FINAL
2015 Annual Report for the Big Tujunga Wash Mitigation Area Los Angeles County, California

Prepared for:

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Department of Public Works
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Table of Contents

Guide to Compliance with CDFW Streambed Alteration Agreement 1
1.0 INTRODUCTION 5
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 10
1.3.2 Continuation of Exotic Plant Eradication Program 10
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 11
1.3.6 Trails Monitoring Program 11
1.3.7 Community Awareness Program 11
1.3.8 Public Outreach Program 11
1.3.9 Special Assessment 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
1.3.13 Least Bell's Vireo and Southwestern Willow Flycatcher Focused Surveys 12
1.3.14 Arroyo Toad Focused Surveys 12
1.3.15 Native Fish Surveys 12
1.3.16 City of Los Angeles Fire Department Notice of Noncompliance 13
2.0 CONTINUATION OF BROWN-HEADED COWBIRD TRAPPING PROGRAM 14
2.1 Brown-headed Cowbird Natural History 14
2.2 Methodology 14
2.3 Results 16
2.4 Discussion 17
3.0 HABITAT RESTORATION PROGRAM 18
3.1 Summary of the Original Habitat Restoration Efforts 18
3.2 Current Status of the Habitat Restoration Program 19
4.0 CONTINUATION OF EXOTIC PLANT ERADICATION AND MAINTENANCE PROGRAM 20
4.1 Exotic Plant Eradication Methods 22
4.2 Exotic Plant Eradication Efforts in 2015 25
5.0 WATER LETTUCE CONTROL PROGRAM 26
6.0 CONTINUATION OF EXOTIC WILDLIFE ERADICATION PROGRAM 27
6.1 Methodology 27
6.2 Results 27
7.0 FUNCTIONAL ASSESSMENT AND SUCCESS MONITORING 31
8.0 WATER QUALITY MONITORING PROGRAM 33
8.1 Baseline Water Quality 33
8.2 Water Quality Sampling Results for 2015 34
8.2.1 Discharge Measurements 35
8.2.2 Comparison of Results with Aquatic Life Criteria 36
9.0 TRAILS MONITORING PROGRAM 38
9.1 Trails System Maintenance 38
9.2 Trail Cleanup Day 40

10.0 COMMUNITY AWARENESS PROGRAM 41
10.1 Newsletters (Spring, Fall) 41
10.2 CAC Meeting 41
11.0 PUBLIC OUTREACH PROGRAM 44
12.0 SPECIAL ASSESSMENTS 46
13.0 ATTENDANCE AT MEETINGS WITH AGENCIES, PUBLIC, AND CONSULTANTS ... 47
14.0 LEAST BELL'S VIREO AND SOUTHWESTERN WILLOW FLYCATCHER SURVEYS .. 48
14.1 Least Bell's Vireo 48
14.2 Southwestern Willow Flycatcher 50
15.0 ARROYO TOAD SURVEYS 52
16.0 NATIVE FISHES MONITORING 54
16.1 Methods 54
16.1.1 Physical Habitat Characterization 54
16.1.2 Native Fishes Surveys 55
16.2 Results 55
16.2.1 Physical Habitat Characterization 55
16.2.2 Native Fish Surveys 56
16.3 Discussion 58
17.0 CITY OF LOS ANGELES FIRE DEPARTMENT NOTICE OF NONCOMPLIANCE 59
18.0 REFERENCES 60

LIST OF FIGURES

Figure 1-1. Project Location 6
Figure 1-2. Big Tujunga Wash Mitigation Area 7
Figure 2-1. Brown-headed Cowbird Trap Locations 15
Figure 4-1. High Priority Exotic Plant Removal Locations 23
Figure 6-1. Exotic Aquatic Wildlife Species Sampling Locations 29
Figure 9-1. Trails in the Mitigation Area 39
Figure 10-1. Big Tujunga Wash Mitigation Area Incident Map, April 2014 to April 2015 42
Figure 14-1. Least Bell's Vireo and Southwestern Willow Flycatcher SurveyArea 49
Figure 15-1. Arroyo Toad Survey Area 53

LIST OF TABLES

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2015 8
Table 4-1. Target Exotic Plant Species 20
Table 4-2. Additional Exotic Plant Species Observed in the Mitigation Area 21
Table 4-3. Invasive Exotic Tree Species 22
Table 6-1. Summary of Exotic Aquatic Species Removal by Location and Method, 2015 30
Table 7-1. Comparison of Functional Capacity Values 32
Table 8-1. Baseline Water Quality Sampling Results (2000) 34
Table 8-2. Summary of Water Quality (November 2, 2015) 35
Table 8-3. Estimated Flows for November 2015 36
Table 8-4. Discussion of November 2015 Big Tujunga Wash Sampling Results 36
Table 14-1. Least Bell's Vireo and Southwestern Willow Flycatcher Survey Area 50
Table 14-2. Southwestern Willow Flycatcher Survey Dates, Personnel, Times, and Weather Conditions 51

Table 15-1. Arroyo Toad Survey Dates, Weather, and Surveyors..... 52
Table 16-1. Number of Individuals Observed in Haines Canyon Creek during Native Fishes Surveys, 2015. 57
Table 16-2. Number of Individuals Captured in Haines Canyon Creek During Native Fishes Survey, 2015. 57

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 – 2015 Brown-headed Cowbird Trapping Report
APPENDIX E – Exotic Plant Removal Memos and CDFW Notifications
APPENDIX F – Exotic Wildlife Removal Memos and Report
APPENDIX G – 2015 Water Quality Monitoring Report
APPENDIX H – Trails Maintenance and Monitoring Memos
APPENDIX I – Stakeholder Mailing List
APPENDIX J – Newsletters
APPENDIX K – Community Advisory Committee Meeting Agendas and Minutes
APPENDIX L – Public Outreach Memo
APPENDIX M – Special Assessment Memo
APPENDIX N – Least Bell's Viero and Southwestern Willow Flycatcher Focused Survey Report
APPENDIX O – Arroyo Toad Survey Report
APPENDIX P – Native Fishes Survey Report
APPENDIX Q – City of Los Angeles Fire Department Notice of Noncompliance Memo

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 the County of Los Angeles Department of Public Works (LACDPW) 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 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 March 1 and September 1 and breeding bird pre-activity surveys were conducted prior to each exotic vegetation removal activity in 2015. In addition, a qualified biological monitor was present during all exotic vegetation removal activities to ensure that no impacts to nesting birds occurred (see Section 4.0). As a result, no impacts occurred to breeding/nesting birds within the Big Tujunga Wash Mitigation Area (Mitigation Area).

Condition 2: Nesting raptor surveys were conducted prior to all vegetation removal activities occurring within the Mitigation Area in 2015. There were no active raptor nests identified within the active work areas; therefore, no 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 2015 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 4.0). 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. No work was conducted on site without the presence of a biological monitor (see Section 4.0).

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 11.0). 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 2015 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: Wildlife-proof trash receptacles have not yet been installed in the Mitigation Area.

Condition 12: Hunting was neither permitted nor authorized within the Mitigation Area in 2015.

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.

Equipment and Access

Condition 17: Vehicles and equipment were neither operated within nor driven though 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.

Structures

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

Condition 21: Installation of erosion control structures was not conducted during 2015, nor was there a need for such structures.

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

Condition 23: There was no construction of any temporary or permanent dams, structures, or flow restrictions 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. The biologists or properly trained LACDPW Flood Maintenance workers carefully removed them to restore the natural flow in the creek (see Sections 9.0 and 11.0)

Pollution, Sedimentation, and Litter

Condition 24: All litter and pollution laws were adhered to by the contractors, subcontractors, and employees of LACDPW. Trash pickup was conducted regularly by the site users and the landscape contractor (see Section 9.0).

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

Condition 26: There were no hazardous spills of any kind in the Mitigation Area during 2015.

Condition 27: Activities conducted within the Mitigation Area in 2015 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 2015.

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 users. Removal of the rock dams was conducted by biologists who are familiar with the sensitive fishes in the stream or by properly trained LACDPW Flood Maintenance workers (see Sections 9.0 and 11.0). 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 (bullfrogs [*Lithobates catesbeianus*], largemouth bass [*Micropterus salmoides*], etc.) 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 (LTMMP) 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: LACDPW submitted the Conservation Easement (CE) on December 23, 2010. Additional work on the CE was not conducted in 2015.

Administrative-Miscellaneous

Condition 33: No amendments to the SAA were submitted to CDFW during the 2015 reporting period. CDFW did not identify any breaches of the SAA during the 2015 period.

Condition 34: There were no violations of any terms or conditions of the SAA during the 2015 period.

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

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 2015.

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

Conditions 38 and 39: CDFW did not request nor conduct a visit the site in 2015.

Conditions 40 through 42: CDFW did not issue a suspension or cancellation of the SAA in 2015.

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 2015. 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, bullfrogs (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*) from the Tujunga Ponds; 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 County of Los Angeles Department of Public Works (LACDPW) in July 2007 to continue MMP activities as part of implementation of the Long-term Maintenance and Monitoring Plan (LTMMP) (Chambers Group 2006). This report summarizes all activities conducted in the Mitigation Area between January and December 2015.

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. 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 the biological resources found on the site are of local, regional, and statewide significance (Safford and Quinn 1998; CDFW 2015). 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 can be found in Figure 1-2.

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_Location_2015.mxd (ECK, KO, DW)-mapping_guest 9/14/2015

Map Date: 7/17/2015
Source: ESRI

Figure 1-1. Project Location

2014-003.005 Big Tujunga Wash Mitigation Area

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Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Aerial Maps\Onsite\Tujunga_Bank_Aerial_v3_2015.mxd (SWagner; DMeanor) -mapping_quest 9/14/2015

Aerial Date: ESRI 2014
9/14/2015

Figure 1-2. Big Tujunga Wash Mitigation Area

2014-003.005 Big Tujunga Wash Mitigation Area

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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 2015. Certain tasks in the MMP were not conducted in previous years 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 native fishes, arroyo toad (*Anaxyrus californicus*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*). This suite of surveys was conducted in 2015 because surveys were last conducted in 2012. Three additional tasks were performed under the Meetings and Special Assessment tasks in 2015, which included providing reports and other documents to California High Speed Rail (HSR) representatives (Section 9.0), an on-site meeting with community members to discuss their concerns with the HSR (Section 13.0), and weeding and trimming activities in response to a City of Los Angeles Fire Department (LAFD) Notice of Noncompliance (Section 17.0). Compendia of all plant and wildlife species observed in the Mitigation Area in 2015 are included as Appendix C.

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2015

Implemented and/or Continued in 2015	
	TASK 1 – Continue Brown-headed Cowbird Trapping Program
x	Brown-headed Cowbird Trapping Program
x	Final Trapping Report
	TASK 2 – Continue Exotic Plant Eradication Program
x	Combined Exotic Plant Removal and Maintenance Program
x	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
x	Exotic Wildlife Removal Efforts
x	Exotic Wildlife Memos
x	Final Exotic Wildlife Removal Report
	TASK 5 – Water Quality Monitoring Program
x	Water Quality Monitoring
x	Water Quality Results Report
	TASK 6 – Trails Monitoring Program
x	Trails Maintenance and Monitoring Site Visits
x	Trails Maintenance and Monitoring Memos
	Trail Cleanup Day

Implemented and/or Continued in 2015	
	TASK 7 – Community Awareness Program
x	Biannual Newsletters
x	Community Advisory Committee Meeting
x	Community Advisory Committee Meeting Minutes
	TASK 8 – Public Outreach Program
x	Public Outreach Weekend Site Visits
x	Public Outreach Memo
	TASK 9 – Special Assessment
x	Special Assessment Site Visits
x	Special Assessment Memos
	TASK 10 – Annual Report
x	2015 Draft Annual Report
x	2015 Final Annual Report
	TASK 11 – Meetings
x	Meetings with LACDPW, Agencies, Public, and Consultants
	TASK 12 – Coordination with LACDPR
x	Coordination with LACDPR
	TASK 13 – Least Bell's Vireo and Southwestern Willow Flycatcher Surveys
x	Least Bell's Vireo Surveys
x	Southwestern Willow Flycatcher Surveys
x	Riparian Bird Report
	TASK 14 – Arroyo Toad Surveys
x	Arroyo Toad Surveys
x	Arroyo Toad Report
	TASK 15 – Native Fish Monitoring Program
x	Native Fishes Surveys
x	Native Fishes Report
	TASK 16 – LAFD Notice of Noncompliance
x	LAFD Notice of Noncompliance Site Visit
x	LAFD Notice of Noncompliance Memo

1.3.1 Continuation of Brown-headed Cowbird Trapping Program

Brown-headed cowbird trapping was conducted in and around the Mitigation Area in the spring and summer of 2015. 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. Two cowbird traps were placed within the Mitigation Area and two traps were placed outside the Mitigation Area in suitable cowbird foraging habitat. A total of 90 cowbirds were removed from the four traps between March 30 and June 29, 2015. 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 consisted 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 2015 period was treating exotic plant species (such as giant reed [*Arundo donax*], castor bean [*Ricinus communis*], and black mustard [*Brassica nigra*]) with CDFW-approved herbicides. The exotic plant species eradication activities that were conducted in 2015 are summarized in Section 4.0.

1.3.3 Water Lettuce Control Program

A new task, water lettuce (*Pistia stratiotes*) removal, was added to the Exotic Plant Eradication Program in 2011 due to an infestation of this 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. No additional herbicide treatments were applied in 2015. 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 bullfrogs, largemouth bass (*Micropterus salmoides*), red swamp crayfish, and Mozambique tilapia (*Oreochromis mossambicus*), from perennial waters at the Tujunga Ponds and Haines Canyon Creek. Exotic wildlife removal efforts targeted both life stages of American bullfrogs (tadpoles and adults) in an effort to maximize the efficiency of the removal program. A total of four exotic wildlife removal efforts occurred during the 2015 reporting period. Exotic wildlife removal tasks implemented in 2015 are summarized in Section 6.0.

1.3.5 Water Quality Monitoring Program

Water quality sampling for the Mitigation Area was conducted by MWH Global, Inc. (MWH) on November 2, 2015. This task is discussed in Section 8.0.

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. Four site visits were conducted in 2015 to look for areas that might qualify for trail closures, identify areas where trails were blocked by trash or debris, and mark locations of extensive stands of poison oak (*Toxicodendron diversilobum*). Areas that required minor erosion repairs were remedied during the visit or in combination with other task site visits. More extensive problem areas were mapped for repair at a later time. The Annual Trail Cleanup Day, tentatively scheduled for the September/October 2015 timeframe, was cancelled due to the generally clean nature of the Mitigation Area. Trail maintenance tasks implemented in 2015 and further information about the Trail Cleanup Day is summarized in Section 9.0.

1.3.7 Community Awareness Program

This program consists of the continued implementation of the Community Advisory Committee (CAC) meetings. The meetings were previously held semiannually, in spring and fall of each year, but changed in 2014 to only be held in the spring. ECORP assisted LACDPW with development of meeting agendas and any supporting handouts (including an updated Mitigation Area Incident Map), summarizing CAC meeting minutes, and producing the Spring and Fall newsletters for distribution by LACDPW. The status of the Community Awareness Program and activities conducted in 2015 are summarized in Section 10.0.

1.3.8 Public Outreach Program

A new 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 2015 due to its past success. On-site interviews and education about the Mitigation Area were conducted on 12 separate occasions by ECORP's bilingual biologists. 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 within the Mitigation Area. While on site, they documented the presence of rock dams within Haines Canyon Creek and any unusual observations or circumstances. A full description of the outreach effort, as well as several notable incidents in 2015, are included in Section 11.0.

1.3.9 Special Assessment

ECORP's staff was available to provide assessments on an on-call basis. One such assessment was conducted on April 23, 2015, after a small fire broke out within the Mitigation Area. Another activity conducted under this task was the compilation of

Mitigation Area data, reports, and Geographic Information Systems (GIS) files for submittal to aid an environmental review of the Palmdale to Burbank segment of the HSR. Full descriptions of these activities are included in Section 12.0.

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

ECORP's staff attended meetings as necessary with LACDPW regarding various aspects of the MMP implementation. One meeting was held at the Mitigation Area on November 10, 2015, with LACDPW and community members to discuss the community members' concerns about the proposed HSR alignments planned through and adjacent to the Mitigation Area. This is discussed in Section 13.0.

1.3.12 Coordination with LACDPR

ECORP's staff informed and coordinated with LACDPR concerning activities that took place within the Mitigation Area and the Tujunga Ponds LACDPR parcel.

1.3.13 Least Bell's Vireo and Southwestern Willow Flycatcher Focused Surveys

Focused surveys for least Bell's vireo and southwestern willow flycatcher were conducted in the Mitigation Area's riparian habitats during spring and summer of 2015. Previous focused surveys were conducted in 2012. Numbers and locations of brown-headed cowbirds were also recorded, in accordance with the least Bell's vireo survey protocol. Survey results for species were negative. Details of these surveys are discussed in Section 14.0.

1.3.14 Arroyo Toad Focused Surveys

Focused surveys for arroyo toad were conducted in the Mitigation Area during spring and summer 2015. Prior focused surveys were conducted in 2012. Six field surveys were conducted between April and July. Arroyo toads were not detected within the Mitigation Area. Details of the survey methodology and results for the 2015 survey are summarized in Section 15.0.

1.3.15 Native Fish Surveys

Two native fish monitoring surveys were conducted within the Mitigation Area in May and October 2015. These surveys focused on three special-status species: Santa Ana Sucker (*Catostomus santaanae*), arroyo chub (*Gila orcuttii*), and Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3). A summary of the results of the surveys can be found in Section 16.0.

1.3.16 City of Los Angeles Fire Department Notice of Noncompliance

ECORP's staff conducted a site visit and provided recommendations on weeding and trimming activities in response to a LAFD Notice of Noncompliance. A summary of this task can be found in Section 17.0.

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 in the Mitigation Area was conducted yearly between 2001 and 2006 and again between 2009 and 2014. 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). In 2015, Griffith Wildlife Biology operated two cowbird traps within the Mitigation Area and two traps adjacent to the Mitigation Area between March 30 and June 29, 2015. The methodology, results, and discussion of the 2015 trapping are presented below and a full copy of the report is included as Appendix D.

2.1 Brown-headed Cowbird Natural History

Brown-headed cowbirds are brood parasites. Cowbirds do not make a nest of their own, nor do they contribute to raising their young. This species parasitizes the nests of native host species by laying their larger egg(s) in the host species' nests and leaving the egg(s) and chick(s) to be reared by the native host. Brown-headed cowbird young are often larger and more demanding than their host offspring, resulting in the host birds raising the cowbird chick and neglecting their own young. Female cowbirds can lay up to 40 eggs during the breeding season (ranging from two to four months; Scott and Ankney 1980).

Population declines of sensitive native songbirds such as the least Bell's vireo and the southwestern willow flycatcher can be partially attributed to high nest parasitism rates by brown-headed cowbirds. In many areas, the reduction or elimination of brown-headed cowbirds through trapping has been directly related to increases in native bird populations.

2.2 Methodology

Brown-headed cowbird trapping was conducted by Griffith Wildlife Biology according to the Brown-headed Cowbird Trapping Protocol, the standard protocol accepted by the United States Fish and Wildlife Service (USFWS) and CDFW (Griffith Wildlife Biology 1992). Four traps were established in and around the Mitigation Area: Trap 1 at the Hansen Dam Stables, Traps 2 and 3 inside the Mitigation Area, and Trap 4 at Gibson Ranch (Figure 2-1). Traps 2 and 3 were placed adjacent to riparian and coastal sage scrub habitat, while Traps 1 and 4 were placed in cowbird foraging areas.

Aerial Date: NAIP 2012
10/23/2014

Figure 2-1. Brown-headed Cowbird Trap Locations

2014-003.003 Big Tujunga Wash Mitigation Area

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Traps were removed from storage and transported to the Mitigation Area. Each trap, measuring approximately 6 feet (ft) wide, 8 ft long, and 6 ft tall, was constructed at each trap site. Food, water, perches, and shade were provided inside each trap. A sign was prominently placed outside each trap explaining the significance of the trap and urging recreational users not to tamper with it. Each trap contained the minimum preferred ratio of male to female decoys (two males and three females) as of April 2, 2015. As of April 10, the ratio was increased to three males and five to six females. The traps were opened on March 30 and operated every day (including holidays) until June 29, 2015. Each trap was serviced daily by either the Principal Investigator or a trapping assistant. Daily servicing activities included:

- Replenishing and/or cleaning the water source;
- Refilling the feed tray with sunflower-free seed;
- Repairing the perches, foraging pad, sign, shade cloth, or lock as needed;
- Wing clipping newly captured female cowbirds;
- Adding/removing decoy cowbirds to maintain the appropriate male to female ratio (2:3);
- Removing and releasing non-target native bird species in the traps; and
- Recording all activities and appropriate data on a data sheet.

Traps were disassembled and returned to storage after June 29, 2015. Cowbirds not used as decoys were euthanized with carbon monoxide and moved off-site to be provided as forage for raptor rehabilitation/reintroduction facilities.

2.3 Results

A total of 90 cowbirds were removed during the 2015 trapping season (48 males, 41 females, and 1 juvenile). Most cowbirds were captured and removed between weeks one and seven (March 30 and May 19) of the 13-week trapping period. Trap 2 was vandalized twice in 2015. On April 18 and May 26, portions of the mesh panel was cut and resulted in the escape of 2 and 3 males, respectively. The traps were immediately repaired and no trap days were lost.

A total of 163 non-target birds (i.e., all species except brown-headed cowbirds) of five native bird species were captured in the traps. The five non-target species that were captured included California towhee (*Pipilo crissalis*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), red-winged blackbird (*Agelaius phoeniceus*), and white-crowned sparrow (*Zonotrichia leucophrys*). Banded cowbirds and/or banded non-target species were not captured during the trapping season. Most non-target birds (160 individuals) captured during the trapping period were released unharmed and in good health. Three non-target individuals (California towhees) were classified as mortalities due to intraspecific competition inside the traps. There were no mortalities of decoy or non-target birds due to the lack of water, food, shade, or unclean conditions in the trap. There were no mortalities of decoy birds inside the traps during the 13 weeks of trapping.

2.4 Discussion

The number of brown-headed cowbirds trapped during the 2015 season is within the range of 2001-2015 numbers. Locally raised juveniles are relatively easy to capture within their natal habitat and can be a good indication of the success of a trapping program. One juvenile brown-headed cowbird was removed during the 2015 trapping season, possibly indicating that nest parasitism levels were essentially eliminated during the breeding season.

In order to effectively reduce regional cowbird populations, brown-headed cowbird trapping would need to be conducted on a yearly basis until the number of cowbirds captured decreases each year. Yearly trapping has been effective at reducing nest parasitism on native host species present in the riparian habitat at the Mitigation Area. Griffith Wildlife Biology recommended no change in the protocol, the number of traps (4), or the dates and duration of cowbird trapping (13 weeks, April 1 to June 30). They do, however, recommend relocating Trap 2 to the north side of Haines Canyon Creek, to be accessed from the South Wheatland Entrance. This trap has not performed well since 2012 and is vandalized most frequently. Despite its low success, this trap was not moved sooner due to the variability of captures year to year at a particular site.

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, arroyo chub, arroyo toad, least Bell's vireo, and southwestern willow flycatcher, all sensitive and listed species known to either occur or 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, 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 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 in order to better address the changing needs of the Mitigation Area and address the long-term maintenance needs of the restoration areas. The habitat restoration plan was also 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); however, a summary of the original habitat restoration efforts is also found below. 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 implemented immediately 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). The exotic plant removal component of the habitat restoration program, however, 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 2015 are discussed in Section 4.0.

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 these areas throughout the Mitigation Area, native plant species are able to flourish because competition for resources, such as light and water, is reduced. 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. Improvement of the function of these habitats benefits 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 and Table 4-2 lists all the additional exotic plant species observed within the Mitigation Area.

Table 4-1. Target Exotic Plant Species

Common Name	Scientific Name
Sticky snakeroot	*Ageratina adenophora*
Palms species	*Arecastrum* sp., *Washingtonia* sp., etc.
Giant reed	*Arundo donax*
Mustard species	*Brassica* species
Italian thistle	*Carduus pycnocephalus*
Non-native weedy thistles	*Cirsium* species.
Umbrella plant	*Cyperus involucratus*
Common water hyacinth	*Eichhornia crassipes*
Eucalyptus	*Eucalyptus* species
Sweet fennel	*Foeniculum vulgare*
White sweet-clover	*Melilotus albus*
Tree tobacco	*Nicotiana glauca*
Common plantain	*Plantago major*
Castor bean	*Ricinus communis*
Pepper trees	*Schinus* species
Milk thistle	*Silybum marianum*
Tamarisk	*Tamarix ramosissima*
Non-native annual grasses	
Wild oat	*Avena fatua*
Slender wild oats	*Avena barbata*
Foxtail chess	*Bromus madritensis*
Ripgut brome	*Bromus diandrus*
Soft chess	*Bromus hordeaceus*
Mouse barley	*Hordeum murinum*
Italian ryegrass	*Lolium multiflorum*
Rabbitfoot grass	*Polypogon monspeliensis*

Common Name	Scientific Name
Non-native perennial grasses	
Pampas grass	*Cortaderia selloana*
Bermuda grass	*Cynodon dactylon*
Fountain grass	*Pennisetum setaceum*
Smilo grass	*Piptatherum miliaceum*

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

Common Name	Scientific Name
Tree of Heaven	*Ailanthus altissima*
Aloe vera	*Aloe* species
Belladonna lily	*Amaryllis belladonna*
Scarlet pimpernel	*Anagallis arvensis*
Southern catalpa	*Catalpa bignonioides*
Tocalote	*Centaurea melitensis*
Spotted spurge	*Chamaesyce maculata*
Poison hemlock	*Conium maculatum*
Pride of Madeira	*Echium candicans*
Red-stemmed filaree	*Erodium cicutarium*
Petty spurge	*Euphorbia peplus*
Roundleaf geranium	*Geranium rotundifolium*
Short podded mustard	*Hirschfeldia incana*
Smooth cat's ear	*Hypochaeris glabra*
Glossy privet	*Ligustrum lucidum*
Sweet alyssum	*Lobularia maritima*
Cheeseweed	*Malva parviflora*
High mallow	*Malva sylvestris*
Horehound	*Marrubium vulgare*
Alfalfa	*Medicago sativa*
Marvel of Peru	*Mirabilis jalapa*
Indian plantain	*Plantago arenaria*
Water beard grass	*Polypogon viridis*
Curly dock	*Rumex crispus*
Fiddle dock	*Rumex pulcher*
Tumble mustard	*Sisymbrium altissimum*
Spanish broom	*Spartium junceum*
Spiny sowthistle	*Sonchus asper*
Common sowthistle	*Sonchus oleraceus*
Common chickweed	*Stellaria media*
Feverfew	*Tanacetum parthenium*
Common dandelion	*Taraxacum officinale*
Puncture vine	*Tribulus terrestris*
Chinese elm	*Ulmus parvifolia*
Wand mullein	*Verbascum virgatum*
Water speedwell	*Veronica anagallis-aquatica*
Greater periwinkle	*Vinca major*
Non-native annual grasses	
Red brome	*Bromus madritensis ssp. rubens*
Barnyard grass	*Echinochloa crus-galli*
Common wheat	*Triticum aestivum*

Common Name	Scientific Name
Non-native perennial grasses	
Perennial veldtgrass	*Ehrharta calycina*
Italian rye grass	*Festuca perennis*

The revised approach to the exotic plant eradication and maintenance program also includes a more aggressive program of targeting the elimination of 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. Invasive Exotic Tree Species

Common Name	Scientific Name
Acacia species	*Acacia dealbata* and *Acacia* spp.
Common catalpa	*Catalpa bignonioides*
Eucalyptus	*Eucalyptus* spp.
Ornamental fig	*Ficus carica*
Evergreen ash	*Fraxinus uhdei*
Japanese privet	*Ligustrum japonicum*
Sweetgum	*Liquidambar stryraciflua*
Mulberry	*Morus alba*
Tree tobacco	*Nicotiana glauca*
Castor bean	*Ricinus communis*
Peruvian peppertree	*Schinus molle*
Brazilian peppertree	*Schinus terebinthifolius*
Chinese elm	*Ulmus parvifolia*
Palms	*Washingtonia* spp., *Phoenix canariensis*, etc.

4.1 Exotic Plant Eradication Methods

Exotic plant eradication activities took place throughout the riparian and upland portions of the entire 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 weeds (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 2015, Figure 4-1 shows the areas that are considered high priority for targeting exotic plant species.

Aerial Date: NAIP 2012
10/23/2014

Figure 4-1. High Priority Exotic Plant Removal Locations

2014-003.005 Big Tujunga Wash Mitigation Area

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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 taken with a global positioning system (GPS) unit and recorded on data sheets. CDFW was notified prior to the commencement of removal activities, in accordance with the Mitigation Area's SAA (see Appendix E).

During the exotic plant eradication efforts, a biological monitor was present to ensure that crews conducted work within the appropriate pre-defined work areas and that the removal activities did not result in impacts to sensitive biological resources, such as nesting bird activity. The biological monitor also conducted 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 (see Appendix B). The biological monitor was responsible for showing the removal crews 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. Plants and trees treated with herbicide were flagged with survey flagging and/or location coordinates were taken to aid in detection during follow-up visits to determine success. All treated areas were documented by the biological monitor and digital photographs were taken to document removal efforts. Following the completion of each eradication effort, a memo was prepared that documented the eradication activities and locations and the presence 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 removed either manually (by cutting or sawing) or by herbicide treatment. Gas-powered circular hand-saws and hand tools (machete or axe) were used for cutting or girdling exotic trees. Large exotic trees that were girdled in 2012 were monitored for regrowth. Locations within a 15-foot distance from permanent (Haines Canyon Creek, Tujunga Ponds) or temporary (Big Tujunga Wash, ephemeral ponds from rains) bodies of water were treated with an approved water-certified herbicide (such as AquaMaster™). All other locations were treated with either Razor Pro® or, when girdling, with Garlon 4® herbicide. Cuttings of giant reed stands (and other 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.

Weed removal activities in the oak/sycamore area near the Cottonwood gate to the Mitigation Area were conducted by hand using Round-Up® herbicide, hand tools, and gasoline-powered weed whackers. The weed removal efforts were timed to remove weeds and non-native grasses during the growing season and prior to deposition of new seeds in the restoration area.

4.2 Exotic Plant Eradication Efforts in 2015

Site-wide exotic plant eradication occurred during three different efforts in 2015: April 1 through 2, 8 through 10, and 13 through 15 (first effort); July 27 through August 3 (second effort); and November 9, 10, 12, 13, 16, and 17 (third effort). Rain events occurred on the site in early April, which slightly changed the schedule of the first removal effort. ECORP biologists Carley Lancaster, Benjamin Smith, Amy Trost, and Rebecca Valdez conducted the pre-activity surveys and/or the biological monitoring for exotic plant eradication efforts.

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, three bird nests were discovered during exotic plant removal activities. The nests were determined to belong to cliff swallow (*Petrochelidon pyrrhonota*), common raven (*Corvus corax*), and one species that was unidentified due to dense vegetation.

Notes and representative site photographs were taken and the coordinates of additional weed/exotic plant locations were recorded using a handheld GPS unit.

Copies of all memos documenting exotic plant removal, CDFW notifications, and photographs taken during removal efforts can be found in Appendix E.

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 is thought to spread via dumping of aquariums (USDA NRCS 2011). The water lettuce at the Tujunga Ponds has the potential to threaten the habitat in Haines Canyon Creek for endangered species, such as the Santa Ana sucker, as well as have a negative impact on the native turtle and bird species that use the ponds as habitat. ECORP immediately contacted LACDPW to create 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; ECORP 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 Connector Channel. 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 applied in 2013 (ECORP 2012; ECORP 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 water lettuce herbicide applications were successful.

Water lettuce was not observed in the Mitigation Area in 2015.

6.0 CONTINUATION OF EXOTIC WILDLIFE ERADICATION PROGRAM

The overall purpose of the exotic wildlife removal program is to maintain, restore, and create 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, bullfrogs, turtles, and red swamp crayfish from both of the Tujunga Ponds and Haines Canyon Creek.

In an ongoing effort to protect and enhance the existing habitat at the Mitigation Area for native wildlife species, ECORP has 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 (East Pond and West Pond) 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.

ECORP fisheries biologists conducted an initial site survey when ECORP was issued the contract to continue implementation of the MMP. The purpose of the site assessment survey was to determine the most appropriate methods for continuing the exotic aquatic wildlife eradication program. The goal was to identify those methods that would produce the most significant impacts on the eradication of exotic aquatic wildlife species and ultimately result in the enhancement of habitat for the native fishes in Haines Canyon Creek. The data presented in this section of the annual report summarize the results of four exotic wildlife removal efforts conducted during 2015. A copy of the full report can be found in Appendix F.

6.1 Methodology

A wide range of removal methods were used during the 2015 exotic aquatic species removal efforts, including fyke net trapping, spearfishing, dip-netting/hand capturing, bullfrog gigging, two-person seining, minnow trapping, turtle trapping, and gillnetting. Electrofishing was not a method employed during 2015 to capture exotic aquatic species.

Fyke net trapping was conducted in the West Tujunga Pond. All spearfishing efforts were conducted while snorkeling. Dip-netting was performed in Haines Canyon Creek during diurnal removal efforts and at night in combination with bullfrog gigging and spearfishing surveys. Hand capturing was conducted when necessary during dip-netting surveys. Bullfrog gigging was conducted at night by patrolling the perimeter of the ponds and throughout Haines Canyon Creek. Two-person seining surveys were performed using un-bagged seines mounted on poles within Haines Canyon Creek. Turtle and crayfish/minnow traps were baited with an attractant (i.e., cat food). Turtle traps were only used in the ponds. All traps remained open overnight. Gillnets were used in the ponds and were checked every eight hours during the removal efforts.

Additionally, during snorkeling activities, any Centrarchid (Sunfish Family) nests or bullfrog egg masses observed were destroyed or removed.

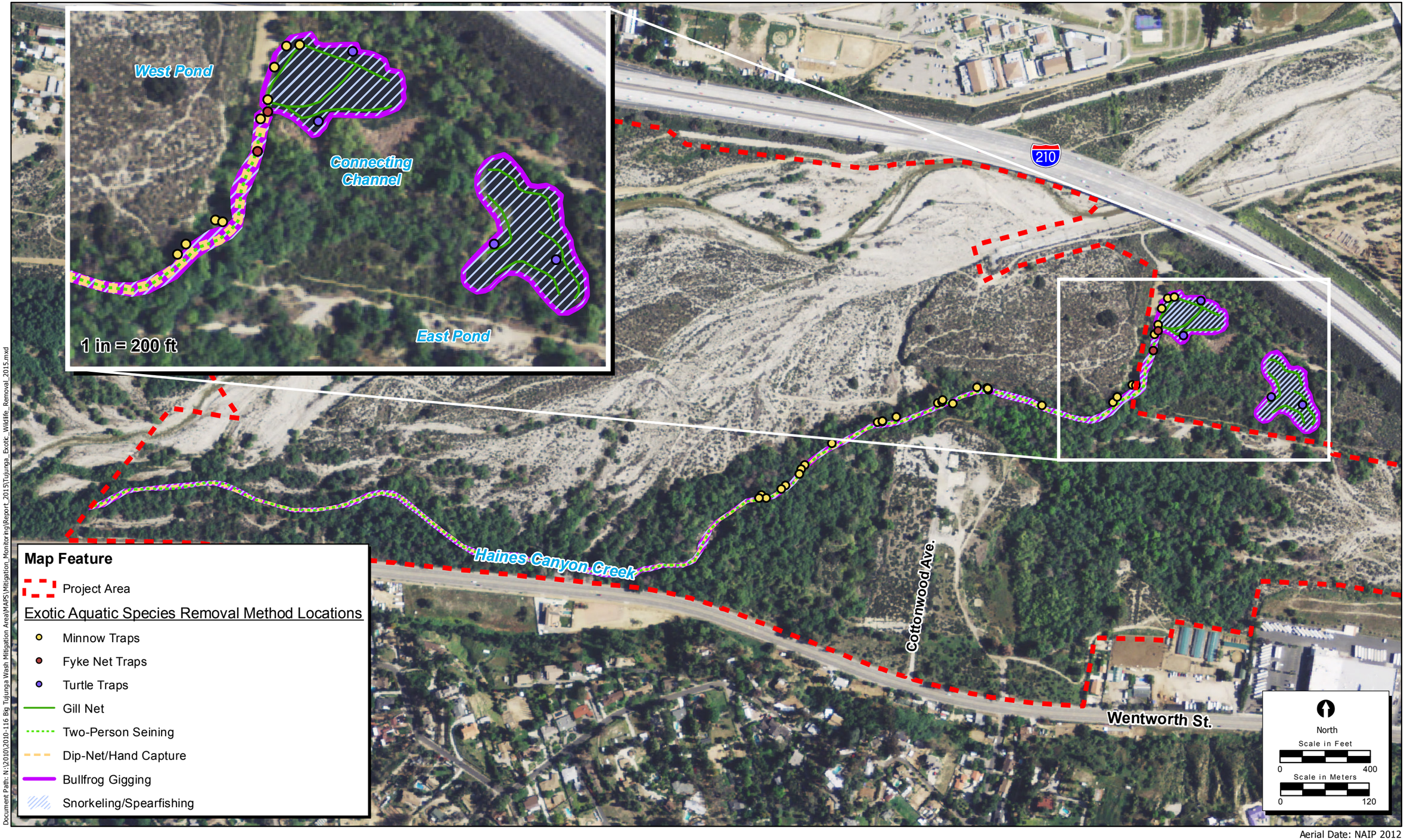
Prior to each removal effort, all potential sampling methods were evaluated for efficacy based upon the current site conditions and information derived from previous removal efforts. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the trap locations were often strategically deployed into areas that were inaccessible to the public. Sampling locations and the various sampling methods used during 2015 are shown in Figure 6-1.

The 2015 removal of exotic aquatic species from the Mitigation Area was conducted over four removal efforts March 23 through 26 (first effort), May 12 through 14 (second effort), August 10 through 13 (third effort), and October 12 through 14 (fourth effort). All removal efforts were conducted under the direction of ECORP biologist Brian Zitt, USFWS 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-27460A-1), and ECORP biologist Todd Chapman, USFWS 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-110094-3). Results of the sampling efforts were summarized in exotic wildlife removal memos that were prepared following each of the surveys. The locations of aquatic removal efforts are displayed in Figure 6-1.

6.2 Results

A total of 2,487 individuals consisting of ten exotic aquatic species (seven fishes, one amphibian, one reptile, and one invertebrate) and two native species were captured during the 2015 removal efforts (Table 6-1). Of the total, 99.9 percent (number of individuals [n]=2,485) of the individuals captured were exotic and removed from the site. Haines Canyon Creek accounted for 62.4 percent of the total catch (n=1,552), while the remaining 37.6 percent were captured in other water features: West Pond (n=654) and East Pond (n=281). Additionally, three native species were captured or observed during the removal efforts (Santa Ana sucker [n=1 captured, n=28 observed], arroyo chub [n=1 observed], and southwestern pond turtle [n=1 captured, n=1 observed]).

The four removal efforts resulted in the capture and removal of 1,363 red swamp crayfish, 771 largemouth bass, 24 western mosquitofish (*Gambusia affinis*), 176 green sunfish (*Lepomis cyanellus*), 127 bluegill (*L. macrochirus*), 9 Mozambique tilapia, 9 bullfrog (5 adults and 4 tadpoles), 3 red-eared slider (*Trachemys scripta elegans*), 2 common carp (*Cyprinus carpio*), and 1 goldfish (*Carassius auratus*). A complete listing of all aquatic species captured during the 2015 sampling efforts is included in the full report in Appendix F.



Aerial Date: NAIP 2012
1/7/2016

Figure 6-1. Exotic Aquatic Wildlife Species Sampling Locations

2014-003.005 Big Tujunga Wash Mitigation Area

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Table 6-1. Summary of Exotic Aquatic Species Removal by Location and Method, 2015

		Exotic Species											Native Species		
Sampling Locations	**Sampling Dates**	**Goldfish**	**Common carp**	**Western mosquitofish**	**Green sunfish**	**Bluegill**	**Largemouth bass**	**Mozambique tilapia**	**American bullfrog adult**	**American bullfrog tadpole**	**Red-eared slider**	**Red swamp crayfish**	**Santa Ana Sucker**	**Southwestern pond turtle**	**Total**
Haines Canyon Creek	March 23-26, 2015			8	31		38					345			422
	May 12-14, 2015	1		7	14	1	13		1			616			653
	August 10-13, 2015				36		25					133			194
	October 12-15, 2015				26		26		2			228	1		283
	Subtotal	**1**		**15**	**107**	**1**	**102**		**3**			**1,322**	**1**		**1,552**
West Tujunga pond	March 23-26, 2015		1		16	11	205	4	1		1				239
	May 12-14, 2015				14	34	92	1							141
	August 10-13, 2015			9	3	15	114	3	1	4		33 *		1	183
	October 12-15, 2015				9	27	55								91
	Subtotal		**1**	**9**	**42**	**87**	**466**	**8**	**2**	**4**	**1**	**33**		**1**	**654**
East Tujunga pond	March 23-26, 2015				12	1	52	1				1			67
	August 10-13, 2015		1		5	9	34					2			51
	October 12-15, 2015				10	29	117				2	5			163
	Subtotal		**1**		**27**	**39**	**203**	**1**			**2**	**8**			**281**
	Total	**1**	**2**	**24**	**176**	**127**	**771**	**9**	**5**	**4**	**3**	**1,363**	**1**	**1**	**2,487**

7.0 FUNCTIONAL ASSESSMENT AND SUCCESS MONITORING

Annual functional analyses in the Mitigation Area are used to quantitatively assess the progress of the restoration effort. A functional analysis was conducted on the site in 1997 to establish baseline functional values for the riparian habitats (Chambers Group 1998). ECORP conducted the functional analyses annually between 2007 and 2012 to determine whether the site had met success criteria that were outlined in Table 2-2 of the MMP (Chambers Group 2000). In 2012, it was determined that the site had, indeed, met the success criteria goals outlined in the MMP. Therefore, the functional assessment and success monitoring studies were not conducted since 2012.

In order to determine the Functional Units (FU) per acre of the willow riparian habitat system, nine evaluation variables were combined into algorithms that express their relationship in the most streamlined fashion practical. Potential mathematical expressions of the relationship between evaluation variables were explored using guidelines in the USFWS Habitat Evaluation Procedures Handbook (1980). The maximum value that could be obtained if all variables were 1 is 10. To scale the FU to a value between 0 and 1, with 1 being the FU for a highly functional reference system in which all of the evaluation variables were equal to 1, the total value of the algorithm is divided by 10, the maximum possible score. Therefore, the algorithm for willow riparian habitat is:

$$FU_{willow} = \frac{(((STD+COV)EXO+CON+CAR+FPA+TOP)REG+URB+RAR+RIC+SPE)}{10}$$

The total Functional Capacity Units (FCU) for the site is determined by multiplying the FU value by the number of acres of habitat present on the site:

$$FCU = FU_{willow} * \text{Acres of willow riparian habitat}$$

Table 7-1 compares the functional capacity values determined for the Mitigation Area based on annual functional analysis studies conducted between 1997 (baseline) and 2012. Overall, the FU for the Mitigation Area increased by 0.09 from 0.79 in 1997 to 0.88 in 2012. The FU target that was set in the 2000 MMP was 0.87. The FU calculated in 2012 was 0.88, which exceeds the target FU value for the Mitigation Area.

A total of 76 acres of riparian vegetation was mapped at the Mitigation Area in 1997 (Table 7-1). Due to enhancement and restoration efforts conducted since 2000, approximately 15 acres of riparian habitat were added to the Mitigation Area, for a total of 91.2 acres in 2012. This increase in the acreage of riparian habitat contributed to the increase in the overall FU value in the Mitigation Area.

