summary

Client: Enthalpy Analytical, Inc
Project/Site: 410049

TestAmerica Job ID: 680-162390-1

Method	Method Description	Protocol	Laboratory
547 LL	Glyphosate (DAI HPLC)	EPA	TAL SAV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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Enthalpy Analytical
 Formerly Associated Labs
 1 Park Plaza, Suite 1000
 Irvine, CA 92614
 Tel: 714.771.6900 Fax: 714.538.1209
 info-sc@enthalpy.com



Subcontract Laboratory:

Test America - Savannah
 5102 LaRoche Avenue
 Savannah, GA 31404
 912-354-7858
 ATTN: Kathy Smith
 PO# 1028963

Project: 410049 **Due:**

PM: Diane Galvan

Email: diane.galvan@enthalpy.com

CC: incomingreports@enthalpy.com

Require: EDD EDF EDT

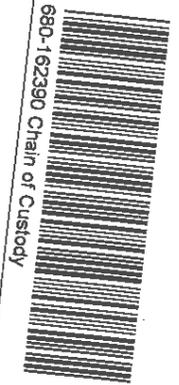
Report To: MDL

Note:

Matrix	Sampled	Sample ID	Analysis	Comment
Water	12/17/18 10:50	Ponds Inlet (410049-001)	547 Out	Glyphosate
Water	12/17/18 11:30	Ponds Outlet (410049-002)	547 Out	Glyphosate
Water	12/17/18 12:30	Haines Creek Exit (410049-003)	547 Out	Glyphosate

Note:

Relinquished By	Received By:
Date/Time 12/18/18 1500	Date/Time 12.19.18 1011 2.9/2.9
Date/Time	Date/Time



Login Sample Receipt Checklist

Client: Enthalpy Analytical, Inc

Job Number: 680-162390-1

Login Number: 162390

List Number: 1

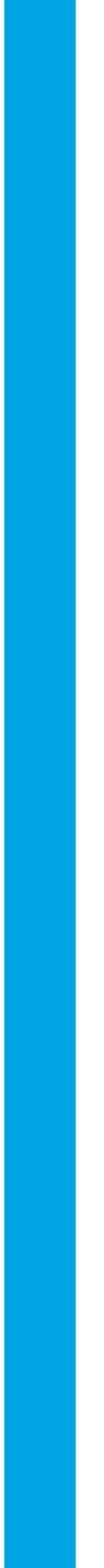
Creator: Laughlin, Paul D

List Source: TestAmerica Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



APPENDIX H – TRAILS MAINTENANCE AND MONITORING MEMOS



September 13, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the June 2018 Trails Monitoring Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the first trail maintenance effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) in June 2018. This memo shows compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in trail maintenance activities within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of the trail maintenance effort including dates, names of participants, locations of maintenance activities performed, sensitive resources encountered, and mitigation actions taken, are found below.

The trail maintenance team focused on historically mapped authorized trails within the designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds and all unauthorized trails. All mapped locations were inspected, and maintenance was performed if required. Substantially more work was required this year due to the damage from the Creek Fire that burned through the BTWMA in December 2017. Fertile portions of the trail that had been blocked by debris from the fire, and thus, were not actively being used, had been overrun with weeds. Fire damage obscured the trails in some locations resulting in equestrian riders and hikers wandering off-trail throughout the BTWMA, following sandy washes and creating new trails. Negative impacts that occurred from equestrian riders and hikers wandering off trail included, the trampling of native seedlings and resprouting vegetation, compaction of the soil, erosion, and the introduction of fertilizer (e.g., horse droppings) and weed seeds into new areas.

METHODS

Collector for ArcGIS (Collector), a Geographic Information System (GIS) application, was used to locate the original authorized trails and clear them of debris and weeds. Exotic plants were treated with a foliar herbicide application when possible or were hand-pulled where herbicides had the potential to damage adjacent native vegetation. The foliar herbicide mixture contained 2.5 percent Roundup Custom (a glyphosate-based herbicide), 1 percent Activator 90, and Turf Trax (a blue indicator dye). Dead trees and hanging branches that could fall onto the trails, or that were found obstructing the trails, were cut down and removed. All cut and collected materials were used as vertical mulch to delineate the trails and encourage hikers and equestrian riders to remain on authorized trails. Vertical mulch was also used to block off the entry points to unauthorized trails. Equipment used to perform these activities included a chainsaw, a pole pruner, loppers, and handsaws. Native vegetation that was found encroaching onto the trails was trimmed with hand tools. Exotic vegetation that was found growing in or encroaching onto the trails was treated with the foliar herbicide mixture. Only California-approved aquatic herbicides were used within 15 feet of any water source. A line trimmer was used to trim back vegetation and cut down grasses that were not suitable for treatment with herbicides.



RESULTS

Trail maintenance was performed starting on June 12, 2018 and was completed on June 26, 2018. The work took an average crew of three, six days to complete. Prior to the start of work, crew members received onsite orientation and instruction regarding safety, permit and mitigation regulations, and sensitive species that may be encountered in the working areas. The meetings were conducted by Director of Restoration Construction (Restoration Specialist), Steven Reinoehl, who was present during all trail maintenance activities. Pre-activity sweeps for sensitive plant and wildlife species including nesting birds, were conducted prior to the start of trail maintenance activities by Biologist Jacob Lloyd Davies. The crew used Collector to navigate and work along authorized trails, and to avoid disturbing any sensitive plants or wildlife during trail maintenance activities.

On June 12, the crew cleared the northern trail that leads from Cottonwood Avenue to the West Tujunga Pond. On June 13 and 14, the crew cleared the southern trail that leads from Cottonwood Avenue to the Tujunga Ponds. On June 15 and 21, the crew cleared the trails along Haines Canyon Creek leading west from Cottonwood Avenue to the western boundary of the BTWMA. The crew cleared the remaining trails on June 26. Non-native vegetation such as castor bean (*Ricinus communis*) found within or encroaching on the trails was treated with the foliar herbicide mixture. Line trimmers were used to cut back non-native grasses that were encroaching on the trails. In the upland areas, most of the work involved trimming back native shrubs such as California buckwheat (*Eriogonum fasciculatum*) to maintain trail width. While working within the riparian areas, the crew cut down dead trees, and any low-hanging or dead branches that were obstructing the trails. Native vegetation including poison oak (*Toxicodendron diversilobum*) and stinging nettle (*Urtica dioica*) that was found encroaching on the trails, was trimmed. Fallen trees, branches, and cut plant materials were used to delineate authorized trails, serving as a guide for equestrian and pedestrian traffic. Care was taken to avoid damaging native plants during this process. No active bird nests or homeless encampments were encountered in or near the work areas during the trail maintenance effort.

SUMMARY AND DISCUSSION

During trail maintenance efforts it was observed that some of the unauthorized trails that had previously been blocked off with vertical mulch had been cleared of the mulch and were actively being used. The vertical mulch was replaced and additional mulch was added to encourage use of the authorized trails. After the second installation of vertical mulch, all but one unauthorized trail remained mulched and the authorized trails were activity being used. On June 26, it was observed that an off-road vehicle had driven through the site. The tracks were observed both on and off the trails. Some small native shrubs had been run over, but even more concerning is the cumulative damage from continued off-road activity. In order to discourage the continued use of unauthorized trails, simple three-wire fencing with "Restoration in Progress" signs could be installed at access points where vertical mulch has not proven successful. Once the restoration areas have recovered the fencing and signs could be removed.

All trail maintenance activities were monitored by Restoration Specialist, Steven Reinoehl, to ensure regulations and requirements were closely followed. Steven reviewed work areas with the crew prior to the start of each work day and traveled alongside the crew to ensure that nesting birds and native species were not disturbed. No birds showed signs of stress during trail maintenance efforts. Only California-approved aquatic herbicides were used within 15 feet of any water source. Crew members used established creek crossings to minimize disturbance to sensitive stream habitat and species residing in the creek.

Please feel free to contact me at (949) 261-5414 extension 7242, via cell phone at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like any additional information.

Sincerely,



CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Crew clearing the authorized trail. Vertical mulch on unauthorized trails to the left has been removed and replaced several times. This section of trail may benefit from signs and fencing to protect recovering vegetation.



Photo 2: Crew clearing trail.





Photo 3: Vertical mulch blocking off unauthorized trail to the left, directing traffic down the restored trail with recovering cottonwood trees.



Photo 4: Example of felled trees and branches used to guide traffic to the authorized trail on the right, allowing the vegetation on the left to recover.





Photo 5: Damage caused by off-road activity.



December 11, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the November 2018 Trails Monitoring Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the November trail maintenance effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) in 2018. This memo shows compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in trail maintenance activities within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of the trail maintenance effort including dates, names of participants, locations of maintenance activities performed, sensitive resources encountered, and mitigation actions taken, are found below.

The trail maintenance team focused on historically mapped authorized trails within the designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, and the Tujunga Ponds, and all unauthorized trails. Areas requiring trail maintenance were inspected, and maintenance was performed if required. Substantially more work has been required this year due to the damage from the Creek Fire that burned through the BTWMA in December 2017. During the previous trail maintenance effort conducted in June 2018, the remaining debris from the fire was cleared and used as vertical mulch to discourage the creation of unauthorized trails. Prior to the June effort, fire damage obscured the trails in some locations resulting in equestrian riders and hikers wandering off-trail throughout the BTWMA, following sandy washes and creating new, unauthorized trails. Negative impacts that occurred from equestrian riders and hikers wandering off trail included, the trampling of native seedlings and resprouting vegetation, compaction of the soil, erosion, and the introduction of fertilizer (e.g., horse droppings) and weed seeds into new areas. The crew reviewed these problem areas and reinforced the vertical mulch to discourage off-trail activities.

METHODS

Collector for ArcGIS (Collector), a Geographic Information System (GIS) application, was used to locate the original authorized trails while clearing them of debris and weeds. Exotic plants were treated with a foliar herbicide application, the cut-stump method, or were hand-pulled where herbicides had the potential to damage adjacent native vegetation. The foliar herbicide mixture contained 2.5 percent Roundup Custom (a glyphosate-based herbicide), 1 percent Activator 90, and Turf Trax (a blue indicator dye). This herbicide mixture was also used to treat the stumps of larger, or woody exotic species that were removed. High winds that occurred in the area on November 14 and 15, caused a number of large, fire-damaged trees and branches to fall throughout the site. Dead trees and hanging branches that could fall onto the trails, or that were found obstructing the trails, were cut down and removed. All cut and collected materials were used as vertical mulch to delineate the trails and encourage hikers and equestrian riders to remain on authorized trails. Vertical mulch was also used to block off the entry points to



unauthorized trails. Equipment used to perform these activities included a chainsaw, a pole pruner, loppers, and handsaws. Native vegetation that was found encroaching onto the trails was trimmed with hand tools. Exotic vegetation that was found growing in or encroaching onto the trails was treated with the foliar herbicide mixture, cut-stump method, or were hand pulled. Only California-approved aquatic herbicides were used within 15 feet of any water source. A line trimmer was used to trim back vegetation and cut down grasses that were not suitable for treatment with herbicides.

RESULTS

Trail maintenance was performed after the first major windstorm of the season starting on November 14, 2018 and continuing through November 28, 2018. An average crew of two performed trail maintenance activities while shifting efforts to exotic plant removal activities during cycles of dry weather, as herbicides cannot be applied during rain events. Prior to the start of work, crew members received onsite orientation and instruction regarding safety, permit and mitigation regulations, and sensitive species that may be encountered in the working areas. The meetings were conducted by Restoration Foreman Tim Wood, who was present during all trail maintenance activities. Pre-activity sweeps for sensitive plant and wildlife species, were conducted prior to the start of trail maintenance activities by Biologist Jacob Lloyd Davies. The crew used Collector to navigate and work along authorized trails, and to avoid disturbing any sensitive plants or wildlife during trail maintenance activities.

On November 14 and 15, the crew cleared the northern trail that leads from Cottonwood Avenue to the West Tujunga Pond. Several large trees had fallen, completely blocking the trails. On November 19, the crew cleared the southern trail that leads from Cottonwood Avenue to the Tujunga Ponds. A number of smaller trees and branches were blocking and compromising the safety of the trails. Because off-trail activity in this area remains a concern, additional vertical mulch was added to new, unauthorized trail entry points. Work continued in this area on November 21 and 26, as additional days of high winds had dropped more branches and debris on the trails. On November 28, the crew began working on the trails to the west of Cottonwood Avenue. Non-native vegetation such as castor bean (*Ricinus communis*) found within or encroaching on the trails was treated with the cut-stump method or was pulled by hand. Line trimmers were used to cut back non-native grasses that were encroaching on the trails. In the upland areas, most of the work involved trimming back native shrubs such as California buckwheat (*Eriogonum fasciculatum*) to maintain trail width. While working within the riparian areas, the crew cut down dead trees, and any low-hanging or dead branches that were obstructing the trails. Native vegetation including poison oak (*Toxicodendron diversilobum*) and stinging nettle (*Urtica dioica*) that was found encroaching on the trails, was trimmed back. Fallen trees, branches, and cut plant materials were used to delineate authorized trails, serving as a guide for equestrian and pedestrian traffic. Care was taken to avoid damaging native plants during this process. No sensitive plant or wildlife species were encountered in or near the work areas during the trail maintenance effort.

SUMMARY AND DISCUSSION

During trail maintenance efforts it was observed that some of the unauthorized trails that had previously been blocked off with vertical mulch had been cleared of the mulch and were actively being used again. The vertical mulch was replaced, and additional mulch was added to encourage use of the authorized trails. After this effort, signs of use were observed that indicated that the authorized trails were more consistently being used. By maintaining a smaller crew size over a longer period of time while conducting maintenance activities, Chambers Group's site presence has increased, and more positive interactions with the community have occurred. This has helped with reducing off-trail site use. No off-road vehicle activity or new damage was observed on the site. In order to discourage the continued use of unauthorized trails, simple three-wire fencing with "Restoration in Progress" signs could be installed along the entire mapped trail system. At a minimum, fencing would be extremely helpful at unauthorized trail entry points where vertical mulch has not proven successful. Once the restoration areas have recovered the fencing and signs could be removed.



All trail maintenance activities were monitored by Biologist Jacob Lloyd Davies, to ensure regulations and requirements were closely followed. Jacob reviewed work areas with the crew prior to the start of each work day and traveled alongside the crew to ensure that sensitive plant and wildlife species were not disturbed. No wildlife showed signs of stress during trail maintenance efforts. Only California-approved aquatic herbicides were used within 15 feet of any water source. Crew members used established creek crossings as much as feasible to minimize disturbance to sensitive stream habitat and species residing in the creek.