Table 7-1. Comparison of Functional Capacity Values

Variable	Success Criteria (2000)	2012	2011	2010	2009	2008	1997 (Baseline)
Structural Diversity (STD)	0.9	0.7	0.7	0.7	0.8	0.8	0.7
Riparian Habitat Cover (COV)	1.0	0.8	1.0	1.0	1.0	1.0	1.0
Percent of Exotic Invasive Species/Vegetation (EXO)	1.0	1.0	1.0	1.0	0.8	1.0	0.8
Contiguity of Habitat (CON)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Available Organic Carbon (CAR)	1.0	0.9	0.9	0.8	1.0	1.0	1.0
Characteristics of Flood-prone Area (FPA)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Micro and Macro Topographic Complexity (TOP)	0.8	1.0	0.8	0.7	0.7	0.7	0.8
Hydrologic Regime of Riparian Zone (REG)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Urban Encroachment (URB)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Rareness – Listed and Sensitive Species (RAR)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	0.8	1.0	0.6	0.8	1.0	1.0	0.7
Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	0.8	1.0	0.8	1.0	1.0	0.6	0.9
Functional Unit (FU)	**0.87**	**0.88**	**0.82**	**0.84**	**0.85**	**0.88**	**0.79**
Acres	**--**	**91.2**	**91.2**	**91.2**	**91.2**	**76.0**	**76.0**
FCU	**66.12**	**80.26**	**74.78**	**76.61**	**77.52**	**66.88**	**59.74**

8.0 WATER QUALITY MONITORING PROGRAM

ECORP's subconsultant, MWH Americas, Inc., conducted the annual water quality sampling for the site in 2015. 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 four sampling locations using a YSI 556-01 Multi Probe System. Samples were taken at mid-depth, along a transect perpendicular to the stream channel alignment. Analytical results for organochlorine pesticides via Environmental Protection Agency (EPA) method 608 were analyzed by Eurofins Calscience in Garden Grove, California. Analytical results for chlorpyrifos and organophosphorous pesticides via EPA method 8141A were analyzed by Emax Laboratories, Torrance, California. All other analyses were performed at Eurofins Eaton Laboratories, Monrovia, California. Quality assurance/quality control (QA/QC) procedures in each laboratory followed the methods described in their respective Quality Assurance Manuals. In addition to the water quality monitoring, flows in the outlet from the Tujunga Ponds, in Haines Canyon Creek (leaving the site), and in Big Tujunga Wash were estimated using a simple field procedure. A float (a small plastic ball) was used to measure stream velocity.

8.1 Baseline Water Quality

Sampling and analysis conducted by LACDPW 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 8-1 and provided in the 2015 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 8-1. 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
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; station dry on the sample date

NTU – nephelometric turbidity units MPN – most probable number ND – non-detect

8.2 Water Quality Sampling Results for 2015

Results of laboratory analyses conducted by Emax and Eurofin Eaton Laboratories are summarized in Table 8-2. 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 8-2. Summary of Water Quality (November 2, 2015)

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
Temperature	°C	19.6	18.1	NA	17.4
Dissolved Oxygen	mg/L	9.3	7.4	NA	10.4
pH	std units	7.26	7.18	NA	8.11
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	0.22	0.88	NA	ND
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	7.9	6.0	NA	5.1
Orthophosphate-P	mg/L	0.017	ND	NA	0.017
Total phosphorus-P	mg/L	0.075	0.058	NA	0.044
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	1.2	2.3	NA	0.3
Fecal Coliform Bacteria	(MPN/100 ml)	79	49	NA	49
Total Coliform Bacteria	(MPN/100 ml)	330	490	NA	1700

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, stirophos, parathion-methyl, tokuthion, and trichloronate.
**EPA method 608 tests for aldrin, BHC, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, and toxaphene.

8.2.1 Discharge Measurements

Using the field technique described in the methodology section, the flows in the outlet from the Tujunga Ponds and in Haines Canyon Creek (leaving the site) were approximated. Estimated flows for November 2015 are summarized in Table 8-3.

Table 8-3. Estimated Flows for November 2015

Sampling Date	Approximate Flow (cubic feet per second)		
	Haines Canyon Creek, Outflow from Tujunga Ponds	Haines Canyon Creek, just before exit from site	Big Tujunga Wash
11/2/15	0.6	1	station dry on sample date

8.2.2 Comparison of Results with Aquatic Life Criteria

Table 8-4 provides the results of the November 2015 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 EPA criteria for freshwater aquatic life.

Table 8-4. Discussion of November 2015 Big Tujunga Wash Sampling Results

Parameter	Discussion
Temperature	• Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations.
Dissolved oxygen	• Dissolved oxygen levels ranged from 7.4 mg/L in the outflow from the Tujunga Ponds to 10.4 in Haines Canyon Creek leaving the site. DO levels at all stations were above the recommended minimum (5.0 mg/L) and recommended mean (7.0 mg/L) for warmwater fish species.
pH	• Lowest pH was observed in the outflow from Tujunga Ponds (7.18), with highest pH observed in Haines Canyon Creek leaving the site (8.11). On this date, pH readings in Haines Canyon Creek and the Tujunga Ponds were within the 6.5 to 8.5 range identified in the Basin Plan (CRWQCB 1994).
Total residual chlorine	• No residual chlorine was detected at any station.
Nitrogen	• Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. • Ammonia was below the detection limit at all stations.
Phosphorus	• Total phosphorus ranged from 0.044 mg/L-P in Haines Canyon Creek leaving the site to 0.075 mg/L-P in the inflow to the Tujunga Ponds. These levels are below the upper end of EPA's recommended range for streams to prevent excess algae growth (recommended range is <0.05 – 0.1 mg/L).
Glyphosate	• Glyphosate was not detected at any station.
Chloropyrifos and Organophosphorous Pesticides	• Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.

Parameter	Discussion
Organochlorine Pesticides	• Pesticides analyzed by EPA Method 608 were not detected at any station.
Turbidity	• Turbidity levels were very low (<3 NTU) at all stations.
Bacteria	• The fresh water bacteria standard for water contact recreation is for E. coli (126 MPN/100 ml geometric mean, 235 MPN/100 ml single sample limits). The observed fecal coliform levels were below the standard at all stations. Sampling specifically for E. coli was not conducted. • Total coliform levels ranged from 330 MPN/100 ml in Haines Canyon Creek inflow to Tujunga Ponds to 1,700 MPN/100 ml in the outflow from the ponds. [Note that recreation standards are for E. coli. Total coliform standards apply to marine waters and waterbodies where shellfish can be harvested for human consumption.]

9.0 TRAILS MONITORING PROGRAM

9.1 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 (Figure 9-1). The preservation of authorized trails is an essential component in the success of 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, the amount of unauthorized creation of new trails and illegal use of the Mitigation Area (e.g., camping, making fires) will be reduced. Maintenance and monitoring of the trail system is a necessary component of the overall restoration and enhancement program.

Four site visits were conducted in 2015. These visits occurred on March 31, 2015 (first visit), July 24, 2015 (second visit), October 14, 2014 (third visit), and December 9, 2015 (fourth visit). ECORP biologists Carley Lancaster and Amy Trost conducted the trails monitoring visits.

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 mark locations of extensive stands of poison oak. Assessment of trail signs, information kiosks, portable toilets, site fencing, and gated entrances was included in each survey. Areas that required minor repairs were remedied during the four site visits or in combination with other site visits. More extensive problem areas were mapped for repair at a later time.

Trail maintenance was conducted by ECORP's landscape contractor, Natures Image, and supervised by ECORP biologists that were present on site at the time of maintenance. During the site visits, the 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 vegetation crowding trails;
- Erosion;
- Large dead trees with the potential to fall on the trail;
- Safety concerns;
- Rock dams and walls constructed in Haines Canyon Creek;
- Poison oak overgrowth; and
- Unauthorized trail establishment by recreational users.

The biologists reported any homeless encampments they encountered during the site visits to LACDPW.

Aerial Date: NAIP 2012
Map Date: 2012

Figure 9-1. Trails in the Mitigation Area

2014-003.005 Big Tujunga Wash Mitigation Area

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Maintenance activities to address the trail issues were monitored by ECORP biologists. Prior to any work, all members of the trail maintenance crew received an onsite orientation and instruction on the Mitigation Area's regulations and concerns relating to the area's sensitive species and habitat by a qualified ECORP biologist. These efforts were summarized following each of the maintenance visits. These memos are included as Appendix H.

9.2 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 Tenth Annual Trail Cleanup Day was tentatively scheduled for the September/October 2015 timeframe; however, the event was cancelled due to the generally clean nature of the site and lack of trash and debris within the Mitigation Area.

10.0 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 was meeting on a semiannual basis (twice yearly) 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. All deliverables were submitted to LACDPW electronically for posting on the LACDPW 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 I.

10.1 Newsletters (Spring, Fall)

ECORP drafted two newsletters during 2015, the spring edition in April and the fall edition in September. Electronic versions of these newsletters were submitted to LACDPW for distribution and incorporation on their web page. Hard copies of the newsletters were also mailed to stakeholders and organizations. The newsletters are included in Appendix J.

10.2 CAC Meeting

The CAC meeting was held on Thursday April 30, 2015. The meeting was held from 6:30 to 8:30 P.M. at LACDPW's 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. Additionally, 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 electronic mail (e-mail) that included a link to the materials posted on the Mitigation Area website.

ECORP representatives Mari Quillman and Kristen (Mobraaten) Wasz attended the meeting and provided a sign-in sheet for all attendees. ECORP recorded notes during the meeting in order to prepare the official meeting minutes summarizing the general proceedings. ECORP distributed a map that documented the location and nature of all incidents that occurred within the Mitigation Area between April 2014 and April 2015 (Figure 10-1). The map included locations of rock dams, picnicking spots, sites where people are often seen fishing or swimming, and public safety concerns such as homeless encampments and loose, aggressive dog encounters. ECORP submitted draft meeting minutes to LACDPW for review and commenting prior to posting on the LACDPW web page. The proceedings at the 2015 CAC meeting were summarized in the meeting minutes, which are included as Appendix K.

Figure 10-1.
Big Tujunga Wash Mitigation Area Incident Map, April 2014 to April 2015

Big Tujunga Wash Mitigation Area

L.A. County Park Parcel

Trails

Violation Category

- Creek Obstructions
- Homeless Encampment
- Miscellaneous Incidents
- Prohibited Activity
- Site Safety/Maintenance Issue
- Trash/Dumping
- Trail Obstructions
- Vandalism

Violation ID and Description

1 Homeless encampment
2 Homeless encampment
3 Zip line
4 Downed tree
5 Downed tree
6 Downed tree
7 Rock dam
8 Homeless encampment with dog
9 Homeless man with fishing pole
10 Downed tree
11 Rock dam
12 Rock dam
13 Graffiti on signs near Ponds
14 Rock dam
15 Rock dam
16 Rock dam
17 Equestrians drinking alcohol observed
18 Downed tree
19 Rock dam
20 Downed tree
21 Homeless encampment
22 Homeless encampment
23 Rock dam
24 Vandalism
25 Dumping
26 Dumping
27 Log dam
28 Trail erosion
29 Homeless encampment
30 Tree branch obstruction
31 Homeless encampment
32 Homeless encampment
33 Trail erosion
34 Vandalism
35 Vandalism
36 Dumping
37 Vandalism
38 Rock dam
39 Unauthorized trails
40 Rock dam
41 Unauthorized trails
42 Fire pit and trash
43 Rock dam
44 Downed branch
45 Poison oak encroaching trail
46 Non-native grasses encroaching on trail
47 Person playing saxophone near creek
48 Vandalism
49 Homeless encampment
50 Horse circle
51 Child's clothing
52 Fire, April 9 2015
53 Homeless encampment
54 Rock Dam

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2014-003.005 Big Tujunga Wash Mitigation Area

Scale in Feet
0 1,000

Photo Source: NAIP 2014

Map Date: 4/29/2015

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Meeting_Maps_and_Analysis\2015-04-21_Violations\Tujunga_Bank_Violations_2014Apr-2015Apr_v2.mxd (MAG)-mguidry 4/29/2015

Below is a list of major issues discussed during the 2015 CAC meeting.

- Trail Cleanup Day
- Site visit and public hike with Los Angeles Council District 7 Councilmember Felipe Fuentes
- Site Safety and Security Issues
    - Map of incidents reported within the Mitigation Area
    - Fire associated with homeless encampment
    - Keeping track of homeless encampments
    - Houses galloping in Mitigation Area
    - Mosquitos and Vector Control near ponds
    - Mountain bike races
- General site maintenance activities
    - Monitoring flow rates of water features
    - Coordination of incident reports with Parks and Recreation
- Updates on MMP Programs
    - Brown-headed cowbird trapping
    - Exotic plant removal activities
    - Exotic wildlife removal activities
    - Water quality monitoring
    - Trail restoration and maintenance
    - Bilingual community outreach efforts
    - Water lettuce control
    - Focused surveys

11.0 PUBLIC OUTREACH PROGRAM

In an ongoing effort to enhance and protect existing wildlife and habitats at the Mitigation Area, another task was developed and implemented during the 2009 contract year and continued in 2015. This task was the direct result of increasing evidence of problematic areas associated with recreational use throughout the Mitigation Area. ECORP and LACDPW 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 2015 contract year because of its success in the years from 2009 to 2014.

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 so they could swim. 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 LACDPW 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 weekly site visits (Appendix B).

On-site interviews and education about the Mitigation Area were conducted on twelve separate occasions in 2015 by ECORP's bilingual biologists Alfredo Aguirre and Jerry Aguirre. These efforts occurred from May to September 2015. All outreach efforts took place on weekends (including holidays), during peak visiting hours between 10 A.M. and 3 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 recreational uses within the Mitigation Area. The brochure also outlined LACDPW's conservation goals, regulations regarding use of the site, and how the behavior and conduct of recreational visitors can further contribute to these goals.

ECORP 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 groups or equestrian user groups. A total of 112 non-equestrian site users were encountered

during the twelve outreach visits. Issues such as alcohol consumption, rock dam construction in the creek, swimming in the creek, littering, smoking, and fishing were observed during the visits. Nearly all groups were receptive after receiving information about the Mitigation Area. One encounter with a group of two males fishing at the Tujunga Ponds occurred on May 25, 2015. The two males were observed with fishing rods near the West Pond and were given a brochure. The gentlemen said they understood the site rules, but were observed fishing later during the visit.

A total of 60 equestrian users were approached and interviewed along the established trails, in the upland areas of the Mitigation Area, and near the Tujunga Ponds. Outreach events with equestrians were usually brief with most of these visitors being receptive to the outreach efforts. Riders were reminded to cross the creek single-file to minimize erosion along the banks and to stay on established trails. Additional awareness education was provided to riders regarding their horses leaving excrement in the waterways and the effects this has on sensitive habitat. Riders who were willing to act as stewards at the site were asked to call LACDPW if they notice any suspicious activity in the Mitigation Area.

ECORP biologists documented several effects of visitors on sensitive habitats in the Mitigation Area. The largest impacts by non-equestrian family groups were caused by swimming and rock dam construction within Haines Canyon Creek. Adolescents and adults were observed swimming and wading in an unauthorized swimming area located approximately 1,000 ft west of the South Wheatland entrance. One of the most detrimental activities associated with the popular swimming hole is the construction of rock dams designed to make the swimming areas deeper. The creation of these rock dams has persisted despite outreach efforts and constant removal. In an effort to reduce these effects, non-equestrian family groups were approached and educated during the outreach site visits. In 2015, the addition of soil and gravel to rock dams was documented. All rock dams were documented and reported to LACDPW for prompt removal. Additional adverse effects of non-equestrian family groups included increased littering within the popular picnic areas, vegetation removal, and unauthorized fire pits and campfires.

Equestrian site visitors have affected sensitive habitat by traveling off of the established trail system. Several equestrian riders were observed consuming alcohol during one of the outreach site visits, which could contribute to litter accumulation if the containers were not properly disposed. The creation of new trails and traveling off of established trails can be avoided with continued trail maintenance and equestrian site visitor education.

A memo documenting the results of all outreach efforts in 2015 are included in Appendix L.

12.0 SPECIAL ASSESSMENTS

Two special assessment-related tasks were performed in 2015, a site visit to document site damage from a small fire and response to a data request for the proposed High Speed Rail (HSR) Project.

On April 9, 2015 a small fire broke out near the east end of the Mitigation Area near I-210. The fire was reported to have been started by "careless smoking at a homeless encampment" according to a local news article. Following the fire, ECORP biologists Shannan Shaffer and Rebecca Valdez conducted a site visit on April 23, 2015 to determine the extent of the damage. The area that was burned was less than 0.03 acre and, because it was such a small event, no immediate actions were necessary. The area was periodically monitored throughout the year during subsequent site visits to assess exotic plant growth or other issues possibly arising from the fire incident affecting the area; however, no issues were noted. A memo documenting the results of the assessment is included in Appendix M.

On July 23, 2015, LACDPW received a request for Mitigation Area data to aid in the environmental review of the Palmdale to Burbank segment of the HSR. The review is being conducted by Circlepoint, a consultant to the California High Speed Rail Authority. On August 7, 2015, ECORP provided Circlepoint with Geographic Information Systems (GIS) shapefiles, maps, special-status species reports, vegetation community map and descriptions, and the master plant and wildlife lists for the Mitigation Area.

13.0 ATTENDANCE AT MEETINGS WITH AGENCIES, PUBLIC, AND CONSULTANTS

ECORP was available on an on-call basis to attend meetings with agencies, the general public, and other consultants as a representative of LACDPW. One meeting was held at the Mitigation Area on November 10, 2015 with LACDPW and community members to discuss the potential impacts from proposed HSR alignments through and adjacent to the Mitigation Area. Melanie Morita and Mayra Cabrera from LACDPW and Mari Quillman and Kristen (Mobraaten) Wasz from ECORP attended the meeting. The group toured vantage points and key locations within the Mitigation Area that would be directly affected by proposed alignment E2, which currently runs along the "paper street" right-of-way between the Wheatland Avenue north and south entrances to the Mitigation Area. The group was concerned that, if HSR alignment E2 were to be constructed, deleterious impacts would occur to Haines Canyon Creek, native vegetation, special-status species, aesthetics, Wentworth Avenue, and local groundwater sources. The community members brought maps of the Mitigation Area and the proposed E2 alignment to help illustrate their concerns.

Additional conference calls and meetings were held on an as-needed basis throughout the year between LACDPW and ECORP.

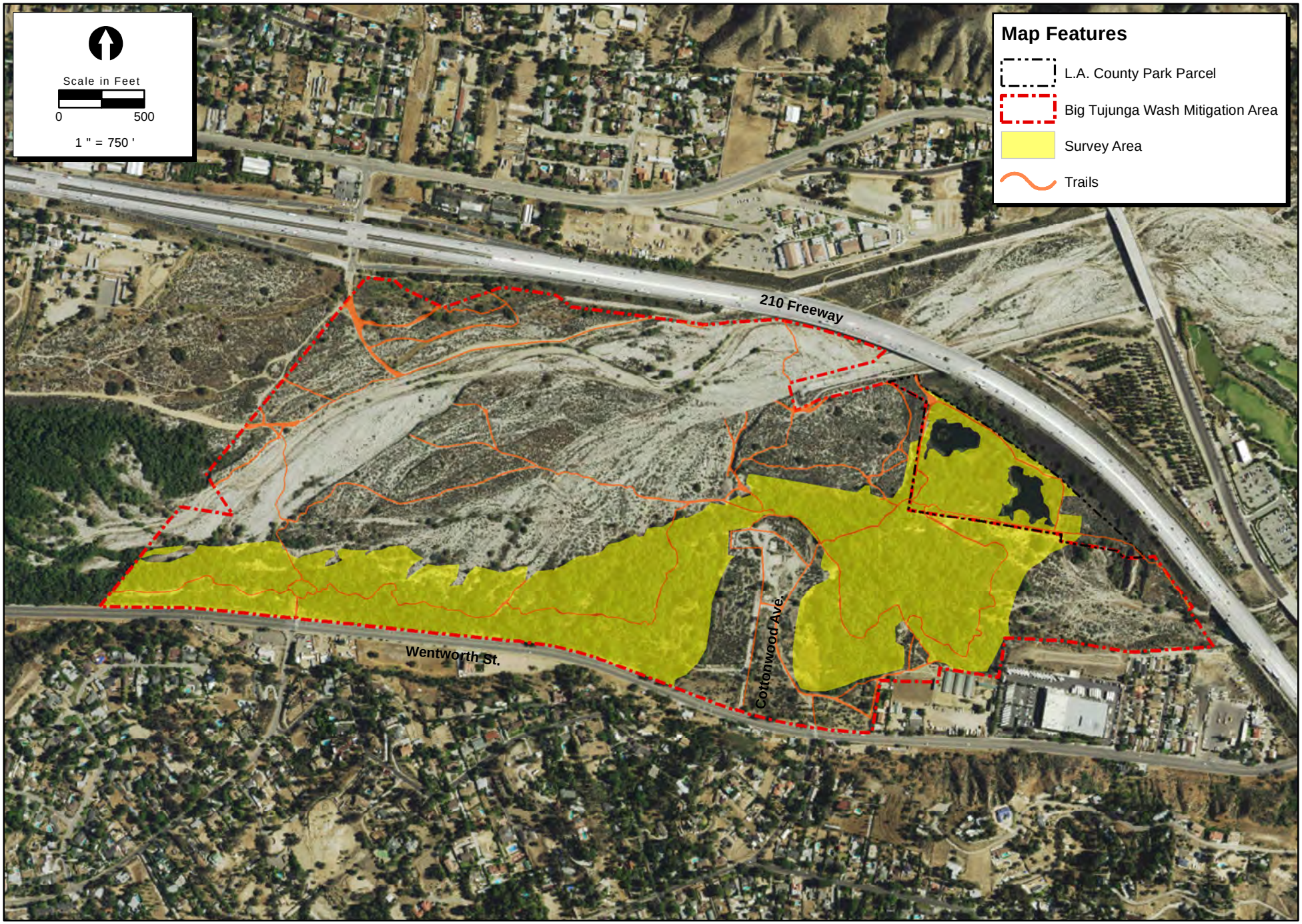
14.0 LEAST BELL'S VIREO AND SOUTHWESTERN WILLOW FLYCATCHER SURVEYS

Focused surveys for least Bell's vireo and southwestern willow flycatcher were conducted by ECORP biologists in 2015. Rainfall totals for 2015 in the Sunland area were suitable for conducting presence/absence surveys for these wildlife species, with the region experiencing approximately two to three inches of precipitation between January and April 2015 (http://www.accuweather.com). Areas surveyed for least Bell's vireo and southwestern willow flycatcher are shown in Figure 14-1. Survey results for both species are included as Appendix N.

14.1 Least Bell's Vireo

Focused surveys were conducted in 2015 for least Bell's vireo in the riparian habitats within the Mitigation Area. Surveys were conducted according to the USFWS Least Bell's Vireo Survey Guidelines (2001) from late April through late July. All surveys were conducted at least ten days apart. Surveys were performed by biologists familiar with the calls, songs, and plumage characteristics of the least Bell's vireo and other riparian bird species. Surveys were not conducted during mornings with unacceptable weather conditions such as sustained high winds (greater than 10 miles per hour), extreme temperatures (less than 55 degrees Fahrenheit [^{o}F] or greater than 100°F taken at six inches above the ground in the shade), rain, hail, or dense fog.

Surveys were performed by ECORP biologists Benjamin Smith and Shannan Shaffer with assistants Jerry Aguirre, Kevin Cornell, Emily Graf, Carley Lancaster, Amy Trost, Wendy Turner, and Rebecca Valdez. Surveys were conducted on foot throughout suitable habitat while listening for least Bell's vireo vocalizations and scanning the canopy with binoculars to identify bird species. Table 14-1 lists the dates, times, biologists present, and weather conditions during the surveys. All wildlife species observed were recorded in field notes. Numbers and locations of brown-headed cowbirds were recorded in accordance with the survey protocol. Least Bell's vireo were neither observed nor detected during the surveys, despite the presence of suitable riparian habitat.



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2015\Tujunga_LBVISurveyArea_2015.mxd *(MGuidry, 9/14/2015)* - mapping_guest

Map Date: 7/17/2015
Photo Source: ESRI 2014

Figure 14-1 Least Bell's Vireo and Southwestern Willow Flycatcher Survey Area

2014-003.005 Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Table 14-1. Least Bell's Vireo and Southwestern Willow Flycatcher Survey Area

Date	Surveyors	Time	Temperature (°F)	Wind (mph)	Cloud Cover (%)
4/23/2015	S. Shaffer R. Valdez	0615-1115	48-59	1-8	100
5/4/2015	S. Shaffer W. Turner	0645-1100	54-68	0-4	0-10
5/19/2015*	B. Smith R. Valdez	0550-1115	53-70	0-3	0-30
6/4/2015*	B. Smith E. Graf	0540-1215	59-75	0-3	10-100
6/15/2015*	B. Smith K. Cornell	0700-1140	65-82	0-5	0-100
6/26/2015*	B. Smith C. Lancaster	0530-1110	63-81	0-3	5-10
7/6/2015*	B. Smith J. Aguirre	0535-1200	70-82	0-3	0-100
7/16/2015	S. Shaffer A. Trost	0600-1115	64-79	0-5	0-100

* Conducted concurrently with SWFL surveys

14.2 Southwestern Willow Flycatcher

Focused surveys for southwestern willow flycatcher were conducted by a qualified biologist in possession of a federal 10(a)(1)(A) recovery permit in suitable riparian habitat within the Mitigation Area during the 2015 breeding season. The five surveys were conducted in accordance with the protocol developed by Sogge et al. (2010) and guidance by the USFWS (2000) between May and July 2015. Surveys were conducted concurrently with those for least Bell's vireo and also during weather that was conducive to high levels of bird activity (e.g., no surveys were conducted during rain events, high winds, cold temperatures, etc.). Surveys were performed by ECORP biologist Benjamin Smith (Federal Recovery Permit TE-67390A-0), with assistants Jerry Aguirre, Kevin Cornell, Emily Graf, Carley Lancaster, Wendy Turner, and Rebecca Valdez. Table 14-2 below lists the times, dates, personnel, and weather conditions, that were present. Results were negative for southwestern willow flycatcher.

Table 14-2. Southwestern Willow Flycatcher Survey Dates, Personnel, Times, and Weather Conditions

Date	Surveyors	Time	Temperature (°F)	Wind (mph)	Cloud Cover (%)
5/19/2015*	B. Smith R. Valdez	0550-1115	53-70	0-3	0-30
6/4/2015*	B. Smith E. Graf	0540-1215	59-75	0-3	10-100
6/15/2015*	B. Smith K. Cornell	0700-1140	65-82	0-5	0-100
6/26/2015*	B. Smith C. Lancaster	0530-1110	63-81	0-3	5-10
7/6/2015*	B. Smith J. Aguirre	0535-1200	70-82	0-3	0-100

* Conducted concurrently with LBVI surveys

15.0 ARROYO TOAD SURVEYS

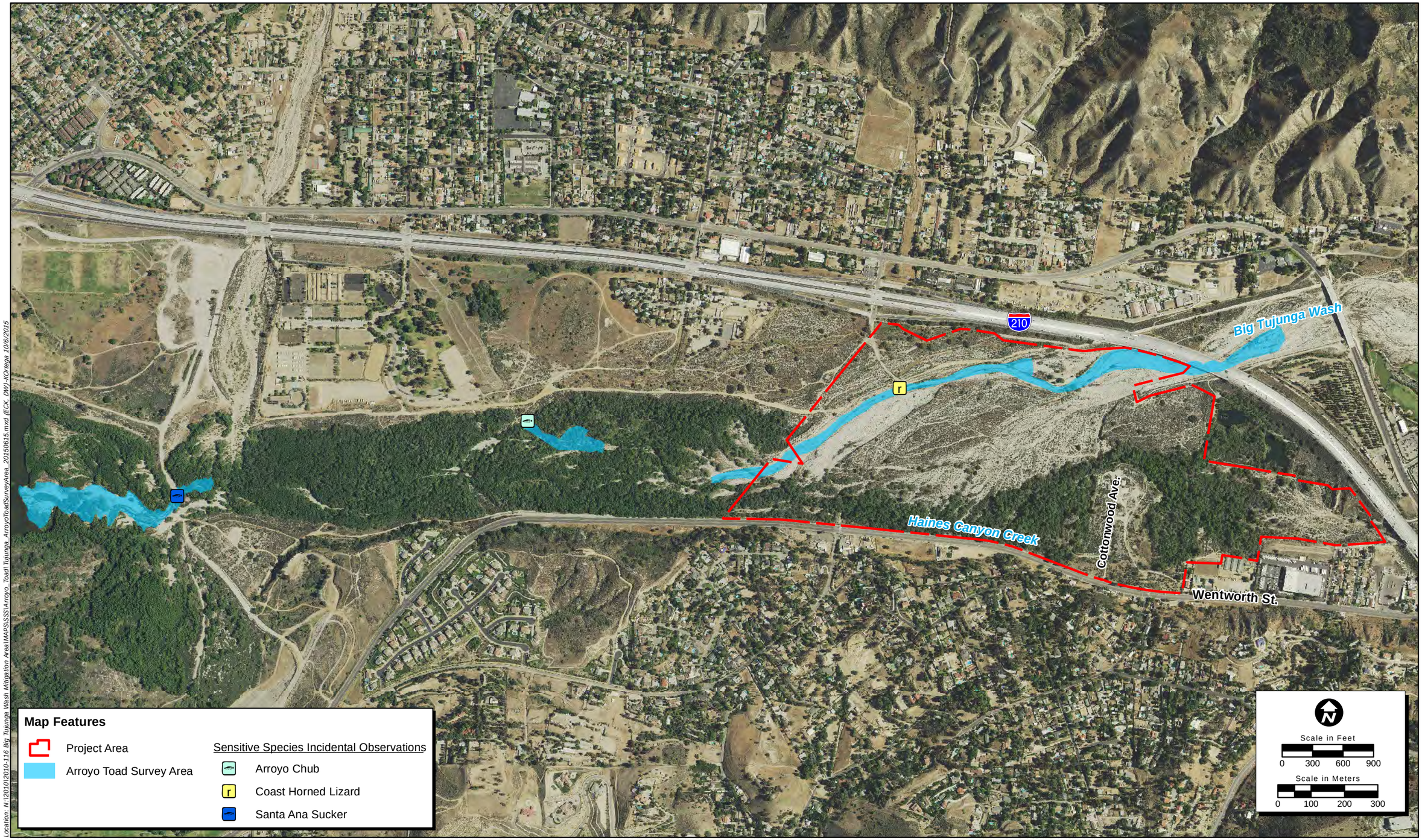
Focused surveys for arroyo toad, which is federally listed as endangered, were conducted in 2015 in the Big Tujunga Wash upstream and downstream of the Mitigation Area (Figure 15-1). Six field surveys were conducted following USFWS protocol (USWFS 1999) between March and June, with at least seven days between each survey and at least one survey performed in March, April, May, and June.

ECORP biologists Brian Zitt, Adam Schroeder, Max Murray, and Todd Chapman conducted daytime and nighttime surveys on days that had weather conducive to observing arroyo toads (new or partial moons, air temperature greater than 55°F). The locations of biological observations were recorded using a handheld GPS unit. The daytime survey component included an assessment of arroyo toad habitat suitability, as well as documenting the presence of any arroyo toad eggs, larvae, or juveniles. The entire portion of the stream channel was surveyed and appropriate routes for the nighttime survey were selected. Selected routes provided the most efficient access to allow for suitable listening stations for toad calls. Nighttime surveys consisted of walking slowly and carefully along stream banks to avoid disturbing eggs and/or creating excess silt that could affect water clarity. Headlights and flashlights were used sparingly during the survey to reach suitable listening stations. Once there, surveyors remained still and silent for approximately 15 minutes listening for the toad's call. If no calls were detected, surveyors searched along the stream channel to visually locate toads using eye-shine techniques.

Survey results were negative for eggs, larval, juvenile, and adult arroyo toads. Table 15-1 displays survey dates, surveyors, and weather during each survey. A copy of this report is included as Appendix O.

Table 15-1. Arroyo Toad Survey Dates, Weather, and Surveyors

Date	Surveyors	Time	Temperature (°F)	Wind (mph)	Cloud Cover (%)
3/17/15	B. Zitt	1515-1830	77-80	2-5	75-100
	A. Schroeder	2004-2311	62-64	3-5	70-75
4/14/15	B. Zitt	1456-1730	80-82	0-3	0
	A. Schroeder	2023-2230	70-72	3-5	0
4/22/15	B. Zitt	1530-1735	64	1-3	100
	A. Schroeder	2029-2315	58-60	1-3	100
5/11/15	B. Zitt	1805-1935	81	1-3	0
	M. Murray	2043-2305	60-64	1-4	0
5/20/15	B. Zitt	1230-1500	73-74	1-3	5-10
	M. Murray	2054-2300	57-63	0-3	0
6/17/15	B. Zitt	1500-1623	92-95	1-5	0
	T. Chapman	2130-2240	72-76	2-4	0



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\SSS\Arroyo_Toad\Tujunga_ArroyoToadSurveyArea_20150615.mxd (ECK, DW) -KOrtega 10/6/2015

Aerial Date: USGS April 2014
Map Date: 10/6/2015

Figure 15-1. Arroyo Toad Survey Area

2014-003.005 Focused Arroyo Toad Surveys
Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
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16.0 NATIVE FISHES MONITORING

ECORP conducted focused surveys for three native fishes (Santa Ana sucker, federally listed threatened and a CDFW SSC; arroyo chub, a CDFW SSC; and Santa Ana speckled dace, also a CDFW SSC) in the sections of Haines Canyon Creek that lie within the Mitigation Area boundaries. One of the three species, Santa Ana Sucker, were detected during the surveys in Haines Canyon Creek. One native species was observed during the surveys, Baja California treefrog (*Pseudacris hypochondriaca*). In addition, the following non-native species were observed: western mosquitofish, green sunfish, largemouth bass, and red swamp crayfish. A suite of habitat and water quality variables were also collected at each survey site within Haines Canyon Creek in an attempt to capture any variation in fish populations and habitat quality within the Mitigation Area boundaries. No surveys were conducted in Big Tujunga Wash in 2015 because of the absence of water in the wash due to drought conditions. The data presented in this section of the annual report summarize the results of two native fishes surveys conducted during 2015. A copy of the full report can be found in Appendix P.

16.1 Methods

Visual encounter and physical habitat (PHAB) data were collected in Haines Canyon Creek over two periods: May 18 through 20, 2015 and October 7 through 9, 2015. Sites were sampled in continuous 82-ft segments, beginning at the downstream boundary (Site 1) and continuing upstream to the Tujunga Ponds (Site 69). Surveys were conducted under the direction of ECORP biologist Brian Zitt, federal 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-27460A-2).

16.1.1 Physical Habitat Characterization

In an effort to minimize any anomalous readings, water quality readings were collected prior to instream surveys. A multi-probe water quality meter (HORIBA Model U-52) was used to record water temperature, conductivity, salinity, dissolved oxygen (DO), total dissolved solids (TDS), pH, turbidity, and oxidation-reduction potential. Water discharge velocity data were collected at the upstream and downstream extent of the survey area along Haines Canyon Creek and in the Wash. Water discharge was measured using a Marsh-McBirney Flo-Mate 2000 electromagnetic flowmeter. PHAB measurements were recorded using a modified version of California's State Water Resources Control Board (SWRCB) Surface Waters Ambient Monitoring Program (SWAMP) procedures (Fetscher et al. 2009).

Visual estimates were made on the amount of still edgewater habitat, flow habitats, and substrate type. Flow habitats were categorized based on the following criteria: cascade/falls, rapids, riffles, runs, glides, pools, and dry. Substrate types were categorized based on the following criteria: bedrock, large boulder, small boulder, cobble, coarse gravel, fine gravel, sand, fine sediment/silt, and wood/other. Canopy cover of overhanging riparian vegetation was recorded at the center of each site in four directions (left bank, right bank, upstream, and downstream) using a densiometer. Photographs and coordinate data were taken at each site. Any human disturbances

present, including exotic species, rock dams, trail crossings, trash, fishing, and swimming/wading, were also recorded.

16.1.2 Native Fishes Surveys

Native fishes surveys were conducted throughout the entire portion of the survey area during daylight hours when water visibility was ideal. Surveys were conducted by one to two biologists, using a mask and snorkel, and one data recorder. Biologists entered the water downstream of each site and proceeded slowly in an upstream direction, identifying fish species and providing size class and count data throughout the site. The biologists worked parallel to one another, covering the entire wetted width of the stream channel in a systematic manner. The data recorder followed closely behind and recorded their observations onto standardized data sheets. In addition, long-handled dipnets and two-person seines were used to sample shallow water habitats or algal/vegetated mats where visual surveys were precluded.

Biologists were outfitted with underwater writing slates to assist them in obtaining counts, especially in areas where multiple individuals, species, or size classes were present. Quality control on fish length estimates were achieved by biologists carrying foldable meter sticks during the visual/snorkeling surveys, and also through a comparison of visual estimates to actual length measurements collected from fish captured in the dipnets or seines. All of the animals captured were identified to species, enumerated, and examined for any observable health conditions (e.g., parasites, lesions, fin erosion) which were noted and recorded. All native fishes were measured to the nearest millimeter standard length (SL) and weighed to the nearest gram before being returned unharmed to their original point of capture. All exotic aquatic species captured were humanely euthanized and buried on site. The gut contents of all exotic fishes greater than 150 mm SL were inspected for native species predation.

16.2 Results

The native fishes surveys were conducted in Haines Canyon Creek between May 18 through 20, 2015 and October 7 through 9, 2015 under the direction of ECORP biologist Brian Zitt, federal 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE 27460A-0), with assistance by ECORP biologists Todd Chapman, Max Murray, and Adam Schroeder.

16.2.1 Physical Habitat Characterization

PHAB data were collected from seven sites in Haines Canyon Creek during the October 2015 survey. These seven sites all contained adult Santa Ana sucker. The maximum water depths ranged from 0.7 to 2.3 ft, and the wetted width ranged from 3.3 to 11.8 ft. Flow habitat was characterized as a combination of riffles (52.9 percent) and glides (47.1 percent), while substrate type consisted of cobble (44.3 percent), sand (23.6 percent), gravels (20.4 percent), small boulder (9.3 percent), and large boulder (1.4 percent). Overhanging vegetation, live tree roots, boulders, and aquatic macrophytes/emergent vegetation were present at each site. Overhanging vegetation and live tree roots represented the majority of instream habitat complexity between the

sites (15.4 and 10.7 percent, respectively). Undercut banks were present at all but one of the sites, while filamentous algae and artificial structures were only present at one site.

The entire creek possessed a well-developed canopy of riparian vegetation, averaging 93.0 percent total cover. Human influence was ubiquitous and widespread throughout Haines Canyon Creek, found primarily in the form of trash and modifications to the stream channel in the form of rock dams. There was also evidence of fishing and swimming/wading in some areas within the creek.

Water discharge data were collected at the upstream and downstream boundaries of the Mitigation Area within Haines Canyon Creek. The discharge at the upstream end of Haines Canyon Creek was 2.68 cubic feet per second (cfs) and the discharge at the downstream end was 1.46 cfs. Water quality data were collected in seven locations during surveys in Haines Canyon Creek. Water quality data remained relatively constant and were in line with what is expected in this system. Temperature ranged from 61.3° to 67.5° F, DO values ranged from 7.32 to 10.21 milligrams per liter (mg/L), conductivity values ranged from 0.537 to 0.639 milliSiemens per cm (mS/cm), and pH values ranged from 7.77 to 8.35. Water clarity was ideal for conducting snorkel surveys with turbidity readings ranging from 0.0 to 1.5 nephelometric turbidity units (NTU).

16.2.2 Native Fish Surveys

A total of 1,963 individuals representing six species were observed during the native fishes surveys (Table 16-1). Additionally, 921 individuals representing six species were captured during these surveys (Table 16-2). Of the total fish observed during the visual surveys, 109 Santa Ana sucker were observed during the May survey, while only 15 Santa Ana sucker were observed during the October survey. Additionally, 32 Santa Ana sucker were captured using seines/dip-nets during the May survey, while only two Santa Ana sucker were captured during the October survey. Although the May survey consisted of 109 observed and 32 captured Santa Ana sucker, some of the individuals captured were also counted as observed based on their location and size data. Accounting for these recounted individuals, the total number of Santa Ana sucker detected during the May survey was estimated at 119 individuals. Unlike the May survey, recounted individuals were not associated with the October Santa Ana sucker totals. The total number of Santa Ana sucker detected in October was 17 individuals.

Table 16-1. Number of Individuals Observed in Haines Canyon Creek during Native Fishes Surveys, 2015.

	Native Species		Exotic Species				
Survey Dates	**Baja California treefrog tadpole**	**Santa Ana sucker**	**Red swamp crayfish**	**Western mosquitofish**	**Green sunfish**	**Largemouth bass**	**Total**
May 18 - 20, 2015	1	109	957	1	8	107	**1,183**
October 7 - 9, 2015	0	15	349	323	12	81	**780**
Total	**1**	**124**	**1,306**	**324**	**20**	**188**	**1,963**

Table 16-2. Number of Individuals Captured in Haines Canyon Creek During Native Fishes Survey, 2015.

	Native Species		Exotic Species				
Survey Dates	**Baja California treefrog tadpole**	**Santa Ana sucker**	**Red swamp crayfish**	**Western mosquitofish**	**Green sunfish**	**Largemouth bass**	**Total**
May 18 - 20, 2015	4	32	481	26	11	48	602
October 7 - 9, 2015	0	2	193	114	0	10	319
Total	**4**	**34**	**674**	**140**	**11**	**58**	**921**

Of the 119 Santa Ana sucker detected in May, 86 individuals were considered juvenile (1.3 inches or less SL), while the remaining 33 individuals were considered adults. All Santa Ana sucker appeared to be in good health with no observable abnormalities. Baja California treefrog tadpoles were the only other native species observed or captured during the surveys (n=1 and n=4, respectively).

Santa Ana sucker observed during the May survey were fairly widespread in the lower half of the survey area, and all observations were made downstream of the Cottonwood Avenue equestrian trail crossing. Individuals were found occupying a mix of glide and riffle habitats over sand, gravel, cobble, boulder and bedrock with depths ranging from 6 to 26 inches. In October, Santa Ana sucker were found in isolated pockets either in or immediately below riffles over a mix of sand, gravel, and cobble often associated with woody debris or overhanging vegetation with depths ranging from 6 to 26 inches. The October survey locations of Santa Ana sucker were all found in areas previously occupied during the May survey. Largemouth bass and red swamp crayfish, both known predators of Santa Ana sucker, were often observed in these same habitat areas.

Exotic species represented the majority of individuals observed and captured during both survey periods (*n*=1,838 and *n*=883, respectively). Red swamp crayfish were the most abundant species observed over both periods (*n*=1,306), followed by western mosquitofish (*n*=324), largemouth bass (*n*=188), and green sunfish (*n*=20). A total of 674 red swamp crayfish, 140 western mosquitofish, 58 largemouth bass, and 11 green sunfish were captured and removed from Haines Canyon Creek during both sampling periods.

16.3 Discussion

The native fishes surveys were conducted over two periods (May and October) in 2015 to document native fishes recruitment in Haines Creek and variations in the survey timing. Surveys were conducted under suitable sampling conditions for capturing/observing fish with both water quality parameters and PHAB conditions comparable between the two sampling periods.

In general, the average water depth in Haines Creek was optimal for visual surveys during the time of the surveys. The 2015 surveys resulted in the detection of just one of the three native fish species in the SCMC, Santa Ana sucker. Successful breeding of Santa Ana sucker was observed during the May survey with the presence of young-of-the-year (YOY) representing the majority of Santa Ana sucker detected during that survey period. The number of Santa Ana sucker detected during the October survey (n=17) decreased in comparison to the May survey (n=119), which was largely due to the absence of YOY being detected. As in previous years' surveys, Santa Ana sucker continue to be the most abundant native fish observed; however, comparisons of the 2015 results to those from previous studies appear to show that the population is in steep decline. In December 2012, during the most recent and comparable native fishes survey, a total of 592 Santa Ana sucker were observed. The numbers of arroyo chub and Santa Ana speckled dace also appear to be in decline, with the last detections of arroyo chub occurring in 2013 (n=2) and Santa Ana speckled dace in 2012 (n=74) (ECORP 2012; ECORP 2013).

Exotic species continue to be widespread throughout Haines Creek and represented over 98 percent of the species observed in the October survey. Although there was no evidence of predation on native species from the stomach contents examined of the captured exotic species, predation is still an expected byproduct of interspecific interactions in the creek. The number of exotic species observed in Haines Creek continues to remain relatively high, but the greatest abundances appeared to be nearest the Tujunga Ponds. Fewer exotic wildlife species were observed further away from the Tujunga Ponds. This coincides with the current distribution of Santa Ana sucker in Haines Creek, which is patchy and restricted to the lower half of the Mitigation Area below the Cottonwood Avenue equestrian trail crossing.

17.0 CITY OF LOS ANGELES FIRE DEPARTMENT NOTICE OF NONCOMPLIANCE

On March 28, 2015 LACDPW received a Notice of Noncompliance from the City of Los Angeles Fire Department (LAFD) regarding brush clearing requirements at the Mitigation Area. The noncompliance notice stipulated that all weeds and other vegetation must be maintained within 10 ft of any roadway or 200 ft of all structures. Areas of concern within the Mitigation Area were along Wentworth Avenue and behind Gibson Ranch.

On October 13, 2015 a reconnaissance level-site visit was conducted with an ECORP biologist, Amy Trost, and a Natures Image senior technician, Luis Lopez, to determine the level of effort that would be required to fulfill the LAFD's request while also preserving the site's integrity as an area designated for LACDPW's mitigation requirements. Inspector Bernal from the City of Los Angeles Fire Department was unable to attend the October 13 site; however, Ms. Trost was able to meet with her the following day, October 14, 2015. A draft memo detailing the LAFD's requirements and ECORP's recommendations is included in Appendix Q as well as the mapbook that was created after the original memo. The memo is currently under revision by LACDPW.

18.0 REFERENCES

[CDFW] California Department of Fish and Wildlife

2015 California Fish and Game Code, Chapter 12, Section 1930-1940. Available at: http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=fgc&codebody=&hits=20.

[Chambers Group] Chambers Group, Inc.

1998 Draft Biological Resources Assessment and Functional Analysis of a Site in Big Tujunga Wash, Los Angeles, California. Unpublished Report prepared for County of Los Angeles, Department of Public Works. April 1998.

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.

[CRWQCB] California Regional Water Quality Control Board, Los Angeles Region

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

[ECORP] ECORP Consulting, Inc.

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.

[Fetscher et al.] Fetscher, A.E., L. Busse, and P.R. Ode.

2009 Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in

California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 002.

Griffith Wildlife Biology
1992 Brown-headed cowbird trapping protocol. Unpublished document prepared for the USFWS, CDFW, and internal use by Griffith Wildlife Biology.

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 Deparment of Fish and Game, Region 5.

Scott, D. M., and C. D. Ankney
1980 Fecundity of the brown-headed cowbird in southern Ontario. Auk 97:677-683.

[Sogge et al.] Sogge, M. K., Ahlers, Darrell, and Sferra, S.J.
2010 A natural history summary and survey protocol for the southwestern willow flycatcher: U.S. Geological Survey Techniques and Methods 2A-10. United States Geological Survey, Reston, VA.

[USDA NRCS] United States Department of Agriculture, Natural Resources Conservation Service
2011 The PLANTS Database. National Plant Data Team, Greensboro, NC 27401-4901 USA. Accessed at http://plants.usda.gov.

[USFWS] United States Fish and Wildlife Service
1999 Survey Protocol for the Arroyo Southwestern Toad. United States Department of the Interior. Carlsbad, CA.

2000 Southwestern Willow Flycatcher Protocol Revision 2000. United States Department of the Interior. Carlsbad, CA.

2001 Least Bell's Vireo Survey Guidelines. United States Department of the Interior. Carlsbad, CA.

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

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-botched 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.

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.

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* Nutsedge), 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

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.

- 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:

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,

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:

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:

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.

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

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 Date
Environmental Program Manager
South Coast Region

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

APPENDIX B

Public Outreach and Worker Education Brochure

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!

www.ladpw.org/wrd/Projects/BTWMA/

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 or bicycles
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 o bicicletas
e. No acampar
f. Los perros deben estar con correas.

¿Preguntas? / Questions?

LACDPW: Grace Yu
BTWMA@dpw.lacounty.gov
Water Resources Division
County of Los Angeles
Department of Public Works
P.O. Box 1460
Alhambra, CA 91802

Big T

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*** *(LACDPW). 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 de Los Angeles** (LACDPW). 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.

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.

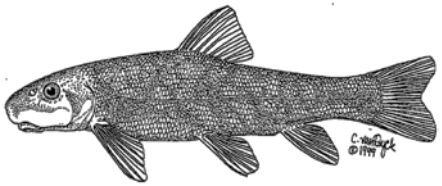
No dams/No presas

There is no place like Big T

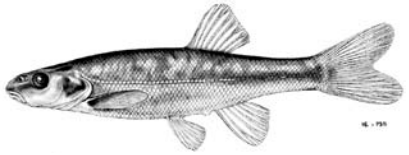
Big T is unique because of the plants and animals that live here. Several of these animals are so rare that regulations have been made to protect where they live. This means that the plants, water, soil, and rocks that make up their homes (or habitat) must not be disturbed or altered.

No hay lugar como Big T

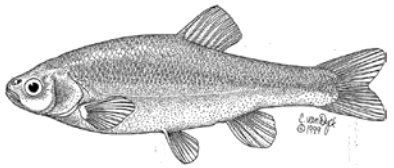
Big T es único por las plantas y los animales que viven aquí. Varios de estos animales son tan únicos que se han hecho regulaciones para proteger el lugar donde viven. Esto significa que las plantas, el agua, la tierra, y las piedras que componen sus hogares (o hábitat) no debe ser dañado.



Santa Ana sucker
(*Catostomus santaanae*)

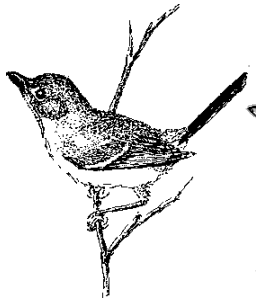


Santa Ana speckled dace
Carpita pinta
(*Rhinichthys osculus*)



Arroyo chub
(*Gila orcutti*)

Southwestern willow flycatcher
(*Empidonax traillii extimus*)



Bell's vireo
(*Vireo bellii pusillus*)

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?

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

APPENDIX C

Plant and Wildlife Compendia

Scientific Name	**Common Name**
GYMNOSPERMS	
PINACEAE	**PINE FAMILY**
*Cedrus deodara**	deodar cedar
*Pinus halepensis**	aleppo pine
ANGIOSPERMS (DICOTYLEDONS)	
ACERACEAE	**MAPLE FAMILY**
Acer negundo var. *californicum*	box elder
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**
Malosma laurina	laurel sumac
Rhus integrifolia	lemonade sumac
Toxicodendron diversilobum	Pacific poison oak
APIACEAE	**CARROT FAMILY**
*Conium maculatum**	poison hemlock
*Foeniculum vulgare**	sweet fennel
APOCYNACEAE (or ASCLEPIADACEAE)	**DOGBANE FAMILY**
*Vinca major**	Periwinkle
ASTERACEAE	**SUNFLOWER FAMILY**
*Ageratina adenophora**	sticky eupatory
Ambrosia acanthicarpa	annual bursage
Ambrosia artemisiifolia	annual ragweed
Artemisia californica	coastal sagebrush
Artemisia douglasiana	mugwort
Artemisia dracunculus	tarragon
Baccharis salicifolia	mule fat
*Carduus pychocephalus**	Italian thistle
*Centaurea melitensis**	tocalote
Cirsium occidentale var.*occidentale*	cobweb thistle
Conyza canadensis	Canadian horseweed
Heterotheca grandiflora	telegraph weed
Heterotheca sessiliflora	golden aster
*Hypochaeris glabra**	smooth cat's ear
*Lactuca serriola**	prickly lettuce
Lepidospartum squamatum	scalebroom
Malacothrix saxatilis	cliff desert dandelion
Pluchea odorata	salt marsh fleabane
Pseudognaphalium biolettii (bicolor)	bicolor cudweed
Pseudognaphalium canescens	fragrant everlasting
Rafinesquia californica	California plumeseed
Senecio flaccidus var. *douglasii*	sand-wash butterweed
*Sonchus asper**	spiny sowthistle
*Sonchus oleraceus**	common sowthistle
Stephanomeria pauciflora var. *pauciflora*	wire-lettuce

Scientific Name	**Common Name**
*Tanacetum parthenium**	feverfew
*Taraxacum officinale**	common dandelion
BETULACEAE	**BIRCH FAMILY**
Alnus rhombifolia	white alder
BIGNONIACEAE	**BIGNONIA FAMILY**
*Catalpa bignonioides**	southern catalpa
BORAGINACEAE	**BORAGE FAMILY**
*Echium candicans**	Pride of Madeira
BRASSICACEAE	**MUSTARD FAMILY**
*Hirschfeldia incana**	shortpod mustard
*Lobularia maritima**	sweet alyssum
Nasturtium officinale	watercress
*Sisymbrium altissimum**	tumble mustard
CACTACEAE	**CACTUS FAMILY**
Opuntia littoralis	coastal prickly pear
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
Sambucus nigra ssp. *caerulea (= S. mexicana)*	blue elderberry
*Stellaria media**	common chickweed
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
Chenopodium sp.	goosefoot
CRASSULACEAE	**STONECROP FAMILY**
Dudleya lanceolata	coastal dudleya
CURCURBITACEAE	**GOURD FAMILY**
Marah macrocarpus	Cucamonga manroot
CUSCUTACEAE	**DODDER FAMILY**
Cuscuta sp.	dodder
*Chamaesyce maculata**	spotted spurge
Croton californicus	croton
*Euphorbia peplus**	petty spurge
*Ricinus communis**	castor bean
FABACEAE	**LEGUME FAMILY**
Acmispon scoparius (= Lotus s.)	common deerweed
*Medicago sativa**	alfalfa
*Melilotus albus**	sweet clover
*Spartium junceum**	Spanish broom
FAGACEAE	**OAK FAMILY**
Quercus agrifolia	California live oak
Quercus berberidifolia	scrub oak
GERANIACEAE	**GERANIUM FAMILY**
*Erodium cicutarium**	red-stemmed filaree
*Geranium rotundifolium**	roundleaf geranium
GROSSULARIACEAE	**GOOSEBERRY FAMILY**
Ribes aureum	golden currant
HYDROPHYLLACEAE	**WATERLEAF FAMILY**

Scientific Name	**Common Name**
Eriodictyon crassifolium	thickleaf yerba santa
Phacelia ramosissima	branching phacelia
JUGLANDACEAE	**WALNUT FAMILY**
Juglans californica (List 4.2)	Southern California walnut
LAMIACEAE	**MINT FAMILY**
*Marrubium vulgare**	horehound
Salvia mellifera	black sage
Stachys sp.	hedge nettle
LOASACEAE	**LOASA FAMILY**
Mentzelia laevicaulis	smoothstem blazingstar
MALVACEAE	**MALLOW FAMILY**
Malacothamnus davidsonii	Davidson's bush mallow
*Malva parviflora**	cheeseweed
*Malva sylvestris**	high mallow
*Ficus carica**	edible fig
*Ficus nitida**	Indian fig
MYRTACEAE	**MYRTLE FAMILY**
Eucalyptus sp. *	gum tree
NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**
*Mirabilis jalapa**	marvel of Peru
OLEACEAE	**OLIVE FAMILY**
*Fraxinus udhei**	evergreen ash
Fraxinus velutina	velvet ash
*Ligustrum lucidum**	glossy privet
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia bistorta	California sun cup
Camissonia californica	California evening primrose
Clarkia unguiculata	elegant clarkia
Epilobium brachycarpum	tall annual willowherb
Oenothera elata	evening primrose
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica	California poppy
PLANTAGINACEAE	**PLANTAIN FAMILY**
*Plantago major**	common plantain
*Plantago psyllium**	sand plantain
PLATANACEAE	**PLANE TREE FAMILY**
Platanus racemosa	western sycamore
POLEMONIACEAE	**PHLOX FAMILY**
Eriastrum densifolium	giant woolly star
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum fasciculatum	California buckwheat
Eriogonum gracile	slender wooly buckwheat
Polygonum hydropiperoides	swamp smartweed
Pterostegia drymarioides	California thread-stem
Rumex sp.	dock

Scientific Name	**Common Name**
*Rumex crispus**	curly dock
*Rumex pulcher**	fiddle dock
PRIMULACEAE	**PRIMROSE FAMILY**
*Anagallis arvensis**	scarlet pimpernel
RANUNCULACEAE	**BUTTERCUP FAMILY**
Delphinium cardinale	scarlet larkspur
RHAMNACEAE	**BUCKTHORN FAMILY**
Ceanothus sp.	ceanothus
ROSACEAE	**ROSE FAMILY**
Heteromeles arbutifolia	toyon
Prunus ilicifolia ssp. *ilicifolia*	holly-leaf cherry
Rosa californica	California rose
Rubus ursinus	California blackberry
SALICACEAE	**WILLOW FAMILY**
Populus fremontii	Fremont cottonwood
Salix exigua	narrowleaf willow
Salix gooddingii	Goodding's willow
Salix laevigata	red willow
Salix lasiolepis	arroyo willow
SCROPHULARIACEAE	**FIGWORT FAMILY**
Mimulus guttatus	common monkeyflower
*Verbascum virgatum**	wand mullein
*Veronica anagallis-aquatica**	water speedwell
SIMAROUBACEAE	**QUASSIA FAMILY**
*Ailanthus altissima**	tree of heaven
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii	jimson weed
Nicotiana attenuata	coyote tobacco
*Nicotiana glauca**	tree tobacco
Solanum americanum	American black nightshade
ULMACEAE	**ELM FAMILY**
*Ulmus parvifolia**	Chinese elm
URTICACEAE	**NETTLE FAMILY**
Urtica dioica	stinging nettle
VITACEAE	**GRAPE FAMILY**
Vitis girdiana	desert wild grape
ZYGOPHYLLACEAE	**CALTROP FAMILY**
*Tribulus terrestris**	puncture vine
ANGIOSPERMS (MONOCOTYLEDONS)	
AGAVACEAE (or Liliaceae)	**AGAVE FAMILY**
Hesperoyucca whipplei (=Yucca w.)	chaparral yucca
AMARYLLIDACEAE	**AMARYLLIS FAMILY**
*Amaryllis belladonna**	belladonna lily
ASPHODELACEAE	**ALOE FAMILY**
Aloe sp.*	aloe vera

Scientific Name	**Common Name**
CYPERACEAE	**SEDGE FAMILY**
Cyperus sp.	flatsedge
*Cyperus involucratus**	umbrella plant
POACEAE	**GRASS FAMILY**
*Agrostis viridis**	bentgrass
*Arundo donax**	giant reed
*Avena barbata**	slender oat
*Avena fatua**	wild oat
*Bromus diandrus**	ripgut brome
*Bromus rubens**	red brome
*Cynodon dactylon**	bermuda grass
*Echinochloa crus-galli**	barnyard grass
*Ehrharta calycina**	perennial veldtgrass
*Lolium perenne**	perennial ryegrass
*Piptatherum miliaceum**	smilo grass
*Polypogon monspeliensis**	rabbitsfoot grass
*Schismus barbatus**	mediterranean schismus
*Triticum aestivum**	common wheat
*Vulpia myuros**	rat-tail fescue
TYPHACEAE	**CATTAIL FAMILY**
Typha domingensis	southern cattail
* non-native species	

2015 Big Tujunga Wash Mitigation Area Master Wildlife List

Scientific Name	**Common Name**
INVERTEBRATES	
MALACOSTRACA	**CRABS, LOBSTERS, SHRIMP**
CAMBARIDAE	**FRESHWATER CRAYFISH**
Procambarus clarkia	red swamp crayfish*
MOLLUSCA	**MOLLUSKS**
CORBICULIDAE	**BASKET CLAMS**
Corbicula fluminea	Asiatic Clam*
OSTEICTHYES (BONY FISHES)	
ACTINOPTERYGII	**RAY-FINNED FISHES**
CATOSTOMIDAE	**SUCKER FISHES**
Catostomus santaanae	Santa Ana sucker***
CENTRARCHIDAE	**SUNFISHES**
Lepomis cyanellus	green sunfish*
Lepomis macrochirus	bluegill *
Micropterus salmoides	largemouth bass*
CICHLIDAE	**CICHLIDS**
Oreochromis mossambicus	Mozambique tilapia*
CYPRINIDAE	**TRUE MINNOWS**
Cyprinus carpio	common carp*
Gila orcuttii	Arroyo chub**
POECILIIDAE	**LIVEBEARERS**
Gambusia affinis	western mosquitofish*
AMPHIBIANS	
BUFONIDAE	**TRUE TOADS**
Anaxyrus boreas	western toad
HYLIDAE	**TREEFROGS**
Pseudacris cadaverina	California treefrog
Pseudacris hypochondriaca	Baja California treefrog
RANIDAE	**TRUE FROGS**
Lithobates catesbeianus	American bullfrog*
REPTILES	
ANGUIDAE	**ALLIGATOR LIZARDS**
Elgaria multicarinata	southern alligator lizard
COLUBRIDAE	**EGG-LAYING SNAKES**
Pituophis catenifer	gopher snake
EMYDIDAE	**SLIDERS**
Actinemys pallida	southwestern pond turtle**
Trachemys scripta elegans	red-eared slider*

Scientific Name	**Common Name**
PHRYNOSOMATIDAE	**SPINY LIZARDS**
Phrynosoma coronatum	Blainville's (=coast) horned lizard
Sceloporus graciosus vandenburgianus	southern sagebrush lizard
Sceloporus occidentalis	western fence lizard
Uta stansburiana	side-blotched lizard
TEIIDAE	**WHIPTAILS AND RACERUNNERS**
Aspidoscelous tigris	western whiptail
BIRDS	
ACCIPITRIDAE	**HAWKS**
Accipiter cooperii	Cooper's hawk**
Buteo jamaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	bushtit
ALCIDINIDAE	**KINGFISHERS**
Megaceryle alcyon	belted kingfisher
ANATIDAE	**DUCKS, GEESE AND SWANS**
Anas platyrhynchos	mallard
Anas strepera	gadwall
Aythya collaris	ring-necked duck
Branta canadensis	Canada goose
Bucephala albeola	bufflehead
Mergus merganser	common merganser
Mergus serrator	red-breasted merganser
Oxyura jamaicensis	ruddy duck
APODIDAE	**SWIFTS**
Aeronautes saxatalis	white-throated swift
ARDEIDAE	**HERONS AND EGRETS**
Ardea alba	great egret
Ardea herodias	great blue heron
Butorides virescens	green heron
Nycticorax nycticorax	black-crowned night heron
BOMBYCILLIDAE	**WAXWINGS**
Bombycilla cedrorum	cedar waxwing
CARDINALIDAE	**GROSBEAKS AND BUNTINGS**
Piranga ludoviciana	western tanager
Pheucticus melanocephalus	black-headed grosbeak
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
COLUMBIDAE	**DOVES AND PIDGEONS**
Columba livia	rock pigeon*

Scientific Name	**Common Name**
Patagioenas fasciata	band-tailed pigeon
Zenaida macroura	mourning dove
CORVIDAE	**JAYS, CROWS, AND THEIR ALLIES**
Aphelocoma californica	western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
EMBERIZIDAE	**SPARROWS AND THEIR ALLIES**
Junco hyemalis	dark-eyed junco
Melospiza lincolnii	Lincoln's sparrow
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculatus	spotted towhee
Zonotrichia leucophrys	white-crowned sparrow
FALCONIDAE	**FALCONS**
Falco sparverius	American kestrel
FRINGILLIDAE	**FINCHES**
Carduelis lawrencei	Lawrence's goldfinch
Spinus pinus	pine siskin
Carduelis psaltria	lesser goldfinch
Carduelis tristis	American goldfinch
Carpodacus mexicanus	house finch
HIRUNDINIDAE	**SWALLOWS**
Petrochelidon pyrrhonota	cliff swallow
Stelgidopteryx serripennis	northern rough-winged swallow
ICTERIDAE	**BLACKBIRDS AND ORIOLES**
Agelaius phoeniceus	red-winged blackbird
Icterus bullockii	Bullock's oriole
Molothrus ater	brown-headed cowbird*
Quiscalus mexicanus	great-tailed grackle
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
PARIDAE	**TITMICE AND CHICKADEES**
Baeolophus inornatus	oak titmouse
PARULIDAE	**WOOD-WARBLERS**
Geothlypis trichas	common yellowthroat
Oreothlypis celbata	orange-crowned warbler
Setophaga coronata	yellow-rumped warbler
Wilsonia pusilla	Wilson's warbler

Scientific Name	**Common Name**
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow*
PICIDAE	**WOODPECKERS**
Colaptes auratus	northern flicker
Melanerpes formicivorus	acorn woodpecker
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	downy woodpecker
Picoides villosus	hairy woodpecker
PODICIPEDIDAE	**GREBES**
Podilymbus podiceps	pied-billed grebe
POLIOPTILIDAE	**CREEPERS AND GNATCATCHERS**
Polioptila caerulea	blue-gray gnatcatcher
PTILOGONATIDAE	**SILKY FLYCATCHERS**
Phainopepla nitens	phainopepla
RALLIDAE	**RAILS**
Fulica americana	American coot
REGULIDAE	**KINGLETS**
Regulus calendula	ruby-crowned kinglet
STURNIDAE	**STARLINGS AND MYNAS**
Sturnus vulgaris	European starling*
SYLVIIDAE	**WRENTITS**
Chamaea fasciata	wrentit
TROCHILIDAE	**HUMMINGBIRDS**
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Selasphorus rufus	rufous hummingbird
Selasphorus sasin	Allen's hummingbird
TROGLODYTIDAE	**WRENS**
Campylorhynchus brunneicapillus	cactus wren
Cistothorus palustris	marsh wren
Salpinctes obsoletus	rock wren
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
TURDIDAE	**BLUEBIRDS**
Catharus ustulatus	Swainson's thrush
Sialia mexicana	western bluebird
TYRANNIDAE	**TYRANT FLYCATCHERS**
Contopus sordidulus	western wood-pewee
Empidonax difficilis	Pacific-slope flycatcher
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black pheobe

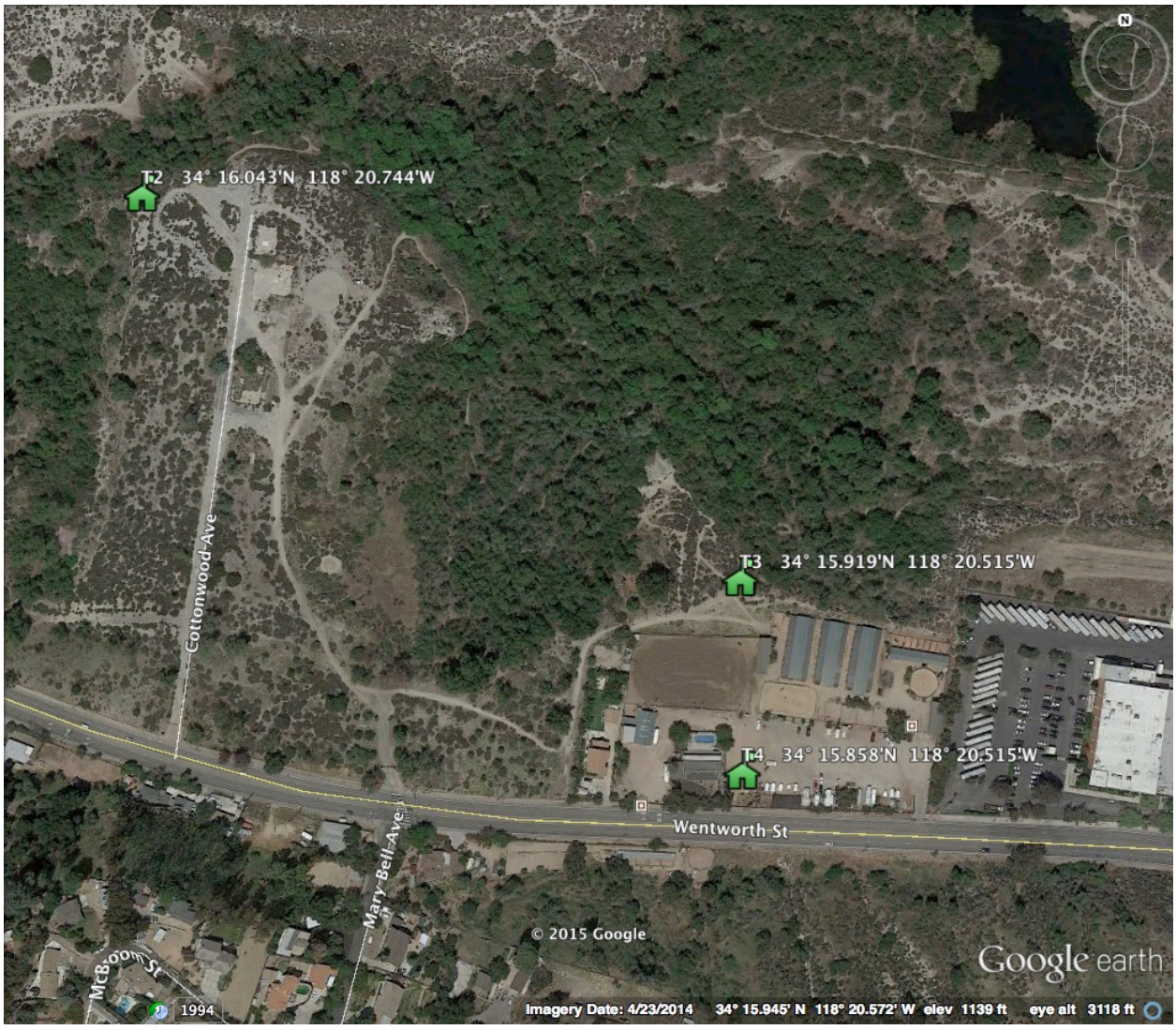
Scientific Name	**Common Name**
Sayornis saya	Say's phoebe
Tyrannus verticalis	western kingbird
VIREONIDAE	**VIREOS**
Vireo gilvus	warbling vireo
Vireo huttoni	Hutton's vireo
MAMMALS	
CANIDAE	**DOGS**
Canis lupus familiaris	domestic dog*
Canis latrans	coyote
EQUIDAE	**HORSES AND ALLIES**
Equus caballus	domestic horse*
LEPORIDAE	**HARES AND RABBITS**
Syvilagus audubonii	desert cottontail
MEPHITIDAE	**SKUNKS**
Mephitis mephitis	striped skunk
MURIDAE	**MICE AND RATS**
Neotoma fuscipes	dusky-footed woodrat
PROCYONIDAE	**RACCOONS AND RINGTAILS**
Procyon lotor	Northern raccoon
SCIURIDAE	**SQUIRRELS**
Sciurus niger	fox squirrel*
Spermophilus beecheyi	California ground squirrel
*Non-native species **CDFW Species of Special Concern/Watch List Species/FP Species ***State and/or Federally Listed Species	

APPENDIX D

2015 Brown-headed Cowbird Trapping Report

2015 BIG TUJUNGA WASH MITIGATION AREA

BROWN-HEADED COWBIRD CONTROL PROGRAM



GRIFFITH WILDLIFE BIOLOGY

2015 BIG TUJUNGA WASH MITIGATION AREA

BROWN-HEADED COWBIRD CONTROL PROGRAM

prepared for:

ECORP Consulting, Inc
1801 Park Court Place, B-103
Santa Ana, California 92701
Attn: Kristen Wasz
Project Number 2014-003.005/001/1

prepared by:

Griffith Wildlife Biology
John T. Griffith and Jane C. Griffith
22670 M-203
P.O. Box 47
Calumet, Michigan 49913
www.griffithwildlife.com

Final Report December 1, 2015

Preferred citation:

Griffith Wildlife Biology 2015. 2015 Big Tujunga Wash Mitigation Area Brown-headed Cowbird Control Program. Unpublished report prepared for ECORP Consulting, Santa Ana, CA, by Griffith Wildlife Biology, Calumet, MI.

EXECUTIVE SUMMARY

Four cowbird traps were operated in the vicinity of the Big Tujunga Wash Mitigation Area near Hansen Dam in 2015. The purpose of the trapping was to reduce the incidence of brown-headed cowbird (*Molothrus ater*) brood parasitism among local native host species, particularly endangered, threatened, or sensitive host species including the least Bell's vireo (*Vireo bellii pusillus*) and the southwestern willow flycatcher (*Empidonax traillii extimus*). The traps were operated from March 30 to June 29 (92 days, 13 weeks). Each trap contained the minimum preferred number of decoy cowbirds (2 males, 3 females) as of April 2, and 3 males and 5-6 female decoys as of April 10 and subsequently.

Ninety (90) cowbirds were removed, including 48 males, 41 females, and 1 juvenile. The 2001-2015 average is 115 (55 males, 55 females, 4 juveniles; r=20-211).

The male: female capture ratio was 1.17:1. Most of the adult cowbirds were captured in weeks 1-7 (54% of the trapping period): 35/48 males (73 %) and 40/41 females (98%). No banded cowbirds or other banded birds were captured. Trap 2 was vandalized twice and 5 males were released.

In addition to cowbirds, 163 non-target birds of 5 different species were captured, of which all but 3 (1.8%) were released unharmed. This total includes the multiple capture, release, and recapture of a smaller number of individuals. No sensitive or endangered, threatened, or candidate non-target species were captured. No decoy or non-target birds died due to lack of food or water, or because of unclean conditions.

No changes to the number of traps, dates of operation, or operation protocol are recommended.

Key words: Big Tujunga Wash, brood parasitism, brown-headed cowbird (*Molothrus ater*), California, California gnatcatcher (*Polioptila californica californica*), coastal sage scrub, Hansen Dam, least Bell's vireo (*Vireo bellii pusillus*), riparian, southwestern willow flycatcher (*Empidonax traillii extimus*).

Table of Contents

Executive Summary..... ii

List of Figures..... iv

List of Tables..... iv

List of Appendices…….. iv

Introduction..... 1

Study Area..... 4

Methods..... 5

Results..... 8

Discussion and Conclusions..... 9

Management Recommendations..... 9

Literature Cited..... 10

List of Figures

Figure 1. 2015 Big Tujunga Wash Mitigation Area brown-headed cowbird control project study area..... 12

Figure 2. 2015 Big Tujunga Wash Mitigation Area brown-headed cowbird control project Trap 1 location……..... 13

Figure 3. 2015 Big Tujunga Wash Mitigation Area brown-headed cowbird control project Traps 2-4 location..... 14

Figure 4. Number of male, female, and juvenile cowbirds removed per week at and in the vicinity of Big Tujunga Wash Mitigation Area in 2015….. 15

List of Tables

Table 1. Number of brown-headed cowbirds captured at and in the vicinity of Big Tujunga Wash Mitigation Area, 2001-2015…….. 16

Table 2. Number of male, female, and juvenile brown-headed cowbirds captured per day, per week, per trap, and total at and in the vicinity of Big Tujunga Wash Mitigation Area in 2015……. 17

Table 3. Number of non-target species captured and released or preyed upon in brown-headed cowbird traps at and in the vicinity of Big Tujunga Wash Mitigation Area in 2015…… 18

List of Appendices

Appendix 1. Warning/informational sign placed on brown-headed cowbird traps at Big Tujunga Wash Mitigation Area in 2015…….…….. 19

INTRODUCTION

Brown-headed Cowbird

The brown-headed cowbird (*Molothrus ater*, cowbird) is a brood parasite. Cowbirds do not make nests or raise young. They lay eggs in the nests of other birds, called hosts, which then raise the cowbird. Female cowbirds defend breeding territories (Darley 1968, 1983; Raim 2000) and can lay 40-100 eggs each spring (Scott and Ankney 1983, Holford and Roby 1993, Smith and Arces 1994). Cowbirds may remove or puncture host eggs during parasitism events, and may kill older host nestlings to initiate host renesting and create parasitism opportunities. Cowbirds are extreme generalists and parasitize nearly every species (at least 220) with which they are sympatric (Friedmann 1963, Friedmann and Kiff 1985). This lack of host specificity allows the extirpation or extinction of rare species (like the vireo) without harm to the cowbird.

Brown-headed cowbirds (males dark, females light).

Two cowbird eggs in a least Bell's vireo nest.

Cowbirds are native to the Great Plains and were closely associated with bison. It is possible that brood parasitism developed because cowbirds traveled with bison and seldom remained in one locale long enough to build a nest, lay and incubate a clutch of eggs, raise nestlings, and care for fledglings. Host species that co-evolved with cowbirds on the Great Plains and margins have behavioral defense mechanisms against parasitism, including cowbird egg removal, nest abandonment, and re-clutching. Hosts in the Far West generally do not.

Cowbirds were first documented in California at Borrego Springs in 1896; the first cowbird egg found in California was in a least Bell's vireo (*Vireo bellii pusillus*, vireo) nest on the San Gabriel River (Unitt 1984). By 1930, cowbirds were "well established" throughout the region (Willett 1933); by 1955 they had reached British Columbia (Flahaut and Schultz 1955). Cowbirds may or may not have reached the Far West without the unwitting aid of humans. Regardless, massive anthropogenic landscape alteration, particularly the provision of year-round cowbird forage by agricultural and livestock operations and the coincident wholesale destruction of native habitats, allowed the establishment of an artificially large cowbird population, and the resulting devastating impact upon local hosts.

In contrast to the increase in distribution and abundance of cowbirds in California over the last century, populations of most native birds are in decline, primarily due to their dependence upon increasingly reduced, fragmented, and degraded native habitats in which they are less productive and more susceptible to predation and parasitism (Gaines 1974, Goldwasser et al 1980). Thus there is an inverse relationship between the amount of native habitat and associated avian populations, such as the vireo and flycatcher, and the number and subsequent impact of brown-headed cowbirds and predators upon such populations.

Cowbird eggs hatch sooner than host eggs and the young are larger and more aggressive. Therefore cowbird chicks are able to outcompete their host nest-mates; small host chicks are unable to obtain food or are simply smothered by the older, larger cowbird chick. Large host species can raise a cowbird without significant harm to their own reproductive effort (Weatherhead 1989, Robinson et al. 1995). Small host species like the endangered vireo, southwestern willow flycatcher (*Empidonax traillii extimus*, flycatcher), and California gnatcatcher (*Polioptila californica californica*) can raise only a single cowbird chick (if that) and none of their own young from parasitized nests (Grzybowski 1995). Nest failure from predation or weather results in re-nesting and normal reproductive success. Brood parasitism, however, consumes the time and energy of an entire breeding season and results in complete reproductive failure (Griffith and Griffith 2000). Decreased productivity caused by persistent cowbird parasitism caused or contributed to the endangered/threatened status of these host species (USFWS 1986, 1993, 1995, 1998).

Cowbird chick in California gnatcatcher nest.

Cowbird chick and smothered/starved gnatcatcher chick.

Cowbird Trapping

The recipe for least Bell's vireo recovery is simple: habitat protection (including land acquisition, exclusion of motorized vehicles and domestic/feral animals, and removal of invasive plants such as *Arundo donax* and *Tamarisk spp*.) combined with cowbird trapping. It has been repeatedly demonstrated that parasitism can be dramatically reduced or eliminated, even over large areas, by removing cowbirds from targeted host habitat during the host breeding season (for the vireo, minimally April 1 – June 30; non-breeding season trapping can also be helpful) using several traps spaced at roughly 1 km intervals within host habitat ("topical trapping") (Griffith and Griffith 2000). A higher density of traps is needed for large, wide rivers, or if there are cowbird foraging areas such as dairies or stables nearby. Cowbird trapping reduces parasitism rates among the vireo from pre-trapping levels of 50%-100% to essentially zero. The entire avian host community benefits from trapping, not just the primary target species (unlike nest monitoring/ cowbird egg removal). For the vireo, cowbird trapping increases per-pair productivity from about 1.3 young per pair to more than 3.5 per pair; the difference between decreasing populations/ extinction and increasing populations/ recovery (Griffith and Griffith 2000). In areas where such topical trapping has been performed for several years, the abundance and diversity of all host species present (not just the intended beneficiary endangered species) has increased markedly (Griffith and Griffith 2000).

The traps are baited with live decoy cowbirds, abundant bait seed and clean water, shade, and perches to attract cowbirds whether they are seeking food, water, shelter, companionship, and/or sex. Since female cowbirds lay the eggs, they are the primary targets of trapping programs. Males are also important as they may participate in egg removal and host nest destruction activities, and are required to fertilize each egg before it is laid. The sex ratio of the at-large cowbird population is assumed to be 1:1. The goal of trapping programs is to capture as many females as possible and achieve a capture sex ratio at or below 1:1.

Male cowbirds are more active and vocal (attractive as decoys) when at least 2 are present; female cowbirds are more likely to enter traps containing more females than males (GWB 1992). Therefore, at least 2 male and 3 female decoy cowbirds are utilized in each trap (and often 3m/5f).

The capture of non-target birds (non-cowbirds) is undesirable yet unavoidable. Many non-target birds are less hardy than cowbirds. To reduce non-target captures, the capture slot is only 1 3/8 inches wide (large enough for cowbirds, small enough to exclude many non-target species), 1-inch hardware cloth is used for the trap panels (small enough to contain cowbirds yet large enough to allow smaller species to exit), a large number of decoys is used, and bait seed without sunflower seed is utilized (sunflower seed attracts some non-target species but not cowbirds; cowbirds prefer millet). To reduce non-target mortality, the traps are checked daily and non-target species are handled with care and released immediately. Some predation by hawks, owls, and snakes, and some mortality from intraspecific competition within the traps (particularly among towhees) is inevitable. The goal of trapping programs is to achieve 0% non-target species mortality; rates above 2% are considered unacceptable and indicative of poorly managed programs (GWB 1992).

Male cowbird interacts with decoys before entering trap.

Cowbirds foraging for seed and insects at a dairy.

Cowbird Trapping at Big Tujunga

The cowbird control project at Big Tujunga Wash Mitigation Area (Mitigation Area) was initiated in 2001 and performed in 2001-2006 and 2009-2015. Its purpose is to enhance reproductive success among the least Bell's vireo and other host species by decreasing or eliminating cowbird brood parasitism by removing cowbirds from riparian habitat.

Cowbird traps have also been operated immediately downstream at Hansen Dam Basin in 1996, 1997, and 2001-2015 (GWB 2015), and immediately upstream of Interstate 210 at Angeles National Golf Course in 2008-2015 (GWB 2015a).

STUDY AREA

The Mitigation Area is located in the northwestern portion of the Los Angeles basin in Los Angeles County, California (Figure 1). The site has a typical Mediterranean climate with warm, dry summers and cool, wet winters. The wash supports healthy stands of high-quality willow-dominated habitat of the type preferred by the least Bell's vireo and southwestern willow flycatcher. Some coastal sage scrub of the type preferred by the California gnatcatcher is found in the wash and surrounding hills.

A growing population of least Bell's vireo is found immediately downstream within the Hansen Dam Basin. In 2009 (the last known full survey), 44 sites occupied by vireos (39 pairs, 5 single males) were detected within the Hansen Dam Basin (GWB 2009). Vireos are expanding their range slightly upstream from the basin, but are not known to have occupied the Big Tujunga Wash study area (upstream of the Hansen Dam Stables and downstream of I-210).

A complete natural history of the study area is available in Big Tujunga Wash Master Mitigation Plan (Chambers Group, Inc 2000).

METHODS

Four cowbird traps were placed, activated, operated, serviced, disassembled, and stored per the *Brown-headed Cowbird Trapping Protocol* (GWB 1992, updates) and state and federal permit requirements (Figure 2, Figure 3). Trap 1 (Hansen Dam Stables), Trap 3 (just outside Gibson Ranch), and Trap 4 (Gibson Ranch) were in foraging areas. Trap 2 and Trap 3 were within the Big Tujunga Wash Mitigation Area within coastal sage habitat and adjacent to riparian habitat. The traps were placed, assembled, and activated on March 30, then operated until June 29 (92 days, 13 weeks).

Each trap is 6 feet wide, 8 feet long, and 6 feet tall, with a 1 3/8 inch wide capture slot on top through which cowbirds can drop down and in but cannot fly up and out. The traps include: 1 floor, 2 side, 2 end (door and back), and 2 top panels, and a plywood slot board.

Transporting cowbird trap panels to the trap site.

Cowbird trap placed and "flowered" for easy assembly.

Each trap was aligned in the field on a north-south axis. A foraging tray was placed on the front portion of the floor panel centered under the capture slot. Four perches made of dead giant reed or ½" diameter dowel were installed in each trap: one in each trap corner at chest height (except above the door) and one in a rear corner at knee height (for subordinate birds). A warning/ informational sign was stapled to the front of each trap (Appendix 1). Shade cloth was applied to the west-facing side panel. Finally, a one-gallon water guzzler, approximately 1 lb of sunflower-free wild birdseed (on the foraging tray), and live decoy cowbirds were added to each trap, and the trap was locked.

Each trap contained the minimum preferred 2 male/ 3 female live decoys as of April 2, and 3 males/ 5-6 females as of April 10 and subsequently. The right primary wing feathers of each female decoy were kept clipped to ensure their demise upon accidental release or escape. Most of the live decoys used to stock the traps in the early season were captured off-site.

Trap assembly supplies.

Bait seed ready to be added through the capture slot.

Shade cloth on the west-facing panel.

Adding live decoy cowbirds to trap from transport cage.

Unclipped wing.

Clipped wing.

The traps were serviced daily from March 30 to June 29. Daily servicing consisted of releasing all non-target birds, adding bait seed, adding water and/or cleaning the water guzzler as needed, wing-clipping newly captured female cowbirds, adding or removing decoy cowbirds to maintain the preferred decoy ratio, repairing or replacing the perches, foraging pad, sign, shade cloth or lock as needed, repairing damage from vandals, if any, and recording all activities on a data sheet. Data sheets were submitted daily to the task manager. The traps were deactivated, disassembled, and transported to off-site storage at the end of June.

The number of cowbirds removed is a net number calculated by subtracting from the gross number of cowbirds captured: the number of banded cowbirds released, cowbirds released by vandals, cowbirds accidentally released, and unexplained missing decoy cowbirds. Negative numbers indicate decoy cowbirds released by vandals. Captured cowbirds not utilized as decoys were euthanized with carbon monoxide and provided as forage to raptor rehabilitation/reintroduction facilities. A complete cowbird trapping protocol is available from Griffith Wildlife Biology (GWB 1992).

This project was performed under the authority of USFWS Federal Endangered Species Permit TE 758175-7 and a Letter Permit from the California Department of Fish & Wildlife. The Principal Investigator was J.T. Griffith. The Project Manager was J.C. Griffith. The Trap Technicians were M. Birney, J.C. Griffith, J.T. Griffith, and K. Griffith.

RESULTS

Ninety (90) cowbirds were removed in 2015, including 48 males, 41 females, and 1 juvenile (Table 1, Table 2). The male: female capture ratio was 1.17:1. No banded cowbirds or other banded birds were captured. The first cowbirds (3 males, 3 females) were captured in Trap 4 on 3 April. As is typical, most of the adult cowbirds were captured as they traveled through or dispersed into the study area early in the season. During Weeks 1-7 (30 March – 19 May; 54% of the trapping period), 35/48 males (73%) and 40/41 females (98%) were removed (Figure 4).

All trap sites except Trap 2 (-3 males, 1 female, 0 juveniles) performed well and should be utilized in 2016. Trap 4 captured the most males (22) and females (18).

In addition to cowbirds, 163 non-target birds of 5 species were captured, of which all but 3 (1.8%) were released unharmed (Table 3). The mortality was caused by intraspecific competition within the traps between adult California towhees (*Melozone crissalis*). The total includes the multiple capture, release, and recapture of a smaller number of individuals. No sensitive or endangered, threatened, or candidate non-target species were captured. No decoy or non-target birds died due to lack of food or water, or because of unclean conditions.

Trap 2 was vandalized twice in 2015. On 18 April, a large section (roughly 2'x2') of mesh was cut from the side panel; 2 males escaped. On 26 May, the mesh on a top panel was cut and 3 males escaped. In both cases, the traps were repaired immediately and no trap days were lost. Also in both cases, although the decoy males were not banded, the same number of males released were captured in Trap 1 and Trap 3 the day of or the day after the vandalism.

The traps were operational for 368 (4 traps x 92 days) of the 364 (4 traps x 91 days) contracted trap days (101%).

The time spent at each trap each day, exclusive of travel time, ranged from 5 minutes to 60 minutes depending upon: the number of cowbirds and non-target birds captured and released, the number of live decoy transfers necessary to maintain the proper decoy ratio, the number of water guzzlers scrubbed, the number and severity of vandalism events, and other variables.

DISCUSSION AND CONCLUSIONS

The number of cowbirds removed in 2015 (48 males, 41 females, 1 juveniles = 90) is solidly within the range of 2001-2015 numbers: males r= 9-103 avg 55.46; females r= 11-111 avg 55.31; juveniles r= 0-18 avg 4.08. It is good to be reminded that the objective of cowbird trapping is to reduce or eliminate brood parasitism among targeted host species, not (necessarily) to capture large numbers of cowbirds. If the latter were the primary goal, traps would be operated only at dairies and stables (where large numbers of cowbirds can be captured, with little effect on parasitism rates) and not along the river (where cowbird density is low, but where the females captured are those breeding in the immediate area). The Mitigation Area foraging area traps are immediately adjacent to the riparian habitat, so their captures are hugely impactful.

The removal of 41 females in 2015 precluded up to 1,640-2,460 parasitism events (40-60 eggs per female) allowing the production of as many as 6,560-9,840 songbird young (4 per otherwise parasitized nest) in the study area. Because not all parasitism events are viable and not all cowbird eggs are laid in the nests of small hosts, the actual numbers of cowbird eggs and songbird young are likely much lower but still significant.