Please feel free to contact me at (949) 261-5414 extension 7242, via cell phone at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like any additional information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: The trail from the Tujunga Ponds to Cottonwood Avenue was completely blocked.



Photo 2: The trail to the ponds was cleared.





Photo 3: Vertical mulch blocking unauthorized trail to the left, directing traffic down the restored trail.



Photo 4: Example of felled trees and branches used to guide traffic, allowing fire damaged vegetation to recover.





Photo 5: Not only trees were felled by the high winds.



January 25, 2019

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the December 2018 Trails Monitoring Program Throughout the Riparian and Uplands of the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the December trail maintenance effort conducted by Chambers Group, Inc. (Chambers Group) at the Big Tujunga Wash Mitigation Area (BTWMA) in 2018. This memo shows compliance and adherence to mitigation and avoidance measures set forth in the Master Mitigation Plan (MMP) and the California Department of Fish and Wildlife (CDFW) Agreement Regarding Proposed Stream or Lake Alteration No. 1600-2008-0253-R5 for the Big Tujunga Wash and Haines Canyon Creek, which are named tributaries to Hansen Dam Flood Control Basin in Los Angeles County, California. Approved Chambers Group biologists participating in trail maintenance activities within the BTWMA worked to monitor that all mitigation and avoidance measures were followed by the work crews. Details of the trail maintenance effort including dates, names of participants, locations of maintenance activities performed, sensitive resources encountered, and mitigation actions taken, are found below.

The trail maintenance team focused on historically mapped authorized trails within the designated high priority areas according to the 2016 BTWMA Annual Report, including Big Tujunga Wash, Haines Canyon Creek, and the Tujunga Ponds, and all unauthorized trails. Areas requiring trail maintenance were reviewed and maintenance was performed if required. Substantially more work has been required this year due to the damage from the Creek Fire that burned through the BTWMA in December 2017. After the fire, the damaged trees and branches blocked portions the trails resulting in equestrian riders and hikers wandering off-trail throughout the BTWMA. They followed sandy washes and creating new, unauthorized trails. During the previous trail maintenance efforts conducted in June and November 2018, debris from the fire was cut and used as vertical mulch to discourage the creation of unauthorized trails. Negative impacts that occurred from equestrian riders and hikers wandering off trail included, the trampling of native seedlings and resprouting vegetation, compaction of the soil, erosion, and the introduction of fertilizer (e.g., horse droppings) and weed seeds into new areas. The unauthorized trails were addressed in June and November 2018 by reinforcing the vertical mulch and improving the authorized trails to discourage off-trail activities. A number of high-wind storms occurred in November and heavy rains occurred in December which resulted in additional trees and branches falling on the trails.

METHODS

Collector for ArcGIS (Collector), a Geographic Information System (GIS) application was used to confirm the locations of the original authorized trails while clearing debris and weeds. Exotic plants were treated with a foliar herbicide application, the cut-stump method, or were hand-pulled where herbicides had the potential to damage adjacent native vegetation. The foliar herbicide mixture contained 2.5 percent Roundup Custom (a glyphosate-based herbicide), 1 percent Liberate, and Turf Trax (a blue indicator dye). The herbicide mixture used to treat the cut stumps contained 25 percent Garlon 4 Ultra, 5 percent Liberate, and Turf Trax. The high winds that occurred in the area on November 14 and 15, caused a number of large, fire-damaged trees and branches to fall throughout the site. The crew continued to cut down dead trees and hanging branches that could fall onto the trails, or that were found



obstructing the trails from recent storms. The crew continued to use cut and collected materials as vertical mulch to delineate the trails and encourage hikers and equestrian riders to remain on authorized trails. Vertical mulch was also used to block off the entry points to unauthorized trails. Equipment used to perform these activities included chainsaws, a pole pruner, loppers, and handsaws. Native vegetation that was found encroaching onto the trails was trimmed with hand tools. Exotic vegetation that was found growing in or encroaching onto the trails was treated with the foliar herbicide mixture, cut-stump method, or were hand pulled. Only California-approved aquatic herbicides were used within 15 feet of any water source. A line trimmer was used to trim back vegetation and cut down grasses that were not suitable for treatment with herbicides.

RESULTS

Trail maintenance efforts that began in November were continued into December, starting on December 4, 2018 and continuing through December 21, 2018. An average crew of two performed trail maintenance activities while shifting efforts to exotic plant removal activities during cycles of calm, dry weather as herbicides cannot be applied during high wind or rain events. Prior to the start of work, crew members received onsite orientation and instruction regarding safety, permit and mitigation regulations, and sensitive species that may be encountered in the work areas. The meetings were conducted by Restoration Foreman Tim Wood (foreman), who was present during all trail maintenance activities. Pre-activity sweeps for sensitive plant and wildlife species, were conducted prior to the start of trail maintenance activities by Biologist Jacob Lloyd Davies. Two crew members, Corey Neal and Marco Barron, also participated in trail maintenance efforts. The crew used Collector to navigate and work along authorized trails, and to avoid disturbing any sensitive plants or wildlife during trail maintenance activities.

On December 4, the foreman assessed the trails east of Cottonwood Avenue in order to identify any areas that would require general maintenance work, or that may pose a safety risk to the public due to storm damage. On December 7, the crew worked to clear the trails of debris that had washed into the site from areas upstream of Haines Canyon Creek during the storms on December 5 and 6. The crew removed 22 shopping carts and four bags of debris. On December 14 and 17, the foreman continued assessing the trails west of Cottonwood Avenue, documenting the condition of the trails, safety issues, and other trail maintenance needs. During the assessment of the trails on December 14, the foreman encountered an individual spraying herbicide on castor bean along Haines Canyon Creek within the BTWMA. Further details regarding the encounter can be found in the December 2018 Exotic Plant Eradication Memo. On December 18 through 21, the crew worked to improve the safety of the trails and conducted general maintenance including, trimming back native species found encroaching on the trails, and removing exotic species from the trails. Exotic vegetation such as castor bean (*Ricinus communis*) found within or encroaching on the trails was treated with the cut-stump method or was pulled by hand. In the upland areas, most of the work involved trimming back native shrubs such as California buckwheat (*Eriogonum fasciculatum*) to maintain trail width. While working within the riparian areas, the crew cut down dead trees, and any low-hanging or dead branches that were obstructing the trails. Exotic species that were present within or near the creek, or that were mixed in with native vegetation were dug out by hand. Native vegetation including poison oak (*Toxicodendron diversilobum*) and stinging nettle (*Urtica dioica*) that was found encroaching on the trails, was trimmed back. Fallen trees, branches, and cut plant materials were cleared and used to delineate authorized trails, serving as a guide for equestrian and pedestrian traffic. Care was taken to avoid damaging native plants during this process. No sensitive plant or wildlife species were encountered in or near the work areas during the trail maintenance effort.

SUMMARY AND DISCUSSION

During trail maintenance efforts it was observed that some of the unauthorized trails that had been blocked off with vertical mulch during the November effort, had once again been cleared of the mulch and were actively being used. The vertical mulch was replaced and additional mulch was added to encourage use of the authorized trails. By maintaining a smaller crew size over a longer period of time while conducting maintenance activities, Chambers



Group's site presence has increased, and more positive interactions with the community have occurred. This has helped with reducing off-trail site use and negative impacts to the protected and sensitive species on the site. No off-road vehicle activity or new damage was observed beyond the effects of the wind and rain storms.

All trail maintenance activities were monitored by Biologist Jacob Lloyd Davies, to ensure regulations and requirements were closely followed. Jacob reviewed work areas with the crew prior to the start of each work day and traveled alongside the crew to ensure that sensitive plant and wildlife species were not disturbed. No wildlife showed signs of stress during trail maintenance efforts. Only California-approved aquatic herbicides were used within 15 feet of any water source. Crew members used established creek crossings as much as feasible to minimize disturbance to sensitive stream habitat and species residing in the creek.

Please feel free to contact me at (949) 261-5414 extension 7242, via cell phone at (714) 318-3547, or at sreinoehl@chambersgroupinc.com, if you have any questions or would like any additional information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction



SITE PHOTOS



Photo 1: Clearing smaller branches and trees from a southern section of the trail that travels through the southeastern portion of the BTWMA.



Photo 2: Restoring and defining the trail to the Tujunga Ponds.





Photo 3: Filling in a section of the trail that was scoured during the rains, located near the bottom of the trail entrance east of Cottonwood Avenue.



Photo 4: A southern section of trail that travels through the southeastern portion of the BTWMA, blocked with debris from the wind and rain storms.





Photo 5: A large, dead branch that was blocking a southern section of the trail that travels through the southeastern portion of the BTWMA.



APPENDIX I – POST-CREEK FIRE TREE ASSESSMENT MEMO



January 11, 2019

Melanie Morita
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for the December 2018 Post-Creek Fire Tree Assessment for the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Ms. Morita,

This memorandum summarizes the post-Creek Fire tree assessment for the Big Tujunga Wash Mitigation Area (Big T) conducted in December 2018, as part of the Trail Maintenance and Monitoring task. The field survey was conducted on December 14, 2018, to assess and map burned native trees (burned during the Creek Fire in December 2017), located along or in close proximity to the existing authorized trail system and the anticipated alternative trail system, that may pose potential public safety concerns due to the compromised integrity of the burned trees and the continuing deterioration of these trees over time. Details of the assessment including native tree species assessed, locations, photos, and recommended actions are included below.

Tree Assessment

Methods

As part of the Trail Maintenance and Monitoring task, the post-Creek Fire tree assessment was conducted by Chambers Group's Restoration Foreman Tim Wood. The assessment focused on identifying burned native tree species along the existing authorized trail system that may pose a public safety concern, and prescribing a recommended action based on the tree species (soft-hardwood versus hard-hardwood species) and the current condition of each tree. Soft-hardwood species that were assessed included Fremont cottonwood (*Populus fremontii*), California boxelder (*Acer negundo*), western sycamore (*Platanus racemosa*), white alder (*Alnus rhombifolia*), and willow species (*Salix* spp.). Hard-hardwood species that were assessed included coast live oak (*Quercus agrifolia*), California black walnut (*Juglans californica*), and velvet ash (*Fraxinus velutina*). In general, the softer-wood tree species tend to burn more severely compromising the overall integrity of the tree, whereas, the harder-wood tree species, being stronger and denser, tend to burn less severely under the same fire conditions. Each tree was assessed on an individual basis and according to current site use conditions.

Results

Based on the current authorized trail alignment, remedial actions were recommended for approximately 60 trees including either cutting down the tree completely, or reducing the crown of the tree (i.e., removing any weak or compromised branches) to a degree that would be determined safe. Of the approximate 60 trees recommended for remedial action, 17 trees were recommended for crown reduction and 43 trees were recommended to be cut down completely. Details of tree species assessed, locations, and recommended actions can be found below in Table 1 Tree Assessment and Recommended Actions. Corresponding photos of each tree location can be found as Attachment 1 Post-Fire Tree Assessment Site Photos.



Table 1: Tree Assessment and Recommended Actions

Photo	Location	Tree ID	GPS Coordinates		Tree Species	Hardness*	Number	Action
1	East Trail	Big T -1	34.26629	-118.34254	Fremont cottonwood	soft	1	cut down
2	East Trail	Big T-2	34.26611	-118.34240	willow	soft	1	cut down
3	East Trail	Big T-3	34.26603	-118.34213	willow	soft	1	cut down
4	East Trail	Big T-4	34.26565	-118.34153	Fremont cottonwood	soft	1	cut down
5	East Trail	Big T-5	34.26588	-118.34103	Fremont cottonwood	soft	1	cut down
6	East Trail	Big T-6	34.26608	-118.34098	Fremont cottonwood	soft	1	cut down
7	East Trail	Big T-7	34.26624	-118.34069	Fremont cottonwood	soft	1	cut down
8	East Trail	Big T-8	34.26629	-118.34065	Fremont cottonwood	soft	1	cut down
9	East Trail	Big T-9	34.26729	-118.34052	Fremont cottonwood	soft	1	cut down
10	East Trail	Big T-10	34.26704	-118.34048	Fremont cottonwood	soft	1	cut down
11	East Trail	Big T-11	34.26729	-118.34052	Fremont cottonwood	soft	1	cut down
12	East Trail	Big T-12	34.26784	-118.34200	Fremont cottonwood	soft	1	cut down
13	East Trail	Big T-13	34.26731	-118.34393	Fremont cottonwood	soft	4	reduce crown
		Big T-13	34.26731	-118.34393	California boxelder	soft	1	reduce crown
		Big T-13	34.26731	-118.34393	willow	soft	5	cut down
		Big T-13	34.26731	-118.34393	coast live oak	hard	4	reduce crown
		Big T-13	34.26731	-118.34393	California black walnut	hard	1	reduce crown
14	Mid Trail	Big T-1	34.26774	-118.34451	coast live oak	hard	1	reduce crown



Photo	Location	Tree ID	GPS Coordinates		Tree Species	Hardness*	Number	Action
15	Mid Trail	Big T-2	34.26782	-118.34486	willow	soft	7	cut down
16	West Trail	Big T-5	34.26606	-118.35068	white alder	soft	1	cut down
		Big T-5	34.26606	-118.35068	California boxelder	soft	1	cut down
17	West Trail	Big T-6	34.26630	-118.35065	white alder	soft	2	cut down
18	West Trail	Big T-7	34.26627	-118.35191	coast live oak	hard	4	reduce crown
19	West Trail	Big T-8	34.26620	-118.35205	white alder	soft	3	cut down
20	West Trail	Big T-9	34.26639	-118.35227	Fremont cottonwood	soft	2	cut down
21	West Trail	Big T-10	34.26647	-118.353280	white alder	soft	2	cut down
		Big T-10	34.26647	-118.353280	California boxelder	soft	1	cut down
		Big T-10	34.26647	-118.353280	western sycamore	soft	2	cut down
22	West Trail	Big T-11	34.26651	-118.35335	velvet ash	hard	1	cut down
23	West Trail	Big T-12	34.26664	-118.35376	white alder	soft	1	cut down
24	West Trail	Big T-13	34.26669	-118.35411	velvet ash	hard	1	cut down
25	West Trail	Big T-14	34.26659	-118.35426	western sycamore	soft	1	cut down
26	West Trail	Big T-15	34.26641	-118.35440	coast live oak	hard	1	reduce crown
		Big T-15	34.26641	-118.35440	willow	soft	1	cut down
		Big T-15	34.26641	-118.35440	western sycamore	soft	1	reduce crown

* Based on: Alden, Harry A. 1995. Hardwoods of North America. U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.