Locally raised cowbirds are easily and quickly captured after fledging, and are therefore good indicators of the efficacy of a trapping program. Only 1 juvenile was removed in 2015, indicating that cowbird parasitism was essentially eliminated in the study area in 2015.

Topical trapping reduces/ eliminates brood parasitism in a targeted area, to broad general benefit (Griffith and Griffith 2000). Annual topical trapping does not, however, reduce the regional cowbird population (if only because so few cowbirds are trapped in so few areas). If it did, the number of cowbirds captured each year would gradually decline, as would the need for cowbird control. However, the number of cowbirds removed each year has not declined over time. If cowbirds were not removed each year, the parasitism rate among hosts would return to pre-trapping levels.

In the absence of proven regional cowbird control, the Big Tujunga Wash Mitigation Area cowbird control project, which successfully removes the local cowbirds and reduces parasitism in the study area to near 0%, will be required indefinitely.

MANAGEMENT RECOMMENDATIONS

1. No changes in the number of traps (4), operation dates (April 1 to June 30), or operation protocol are recommended.

2. Trap 2, the sole (pure) riparian-area trap, has not performed well since 2012 (when it removed 2 males and 4 females). It also catches the most towhees and gets vandalized. We recommend moving the trap to the north side of the river in 2016, accessed off the south end of Wheatland Avenue.

LITERATURE CITED

California Department of Fish & Wildlife. 2011. California Natural Diversity Database List of Special Animals. January 2011 update.

Chambers Group, Inc. 2000. Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank. Unpublished report prepared for the County of Los Angeles Department of Public Works by Chambers Group Inc, Irvine, California.

Darley, J.A. 1983. Territorial behavior of the female Brown-headed Cowbird (*Molothrus ater*). Can. J. Zool. 61: 65-69.

_____. 1968. The Social Organization of breeding Brown-headed Cowbirds. Ph.D. Thesis, University of Western Ontario, London, Ontario.

Flahaut, M.R., and Z.M. Schultz. 1955. Northern Pacific Coast Region. Audubon Field Notes 9:395-397.

Friedmann, H. 1963. Host relations of the parasitic cowbirds. US Natl. Mus. Bull. 233. 273 pp.

Freidmann, H., and L. F. Kiff. 1985. The parasitic cowbirds and their hosts. Proc. West. Found. Zool. 2:226-304.

Gaines, D. 1974. A new look at the nesting riparian avifauna of the Sacramento Valley, California. Western Birds 5:61-80.

Goldwasser, S., Gaines, D., and S.R. Wilbur. 1980. The least Bell's vireo in California: a de facto endangered race. American Birds 34:742-745.

Griffith, J. T. and Griffith, J. C. 2000. Cowbird control and the endangered least Bell's vireo: a management success story. Pp. 342-356 *in* The Ecology and Management of Cowbirds and their Hosts. University of Texas Press, Austin, Texas.

Griffith Wildlife Biology (GWB). 2015 Orcas Park [Hansen Dam] brown-headed cowbird control program. Unpublished report prepared for the City of Los Angeles by Griffith Wildlife Biology, Calumet, MI.

_____. 2015a. 2015 Angeles National Golf Course brown-headed cowbird control program. Unpublished document prepared for ANGC, Sunland, CA, by Griffith Wildlife Biology, Calumet, MI

_____. 2014. 2014 Big Tujunga Wash Mitigation Area Brown-headed Cowbird Control Program. Unpublished report prepared for ECORP Consulting, Santa Ana, CA, by Griffith Wildlife Biology, Calumet, MI. [similar annual reports produced by GWB 2006-2012]

_____ 2009. The Status of the Least Bell's Vireo and Southwester Willow Flycatcher at Los Angeles County Drainage Areas [including Hansen Dam] in 2009. Unpublished report prepared for the United State Army Corps of Engineers, Los Angeles District, by Griffith Wildlife Biology, Calumet, MI.

_____. 1992 (updates). Brown-headed cowbird trapping protocol. Unpublished document prepared for the USFWS, CDFG, and internal use by Griffith Wildlife Biology, Calumet, MI.

Grzybowski, J.A. 1995. The black-capped vireo (*Vireo atricappilus*). *In* The Birds of North America 181 (A. Poole and F. Gill, eds). Academy of Natural Sciences, Philadelphia; American Ornithologist's Union, Washington D.C.

Holford, K.C. and D.D. Roby. 1993. Factors limiting fecundity of Brown-headed Cowbirds. Condor 95:536-654.

Raim, Arlo. 2000. Spatial Patterns of Breeding Female Brown-headed Cowbirds on an Illinois Site. Pp. 87-99 *in* The Ecology and Management of Cowbirds and their Hosts. University of Texas Press, Austin, Texas.

Robinson, S.K., S.I. Rothstein, M.C. Brittingham, L.J. Petit, and J.A. Grzybowski. 1995. Ecology and behavior of cowbirds and their impact on host populations. Pp. 428-460 *in* Ecology and Management of neotropical migratory birds (T.E. Martin and D.M. Finch, eds). Oxford University Press, New York.

Scott, D.M., and C.D. Ankney. 1983. The laying cycle of Brown-headed Cowbirds: Passerine Chickens? Auk 100:583-592.

Smith, J.N.M., and P. Arcese. 1994. Brown-headed Cowbirds and an island population of Song Sparrow: A 16-year study. Condor 96:916-934.

United States Fish & Wildlife Service (USFWS). 1998. Unpublished report. Draft recovery plan for the least Bell's vireo. Prepared for the USFWS, Portland, Oregon; Mar.

_____. 1995. Final Rule Determining Endangered Status for the Southwestern Willow Flycatcher. USFWS, Carlsbad Field Office.

_____. 1993. Determination of Threatened Status for the California Gnatcatcher. Federal Register 58: 16742.

_____. 1986. Determination of Endangered Status for the Least Bell's Vireo. Federal Register 60(38):10694. 43 pp.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. of Natural History, Memoir 13.

Weatherhead, P.J. 1989. Sex-ratios host-specific reproductive success, and impact of Brown-headed Cowbirds. Auk. 106:358-366.

Willett, G. 1933. Revised list of birds of SW California. Pacific Coast Avifauna. 21:1-203.

Figure 1. 2015 Big Tujunga Wash Mitigation Area brown-headed cowbird control project study area.

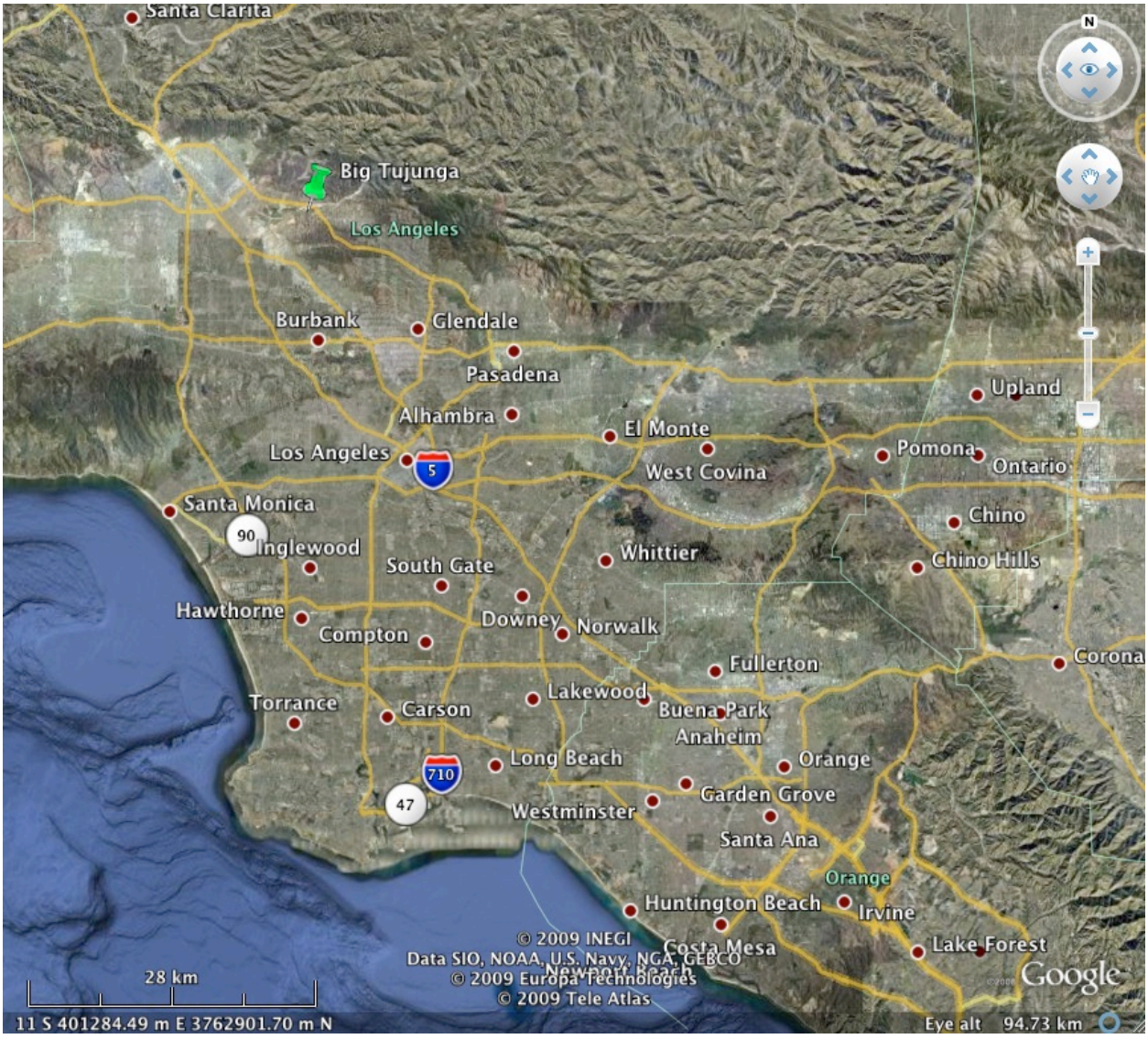


Figure 2. 2015 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 1 location.

Figure 3. 2015 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 2-4 locations.

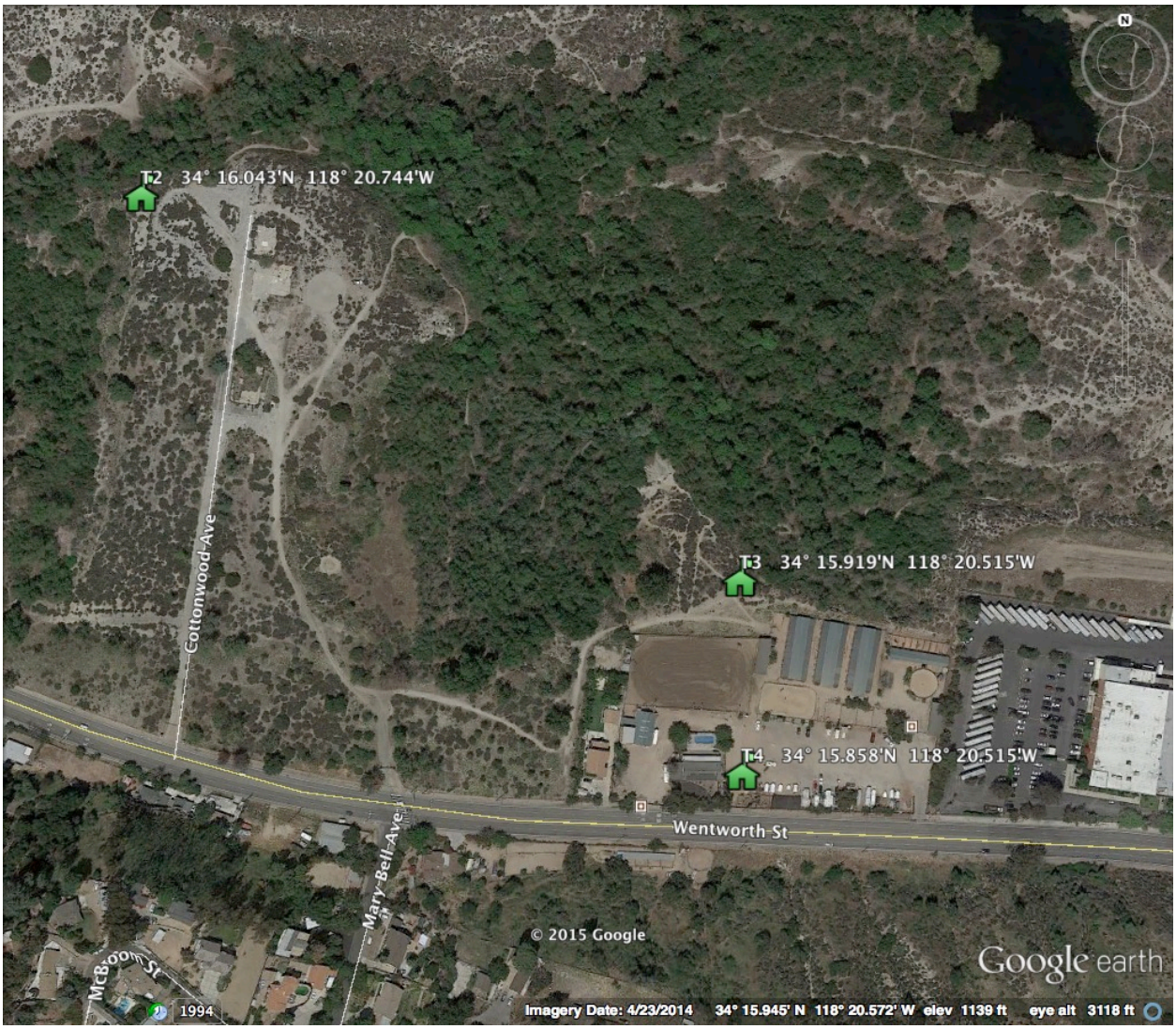


Figure 4. Number of male (M), female (F), and juvenile (J) cowbirds removed per week at and in the Vicinity of Big Tujunga Wash Mitigation Area in 2015.

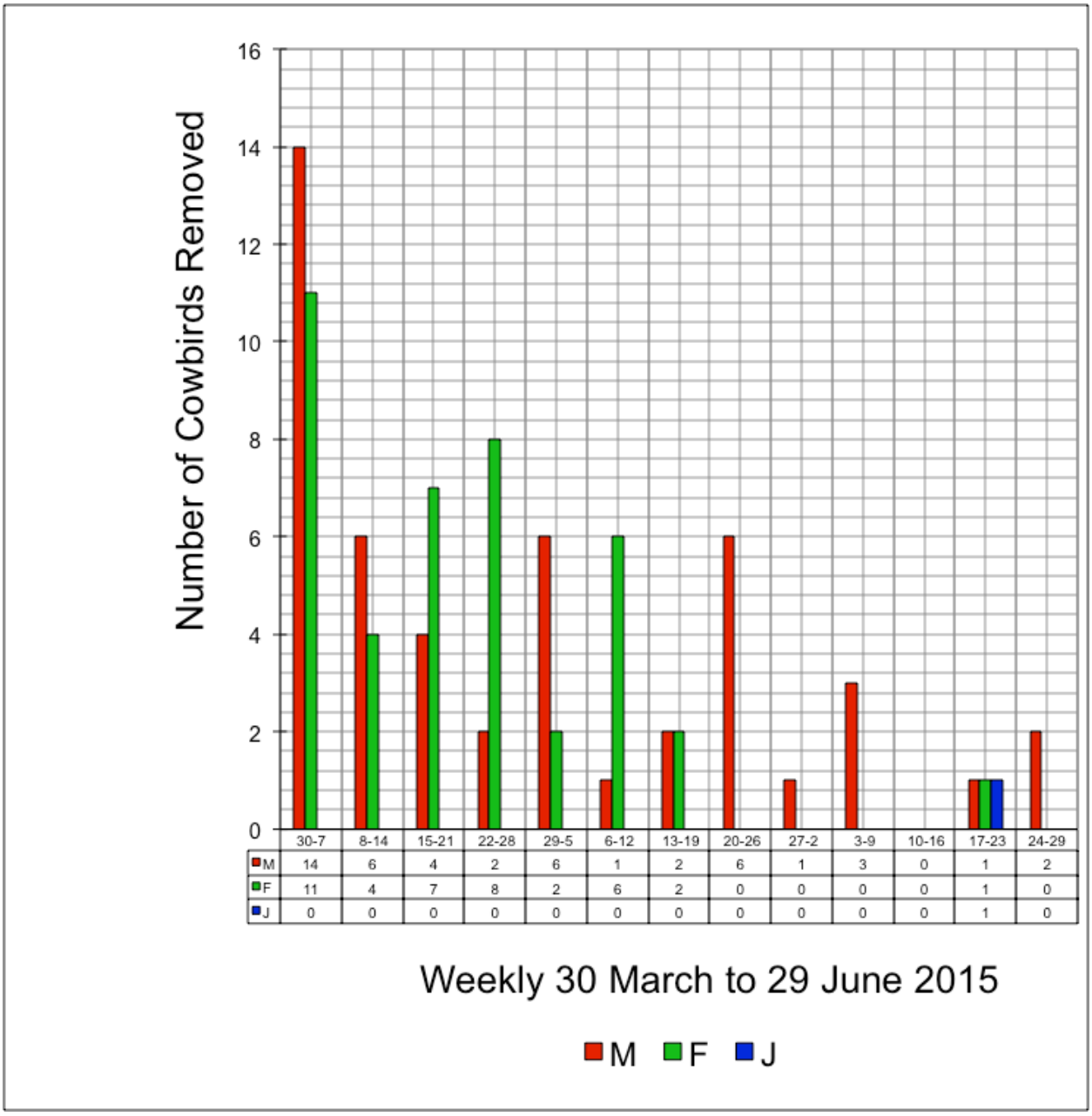


Table 1. Number of brown-headed cowbirds captured at and in the vicinity of Big Tujunga Wash Mitigation Area, 2001-2015.

Year	Number of Traps	Trapping Period	Number of Cowbirds Captured				Number Per Trap	M:F Ratio
			Male	Female	Juvenile	Total		
2001	7	3/15 - 7/15	37	24	9	70	10.00	1.54
2002	7	3/15 - 7/16	66	105	2	173	24.71	0.63
2003	7	3/15 - 6/19	9	11	0	20	2.86	0.82
2004	7	3/15 - 7/15	46	37	6	89	12.71	1.24
2005	7	3/30 - 8/1	53	66	18	137	19.57	0.80
2006	4	4/6 - 6/29	30	24	2	56	14.00	1.25
2009	4	4/1 - 6/30	78	111	3	192	48.00	0.70
2010	4	4/1 - 6/30	78	67	1	146	36.50	1.16
2011	4	4/1 - 6/30	103	99	9	211	52.75	1.04
2012	4	4/2 - 6/30	68	68	1	137	34.25	1.00
2013	4	4/1 - 6/30	54	42	1	97	24.25	1.29
2014	4	4/1 - 6/30	51	24	0	75	18.75	2.13
2015	4	3/30 - 6/29	48	41	1	90	22.50	1.17
TOTAL	67		721	719	53	1493	22.28	1.00
AVG	5.15		55.46	55.31	4.08	114.85	22.28	1.00

Table 2. Number of male (M), female (F), and juvenile (J) cowbirds captured per day, per week, per trap, and total at and in the vicinity of Big Tujunga Wash Mitigation Area in 2015.

Date		Trap 1			Trap 2			Trap 3			Trap 4			TOTAL		
		M	F	J	M	F	J	M	F	J	M	F	J	M	F	J
Apr	1													0	0	0
	2													0	0	0
	3										3	3		3	3	0
	4							1	2		2			3	2	0
	5				1			1	1		2			4	1	0
	6				1			2	2			3		3	5	0
	7							1						1	0	0
wk 1		0	0	0	2	0	0	5	5	0	7	6	0	14	11	0
	8													0	0	0
	9													0	0	0
	10							2				1		2	1	0
	11										1			1	0	0
	12							2	2					2	2	0
	13										1	1		1	1	0
	14													0	0	0
wk 2		0	0	0	0	0	0	4	2	0	2	2	0	6	4	0
	15													0	0	0
	16										1			1	0	0
	17							1	1					1	1	0
	18				-2				4					-2	0	4
	19	1						1						2	1	0
	20					1		1			1	1		2	2	0
	21													0	0	0
wk 3		1	0	0	-2	1	0	3	5	0	2	1	0	4	7	0
	22													0	0	0
	23								1					0	1	0
	24													0	0	0
	25								1					0	1	0
	26													0	0	0
	27		1						1			4		0	6	0
	28							1			1			2	0	0
wk 4		0	1	0	0	0	0	1	3	0	1	4	0	2	8	0
	29													0	0	0
	30							1			2			3	0	0
May	1		1					1						1	1	0
	2		1											0	1	0
	3							1						1	0	0
	4													0	0	0
	5	1												1	0	0
wk 5		1	2	0	0	0	0	3	0	0	2	0	0	6	2	0
	6													0	0	0
	7													0	0	0
	8								1			4		0	5	0
	9	1												1	0	0
	10													0	0	0
	11		1											0	1	0
	12													0	0	0
wk 6		1	1	0	0	0	0	0	1	0	0	4	0	1	6	0
	13		1											0	1	0
	14													0	0	0
	15													0	0	0
	16								1					0	1	0
	17	1												1	0	0
	18													0	0	0
	19	1												1	0	0
wk 7		2	1	0	0	0	0	0	1	0	0	0	0	2	2	0

Date		Trap 1			Trap 2			Trap 3			Trap 4			TOTAL		
		M	F	J	M	F	J	M	F	J	M	F	J	M	F	J
	20										1			1	0	0
	21	2												2	0	0
	22	2												2	0	0
	23													0	0	0
	24										2			2	0	0
	25													0	0	0
	26	2			-3									-1	0	0
wk 8		6	0	0	-3	0	0	0	0	0	3	0	0	6	0	0
	27													0	0	0
	28													0	0	0
	29										1			1	0	0
	30													0	0	0
	31													0	0	0
Jun	1													0	0	0
	2													0	0	0
wk 9		0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
	3													0	0	0
	4	1												1	0	0
	5										1			1	0	0
	6										1			1	0	0
	7													0	0	0
	8													0	0	0
	9													0	0	0
wk 10		1	0	0	0	0	0	0	0	0	2	0	0	3	0	0
	10													0	0	0
	11													0	0	0
	12													0	0	0
	13													0	0	0
	14													0	0	0
	15													0	0	0
	16													0	0	0
wk 11		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17										1			1	0	0
	18													0	0	0
	19											1		0	1	0
	20													0	0	0
	21													0	0	0
	22													0	0	0
	23									1				0	0	1
wk 12		0	0	0	0	0	0	0	0	1	1	1	0	1	1	1
	24													0	0	0
	25	1									1			2	0	0
	26													0	0	0
	27													0	0	0
	28													0	0	0
	29													0	0	0
	30													0	0	0
wk 13		1	0	0	0	0	0	0	0	0	1	0	0	2	0	0
TOTAL		**13**	**5**	**0**	**-3**	**1**	**0**	**16**	**17**	**1**	**22**	**18**	**0**	**48**	**41**	**1**

Negative numbers indicate decoy cowbirds released by vandals.

Table 3. Number of non-target species captured & released (C&R) or preyed upon (PU) in cowbird traps at and in the vicinity of Big Tujunga Wash Mitigation Area in 2015.

Species	Week 1		Week 2		Week 3		Week 4		Week 5		Week 6		Week 7	
	C&R	PU	C&R	PU	C&R	PU	C&R	PU	C&R	PU	C&R	PU	C&R	PU
CATO	9		7	1	5	1	8		6		7		7	
WCSP	1													
RWBL					1									
HOFI	3										2			
HOSP	1								6				5	
TOTAL	14	0	7	1	6	1	8	0	12	0	9	0	12	0

Species	Week 8		Week 9		Week 10		Week 11		Week 12		Week 13		**TOTAL**	
	C&R	PU	C&R	PU	C&R	PU	C&R	PU	C&R	PU	C&R	PU	**C&R**	**PU**
CATO	9		20	1	14		13		9		3		**117**	**3**
WCSP													**1**	**0**
RWBL													**1**	**0**
HOFI											1		**6**	**0**
HOSP	1		8				5		8		1		**35**	**0**
TOTAL	10	0	28	1	14	0	18	0	17	0	5	0	**160**	**3**

CATO California towhee
WCSP white-crowned sparrow
RWBL red-winged blackbird
HOFI house finch
HOSP house sparrow

Notes:

1. HOSP euthanized as required by permit; not counted as such here so as to not skew PU data.

2. Mortality caused by intraspecific competition within the traps by CATO.

Appendix 1. Warning/informational sign placed on cowbird traps at Big Tujunga Wash Mitigation Area in 2015.

PLEASE DO NOT DISTURB

ENDANGERED SPECIES MANAGEMENT PROGRAM

This trap is operated by GWB under authority of the U.S. Fish & Wildlife Service and the California Department of Fish & Wildlife. The purpose of the trap is to remove brown-headed cowbirds from the breeding habitat of endangered songbirds during the nesting season (April - July) to allow normal reproduction. Cowbirds are non-native, artificially abundant blackbirds. Cowbirds never build nests. Instead, they lay their eggs (one every other day for 80-120 days) in the nests of other birds (hosts). This is called brood parasitism. The host parents then raise a single cowbird; their own chicks are smothered. This trap contains live decoy male (shiny black body, brown head) and female (plain brown) cowbirds. THIS TRAP IS SERVICED DAILY to care for the decoy birds, release all non-cowbirds, and add fresh seed and water. Please do not interfere with the operation of this trap. For each female cowbird removed, up to 240 more native songbird young are raised in this area. If you have questions about the operation of this trap, please call 906.337.0782 or visit www.griffithwildlife.com

THANK YOU FOR YOUR COOPERATION

GRIFFITH WILDLIFE BIOLOGY

APPENDIX E

Exotic Plant Removal Memos and CDFW Notifications

Exotic Plant Removal Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

May 22, 2015
(2014-003.005/002/2)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: First Phase Memorandum for the Exotic Plant Removal (April 2015) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a documentation of the first phase exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during April 2015.

A pre-activity reconnaissance site visit and nesting bird survey was conducted on March 31, 2015 by ECORP Consulting, Inc. (ECORP) biologist Rebecca Valdez. This site visit was conducted to identify any sensitive biological resources (such as bird nests because the timing of the event occurred during the breeding bird season) and to identify areas with high densities of exotic plant species. Active bird nests were not documented within the weeding areas and sensitive resources were not observed during the pre-activity survey. Large areas of exotic plant species were flagged and recorded using a global positioning system (GPS) unit. These areas included re-growth of giant reed (*Arundo donax*), castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), and various other weeds and exotic plant species.

The removal of the invasive exotic plant species was conducted by ECORP's landscape contractor (Natures Image, Inc.) on April 1 and 2, April 8 through 10, and April 13 through 15, 2015. Prior to any work, all members of the landscape contractor crew received an onsite orientation and instruction on the Mitigation Area's regulations and concerns related to the area's sensitive species and habitat by the qualified biological monitor. ECORP biologists Amy Trost and Rebecca Valdez monitored exotic plant removal activities.

The removal effort began at the northern end of the Tujunga Ponds on April 1, 2015. The removal efforts were focused on removing species such as brome grasses (*Bromus* sp.), black mustard (*Brassica nigra*), castor bean, tree tobacco, giant reed, and various species of thistle from the understory (Figures 1 and 2). Large stands of exotic species were cut down using machetes and then sprayed with herbicide, while smaller solitary plants were either sprayed or pulled out by hand. One homeless encampment and a

rock with graffiti were discovered (Figures 3 and 4). The County of Los Angeles Department of Public Works (LACDPW) was immediately notified of the location of the encampment and vandalism via email.

The removal effort continued on April 2, 2014, with work continuing around Tujunga Ponds and in the western portion of Haines Canyon Wash. The main species of focus were black mustard, castor bean, giant reed, and brome grasses (Figure 5). Large stands of exotic species were cut down using machetes and then sprayed with herbicide, while smaller solitary plants were either sprayed or pulled out by hand.

Exotic plant removal activities continued on April 8, 2015, where the crews also used weed whackers and chainsaws to remove overgrown vegetation along the trails from the Cottonwood entrance, to the Ponds, and towards the South Wheatland Entrance (Figure 6). The main focus was overgrown non-native grasses, low-hanging branches, fallen branches, and poison oak encroaching on the trails. Trails maintenance activities (clearing existing trails, removing trash and debris, etc.) were also conducted on this day along the trails adjacent to Haines Canyon Creek, from Cottonwood Avenue to the Tujunga Ponds, and from Cottonwood to near the Wheatland south gate.

The removal activities continued on April 9, 2015 where the crews worked in the riparian area south of the Tujunga Ponds, spraying with herbicide and hand-pulling small stands of exotic plants. They continued to work along Haines Creek, where the crew walked along the edge of the creek targeting species such as giant reed, black mustard, and castor bean.

The crew continued to work along Haines Creek on April 10, 2015 from where they left off the day prior and moved toward the western edge of the Mitigation Area. Targeted species included black mustard, giant reed, and non-native thistle. The crew also used a weed whacker to open the trail from the creek crossing to the South Wheatland Entrance.

On April 13, 2015 the crew removed exotic plants in the western portion of Haines Canyon Wash. Targeted species included black mustard, non-native thistle, salt cedar (*Tamarisk* spp.), and castor bean. They used a weed whacker to clear the overgrown grasses and poison oak along the trail near the South Wheatland Entrance. The crew continued along the western end of the Mitigation Area, and sprayed herbicide along the trails from where they left off on April 8, 2015. They also removed the rock dam, garbage, and rope swing at the popular picnic area mentioned in previous memos. The crew completed the remainder of the trails maintenance in the riparian areas including from Cottonwood Avenue to the western border of the Mitigation Area. The main focus of the maintenance activities was removing and/or cutting fallen tree branches obstructing trails and posing a threat to equestrian users. Chainsaws and modified weed whackers were used to trim and/or remove trail obstructions. The crew also focused on closing unauthorized trails by using previously trimmed vegetation to block unauthorized trails (Figure 7).

On April 14, 2015 the crew used weed whackers in the upland areas from the Cottonwood Avenue entrance to Gibson Ranch to remove large stands of mustard and brome grasses (Figure 8). On April 15, 2015 the crew continued clearing black mustard in the upland areas near Cottonwood Avenue entrance using weed whackers and herbicide (Figure 9).

On April 1, 2015 cliff swallows (*Petrochelidon pyrrhonota*) were observed nesting in mud nests under Interstate 210 (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 376570E 3792520N). The crew did not encroach on the nests so a no-work buffer was not needed. On April 13, 2015 a common raven (*Corvus corax*) nest was observed (Figure 10). An adult raven was observed sitting on the nest with an incubating posture. The nest was located on a transmission tower (NAD 83, UTM 376316 E, 3792957 N). A 25-foot no work buffer was established around the nest. On April 9, 2015, a nest made of grasses was observed in a cottonwood tree (*Populus* sp.) approximately 75 feet above the ground (NAD 83, UTM 376418 E, 3792486 N). An adult bird was sitting on the nest in an incubating posture. Due to the dense vegetation in front of the nest tree and the height of the nest, a clear photograph could not be taken and the species of the bird could not be determined. A 100-foot no-work buffer was established around the nest.

During the exotic plant removal and maintenance activities, the following protocols were conducted to minimize disturbance to sensitive habitat and species:

- Nesting bird surveys were conducted prior to the start of the exotic plant removal effort and again on a daily basis by the biological monitors in specific areas the crews planned to work in prior to the start of any removal activities.
- Only water-soluble herbicide was used in areas within a 15-foot distance from all water sources. Water sources include Haines Canyon Creek, Tujunga Ponds, and any standing or ponded water. Outside of the 15-foot distance, oil-based and water-based herbicides were used.
- In the limited cases when the landscape contractor's crew members and ECORP biologists entered Haines Canyon Creek, crossings were made only at established creek crossings to minimize disturbance to sensitive habitat and species.

The second exotic plant removal effort is tentatively scheduled for the summer of 2015.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: Rebecca L Valdez DATE: May 22, 2015

Rebecca Valdez
Associate Biologist

Figure 1. Mustard and giant reed plants before removal.

Figure 2. Crew spraying brome grass.

Figure 3. Homeless encampment discovered on April 1, 2015.

Figure 4. Vandalism observed on April 1, 2015.

Figure 5. Crew spraying brome grasses.

Figure 6. Crew using a weed whacker to clear the trails of overgrown vegetation.

Figure 7. An unauthorized trail blocked with previously trimmed vegetation.

Figure 8. The Cottonwood Avenue entrance after being treated for exotic plants on April 14, 2015.

Figure 9. Crew using weed whacker to cut grasses and mustard.

Figure 10. Common raven nest on the left side of the transmission tower.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 19, 2015
(2014-003.005/002/2)

Melanie Morita
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Second Phase Memorandum for the Exotic Plant Removal (July and August 2015) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Morita:

This memorandum serves as a documentation of the second phase exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during July and August 2015.

A pre-activity reconnaissance site visit and nesting bird survey was conducted on July 24, 2015 by ECORP Consulting, Inc. (ECORP) biologist Amy Trost. This site visit was conducted to identify any sensitive biological resources (such as bird nests because the timing of the event occurred during the breeding bird season) and to identify areas with high densities of exotic plant species. Active bird nests were not documented within the work areas and sensitive resources were not observed during the pre-activity survey. Large areas of exotic plant species were flagged and recorded using a global positioning system (GPS) unit using North American Datum 1983 (NAD 83), Universal Transverse Mercator (UTM). These areas included re-growth of giant reed (*Arundo donax*), castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), and various other weeds and exotic plant species. During the survey, the biologist encountered an unidentified man carrying multiple cutting/trimming tools, including a chainsaw, axe, and Pulaski, near the northeast end of the Tujunga Ponds. He indicated that he was clearing vegetation from the trails to help eliminate hazards for recreational users. The biologist was uncomfortable by his presence and did not speak to him further. A shrub was discovered nearby that had been cut back (11S 376698 E, 3792680 N), presumably by the unidentified man.

The removal of the invasive exotic plant species was conducted by ECORP's landscape contractor (Natures Image, Inc.) between July 27, 2015 and August 3, 2015. Prior to any work, all members of the landscape contractor crew received an onsite orientation and instruction on the Mitigation Area's regulations and concerns related to the area's sensitive species and habitat by the qualified biological monitor. ECORP biologists Carley Lancaster, Amy Trost, and Rebecca Valdez monitored exotic plant removal activities.

The removal effort began in Haines Canyon Wash, south of the Tujunga Ponds, on July 27, 2015. The removal efforts were focused on removing species such as castor bean, brome grasses (*Bromus* sp.), black mustard (*Brassica nigra*), tree tobacco, and giant reed. Large stands of exotic species were cut down using machetes and then sprayed with herbicide, while smaller solitary plants were either sprayed or pulled out by hand. A dead Cooper's hawk was observed in Haines Canyon Wash (Figure 1). When the crew was finished in the wash they continued west into the adjacent riparian area.

The removal effort continued on July 28, 2015, with work continuing around the Tujunga Ponds and along Haines Canyon Creek. While spraying herbicide around the wash, two cottonwood trees were discovered that had been cut with a chainsaw, likely for firewood (11S 376567 E, 3792751 N and 11S 376474 E, 3792747 N). The cuts appeared to be less than a week old and the trees appeared to have been alive when cut (Figures 2 and 3). It is likely that the trees were cut by the man encountered during the pre-activity survey. A short while later, while spraying herbicide along Haines Canyon Creek, two additional trees were discovered that had been cut (11S 376331 E, 3792667 N and 11S 376273 E, 3792676 N). The cuts appeared to be older and the trees did not appear to have been alive when cut (Figures 4 and 5). These trees were likely cut by the unidentified man encountered during the pre-activity survey. Towards the end of the day, an area of trash dumping was observed off the side of the paved area near the Cottonwood Gate (11S 376102 E, 3792610 N; Figure 6).

Exotic plant removal activities continued along Haines Canyon Creek on July 29. A rock dam, which had been constructed with fake grass, was discovered within Haines Canyon Creek (11S 375255 E, 3792553 N; Figures 7 and 8). The fake grass was removed by the biologist but the rock dam was too large to be removed without further assistance. However, water was moving over the rocks. The County of Los Angeles Department of Public Works was immediately notified via email. When finished spraying herbicide along the creek, the crew sprayed along the southern fence line starting at the southwestern corner.

On July 30 the crew began spraying black mustard, giant reed, and tamarisk (*Tamarix* sp.) in the Big Tujunga Wash (Figure 9). When finished in Big Tujunga Wash, the crew moved to the Cottonwood Gate and sprayed along the fence line towards the Mary Bell entrance.

On July 31 the crew conducted trail maintenance activities by trimming encroaching vegetation with weed whackers, machetes, and clippers. The crew also trimmed poison oak which was beginning to encroach along the trail near the South Wheatland Entrance (Figure 10). Two areas of minor erosion were observed north of the horse ranch (11S 376403 E, 3792479 N and 11S 376556 E, 3792471 N; Figures 11 and 12).

Removal activities continued on August 3, 2015 where the crew used weed whackers in the upland areas from the Cottonwood Gate to Gibson Ranch to remove large stands of black mustard (Figure 13). A new horse circle was observed near the Mary Bell entrance (11S 376255 E, 3792354 N; Figure 14).

No bird nests were observed during this exotic plant removal effort.

During the exotic plant removal and maintenance activities, the following protocols were conducted to minimize disturbance to sensitive habitat and species:

- Nesting bird surveys were conducted prior to the start of the exotic plant removal effort and again on a daily basis by the biological monitors in specific areas the crews planned to work in prior to the start of any removal activities.
- Only water-soluble herbicide was used in areas within a 15-foot distance from all water sources. Water sources include Haines Canyon Creek, Tujunga Ponds, and any standing or ponded water. Outside of the 15-foot distance, oil-based and water-based herbicides were used.
- In the limited cases when the landscape contractor's crew members and ECORP biologists entered Haines Canyon Creek, crossings were made only at established creek crossings to minimize disturbance to sensitive habitat and species.

The third exotic plant removal effort is tentatively scheduled for the fall/early winter of 2015.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: September 19, 2015

Amy Leigh Trost
Associate Biologist

Figure 1. Dead Cooper's hawk observed in Haines Canyon Wash.

Figure 2. Cut tree #1 near Tujunga Ponds.

Figure 3. Cut tree #2 near Tujunga Ponds.

Figure 4. Cut tree #3 near Haines Canyon Creek.

Figure 5. Cut tree #4 near Haines Canyon Creek.

Figure 6. Trash dumping near Cottonwood Gate.

Figure 7. Rock dam constructed of rocks and fake grass in Haines Canyon Creek.

Figure 8. Rock dam after fake grass was removed.

Figure 9. Crew spraying in the Big Tujunga Wash.

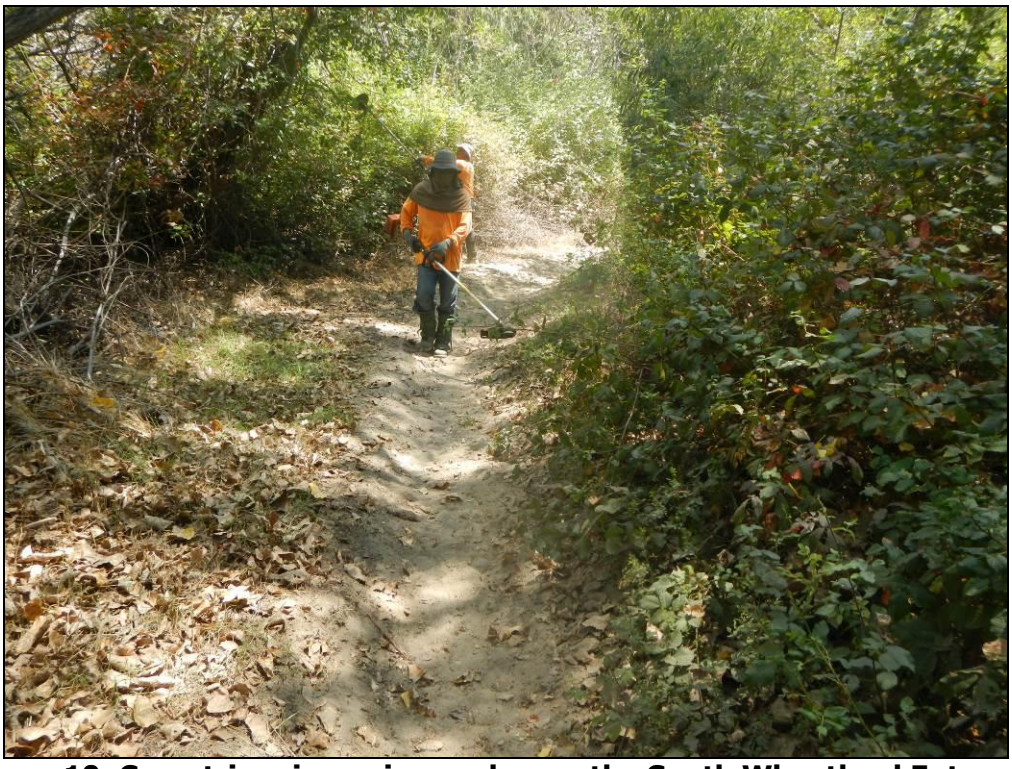


Figure 10. Crew trimming poison oak near the South Wheatland Entrance.

Figure 11. Minor erosion north of Gibson Ranch.

Figure 12. Second area of minor erosion north of Gibson Ranch.

Figure 13. Crew trimming black mustard near the Cottonwood Gate.

Figure 14. New horse circle near Mary Bell Entrance.

November 20, 2015
(2014-003.005/002/2)

Mayra Cabrera
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Third Phase Memorandum for the Exotic Plant Removal (November 2015) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Cabrera:

This memorandum serves as a documentation of the third phase exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during November 2015.

A pre-activity reconnaissance site visit was conducted on November 6, 2015 by ECORP Consulting, Inc. (ECORP) biologists Carley Lancaster and Benjamin Smith. This site visit was conducted to identify any sensitive biological resources and to identify areas with high densities of exotic plant species. Sensitive resources were not observed during the pre-activity survey. Large areas of exotic plant species were flagged and recorded using a global positioning system (GPS) unit using North American Datum 1983 (NAD 83), Universal Transverse Mercator (UTM). These areas included castor bean (*Ricinus communis*), re-growth of giant reed (*Arundo donax*), tree tobacco (*Nicotiana glauca*), and various other weeds and exotic plant species.

During the pre-activity survey, two small rock dams were observed just east of the South Wheatland entrance (11S 375401 E, 3792525 N; Figure 1). Another rock dam was discovered at the popular picnic area (noted in previous memos) located west of the South Wheatland entrance (11 S 375183 E, 3792579 N; Figure 2). This dam was noted during previous site visits and continues to be a problem in this area. A fallen tree was observed blocking the trail along Haines Canyon Creek near the western border of the Mitigation Area (11S 375209 E, 3792549 N; Figure 3). An area of erosion was noted at the top of the trail that leads from the cottonwood upland area down to Haines Canyon Creek (11S 376152 E, 3792642 N; Figure 4). This area of erosion has been noted and filled previously; however, it continues to be an issue.

The removal of invasive exotic plant species was conducted by ECORP's landscape contractor (Natures Image, Inc.) on November 9, 10, 12, 13, 16, and 17, 2015. Prior to any work, all members of the landscape contractor crew received an onsite orientation

and instruction on the Mitigation Area's regulations and concerns related to the area's sensitive species and habitat by the qualified biological monitor. ECORP biologists Carley Lancaster and Amy Trost monitored exotic plant removal activities.

The removal effort began on November 9, 2015. Due to the chance of light rain that day, the crew spent the day conducting trail maintenance activities by clearing the trails of all obstructions, including the downed tree that was observed during the pre-activity survey (Figure 5). Herbicide spraying was not conducted because of the light rain in the weather forecast.

On November 10 the crew sprayed exotic species around the Tujunga Ponds and began spraying in Haines Canyon Wash. The removal effort focused on castor bean due to the high numbers of the plant that germinated after the heavy rains in late summer/early fall. Brome grasses (*Bromus* sp.), black mustard (*Brassica nigra*), tree tobacco, and giant reed were also targeted.

The crew did not work on November 11, 2015 due to the Veteran's Day holiday. On November 12, 2015, the crew continued spraying in Haines Canyon Wash and moved into the riparian area south of the Tujunga Ponds (Figure 6). While monitoring, the biologist discovered a tree with cans hanging from a branch and a painting on the trunk (11 S 376402 E, 3792663 N; Figure 7). The crew began spraying and trimming weeds in the cottonwood upland area on November 13, 2015.

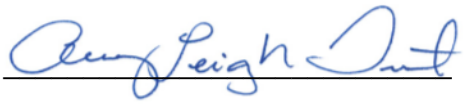
On November 16, 2015 the crew finished spraying and trimming weeds in the cottonwood upland area and began spraying along Haines Canyon Creek (Figure 8). During a recent meeting between LACDPW and ECORP, a tree was noted hanging over telephone lines near the Mary Bell Entrance (Figure 9). The biologist monitoring the exotic plant removal discussed trimming the tree with the crew's foreman and determined that the tree could not be trimmed that day and a tree trimming crew would be needed to remove the higher branches. The landscape contractor crew is not authorized to trim any branches above 12 feet off the ground. Furthermore, because the branches were on the other side of the fence, traffic would need to be diverted along Wentworth Street. On November 17, 2015 the crew finished spraying along Haines Canyon Creek, concluding the exotic plant removal efforts for 2015.

During the exotic plant removal and maintenance activities, the following protocols were conducted to minimize disturbance to sensitive habitat and species:

- Only water-soluble herbicide was used in areas within a 15-foot distance from all water sources. Water sources include Haines Canyon Creek, Tujunga Ponds, and any standing or ponded water. Outside of the 15-foot distance, oil-based and water-based herbicides were used.
- In the limited cases when the landscape contractor's crew members and ECORP biologists entered Haines Canyon Creek, crossings were made only at established creek crossings to minimize disturbance to sensitive habitat and species.

No additional exotic plant removal efforts are scheduled for 2015 and the next exotic plant removal effort will be in 2016.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED:  DATE: November 20, 2015

Amy Leigh Trost
Associate Biologist

Figure 1. Two small rock dams in Haines Canyon Creek east of the South Wheatland entrance.

Figure 2. Rock dam at the popular picnic area.

Figure 3. Tree fallen over trail near western border of the Mitigation Area.

Figure 4. Erosion near the cottonwood upland area.

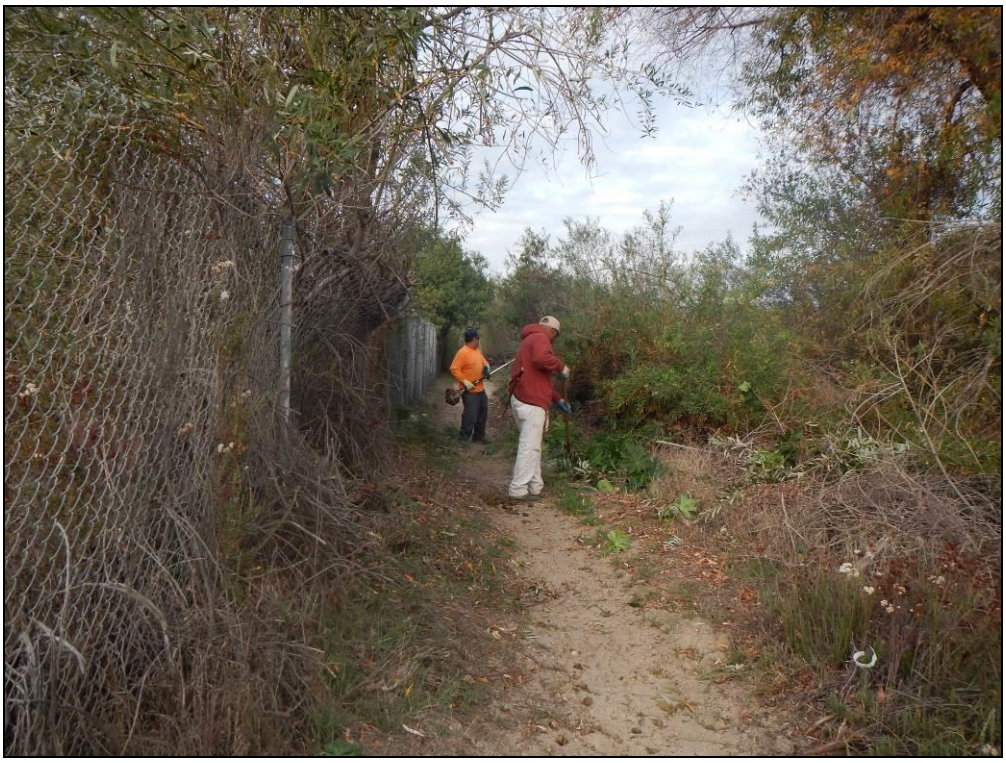


Figure 5. Crew trimming vegetation back from the edge of the trails.

Figure 6. Patch of large castor bean that was cut and sprayed.

Figure 7. Tree with hanging cans and painting along Haines Canyon Creek near the Tujunga Ponds.

Figure 8. Crew spraying castor bean along Haines Canyon Creek.

Figure 9. Tree hanging over wires near Mary Bell Entrance.

CA Department of Fish and Wildlife Notifications

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

March 25, 2015
(2014-003.005/002/2)

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 (Sent via email to matthew.chirdon@wildlife.ca.gov)

Dear Mr. Chirdon:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning April 1, 2015 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 plant species will need to be removed. This pre-activity survey will take place on March 31, 2015. The locations of all sensitive biological resources that are found will be identified using a Global Positioning System (GPS) unit and areas that will require maintenance will also be identified using a GPS. If active bird nests are identified, then an appropriately-sized buffer will be established as a "no work" zone. A biological monitor will be on site during all site maintenance and exotic plant removal activities.

If you have any questions regarding the activities or the project in general, please contact me at (714) 648-0630.

Sincerely,

ECORP Consulting, Inc.

Mari Quillman

Mari (Schroeder) Quillman
Principal Biological Resources Program Manager

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

July 20, 2015
(2014-003.005/002/2)

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 (Sent via email to matthew.chirdon@wildlife.ca.gov)

Dear Mr. Chirdon:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning July 27, 2015 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 plant species will need to be removed. This pre-activity survey will take place on July 24, 2015. The locations of all sensitive biological resources that are found will be identified using a Global Positioning System (GPS) unit and areas that will require maintenance will also be identified using a GPS. If active bird nests are identified, then an appropriately-sized buffer will be established as a "no work" zone. A biological monitor will be on site during all site maintenance and exotic plant removal activities.

If you have any questions regarding the activities or the project in general, please contact me at (714) 648-0630.

Sincerely,

ECORP Consulting, Inc.

Kristen Wasz
Senior Biologist

1801 Park Court Place, Building B, Suite 103
Santa Ana, California 92701
Phone: (714) 648-0630
Fax: (714) 648-0935

Rocklin
Redlands
San Diego
Santa Ana

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

November 2, 2015
(2014-003.005/002/2)

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 (Sent via email to matthew.chirdon@wildlife.ca.gov)

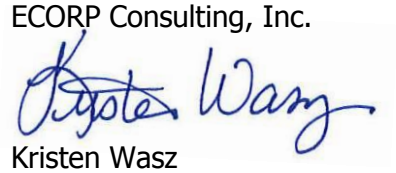
Dear Mr. Chirdon:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning November 9, 2015 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 plant species will need to be removed. This pre-activity survey will take place on November 6, 2015. The locations of all sensitive biological resources that are found will be identified using a Global Positioning System (GPS) unit and areas that will require maintenance will also be identified using a GPS. If any sensitive biological resource is identified during the survey, then an appropriately-sized buffer will be established as a "no work" zone. A biological monitor will be on site during site maintenance and exotic plant removal activities.

If you have any questions regarding the activities or the project in general, please contact me at (714) 648-0630.

Sincerely,

ECORP Consulting, Inc.



Kristen Wasz
Senior Biologist

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APPENDIX F

Exotic Wildlife Removal Memos and Report

Exotic Wildlife Removal Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

May 22, 2015
(2014-003.005/004/4)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: **First Phase Exotic Aquatic Species Removal Effort (March 2015) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**

Dear Ms. Yu:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds, Haines Canyon Creek, and Big Tujunga Wash to reduce their negative impacts on sensitive native species. These negative impacts on sensitive native species include, but are not limited to, the following: food and habitat competition, predation, and the potential to transmit harmful pathogens and parasites.

The exotic aquatic species removal effort took place March 23 through March 26, 2015. The primary species targeted during the removal effort were largemouth bass (*Micropterus salmoides*), American bullfrog (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*). ECORP fisheries biologists, Brian Zitt, Max Murray, Adam Schroeder, and Todd Chapman, conducted the removal effort which focused on removing exotic aquatic species from the Tujunga Ponds and Haines Canyon Creek. The Big Tujunga Wash did not contain any surface water, so removal efforts were not conducted in this location.

During this removal effort, eight gillnets of various lengths (100 to 500 feet) and monofilament mesh sizes (0.5- to 2-inch) were used in the Tujunga Ponds (four nets in the West Tujunga Pond and four nets in the East Tujunga Pond). The use of various mesh sizes targeted multiple size classes of exotic fishes. Two-person seine surveys were conducted in various pools throughout Haines Canyon Creek. Seventeen minnow traps were set in various locations in Haines Canyon Creek, and four turtle traps were set in the Tujunga Ponds (two traps in each pond). Visibility in the ponds was good, ranging from 5 to 10 feet, which allowed snorkeling and spearfishing surveys to be conducted. Bullfrog gigging surveys were conducted along the perimeter of the ponds and Haines Canyon Creek.

The exotic aquatic species captured and removed during this effort included 1 common carp (*Cyprinus carpio*), 8 western mosquitofish (*Gambusia affinis*), 59 green sunfish (*Lepomis cyanellus*), 12 bluegill (*Lepomis macrochirus*), 295 largemouth bass, 5 Mozambique tilapia (*Oreochromis mossambicus*), 1 American bullfrog, 346 red swamp crayfish, and 1 red-eared slider (*Trachemys scripta elegans*). There was no evidence of Mozambique tilapia breeding in the Tujunga Ponds; however, the presence of both males and females is a cause for concern that breeding could occur. ECORP biologists did observe and destroy several largemouth bass nests in the Tujunga Ponds during this removal effort. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during this removal effort.

Nineteen Santa Ana sucker (*Catostomus santaanae*), a federally listed (threatened) species and a California Department of Fish and Wildlife Species of Special Concern (CDFW SSC), and one arroyo chub (*Gila orcuttii*), a CDFW SSC, were observed in Haines Canyon Creek during these efforts. The biologists did not observe any other native aquatic species during these surveys.

Evidence of fishing in the Tujunga ponds and Haines Canyon Creek was prevalent in the form of discarded bait containers, fishing line, monofilament netting, and lures. Trash was also prominent throughout the Tujunga Ponds and Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, and clothing.

I hereby certify that the statements furnished above present the data and information required for this biological monitoring report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: May 22, 2015

Adam Schroeder
Fisheries Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

June 9, 2015
(2014-003.005/004/4)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: **Second Phase Exotic Aquatic Species Removal Effort (May 2015) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**

Dear Ms. Yu:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds, Haines Canyon Creek, and Big Tujunga Wash to reduce their negative impacts on sensitive native species. These negative impacts on sensitive native species include, but are not limited to, the following: food and habitat competition, predation, and the potential to transmit harmful pathogens and parasites.

The exotic aquatic species removal effort took place May 12 through May 14, 2015. The primary species targeted during the removal effort were largemouth bass (*Micropterus salmoides*), American bullfrog (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*). ECORP fisheries biologists, Brian Zitt, Max Murray, Adam Schroeder, and Todd Chapman, conducted the removal effort which focused on removing exotic aquatic species from the Tujunga Ponds and Haines Canyon Creek. The Big Tujunga Wash did not contain any surface water, so removal efforts were not conducted in this location.

During this removal effort, four gillnets of various lengths (100 to 500 feet) and monofilament mesh sizes (0.5- to 2-inch) were used in the West Tujunga Pond. The use of various mesh sizes targeted multiple size classes of exotic fishes. Twenty-six minnow traps were set in various locations in Haines Canyon Creek and four turtle traps were set in the West Tujunga Pond. Visibility in the ponds was good, ranging from 5 to 10 feet, which allowed snorkeling and spearfishing surveys to be conducted. Bullfrog gigging surveys were conducted along the perimeter of the ponds and Haines Canyon Creek.

The exotic aquatic species captured and removed during this effort included 1 goldfish (*Carassius* auratus), 7 western mosquitofish (*Gambusia affinis*), 28 green sunfish (*Lepomis cyanellus*), 35 bluegill (*Lepomis macrochirus*), 105 largemouth bass, 1 Mozambique tilapia (*Oreochromis mossambicus*), 1 American bullfrog, and 616 red swamp crayfish. There

was no evidence of Mozambique tilapia breeding in the Tujunga Ponds; however, the young-of the-year largemouth bass were observed in the ponds indicating spawning for other species had occurred in the ponds. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during this removal effort.

One Santa Ana sucker (*Catostomus santaanae*), a federally listed (threatened) species and a California Department of Fish and Wildlife Species of Special Concern (CDFW SSC) was observed in Haines Canyon Creek during these efforts. The biologists did not observe any other native aquatic species during these surveys.

Evidence of fishing in the Tujunga Ponds and Haines Canyon Creek was prevalent in the form of discarded bait containers, fishing line, monofilament netting, and lures. During morning trap checks on May 13, 2015 biologists encountered two men consuming alcoholic beverages who had been fishing from a canoe in the West Tujunga Pond. When the two men noticed the biologists approaching, they quickly discarded their catch (largemouth bass) back into the pond and released one of our turtle traps they had untied and carried across the pond. When approached, the two men collected their belongings and hiked back to their truck which was parked at the entrance gate off of Foothill Boulevard. The Los Angeles County Sheriff's Department was notified of this incident and arrived on scene shortly after, but the two men had already departed the area. County of Los Angeles Department of Public Works (LACDPW) was also notified.

Trash was prominent throughout the areas surrounding the Tujunga Ponds and Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, and clothing.

I hereby certify that the statements furnished above present the data and information required for this biological monitoring report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

SIGNED:_____ DATE: June 9, 2015

Max Murray
Fisheries Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

August 20, 2015
(2014-003.005/004/4)

Melanie Morita
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: **Third Phase Exotic Aquatic Species Removal Effort (August 2015) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**

Dear Ms. Morita:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds, Haines Canyon Creek, and Big Tujunga Wash to reduce their negative impacts on sensitive native species. These negative impacts on sensitive native species include, but are not limited to, the following: food and habitat competition, predation, and the potential to transmit harmful pathogens and parasites.

The exotic aquatic species removal effort took place August 10 through August 13, 2015. The primary species targeted during the removal effort were largemouth bass (*Micropterus salmoides*), American bullfrog (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*). ECORP fisheries biologists, Brian Zitt, Max Murray, and Adam Schroeder, conducted the removal effort which focused on removing exotic aquatic species from the Tujunga Ponds and Haines Canyon Creek. The Big Tujunga Wash did not contain any surface water, so removal efforts were not conducted in this location.

During this removal effort, 14 minnow traps were set in various locations in Haines Canyon Creek and 6 minnow traps were set in the West Tujunga Pond. One Fyke net was also set in the West Tujunga Pond. Visibility in the ponds was good, ranging from 5 to 10 feet, which allowed snorkeling and spearfishing surveys to be conducted. Two-person seining and dipnetting surveys were conducted in Haines Canyon Creek. Bullfrog gigging surveys were conducted along the perimeter of the ponds and in Haines Canyon Creek.

The exotic aquatic species captured and removed during this effort included 1 common carp (*Cyprinus carpio*), 9 western mosquitofish (*Gambusia affinis*), 44 green sunfish (*Lepomis cyanellus*), 24 bluegill (*Lepomis macrochirus*), 173 largemouth bass, 3

Mozambique tilapia (*Oreochromis mossambicus*), 5 American bullfrogs (1 adult and 4 tadpoles), and 168 red swamp crayfish. There was no evidence of Mozambique tilapia breeding in the Tujunga Ponds; however, young-of the-year largemouth bass were observed in the ponds and in Haines Canyon Creek, indicating spawning for other species had occurred. American bullfrog tadpoles found in the west pond indicate that breeding had occurred earlier in the year. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during this removal effort.

One southwestern pond turtle (*Actinemys pallida*), a California Department of Fish and Wildlife Species of Special Concern (CDFW SSC), was captured and released in the West Tujunga Pond during this effort. The biologists did not observe any other native aquatic species during these surveys.

Evidence of fishing in the Tujunga Ponds and Haines Canyon Creek was prevalent in the form of discarded bait containers, fishing line, lures, and baited hooks. Multiple fishermen were also observed during this effort and were told that fishing was not allowed in the Mitigation Area or the Tujunga Ponds. During the morning trap checks, ECORP biologists noticed that two minnow traps had been stolen from the locations where they were set in Haines Canyon Creek. ECORP biologists also noticed areas along Haines Canyon Creek with evidence that wood cutting had taken place. It appeared that someone had been using a chainsaw to cut down dead trees, possibly to make firewood.

Trash was prominent throughout the areas surrounding the Tujunga Ponds and Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, and clothing.

I hereby certify that the statements furnished above present the data and information required for this biological monitoring report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

SIGNED: DATE: August 20, 2015

Adam Schroeder
Fisheries Biologist

December 23, 2015
(2014-003.005/004/4)

Mayra Cabrera
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: **Fourth Phase Exotic Aquatic Species Removal Effort (October 2015) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**

Dear Ms. Cabrera:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds, Haines Canyon Creek, and Big Tujunga Wash to reduce their negative impacts on sensitive native species. These negative impacts on sensitive native species include, but are not limited to, the following: food and habitat competition, predation, and the potential to transmit harmful pathogens and parasites.

The exotic aquatic species removal effort took place October 12 through October 15, 2015. The primary species targeted during the removal effort were largemouth bass (*Micropterus salmoides*), American bullfrog (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*). ECORP fisheries biologists, Brian Zitt, Max Murray, Adam Schroeder, and Phil Wasz, conducted the removal effort which focused on removing exotic aquatic species from the Tujunga Ponds and Haines Canyon Creek. The Big Tujunga Wash did not contain any surface water, so removal efforts were not conducted in this location.

During this removal effort, 10 minnow traps were set in various locations in Haines Canyon Creek and four gill nets were set in the Tujunga Ponds (three in the east Tujunga Pond, and one in the west Tujunga Pond). One fyke net was also set in the west Tujunga Pond. Visibility in the ponds was good, ranging from 5 to 15 feet, which allowed snorkeling and spearfishing surveys to be conducted. Two-person seining, dipnetting, and spearfishing surveys were conducted in Haines Canyon Creek. Bullfrog gigging surveys were conducted along the perimeter of the ponds and in Haines Canyon Creek.

The exotic aquatic species captured and removed during this effort included 45 green sunfish (*Lepomis cyanellus*), 56 bluegill (*Lepomis macrochirus*), 198 largemouth bass, 2 American bullfrogs, 2 red-eared sliders, and 233 red swamp crayfish. Mozambique Tilapia were not captured or observed in the Tujunga Ponds during this effort; therefore, no evidence of breeding was observed. Young-of the-year largemouth bass and green sunfish were observed in the Tujunga Ponds and in Haines Canyon Creek, while young-of the-year bluegill were only observed in the Tujunga Ponds, indicating spawning for these species had occurred earlier in the year. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during this removal effort.

One Santa Ana sucker (*Catostomus santaanae*), a federally listed (threatened) species and a California Department of Fish and Wildlife Species of Special Concern (CDFW SSC) was captured and released while two-person seining, and an additional 8 Santa Ana sucker were observed in Haines Canyon Creek. One southwestern pond turtle (*Actinemys pallida*), a CDFW SSC, was observed in the west Tujunga Pond. The biologists did not observe any other native aquatic species during this effort.

Evidence of fishing in the Tujunga Ponds and Haines Canyon Creek was prevalent in the form of discarded bait containers, fishing line, lures, and baited hooks. One fisherman was observed during this effort and was informed that fishing was not allowed in the Mitigation Area or the Tujunga Ponds. On the morning of October 12, 2015, ECORP biologists observed a man with a chainsaw cutting wood beneath the Interstate 210 Freeway immediately outside the Mitigation Area. The Los Angeles County Sheriff's Department was notified of the observed activities. A vandalism report #915-00402-8337-261 was completed by Deputy Howard. While retrieving minnow traps from Haines Canyon Creek on October 15, 2015, ECORP biologists found red caution tape blocking off a section of creek, and one minnow trap had been removed from the water with a sign posted that read "Don't put trap here, ongoing tree felling study." The County of Los Angeles Department of Public Works (LACDPW) was notified immediately of both incidents.

Trash was prominent throughout the areas surrounding the Tujunga Ponds and Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, and clothing.

I hereby certify that the statements furnished above present the data and information required for this biological monitoring report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

SIGNED: DATE: December 23, 2015

Adam Schroeder
Fisheries Biologist

2015 Exotic Wildlife Removal Report

2015 Exotic Aquatic Species Removal Report for the Big Tujunga Wash Mitigation Area

Prepared for:

County of Los Angeles
Department of Public Works
900 S. Fremont Avenue
Alhambra, California 91803-1331

Prepared by:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
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(714) 648-0630

January 2016

CONTENTS

2015 Exotic Aquatic Species Removal Report for the Big Tujunga Wash Mitigation Area

1.0 INTRODUCTION 1
1.1 Location and Setting 2
1.2 Exotic Aquatic Species Ecology in Big Tujunga Wash Mitigation Area 6
2.0 METHODS 8
2.1 Sampling Methods 8
2.1.1 Fyke Net Trapping 8
2.1.2 Spearfishing Surveys 11
2.1.3 Dip-netting/Hand Capturing Surveys 11
2.1.4 Bullfrog Gigging Surveys 11
2.1.5 Two-person Seining Surveys 12
2.1.6 Minnow Trapping 12
2.1.7 Turtle Trapping 12
2.1.8 Gillnetting 13
2.2 Processing Protocol 13
3.0 RESULTS 14
3.1 Exotic Aquatic Species Captured in Haines Creek 14
3.2 Exotic Aquatic Species Captured in the West Pond 17
3.3 Exotic Aquatic Species Captured in the East Pond 17
3.4 Native Aquatic Species Incidental Captures and Observations 17
4.0 DISCUSSION 21
4.1 Problems Encountered During Removal 24
5.0 CONCLUSIONS AND RECOMMENDATIONS 26
6.0 REFERENCES 28

LIST OF FIGURES

Figure 1-1. Project Location 3
Figure 1-2. Project Area Watercourses 4
Figure 2-1. Exotic Aquatic Wildlife Species Sampling Locations 10

LIST OF TABLES

Table 3-1. Summary of Species Captured by Location and Removal Date, 2015 15
Table 3-2. Species Abundance Summary by Removal Method, Haines Canyon Creek, 2015 16
Table 3-3. Species Abundance Summary by Removal Method, West Tujunga Pond, 2015 18
Table 3-4. Species Abundance Summary by Removal Method, East Tujunga Pond, 2015 19
Table 3-5. Native Species Abundance Summary by Removal Method (Including Observations), 2015 20

LIST OF APPENDICES

APPENDIX A - Species Captured During the Exotic Aquatic Species Removal Efforts, 2015
APPENDIX B - Exotic Aquatic Species Removal Photographs, 2015

1.0 INTRODUCTION

The Big Tujunga Wash Mitigation Area (Mitigation Area) is an approximately 210-acre parcel located in the City of Los Angeles Sunland area. The Mitigation Area was purchased in 1998 by the County of Los Angeles Department of Public Works (LACDPW) to compensate for habitat loss from other LACDPW projects.

In 2000, a Master Mitigation Plan (MMP) was created for the Mitigation Area to serve as a five-year guide for implementation of various enhancement programs and to fulfill the California Department of Fish and Wildlife's (CDFW, formerly California Department of Fish and Game) requirement for the preparation of a management plan for the site (Chambers Group 2000). The MMP encompassed strategies to enhance and protect the existing habitat for fish and wildlife and to create additional natural areas that could be used by native wildlife and numerous user (recreational) groups. The ultimate goal of establishing the Mitigation Area was to provide for the long-term preservation, management, and enhancement of biological resources.

Implementation of the MMP initially began in August 2000, and a Long-term Management Plan (LTMP) is currently being developed. The LTMP provides a summary of the restoration actions and planning that has taken place since 2000 and sketches the outline for actions and planning efforts that will take the management of the Mitigation Area into the long-term maintenance phase in association with the goals of the site. Efforts to remove exotic aquatic species within the Mitigation Area have been implemented based on the site's MMP (Chambers Group 2000) and a draft Streambed Alteration Agreement (SAA) (#1600-2008-0253-R5) from CDFW on January 29, 2009. The SAA remained in effect through March 31, 2014. Since the expiration of the SAA, activities conducted at the Mitigation Area have been under the direct supervision of CDFW biologist Matthew Chirdon. In accordance with the LTMP, ECORP was contracted by LACDPW to continue the exotic aquatic species removal program in 2015 within the Mitigation Area.

Historically, all southern California coastal freshwater fishes have experienced population and environmental impacts as a result of habitat alteration and dewatering and thus are greatly reduced in both their distribution and abundances (Moyle 2002; Swift et al. 1993). These impacts are further compounded by the effects exotic aquatic species can have on native fish assemblages. One such native freshwater fish assemblage in southern California is the South Coast Minnow-Sucker fish community (Ellison 1984), which is known to occur in the Mitigation Area. This assemblage consists of the following native fishes: Santa Ana sucker (*Catostomus santaanae*), a federally listed (threatened) species and a CDFW Species of Special Concern (SSC) (USFWS 2000, CDFW 2015); Santa Ana speckled dace (*Rhinichthys osculus* spp. 3), a CDFW SSC; and arroyo chub (*Gila orcuttii*), a CDFW SSC. Compared to historical records, the current distribution for each of these species has been severely reduced. The Mitigation Area

provides an important refuge for these native fish populations from habitat alteration and dewatering. Additionally, the Mitigation Area is considered to be one of the last remaining locations in the Los Angeles River Drainage where these three species of fish can still be found (Swift et al. 1993).

The Mitigation Area currently provides suitable habitat for two sensitive reptile species, southwestern pond turtle (*Actinemys pallida*) and two-striped garter snake (*Thamnophis hammondii*). These species are both listed as CDFW SSC and are known to occur within the Mitigation Area. Historically, the Mitigation Area supported suitable habitat for federally listed, native amphibian species such as the arroyo toad (*Anaxyrus californicus*) and California red-legged frog (*Rana draytonii)*. In recent years there have been no observations of either of these amphibian species in the Mitigation Area. Arroyo toads are considered to be habitat specialists, relying on specific features associated with large rivers and wash systems in southern California (USFWS 2009). Habitat alteration through changes or manipulation of the hydroperiod, generally associated with damming and/or controlling upstream water releases, likely contributed to the absence of arroyo toad within the Mitigation Area. Likewise, the absence of California red-legged frog is likely attributed to competition and predation pressures associated with the introduction of the exotic American bullfrog (bullfrog; *Lithobates catesbeianus*) (Hayes and Jennings 1986; Kiesecker and Blaustein 1998).

The purpose of implementing this exotic aquatic species removal program in the Mitigation Area is to restore, create, and maintain suitable habitat for native aquatic species. The program focuses on the removal of exotic fishes, reptiles, amphibians, and invertebrates from all aquatic habitats using a suite of sampling techniques. This report provides the results of the exotic aquatic species removal efforts conducted at the Mitigation Area in 2015.

1.1 Location and Setting

The Mitigation Area is located in Big Tujunga Wash (Wash), just downstream of the Interstate 210 (I-210) freeway overcrossing, near the City of Los Angeles' Sunland community, Los Angeles County (Figure 1-1). The Mitigation Area is bordered on the north by I-210, on the east by I-210 and the Tujunga Ponds, and on the south by Wentworth Street. The western boundary is bordered by high voltage power lines crossing the Wash just upstream of Hansen Dam Park and Recreation Area. The Mitigation Area is located within a state-designated Significant Natural Area (LAX-018), and the biological resources are of local, regional, state, and federal significance (Safford and Quinn 1998; CDFW 2014).

The Mitigation Area contains two watercourses (Figure 1-2): The Wash and Haines Canyon Creek (Haines Creek), both of which are designated as critical habitat for Santa Ana sucker in the Los Angeles River basin (USFWS 2010). The Wash, located in the northern portion of the Mitigation Area, is a wide (greater than 98 feet [ft] or 30 meters [m]) partially-concrete lined tributary of the Los Angeles River. Water flow in the Wash originates from the Big Tujunga Dam

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_Location_2014.mxd (eck/KO)-mapping_guest 10/29/2015

Map Date: 10/20/2014
Source: ESRI

Figure 1-1. Project Location

2014-003.005 Big Tujunga Wash Mitigation Area

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Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2014\Tujunga_SiteOverview_2014.mxd (mapping_guest 10/29/2015)

Aerial Date: NAIP 2012
1/6/2015

Figure 1-2. Project Area Watercourses

2014-003.005 Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

(approximately 10.9 miles [mi] or 17.5 kilometers [km] upstream) and is dependent on controlled releases and from local rainfall. Flow is therefore intermittent, leaving it dry for large portions of the year. Haines Creek, located in the southern portion of the Mitigation Area, is a tributary that conveys water flow from Haines Canyon to the Wash. Water flow is perennial and is fed by groundwater and/or runoff from adjacent residential areas. Haines Creek and the Wash merge near the western boundary of the Mitigation Area and continue into the Hansen Dam Flood Control Basin, located approximately 0.5 mi (0.8 km) downstream of the site.

Haines Creek is a relatively narrow (less than 33 ft [10 m] width) and densely vegetated stream with flow originating from the East and West Tujunga Ponds (Ponds). The creek contains a variety of flow types, ranging from slow moving glides (less than 1.0 foot/second [ft/s] or 0.3 meters/second [m/s]) and pools (greater than 1.6 ft [0.5 m]), to fast-flowing riffles and runs (greater than 1.0 ft/s [0.3 m/s]) over a mix of substrates (i.e., boulder, cobble, gravel, sand, and fine sediment). The banks along the creek provide a diverse set of habitats, ranging from deep pools with overhanging vegetation and undercuts, to shallow (less than 1.6 ft [0.5 m]) sandy beaches which can be suitable for juvenile life stages of native fishes and amphibians. Haines Creek maintains a dense riparian buffer which provides an intact canopy cover throughout a majority of its course in the Mitigation Area. This canopy layer helps to keep dissolved oxygen levels and water temperatures stable during the warm summer months. This riparian buffer also provides a source of large woody debris, instream vegetation, and bank stability.

Water flowing into Haines Creek originates from underground springs that supply water directly into the Ponds. The Ponds are located adjacent to the northeast corner of the Mitigation Area and consist of two large interconnected bodies of water each being approximately 330 ft (100 m) across at their widest point. The Ponds are divided into three distinct water features: the West Pond, the Connector Channel, and the East Pond.

The West Pond lies adjacent to the I-210 freeway, approximately 200 ft (60 m) to the south, and connects directly to Haines Creek. The West Pond has a surface area of approximately 10,500 square feet (ft^2) or 3,200 square meters (m^2) providing a complex, heterogeneous space for many aquatic species. The water depths range from approximately 3 to 12 ft (0.9 to 3.7 m), and the substrate consists primarily of fine silts and sands in the middle of the West Pond with cobble and gravel areas along portions of the perimeter. The West Pond is oblong in shape with a relatively uniform and less convoluted bank. The banks are heavily lined with emergent and riparian vegetation that provide both submerged and overhanging habitat. Variations in algal and emergent aquatic plant growth along the banks fluctuate according to seasonal changes, contributing to the habitat complexity within the West Pond.

The Connector Channel is a 230-ft (70-m) long, narrow channel that connects the Ponds. This channel has a maximum width of 16 ft (5 m), with dense stands of emergent vegetation along both banks that extend into the channel leaving very little open water habitat. Water depths

range from approximately 2 to 5 ft (0.6 to 1.5 m), with the deepest point near the connection with the West Pond.

The East Pond lies adjacent to the I-210 freeway, approximately 210 ft (65 m) to the south. The East Pond has a surface area of approximately 10,800 ft^2 (3,300 m^2) and, like the West Pond, it also provides a diverse combination of aquatic habitats. Water depths in the East Pond range from approximately 2 to 12 ft (0.6 to 3.7 m) with substrates consisting mainly of fine silts and sands in the middle with cobble and gravel areas along portions of the perimeter. The banks are heavily lined with emergent and riparian vegetation that provide both submerged and overhanging habitat. Unlike the West Pond, the East Pond possesses more complexity along its banks with several shallow water coves.

In addition to the aquatic habitats within the Mitigation Area, a cement-lined drainage ditch, located between the equestrian trail and the I-210 freeway along the northeastern portion of the Ponds, also contains habitat for exotic aquatic species. This freeway drainage is located within the California Department of Transportation (Caltrans) easement just outside the Mitigation Area boundary/fence line. The freeway drainage is densely vegetated and holds water year-round. Although a chain-link fence is in place along the freeway drainage, several openings allow biologists access to survey for exotic aquatic species. Following periods of heavy rain, the water can spill over from the freeway drainage and flood the adjacent equestrian trail. Flooding of the equestrian trail provides a continuous wetted habitat from the Ponds to the freeway drainage, and gives exotic aquatic species (i.e., red swamp crayfish [*Procambarus clarkii*] and bullfrog) an opportunity to move from the freeway drainage into the Ponds.

Haines Creek and the Ponds are in fact part of the same watercourse, but when taking into consideration the ecological requirements of the South Coast Minnow-Sucker assemblage these two systems are extremely different in the amount of suitable habitat they can each provide for native fishes. Historically, perennial deep-water habitats (i.e., ponds and lakes) were uncommon in southern California and thus, this type of habitat is not well suited for native southern California fishes, in particular the South Coast Minnow-Sucker fish assemblage. This perennial deep water habitat does, however, favor the exotic aquatic species currently present within the Mitigation Area. The substrates within both Ponds provide excellent breeding areas for exotics such as largemouth bass (*Micropterus salmoides*) and other Centrarchid (sunfish) species. The heavily vegetated banks surrounding both Ponds provide refuge and forage areas for larval and juvenile life stages of exotic aquatic species. Due to the perennial nature of the Ponds, they will continue to act as a nursery where exotic aquatic species can produce offspring that could eventually move down into Haines Creek.

1.2 Exotic Aquatic Species Ecology in Big Tujunga Wash Mitigation Area

Favorable habitat conditions in the Ponds (i.e. clear, slow moving water; abundant vegetation; availability of prey items — both native and introduced) have allowed several exotic aquatic species to become established, either by deliberate introductions or by natural range

expansions from other locations. Furthermore, several of these species have persisted and proliferated due to the absence of natural predators and competitors. The presence of these exotic aquatic species in the Mitigation Area can have both direct and indirect negative effects upon the resident native species.

One of the most notable and predictable effects of exotic aquatic species on natives is direct predation of both adults and their young (Minckley et al. 1991). Largemouth bass spawn from late spring to late fall which coincides with the spawning periods for Santa Ana sucker, Santa Ana speckled dace, and arroyo chub. Largemouth bass are known to cease feeding during their spawning period, but in the weeks leading up to the spawn they feed voraciously in shallow water areas and along vegetated banks (Moyle 2002). There is, therefore, a high risk of predation on gravid female and mature male native fishes during the largemouth bass pre-spawning period. Following their spawn the threat resumes for both adult and juvenile native fishes when largemouth bass resume their normal feeding activities. Predation of Santa Ana sucker was first documented in October of 2007, when a Santa Ana sucker was discovered inside the stomach of a largemouth bass captured in Haines Creek (ECORP 2009).

Santa Ana sucker, Santa Ana speckled dace, and arroyo chub feed primarily on filamentous algae, crustaceans, insects, and detritus. Their diet places them in direct competition with many of the juvenile exotic fishes found within the Mitigation Area. Juvenile bluegill (*Lepomis macrochirus*) feed on algae and zooplankton; green sunfish (*Lepomis cyanellus*) feed on insects and zooplankton; western mosquitofish (*Gambusia affinis*) feed upon zooplankton, and juvenile largemouth bass feed on zooplankton and small aquatic invertebrates. Competition for food resources during the juvenile life stage can force a phenomenon known as "juvenile bottleneck," where interspecific competition between juveniles of various species can cause a reduction in overall recruitment that can adversely affect year-class strength (Traxler and Murphy 1995).

The transmission of pathogens or parasites by exotic aquatic species is another potential threat to native species (Moyle and Nichols 1973), especially in instances where these individuals are deliberately introduced from different waterways or regions. One example of this threat is the largemouth bass virus (LMBV), which is currently known to only affect the largemouth bass (Grant et al. 2003). Genetic variations within LMBV have been observed from various infected populations and these newly identified strains often manifest different symptoms within each affected population (Goldberg et al. 2003). This genetic variability suggests that although LMBV currently only affects largemouth bass, novel mutations of this virus could eventually pose a threat to native fishes.

2.0 METHODS

The 2015 removal of exotic aquatic species from the Mitigation Area was conducted over four removal efforts: March 23 through March 26 (effort one), May 12 through May 14 (effort two), August 10 through August 13 (effort three), and October 12 through October 15 (effort four). Removal efforts were conducted under the direction of ECORP biologist Brian Zitt, U.S. Fish and Wildlife Service (USFWS) 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-27460A-2). Since the Mitigation Area is home to several special-status species, sampling methods were selected and deployed in habitats with the lowest potential for impacting native species, especially during their spawning/breeding season. In addition to the exotic aquatic wildlife species removal efforts in Haines Creek, efforts were also made to remove rock dams and foot bridges when they were encountered.

2.1 Sampling Methods

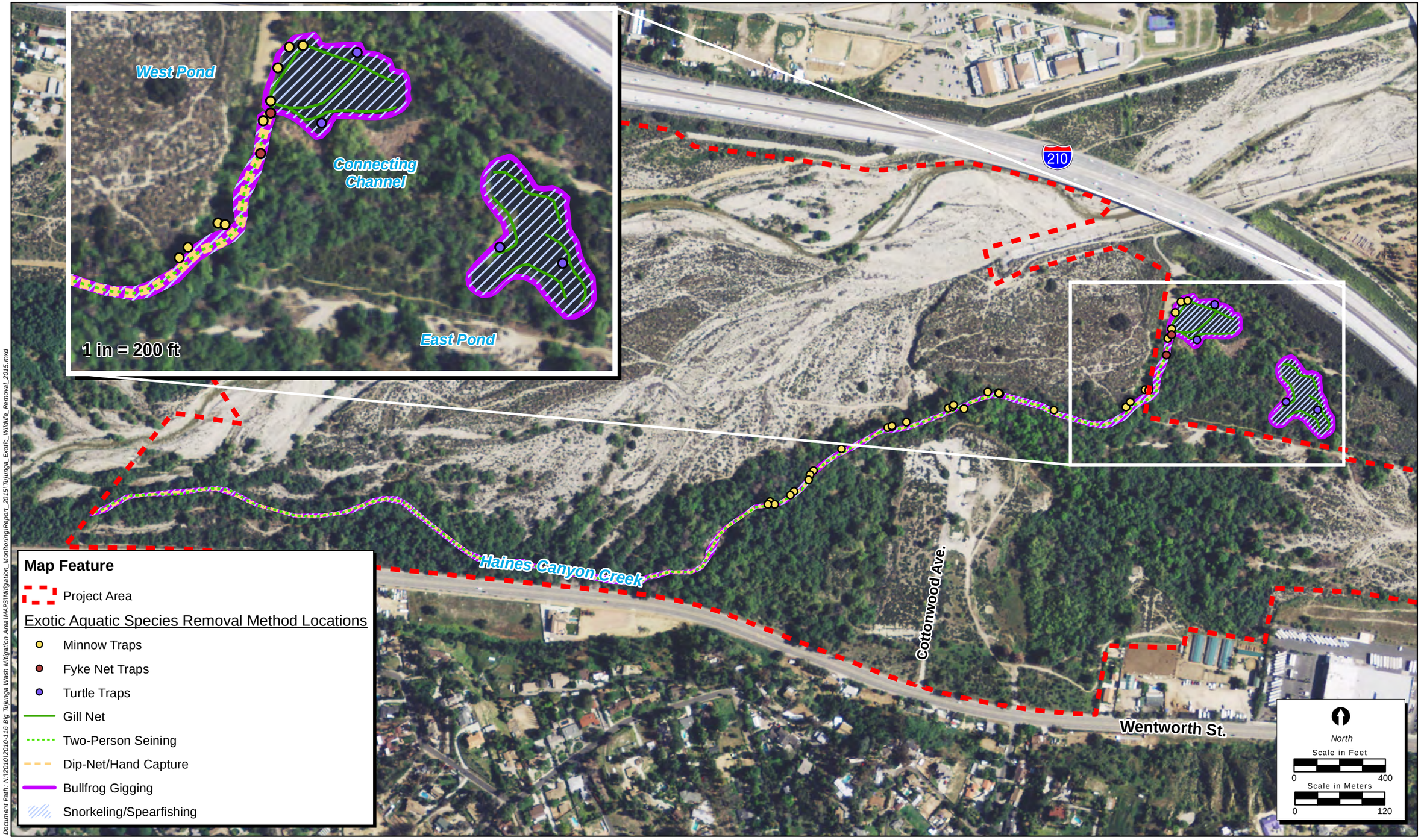
A wide range of sampling methods were used during the 2015 exotic aquatic species removal efforts, including fyke net trapping, spearfishing, dip-netting/hand capturing, bullfrog gigging, two-person seining, minnow trapping, turtle trapping, and gillnetting (Table 2-1). Prior to each removal effort, all potential sampling methods were evaluated for efficacy based upon the current site conditions and information derived from previous removal efforts. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the trap locations were often strategically deployed in areas that were inaccessible to the public. Sampling locations and the various sampling methods utilized during 2015 are shown in Figure 2-1. A description of each method used during the exotic aquatic species removal efforts is presented below.

2.1.1 Fyke Net Trapping

Fyke net traps are large hoop-style nets with detachable wings attached to the throat of the net. Each trap consisted of three steel frames (3.3 ft^2 [1.0 m^2]) wrapped with 0.25-inch (in) or 6.35-millimeter (mm) delta weave mesh, 15.0-ft (4.57-m) detachable wings (3.3-ft [1.0-m] high), and funnels (fykes) on the first, second, and third square frames. The wings provide the ability to block off channels or areas on either side of the trap, funneling fish to swim into the trap. Each trap was allowed to fish for a minimum of 12 hours prior to being checked, and was set with adequate head space to prevent mortality of incidentally captured animals (e.g., birds, turtles, etc.). A fyke net trap was set in the West Pond toward the confluence with Haines Creek in water depths ranging from 3.0 to 3.3 ft (0.9 to 1.0 m) for a total of eight days during removal efforts three and four.

Table 2-1. Sampling Methods Used by Date, Big Tujunga Wash Mitigation Area, 2015

Samplingl Location	Sampling Dates	Fyke Net Trapping	Spearfishing (Day)	Spearfishing (Night)	Dip-Netting / Hand Capture	Bullfrog Gigging	Two-Person Seining	Minnow Trapping	Turtle Trapping	Gillnetting
Haines Canyon Creek	March 23, 2015							X		
	March 24, 2015			X		X		X		
	March 25, 2015			X		X	X	X		
	March 26, 2015							X		
	May 12, 2015							X		
	May 13, 2015			X	X	X		X		
	May 14, 2015							X		
	August 10, 2015							X		
	August 11, 2015							X		
	August 12, 2015				X		X	X		
	August 13, 2015							X		
	October 12, 2015							X		
	October 13, 2015			X	X	X		X		
	October 14, 2015			X		X	X	X		
	October 15, 2015							X		
East Tujunga pond	March 23, 2015			X		X			X	X
	March 24, 2015			X		X			X	X
	March 25, 2015			X		X			X	X
	March 26, 2015								X	X
	August 10, 2015			X		X				
	October 12, 2015			X		X				X
	October 13, 2015		X	X	X	X				X
	October 14, 2015		X	X	X	X				X
	October 15, 2015									X
West Tujunga pond	March 23, 2015			X		X			X	X
	March 24, 2015		X	X		X			X	X
	March 25, 2015		X	X		X			X	X
	March 26, 2015								X	X
	May 12, 2015		X	X		X			X	X
	May 13, 2015		X	X		X			X	X
	May 14, 2015								X	X
	August 10, 2015	X	X			X		X		
	August 11, 2015	X	X	X		X		X		
	August 12, 2015	X	X		X		X	X		
	August 13, 2015	X	X					X		
	October 12, 2015	X	X	X		X				X
	October 13, 2015	X	X	X		X				X
	October 14, 2015	X	X	X		X				X
	October 15, 2015	X								X



Document Path: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2015\Tujunga_Exotic_Wildlife_Removal_2015.mxd

Aerial Date: NAIP 2012
11/3/2015

Figure 2-1. Exotic Aquatic Wildlife Species Sampling Locations

2014-003.005 Big Tujunga Wash Mitigation Area

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2.1.2 Spearfishing Surveys

Spearfishing was conducted while snorkeling, where surveyors used either banded spear guns or pole spear slings equipped with barbed, five-prong trident tips. Surveys were conducted in Haines Creek and the Ponds during the day and at night to target exotic fishes. When observed, sunfish nests were destroyed. These surveys provided biologists valuable insight into the current underwater habitat features, species-specific habitat preferences, and approximate locations of exotic aquatic species aggregations. Spearfishing was utilized as a sampling method for a total of 12 days/nights during all four removal efforts.