Discussion and Recommendations

The post-Creek Fire tree assessment was based on the current authorized trail system. Coordination with the agencies is currently underway to reroute portions of the existing trail system along the north side of Haines Canyon Creek



within the western portion of Big T in order to minimize the number of stream crossings that currently exist along Haines Canyon Creek, thus reducing negative impacts to sensitive stream habitat and listed fish species. The new trail will utilize existing (and unauthorized) pedestrian trails, and bare ground areas. The southern trail will be abandoned (blocked off) and is anticipated to be restored to mule fat scrub/least Bell's vireo habitat in the near future. Depending on the new route for trail realignment, the number of burned native trees recommended for remedial action could be reduced, or the number could shift to include trees that were not originally assessed but could pose a potential public safety risk based on the new trail realignment route.

It is recommended that compromised trees along sections of authorized trails that are not planned to be rerouted during trail realignment be addressed as soon as possible so that cut trunks and branches may be collected and used as vertical mulch along the new trail realignment route once realignment work has been approved. Adding vertical mulch along the newly established route will help guide Big T visitors and equestrian users to stay on the authorized trails and can also be used to block off access to old or unauthorized trails.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



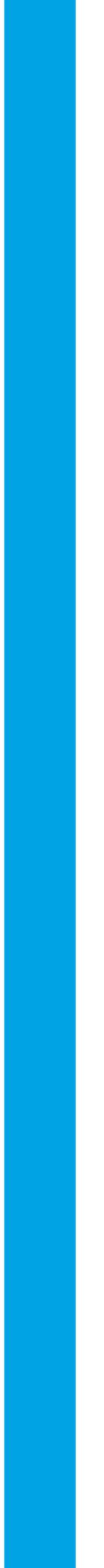
Paul Morrissey
Principal | Director of Biology

Attachments

- Attachment 1 – Post-Fire Tree Assessment Site Photos



ATTACHMENT 1 – POST-FIRE TREE ASSESSMENT SITE PHOTOS



SITE PHOTOS



Photo 1

East Trail Big T-1

- **Location:** Southern-Eastbound Trail – right side
- **Species:** Fremont cottonwood
- **GPS:** 34.26629140, -118.34254790
- **Action:** Cut down



Photo 2

East Trail Big T-2

- **Location:** Southern-Eastbound Trail – right side
- **Species:** willow
- **GPS:** 34.26610544, -118.34240068
- **Action:** Cut down



Photo 3

East Trail Big T-3

- **Location:** Southern-Eastbound Trail – right side
- **Species:** willow
- **GPS:** 34.26603417, -118.34213239
- **Action:** Cut down



Photo 4

East Trail Big T-4

- **Location:** Southern-Eastbound Trail – left side
- **Species:** Fremont cottonwood
- **GPS:** 34.26564862, -118.34152909
- **Action:** Cut down



Photo 5
East Trail Big T-5

- **Location:** Southern-Eastbound Trail – left side
- **Species:** Fremont cottonwood
- **GPS:** 34.26588192, -118.34102680
- **Action:** Cut down



Photo 6
East Trail Big T-6

- **Location:** Southern-Eastbound Trail – left side
- **Species:** Fremont cottonwood
- **GPS:** 34.26608096, -118.34098388
- **Action:** Cut down



Photo 7

East Trail Big T-7

- **Location:** Eastern-Northbound Trail – right side
- **Species:** Fremont cottonwood
- **GPS:** 34.26623820, -118.34068991
- **Action:** Cut down



Photo 8

East Trail Big T-8

- **Location:** Eastern-Northbound Trail – left side
- **Species:** Fremont cottonwood
- **GPS:** 34.26628566, -118.34064619
- **Action:** Cut down



Photo 9

East Trail Big T-9

- **Location:** Eastern-Northbound Trail – right side
- **Species:** Fremont cottonwood
- **GPS:** 34.26729292, -118.34051965
- **Action:** Cut down



Photo 10

East Trail Big T-10

- **Location:** Eastern-Northbound Trail – left side
- **Species:** Fremont cottonwood
- **GPS:** 34.26703590, -118.34048460
- **Action:** Cut down



Photo 11

East Trail Big T-11

- **Location:** Northern-Westbound Trail – right side
- **Species:** Fremont cottonwood
- **GPS:** 34.26728660, -118.34052000
- **Action:** Cut down



Photo 12

East Trail Big T-12

- **Location:** Northern-Westbound Trail – left side
- **Species:** Fremont cottonwood
- **GPS:** 34.26783029, -118.34200007
- **Action:** Cut down



Photo 13

East Trail Big T-13

- **Location:** Western-Southwest bound Trail – both sides
- **Species:** willow (5), Fremont cottonwood (4), California box elder (1), coast live oak (4), California black walnut (1)
- **GPS start point:** 34.26731276, -118.34392945 – (northeast along Haines Canyon Creek to Parks & Recreation)
- **Action:** willow (cut down); Fremont cottonwood, California box elder, coast live oak, California black walnut (reduce crown)



Photo 14

Mid-trail Big T-1

- **Location:** Westbound on Trail – right side
- **Species:** coast live oak
- **GPS:** 34.26774424, -118.34451476
- **Action:** Reduce crown



Photo 15

Mid-trail Big T-2

- **Location:** Westbound Trail – right side
- **Species:** willow (7)
- **GPS:** 34.26782395, -118.34485890 (midpoint location through short section of trail)
- **Action:** Cut Down



Photo 16

West Trail Big T-5

- **Location:** Southern-Westbound Trail – both sides
- **Species:** white alder, California box elder
- **GPS:** 34.26605515, -118.35067550
- **Action:** Cut down



Photo 17

West Trail Big T-6

- **Location:** Southern-Westbound Trail – left side
- **Species:** white alder (2)
- **GPS:** 34.2662982, -118.35064968
- **Action:** Cut down



Photo 18

West Trail Big T-7

- **Location:** Southern-Westbound Trail – left side
- **Species:** coast live oak (4)
- **GPS:** 34.26627448, -118.35191152
- **Action:** Reduce crown



Photo 19

West Trail Big T-8

- **Location:** Southern-Westbound Trail – left side
- **Species:** white alder (3)
- **GPS:** 34.26620343, -118.35205345
- **Action:** Cut down



Photo 20

West Trail Big T-9

- **Location:** Southern-Westbound Trail – left side
- **Species:** Fremont cottonwood (2)
- **GPS:** 34.26639104, -118.35226830
- **Action:** Cut down



Photo 21

West Trail Big T-10

- **Location:** Southern-Westbound Trail – both sides
- **Species:** white alder (2), California box elder, western sycamore (2)
- **GPS:** 34.26647168, -118.35327939
- **Action:** Cut down



Photo 22

West Trail Big T-11

- **Location:** Southern-Westbound Trail – right side
- **Species:** velvet ash
- **GPS:** 34.26651364, -118.35334883
- **Action:** Cut down



Photo 23

West Trail Big T-12

- **Location:** Southern-Westbound Trail – right side
- **Species:** white alder
- **GPS:** 34.26663809, -118.35375648
- **Action:** Cut down



Photo 24

West Trail Big T-13

- **Location:** Southern-Westbound Trail – right side
- **Species:** velvet ash
- **GPS:** 34.26669239, -118.35410598
- **Action:** Cut down



Photo 25

West Trail Big T-14

- **Location:** Southern-Westbound Trail – left side
- **Species:** western sycamore
- **GPS:** 34.26658523, -118.35425884
- **Action:** Cut down

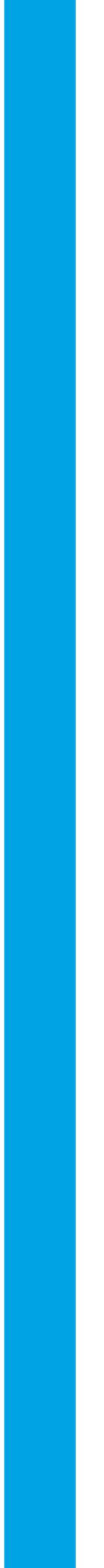


Photo 26

West Trail Big T-15

- **Location:** Southern-Westbound Trail – right side
- **Species:** coast live oak, western sycamore, willow
- **GPS:** 34.26640812, -118.35439596
- **Action:** coast live oak and western sycamore (reduce crown); willow (cut down)

APPENDIX J– STAKEHOLDER MAILING LIST



Mr. Aaron Allen
U.S. Army Corps of Engineers
Office of the Chief, Regulatory Branch
2151 Alessandro Drive, Suite 110
Ventura, CA 93001
Aaron.O.Allen@usace.army.mil

Ms. Mary Benson
City of Los Angeles
District 7
11070 Sheldon Street
Sun Valley, CA 91352
c-maryb@msn.com

Sergeant John Caffrey
LA County Sheriff's Dept, Parks Bureau
32113 Castaic Lake Drive
Castaic, CA 91384
jcaffre@lasd.org

Mr. Wesley Collins
Greater LA County Vector Control
District 16320 Foothill Boulevard
Sylmar, CA 91342
wcollins@glacvcd.org

Mr. William Eick
Small Wilderness Area Preserve
9647 Stonehurst Avenue
Sun Valley, CA 91352
weeick@pacbell.net

Ms. Linda Fullerton
Equestrian Trails, Inc. & California Trail
Users Coalition
9800 Craig Mitchell
Shadow Hills, CA 91040
linda@wrightcolor.com

Rene Herrera
Foothill Mounted Patrol
10842 Art Street
Shadow Hills, CA 91040
rnkranch@me.com

Mr. Tony Klecha
California Regional Water Quality Control
Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

The Honorable Michael Antonovich
Supervisor Fifth District
Attention: Mr. Jarrod DeGonia
County of Los Angeles
21943 Plummer Street
Chatsworth, CA 91311
JDeGonia@lacbos.org

Ms. Kim Bosell
County of Los Angeles
Department of Parks and Recreation
1750 North Altadena drive
Pasadena, CA 91321
kbosell@parks.lacounty.gov

Mr. Matthew Chirdon
California Department of Fish and Wildlife
matthew.chirdon@wildlife.ca.gov

Mr. Ken Corey
U.S. Fish and Wildlife Service
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, CA 92009-4219

Octaviano Fernandez
County of Los Angeles
Department of Public Works
Flood Maintenance Division
10179 Glenoaks Boulevard
Sun Valley, CA 91352
OFERNANDEZ@dpw.lacounty.gov

Mr. Dale Gibson
Gibson Ranch
9655 Wentworth Street
Sunland, CA 91040
gibsonranch@mac.com

Asatur Hovhannisyan
Council Deputy
City of Los Angeles District 7
Office of Councilmember Felipe Fuentes
7747 Foothill Boulevard
Tujunga, CA 91042
asatur.hovhannisyan@lacity.org

Ms. Electra Kruger
Shadow Hills Property
Owners Association
10544 Mahoney Drive
Sunland, CA 91040
kalkrugers@earthlink.net

Mr. Eric Baul
County of Los Angeles
Department of Public Works
Watershed Management Division
900 South Freemont
Alhambra, CA 91803
EBAUL@dpw.lacounty.gov

Tomi Bowling
8545 Tujunga Valley Street
Sunland, CA 91040
tomi@tomirealty.com

Ms. Cindy Cleghorn
Sunland Tujunga Chamber
8250 A Foothill Blvd
Sunland, CA 91040
cindy@cmprintmail.com

Ms. Chris Creekpau
Shadow Hills Property
Owners Association
9635 La Canada Way
Sunland, CA 91040
chrisarlington43@yahoo.com

Ms. Joyce Fitzpatrick
County of Los Angeles
Department of Parks and Recreation
jfitzpatrick@parks.lacounty.gov

Mr. Randy Hammock
Equestrian Trails, Inc.
11000 Art St
Sun Valley, CA 91352
rhammock.hur@gmail.com

Mr. Terry Kaiser
Equestrian Trails, Inc. &
California Trail Users Coalition
10354 McBroom Street
Shadow Hills, CA 91040
hdconcerns@ca.rr.com

Mr. John Laue
Sunland Tujunga Neighborhood Council
Land Use Committee
11063 Eldora Place
Sunland, CA 91040
lauejp@gmail.com

Ms. Christine L. Medak
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008
Christine_Medak@fws.gov

Ms. Debbie Pepe
County of Los Angeles
Department of Parks and Recreation
28000 Devil's Punchbowl Road
Pearblossom, CA 93553
dpepe@parks.lacounty.gov

Ms. Claudia Rodriguez
Planning Deputy
City of Los Angeles District 7
Office of Councilmember Felipe Fuentes
200 North Spring Street, Room 455
Los Angeles, CA 90012
claudia.rodriguez@lacity.org

Ms. Carli Simons
carlisimons@yahoo.com

Benny Miranda
County of Los Angeles
Department of Public Works
Flood Maintenance Division
10179 Glenoaks Boulevard
Sun Valley, CA 91352
BMIRANDA@dpw.lacounty.gov

Mr. Jerry Piro
Sun Valley Watershed Group
8600 Robert Avenue
Sun Valley, CA 91352

Ms. Carol Roper
Shadow Hills Property
Owners Association
9635 La Canada Way
Sunland, CA 91040

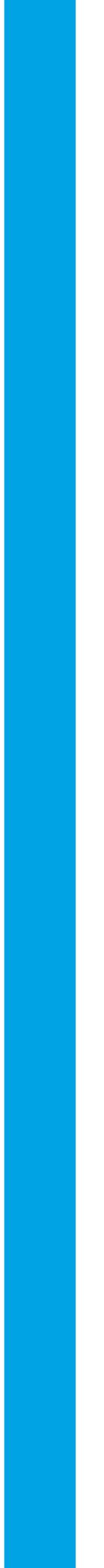
Mr. Albert Torres
Senior Park Ranger
City of Los Angeles
4730 Crystal Springs Drive
Los Angeles, CA 90027
albert.torres@lacity.org

Sergeant Boris Nikolof
LA County Sherrif's Dept, Parks Bureau
32113 Castaic Lake Drive
Castaic, CA 91384

Ms. Sarah Rains
California Department of Fish and Wildlife
South Coast Region
P.O. Box 279
Newbury Park, CA 91319
Sarah.Rains@wildlife.ca.gov

Ms. Kristen Sabo
P.O. Box 337
Sunland, CA 91041
ksabo@wildwildwest.org

APPENDIX K – NEWSLETTERS





Big T Wash Line

Spring 2018

A Publication of the County of Los Angeles Department of Public Works

IN THIS ISSUE



Fire Adaptation

• 2 •



2017 Cleanup Day

• 4 •



Ash and Safety

• 4 •



ABOUT THE BIG TUJUNGA WASH MITIGATION AREA

“Big T” is a parcel of land located in the City of Los Angeles’s Sunland area (see Page 6).