2.1.3 Dip-netting/Hand Capturing Surveys

Long handled dip-nets (0.12-in [3.00-mm] knotless nylon mesh) were used in the most appropriate habitats (e.g., undercut banks and areas containing overhanging vegetation) for capturing exotic aquatic wildlife species (i.e., red swamp crayfish, juvenile fishes, bullfrog tadpoles). This method was employed during the day in areas of Haines Creek where seining was limited due to accessibility and also at night in combination with bullfrog gigging and spearfishing surveys. Red swamp crayfish and bullfrogs are most active at night and are therefore more susceptible to being located and captured. The use of a light source (either a head and/or hand lamp) is the most effective way to locate and identify red swamp crayfish and bullfrogs because light directed into their eyes will reflect and thereby expose their location. Fish are generally inactive at night and easier to approach, which makes them more susceptible to being captured during night surveys. Although dip-nets are capable of sampling most habitats, it was sometimes necessary to capture some animals by hand during these surveys. Dip-netting/hand capturing surveys were used as a sampling method for four days during removal efforts two, three, and four.

2.1.4 Bullfrog Gigging Surveys

Bullfrog gigging surveys were conducted throughout Haines Creek and around the perimeter of the Ponds. These surveys focused mainly in areas where suitable habitat for bullfrog exists (pools and slow moving side channels with aquatic vegetation). Surveys were conducted at night with the use of a light source, when adult and juvenile bullfrogs are most active and more susceptible to being located and captured. Biologists searched systematically for bullfrog eye-shine by shining a light along the shoreline, the surface of the water, and any exposed banks. In open areas, biologists scanned the area ahead of them looking for any eye-shine before moving slowly through an area searching the bank habitat in a more detailed manner. Often times (during the breeding season) surveyors would listen for calls around open water areas, a technique which helped cue surveyors in on the location of breeding adults. Adult and juvenile bullfrogs were captured either by hand or with the use of pole spear slings equipped with barbed, five-prong trident tips. Bullfrog gigging surveys were used as a sampling method for a total of ten nights during all four removal efforts.

2.1.5 Two-person Seining Surveys

Two-person seining surveys were accomplished through the use of an un-bagged seine (0.12-in [3.00-mm]) (16-ft [5.0-m]) delta weave mesh mounted on poles within Haines Creek. Seines were generally hauled upstream or across pooled habitats and either pulled up out of the water or onto the banks. Seining was the preferred method used to sample slower moving waters lacking woody debris or heavy vegetation, and areas often too wide or deep for other sampling techniques to be effective. This method allows for the capture of large numbers of individuals while minimizing the potential for injury or mortality to native species. Two-person seining was used as a sampling method for a total of three days during removal efforts one, three, and four.

2.1.6 Minnow Trapping

Minnow traps are two-piece cylinders (16 in or 41 centimeter [cm] in height by 10 in [25 cm] in diameter) encased in 0.250-in (6.35-mm) wire mesh with 1.00-in (2.52-cm) diameter funnel openings at either end. Minnow traps were typically set in slow moving water under overhanging riparian vegetation and along undercut banks to target the following species: red swamp crayfish, bullfrog tadpoles, and young-of-the-year (YOY) fishes. Minnow traps were baited with an attractant (i.e. fish-flavored cat food), and secured to either the surrounding vegetation at various locations around the perimeter of the West Pond and in Haines Creek. Each trap was allowed to fish for a minimum of 12 hours prior to being checked. Minnow traps were used as a sampling method for a total of 15 days during all four removal efforts.

2.1.7 Turtle Trapping

Turtle traps are hoop-net traps 3.9 ft (1.2 m) in total length consisting of three steel rings (20 in [51 cm] in diameter), surrounded by 1.5-in (38-mm) knotted nylon mesh, with a single fingered throat on the first ring. The traps were retrofitted with notched wooden stakes to ensure full deployment, and accessory floats to provide sufficient buoyancy for the maintenance of an adequate head space to allow captured turtles room to breathe. Orientation of the traps was typically directed toward the most suitable habitat within a sampling area. Typically traps were set in pool habitat areas containing little to no flow, and water depths of at least (3.3 ft [1.0 m]). These floating traps were baited with cans of sardines and secured to the bank. The turtle traps were placed in both Ponds and checked daily following a period of at least 12 hours in the water. Four turtle traps were employed as a sampling method for a total of seven days during removal effort one and two.

2.1.8 Gillnetting

Gillnets are monofilament nets that sit vertically in the water column by means of a float line and a lead line. Fish swim into the net and become entrapped, usually at their gills. The mesh sizes vary from 0.4 to 3.9 in (1 to 10 cm) which allows for the capture of multiple size classes. Two different lengths of gillnet were deployed in the Ponds and the Connector Channel (98 ft [30 m] and 328 ft [100 m]). Gillnets were checked frequently during snorkeling and spearfishing surveys, with no more than eight hours between checks. Due to the entanglement hazard involved with gillnetting, bilingual signs were posted around the access points to inform the public to stay out of the water. Gillnets were used as a sampling method for 11 days during all removal efforts one, two, and four.

2.2 Processing Protocol

All of the animals captured were identified to species, enumerated, and examined for any observable health conditions (e.g., parasites, lesions, fin erosion) which were noted and recorded onto standardized data sheets. The first 30 individuals of a species captured by each sampling method at a location were measured to the nearest mm standard length (SL). All native aquatic species captured during the removal efforts were returned unharmed to their original point of capture. All exotic aquatic species captured were humanely euthanized and buried on site.

The locations of each sampling area and species encountered during the surveys were recorded using a handheld Geographic Positioning System (GPS) unit (Garmin 62st™ and 64st™) in Universal Transverse Mercator (UTM) coordinates, North American Datum 1983 (NAD83). Photographs were taken of representative individuals from each species captured, site locations, and sampling methods. Field notes regarding weather conditions and other habitat features were also recorded.

3.0 RESULTS

A total of 2,487 individuals were captured, consisting of ten exotic aquatic species (seven fishes, one amphibian, one reptile, and one invertebrate) and two native species during the 2015 removal efforts (Table 3-1). Of the total, 99.9 percent (number of individuals [n]=2,485) of the individuals captured were exotic and removed from the site. Haines Creek accounted for 62.4 percent of the total catch (n=1,552), while the remaining 37.6 percent were captured in other water features: West Pond (n=654) and East Pond (n=281). The four removal efforts resulted in the capture and removal of 1,363 red swamp crayfish, 771 largemouth bass, 176 green sunfish, 127 bluegill, 24 western mosquitofish, 9 Mozambique tilapia (*Oreochromis mossambicus*), 9 bullfrog (5 adults and 4 tadpoles), 3 red-eared slider (*Trachemys scripta elegans*), 2 common carp (*Cyprinus carpio*), and 1 goldfish (*Carassius auratus*). Additionally, three native species were captured or observed during the removal efforts (Santa Ana sucker [n=1 captured, n=28 observed], arroyo chub [n=1 observed], and southwestern pond turtle [n=1 captured, n=1 observed]).

A complete listing of all aquatic species captured during the 2015 sampling efforts is included in Appendix A. Appendix B contains representative photographs of species captured, site locations, and sampling methods. The results from each sampling location are provided in detail below.

3.1 Exotic Aquatic Species Captured in Haines Creek

A total of 1,552 individuals, consisting of seven exotic aquatic species were captured in Haines Creek during the 2015 removal efforts, including five fishes (goldfish, western mosquitofish, green sunfish, bluegill, and largemouth bass), bullfrog (adults) and red swamp crayfish (Table 3-2). Red swamp crayfish were the most abundant species captured, accounting for 85.2 percent (n=1,322) of the total catch at this location. Minnow trapping was the most effective method for capturing exotic aquatic species, accounting for 50.7 percent (n=786) of the exotic aquatic species captured at this location. Spearfishing efforts (night) accounted for 19.9 percent (n=308) of the exotic aquatic species, and dip-netting/hand captures accounted for 18.0 percent (n=280) of the exotic aquatic species captured in Haines Creek. Two-person seining accounted for 11.3 percent (n=176), and bullfrog gigging accounted for the remaining 0.1 percent (n=2) of the exotic aquatic species captured at this location.

Table 3-1. Summary of Species Captured by Location and Sampling Date, 2015

Sampling Locations	Sampling Dates	Exotic Species											Native Species		Total
		Goldfish	Common carp	Western mosquitofish	Green sunfish	Bluegill	Largemouth bass	Mozambique tilapia	American bullfrog adult	American bullfrog tadpole	Red-eared slider	Red swamp crayfish	Santa Ana Sucker	Southwestern pond turtle	
Haines Canyon Creek	March 23-26, 2015			8	31		38					345			422
	May 12-14, 2015	1		7	14	1	13		1			616			653
	August 10-13, 2015				36		25					133			194
	October 12-15, 2015				26		26		2			228	1		283
	Subtotal	**1**		**15**	**107**	**1**	**102**		**3**			**1,322**	**1**		**1,552**
West Tujunga pond	March 23-26, 2015		1		16	11	205	4	1		1				239
	May 12-14, 2015				14	34	92	1							141
	August 10-13, 2015			9	3	15	114	3	1	4		33 *		1	183
	October 12-15, 2015				9	27	55								91
	Subtotal		**1**	**9**	**42**	**87**	**466**	**8**	**2**	**4**	**1**	**33**		**1**	**654**
East Tujunga pond	March 23-26, 2015				12	1	52	1				1			67
	August 10-13, 2015		1		5	9	34					2			51
	October 12-15, 2015				10	29	117				2	5			163
	Subtotal		**1**		**27**	**39**	**203**	**1**			**2**	**8**			**281**
	Total	**1**	**2**	**24**	**176**	**127**	**771**	**9**	**5**	**4**	**3**	**1,363**	**1**	**1**	**2,487**

Table 3-2. Species Abundance Summary by Sampling Method, Haines Canyon Creek, 2015

Sampling Methods	Sampling Dates	Exotic Species							Native Species	Total
		Goldfish	Western mosquitofish	Green sunfish	Bluegill	Largemouth bass	American bullfrog adult	Red swamp crayfish	Santa Ana Sucker	
Spearfishing (Night)	March 23-26, 2015			7		28		163		198
	May 12-14, 2015	1			1	12		69		83
	October 12-15, 2015			8		19				27
	Subtotal	**1**		**15**	**1**	**59**		**232**		**308**
Bullfrog gigging	October 12-15, 2015						2			2
	Subtotal						**2**			**2**
Dip-netting / Hand Capture	May 12-14, 2015		7			1	1	168		177
	October 12-15, 2015							103		103
	Subtotal		**7**			**1**	**1**	**271**		**280**
Two-person seining	March 23-26, 2015		8	2		10		9		29
	August 10-13, 2015			34		24		79		137
	October 12-15, 2015			1		6		2	1	10
	Subtotal		**8**	**37**		**40**		**90**	**1**	**176**
Minnow trapping	March 23-26, 2015			22				173		195
	May 12-14, 2015			14				379		393
	August 10-13, 2015			2		1		54		57
	October 12-15, 2015			17		1		123		141
	Subtotal			**55**		**2**		**729**		**786**
	Total	**1**	**15**	**107**	**1**	**102**	**3**	**1,322**	**1**	**1,552**

3.2 Exotic Aquatic Species Captured in the West Pond

A total of 654 individuals, consisting of nine exotic aquatic species, were captured in the West Pond during the 2015 removal efforts, including six fishes (common carp, western mosquitofish, green sunfish, bluegill, largemouth bass, and Mozambique tilapia), bullfrog (adults and tadpoles), red-eared slider, and red swamp crayfish (Table 3-3). Largemouth bass was the most abundant species captured, accounting for 71.3 percent (n=466) of the total catch at this location. Combined, day and night spearfishing was the most effective method for removing exotic fishes, accounting for 68.3 percent (n=447) of the exotic aquatic species captured in the West Pond. Gillnetting accounted for 24.5 percent (n=160), while bullfrog gigging, two-person seining, minnow trapping, and hand capture efforts combined to account for the remaining 7.2 percent (n=47) of the exotic aquatic species captured at this location.

3.3 Exotic Aquatic Species Captured in the East Pond

A total of 281 individuals, consisting of seven exotic aquatic species, were captured in the East Pond during the 2015 removal efforts, including five fishes (common carp, green sunfish, bluegill, largemouth bass, and Mozambique tilapia), red-eared slider, and red swamp crayfish (Table 3-4). Largemouth bass was the most abundant species captured, accounting for 72.2 percent (n=203) of the total catch at this location. Combined, day and night spearfishing was the most effective method for removing exotic fishes, accounting for 72.6 percent (n=204) of the total catch. Gillnetting accounted for 26.7 percent (n=75), while hand capture accounted for the remaining 0.7 percent (n=2) of the total catch at this location.

3.4 Native Aquatic Species Incidental Captures and Observations

Sensitive native species were incidentally observed or captured during removal efforts one, two, and four in 2015 (Table 3-5). Santa Ana sucker was the most abundant native species with 28 individuals observed and one captured during these three efforts in Haines Creek. The single Santa Ana sucker was captured while two-person seining in Haines Creek downstream of the Cottonwood Avenue trail crossing during removal effort four. This individual was in good overall health and immediately released back into the Haines Creek. Only one arroyo chub was observed during removal effort one, and no Santa Ana speckled dace were observed or captured in Haines Creek in 2015. One adult male southwestern pond turtle was captured by hand in the West Pond during removal effort three, and was again observed during removal effort four. No native species were detected in the East Pond in 2015.

Table 3-3. Species Abundance Summary by Sampling Method, West Tujunga Pond, 2015

		Exotics Species										Native Species	
Sampling Locations	**Sampling Dates**	**Common carp**	**Western mosquitofish**	**Green sunfish**	**Bluegill**	**Largemouth bass**	**Mozambique tilapia**	**American bullfrog adult**	**American bullfrog tadpole**	**Red-eared slider**	**Red swamp crayfish**	**Southwestern pond turtle**	**Total**
Spearfishing (Day)	March 23-26, 2015	1			1	71							73
	May 12-14, 2015					28							28
	August 10-13, 2015				12	99	3						114
	October 12-15, 2015			1	7	39							47
	Subtotal	**1**		**1**	**20**	**237**	**3**						**262**
Spearfishing (Night)	March 23-26, 2015			8	2	81	1	1					93
	May 12-14, 2015			6	7	27							40
	August 10-13, 2015			3	3	15		1					22
	October 12-15, 2015			7	13	10							30
	Subtotal			**24**	**25**	**133**	**1**	**2**					**185**
Hand Capture	August 10-13, 2015											1	1
	Subtotal											**1**	**1**
Bullfrog gigging	August 10-13, 2015								1		28 *		29
	Subtotal								**1**		**28**		**29**
Two-person seining	August 10-13, 2015		9						3				12
	Subtotal		**9**						**3**				**12**
Minnow trapping	August 10-13, 2015										5		5
	Subtotal										**5**		**5**
Gill net	March 23-26, 2015			8	8	53	3			1			73
	May 12-14, 2015			8	27	37	1						73
	October 12-15, 2015			1	7	6							14
	Subtotal			**17**	**42**	**96**	**4**			**1**			**160**
	Total	**1**	**9**	**42**	**87**	**466**	**8**	**2**	**4**	**1**	**33**	**1**	**654**

*24 Red swamp crayfish were captured in the Freeway Drainage

Table 3-4. Species Abundance Summary by Sampling Method, East Tujunga Pond, 2015

Sampling Method	Sampling Dates	Exotic Species							Total
		Common carp	Green sunfish	Bluegill	Largemouth bass	Mozambique tilapia	Red swamp crayfish	Red-eared slider	
Spearfishing (Day)	October 12-15, 2015			2	38				40
	Subtotal			**2**	**38**				**40**
Spearfishing (Night)	March 23-26, 2015		10	1	42				53
	August 10-13, 2015	1	5	9	34		2		51
	October 12-15, 2015		7	13	35		5		60
	Subtotal	**1**	**22**	**23**	**111**		**7**		**164**
Hand Capture	October 12-15, 2015							2	2
	Subtotal							**2**	**2**
Gill net	March 23-26, 2015		2		10	1	1		14
	October 12-15, 2015		3	14	44				61
	Subtotal		**5**	**14**	**54**	**1**	**1**		**75**
Total		**1**	**27**	**39**	**203**	**1**	**8**	**2**	**281**

Table 3-5. Native Species Abundance Summary by Sampling Method (Including Observations), 2015

Sampling Method	Sampling Dates	Native Species			Total
		Arroyo chub	Santa Ana Sucker	Southwestern pond turtle	
Observed	March 24, 2015		4		4
	March 25, 2015	1	15		16
	May 13, 2015		1		1
	October 13, 2015		8		8
	October 14, 2015			1	1
	Subtotal	**1**	**28**	**1**	**30**
Hand Capture	August 12, 2015			1	1
	Subtotal			**1**	**1**
Two-Person Seining	October 14, 2015		1		1
	Subtotal		**1**		**1**
	Total	**1**	**29**	**2**	**32**

4.0 DISCUSSION

The four exotic aquatic species removal efforts conducted in 2015 captured and removed 2,485 individuals, representing ten exotic aquatic species. Haines Creek accounted for 62.4 percent of the exotic aquatic species captured, while the Ponds accounted for the remaining 37.6 percent. Dense vegetation growth in the form of cattails (*Typha* sp.) precluded sampling in the Connector Channel in 2015. Overall, each method utilized techniques based on the habitat types being sampled, the life stages being targeted, and the time of year sampling was conducted. All removal efforts were conducted in a manner that avoided incidental take of Santa Ana sucker, especially YOY individuals which are more susceptible to disturbances in the creek. Removal efforts one, two, and three were conducted within the breeding season for Santa Ana sucker, or while YOY were present; therefore, noninvasive sampling methods were used and habitats where sensitive species where present were avoided. Although removal effort four was conducted outside the breeding season for Santa Ana sucker biologists were still careful to avoid any impacts to the species. There were no mortalities or injuries to any sensitive species resulting from these removal efforts.

As with previous years' removal efforts, red swamp crayfish was the most abundant species captured in Haines Creek, making up 85.2 percent of exotic aquatic species captured in 2015. In previous years, two-person seining has typically been the most effective method for removing exotic aquatic species in Haines Creek; however, minnow trapping was the most effective method in 2015. Minnow trapping was likely more successful this year because traps were used during the breeding season in selectively placed locations where red swamp crayfish were present and no sensitive species occurred. These locations were repeatedly trapped until they yielded no red swamp crayfish. This method yielded 55.1 percent of the red swamp crayfish captured in Haines Creek. The lower numbers of individuals captured while two-person seining is likely attributed to a limitation in the amount of available sampling habitat. This year it appeared there was an increase in the amount of fallen trees and woody debris in the stream channel which reduced the total area in which the seine net could be used. Seining is often limited to open water habitats, free of woody debris and other obstructions. In addition, areas containing suitable habitat for Santa Ana sucker were typically avoided. Dip-netting and spearfishing were used in locations where seines were not capable of sampling (e.g., pools with large amounts of woody debris, deep undercut banks and locations with overhanging or instream vegetation), and were also more effective this year. By using a combination of these passive (trapping) and active (seining, dipnetting, and spearfishing) methods, biologists were able to sample all habitats in Haines Creek and were highly effective at removing large numbers of exotic aquatic species.

Spearfishing/snorkeling continues to be an effective tool for removing larger fishes, disrupting sunfish nests, and examining areas around downed trees, snags, and undercut banks for the presence of exotic turtles. The implementation of spear guns has proven to be an effective method for removing these fishes during the day as it has a considerably longer range than the

pole spear/gig, and utilizes a trigger mechanism which offers less fatigue on the hand. In turn, this allows for more time spent spearfishing and increases the accuracy of each shot. As a result of implementing spear guns, spearfishing during the day was the most effective sampling method in the West Pond, making up 40.1 percent of the total catch at this location.

Bullfrog gigging continues to be the most effective method for capturing adult bullfrogs. The gig, used to capture bullfrogs, can also be used for spearfishing. This flexibility allows biologists to spear exotic fishes underwater or gig bullfrogs along the banks using the same equipment. In general, fish are less active and slower, while bullfrog and red swamp crayfish appear to be more active and easily observed at night. When water visibility is good, both of these scenarios allow for greater capture rates at night than during daytime surveys. Nighttime spearfishing with the spear/gig was the most effective method in the East Pond, making up 58.4 percent of the total catch. Bullfrog tadpoles and egg masses were not observed during snorkeling surveys; however, one bullfrog tadpole was captured while bullfrog gigging, and three tadpoles were captured while two person seining in the West Pond. The presence of tadpoles indicated that breeding was successful this year; however, the number of tadpoles captured was very low (n=4). The number of bullfrogs detected at the Mitigation Area has remained relatively low through the years, especially compared to other southern California locations where bullfrogs are present. This suggests that the lack of bullfrogs on site may be due to pressures associated with predation or environmental conditions. Individuals may also preferentially select habitats outside the Mitigation Area or be dispersing from outside areas into the Mitigation Area, either on their own or through human introductions.

Although turtle traps were set in the Ponds during removal efforts one and two, the traps did not yield any captures. Since 2007, only 2.1 percent (n=1) of the 47 turtles (38 exotic and 9 native) captured in the Ponds or Connector Channel were captured in a turtle trap. The reason for the lack of effectiveness of turtle traps in the Mitigation Area is unknown; however, some factors that may contribute to the ineffectiveness include: relatively low numbers of turtles in the Ponds to begin with, an abundance of prey items in the Ponds which may preclude turtles from entering the baited traps, the total number of traps used, and the consecutive number of days the traps are left in the water during each removal effort. Trapping protocol for the southwestern pond turtle dictates that traps be left in the water for a minimum of four days when sampling (USGS 2006), but the duration of each removal effort is typically four days or less. Capturing turtles by hand while conducting snorkeling/spearfishing surveys has been the most effective method over the years with three red-eared sliders captured in the Ponds in 2015. In addition to the exotic turtles captured, one male southwestern pond turtle was captured during removal effort three, and observed again during removal effort four. This male pond turtle had heavy scarring on its shell indicative of canid predation attempts and has been captured or observed multiple times. Aside from this resident male, the last record of a southwestern pond turtle (a female also with distinctive markings on her carapace) in the Mitigation Area was in 2011 (ECORP 2013). Between 2007 and 2011 this female was the only southwestern pond turtle detected during surveys.

Gillnets were used in combination with spearfishing surveys in the Ponds and were effective at capturing and removing exotic fishes. Gillnetting accounted for the second greatest number of exotic fishes captured in the Ponds behind spearfishing. The combination of these two methods seems to be very effective for removing multiple size classes of exotic fishes from the Ponds. Variation in the presence of algae, emergent vegetation, and underwater visibility throughout the year can affect the effectiveness of gillnetting and spearfishing surveys in the Ponds. For example, poor water visibility will result in a lower spearfishing catch rate during a survey, but the gillnetting catch rate will likely increase because the net is less visible. The opposite is true for good water visibility in that spearfishing catch rates will increase, and gillnetting catch rates will decrease. Largemouth bass continues to be the dominant species captured in the Ponds, accounting for 71.6 percent of the total in those locations. YOY largemouth bass and green sunfish were observed in large aggregations in the Ponds and Haines Creek, while YOY bluegill were observed only in the Ponds, indicating these three species successfully spawned in 2015.

Fyke net trapping was used sparingly in 2015, as the amount of available open water habitat in the Connector Channel was filled in with cattails. Fyke net trapping is typically used in areas where animals migrate from one location to another. Historically, the Connector Channel has been a good place to set a fyke net as animals tend to move between the East and West Ponds. The dense vegetation in the Connecting Channel did not allow for deployment of a fyke net, so instead it was set in the West Pond, just upstream from the confluence with Haines Creek to capture any fish that may be moving downstream into the Creek. Although the idea was novel, the fyke net was set further back in the channel of the West Pond so it was only accessible from the water. The water depth at this location exceeded the depth of the net, and in order to maintain a sufficient air space in the trap a large gap (approximately two feet) was present beneath the trap. This gap allowed fishes to swim beneath the fyke net trap without being captured, and was likely the reason the trap did not yield a catch.

During the 2015 removal effort, eight Mozambique tilapia were captured in the West Pond (four by spear and four by gillnet), and one was captured in the East Pond (gillnet). This is the highest number of Mozambique tilapia captured within a given year since they were documented in the Mitigation Area in 2012. Based on observations and fish captured in the ponds, there has been no evidence of Mozambique tilapia breeding at the site; however, it is unclear whether the increase in the number captured is due to successful breeding in the ponds, fish remaining from the initial introduction, or new introductions. Given the proximity of the West Pond to Haines Creek, there is potential for the species to migrate downstream and become established in Haines Creek.

Incidental observations of native fishes were low during the 2015 removal effort. A total of 29 Santa Ana sucker and one arroyo chub were the only native fishes encountered. Successful breeding of Santa Ana sucker was documented throughout Haines Creek during the native fishes survey conducted in May; however, only adults were detected during subsequent surveys

in October. This was also the case during the exotic aquatic species removal efforts conducted in October where only one adult was captured and an additional eight adults were observed. This may be an artifact of sampling or it may be that the YOY individuals were no longer present due to predation or some other factor. Since 2007, the number of Santa Ana sucker detected during exotic aquatic species removal efforts has varied, but has shown an overall decrease in abundance. The same is true for Santa Ana speckled dace and arroyo chub. Santa Ana speckled dace were most recently detected in the Mitigation Area in 2012 (one individual), and aside from the single arroyo chub that was observed in 2015, they were most recently detected in 2013 (two individuals). The number of exotic aquatic species captured in Haines Creek has remained high, and has shown an increase in the number of individuals captured each year from 2012 to 2015. Native fishes surveys observed an overall decrease in native species abundance and an overall increase in exotic aquatic species abundance, showing a continuing trend of exotic aquatic species outcompeting native species.

4.1 Problems Encountered During Removal

Managing the public recreational usage at the Mitigation Area is challenging; although outreach programs are in place, the progresses are limited by their resources, ability to reach non-residents, obtaining 100 percent compliance from all users, and having real-time enforceable actions taken when there are infractions. While conducting exotic wildlife species removals efforts, biologists recorded the following unauthorized activities: tree cutting, the formation of new trails and stream crossings, creation of rock dams, swimming, fishing, evidence of camp fires, trash dumping, and the consumption of alcoholic beverages. All unauthorized activities were immediately reported and, when possible, biologists educated the public on rules of the Mitigation Area. If the issue was not immediately resolved at the time of observation, it was addressed during follow-up site visits or by notifying LACDPW. Access points for the unauthorized trail and creek crossings were blocked off using fallen tree branches, while rock dams were dismantled and distributed haphazardly back into the creek. Rock dams are barriers for fish passage and alter the stream habitat type (from riffle or glide to deep pools) and instream habitat complexity (i.e., filamentous algae, aquatic macrophytes, and overhanging vegetation). These altered habitats often created suitable foraging and breeding habitat for exotic aquatic species. The removal of these man-made structures restores the natural flow of the creek and removes the potential for adverse impacts to sensitive native fishes.

Trap locations were generally chosen based upon the availability of suitable habitat for exotic aquatic species as well as the ability to keep the traps concealed and inaccessible to the public in an attempt to reduce the potential for theft, removal, or vandalism. Gillnets were the only exception. Due to a potential entanglement hazard, signs were posted notifying the public not to swim or fish in the Ponds. In 2015, there were multiple instances of equipment being tampered with during removal efforts. During removal effort two, ECORP biologists arrived at the Mitigation Area on the morning of May 13, 2015 to find two fishermen with a canoe. These fishermen were consuming alcoholic beverages and had removed one of the turtle traps from

the water. Despite efforts to conceal minnow traps in Haines Creek, two traps were stolen during removal effort three, and one trap was removed from the water during removal effort four with a note that stated not to set traps in the area.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The keys to enhancing and maintaining a successful exotic aquatic species removal program are:

1) maintain a systematic sampling approach that allows for dynamic variation with regard to changes in target species and their life stages, site conditions, and seasonal variations;
2) eliminate habitat for exotic aquatic species to breeding, foraging, or take up shelter;
3) reduce the potential for migration and/or introductions;
4) educate the public on exotic aquatic species and provide opportunities for them to get involved; and
5) provide continuous monitoring efforts to ensure long-term success.

Due to the various intricacies associated with the exotic aquatic species removal program within the Mitigation Area, (e.g., potential for migration, habitat complexity, sensitivity of avoiding impacts to native species who share the same habitat as targeted species) the complete eradication of exotic aquatic species is likely not possible without extensive measures.

The current exotic aquatic species removal program uses techniques which are effective at capturing individuals posing the greatest impact to native species within the Mitigation Area. This program incorporates a variety of sampling methods, often used in combination, to systematically target habitats with the highest densities of exotic aquatic species. Although the exotic aquatic species removal program continues to remove large numbers of exotic aquatic species, it is unclear what level of relief the current program is providing to the native species of the Mitigation Area. Native fishes surveys conducted in Haines Creek in 2012 showed a trend of decreasing relative abundance of exotic aquatic species with distance away from the Ponds and increasing relative abundance of native fishes with distance away from the Ponds (ECORP 2013). A similar survey in 2015 showed a steep decline in the abundance of native fishes, while the abundance of exotic aquatic species remained high. This is likely due to a source population upstream in the Ponds, and the ability of exotics species to outcompete native species for resources. The Ponds continue to provide exceptional breeding habitat for exotic aquatic species and efforts should be made to address this problem.

Prior exotic aquatic species reports have suggested transforming the Ponds into a stream-type system to coincide with the habitat in Haines Creek. This would be the most beneficial long-term approach to support the native aquatic species of the Mitigation Area. Transforming the Ponds into a stream-type habitat would greatly reduce the available habitat for exotic aquatic species to breed, forage, or take up shelter; however, it would also eliminate habitat that may be necessary for migratory bird species. Another variation of this transformation could be to re-engineer the Ponds so that only one would be holding water at any given time, which would allow for the periodic draining of one Pond into the other. This periodic draining could

essentially eliminate exotic aquatic species from the Ponds, while still providing the necessary habitat for migratory bird species.

Other suggestions have been made to install a fish screen at the confluence of the West Pond and Haines Creek in an effort to reduce the migration of exotic aquatic species downstream into the creek. In June 2015, ECORP received notice that funding had been approved by the USFWS to install a fish screen. Once the project is fully funded, the fish screen will be installed at the confluence of the West Pond and Haines Creek. Although this is the first attempt at installing any type of fish screen at the Mitigation Area, fish screens installed in other watersheds have been costly to maintain and only restricted size classes larger than the mesh size of the particular screen. In most instances, juvenile and YOY fishes were still able to swim past fish screens and become established downstream.

Rock dams, foot bridges, and other obstructions in Haines Creek that impede the creeks natural flow can be problematic to native fishes and often create favorable conditions for exotic aquatic species. Efforts should continue to monitor for these types of obstructions and they should be removed when observed. Public outreach regarding the biological resources of the Mitigation Area should continue in an effort to educate recreational users of the approved and prohibited recreational activities at the site.

A clean-out effort conducted along the I-210 freeway drainage to remove suitable habitat for exotic aquatic species would be helpful to control exotic aquatic species near the Ponds. LACDPW could work with Caltrans to either eliminate the source of the standing water or to determine what vegetation thinning could be done to decrease the suitability of this area for exotic aquatic species.

6.0 REFERENCES

[CDFW] California Department of Fish and Wildlife

2014 California Fish and Game Code Chapter 12, Section 1930-1940. Available at: http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=fgc&codebody=&hits=20.

2015 Special Animals List. Natural Diversity Database. Periodic publication. 50 pp. Available at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf.

Chambers Group, Inc.

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.

[ECORP] ECORP Consulting, Inc.

2009 2007/2008 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles, CA. Final Report prepared for the Los Angeles County Department of Public Works.

2013 2012 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Final Report submitted to Los Angeles County Department of Public Works. April 2012.

Ellison, J. P.

1984 A revised classification of native aquatic communities of California. No. 84-1. California State Resources Agency, Sacramento.

Goldberg, T. L., D. A. Coleman, E. C. Grant, K. R. Inendino, and D. P. Philipp

2003 Strain variation in an emerging iridovirus of warm-water fishes. *Journal of Virology* 77(16):8812-8818.

Grant, E. C., D. P. Philipp, K. R. Indendino, and T. L. Goldberg

2003 Effects of temperature on the susceptibility of largemouth bass to largemouth bass virus. *Journal of Aquatic Animal Health* 15(3):215-220.

Hayes, M. P., M. R. Jennings

1986 Decline of ranid frog species in western North America: are bullfrogs (*Rana catesbeiana*) responsible? *Journal of Herpetology* 20(4):490-509.

Kiesecker. J. M., A. R. Blaustein

1998 Effects of introduced bullfrogs and smallmouth bass on microhabitat use, growth, and survival of native red-legged frogs (*Rana aurora*). *Conservation Biology* 12(4):776-787.

Minckley, W. L., P. C. Marsh, J. E. Brooks, J. E. Johnson, and B. L. Jensen

1991 Management towards recovery of the Razorback sucker. Pages 303-358 in W. L. Minckley and J. E. Deacon, eds. Battle against extinction: native fish management in the American west. University of Arizona Press, Tucson.

Moyle, P. B.

2002 Inland Fishes of California. University of California Press, Berkeley.

Moyle, P. B., and R. D. Nichols

1973 Ecology of some native and introduced fishes of the Sierra Nevada foothills in central California. *Copeia*. Pp. 478-490.

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.

Swift, C. C., T. R. Haglund, M. Ruiz, and R. N. Fisher

1993 The status and distribution of the freshwater fishes of southern California. *Bulletin of the Southern California Academy of Sciences* 92(3):101-167.

Traxler, S. L. and B. Murphy

1995 Experimental trophic ecology of juvenile largemouth bass, *Micropterus salmoides*, and blue tilapia, *Oreochromis aureus*.

[USFWS] U.S. Fish and Wildlife Service

2000 Endangered and Threatened Wildlife and Plants; Threatened Status for the Santa Ana Sucker, Final Rule. Federal Register 65(71): 19686–19698.

2009 Arroyo Toad (*Bufo californicus* [*microscaphus*]) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura, California. 31pp.

2010 Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for Santa Ana Sucker; Final Rule. *Federal Register* 75(239):77962-78027.

[USGS] U.S. Geological Survey

2006 USGS Western Pond Turtle (*Emys marmorata*) Trapping Survey Protocol for the Southcoast Ecoregion. U.S. Geological Survey protocol. San Diego, CA. 30 pp.

LIST OF APPENDICES

APPENDIX A - Species Captured During the Exotic Aquatic Species Removal Efforts, 2015

APPENDIX B - Exotic Aquatic Species Removal Photographs, 2015

APPENDIX A

Species Captured During the Exotic Aquatic Species Removal Efforts, 2015

Appendix A: Species Captured During the Exotic Aquatic Species Removal Efforts, 2015.

COMMON NAME	SCIENTIFIC NAME
MALOCOSTRACANS	**MALOCOSTRACA**
Freshwater Crayfishes	**Cambaridae**
Red swamp crayfish[3]	*Procambarus clarkii*
RAY-FINNED FISHES	**ACTINOPTERYGII**
Carps and Minnows	**Cyprinidae**
Goldfish[3]	*Carassius auratus*
Common carp[3]	*Cyprinus carpio*
Suckers	**Catostomidae**
Santa Ana sucker[1,2]	*Catostomus santaanae*
Livebearers	**Poeciliidae**
Western mosquitofish[3]	*Gambusia affinis*
Sunfishes	**Centrarchidae**
Green sunfish[3]	*Lepomis cyanellus*
Bluegill[3]	*Lepomis macrochirus*
Largemouth bass[3]	*Micropterus salmoides*
Cichlids	**Cichlidae**
Mozambique tilapia[3]	*Oreochromis mossambicus*
AMPHIBIANS	**AMPHIBIA**
True Frogs	**Ranidae**
American bullfrog[3]	*Lithobates catesbeianus*
REPTILES	**REPTILIA**
Pond turtles	**Emydidae**
Southwestern pond turtle[2]	*Actinemys pallida*
Red-eared slider[3]	*Trachemys scripta elegans*

[1] Federally Listed Threatened Species
[2] CDFW SSC
[3] Exotic Species

APPENDIX B

Exotic Aquatic Species Removal Photographs, 2015

B-1) The West Pond covered in algae.

B-2) Cut trees that have fallen over Haines Canyon Creek.

B-3) An ECORP biologist checking a minnow trap in Haines Canyon Creek.

B-4) Red swamp crayfish captured in a minnow trap in Haines Canyon Creek.

B-5) A largemouth bass captured while spearfishing in the West Pond.

B-6) A common carp captured while spearfishing in the East Pond.

B-7) A bluegill captured while spearfishing in the West Pond.

B-8) A Mozambique tilapia captured while spearfishing in the West Pond.

B-9) Largemouth bass and bluegill captured while spearfishing in the West Pond.

B-10) A gravid female red swamp crayfish captured by hand in Haines Canyon Creek.

Exotic Aquatic Species Removal Photographs

B-11) A red-eared slider captured by hand in the West Pond.

B-12) A southwestern pond turtle captured by hand in the West Pond.

B-13) A man that was observed fishing in the West Pond.

B-14) Unauthorized tree cutting and trail blocking in Haines Canyon Creek.

B-15) A stockpile of firewood near Haines Canyon Creek.

B-16) A stockpile of firewood and a cut tree near Haines Canyon Creek.

APPENDIX G

2015 Water Quality Monitoring Report

County of Los Angeles
Department of Public Works

November 2015 Water Quality Monitoring Report

for the

Big Tujunga Wash Mitigation Area

January 2016

MWH

November 2015 Water Quality Monitoring Report

for the

Big Tujunga Wash Mitigation Area

January 2016

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Table of Contents

Section Name **Page Number**

Background....1
Materials and Methods....3
Results....7
Discussion....16
Glossary....17

Appendix A Big Tujunga Wash Mitigation Area Water Quality Monitoring Program Laboratory Results November 2015

LIST OF FIGURES

Figure Number **Page**

Figure 1 Mitigation Area Water Quality Sampling Stations....4

LIST OF TABLES

Table Number **Page**

Table 1 Major Activities to Date at the Big Tujunga Wash Mitigation Area....1
Table 2 Pesticides Potentially Used at the Angeles National Golf Club....3
Table 3 Water Quality Sampling Locations and Conditions for November 2015....5
Table 4 Water Quality Sampling Parameters....6
Table 5 Baseline Water Quality (2000)....8
Table 6 Summary of Water Quality Results – November 2, 2015....9
Table 7 Estimated Flows for November 2015....10
Table 8 National and Local Recommended Water Quality Criteria - Freshwaters....11
Table 9 Temperature and pH-Dependent Values of the CMC (Acute Criterion)....12
Table 10 Temperature and pH-Dependent Values of the CCC (Chronic Criterion)....13
Table 11 30-Day Average Objective for Ammonia-N for Freshwaters Applicable to Waters Subject to the "Early Life Stage Present" Condition (mg N/L)....14
Table 12 One-Hour Average Objective for Ammonia-N for Freshwaters (mg N/L)....15
Table 13 Example Calculated Values for Maximum Weekly Average Temperature for Growth and Short-Term Maxima for Survival of Juvenile and Adult Fishes During the Summer....15
Table 14 Discussion of November 2015 Water Quality Sampling Results....16

Distribution

Water quality monitoring reports are distributed to the following agencies:

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Water Quality Monitoring
November 2015

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 ECORP Consulting, Inc. (ECORP). MWH, a subconsultant to ECORP, is responsible for the water quality monitoring program described in the FMMP. 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, and in 2013 and 2014, monitoring was conducted in October. This report presents the results of the water quality sampling for November 2015.

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.

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
4/2000	Baseline water quality sampling
11/2000 to 11/2001	Arundo, tamarisk, and pepper tree removal Chemical (Rodeo®) application
12/2000 to 11/2002	Water hyacinth removal
12/2000	Fish Sampling at Haines Canyon Creek
12/2000	Water quality sampling
1/2001 to present	Exotic aquatic wildlife (non-native fish, crayfish, bullfrog, and turtle) removal – conducted quarterly
2/2001	Partial riparian planting
3/2001	Selective clearing at Canyon Trails Golf Club
3/2001	Water quality sampling
6/2001	Water quality sampling
7/2001	Fish Sampling at Haines Canyon Creek
9/2001	Water quality sampling

Date	Activity
10/2001 to 11/2001	Fish Sampling at Haines Canyon Creek
12/2001	Water quality sampling
1/2002	Final riparian planting
2/2002	Upland replacement planting
3/2002	Water quality sampling
6/2002	Water quality sampling
7/2002	Fish Sampling at Haines Canyon Creek
9/2002	Water quality sampling
10/2002	Grading at Canyon Trails Golf Club begins
11/2002	Fish Sampling at Haines Canyon Creek
12/2002	Water quality sampling
3/2003	Water quality sampling
4/2003	Meeting with Canyon Trails Golf Club to discuss future use of herbicides and fertilizers
6/2003	Water quality sampling
8/2003	Fish Sampling at Haines Canyon Creek
9/2003	Water quality sampling
Fall 2003	Completion of the golf course construction
12/2003	Water quality sampling
1/2004	Fish Sampling at Haines Canyon Creek
4/2004	Water quality sampling
4/2004	Rock Dam Removal Day
6/2004	Angeles National Golf Club (previously named Canyon Trails) opens to the public
7/2004	Water quality sampling
10/2004	Water quality sampling
12/2004	Water quality sampling
4/2005	Water quality sampling
6/2005	Water quality sampling
10/2005	Water quality sampling
12/2005	Water quality sampling
7/2006	Water quality sampling
12/2006	Water quality sampling
12/2007	Water quality sampling
12/2008	Water quality sampling
8/2009 to 10/2009	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/)
12/2009	Water quality sampling
11/2010	Water quality sampling
12/2010	Water quality sampling for pesticides
9/2011 to 1/2012	Water lettuce removal
2/2012	Water quality sampling
11/2012	Water quality sampling
10/2013	Water quality sampling
10/2014	Water quality sampling
11/2015	Water quality sampling

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

Source: 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).

MATERIALS AND METHODS

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 November 2, 2015.

Key to Features

Mitigation Area

Station Number	Name
1	Inflow to Tujunga Ponds
2	Outflow from Tujunga Ponds
3	Big Tujunga Wash
4	Haines Canyon Creek, just before exit from site

N

0 450 900 Feet

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Date: April 19, 2012

Big Tujunga Wash Mitigation Area Water Quality Sampling Stations

MWH.

Figure 1

Table 3
Water Quality Sampling Locations and Conditions for November 2015

Date	November 2, 2015		
Air Temperature	Approximately 65-67 degrees Fahrenheit during sample collection period		
Skies	Partly cloudy		
Observations	Water clear at all locations; relatively low turbidity; horse sign at outflow from Tujunga Ponds and Haines Canyon Creek; recently used fire pit at Haines Canyon Creek leaving the site		
Sampling Locations	**Latitude**	**Longitude**	**Time of sample**
Haines Canyon Creek	34 16' 0.092'' N	118 21' 25.716' 'W	1140
Haines Canyon Creek, inflow to Tujunga Ponds	34 16' 6.040'' N	118 20' 22.616'' W	1100
Haines Canyon Creek, outflow from Tujunga Ponds	34 16' 8.263'' N	118 20' 30.824'' W	1020
Big Tujunga Wash	34 16' 11.615'' N	118 21' 4.519'' W	station dry

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 for organochlorine pesticides via EPA method 608 were analyzed by Eurofins Calscience in Garden Grove, California. Analytical results for chlorpyrifos and organophosphorous pesticides via EPA method 8141A were analyzed by Emax Laboratories, Torrance, California. All other analyses were performed at Eurofins Eaton Laboratories, Monrovia, California. 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	laboratory	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, stirophos, 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.

Discharge Measurements. In addition to the water quality monitoring, flows in the outlet from the Tujunga Ponds and in Haines Canyon Creek leaving the site were estimated using a simple field procedure. The technique uses a float to measure stream velocity.

Calculating flow then involves solving the following equation:

$$Flow = ALC / T$$

Where:

A = Average cross-sectional area of the stream (stream width multiplied by average water depth)

L = Length of the stream reach measured (usually 20 feet)

C = A coefficient or correction factor (0.8 for rocky-bottom streams or 0.9 for muddy-bottom streams). This allows you to correct for the fact that water at the surface travels faster than near the stream bottom due to resistance from gravel, cobble, etc. Multiplying the surface velocity by a correction coefficient decreases the value and gives a better measure of the stream's overall velocity.