The Big Tujunga Wash Mitigation Area (Big T) covers an area of approximately 210 acres of sensitive habitat, encompassing the Big Tujunga Wash and Haines Creek. The site was purchased by the Los Angeles County Department of Public Works (LACDPW) in 1998 as compensation for habitat loss for other LACDPW projects.

LACDPW’s implementation of the Master Mitigation Plan for Big T has been underway since April 2000. Big T protects one of the most rapidly diminishing habitat types found in Southern California: willow riparian woodland. The Big Tujunga Wash is home to several

protected species of fish, including the Santa Ana sucker, Santa Ana speckled dace, and arroyo chub, and contains habitat for sensitive bird species such as the least Bell’s vireo and southwestern willow flycatcher.

The purpose of this newsletter is to provide updates to ongoing programs and to explain upcoming enhancement measures that will be implemented on the site. Newsletters are published on a semi-annual basis in the spring and fall.

More information can be found at:
dpw.lacounty.gov/wrd/projects/BTWMA

Fire Adaptations

How do plants persist after a wildfire?

Imagine you're a plant. Now imagine you're a plant with eyes. You see a bewildering glow in the distance. As it creeps nearer, you hear an unfamiliar crackle (yes, you're also a plant with ears), and the temperature begins to rise. It's getting too hot for your little plant body to bare! A huge gust of wind and in seconds you're engulfed in smoke. Your vision is clouded and you try not to breath in the harsh fumes (no surprise, you're a plant with a nose and lungs as well). It's a fire! What do you do? Run? Duck into a nearby burrow and wait for the flames to pass? Jump into the creek and hope for the best? Fly away? Unfortunately, plants can't escape wildfires. They are rooted to the ground and must bare whatever adversity comes their way.

As most are well aware, adversity visited Big Tujunga Wash in early December of last year when the Creek Fire swept through, burning a large portion of the Big Tujunga Wash Mitigation Area (Big T) and leaving behind the stark and ashy remains of Big T past. However, all is not lost. Although the plants at Big T have none of the characteristics we were imagining, many of them do have a plan! A plan that allows them to persist in an environment punctuated by intense, wind-driven burns. A plan more specifically referred to as adaptations.

Adaptations are alterations in behavior or physiology that allow living things to become better fitted to survive and multiply in their environment. Big T is composed of and surrounded by several vegetation communities that have long-running relationships with wildfires. Plant species within these communities have developed various ways to persist, or at a minimum, allow their offspring to persist even after being burned to a crisp!

Let's take a look at some fire adaptations of plants you may be familiar with at Big T. First up, the **obligate resprouter**. After a burn the obligate resprouter will resprout vigorously from the root crown, a portion of the root that stores dormant buds and carbohydrates. The seeds of obligate resprouters typically cannot endure the heat of a burn and thus, the plant is "obligated" to resprout after a fire in order to persist. Examples of obligate resprouters you may encounter at Big T are toyon (*Heteromeles arbutifolia*) and scrub oak (*Quercus berberidifolia*). Speaking of resprouting – in case you were concerned that all of the poison oak at Big T would be gone forever, you'll be glad to know that poison oak can resprout from an extensive underground root system and should be back in no time!

Next, we have the **obligate seeder**. The obligate seeder will die in the fire; however, the obligate seeder will have many generations (hopefully) of fire resistant seed stored in the seedbank. The seeds of obligate seeders



The native Fire Poppy (*Papaver californicum*).

lay dormant in the soil until they receive an environmental cue that tells them to start growing. In fire adapted species this cue could be the intense heat from a burn that weakens the tough outer seed coats of seeds preparing them for germination, or chemical cues from combustion products that stimulate enzymes or growth regulators within seeds, initiating germination. Obligate seeders you may encounter at Big T include species of Ceanothus (*Ceanothus sp.*) that cannot resprout from vegetative structures (i.e., roots) after a fire.

Then comes the **facultative seeder**. The facultative seeder likes to keep its options open. It can resprout from the root crown but also produces fire resistant seed that can germinate with fire cues. Laurel sumac (*Malosma laurina*) and lemonade berry (*Rhus integrifolia*) are examples of facultative seeders you may encounter at Big T.

Last but not least, are the plants commonly referred to as "**fire followers**". Fire followers take full advantage of the increased sunlight and reduced resource competition that fires provide when they destroy mature vegetation communities. These plants may not be present at the time of a fire but have seeds present in the seedbank that will respond



Habitat damage from the 2017 Creek Fire in the Verdugo Mountains.

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to fire cues and germinate after a burn. Fire followers are obligate seeding annuals or short-lived perennial species that may only be present for a season or two after a fire occurs or may persist for several years until dominant plant species have had time to establish. Once dominant plant species establish, the fire followers decline or completely disappear until the next fire. Fire followers you may encounter at Big T include: deer weed (*Acmispon glaber*), bush poppy (*Dendromecon rigida*), stinging lupine (*Lupinus hirsutissimus*), phacelia species (*Phacelia* sp.), fire poppy (*Papaver californicum*), whispering bells (*Emmenanthe penduliflora* var. *penduliflora*), wild cucumber (*Marah macrocarpus*) and many more!

Big T's recovery after the Creek Fire will be a slow and complex process. For the next one to three years, you can expect Big T to be dominated by annual and perennial grasses

and herbaceous species. Once the shrubs have had time to develop and the shrub canopy begins to close, herbaceous species will start to decline. It will likely be five years or more before shrubs are once again dominant and the landscape starts to resemble pre-fire conditions. The post-fire recovery of riparian habitat (vegetation found along rivers and streams) such as the willow riparian habitat found along Haines Canyon Creek will take longer. Riparian habitats are fairly fire resistant due to the high water content of streamside vegetation, however, when riparian habitats are located adjacent to drier shrub habitats that are prone to burning (such is the case at Big T), riparian habitats can burn as well. Riparian trees such as willows and cottonwoods that were burned but not completely killed by the fire have the potential to resprout within a couple of years, but it may be more than a decade before a mature tree canopy will be seen along the creek again.

WHAT ABOUT THE WILDLIFE?

Once the grasses and herbaceous plants start to grow, herbivores will start to repopulate the Mitigation Area, and once those grasses and herbs go to seed, the granivores (seed eating animals) will move in. It won't be long before the omnivores and carnivores figure out the best place around to find a meal, and once they do, balance will start to return to Big T.

Announcements

2018 Annual Meeting and upcoming recovery efforts. If you ever see a fire, call 911!

Report Any Emergencies! If you see something suspicious occurring in the Mitigation Area, call the LA Sheriff's Department dispatch immediately to report it. LACDPW cannot respond to emergencies; however, please notify BTWMA@dpw.lacounty.gov of any incidents reported to law enforcement, and we will gladly follow up. LA Sheriff's Department Dispatch: (800) 834-0064

Community Advisory Committee Annual Meeting

The annual meeting of the Big Tujunga Wash Mitigation Area Community Advisory Committee (CAC) will be held on Thursday, April 26, 2018 from 6:30 p.m. to 8:30 p.m. at:

Hansen Yard
10179 Glenoaks Boulevard
Sun Valley, CA 91352

The purpose of the CAC meeting is to update members on the status of site monitoring efforts in the mitigation area and to discuss upcoming activities. We invite all interested

parties to attend. The minutes from the previous meeting are located on the mitigation area website. We look forward to seeing you there this April.

ATV/AUV Use During Recovery

The use of all-terrain utility vehicles (AUV) will be utilized at Big T as part of the exotic weed eradication efforts. There will be up to two AUVs in use for a couple of months. The AUVs will be mounted with a spray rig to access most areas of the site. As much vegetation has been destroyed at Big T, this will allow for quicker coverage to prevent emergence of invasive species. All AUV personnel will have Chambers Group shirts and business cards.

Fire Prevention

Fire safety practices must continue even though the Creek Fire destroyed the Mitigation Area and surrounding areas in Big T. Existing vegetation and the emergent vegetation growing this spring and summer, coupled with dry, windy conditions continues

to be a fire risk. Removal of dead vegetation, debris, weeds, waste, litter, and any other combustible materials from your properties and surrounding areas is encouraged to prevent fire spread.

As a reminder, fire safety practices are not just for these habitats and can also be practiced at home. Practice these spring cleanup tips at home to prepare for the coming warmer months:

- Clean garage and yards of rubbish that may fuel a fire.
- Test your smoke alarms & change batteries if needed.
- Dispose of any oily or greasy rags, or store in proper containers.
- Be cautious using outdoor BBQ grills. Place it away from buildings, windows, heating, A/C units, and dead vegetation.
- Check your electrical cords and outlets to make sure they are in safe, working condition.
- Clean out your clothes dryer, as lint can be a fire hazard.

2017 Cleanup Day

On Saturday morning November 4, 2017, the County of Los Angeles Department of Public Works and Chambers Group hosted the 11th Annual Big Tujunga Wash Mitigation Area Trail Cleanup Day.

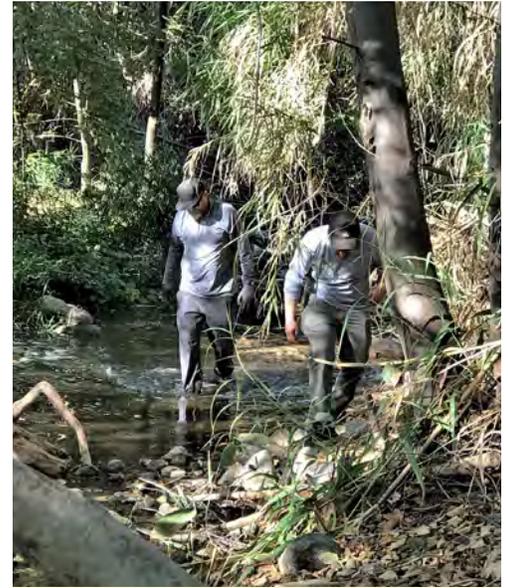


Dozens of community members, County employees, and Chambers Group employees gathered at the Cottonwood Avenue entrance and signed up for a day of trash and rubbish cleanup along the trails. After a brief safety meeting and some group stretches, the volunteers were divided into two teams playfully dubbed the “wet team” and the “dry team”.

The “wet team” focused on cleaning trash and debris from riparian trails west of Cottonwood Avenue where the main trail crosses Haines Canyon Creek several times; thus, they all got wet during the cleanup process! The “dry team” focused their cleanup efforts on the riparian trails east of Cottonwood Avenue and around the Tujunga Ponds where there are no creek crossings; thus, they all stayed dry (except for a little sweat)!

The volunteers worked through the morning hours with some collecting and bagging the trash and debris from the trails and others transporting full bags of trash and bulky items to up to a collection point near the Cottonwood entrance. The teams finished with all of the garbage piled high into one heap, ready for the County’s crews to pick up and haul away.

Over forty full trash bags of debris were collected including hundreds of metallic cans, plastic containers, plastic bags, clothing items, boxes, paper, diapers, tarps, toys, fishing line, rope, cable, and other debris. Bulky trash items, including several mattresses, tires, wooden pallets, coolers, suitcases, and dozens of shopping carts, were also removed. All trails remained open to the public during the cleanup efforts.



Regular removal of trash enhances habitat within the Mitigation Area by reducing predator attraction (ravens, coyotes), reducing harm to aquatic and terrestrial wildlife, increasing aesthetics, and increasing public health and safety.

A big thank-you to the volunteers that helped make the 11th Annual Trail Cleanup Day a success! We hope you'll join us for the 12th Annual Trail Cleanup Day planned for the Fall of 2018.

Stay tuned for event details and other Big T news

dpw.lacounty.gov/wrd/projects/BTWMA

Ash and Safety

Fire safety doesn't end when the fire is put out.

After being spared by the smallest margin from the La Tuna fire this past September, Big T was almost completely burned by the Creek Fire in December 2017. It will take years for the wash to recover. In these early stages of the recovery, we need to remain vigilant of the hazards present in the area and the need for safety when in fire-burned areas.

Although not permitted, camping and dumping had left all kinds of trash strewn throughout Big T. While the fire did consume the flammable material, the remaining metal, glass and non-flammable material

poses a risk to all who walk through Big T. Cuts and punctures can occur from the remaining trash covered by ash. We do not know the threats that lie below the fine, powdery ash until it gives way causing a tripping hazard.

Wildfires, which burn at higher temperatures than brush and forest fires, also produce toxins that mix with the ash. These toxins can range from heavy metals like copper and arsenic, uptaken by the vegetation in the previous years and decades and from the burnt trash,

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to asbestos and lead from the surrounding affected neighborhoods which was blown into Big Tujunga Wash on the fine ash clouds.

Moving through fire-burned areas disturbs the ash causing it to plume and decrease the air quality we breathe. This is why it is highly advised to use respirator masks and only enter these fire-burned areas only when needed. It is especially true for those with asthma, bronchitis, and other respiratory conditions as health problems can occur from breathing in the fine particulate and irritating the respiratory passageways. Everyone's health and safety is of utmost importance, so it is advised to avoid fire-burned areas like Big T whenever possible and to take all precautions when venturing in until the rain has reduced the amount of ash present.

Even with all the problems caused by wildfires the ash also poses a benefit for the environment. Ash contains the macro- and micronutrients needed for plants to grow. As the ash becomes incorporated into the soil it becomes fertilizer for the succession of vegetation re-colonizing the newly-empty land. Signs of this can already be seen at Big T. The Creek Fire did not reach the canopies of trees and new shoots could be observed a few weeks afterwards. Surviving seeds have

already begun germinating. Big T will rebound and make a comeback over the years. The LACDPW-led efforts to restore the wash will hopefully allow native vegetation to gain a foothold over the invasive non-native plants that have encroached over the past decades.

The Aquatic Environment

The Creek Fire not only affected the terrestrial ecosystems within Big T, but also the aquatic ecosystems. The rapid influx of ash into the ponds and Haines Creek affects the fish and amphibians that call the waterways home.

The endemic Santa Ana sucker depends on algae for a large part of its diet, but the large inflow of ash initially covers and kills off much of that algae, as it can no longer photosynthesize. As such, the Santa Ana sucker and other algivores (algae eaters) need to move to other not affected, but possibly less favorable, sections of the waterways.

When all the nutrients — like phosphorus and nitrogen — of the ash build up in the water column, an algal bloom is produced. The free-floating algae takes over the streams and lakes, but is not accessible as a food source for fish and the larval stages of amphibians. The algal bloom grows exponentially until it consumes all the dissolved oxygen, and then

crashes in a process called eutrophication.

While the foundation of the food chain for many species in the aquatic ecosystem is decimated and the dissolved oxygen is depleted, the influx of ash also briefly increases the acidity (lowers pH) of the water as the carbon is incorporated into the water column. Although the spike in pH will subside in a few hours or days, the effect on the organisms is longer or permanent. Fish and amphibian eggs will be stunted as the change in acidity can fluctuate outside the tolerance of the processes needed for normal development. Fish and amphibian larvae gills can be burned by the change in acidity, inhibiting their ability to intake oxygen. If serious enough the fish and larvae will suffocate.

However, the aquatic ecosystems are resilient and will eventually recover, especially with the help of the community. Treading lightly and carefully, and taking the shortest path while crossing streams within Big T will increase the rate at which the ecosystem can reestablish.

Types of Fires

Both brush fires and forest fires are wildfires occurring in scrubland and forests, respectively. Normally the brush and forest fires burn at a lower temperature and at regular intervals, burning the vegetation within the area.

Ecosystems have evolved to actually rely on these fires. Due to decades of fire management, where all fires were put out as soon as possible, dead and dying material has been left to accumulate.

In this context, wildfires are large uncontrolled fires that consume everything in their path at higher temperatures due to all the built-up fuel. This can kill the vegetation normally resistant to fires and sterilizes the soil, extending the recovery period as soil bacteria recolonize the area afterwards.

RESPIRATORY SAFETY

After a fire, there are considerable deposits of ash near fire locations both indoors and outdoors. Fire ash can be irritating to the skin and can cause respiratory issues if inhaled. Short-term exposure to these particulates can have the following signs and symptoms:

Coughing, Scratchy throat, Eye irritation/watery/puffy, Runny nose, Asthma, Headaches, Sneezing/Wheezing, Tightness of the chest, and Shortness of breath.

People who have pre-existing respiratory conditions, young children, and the elderly are more sensitive when exposed and can experience chest pains, palpitations, fatigue, and light-headedness. Practice the following safety tips if you are planning outdoor activities that may expose you to dust and ash:

- Walk in areas where ash has been reduced by foot traffic (such as trails).
- Keep vents and windows closed when riding in a car to reduce outside air from entering.
- Avoid areas that may worsen breathing

conditions such as smoking areas or bonfires.

- Avoid spreading ash and dirt in the air by wetting down surfaces (do not use leaf blowers or vacuum) when cleaning.
- Keep children and pets away from areas accumulated with ash.
- Avoid outdoor activities if possible during windy conditions.
- Use physician-recommended respirators or masks if you have a respiratory condition. Make sure the use of these devices does not get in the way of breathing.
- Use dust mask rated N-95 or P-100 to effectively block dust and ash particles.
- If you start feeling dizzy, or have difficulty breathing when wearing a respirator or dust mask, go to a place with cleaner air and remove mask.

If you still experience any of those symptoms and are starting to feel dizzy, lightheaded and have trouble breathing leave the area immediately and call 911.

KID'S CORNER**Creek Fire Word Search****Word Bank**

1. Big Tujunga
2. mitigation
3. habitat
4. riparian
5. adaptation
6. seedbank
7. ash
8. poppy
9. algae
10. amphibian
11. oxygen
12. wildfire

b	b	r	i	p	a	r	i	a	n	n	k
i	q	f	a	u	x	t	t	o	o	n	w
g	a	l	g	a	e	a	i	i	a	y	i
t	s	y	t	f	t	t	t	b	p	n	l
u	h	y	r	i	a	a	d	p	y	x	d
j	h	a	b	t	g	e	o	u	k	p	f
u	k	a	p	i	e	p	d	y	l	h	i
n	h	a	t	s	e	s	o	m	l	o	r
g	d	i	w	e	o	x	y	g	e	n	e
a	m	a	m	p	h	i	b	i	a	n	p

EMERGENCIES? INCIDENTS? QUESTIONS?

CALL 911 TO REPORT ANY EMERGENCY SUCH AS FIRE OR ACCIDENT

- To report minor incidents or regulation infractions contact the Sheriff's Department at 1-800-834-0064. (Please DO NOT use 911.)
- Do not attempt to enforce regulations yourself; please allow law enforcement to handle the situation or incident.
- For emergency follow up or to report minor incidents, obtain information, or get questions answered during weekday work hours (8:00 a.m. to 5:00 p.m., Monday through Thursday), please contact:

Crystal Franco, Stormwater Engineering Division
 County of Los Angeles Department of Public Works
 900 S. Fremont Avenue
 Alhambra, CA 91803
 Email: BTWMA@dpw.lacounty.gov
 Phone: (626) 458-6158

Where is the Big Tujunga Wash Mitigation Area?

Downstream of Big Tujunga Canyon, right in Lake View Terrace and south of the 210 freeway, you'll find a native riparian (water loving plant) natural area filled with cottonwoods, willows, and pools of water that support many native aquatic species.

Check out the Big T website for more information at:

- dpw.lacounty.gov/wrd/projects/BTWMA





Big T Wash Line

Fall 2018

A Publication of the County of Los Angeles Department of Public Works

IN THIS ISSUE



Life Finds a Way

. 2 .



Invasive Aquatic Species

. 3 .



Trail Reestablishment

. 5 .



ABOUT THE BIG TUJUNGA WASH MITIGATION AREA

“Big T” is a parcel of land located in the City of Los Angeles’s Sunland area (see Page 6).

The Big Tujunga Wash Mitigation Area (Big T) covers an area of approximately 210 acres of sensitive habitat, encompassing the Big Tujunga Wash and Haines Canyon Creek. The site was purchased by the Los Angeles County Department of Public Works (LACDPW) in 1998 as compensation for habitat loss for other LACDPW projects.

LACDPW’s implementation of the Master Mitigation Plan for Big T has been underway since April 2000. Big T protects one of the most rapidly diminishing habitat types found in Southern California: willow riparian woodland. Big T is home to several protected species of

fish, including the Santa Ana sucker, Santa Ana speckled dace, and arroyo chub, and contains habitat for sensitive bird species such as the least Bell’s vireo and southwestern willow flycatcher.

The purpose of this newsletter is to provide updates to ongoing programs and to explain upcoming enhancement measures that will be implemented on the site. Newsletters are published on a semi-annual basis in the spring and fall.

More information can be found at:
dpw.lacounty.gov/wrd/projects/BTWMA



Life Finds a Way

What is life like after the devastation of a wildfire?

As Dr. Malcolm said memorably in Jurassic Park, “Life finds a way...” Signs of recovery can be seen everywhere at Big T since the Creek Fire burned through in December 2017. When biologists conducted their first post-fire vegetation surveys the following February, the results seemed somewhat grim. They found that over 80 percent of the native alluvial scrub vegetation had been burned in the wildfire. Additionally, most of the riparian trees and shrubs had completely burned to the ground or were totally scorched, leaving behind a seemingly sterile landscape. The thick, lush creek-side vegetation was gone. The soil was blackened and covered in thick ash. Most of



the site seemed like a barren and desolate landscape, bearing little resemblance to what had been there before. The losses seemed devastating, compounded by an already catastrophic California wildfire season. After suffering such loss, would Big T ever be the same?

Human environments are not very well adapted to wildfires, but the California native flora is. Many native plants have various adaptations to survive wildfires. The aboveground leaves, stems, and trunks will burn in the fire, but the soil protects the seeds and roots from the heat,

which helps the plants survive. Following the fire, these plants will “return” to the site when the rains come, and the ash acts like a fertilizer to give them nutrients to grow and flourish. The “fire followers” are plants whose seeds “lie-in-wait” until a fire comes, and only then can they germinate and grow. These plants will only live for a short time following a wildfire, just long enough to flower and disperse their seed into the soil and then wait patiently until the next wildfire. Some of the native “fire follower” species that flourished at Big T this spring were lupines, poppies, phacelia, horsetweed, and deerweed. The riparian trees and shrubs, which are the native plants growing right along the river banks, are able to resprout from their



roots. Like the “phoenix that rises up from the ashes”, many of these riparian species such as willows, cottonwoods, and sycamores can resprout from their root crown even when their aboveground vegetation has completely burned. These species are also emerging from seed, and countless little seedlings of willows, cottonwoods, and sycamores can be found all along Haines Canyon Creek and near the Tujunga Ponds. Although most of the native vegetation was burned last winter, many signs of native regeneration can be found at Big T!

But that’s not the whole story, that’s just the

“good guys”. There are also the “bad guys”, otherwise known as invasive weeds. Big T has many invasive weeds, and following the Creek Fire, there have been more weeds than ever! The weed seeds are germinating in higher quantities than in previous years. When the Creek Fire burned out the dense native trees and shrubs, it created a lot of space and light for weeds to thrive, where before there was dense native vegetation that prevented many of them from establishing. The burned ground and ash acts like fertilizer for the weeds as well, further stimulating the growth and establishment of weeds like European annual grasses, castor bean, lamb’s quarters, radish, mustard, tree tobacco, and prickly lettuce. Since invasive weeds can establish more rapidly and aggressively following a wildfire, they are very good at suppressing the recovery of the native California plant species. Without actively managing the weeds at Big T, the native plants at the site would be overrun by weed species. Weeds increase the fuel load for fires, so more weeds can lead to even more frequent and intense wildfires. Suppressing weed growth helps Big T to be more fire-safe! That makes the communities surrounding Big T more fire-safe as well.

The trail system at Big T was also heavily impacted by the Creek Fire. Before the fire, there was dense vegetation with trails that meandered through the riparian trees and shrubs along Haines Canyon Creek and to the Tujunga Ponds. In the aftermath of the fire, burned and toppled trees were blocking parts of the trails. Since the wildfire, Big T is more open and doesn’t have the thick tangles of native trees and shrubs. This has allowed people and horses to wander off-trail or take

Continued on next page...

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“short-cuts” that bypass the existing trail system and create new, unofficial trails that go straight to the Tujunga Ponds and cut through sensitive recovery areas.

The creation of unofficial trails can cause erosion problems, facilitate the trampling of reestablishing native vegetation (especially small seedlings), and spread weed seeds across the area. In fact, many new trails were identified by the tall non-native grasses that emerged from horse excrement left behind. Maintenance crews have been working hard to clear the downed trees from the existing trail system and stream crossings, redefine the existing trail system and block off the unofficial trails. Community members can help reduce erosion and the

spread of weeds by staying on the existing trail system when hiking or equestrian riding at Big T.

By staying on the maintained trail system, we can reduce the spread of weeds, reduce erosion and allow native vegetation to reestablish without the risk of being trampled. This is one small thing we can all do to help create a healthy ecosystem at Big T.

The good news is that the native plants at Big T are coming back, and “life is finding a way” with human intervention to help the “good guys” (native plants) win over the “bad guys” (weeds). With good land management practices such as reducing invasive weeds, we can help Big T recover and become even healthier than it was before the Creek Fire.



Invasive Aquatic Species

Several common exotic species affect the aquatic ecosystems of Big T

Big T is a small island of habitat within a concrete jungle and contains several sensitive native species. Among these are fish species including: Santa Ana sucker (Federally Threatened), Santa Ana speckled dace (California Species of Special Concern; SSC), and the arroyo chub (SSC, USFS Sensitive). Like some of their names show, these fish are endemic to, or solely found in, the Santa Ana River and surrounding watersheds. Because fish can't fly to other surrounding habitats like birds or disperse their pollen and seeds over a wider area like plants, fish species are more prone to changes in their limited environments.

As discussed in the April 2018 edition of Big T Washline, adverse changes to aquatic environments can be caused by naturally occurring events such as the influx of ash and nutrients after seasonal wildfires, but even more damaging to the aquatic environments at Big T, are the continuous and purposeful introduction of exotic wildlife species for gaming purposes, and the dumping of unwanted aquatic pets into Haines Canyon Creek and the Tujunga Ponds. Although the introduced wildlife may survive and thrive in these waterways, they are still exotic species that alter the aquatic habitats upon which native fish species depend to survive. If nothing is done, the suckers, dace, and chub may be driven to extinction.

Some of the most commonly encountered exotic wildlife species at Big T are largemouth bass, green sunfish, bluegill, red swamp crayfish, and exotic turtles.



Largemouth Bass

The largemouth bass (*Micropterus salmoides*) is an olive-green to grayish-green gamefish with a dark horizontal stripe along its sides and a whitish underside. They are native to waterways on the eastern half of the United States, from Canada to the Gulf of Mexico. Being apex predators, they remain hidden within aquatic vegetation and between rocks and roots until their prey moves by. Largemouth bass can feed on prey over half their body length and are aggressive and voracious eaters. As a result, the largemouth bass at Big T can decimate native fish populations, especially when the fish are trapped upstream of illegally constructed dams.



Green Sunfish

The green sunfish (*Lepomis cyanellus*) is a bluish-green fish with a yellow underside. Native to watersheds from the Midwest to the Appalachian Mountains, green sunfish are commonly found in slow-moving lakes and streams where they are the natural prey of largemouth bass. It is for this reason that waterways are often stocked (including illegally at the Tujunga Ponds), with sunfish species along with largemouth bass. Sunfish serve as a food source for bass and as a bait fish for anglers, but they also outcompete native fish for resources such as food and breeding space, and feed on smaller fish.

Continued on next page...

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Bluegill

The bluegill (*Lepomis macrochirus*) is an olive-green fish with a blue head, reddish-orange underside and vertical stripes on its sides. Although sometimes confused with the green sunfish, as both species have dark spots on their gill covers, the bluegill can be distinguished by a dark spot on its dorsal fin. The native habitat of the bluegill is in shallow waters east of the Rocky Mountains where they are also the natural prey of largemouth bass. Like the green sunfish, bluegill are also introduced to waterways as a food source and bait for largemouth bass. Not only do bluegill compete with native fish species for limited resources, they also breed in large spawning beds that alter the streambeds upon which native fish feed. When creating spawning beds, bluegill dig up the substrate which muddies the water and covers the algae that Santa Ana suckers feed on with silt.

Red Swamp Crayfish

The red swamp crayfish (*Procambarus clarkii*) is a dark red, freshwater crayfish native to slow-moving waterways in the Gulf states. Being an opportunistic omnivore, the crayfish will eat whatever is available, be it fish and other animals, plant matter, or decaying organic materials (detritus). Crayfish also dig burrows along the banks of creeks, and during burrow construction they churn the sediment, releasing nutrients into the water and causing eutrophic (nutrient-rich) conditions. Eutrophic conditions can lead to a lack of oxygen in the water, which causes dieback of the algae that some native fish species depend on.