T = Time, in seconds, for the float to travel the length of L

RESULTS

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.

November 2015 Results

Water Quality

Results of analyses conducted by Eurofins and Emax Laboratories are appended to this report (**Appendix A**) and summarized in **Table 6**.

Table 5
Baseline Water Quality (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
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
Fecal coliform	MPN/ 100 ml	4/12/00	500	300	40	80
		4/18/00	500	30,000	2,400	50,000
Ammonia-N	mg/L	4/12/00	0	0	0	0
		4/18/00	0	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
Nitrite-N	mg/L	4/12/00	0.061	0	0	0
		4/18/00	0.055	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
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
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
Turbidity	NTU	4/12/00	1.83	0.38	1.75	0.6
		4/18/00	4.24	323	4070	737

Table 6
Summary of Water Quality Results – November 2, 2015

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
Temperature	°C	19.6	18.1	NA	17.4
Dissolved Oxygen	mg/L	9.3	7.4	NA	10.4
pH	std units	7.26	7.18	NA	8.11
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	0.22	0.88	NA	ND
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	7.9	6.0	NA	5.1
Orthophosphate-P	mg/L	0.017	ND	NA	0.017
Total phosphorus-P	mg/L	0.075	0.058	NA	0.044
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	1.2	2.3	NA	0.3
Fecal Coliform Bacteria	(MPN/100 ml)	79	49	NA	49
Total Coliform Bacteria	(MPN/100 ml)	330	490	NA	1700

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, stirophos, parathion-methyl, tokuthion, and trichloronate.

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

Discharge Measurements

Using the field technique described above, flows in the outlet from the Tujunga Ponds and in Haines Canyon Creek (leaving the site) were approximated. Estimated flows for November 2015 are summarized in **Table 7**.

Table 7
Estimated Flows for November 2015

Sampling Date	Approximate Flow (cubic feet per second)		
	Haines Canyon Creek, Outflow from Tujunga Ponds	Haines Canyon Creek, just before exit from site	Big Tujunga Wash
11/2/15	0.6	1	station dry on sample date

Comparison of Results with Aquatic Life Criteria

Tables 8 through **13** 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 8
National and Local Recommended Water Quality Criteria - Freshwaters

Parameter	Basin Plan Objectives[a]	EPA Criteria		
		CMC	CCC	Human Health
Temperature (^{o}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 *E. coli*) (water contact recreation)	--	--	Swimming stds: 33[g] (geometric mean for enterococci) 126[g] (geometric mean for *E. coli*)
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 9
Temperature and pH-Dependent Values of the CMC (Acute Criterion)
Mussels Absent

CMC: Mussels Absent, mg N/L										
pH	Temperature, C									
	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
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 10
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 11
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 12
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 13
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.

DISCUSSION

Results from the November 2015 sampling are described by parameter in **Table 14**.

Table 14
Discussion of November 2015 Water Quality Sampling Results

Parameter	Discussion
Temperature	• Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations.
Dissolved oxygen	• Dissolved oxygen levels ranged from 7.4 mg/L in the outflow from the Tujunga Ponds to 10.4 in Haines Canyon Creek leaving the site. DO levels at all stations were above the recommended minimum (5.0 mg/L) and recommended mean (7.0 mg/L) for warmwater fish species.
pH	• Lowest pH was observed in the outflow from Tujunga Ponds (7.18), with highest pH observed in Haines Canyon Creek leaving the site (8.11). On this date, pH readings in Haines Canyon Creek and the Tujunga Ponds were within the 6.5 to 8.5 range identified in the Basin Plan.
Total residual chlorine	• No residual chlorine was detected at any station.
Nitrogen	• Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. • Ammonia was below the detection limit at all stations.
Phosphorus	• Total phosphorus ranged from 0.044 mg/L-P in Haines Canyon Creek leaving the site to 0.075 mg/L-P in the inflow to the Tujunga Ponds. These levels are below the upper end of EPA's recommended range for streams to prevent excess algae growth (recommended range is <0.05 – 0.1 mg/L).
Glyphosate	• Glyphosate was not detected at any station.
Chloropyrifos and Organophosphorous Pesticides	• Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.
Organochlorine Pesticides	• Pesticides analyzed by EPA Method 608 were not detected at any station.
Turbidity	• Turbidity levels were low (<3 NTU) at all stations.
Bacteria	• The fresh water bacteria standard for water contact recreation is for *E. coli* (126 MPN/100 ml geometric mean, 235 MPN/100 ml single sample limits). The observed fecal coliform levels were below the standard at all stations. Sampling specifically for *E. coli* was not conducted. • Total coliform levels ranged from 330 MPN/100 ml in Haines Canyon Creek inflow to Tujunga Ponds to 1,700 MPN/100 ml in the outflow from the ponds. [Note that recreation standards are for *E. coli*. Total coliform standards apply to marine waters and waterbodies where shellfish can be harvested for human consumption.]

GLOSSARY

Ammonia-Nitrogen – NH_3-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 – NO3$^-$-N is an essential nutrient for many photosynthetic autotrophs.

Nitrite-Nitrogen – NO2$^-$-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

BIG TUJUNGA WASH MITIGATION AREA
WATER QUALITY MONITORING PROGRAM

LABORATORY RESULTS
November 2015

eurofins | Eaton Analytical

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: (626) 386-1100
Fax: (626) 386-1101
1 800 566 LABS (1 800 566 5227)

ilac-MRA

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
AT-1807

Laboratory Report

for

MWH Americas - Pasadena
300 N. Lake Avenue
Suite 400
Pasadena, CA 91101
Attention: Sarah Garber

Date of Issue
11/24/2015

EUROFINS EATON ANALYTICAL

DST: David S Tripp

Project Manager

NELAP ACCREDITED TNI LABORATORY
ORELAP 4034

Report: 560571
Project: BIG-TUJUNGA
Group: Water Quality Monitoring
PO#: 10508004.011701

* Accredited in accordance with TNI 2009 and ISO/IEC 17025:2005.
* Laboratory certifies that the test results meet all **TNI 2009 and ISO/IEC 17025:2005** requirements unless noted under the individual analysis.
* Following the cover page are State Certification List, ISO 17025 Accredited Method List, Acknowledgement of Samples Received, Comments, Hits Report, Data Report, QC Summary, QC Report and Regulatory Forms, as applicable.
* Test results relate only to the sample(s) tested.
* This report shall not be reproduced except in full, without the written approval of the laboratory.

STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	**Mississippi**	Certified
----------	--------	**Montana**	Cert 0035
Arizona	AZ0778	**Nebraska**	Certified
Arkansas	Certified	**Nevada**	CA00006-2015
California-Monrovia-ELAP	2813	**New Hampshire ***	2959
California-Colton- ELAP	2812	**New Jersey ***	CA 008
California-Folsom- ELAP	2820	**New Mexico**	Certified
California-Fresno- ELAP	2966	**New York ***	11320
Colorado	Certified	**North Carolina**	06701
Connecticut	PH-0107	**North Dakota**	R-009
Delaware	CA 006	**Oregon (Primary AB) ***	**ORELAP 4034**
Florida *	E871024	**Pennsylvania ***	68-565
Georgia	947	**Rhode Island**	LAO00326
Guam	15-003r	**South Carolina**	87016
Hawaii	Certified	**South Dakota**	Certified
Idaho	Certified	**Tennessee**	TN02839
Illinois *	200033	**Texas ***	T104704230-14-7
Indiana	C-CA-01	**Utah ***	CA000062015-8
Kansas *	E-10268	**Vermont**	VT0114
Kentucky	90107	**Virginia ***	460260
Louisiana *	LA150018	**Washington**	C838
Maine	CA0006	**West Virginia**	9943 C
Maryland	224	**Wisconsin**	998316660
Commonwealth of Northern Marianas Is.	MP0004	**Wyoming**	8TMS-L
Massachusetts	M-CA006	**EPA Region 5**	Certified
Michigan	9906	**Los Angeles County Sanitation Districts**	10264

* NELAP/TNI Recognized Accreditation Bodies

ISO 17025 Accredited Method List

The tests listed below are accredited and meet the requirements of ISO 17025 as verified by the ANSI-ASQ National Accreditation Board/ANAB.

Refer to Certificate and scope of accreditation (AT 1807) found at: http://www.eatonanalytical.com

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environ-mental (Drinking Water)	Environ-mental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
1,4-Dioxane	EPA 522	x		x
2,3,7,8-TCDD	Modified EPA 1613B	x		x
Acrylamide	In House Method (2440)	x		x
Alkalinity	SM 2320B	x	x	x
Ammonia	EPA 350.1		x	x
Ammonia	SM 4500-NH3 H		x	x
Anions and DBPs by IC	EPA 300.0	x	x	x
Anions and DBPs by IC	EPA 300.1	x		x
Asbestos	EPA 100.2	x	x	
Bicarbonate Alkalinity as HCO3	SM 2320B	x	x	x
BOD / CBOD	SM 5210B		x	x
Bromate	In House Method (2447)	x		x
Carbamates	EPA 531.2	x		x
Carbonate as CO3	SM 2330B	x	x	x
Carbonyls	EPA 556	x		x
COD	EPA 410.4 / SM 5220D		x	
Chloramines	SM 4500-CL G	x	x	x
Chlorinated Acids	EPA 515.4	x		x
Chlorinated Acids	EPA 555	x		x
Chlorine Dioxide	SM 4500-CLO2 D	x		x
Chlorine -Total/Free/ Combined Residua	SM 4500-Cl G	x	x	x
Conductivity	EPA 120.1		x	
Conductivity	SM 2510B	x	x	x
Corrosivity (Langelier Index)	SM 2330B	x		x
Cryptosporidium	EPA 1622, 1623	x		x
Cyanide, Amenable	SM 4500-CN G	x	x	
Cyanide, Free	SM 4500CN F	x	x	x
Cyanide, Total	EPA 335.4	x	x	x
Cyanogen Chloride (screen)	In House Method (2470)	x		x
Diquat and Paraquat	EPA 549.2	x		x
DBP/HAA	SM 6251B	x		x
Dissolved Oxygen	SM 4500-O G		x	x
DOC	SM 5310C	x		x
E. Coli	(MTF/EC+MUG)	x		x
E. Coli	CFR 141.21(f)(6)(i)	x		x
E. Coli	SM 9223		x	
E. Coli (Enumeration)	SM 9221B.1/ SM 9221F	x		x
E. Coli (Enumeration)	SM 9223B	x		x
EDB/DCBP	EPA 504.1	x		
EDB/DBCP and DBP	EPA 551.1	x		x
EDTA and NTA	In House Method (2454)	x		x
Endothall	EPA 548.1	x		x
Endothall	In-house Method (2445)	x		x
Enterococci	SM 9230B	x	x	
Fecal Coliform	SM 9221 E (MTF/EC)	x		
Fecal Coliform	SM 9221C, E (MTF/EC)		x	
Fecal Coliform (Enumeration)	SM 9221E (MTF/EC)	x		x
Fecal Coliform with Chlorine Present	SM 9221E		x	
Fecal Streptococci	SM 9230B	x	x	
Fluoride	SM 4500-F C	x	x	x
Giardia	EPA 1623	x		x
Glyphosate	EPA 547	x		x
Gross Alpha/Beta	EPA 900.0	x	x	x
Gross Alpha Coprecipitation	SM 7110 C	x	x	x
Hardness	SM 2340B	x	x	x
Heterotrophic Bacteria	In House Method (2439)	x		x
Heterotrophic Bacteria	SM 9215 B	x		x
Hexavalent Chromium	EPA 218.6	x	x	x

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environ-mental (Drinking Water)	Environ-mental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
Hexavalent Chromium	EPA 218.7	x		x
Hexavalent Chromium	SM 3500-Cr B		x	
Hormones	EPA 539	x		x
Hydroxide as OH Calc.	SM 2330B	x		x
Kjeldahl Nitrogen	EPA 351.2		x	
Legionella	CDC Legionella	x		x
Mercury	EPA 245.1	x	x	x
Metals	EPA 200.7 / 200.8	x	x	x
Microcystin LR	ELISA (2360)	x		x
NDMA	EPA 521	x		x
Nitrate/Nitrite Nitrogen	EPA 353.2	x	x	x
OCL, Pesticides/PCB	EPA 505	x		x
Ortho Phosphate	EPA 365.1	x	x	x
Ortho Phosphate	SM 4500P E			x
Ortho Phosphorous	SM 4500P E	x		
Oxyhalides Disinfection Byproducts	EPA 317.0	x		x
Perchlorate	EPA 331.0	x		x
Perchlorate (low and high)	EPA 314.0	x		x
Perfluorinated Alkyl Acids	EPA 537	x		x
pH	EPA 150.1	x		
pH	SM 4500-H+B	x	x	x
Phenylurea Pesticides/ Herbicides	In House Method, based on EPA 532 (2448)	x		x
Pseudomonas	IDEXX Pseudalert (2461)	x		x
Radium-226	GA Institute of Tech	x		x
Radium-228	GA Institute of Tech	x		x
Radon-222	SM 7500RN	x		x
Residue, Filterable	SM 2540C	x	x	x
Residue, Non-filterable	SM 2540D		x	
Residue, Total	SM 2540B		x	x
Residue, Volatile	EPA 160.4		x	
Semi-VOC	EPA 525.2	x		x
Semi-VOC	EPA 625		x	x
Silica	SM 4500-Si D	x	x	
Silica	SM 4500-SiO2 C	x	x	
Sulfide	SM 4500-$S^{=}$ D		x	
Sulfite	SM 4500-SO^{3}B	x	x	x
Surfactants	SM 5540C	x	x	x
Taste and Odor Analytes	SM 6040E	x		x
Total Coliform (P/A)	SM 9221 A, B	x		x
Total Coliform (Enumeration)	SM 9221 A, B, C	x		x
Total Coliform / E. coli	Colisure (2346)	x		x
Total Coliform	SM 9221B		x	
Total Coliform with Chlorine Present	SM 9221B		x	
Total Coliform / E.coli (P/A and Enumeration)	SM 9223	x		x
TOC	SM 5310C	x	x	x
TOX	SM 5320B		x	
Total Phenols	EPA 420.1		x	
Total Phenols	EPA 420.4	x	x	x
Total Phosphorous	SM 4500 P E		x	
Turbidity	EPA 180.1	x	x	x
Turbidity	SM 2130B	x	x	
Uranium by ICP/MS	EPA 200.8	x		x
UV 254	SM 5910B	x		
VOC	EPA 524.2/EPA 524.3	x		x
VOC	EPA 624		x	x
VOC	EPA SW 846 8260	x		x
VOC	In House Method (2411)	x		x
Yeast and Mold	SM 9610	x		x

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Acknowledgement of Samples Received

Addr: **MWH Americas - Pasadena**
300 N. Lake Avenue
Suite 400
Pasadena, CA 91101

Attn: Sarah Garber
Phone: 626-568-6071

Client ID: MWH-ECORP
Folder #: 560571
Project: BIG-TUJUNGA
Sample Group: Water Quality Monitoring

Project Manager: David S Tripp
Phone: (626) 386-1158
PO #: 10508004.011701

The following samples were received from you on **November 02, 2015** at **1324**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical.

Sample #	Sample ID	Sample Date
201511020223	TJPOUT110215	11/02/2015 1020

@608_PCBS	@608_PEST	@8141EDD
Ammonia Nitrogen	Fecal Coliform Bacteria	Glyphosate
Nitrate as Nitrogen by IC	Nitrate as NO3 (calc)	Nitrite Nitrogen by IC
Orthophosphate as P (OPO4)	Orthophosphate as PO4	Total Chlorine Residual
Total Coliform Bacteria	Total Kjeldahl Nitrogen	Total phosphorus as P
Total phosphorus as PO4- Calc.	Turbidity	

Sample #	Sample ID	Sample Date
201511020224	TJPIN110215	11/02/2015 1100

@608_PCBS	@608_PEST	@8141EDD
Ammonia Nitrogen	Fecal Coliform Bacteria	Glyphosate
Nitrate as Nitrogen by IC	Nitrate as NO3 (calc)	Nitrite Nitrogen by IC
Orthophosphate as P (OPO4)	Orthophosphate as PO4	Total Chlorine Residual
Total Coliform Bacteria	Total Kjeldahl Nitrogen	Total phosphorus as P
Total phosphorus as PO4- Calc.	Turbidity	

Sample #	Sample ID	Sample Date
201511020225	HCC110215	11/02/2015 1140

@608_PCBS	@608_PEST	@8141EDD
Ammonia Nitrogen	Fecal Coliform Bacteria	Glyphosate
Nitrate as Nitrogen by IC	Nitrate as NO3 (calc)	Nitrite Nitrogen by IC
Orthophosphate as P (OPO4)	Orthophosphate as PO4	Total Chlorine Residual
Total Coliform Bacteria	Total Kjeldahl Nitrogen	Total phosphorus as P
Total phosphorus as PO4- Calc.	Turbidity	

Test Description

@608_PCBS -- Organochlorine PCBs

@608_PEST -- Organochlorine Pesticides

@8141EDD -- Organophosphorous Pesticides (Sub)

CHAIN OF CUSTODY RECORD

560571

eurofins | Eaton Analytical

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Phone: 626 386 1100
Fax: 626 386 1101

800 566 LABS (800 566 5227)

Website: www.EatonAnalytical.com

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: _____

SAMPLES CHECKED AGAINST COC BY: PO 14:11

SAMPLES LOGGED IN BY: Wena

SAMPLES REC'D DAY OF COLLECTION? [X] (check for yes)

SAMPLE TEMP RECEIVED AT:

[ ] _____ (Other) IR Gun ID = _____ (Observation= _____ °C) (Corr.Factor _____ °C) (Final = _____ °C)

[X] Monrovia IR Gun ID = 464A (Observation= 14.1 °C) (Corr.Factor 0.2 °C) (Final = 13.9 °C)

Compliance Acceptance Criteria: (Chemistry: 4 ± 2 °C) (Microbiology: < 10°C)

TYPE OF ICE: Real ✓ Synthetic _____ No Ice _____ CONDITION OF ICE: Frozen _____ Partially Frozen ✓ Thawed _____ N/A _____

METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: _____

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: MWH-ECORP

PROJECT CODE: 105 08004.011701 BIG TUJUNGA

COMPLIANCE SAMPLES (check for yes) [ ] - Requires state forms [ ]

NON-COMPLIANCE SAMPLES (check for yes) [✓]

REGULATION INVOLVED: _____ (eg. SDWA, NPDES, etc.)

Type of samples (circle one): ROUTINE SPECIAL CONFIRMATION

EEA CLIENT CODE: _____ COC ID: _____ SAMPLE GROUP: _____

SEE ATTACHED KIT ORDER FOR ANALYSES [✓] (check for yes), OR

List ALL ANALYSES REQUIRED (enter number of bottles sent for each test for each sample)

TAT requested: rush by adv notice only STD ✓ 1 wk ___ 3 day ___ 2 day ___ 1 day ___

SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX *	FIELD DATA	FIELD DATA	SAMPLER COMMENTS
11/2	1020	TJPOUT110215		RSW			4th Station
11/2	1100	TJPIN 110215		RSW			Dry - No Samples
11/2	1140	HCC110215		RSW			
		Pat 11/2	Short Hold Wena 11/2 1500				

2015

* **MATRIX TYPES:** RSW = Raw Surface Water; RGW = Raw Ground Water; CFW = Chlor(am)inated Finished Water; FW = Other Finished Water; SEAW = Sea Water; WW = Waste Water; BW = Bottled Water; SW = Storm Water; SO = Soil; SL = Sludge; O = Other - Please Identify

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
SAMPLED BY:		SARAH GARBER	MWH / PRIN ENV SCI	11/2/15	1140
RELINQUISHED BY:		SARAH GARBER	MWH " " "	11/2/15	1323
RECEIVED BY:		H. Ojeda	FEH	11/2/15	13:24
RELINQUISHED BY:					
RECEIVED BY:					

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Kit Order for MWH Americas - Pasadena

David S Tripp is your Eurofins Eaton Analytical Service Manager

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
(626) 386-1100 FAX (626) 386-1101

Note: Sampler Please return this paper with your samples

Kit #: 123711

Created By: Ayla Anderstrom - [CK2P]
Deliver By: 10/30/2015
STG: Bottle Orders
Ice Type: W

Client ID: MWH-ECORP
Project Code: BIG-TUJUNGA Bottle Orders
Group Name: Water Quality Monitoring
PO#/JOB#: 10508004.011701

Ship Sample Kits to
MWH Americas - Pasadena
300 N. Lake Avenue
Suite 400
Pasadena, CA 91101

Attn: Sarah Garber
Phone: 626-568-6071

Send Report to
MWH Americas - Pasadena
300 N. Lake Avenue
Suite 400
Pasadena, CA 91101

Attn: Sarah Garber
Phone: 626-568-6071

Billing Address

,

Attn:

# of Samples	Tests	Bottle Qty - Type [preservative information]	UN DOT #
4	Glyphosate	1 - 125ml amber glass [no preservative]	
4	Total Chlorine Residual	1 - 125ml amber glass [no preservative]	
4	Nitrate as Nitrogen by IC, Nitrate as NO3 (calc), Nitrite Nitrogen by IC, Orthophosphate as P, Turbidity	1 - 125ml poly [no preservative]	
4	Orthophosphate as PO4	1 - 125ml poly [no preservative]	
4	@8081A	2 - 1L amber glass [no preservative]	
4	@8141EDD	2 - 1L amber glass [no preservative]	
4	Ammonia Nitrogen, Total Kjeldahl Nitrogen, Total phosphorus as P	1 - 250ml poly [0.5 ml H2SO4 (50%)]	UN1830
4	Fecal Coliform Bacteria, Total Coliform Bacteria	1 - 250ml poly sterilized [0.25 ml Thio (8%)]	

Comments Pa 11/2

SHIPPING: Please label "BIG T WASH" and include wet ice packing instructions. Client will pickup the sample kits on Friday 10/30/15
SAMPLER: Please return samples on fresh wet ice to the lab same day collected.

Code	Status	Date Shipped	Via	Tracking #	# of Coolers	Prepared By

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INTERNAL CHAIN OF CUSTODY RECORD

COMPANY NAME / EEA CLIENT CODE:	PROJECT CODE:
MWH- ECORP	

SAMPLE TEMP RECEIVED: **SAMPLES REC'D DAY OF COLLECTION?** ☐

IR Gun ID = 464A (Observation= 14.1 °C) (Corr.Factor 0.2 °C) (Final = 13.9 °C)

TYPE OF ICE: Real ✓ Synthetic ____ No Ice ____ **CONDITION OF ICE:** Frozen ____ Partially Frozen ✓ Thawed ____ N/A ____

~~**METHOD OF SHIPMENT:** Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: _____~~

Compliance Acceptance Criteria:

1) Chemistry: ≤ 6°C, not frozen (NELAP) (if received after 24 hrs of sample collection)

2) Microbiology, Distribution: < 10°C, not frozen (can be ≥10°C if received on ice the same day as sample collection, within 8 hours)

3) Microbiology, Surface Water: < 10°C (if received after 2 hours of sample collection)

If over temp is not confirmed, then record each temperature of each quadrant

1 = (Observation= ____ °C) (Corr.Factor ____ °C) (Final = ____ °C)	2 = (Observation= ____ °C) (Corr.Factor ____ °C) (Final = ____ °C)
3 = (Observation= ____ °C) (Corr.Factor ____ °C) (Final = ____ °C)	4 = (Observation= ____ °C) (Corr.Factor ____ °C) (Final = ____ °C)

4) UCMR3 : (non-GLEC) **524.3:** (Observation= _____ °C) (Corr.Factor _____ °C) (Final = _____ °C)

522: (Observation= _____ °C) (Corr.Factor _____ °C) (Final = _____ °C)

≤ 10°C if received within 48 hours of sample collection (not the same business day); ≤ 6°C if received after 48 hours of sample collection. Measure temperature for each method above.

5) LT2: Giardia /Cryptosporidium: <20 °C, not frozen (received after 8 hours of sample collection)

E. Coli: < 10°C, not frozen (if received after 2 hours of sample collection)

Giardia/Crypto: (Observation= _____ °C) (Corr.Factor _____ °C) (Final = _____ °C)

E.Coli: (Observation= _____ °C) (Corr.Factor _____ °C) (Final = _____ °C)

Note: If samples are over temp, let the ASMs know. ASMs will determine whether to proceed with analysis or not.

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
RECEIVED BY:			Eurofins Eaton Analytical	11/2/15	13:24

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Laboratory Comments
Report: 560571

MWH Americas - Pasadena
Sarah Garber
300 N. Lake Avenue
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Pasadena, CA 91101

Folder Comments

Analytical results for 608 are submitted by Eurofins Calscience in Garden Grove, CA CAELAP 2944 exp 9-30-2016
Analytical results for 8141 are submitted by Emax Laboratories, Inc. Torrance, CA, CAELAP 2672 exp 6-30-17

Flags Legend:

MD - Matrix spike recovery was low; the associated blank spike recovery was acceptable. MS/MSD RPD met acceptance criteria.

The Comments Report may be blank if there are no comments for this report.

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Laboratory Hits
Report: 560571

MWH Americas - Pasadena
Sarah Garber
300 N. Lake Avenue
Suite 400
Pasadena, CA 91101

Samples Received on:
11/02/2015 1324

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
	201511020223	**TJPOUT110215**				
11/02/2015 16:31	Fecal Coliform Bacteria		49		MPN/100 mL	1.8
11/21/2015 17:51	Kjeldahl Nitrogen		0.88		mg/L	0.2
11/03/2015 02:59	Nitrate as Nitrogen by IC		6.0	10	mg/L	0.2
11/03/2015 02:59	Nitrate as NO3 (calc)		27	45	mg/L	0.88
11/02/2015 16:31	Total Coliform Bacteria		490		MPN/100 mL	1.8
11/04/2015 16:41	Total phosphorus as P		0.058		mg/L	0.02
11/05/2015 13:39	Total phosphorus as PO4- Calc.		0.18		mg/L	0.031
11/03/2015 18:39	Turbidity		2.3	5	NTU	0.05
	201511020224	**TJPIN110215**				
11/02/2015 16:31	Fecal Coliform Bacteria		79		MPN/100 mL	1.8
11/21/2015 17:53	Kjeldahl Nitrogen		0.22		mg/L	0.2
11/03/2015 02:47	Nitrate as Nitrogen by IC		7.9	10	mg/L	0.2
11/03/2015 02:47	Nitrate as NO3 (calc)		35	45	mg/L	0.88
11/03/2015 19:32	Orthophosphate as P		0.017		mg/L	0.01
11/04/2015 13:23	Orthophosphate as PO4		0.052		mg/L	0.031
11/02/2015 16:31	Total Coliform Bacteria		330		MPN/100 mL	1.8
11/04/2015 16:45	Total phosphorus as P		0.075		mg/L	0.02
11/05/2015 13:40	Total phosphorus as PO4- Calc.		0.23		mg/L	0.031
11/03/2015 18:35	Turbidity		1.2	5	NTU	0.05
	201511020225	**HCC110215**				
11/02/2015 16:31	Fecal Coliform Bacteria		49		MPN/100 mL	1.8
11/03/2015 03:12	Nitrate as Nitrogen by IC		5.1	10	mg/L	0.2
11/03/2015 03:12	Nitrate as NO3 (calc)		22	45	mg/L	0.88
11/03/2015 19:33	Orthophosphate as P		0.017		mg/L	0.01
11/04/2015 13:23	Orthophosphate as PO4		0.052		mg/L	0.031
11/02/2015 16:31	Total Coliform Bacteria		1700		MPN/100 mL	1.8
11/04/2015 16:46	Total phosphorus as P		0.044		mg/L	0.02
11/05/2015 13:40	Total phosphorus as PO4- Calc.		0.14		mg/L	0.031
11/03/2015 18:38	Turbidity		0.30	5	NTU	0.05

SUMMARY OF POSITIVE DATA ONLY

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Laboratory Data
Report: 560571

MWH Americas - Pasadena
Sarah Garber
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Pasadena, CA 91101

Samples Received on:
11/02/2015 1324

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
TJPOUT110215 (201511020223)						**Sampled on 11/02/2015 1020**		
			SM 9221C - Fecal Coliform Bacteria					
	11/02/2015 16:31	870697	(SM 9221C)	Fecal Coliform Bacteria	49	MPN/100 mL	1.8	1
			SM 9221B - Total Coliform Bacteria					
	11/02/2015 16:31	870696	(SM 9221B)	Total Coliform Bacteria	490	MPN/100 mL	1.8	1
			S4500PE/ 365.1 - Total phosphorus as PO4- Calc.					
	11/05/2015 13:39		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.18	mg/L	0.031	1
			4500P-E/365.1 - Orthophosphate as PO4 (CAL)					
	11/04/2015 13:23		(4500P-E/365.1)	Orthophosphate as PO4	ND	mg/L	0.031	1
			EPA 547 - Glyphosate					
	11/09/2015 14:32	872252	(EPA 547)	Glyphosate	ND	ug/L	6	1
			EPA 300.0 - Nitrate, Nitrite by EPA 300.0					
	11/03/2015 02:59	870894	(EPA 300.0)	Nitrate as Nitrogen by IC	6.0	mg/L	0.2	2
	11/03/2015 02:59	870894	(EPA 300.0)	Nitrate as NO3 (calc)	27	mg/L	0.88	2
	11/03/2015 02:59	870894	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
			SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)					
	11/04/2015 16:41	871333	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.058 (MD)	mg/L	0.02	1
			EPA 351.2 - Total Kjeldahl Nitrogen					
	11/21/2015 17:51	875074	(EPA 351.2)	Kjeldahl Nitrogen	0.88	mg/L	0.2	1
			EPA 350.1 - Ammonia Nitrogen					
	11/16/2015 18:02	873689	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
			EPA 8141A - Organophosphorous Pesticides (Sub)					
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Azinphos methyl	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Bolstar	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Chlorpyrifos	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Coumaphos	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Demeton	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Diazinon	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Dichlorvos	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Disulfoton	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Ethoprop	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Fensulfothion	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Fenthion	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Methyl Parathion	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Mevinphos	ND	ug/L	11	11
11/5/2015	11/10/2015 01:52		(EPA 8141A)	Naled	ND	ug/L	11	11

Rounding on totals after summation.
(c) - indicates calculated results

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Report: 560571

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Pasadena, CA 91101

Samples Received on:
11/02/2015 1324

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Phorate	ND	ug/L	11	11
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Ronnel	ND	ug/L	11	11
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Stirophos	ND	ug/L	11	11
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Tokuthion	ND	ug/L	11	11
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Trichloronate	ND	ug/L	11	11
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Tributylphosphate	92	%		11
11/5/2015	11/10/2015	01:52	(EPA 8141A)	Triphenyl Phosphate	93	%		11
			EPA 608 - Organochlorine Pesticides					
11/3/2015	11/04/2015	14:11	(EPA 608)	4,4-DDD	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	4,4-DDE	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	4,4-DDT	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Aldrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	alpha-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	alpha-Chlordane	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	beta-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	delta-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Dieldrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Endrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Endrin Ketone	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Gamma-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	gamma-Chlordane	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Heptachlor	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Methoxychlor	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Toxaphene	ND	ug/L	1.9	1
11/3/2015	11/04/2015	14:11	(EPA 608)	Decachlorobiphenyl	106	%		1
11/3/2015	11/04/2015	14:11	(EPA 608)	Tetrachlorometaxylene	101	%		1
			EPA 608 - Organochlorine PCBs					
11/3/2015	11/04/2015	14:11	(EPA 608)	PCB 1016 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:11	(EPA 608)	PCB 1221 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:11	(EPA 608)	PCB 1232 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:11	(EPA 608)	PCB 1242 Aroclor	ND	ug/L	0.95	1

Rounding on totals after summation.
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Laboratory Data
Report: 560571

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Samples Received on:
11/02/2015 1324

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/3/2015	11/04/2015 14:11		(EPA 608)	PCB 1248 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:11		(EPA 608)	PCB 1254 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:11		(EPA 608)	PCB 1260 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:11		(EPA 608)	Decachlorobiphenyl	106	%		1
11/3/2015	11/04/2015 14:11		(EPA 608)	Tetrachlorometaxylene	101	%		1
	EPA 180.1 - Turbidity							
	11/03/2015 18:39	871153	(EPA 180.1)	Turbidity	2.3	NTU	0.05	1
	4500P-E/365.1 - Orthophosphate as P (OPO4)							
	11/03/2015 19:31	871026	(4500P-E/365.1)	Orthophosphate as P	ND	mg/L	0.01	1
	SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	11/02/2015 18:00	871081	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1
TJPIN110215 (201511020224)						**Sampled on 11/02/2015 1100**		
	SM 9221C - Fecal Coliform Bacteria							
	11/02/2015 16:31	870697	(SM 9221C)	Fecal Coliform Bacteria	79	MPN/100 mL	1.8	1
	SM 9221B - Total Coliform Bacteria							
	11/02/2015 16:31	870696	(SM 9221B)	Total Coliform Bacteria	330	MPN/100 mL	1.8	1
	S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/05/2015 13:40		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.23	mg/L	0.031	1
	4500P-E/365.1 - Orthophosphate as PO4 (CAL)							
	11/04/2015 13:23		(4500P-E/365.1)	Orthophosphate as PO4	0.052	mg/L	0.031	1
	EPA 547 - Glyphosate							
	11/09/2015 14:43	872252	(EPA 547)	Glyphosate	ND	ug/L	6	1
	EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	11/03/2015 02:47	870894	(EPA 300.0)	Nitrate as Nitrogen by IC	7.9	mg/L	0.2	2
	11/03/2015 02:47	870894	(EPA 300.0)	Nitrate as NO3 (calc)	35	mg/L	0.88	2
	11/03/2015 02:47	870894	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
	SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)							
	11/04/2015 16:45	871333	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.075	mg/L	0.02	1
	EPA 351.2 - Total Kjeldahl Nitrogen							
	11/21/2015 17:53	875074	(EPA 351.2)	Kjeldahl Nitrogen	0.22	mg/L	0.2	1
	EPA 350.1 - Ammonia Nitrogen							
	11/16/2015 18:04	873689	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
	EPA 8141A - Organophosphorous Pesticides (Sub)							
11/5/2015	11/09/2015 18:29		(EPA 8141A)	Azinphos methyl	ND	ug/L	1.1	1
11/5/2015	11/09/2015 18:29		(EPA 8141A)	Bolstar	ND	ug/L	1.1	1

Rounding on totals after summation.
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Samples Received on:
11/02/2015 1324

Prepared	Analyzed		QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Coumaphos	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Demeton	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Diazinon	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Dichlorvos	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Disulfoton	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Ethoprop	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Fensulfothion	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Fenthion	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Methyl Parathion	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Mevinphos	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Naled	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Phorate	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Ronnel	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Stirophos	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Tokuthion	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Trichloronate	ND	ug/L	1.1	1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Tributylphosphate	79	%		1
11/5/2015	11/09/2015	18:29		(EPA 8141A)	Triphenyl Phosphate	102	%		1
		EPA 608 - Organochlorine Pesticides							
11/3/2015	11/04/2015	14:25		(EPA 608)	4,4-DDD	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	4,4-DDE	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	4,4-DDT	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Aldrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	alpha-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	alpha-Chlordane	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	beta-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	delta-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Dieldrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Endrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Endrin Aldehyde	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Endrin Ketone	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:25		(EPA 608)	Gamma-BHC	ND	ug/L	0.095	1

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11/02/2015 1324

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/3/2015	11/04/2015 14:25		(EPA 608)	gamma-Chlordane	ND	ug/L	0.095	1
11/3/2015	11/04/2015 14:25		(EPA 608)	Heptachlor	ND	ug/L	0.095	1
11/3/2015	11/04/2015 14:25		(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.095	1
11/3/2015	11/04/2015 14:25		(EPA 608)	Methoxychlor	ND	ug/L	0.095	1
11/3/2015	11/04/2015 14:25		(EPA 608)	Toxaphene	ND	ug/L	1.9	1
11/3/2015	11/04/2015 14:25		(EPA 608)	Decachlorobiphenyl	103	%		1
11/3/2015	11/04/2015 14:25		(EPA 608)	Tetrachlorometaxylene	97	%		1
	EPA 608 - Organochlorine PCBs							
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1016 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1221 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1232 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1242 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1248 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1254 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	PCB 1260 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015 14:25		(EPA 608)	Decachlorobiphenyl	103	%		1
11/3/2015	11/04/2015 14:25		(EPA 608)	Tetrachlorometaxylene	97	%		1
	EPA 180.1 - Turbidity							
	11/03/2015 18:35	871153	(EPA 180.1)	Turbidity	1.2	NTU	0.05	1
	4500P-E/365.1 - Orthophosphate as P (OPO4)							
	11/03/2015 19:32	871026	(4500P-E/365.1)	Orthophosphate as P	0.017	mg/L	0.01	1
	SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	11/02/2015 18:00	871081	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1

HCC110215 (201511020225) **Sampled on 11/02/2015 1140**

	SM 9221C - Fecal Coliform Bacteria							
	11/02/2015 16:31	870697	(SM 9221C)	Fecal Coliform Bacteria	49	MPN/100 mL	1.8	1
	SM 9221B - Total Coliform Bacteria							
	11/02/2015 16:31	870696	(SM 9221B)	Total Coliform Bacteria	1700	MPN/100 mL	1.8	1
	S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/05/2015 13:40		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.14	mg/L	0.031	1
	4500P-E/365.1 - Orthophosphate as PO4 (CAL)							
	11/04/2015 13:23		(4500P-E/365.1)	Orthophosphate as PO4	0.052	mg/L	0.031	1
	EPA 547 - Glyphosate							
	11/09/2015 14:55	872252	(EPA 547)	Glyphosate	ND	ug/L	6	1
	EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	11/03/2015 03:12	870894	(EPA 300.0)	Nitrate as Nitrogen by IC	5.1	mg/L	0.2	2

Rounding on totals after summation.
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Laboratory Data
Report: 560571

MWH Americas - Pasadena
Sarah Garber
300 N. Lake Avenue
Suite 400
Pasadena, CA 91101

Samples Received on:
11/02/2015 1324

Prepared	Analyzed		QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	11/03/2015	03:12	870894	(EPA 300.0)	Nitrate as NO3 (calc)	22	mg/L	0.88	2
	11/03/2015	03:12	870894	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
				SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)					
	11/04/2015	16:46	871333	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.044	mg/L	0.02	1
				EPA 351.2 - Total Kjeldahl Nitrogen					
	11/21/2015	17:54	875074	(EPA 351.2)	Kjeldahl Nitrogen	ND	mg/L	0.2	1
				EPA 350.1 - Ammonia Nitrogen					
	11/16/2015	18:05	873689	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
				EPA 8141A - Organophosphorous Pesticides (Sub)					
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Azinphos methyl	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Bolstar	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Chlorpyrifos	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Coumaphos	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Demeton	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Diazinon	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Dichlorvos	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Disulfoton	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Ethoprop	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Fensulfothion	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Fenthion	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Methyl Parathion	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Mevinphos	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Naled	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Phorate	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Ronnel	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Stirophos	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Tokuthion	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Trichloronate	ND	ug/L	0.93	1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Tributylphosphate	80	%		1
11/5/2015	11/09/2015	19:38		(EPA 8141A)	Triphenyl Phosphate	100	%		1
				EPA 608 - Organochlorine Pesticides					
11/3/2015	11/04/2015	14:39		(EPA 608)	4,4-DDD	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	4,4-DDE	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	4,4-DDT	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Aldrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	alpha-BHC	ND	ug/L	0.095	1

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Laboratory Data
Report: 560571

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Pasadena, CA 91101

Samples Received on:
11/02/2015 1324

Prepared	Analyzed		QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/3/2015	11/04/2015	14:39		(EPA 608)	alpha-Chlordane	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	beta-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	delta-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Dieldrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Endrin	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Endrin Aldehyde	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Endrin Ketone	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Gamma-BHC	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	gamma-Chlordane	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Heptachlor	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Methoxychlor	ND	ug/L	0.095	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Toxaphene	ND	ug/L	1.9	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Decachlorobiphenyl	109	%		1
11/3/2015	11/04/2015	14:39		(EPA 608)	Tetrachlorometaxylene	103	%		1
		EPA 608 - Organochlorine PCBs							
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1016 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1221 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1232 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1242 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1248 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1254 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	PCB 1260 Aroclor	ND	ug/L	0.95	1
11/3/2015	11/04/2015	14:39		(EPA 608)	Decachlorobiphenyl	109	%		1
11/3/2015	11/04/2015	14:39		(EPA 608)	Tetrachlorometaxylene	103	%		1
		EPA 180.1 - Turbidity							
	11/03/2015	18:38	871153	(EPA 180.1)	Turbidity	0.30	NTU	0.05	1
		4500P-E/365.1 - Orthophosphate as P (OPO4)							
	11/03/2015	19:33	871026	(4500P-E/365.1)	Orthophosphate as P	0.017	mg/L	0.01	1
		SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	11/02/2015	18:00	871081	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1

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QC Ref # 870696 - Total Coliform Bacteria — **Analysis Date: 11/02/2015**

201511020223	TJPOUT110215	Analyzed by: DGA8
201511020224	TJPIN110215	Analyzed by: DGA8
201511020225	HCC110215	Analyzed by: DGA8

QC Ref # 870697 - Fecal Coliform Bacteria — **Analysis Date: 11/02/2015**

201511020223	TJPOUT110215	Analyzed by: DGA8
201511020224	TJPIN110215	Analyzed by: DGA8
201511020225	HCC110215	Analyzed by: DGA8

QC Ref # 870894 - Nitrate, Nitrite by EPA 300.0 — **Analysis Date: 11/03/2015**

201511020223	TJPOUT110215	Analyzed by: 6Q4
201511020224	TJPIN110215	Analyzed by: 6Q4
201511020225	HCC110215	Analyzed by: 6Q4

QC Ref # 871026 - Orthophosphate as P (OPO4) — **Analysis Date: 11/03/2015**

201511020223	TJPOUT110215	Analyzed by: AY1V
201511020224	TJPIN110215	Analyzed by: AY1V
201511020225	HCC110215	Analyzed by: AY1V

QC Ref # 871081 - Total Chlorine Residual (H3=past HT not complian — **Analysis Date: 11/02/2015**

201511020223	TJPOUT110215	Analyzed by: NJR
201511020224	TJPIN110215	Analyzed by: NJR
201511020225	HCC110215	Analyzed by: NJR

QC Ref # 871153 - Turbidity — **Analysis Date: 11/03/2015**

201511020223	TJPOUT110215	Analyzed by: MIA8
201511020224	TJPIN110215	Analyzed by: MIA8
201511020225	HCC110215	Analyzed by: MIA8

QC Ref # 871333 - Total phosphorus as P (T-P) — **Analysis Date: 11/04/2015**

201511020223	TJPOUT110215	Analyzed by: AZS
201511020224	TJPIN110215	Analyzed by: AZS
201511020225	HCC110215	Analyzed by: AZS

QC Ref # 872252 - Glyphosate — **Analysis Date: 11/09/2015**

201511020223	TJPOUT110215	Analyzed by: SZZ
201511020224	TJPIN110215	Analyzed by: SZZ
201511020225	HCC110215	Analyzed by: SZZ

QC Ref # 873689 - Ammonia Nitrogen — **Analysis Date: 11/16/2015**

201511020223	TJPOUT110215	Analyzed by: LUPE
201511020224	TJPIN110215	Analyzed by: LUPE
201511020225	HCC110215	Analyzed by: LUPE

QC Ref # 875074 - Total Kjeldahl Nitrogen — **Analysis Date: 11/21/2015**

201511020223	TJPOUT110215	Analyzed by: MYH
201511020224	TJPIN110215	Analyzed by: MYH
201511020225	HCC110215	Analyzed by: MYH

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QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
QC Ref# 870894 - Nitrate, Nitrite by EPA 300.0 by EPA 300.0						**Analysis Date: 11/02/2015**			
LCS1	Nitrate as Nitrogen by IC		2.5	2.55	mg/L	102	(90-110)		
LCS2	Nitrate as Nitrogen by IC		2.5	2.56	mg/L	102	(90-110)	20	0.39
MBLK	Nitrate as Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrate as Nitrogen by IC		0.05	0.0498	mg/L	100	(50-150)		
MRLLW	Nitrate as Nitrogen by IC		0.013	0.0138	mg/L	110	(50-150)		
MS_201510020005	Nitrate as Nitrogen by IC	5.6	2.6	8.20	mg/L	102	(80-120)		
MS_201511020226	Nitrate as Nitrogen by IC	1.3	1.3	2.64	mg/L	104	(80-120)		
MSD_201510020005	Nitrate as Nitrogen by IC	5.6	2.6	8.17	mg/L	101	(80-120)	20	0.37
MSD_201511020226	Nitrate as Nitrogen by IC	1.3	1.3	2.66	mg/L	105	(80-120)	20	0.76
LCS1	Nitrite Nitrogen by IC		1	0.965	mg/L	97	(90-110)		
LCS2	Nitrite Nitrogen by IC		1	0.966	mg/L	97	(90-110)	20	0.10
MBLK	Nitrite Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrite Nitrogen by IC		0.05	0.0479	mg/L	96	(50-150)		
MRLLW	Nitrite Nitrogen by IC		0.013	0.0124	mg/L	99	(50-150)		
MS_201510020005	Nitrite Nitrogen by IC	ND	1	0.963	mg/L	96	(80-120)		
MS_201511020226	Nitrite Nitrogen by IC	ND	0.5	0.480	mg/L	96	(80-120)		
MSD_201510020005	Nitrite Nitrogen by IC	ND	1	0.964	mg/L	96	(80-120)	20	0.10
MSD_201511020226	Nitrite Nitrogen by IC	ND	0.5	0.485	mg/L	97	(80-120)	20	1.0
QC Ref# 871026 - Orthophosphate as P (OPO4) by 4500P-E/365.1						**Analysis Date: 11/03/2015**			
LCS1	Orthophosphate as P		0.25	0.261	mg/L	104	(90-110)		
LCS2	Orthophosphate as P		0.25	0.257	mg/L	103	(90-110)	20	1.5
MBLK	Orthophosphate as P			<0.01	mg/L				
MRL_CHK	Orthophosphate as P		0.01	0.0130	mg/L	130	(50-150)		
MS_201511030464	Orthophosphate as P	0.20	0.5	0.690	mg/L	99	(90-110)		
MS_201511030428	Orthophosphate as P	0.46	0.5	0.957	mg/L	100	(90-110)		
MSD_201511030428	Orthophosphate as P	0.46	0.5	0.962	mg/L	101	(90-110)	20	0.52
MSD_201511030464	Orthophosphate as P	0.20	0.5	0.705	mg/L	102	(90-110)	20	2.1
QC Ref# 871081 - Total Chlorine Residual (H3=past HT not compliant) by SM 4500-CL G						**Analysis Date: 11/02/2015**			
LCS1	Total Chlorine Residual		1	1.02	mg/L	102	(85-115)		
LCS2	Total Chlorine Residual		1	1.05	mg/L	105	(85-115)	20	2.9
MBLK	Total Chlorine Residual			<0.1	mg/L				
MRL_CHK	Total Chlorine Residual		0.1	0.110	mg/L	110	(50-150)		
QC Ref# 871153 - Turbidity by EPA 180.1						**Analysis Date: 11/03/2015**			
DUP1_201511020224	Turbidity	1.2	0.05	1.17	NTU		(0-20)	20	1.7
LCS1	Turbidity		20	21.2	NTU	106	(90-110)		

Spike recovery is already corrected for native results.
Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.
RPD not calculated for LCS2 when different a concentration than LCS1 is used.
RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).
(S) - Indicates surrogate compound.
(I) - Indicates internal standard compound.