Red-Eared Slider

By far, the most common exotic turtle encountered at Big T is the red-eared slider (*Trachemys scripta elegans*). Native to the Mississippi River tributaries, the red-eared slider typically measures less than a foot long, and gets its name due to the red stripe behind its ears. This turtle is the most common species of pet turtle and can live for over 30 years, so it's no surprise that it is also the most common species of turtle abandoned in nearby waterways when no longer wanted as a pet. When released, red-eared sliders will feed on any fish they can catch and on aquatic vegetation.

Exotic species not only compete with native fish species on an individual basis but can completely take over native fish habitats in short periods of time due to their high reproductive rates. These high reproductive rates lead to more and more exotics competing with a lesser number of native fish for the same limited resources. The introduction of exotic species into native fish populations can also introduce bacteria and diseases which native fish species are often unable to cope with.

Not only does releasing exotic wildlife adversely affect the ecosystems into which they are dumped, it is also illegal. California Department Fish and Wildlife (CDFW) Citation 14 CCR § 671.6. Release of Animals into the Wild (a) states:

No person shall release into the wild without written permission of the commission any wild animal (as defined by Section 2116 of the Fish and Game Code), including domestically reared stocks of such animals, which: (1) is not native to California; (2) is found to be diseased, or there is reason to suspect may have the potential for disease; (3) may be genetically detrimental to agriculture or to native wildlife; (4) has not been successfully introduced prior to 1955.

Violations of this regulation may result in a fine starting at \$250.

If you see biologists out in the water or in the ponds, they are there for a reason: providing exotic species maintenance throughout the year in an effort to restore native species balance in Haines Canyon Creek within Big T.



12th Annual Trail Cleanup Day

Last year's 11th Annual Cleanup Day was a huge success with dozens of volunteers included community members, County employees and Chambers Group employees working together to collect over forty full trash bags of debris. Hundreds of metallic cans, plastic containers, plastic bags, clothing items, boxes, paper, diapers, tarps, toys, fishing line, rope, cable, and other debris items were removed from Haines Canyon Creek and the surrounding trails. Bulky trash items, including several mattresses, tires, wooden pallets, coolers, suitcases, and dozens of shopping carts, were also removed. We hope you will join us for the 12th Annual Trail Cleanup Day scheduled for Saturday November 3rd at 8:00 a.m. Please come prepared with comfortable clothing, closed-toed shoes, gloves, a hat, sunblock, and insect repellent if desired. Water, snacks and trash bags will be provided. If there is rain or poor weather on November 3rd, the event will be rescheduled to Sunday November 4th.

We are looking forward to another opportunity to help beautify Big T while making it a cleaner and safer place for human visitors and wildlife alike! See you there!

Trail Reestablishment

One of the biggest threats to aquatic wildlife at Big T is the degradation of sensitive stream habitat. Any time a stream is disturbed or altered there is potential for negative consequences to wildlife to follow. Disturbances to stream habitat can include actions as simple as skipping rocks into the stream, or even more destructive, building rock dams, swimming and recreating in the stream and yes, even crossing the stream on horseback or on foot. As mentioned in the Invasive Aquatic Species article (see page 3), any action that stirs up the stream bottom or alters the natural stream flow in Haines Canyon Creek can cause negative impacts to sensitive native fish species including Santa Ana sucker, arroyo chub and Santa Ana speckled dace. These fish are struggling, and they depend on healthy stream habitat if they are ever to thrive again.

That being said, healthy streams cannot exist on their own and require the health of a larger system that provides inputs into streams. At Big T the larger system is the cottonwood-willow riparian habitat that can be found along Haines Canyon Creek and the inputs are the nutrients or organic matter (think leaf

litter, decaying wood, insects etc.) this habitat provides to the creek. In addition to inputs of nutrients, well-developed riparian vegetation provides shading to the creek which controls things like water temperature and aquatic plant growth, and can help limit erosion by providing stability along the creek's banks.



As you can see, these processes are all interconnected and complicated, and while we could discuss stream ecology for days, let's just cut to the chase... we need your help. We need visitors at Big T to stay on authorized trails no matter how tempting it is to "go your own way". Maintenance crews have been working hard to clean up and reestablish authorized trails that were damaged during the Creek Fire. Part of this process has included blocking off unauthorized trails



County of Los Angeles Department of Public Works
and
Los Angeles County Flood Control District



Big Tujunga Wash Mitigation Area

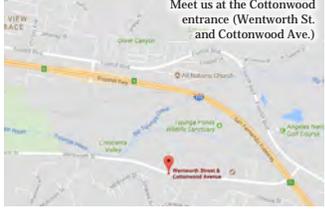
Join us for the 12th Annual Trail Cleanup Day

November 3, 2018 at 8am

Water, snacks, and trash bags will be provided

Please Bring:

- Comfortable clothes
- Closed-toe shoes
- Gloves
- Hat
- Sun block
- Bug repellent



Meet us at the Cottonwood entrance (Wentworth St. and Cottonwood Ave.)

If there is rain or poor weather on the 3rd, the event will be rescheduled to the 4th.
For more information contact Yi Sak Kim at (626) 458-6327 or btwma@dpw.lacounty.gov

where sensitive vegetation communities are reestablishing. With a lack of dense vegetation after the burn, it has become convenient for hikers and equestrian users to make new trails in unauthorized areas. Maintenance crews have attempted to block unauthorized trails with vertical mulch (cut branches and plant materials); however, they return to find that the vertical mulch has been moved aside and that visitors continue to "go their own way".

In the coming weeks, maintenance crews will be out at Big T reestablishing trails and installing signage to help keep visitors on the right track while recreating at Big T. Trail reestablishment is expected to include approximately 1,300 feet of new trails in the cottonwood-riparian habitat north of Haines Canyon Creek and the removal of several stream crossings in order to protect sensitive stream species. New trails will be delineated using fallen trees, branches and rocks collected during trail establishment and have been designed to avoid large patches of poison oak, which will allow for a more enjoyable trail experience. If you are visiting Big T and you come across a blocked trail or signage indicating that a particular trail is unauthorized, please respect these efforts to improve Big T and stay on authorized trails.

KID'S CORNER

Help restore Big T!
Color the stream
and forest to how
you'd like to see
them again.



EMERGENCIES? INCIDENTS? QUESTIONS?

CALL 911 TO REPORT ANY EMERGENCY
SUCH AS FIRE OR ACCIDENT

- To report minor incidents or regulation infractions contact the Sheriff's Department at 1-800-834-0064. (Please DO NOT use 911.)

- Do not attempt to enforce regulations yourself; please allow law enforcement to handle the situation or incident.

- For emergency follow up or to report minor incidents, obtain information, or get questions answered during weekday work hours (8:00 a.m. to 5:00 p.m., Monday through Thursday), please contact:

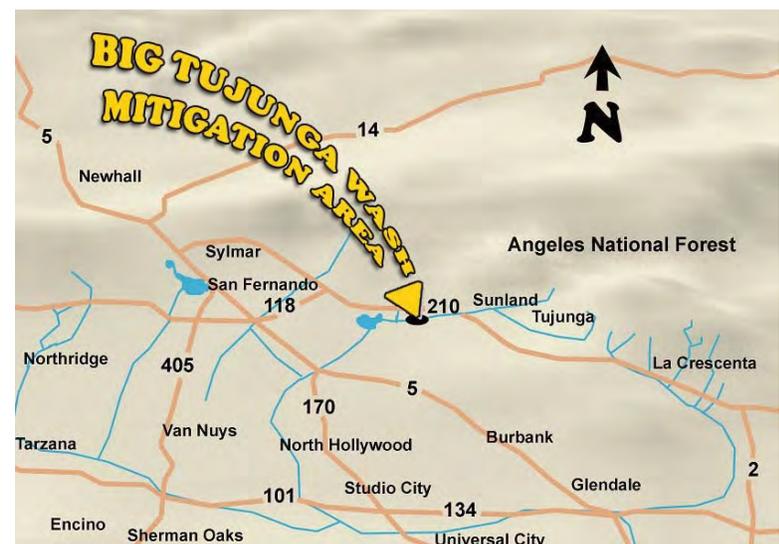
Crystal Franco, Stormwater Engineering Division
County of Los Angeles Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803
Email: BTWMA@dpw.lacounty.gov
Phone: (626) 458-6158

Where is the Big Tujunga Wash Mitigation Area?

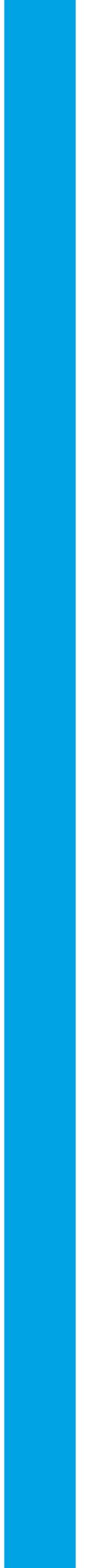
Downstream of Big Tujunga Canyon, right in Lake View Terrace and south of the 210 freeway, you'll find a native riparian (water loving plant) natural area filled with cottonwoods, willows, and pools of water that support many native aquatic species.

Check out the Big T website for more information at:

- dpw.lacounty.gov/wrd/projects/BTWMA



**APPENDIX L – COMMUNITY ADVISORY COMMITTEE MEETING AGENDAS AND
MINUTES**





PUBLIC NOTICE

BIG TUJUNGA WASH MITIGATION AREA COMMUNITY ADVISORY COMMITTEE MEETING

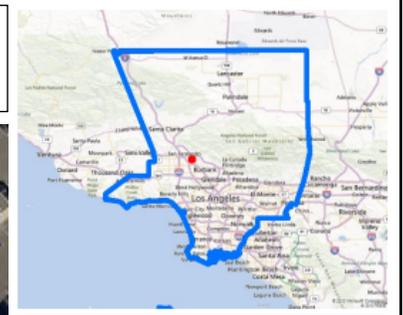
Notice is hereby given that annual meeting of the Big Tujunga Wash Mitigation Area Community Advisory Committee (CAC) will be held on:

**Thursday, April 26, 2018
6:30 p.m. to 8:30 p.m.
Hansen Yard
10179 Glenoaks Boulevard
Sun Valley, CA 91352**

Note: Entrance to Hansen Yard is off Branford Street. There is no access from Glenoaks Boulevard. Please refer to map for entrance to facility.

The purpose of the CAC meeting is to update members on the status of site monitoring efforts in the mitigation area and to discuss upcoming activities. We invite all interested parties to attend (see attached agenda). The minutes from the previous meeting are located on the mitigation area website (link is included below). We look forward to seeing you there.

For more information about the mitigation area, please visit www.dpw.lacounty.gov/wrd/projects/BTWMA. If you have changes to your e-mail address or would like to be removed from the CAC distribution list, please contact BTWMA@dpw.lacounty.gov.



Big Tujunga Wash Mitigation Area

CAC Meeting Location

Hansen Yard
10179 Glenoaks Blvd
Sun Valley, CA 91352

Note: Entrance to Hansen Yard is off Branford St. Please refer to map for entrance to facility.

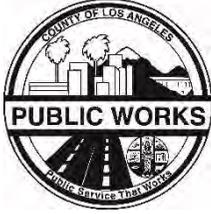


1: 2,257



0.07 Miles 0 0.07 Miles

Notes



**BIG TUJUNGA WASH MITIGATION AREA
COMMUNITY ADVISORY COMMITTEE MEETING**

AGENDA

**Thursday, April 26, 2018
6:30 p.m. to 8:30 p.m.
Hansen Yard
10179 Glenoaks Boulevard
Sun Valley, CA 91352**

Panel: County of Los Angeles Department of Public Works
Chambers Group Inc.

- I. Welcome/Introduction**
- II. Review of Meeting Agenda**
- III. Site Maintenance Issues**
Discussion of Action Items from Previous Meeting
- IV. Current Status of Programs**
 1. Creek Fire and Site Recovery
 2. Exotic Plant Eradication Program
 3. Exotic Wildlife Removal/Monitoring
 4. Water Quality Analysis
 5. Trails Restoration/Maintenance
 6. Public Outreach Program
- V. Schedule Next CAC Meeting**
- VI. Comments, Questions, and Answers**

**Big Tujunga Wash Mitigation Area Project
Community Advisory Committee
2018 Spring Meeting Minutes
April 26, 2018**

I. Welcome and Introduction

Attendee sign-in

II. Review of Meeting Agenda

David Belicki with Los Angeles County Department of Public Works (LACDPW) reviewed the meeting agenda.

III. Ongoing and New Discussion Items

1. Site and Security Issues

- The group discussed sending out an email blast when AUV/ATVs will be used for onsite maintenance so that residents know the difference between recreational rides and Chambers Group staff.
- The group discussed the need to replace two trashcans by the ponds near northwest Wheatland entrance, and to replace trashcans by the Cottonwood entrance.
- The group discussed the need to remove the fire-melted porta-potty at the Cottonwood entrance.

2. Public Concerns

- Residents asked for help with removing a bathtub that is present on site, possibly within the Caltrans right-of-way.
- Residents inquired about the possibility of replacing and extending the wooden barriers/rails at the Cottonwood Avenue trail entrance. Equestrian riders would like the barriers replaced and extended to keep horses on the designated trail and to prevent them from attempting to walk down the steep embankment. New barriers would also serve as a tie-off location for horses if needed.

3. Volunteer Opportunities

- Residents expressed interest in coordinating with LACDPW and Chambers Group on volunteer opportunities as they arise.
- Residents will help identify large bulky debris items to be removed and will contact Chambers Group/LACDPW for removal with AUV/ATV.

IV. Current Status of Programs

Chambers Group provided a power point presentation on the Big Tujunga Wash Mitigation Area current status of programs. A summary of the presentation is found below:

1. Creek Fire Assessment and Site Recovery

- Fire severity categories/areas map
- Post-fire invasive plant emergence
- Native plant recovery



2. Exotic Plant and Wildlife Eradication

- Methods for exotic plant and wildlife eradication
- Potential use of AUVs for more site coverage
- Targeted species and importance for eradication

3. Water Quality Analysis

- Reasons for analysis
- Sampling locations

4. Trails Restoration/Maintenance

- Damaged trees near trails
- New trails being made by hikers and equestrians due to debris blocking old trail alignments
- Methods to reestablish trails and remove burned/fallen debris
- October 2017 Trails Cleanup Day summary

5. Public Outreach

- Pamphlets in English/Spanish provided to public on summer weekends

After the presentation, Chambers Group discussed the sensitive species found at Big T, including:

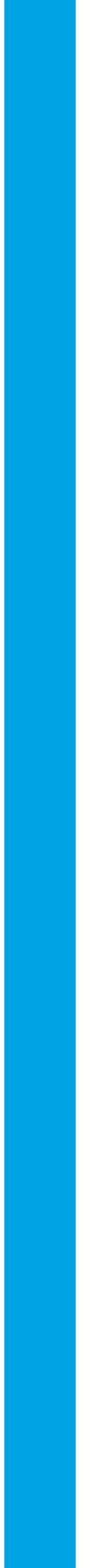
- Santa Ana sucker and arroyo chub fish
- Crossing perpendicular to creek to minimize impacts to fish species
- Least Bell's vireo habitat emergence and future habitat suitability
- Post-fire effects on species
- Importance of informing the equestrian riders about the sensitivity of the creek and associated riparian habitat

V. Schedule Next CAC Meeting

The next CAC meeting is tentatively scheduled for Thursday, April 25, 2019, from 6:30 p.m. to 8:30 p.m. at Hansen Yard, 10179 Glen Oaks Boulevard, Sun Valley, California 91352.



APPENDIX M – PUBLIC OUTREACH MEMO



September 20, 2018

Yi Sak Kim
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Public Outreach for August and September 2018 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Mr. Kim,

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Area (Mitigation Area) for native wildlife species, Chambers Group, Inc. (Chambers Group) has continued bilingual public outreach efforts to non-equestrian and equestrian user groups who regularly visit the Mitigation Area for recreational purposes.

Outreach Efforts

Onsite interviews and education about the Mitigation Area were conducted on three occasions in 2018 by Chambers Group bilingual biologists Erik Olmos, Cindy Chavez, and Jacob Lloyd Davies. Outreach efforts took place on August 19, August 25, and September 1, 2018. All outreach efforts took place during the peak site use hours of 9:00 a.m. to 1:00 p.m.

Chambers Group biologists walked the authorized trails system and popular swimming/wading locations in the Haines Canyon Creek and Tujunga Ponds areas, speaking with visitors they encountered. Visitors that were interviewed fell into one of two groups: non-equestrian user groups or equestrian user groups.

During the three outreach visits, all non-equestrian and equestrian visitors encountered were offered an educational brochure outlining the County of Los Angeles Department of Public Works' (LACDPW) conservation goals for the Mitigation Area. The educational brochure contained the Mitigation Area's rules and regulations, as well as a list of the sensitive species found on the site. During each outreach event, Chambers Group biologists provided information on why specific activities are prohibited in the Mitigation Area and the extent of their impacts on the sensitive species. Most outreach events consisted of informal interviews and short question and answer sessions. Questions from the visitors were primarily about the purpose of the Mitigation Area's rules and regulations and the types of sensitive resources found in the Mitigation Area. Most equestrian users expressed appreciation towards the outreach efforts and agreed with the information presented on the pamphlets. In general, equestrian and non-equestrian users were responsive to the public outreach efforts.

Non-Equestrian User Groups

A total of three non-equestrian site users were encountered during the three outreach visits in 2018. All three of the non-equestrian site users interviewed were local residents. Most of these individuals were encountered along the trails around Haines Canyon Creek and the Tujunga Ponds. All site users were offered an educational brochure about the site, informed about activities that are prohibited in the Mitigation Area, and were asked if they had any questions on any of the information presented. Some of the issues observed by the biologists during the outreach included fishing and an individual building dams and swimming in Haines Canyon Creek.

Individuals that were encountered during the outreach visits were generally receptive to the information provided on the sensitive resources and rules within the Mitigation Area. Individuals that were unaware of and/or violating rules were generally respectful and receptive to the information provided by the biologists. Interactions with individuals that were observed violating the rules of the Mitigation Area are described below.



On August 19, an individual was encountered sitting near a rock dam in Haines Canyon Creek, northwest of the south Wheatland Avenue entrance. The biologists were approaching the dam to photograph it when the individual explained that she had constructed it so she could swim. The biologists gave her an educational brochure and explained that damming the creek and swimming in the Mitigation Area is prohibited. The individual was receptive to the biologists when discussing how altering the streambed in any way can adversely affect sensitive resources. The individual explained that she had previously been approached by others over the years who provided her the same information, but that she has been building dams along Haines Canyon creek every year (in order to swim) for more than 30 years and that she doesn't understand what the issue is with swimming and building dams. She added that she doesn't understand how her actions adversely affect the sensitive fish species as she has never directly harmed them. The biologists reiterated how any change to the streambed (e.g., sedimentation) can adversely affect sensitive resources, at which point the individual thanked the biologists and wished them a good day. The individual was again encountered at the dam on August 25. When the biologists, once again, tried to explain to the individual why building dams and swimming are prohibited in the Mitigation Area, the individual explained that she didn't see the harm she was doing to the sensitive resources, and rather, that she was taking care of them as she regularly fed algae-based fish food to the Santa Ana sucker and arroyo chub in the dammed area. The fish in the dammed area were observed displaying flashing behavior in an attempt to remove parasites from their gills. On September 1, the same individual was encountered sitting on rocks beside where the dam had been removed days prior. During the interaction with the individual the biologists reminded her of the importance of not feeding the fish and damming the creek.

On September 1, an individual was encountered fishing at the Tujunga Ponds. The biologists approached the individual and gave him an educational brochure and explained that fishing within the Mitigation Area is prohibited. He explained that he occasionally fishes at the Tujunga Ponds since designated fishing areas like Hansen Dam are not well stocked and that the Tujunga Ponds are convenient to fish at since they are close to his home. The individual was receptive to the biologists and ceased fishing after being informed about the sensitive resources within the Mitigation Area.

Primary usage of the Mitigation Area as described by the non-equestrian users interviewed included, hiking/walking, exercise, fishing, and general recreation. Concerns raised by non-equestrian users interviewed included, a lack of trash receptacles throughout the Mitigation Area, a lack of signage marking trails and outlining the rules for use of the Mitigation Area, trash, vandalism, off-highway-vehicle use on the trails, and the homeless population. The biologist asked the individuals to contact local law enforcement and LACDPW if suspicious or illegal activities are observed in the Mitigation Area. Recommendations provided by non-equestrian users interviewed included, placing more trash cans and signage throughout the Mitigation Area, more clean-up events, and removing homeless encampments.

Effects on Sensitive Habitat by Non-Equestrian User Groups

The most substantial impacts on sensitive habitat by non-equestrian user groups are caused by swimming and building rock dams within Haines Canyon Creek. Rock dams are constructed by individuals to make swimming areas deeper. There are a few unauthorized swimming areas that have become popular spots for non-equestrian users to congregate, picnic, and swim. The most popular location is the unauthorized swimming area situated approximately 280 feet northwest of the south Wheatland Avenue entrance. This area had a large rock dam that required multiple people to remove.

Several large rock dams were encountered in the creek and were removed during 2018 public outreach and exotic wildlife removal efforts. Rock dams are usually constructed with boulders and tree branches and were often found reinforced with tarps and other materials that reduce the natural flow of the creek and create a buildup of water. The changes to the natural flow of the creek can be detrimental to the sensitive species of fish within the creek. Rock dams reduce the flow of the creek and create large pools of water that are favorable habitat for the exotic, invasive aquatic species such as the red swamp crayfish (*Procambarus clarkii*) and American bullfrog (*Lithobates catesbeianus*), that prey on native species such as the Federally Listed (threatened) Santa Ana sucker (*Catostomus santaanae*). These pools reduce suitable breeding habitat for sensitive fish species as well. In an effort to reduce these effects, non-



equestrian user groups were approached and educated during the outreach site visits. All rock dams encountered during site visits were documented and the larger rock dams reported to LACDPW for removal. A photo of rock dam is included as Photo 1 below.

Equestrian User Groups

A total of 12 equestrian users were approached and interviewed along the authorized trails of the Mitigation Area along Haines Canyon Creek and near the Tujunga Ponds. Of the 12 equestrian users interviewed, 11 were local residents. Equestrian users were offered an educational brochure and were informed about various aspects of the Mitigation Area. Outreach events with equestrian users were usually brief, as most of the equestrian site visitors were frequent users of the Mitigation Area and were receptive to the outreach efforts. Many equestrian users commended the outreach efforts and contributed information to the biologists. Most questions to the Chambers Group biologists were about trail maintenance efforts taking place at the Mitigation Area.

Secondary usage of the Mitigation Area as described by the equestrian users interviewed included hiking and walking. Concerns raised by equestrian users interviewed included, a lack of trash receptacles throughout the mitigation area, a lack of signage marking trails and outlining the rules for use of the Mitigation Area, trail maintenance (particularly vegetation overgrowth and rocks on the trails), trash, illegal dumping, individuals setting “booby-traps” and barbed wire across trails, and the homeless population. Equestrian users reported observations of individuals camping in the Mitigation Area, illegal camp fires, and illegal dumping. The biologists asked the equestrian users to contact local law enforcement and LACDPW if suspicious or illegal activities are observed in the Mitigation Area. Equestrian users that had called law enforcement in the past expressed disappointment in the fact that by the time law enforcement arrives, often over an hour after the call was made, the offending individual(s) have usually already left the area and hence, issues go unresolved. Recommendations provided by equestrian users interviewed included, placing more trash cans and signage throughout the Mitigation Area including signage in Spanish, more clean-up events, more community meetings regarding the Mitigation Area, increasing oversight and security in the Mitigation Area, widening the trails, and fining individuals that are observed misusing the Mitigation Area.

Effects on Sensitive Habitat by Equestrian User Groups

Equestrian site users can affect sensitive terrestrial habitat by traveling off from the established trail systems and can disturb sensitive aquatic habitat when traveling through Haines Canyon Creek. Riders were reminded to cross the creek single-file to minimize erosion along the banks, and to stay on the authorized trails. Equestrian users were not observed off-trail or breaking other rules during the 2018 outreach efforts. The creation of new trails and traveling off from the authorized trails can be minimized with continued trail maintenance and equestrian site user education.

Please do not hesitate to contact me at (949) 261-5414 or at pmorrissey@chambersgroupinc.com, to discuss any questions or concerns.

Sincerely,

CHAMBERS GROUP, INC.



Paul Morrissey
Principal | Director of Biology



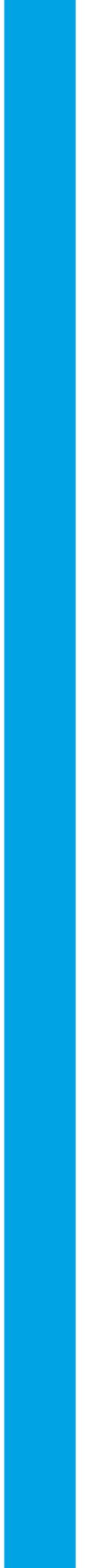
SITE PHOTOS



Photo 1: Rock dam observed on August 19, 2018, during a public outreach effort. The rock dam was located along Haines Canyon Creek northwest of the south Wheatland entrance.



APPENDIX N – POST-CREEK FIRE ASSESSMENT MEMO REPORT



Yi Sak Kim
County of Los Angeles, Department of Public Works
Stormwater Engineering Division
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Memorandum for February 2018 Post Creek Fire Assessment for the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Mr. Kim,

This memorandum summarizes the post Creek Fire assessment for the Big Tujunga Wash Mitigation Area (Big T) conducted in February 2018. Field surveys were conducted on February 20, 23, and 27 2018 to map the severity of the fire, record current conditions of Big T (photos and aerial imagery), assess the potential survival of vegetation (identify re-sprouting vegetation and germinating seedlings), map the currently existing trails, and identify potential public safety concerns (i.e., woody debris that should be cut down for safe access through site).

Fire Assessment

The site assessment for the fire damage was performed by Steven Reinoehl, Paul Morrissey, Heather Clayton, Heather Franklin, Clark Austin, and Jeremy Smith. The assessment focused on the fire damaged area within the Big Tujunga Wash, Haines Creek, Tujunga Ponds and all authorized trails as well as areas that had been previously treated for the exotic eradication effort.

Fire severity was mapped within Big T and is provided in Attachment A in two figures: Figure 1 Fire Severity Map with aerial imagery pre-Creek Fire; and Figure 2 Fire Severity Map with current aerial imagery. The following is the key for the fire assessment:

0. Deeply Burned (all above-ground vegetation consumed, <1% resprouts observed, thick ash layer on soil surface several centimeters deep with organic layer largely consumed, very limited seedling regeneration, greatest potential for restoration).
1. Severe Surface Burn (parts of the woody vegetation layer consumed, all understory plants charred or consumed, resprouting observed on 1-25% of the woody vegetation, ash layer thin, patchy).
2. Lightly Scorched (some vegetation scorched or exhibiting leaf loss from radiant heat, resprouting observed on 26-75% of the woody vegetation with a high potential for natural community regeneration, soil organic layer largely intact).
3. Unburned (vegetation untouched by fire, no direct effect from heat).

Based on the conditions documented in February 2018, it was determined that almost all the vegetation was damaged or destroyed by the fire (see Figure 2 and photos in Attachment B). It appears that the areas with the highest density of plants, mostly along Haines Creek, were deeply burned or showed signs of severe surface burns. Deeply burned areas were identified in areas along Haines Creek within the southern

cottonwood – willow riparian habitat communities. Almost 75 percent of the entire site exhibited signs of severe surface burns, including approximately all of the riparian communities found within Haines Creek, and more than half of the Big Tujunga Wash area. In some of the riparian areas, the fire burned intensely enough to sterilize the soil (destroy the seed bank in the topsoil).

The majority of the riparian areas and much of transitional zones were completely burned (severe surface burn); however, the amount of regrowth and seed germination is relatively high demonstrating that the burned areas were surface burns and the vegetation was not completely destroyed. The larger shrubs and trees showed signs of resprouting near the crown of the vegetation. Seedlings are carpeting much of the open areas. Unfortunately, most of those seedlings are exotic and invasive species. Some of the most commonly observed emergent species were non-native grasses, castor bean, erodium spp., and mustard spp. The fire has created an ideal environment for germinating weeds with an open canopy, alkaline soil, and ash that will soak up and hold rainfall.

Lightly scorched and unburned areas were found along Big Tujunga Wash, likely due to less dense vegetation present to spread the fire. The areas that had a lower density of vegetation have a greater number of individual plants that survived the fire. The vegetation around the Tujunga Ponds were also damaged, but appear to be recovering quickly compared to other areas within Big T. The upland sage scrub areas have patches that completely burned adjacent to patches that survived with little damage. Previously, the scrub areas had the low amount of exotic species coverage with non-native grasses as the main concern.

Trails

Trails through the ash have been re-established in approximately the same general locations, although small deviations to the trails were noticed. Trees and branches that fell into the Haines Creek and onto the trails during the fire escaped burning completely. This has left some parts of the trails tangled with branches and blocked with fallen debris. Other parts of the trail contain burnt overhead branches which discourage safe passage for trail users. The recent hikers and equestrian riders have deviated off the original trail where the trail is blocked with debris or covered with deep ash, and have begun to create new trails as a result of these conditions.

Recovery Efforts

Recruitment of non-native species will limit the success of native species reestablishment. The native pioneer species that are emerging will have a higher reestablishment (success) rate without competition from the invasive species. Unfortunately, Big T is now dominated by invasive plant species that were prevalent pre-fire such as castor bean, non-native annual grasses, *Erodium* spp., and mustards.

Exotic plant control efforts began in early May 2018 and will continue throughout the summer, focusing on Haines Canyon Creek, the Tujunga Ponds, Big Tujunga Wash, all authorized trails, and other areas that were treated during previous weed control efforts. Treatment will continue until weed species have set seed to maximize the herbicide's effectiveness. The non-native grasses are being treated with a selective herbicide in areas with desirable native species. To aid in the fire recovery, weeds growing near crown sprouting plants are prioritized. All herbicides used during exotic eradication efforts are California-approved aquatic herbicides approved for use within 15 feet of any water source. Exotic plants measuring less than five feet in height are being treated with a foliar herbicide application. The foliar herbicide mixture contains 2% Roundup Custom (a

glyphosate-based herbicide), 1% Polaris (an imazapyr-based herbicide), 1% Liberate (a penetrant, deposition, and drift control agent), and Turf Trax (a blue indicator dye). Exotic plants measuring more than five feet in height are being treated with a cut-stump method (cut the vegetation near the crown and spray the herbicide mixture directly on the cut stump) using an herbicide mixture of 50% Polaris, 2% Liberate, and Turf Trax.

Recruitment of non-native species is also occurring alongside the trails. Exotic removal herbicide treatments and hand cutting to suppress vegetation from encroaching the trail is being conducted to maintain the trails and suppress exotic weed growth. In order to prevent hikers and equestrian riders from creating new trails through restored areas, Chambers Group will be conducting trail maintenance activities in the summer of 2018. To reestablish the trails, the fallen trees and branches will be cleared from the trails and laid to the sides to help guide the public to remain on the trails. Other damaged and dead trees and branches that are blocking the trail will be cut and moved to line the trail in areas where the path is unclear. Trail sections that are piled with thick ash will be cleared and windrowed alongside the trail.

Negative impacts to native aquatic species are occurring due to exotic wildlife within the stream and pond areas. These potential negative impacts include, but are not limited to: resource competition, predation, and the transmission of harmful pathogens and parasites.

To reduce the negative impacts to sensitive native aquatic species, Chambers Group is performing exotic wildlife eradication throughout 2018. The areas of focus include Haines Canyon Creek and the Tujunga Ponds (over the past two years, Big Tujunga Wash has not had a consistent surface flow to warrant exotic species removal from the Tujunga Wash area). The biologists are employing the following removal methods: dip-netting, seining, hand capture, jigging, and rod-and-reel. Exotic species captured are immediately euthanized, and capture data is collected for all removal efforts. Removal efforts are focusing on aquatic species including: American bullfrog (*Lithobates catesbeianus*), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), Mozambique tilapia (*Oreochromis mossambicus*), red swamp crayfish (*Procambarus clarkii*), and western mosquitofish (*Gambusia affinis*).

If you have any questions regarding this memo, please feel free to contact me at (949) 261-5414 extension 7288, or at pmorrissey@chambersgroupinc.com, if you have any questions or are in need of further information.

Sincerely,

CHAMBERS GROUP, INC.



Steven Reinoehl
Director of Restoration Construction

Attachments

- Attachment 1 - Fire Severity Maps (Figures 1 and 2)
- Attachment 2 – Post Fire Site Photos

**ATTACHMENT 1 – Fire Severity Maps for February 2018 Post Creek Fire
Assessment for the Big Tujunga Wash Mitigation Area, Los Angeles County,**

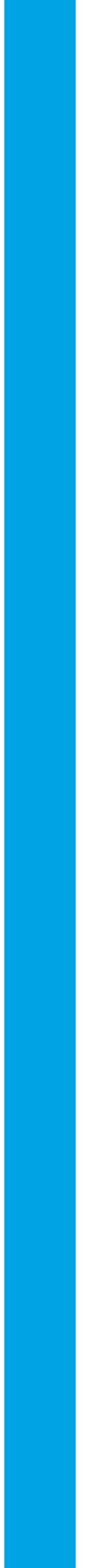
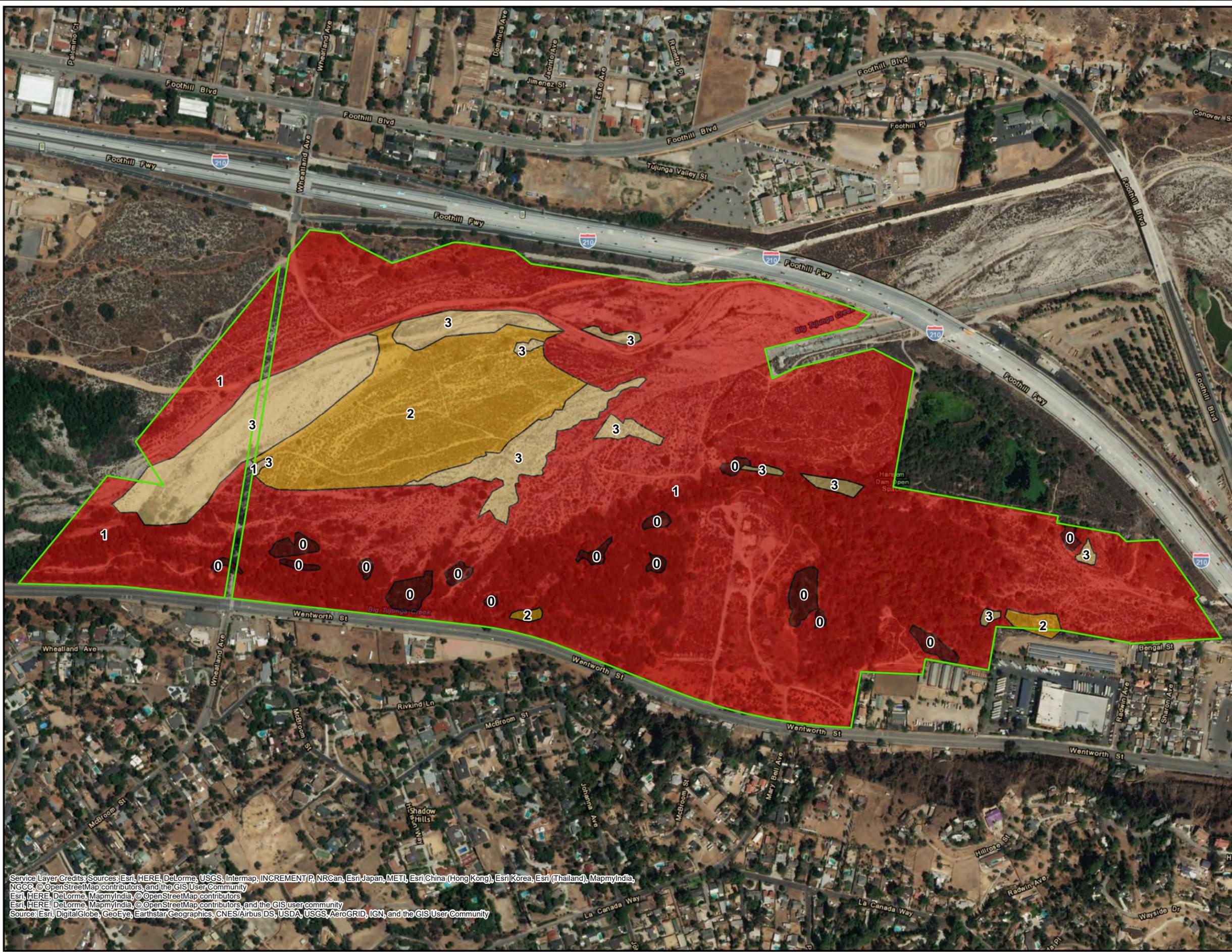


Figure 1 Fire Severity Map

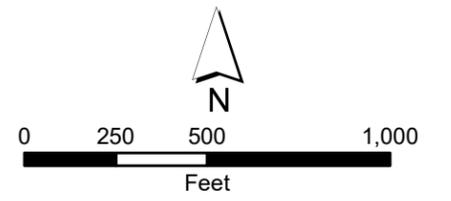


Legend

Mitigation Area

Fire Severity

- 0 - Deeply Burned
- 1 - Severe Surface Burn
- 2 - Lightly Scorched
- 3 - Unburned



Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap contributors, and the GIS User Community
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 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

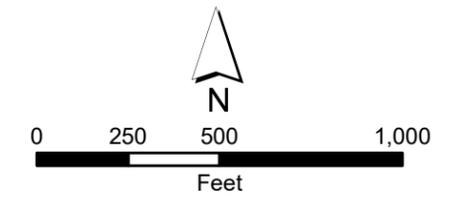
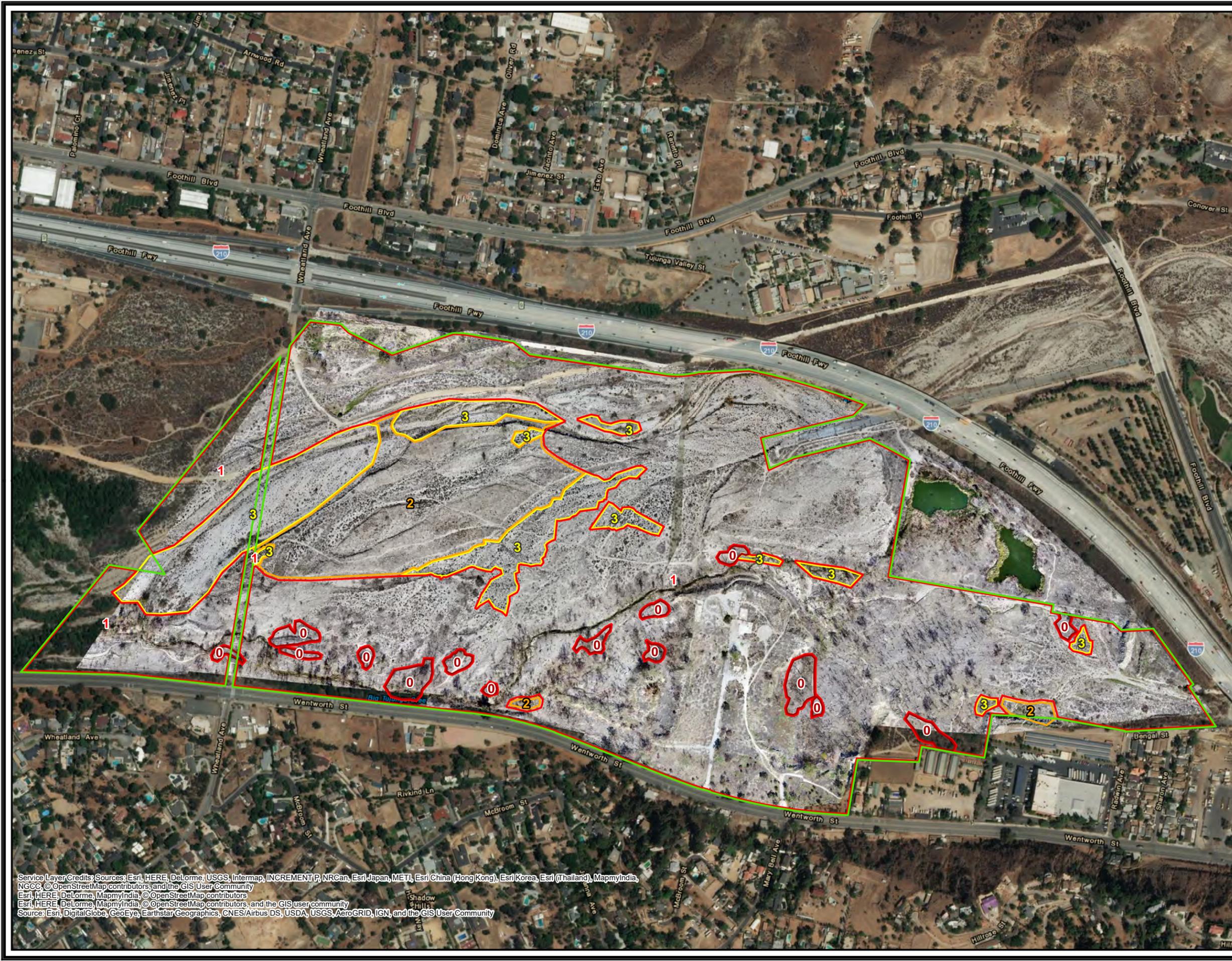


Figure 2

Fire Severity Map With Drone Imagery

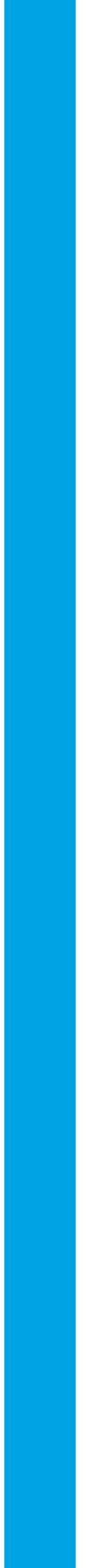
Legend

- Mitigation Area
- Fire Severity**
- 0 - Deeply Burned
- 1 - Severe Surface Burn
- 2 - Lightly Scorched
- 3 - Unburned



Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap contributors, and the GIS User Community
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 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**ATTACHMENT 2 – Post Fire Photos for February 2018 Post Creek Fire Assessment
for the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**



ATTACHMENT 2 - SITE PHOTOGRAPHS



Photo 1: Exotic species castor bean and stork's bill seedlings emerging near Haines Creek.



Photo 2: Photo of patches of mostly exotic weeds, looking east of Cottonwood entrance.



Photo 3: Photo of native laurel sumac sprouting from crown of the fire damaged shrub.



Photo 4: Photo southwestern Tujunga Pond. The native cattails (green) growing immediately around the pond survived the fire.



Photo 5: Photo of northwestern pond, looking through the native cattails that survived the fire. The surrounding trees were damaged.



Photo 6: Photo of dangerous trees and branches hanging over trail. Dead trees and branches will be cut and placed alongside the trail to prevent injury and delineate the trails.



Photo 7: Woody debris blocking trail. Fallen debris will be removed and placed alongside the trail to prevent creation of new trails used by equestrian riders and hikers.