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Report: 560571

MWH Americas - Pasadena

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS2	Turbidity		20	21.1	NTU	106	(90-110)	20	0.47
MBLK	Turbidity			<0.05	NTU				
MRL_CHK	Turbidity		0.05	0.0610	NTU	122	(50-150)		
QC Ref# 871333 - Total phosphorus as P (T-P) by SM4500-PE/EPA 365.1						**Analysis Date: 11/04/2015**			
LCS1	Total phosphorus as P		0.4	0.382	mg/L	96	(90-110)		
LCS2	Total phosphorus as P		0.4	0.390	mg/L	97	(90-110)	20	2.1
MBLK	Total phosphorus as P			<0.01	mg/L				
MRL_CHK	Total phosphorus as P		0.02	0.0130	mg/L	65	(50-150)		
MS_201510280168	Total phosphorus as P	0.054	0.4	0.467	mg/L	103	(90-110)		
MS2_201511020223	Total phosphorus as P	0.058	0.4	0.396	mg/L	**85**	(90-110)		
MSD_201510280168	Total phosphorus as P	0.054	0.4	0.483	mg/L	107	(90-110)	20	3.4
MSD2_201511020223	Total phosphorus as P	0.058	0.4	0.427	mg/L	92	(90-110)	20	7.5
QC Ref# 872252 - Glyphosate by EPA 547						**Analysis Date: 11/09/2015**			
CCCH	Glyphosate		25	23.4	ug/L	94	(80-120)		
CCCM	Glyphosate		10	8.83	ug/L	88	(80-120)		
LCS1	Glyphosate		10	9.52	ug/L	95	(70-130)		
MBLK	Glyphosate			<6	ug/L				
MRL_CHK	Glyphosate		6	4.51	ug/L	75	(50-150)		
MS_201510020365	Glyphosate	ND	10	8.45	ug/L	85	(70-130)		
MS2_201510300216	Glyphosate	ND	10	9.62	ug/L	96	(70-130)		
MSD_201510020365	Glyphosate	ND	10	9.62	ug/L	96	(70-130)	20	13
QC Ref# 873689 - Ammonia Nitrogen by EPA 350.1						**Analysis Date: 11/16/2015**			
LCS1	Ammonia Nitrogen		0.5	0.517	mg/L	103	(90-110)		
LCS2	Ammonia Nitrogen		0.5	0.517	mg/L	103	(90-110)	20	0.0
MBLK	Ammonia Nitrogen			<0.025	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0527	mg/L	105	(79-126)		
MS_201510130104	Ammonia Nitrogen	ND	0.5	0.490	mg/L	98	(90-110)		
MS_201510080028	Ammonia Nitrogen	ND	0.5	0.0213	mg/L	**-0.919**	(90-110)		
MSD_201510080028	Ammonia Nitrogen	ND	0.5	0.0206	mg/L	**-1.05**	(90-110)	20	3.3
MSD_201510130104	Ammonia Nitrogen	ND	0.5	0.481	mg/L	96	(90-110)	20	1.9
QC Ref# 875074 - Total Kjeldahl Nitrogen by EPA 351.2						**Analysis Date: 11/21/2015**			
LCS1	Kjeldahl Nitrogen		4	3.62	mg/L	91	(90-110)		
LCS2	Kjeldahl Nitrogen		4	3.62	mg/L	91	(90-110)	20	0.0
MBLK	Kjeldahl Nitrogen			<0.1	mg/L				
MRL_CHK	Kjeldahl Nitrogen		0.2	0.247	mg/L	123	(50-150)		
MS_201511050526	Kjeldahl Nitrogen	0.90	4	4.81	mg/L	98	(90-110)		

Spike recovery is already corrected for native results.
Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.
RPD not calculated for LCS2 when different a concentration than LCS1 is used.
RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).
(S) - Indicates surrogate compound.
(I) - Indicates internal standard compound.

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750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: (626) 386-1100
Fax: (626) 386-1101
1 800 566 LABS (1 800 566 5227)

Laboratory QC
Report: 560571

MWH Americas - Pasadena

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MS_201511050532	Kjeldahl Nitrogen	1.5	4	5.20	mg/L	92	(90-110)		
MSD_201511050532	Kjeldahl Nitrogen	1.5	4	5.04	mg/L	**88**	(90-110)	10	3.1
MSD_201511050526	Kjeldahl Nitrogen	0.90	4	4.79	mg/L	97	(90-110)	10	0.42

Spike recovery is already corrected for native results.
Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.
RPD not calculated for LCS2 when different a concentration than LCS1 is used.
RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).
(S) - Indicates surrogate compound.
(I) - Indicates internal standard compound.

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WORK ORDER NUMBER: 15-11-0089

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Eurofins Eaton Analytical, Inc

Client Project Name: 560571

Attention: Jaclyn Contreras
750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Approved for release on 11/10/2015 by:
Cecile deGuia
Project Manager

ResultLink

Email your PM

Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC 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.

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Contents

Client Project Name: 560571
Work Order Number: 15-11-0089

1 Work Order Narrative. 3

2 Sample Summary. 4

3 Client Sample Data. 5
3.1 EPA 608 Pesticides and PCBs (Aqueous). 5

4 Quality Control Sample Data. 9
4.1 LCS/LCSD. 9

5 Sample Analysis Summary. 10

6 Glossary of Terms and Qualifiers. 11

7 Chain-of-Custody/Sample Receipt Form. 12

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Work Order Narrative

Work Order: 15-11-0089 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 11/03/15. They were assigned to Work Order 15-11-0089.

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 <= 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.

Return to Contents

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Sample Summary

Client:	Eurofins Eaton Analytical, Inc 750 Royal Oaks Drive, Suite 100 Monrovia, CA 91016-3629	Work Order:	15-11-0089
		Project Name:	560571
		PO Number:	99-37534
		Date/Time Received:	11/03/15 10:19
		Number of Containers:	3
Attn:	Jaclyn Contreras		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
201511020223	15-11-0089-1	11/02/15 10:20	1	Aqueous
201511020224	15-11-0089-2	11/02/15 11:00	1	Aqueous
201511020225	15-11-0089-3	11/02/15 11:40	1	Aqueous

Return to Contents

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Analytical Report

Eurofins Eaton Analytical, Inc		Date Received:	11/03/15
750 Royal Oaks Drive, Suite 100		Work Order:	15-11-0089
Monrovia, CA 91016-3629		Preparation:	EPA 608
		Method:	EPA 608
		Units:	ug/L
Project: 560571			Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
201511020223	**15-11-0089-1-A**	**11/02/15 10:20**	**Aqueous**	**GC 44**	**11/03/15**	**11/04/15 14:11**	**151103L10A**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Aldrin	ND	0.095	0.025	1.00	
Alpha Chlordane	ND	0.095	0.026	1.00	
Alpha-BHC	ND	0.095	0.027	1.00	
Aroclor-1016	ND	0.95	0.28	1.00	
Aroclor-1221	ND	0.95	0.27	1.00	
Aroclor-1232	ND	0.95	0.24	1.00	
Aroclor-1242	ND	0.95	0.17	1.00	
Aroclor-1248	ND	0.95	0.19	1.00	
Aroclor-1254	ND	0.95	0.21	1.00	
Aroclor-1260	ND	0.95	0.25	1.00	
Beta-BHC	ND	0.095	0.029	1.00	
Chlordane	ND	0.95	0.31	1.00	
4,4'-DDD	ND	0.095	0.026	1.00	
4,4'-DDE	ND	0.095	0.025	1.00	
4,4'-DDT	ND	0.095	0.025	1.00	
Delta-BHC	ND	0.095	0.027	1.00	
Dieldrin	ND	0.095	0.027	1.00	
Endosulfan I	ND	0.095	0.026	1.00	
Endosulfan II	ND	0.095	0.026	1.00	
Endosulfan Sulfate	ND	0.095	0.028	1.00	
Endrin	ND	0.095	0.029	1.00	
Endrin Aldehyde	ND	0.095	0.025	1.00	
Endrin Ketone	ND	0.095	0.023	1.00	
Gamma Chlordane	ND	0.095	0.026	1.00	
Gamma-BHC	ND	0.095	0.029	1.00	
Heptachlor	ND	0.095	0.025	1.00	
Heptachlor Epoxide	ND	0.095	0.024	1.00	
Methoxychlor	ND	0.095	0.024	1.00	
Toxaphene	ND	1.9	0.56	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	106	50-135	
2,4,5,6-Tetrachloro-m-Xylene	101	50-135	

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

Return to Contents

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Analytical Report

Eurofins Eaton Analytical, Inc
750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Date Received: 11/03/15
Work Order: 15-11-0089
Preparation: EPA 608
Method: EPA 608
Units: ug/L

Project: 560571

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
201511020224	**15-11-0089-2-A**	**11/02/15 11:00**	**Aqueous**	**GC 44**	**11/03/15**	**11/04/15 14:25**	**151103L10A**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Aldrin	ND	0.095	0.025	1.00	
Alpha Chlordane	ND	0.095	0.026	1.00	
Alpha-BHC	ND	0.095	0.027	1.00	
Aroclor-1016	ND	0.95	0.28	1.00	
Aroclor-1221	ND	0.95	0.27	1.00	
Aroclor-1232	ND	0.95	0.24	1.00	
Aroclor-1242	ND	0.95	0.17	1.00	
Aroclor-1248	ND	0.95	0.19	1.00	
Aroclor-1254	ND	0.95	0.21	1.00	
Aroclor-1260	ND	0.95	0.25	1.00	
Beta-BHC	ND	0.095	0.029	1.00	
Chlordane	ND	0.95	0.31	1.00	
4,4'-DDD	ND	0.095	0.026	1.00	
4,4'-DDE	ND	0.095	0.025	1.00	
4,4'-DDT	ND	0.095	0.025	1.00	
Delta-BHC	ND	0.095	0.027	1.00	
Dieldrin	ND	0.095	0.027	1.00	
Endosulfan I	ND	0.095	0.026	1.00	
Endosulfan II	ND	0.095	0.026	1.00	
Endosulfan Sulfate	ND	0.095	0.028	1.00	
Endrin	ND	0.095	0.029	1.00	
Endrin Aldehyde	ND	0.095	0.025	1.00	
Endrin Ketone	ND	0.095	0.023	1.00	
Gamma Chlordane	ND	0.095	0.026	1.00	
Gamma-BHC	ND	0.095	0.029	1.00	
Heptachlor	ND	0.095	0.025	1.00	
Heptachlor Epoxide	ND	0.095	0.024	1.00	
Methoxychlor	ND	0.095	0.024	1.00	
Toxaphene	ND	1.9	0.56	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	103	50-135	
2,4,5,6-Tetrachloro-m-Xylene	97	50-135	

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

Return to Contents

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Analytical Report

Eurofins Eaton Analytical, Inc
750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Date Received: 11/03/15
Work Order: 15-11-0089
Preparation: EPA 608
Method: EPA 608
Units: ug/L

Project: 560571

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
201511020225	**15-11-0089-3-A**	**11/02/15 11:40**	**Aqueous**	**GC 44**	**11/03/15**	**11/04/15 14:39**	**151103L10A**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Aldrin	ND	0.095	0.025	1.00	
Alpha Chlordane	ND	0.095	0.026	1.00	
Alpha-BHC	ND	0.095	0.027	1.00	
Aroclor-1016	ND	0.95	0.28	1.00	
Aroclor-1221	ND	0.95	0.27	1.00	
Aroclor-1232	ND	0.95	0.24	1.00	
Aroclor-1242	ND	0.95	0.17	1.00	
Aroclor-1248	ND	0.95	0.19	1.00	
Aroclor-1254	ND	0.95	0.21	1.00	
Aroclor-1260	ND	0.95	0.25	1.00	
Beta-BHC	ND	0.095	0.029	1.00	
Chlordane	ND	0.95	0.31	1.00	
4,4'-DDD	ND	0.095	0.026	1.00	
4,4'-DDE	ND	0.095	0.025	1.00	
4,4'-DDT	ND	0.095	0.025	1.00	
Delta-BHC	ND	0.095	0.027	1.00	
Dieldrin	ND	0.095	0.027	1.00	
Endosulfan I	ND	0.095	0.026	1.00	
Endosulfan II	ND	0.095	0.026	1.00	
Endosulfan Sulfate	ND	0.095	0.028	1.00	
Endrin	ND	0.095	0.029	1.00	
Endrin Aldehyde	ND	0.095	0.025	1.00	
Endrin Ketone	ND	0.095	0.023	1.00	
Gamma Chlordane	ND	0.095	0.026	1.00	
Gamma-BHC	ND	0.095	0.029	1.00	
Heptachlor	ND	0.095	0.025	1.00	
Heptachlor Epoxide	ND	0.095	0.024	1.00	
Methoxychlor	ND	0.095	0.024	1.00	
Toxaphene	ND	1.9	0.56	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	109	50-135	
2,4,5,6-Tetrachloro-m-Xylene	103	50-135	

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

Return to Contents

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Analytical Report

Eurofins Eaton Analytical, Inc
750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Date Received: 11/03/15
Work Order: 15-11-0089
Preparation: EPA 608
Method: EPA 608
Units: ug/L

Project: 560571

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-731-367**	**N/A**	**Aqueous**	**GC 44**	**11/03/15**	**11/04/15 13:42**	**151103L10A**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Aldrin	ND	0.10	0.027	1.00	
Alpha Chlordane	ND	0.10	0.027	1.00	
Alpha-BHC	ND	0.10	0.028	1.00	
Aroclor-1016	ND	1.0	0.29	1.00	
Aroclor-1221	ND	1.0	0.28	1.00	
Aroclor-1232	ND	1.0	0.25	1.00	
Aroclor-1242	ND	1.0	0.18	1.00	
Aroclor-1248	ND	1.0	0.20	1.00	
Aroclor-1254	ND	1.0	0.23	1.00	
Aroclor-1260	ND	1.0	0.26	1.00	
Beta-BHC	ND	0.10	0.030	1.00	
Chlordane	ND	1.0	0.33	1.00	
4,4'-DDD	ND	0.10	0.027	1.00	
4,4'-DDE	ND	0.10	0.027	1.00	
4,4'-DDT	ND	0.10	0.027	1.00	
Delta-BHC	ND	0.10	0.029	1.00	
Dieldrin	ND	0.10	0.029	1.00	
Endosulfan I	ND	0.10	0.028	1.00	
Endosulfan II	ND	0.10	0.027	1.00	
Endosulfan Sulfate	ND	0.10	0.029	1.00	
Endrin	ND	0.10	0.031	1.00	
Endrin Aldehyde	ND	0.10	0.026	1.00	
Endrin Ketone	ND	0.10	0.024	1.00	
Gamma Chlordane	ND	0.10	0.027	1.00	
Gamma-BHC	ND	0.10	0.030	1.00	
Heptachlor	ND	0.10	0.026	1.00	
Heptachlor Epoxide	ND	0.10	0.025	1.00	
Methoxychlor	ND	0.10	0.025	1.00	
Toxaphene	ND	2.0	0.59	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	107	50-135	
2,4,5,6-Tetrachloro-m-Xylene	112	50-135	

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

Return to Contents

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Quality Control - LCS/LCSD

Eurofins Eaton Analytical, Inc
750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Project: 560571

Date Received: 11/03/15
Work Order: 15-11-0089
Preparation: EPA 608
Method: EPA 608

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-731-367	**LCS**	**Aqueous**	**GC 44**	**11/03/15**	**11/05/15 15:19**	**151103L10A**
099-12-731-367	**LCSD**	**Aqueous**	**GC 44**	**11/03/15**	**11/05/15 16:31**	**151103L10A**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Aldrin	0.5000	0.4021	80	0.4953	99	50-135	36-149	21	0-25	
Alpha Chlordane	0.5000	0.4052	81	0.4910	98	50-135	36-149	19	0-25	
Alpha-BHC	0.5000	0.3996	80	0.5159	103	50-135	36-149	25	0-25	
Aroclor-1016	2.000	2.665	133	2.498	125	50-135	36-149	6	0-25	
Aroclor-1260	2.000	1.938	97	1.941	97	50-135	36-149	0	0-25	
Beta-BHC	0.5000	0.8168	163	0.8333	167	50-135	36-149	2	0-25	X
4,4'-DDD	0.5000	0.4144	83	0.4998	100	50-135	36-149	19	0-25	
4,4'-DDE	0.5000	0.4064	81	0.4983	100	50-135	36-149	20	0-25	
4,4'-DDT	0.5000	0.4415	88	0.5221	104	50-135	36-149	17	0-25	
Delta-BHC	0.5000	0.4055	81	0.5241	105	50-135	36-149	26	0-25	X
Dieldrin	0.5000	0.4226	85	0.5090	102	50-135	36-149	19	0-25	
Endosulfan I	0.5000	0.4013	80	0.4907	98	50-135	36-149	20	0-25	
Endosulfan II	0.5000	0.4183	84	0.4888	98	50-135	36-149	16	0-25	
Endosulfan Sulfate	0.5000	0.4454	89	0.5037	101	50-135	36-149	12	0-25	
Endrin	0.5000	0.4708	94	0.6020	120	50-135	36-149	24	0-25	
Endrin Aldehyde	0.5000	0.4111	82	0.4584	92	50-135	36-149	11	0-25	
Gamma Chlordane	0.5000	0.3931	79	0.4834	97	50-135	36-149	21	0-25	
Gamma-BHC	0.5000	0.4158	83	0.5402	108	50-135	36-149	26	0-25	X
Heptachlor	0.5000	0.4220	84	0.5283	106	50-135	36-149	22	0-25	
Heptachlor Epoxide	0.5000	0.3984	80	0.4918	98	50-135	36-149	21	0-25	
Methoxychlor	0.5000	0.4512	90	0.5389	108	50-135	36-149	18	0-25	

Total number of LCS compounds: 21
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

RPD: Relative Percent Difference. CL: Control Limits

Return to Contents

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Sample Analysis Summary Report

Work Order: 15-11-0089 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 608	EPA 608	960	GC 44	1

Return to Contents

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Glossary of Terms and Qualifiers

Work Order: 15-11-0089 Page 1 of 1

Qualifiers	Definition
*	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.

Return to Contents

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Ship To:
Eurofins CalScience
7440 Lincoln Way

Garden Grove, CA 92641-1432

Phone: 714-895-5494 Fax: 714-894-7501

Submittal Form & Purchase Order 99-37534

Date: 11/3/2015

REPORTING REQUIRMENTS:** ***Do Not Combine Reports with any other samples submitted under different Folder Numbers!
Report & Invoice must have the Folder # **560571** Sub PO# **99-37534** and Job # **1000014**

Report all quality control data according to Method. Include dates analyzed. Date extracted (if extracted) and Method reference on the report.
Results must have Complete data & QC with Approval Signature.

Reports: Jackie Contreras Sub-Contracting Administrator
EMAIL TO: us20_subcontract@eurofinsus.com
Eurofins Eaton Analytical 750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016
Phone (626) 386-1165 Fax (626) 386-1122
Invoices to: Eurofins Eaton Analytical
Accounts Payable 2425 New Holland Pike, Lancaster, PA 17605

Provide in each Report the Specified State Certification # & Exp Date for requested tests + matrix.

Samples from: **CALIFORNIA**

15-11-0089

Folder #:	Report Due:	Sub PO #:
560571	11/23/2015	99-37534

JLS	Use Lab Order # for ID	Client Sample ID for reference only		Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
	201511020223	TJPOUT110215	(1)		11/02/15 1020	DW		
EPA 608	@608_PEST			Organochlorine Pesticides				
EPA 608	@608_PCBS			Organochlorine PCBs				
	201511020224	TJPIN110215	(2)		11/02/15 1100	DW		
EPA 608	@608_PEST			Organochlorine Pesticides				
EPA 608	@608_PCBS			Organochlorine PCBs				
	201511020225	HCC110215	(3)		11/02/15 1140	DW		
EPA 608	@608_PEST			Organochlorine Pesticides				
EPA 608	@608_PCBS			Organochlorine PCBs				

Relinquished by: Sample Control Date 11/3/15 Time 10:19

Received by: Date 11/03/15 Time 1019

Relinquished by: Sample Control Date _____ Time _____

Received by: Date _____ Time _____

NOTIFICATION REQUIRED IF RECEIVED OUTSIDE OF 0-6 CELSIUS

An Acknowledgement of Receipt is requested to attn: Jackie Contreras

Return to Contents

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WORK ORDER NUMBER: 15-11- 0089

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: EEA

DATE: 11 / 03 / 2015

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC2 (CF:-0.4°C); Temperature (w/o CF): 3.4 °C (w/ CF): 3.0 °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: 836

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 836

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 1048

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

CONTAINER TYPE: (Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA**h** ☐ VOA**na$_2$** ☐ 100PJ ☐ 100PJ**na$_2$** ☐ 125AGB ☐ 125AGB**h** ☐ 125AGB**p** ☐ 125PB

☐ 125PB**znna** ☐ 250AGB ☐ 250CGB ☐ 250CGB**s** ☐ 250PB ☐ 250PB**n** ☐ 500AGB ☐ 500AGJ ☐ 500AGJ**s**

☐ 500PB ☑ 1AGB ☐ 1AGB**na$_2$** ☐ 1AGB**s** ☐ 1PB ☐ 1PB**na** ☐ _____ ☐ _____ ☐ _____ ☐ _____

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** = HNO_3, **na** = NaOH, **na$_2$** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **znna** = $Zn(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: 1048

Reviewed by: 1017

Return to Contents

TABLE OF CONTENTS

CLIENT: **EUROFINS EATON ANALYTICAL**

PROJECT: **560571**

SDG: **15K013**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1004
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	METHOD 3520C/8141A	5000 – 5009
HPLC	**	6000 –
METALS	**	7000 –
WET	**	8000 –
OTHERS	**	9000 –

** - Not Requested

LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 11-13-2015
EMAX Batch No.: 15K013

Attn: Jackie Contreras

Eurofins Eaton Analytical
750 Royal Oaks Dr., Suite 100
Monrovia, CA 91016-3629

Subject: Laboratory Report
Project: 560571

Enclosed is the Laboratory report for samples received on 11/04/15.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
201511020223	K013-01	11/02/15	WATER	PESTICIDES ORGANOPHOSPHORUS
201511020224	K013-02	11/02/15	WATER	PESTICIDES ORGANOPHOSPHORUS
201511020225	K013-03	11/02/15	WATER	PESTICIDES ORGANOPHOSPHORUS

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning
these results.

Sincerely yours,

Caspar J. Pang
Laboratory Director

This report is confidential and intended solely for the use of the individual or entity to whom it is addressed. This report shall not be reproduced except in full or without the written approval of EMAX.

EMAX certifies that results included in this report meets all NELAC & DOD requirements unless noted in the Case Narrative.

NELAP Accredited Certificate Number E871112
L-A-B Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672

eurofins | Eaton Analytical

Ship To:
EMAX Laboratories, Inc.
1835 W. 205th St.

Torrance, CA 90501

Phone: 310-618-8889 Fax: 310-618-0818

Submittal Form & Purchase Order 99-37541

151013

Date: 11/3/2015

*REPORTING REQUIRMENTS: ***Do Not Combine Reports with any other samples submitted under different Folder Numbers!***
Report & Invoice must have the Folder # **560571** Sub PO# **99-37541** and Job # **1000014**

Report all quality control data according to Method, Include dates analyzed. Date extracted (if extracted) and Method reference on the report.
Results must have Complete data & QC with Approval Signature.

Reports: Jackie Contreras Sub-Contracting Administrator
EMAIL TO: us20_subcontract@eurofinsus.com
Eurofins Eaton Analytical 750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016
Phone (626) 386-1165 Fax (626) 386-1122
Invoices to: Eurofins Eaton Analytical
Accounts Payable 2425 New Holland Pike, Lancaster, PA 17605

Provide in each Report the Specified State Certification # & Exp Date for requested tests + matrix.

Samples from: **CALIFORNIA**

Folder #:	Report Due:	Sub PO #:
560571	11/18/2015	99-37541

	JLS	Use Lab Order # for ID	Client Sample ID for reference only	Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
1	EPA 8141A	201511020223 @8141EDD	TJPOUT110215	Organophosphorous Pesticides (Sub)	11/02/15 1020	DW		
2	EPA 8141A	201511020224 @8141EDD	TJPIN110215	Organophosphorous Pesticides (Sub)	11/02/15 1100	DW		
3	EPA 8141A	201511020225 @8141EDD	HCC110215	Organophosphorous Pesticides (Sub)	11/02/15 1140	DW		

Relinquished by: Sample Control Date 11/3/15 Time 0920

Received by: _____ Date _____ Time _____

Relinquished by: Sample Control Date _____ Time _____

Received by: _____ Date 11/04/15 Time 9:00

NOTIFICATION REQUIRED IF RECEIVED OUTSIDE OF 0-6 CELSIUS

An Acknowledgement of Receipt is requested to attn: Jackie Contreras

180

SAMPLE RECEIPT FORM 1

Reference Number: SM02.7.3

Type of Delivery	Airbill / Tracking Number	ECN 15K013
☑ Fedex ☐ UPS ☐ GSO ☐ Others	6494 5357 4968	Recipient Miguel
☐ EMAX Courier ☐ Client Delivery		Date 11/04/15 Time 9:00

COC INSPECTION

☑ Client Name	☑ Client PM/FC	☐ Sampler Name	☑ Sampling Date/Time	☑ Sample ID	☑ Matrix
☑ Address	☑ Tel # / Fax #	☐ Courier Signature	☑ Analysis Required	☐ Preservative (if any)	☑ TAT
Safety Issues (if any)	☐ High concentrations expected	☐ From Superfund Site	☐ Rad screening required		

Note: _____

PACKAGING INSPECTION

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☑ Custody Seal	☑ Intact	☐ Damaged		
Packaging	☑ Bubble Pack	☐ Styrofoam	☐ Popcorn	☑ Sufficient	☐ _____
Temperatures (Cool, ≤6 °C but not frozen)	☑ Cooler 1 1.8 °C	☐ Cooler 2_____ °C	☐ Cooler 3_____ °C	☐ Cooler 4_____ °C	☐ Cooler 5_____ °C
	☐ Cooler 6_____ °C	☐ Cooler 7_____ °C	☐ Cooler 8_____ °C	☐ Cooler 9_____ °C	☐ Cooler 10_____ °C
Thermometer:	*A - S/N* _____	FM 11/20/15 *B - S/N* 140252070	*C - S/N* 140252067	*D - S/N* 150555630	

Comments: ☐ **Temperature is out of range. PM was informed IMMEDIATELY.**

Note: _____

DISCREPANCIES

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action

11/4/15

☐ pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time. RB 11/4/15

NOTES/OBSERVATIONS:

LEGEND:

☐ **Continue to next page.**

Code	Description- Sample Management
D1	Analysis is not indicated in _____
D2	Analysis mismatch COC vs label
D3	Sample ID mismatch COC vs label
D4	Sample ID is not indicated in _____
D5	Container -[improper] [leaking] [broken]
D6	Date/Time is not indicated in _____
D7	Date/Time mismatch COC vs label
D8	Sample listed in COC is not received
D9	Sample received is not listed in COC
D10	No initial/date on corrections in COC/label
D11	Container count mismatch COC vs received
D12	Container size mismatch COC vs received

Code	Description-Sample Management
D13	Out of Holding Time
D14	Bubble is >6mm
D15	No trip blank in cooler
D16	Preservation not indicated in _____
D17	Preservation mismatch COC vs label
D18	Insufficient chemical preservative
D19	Insufficient Sample
D20	No filtration info for dissolved analysis
D21	No sample for moisture determination
D22	_____
D23	_____
D24	_____

Code	Description-Sample Management
R1	Proceed as indicated in ☐ COC ☐ Label
R2	Refer to attached instruction
R3	Cancel the analysis
R4	Use vial with smallest bubble first
R5	Log-in with latest sampling date and time+1 min
R6	Adjust pH as necessary
R7	Filter and preserved as necessary
R8	_____
R9	_____
R10	_____
R11	_____
R12	_____

REVIEWS:

Sample Labeling Date 11/04/15 / 11/4/15

SRF Date 11/4/15

PM RB Date 11/4/15

ORIGIN ID:WHPA (626) 386-1100
KARLOS RUECKERT
EUROFINS EATON ANALYTICAL
750 ROYAL OAKS DR SUITE 100
MONROVIA, CA 91016
UNITED STATES US
SHIP DATE: 03NOV15
ACTWGT: 50.2 LB
CAD: 31999/CAFE2910
DIMS: 24x14x14 IN
BILL SENDER
TO SAMPLE RECEIVING
EMAX LABORATORIES, INC.
1835 W. 205TH STREET
TORRANCE CA 90501
(310) 618-8889 X 118
PO: JGS
DEPT: SAMPLE PREP. / SHIPPING
FedEx
Express
TRK# 0201 6494 5357 4968
WED - 04 NOV 10:30A
PRIORITY OVERNIGHT
92 HHRA
90501
CA-US LAX

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than LOQ/RL but greater than LOD/MDL/DL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range or estimated value.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

EUROFINS EATON ANALYTICAL

560571

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

SDG#: 15K013

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project: 560571

SDG : 15K013

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

A total of three (3) water samples were received on 11/04/15 to be analyzed for Organophosphorous Compounds by GC in accordance with Method 3520C/8141A and project specific requirements.

Holding Time
Samples were analyzed within the prescribed holding time.

Calibration
Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using a secondary source (ICV). Continuing calibration (CCV) verifications were carried on a frequency specified by the project. All calibration requirements were within acceptance criteria. Refer to calibration summary forms of ICAL, ICV and CCV for details.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one (1) method blank was analyzed. NPK002WB - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of LCS/LCD was analyzed. All Analytes in NPK002WL/NPK002WC were within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample
No matrix QC sample was designated on this SDG.

Surrogate
Surrogates were added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met. Sample K013-01 was analyzed with 10X dilution due to sample matrix problem.

LAB CHRONICLE
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL
Project : 560571

SDG NO. : 15K013
Instrument ID : GCT012

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	NPK002WB	1	NA	11/09/1513:52	11/05/1512:00	ZK09003A	ZK09002A	NPK002W	Method Blank
LCS1W	NPK002WL	1	NA	11/09/1515:05	11/05/1512:00	ZK09004A	ZK09002A	NPK002W	Lab Control Sample (LCS)
LCD1W	NPK002WC	1	NA	11/09/1515:39	11/05/1512:00	ZK09005A	ZK09002A	NPK002W	LCS Duplicate
201511020224	K013-02	1.08	NA	11/09/1518:29	11/05/1512:00	ZK09010A	ZK09002A	NPK002W	Field Sample
201511020225	K013-03	0.93	NA	11/09/1519:38	11/05/1512:00	ZK09012A	ZK09011A	NPK002W	Field Sample
201511020223	K013-01	10.6	NA	11/10/1501:52	11/05/1512:00	ZK09023A	ZK09022A	NPK002W	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 11/02/15
Project : 560571	Date Received: 11/04/15
Batch No. : 15K013	Date Extracted: 11/05/15 12:00
Sample ID: 201511020223	Date Analyzed: 11/10/15 01:52
Lab Samp ID: K013-01	Dilution Factor: 10.6
Lab File ID: ZK09023A	Matrix : WATER
Ext Btch ID: NPK002W	% Moisture : NA
Calib. Ref.: ZK09022A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	11	5.3 | 5.3
MEVINPHOS	(ND) | ND	11	5.3 | 5.3
DEMETON	(ND) | ND	11	5.3 | 5.3
ETHOPROP	(ND) | ND	11	5.3 | 5.3
PHORATE	(ND) | ND	11	5.3 | 5.3
NALED	(ND) | ND	11	5.3 | 5.3
DIAZINON	(ND) | ND	11	5.3 | 5.3
DISULFOTON	(ND) | ND	11	5.3 | 5.3
RONNEL	(ND) | ND	11	5.3 | 5.3
CHLORPYRIFOS	(ND) | ND	11	5.3 | 5.3
FENTHION	(ND) | ND	11	5.3 | 5.3
TRICHLORONATE	(ND) | ND	11	5.3 | 5.3
METHYL PARATHION	(ND) | ND	11	5.3 | 5.3
TOKUTHION	(ND) | ND	11	5.3 | 5.3
STIROPHOS	(ND) | ND	11	5.3 | 5.3
BOLSTAR	(ND) | ND	11	5.3 | 5.3
FENSULFOTHION	(ND) | ND	11	5.3 | 5.3
AZINPHOS-METHYL	(ND) | ND	11	5.3 | 5.3
COUMAPHOS	(ND) | ND	11	5.3 | 5.3

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	(1.454) | 1.249	1.590	(91.5) | 78.5	30-130
TRIPHENYL PHOSPHATE	(1.470) | 1.456	1.590	(92.5) | 91.6	50-130

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 11/02/15
Project : 560571	Date Received: 11/04/15
Batch No. : 15K013	Date Extracted: 11/05/15 12:00
Sample ID: 201511020224	Date Analyzed: 11/09/15 18:29
Lab Samp ID: K013-02	Dilution Factor: 1.08
Lab File ID: ZK09010A	Matrix : WATER
Ext Btch ID: NPK002W	% Moisture : NA
Calib. Ref.: ZK09002A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	1.1	0.54 | 0.54
MEVINPHOS	(ND) | ND	1.1	0.54 | 0.54
DEMETON	(ND) | ND	1.1	0.54 | 0.54
ETHOPROP	(ND) | ND	1.1	0.54 | 0.54
PHORATE	(ND) | ND	1.1	0.54 | 0.54
NALED	(ND) | ND	1.1	0.54 | 0.54
DIAZINON	(ND) | ND	1.1	0.54 | 0.54
DISULFOTON	(ND) | ND	1.1	0.54 | 0.54
RONNEL	(ND) | ND	1.1	0.54 | 0.54
CHLORPYRIFOS	(ND) | ND	1.1	0.54 | 0.54
FENTHION	(ND) | ND	1.1	0.54 | 0.54
TRICHLORONATE	(ND) | ND	1.1	0.54 | 0.54
METHYL PARATHION	(ND) | ND	1.1	0.54 | 0.54
TOKUTHION	(ND) | ND	1.1	0.54 | 0.54
STIROPHOS	(ND) | ND	1.1	0.54 | 0.54
BOLSTAR	(ND) | ND	1.1	0.54 | 0.54
FENSULFOTHION	(ND) | ND	1.1	0.54 | 0.54
AZINPHOS-METHYL	(ND) | ND	1.1	0.54 | 0.54
COUMAPHOS	(ND) | ND	1.1	0.54 | 0.54

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	(1.275) | 1.231	1.620	(78.7) | 76.0	30-130
TRIPHENYL PHOSPHATE	1.274 | (1.645)	1.620	78.7 | (102)	50-130

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 11/02/15
Project : 560571	Date Received: 11/04/15
Batch No. : 15K013	Date Extracted: 11/05/15 12:00
Sample ID: 201511020225	Date Analyzed: 11/09/15 19:38
Lab Samp ID: K013-03	Dilution Factor: 0.93
Lab File ID: ZK09012A	Matrix : WATER
Ext Btch ID: NPK002W	% Moisture : NA
Calib. Ref.: ZK09011A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	0.93	0.47 | 0.47
MEVINPHOS	(ND) | ND	0.93	0.47 | 0.47
DEMETON	(ND) | ND	0.93	0.47 | 0.47
ETHOPROP	(ND) | ND	0.93	0.47 | 0.47
PHORATE	(ND) | ND	0.93	0.47 | 0.47
NALED	(ND) | ND	0.93	0.47 | 0.47
DIAZINON	(ND) | ND	0.93	0.47 | 0.47
DISULFOTON	(ND) | ND	0.93	0.47 | 0.47
RONNEL	(ND) | ND	0.93	0.47 | 0.47
CHLORPYRIFOS	(ND) | ND	0.93	0.47 | 0.47
FENTHION	(ND) | ND	0.93	0.47 | 0.47
TRICHLORONATE	(ND) | ND	0.93	0.47 | 0.47
METHYL PARATHION	(ND) | ND	0.93	0.47 | 0.47
TOKUTHION	(ND) | ND	0.93	0.47 | 0.47
STIROPHOS	(ND) | ND	0.93	0.47 | 0.47
BOLSTAR	(ND) | ND	0.93	0.47 | 0.47
FENSULFOTHION	(ND) | ND	0.93	0.47 | 0.47
AZINPHOS-METHYL	(ND) | ND	0.93	0.47 | 0.47
COUMAPHOS	(ND) | ND	0.93	0.47 | 0.47

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	(1.120) | 1.071	1.395	(80.3) | 76.8	30-130
TRIPHENYL PHOSPHATE	1.175 | (1.390)	1.395	84.2 | (99.7)	50-130

QC SUMMARIES

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: NA
Project : 560571	Date Received: 11/05/15
Batch No. : 15K013	Date Extracted: 11/05/15 12:00
Sample ID: MBLK1W	Date Analyzed: 11/09/15 13:52
Lab Samp ID: NPK002WB	Dilution Factor: 1
Lab File ID: ZK09003A	Matrix : WATER
Ext Btch ID: NPK002W	% Moisture : NA
Calib. Ref.: ZK09002A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	1.0	0.50 | 0.50
MEVINPHOS	(ND) | ND	1.0	0.50 | 0.50
DEMETON	(ND) | ND	1.0	0.50 | 0.50
ETHOPROP	(ND) | ND	1.0	0.50 | 0.50
PHORATE	(ND) | ND	1.0	0.50 | 0.50
NALED	(ND) | ND	1.0	0.50 | 0.50
DIAZINON	(ND) | ND	1.0	0.50 | 0.50
DISULFOTON	(ND) | ND	1.0	0.50 | 0.50
RONNEL	(ND) | ND	1.0	0.50 | 0.50
CHLORPYRIFOS	(ND) | ND	1.0	0.50 | 0.50
FENTHION	(ND) | ND	1.0	0.50 | 0.50
TRICHLORONATE	(ND) | ND	1.0	0.50 | 0.50
METHYL PARATHION	(ND) | ND	1.0	0.50 | 0.50
TOKUTHION	(ND) | ND	1.0	0.50 | 0.50
STIROPHOS	(ND) | ND	1.0	0.50 | 0.50
BOLSTAR	(ND) | ND	1.0	0.50 | 0.50
FENSULFOTHION	(ND) | ND	1.0	0.50 | 0.50
AZINPHOS-METHYL	(ND) | ND	1.0	0.50 | 0.50
COUMAPHOS	(ND) | ND	1.0	0.50 | 0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	(1.053) | 0.9650	1.500	(70.2) | 64.3	30-130
TRIPHENYL PHOSPHATE	1.157 | (1.355)	1.500	77.1 | (90.3)	50-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: EUROFINS EATON ANALYTICAL
PROJECT: 560571
BATCH NO.: 15K013
METHOD: METHOD 3520C/8141A

MATRIX: WATER % MOISTURE: NA

DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK1W				
LAB SAMP ID:	NPK002WB	NPK002WL	NPK002WC		
LAB FILE ID:	ZK09003A	ZK09004A	ZK09005A		
DATE EXTRACTED:	11/05/1512:00	11/05/1512:00	11/05/1512:00	DATE COLLECTED:	NA
DATE ANALYZED:	11/09/1513:52	11/09/1515:05	11/09/1515:39	DATE RECEIVED:	11/05/15
PREP. BATCH:	NPK002W	NPK002W	NPK002W		
CALIB. REF:	ZK09002A	ZK09002A	ZK09002A		

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Phorate	(ND) | ND	1.50	1.26 | (1.60)	84 | (107)	1.50	1.22 | (1.44)	81 | (96)	3 | (11)	10-130	30
Ronnel	(ND) | ND	1.50	1.44 | (1.68)	96 | (112)	1.50	1.28 | (1.49)	85 | (99)	12 | (12)	30-140	30
Chlorpyrifos	(ND) | ND	1.50	1.46 | (1.57)	97 | (105)	1.50	1.30 | (1.46)	87 | (97)	12 | (7)	40-140	30
Tokuthion	(ND) | ND	1.50	1.46 | (1.72)	97 | (115)	1.50	1.38 | (1.62)	92 | (108)	6 | (6)	40-130	30
Bolstar	(ND) | ND	1.50	(1.49) | 1.36	(99) | 91	1.50	(1.30) | 1.26	(87) | 84	(14) | 8	20-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Tributyl Phosphate	1.500	1.350 | (1.414)	90.0 | (94.3)	1.500	1.204 | (1.341)	80.3 | (89.4)	30-130
Triphenyl Phosphate	1.500	1.383 | (1.436)	92.2 | (95.7)	1.500	1.311 | (1.343)	87.4 | (89.5)	50-130

APPENDIX H

Trails Maintenance and Monitoring Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

May 22, 2015
(2014-003.005/006/6)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: First Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (March 2015) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in March 2015.

All trails within the Mitigation Area were surveyed on March 31, 2015 by ECORP Consulting, Inc. (ECORP) biologist, Amy Trost, to identify any problem areas along the trail system at the Mitigation Area. The biologist surveyed for areas of erosion, fallen trees, poison oak overgrowth, and potential safety hazards present on and adjacent to the trails. The biologist noted any rock or debris dams observed in Haines Canyon Creek. The current condition of the trails and trail system was documented and representative site photographs were taken.

The popular picnic area (noted in previous memos) located near the South Wheatland entrance (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 11 S 375184 E, 3792585 N) showed evidence of recent use, including a small piece of wood that was added to the existing rope swing (Figure 1), trash (Figure 2), and a large rock dam (Figure 3).

An unauthorized trail (Figure 4) was observed near the Cottonwood Avenue entrance (NAD 83, UTM 376172 E, 3792660 N). Part of the trail was blocked using previously trimmed vegetation; however, the trail will be completely blocked during the exotic plant removal effort planned for April 2015.

A fire pit, trash, and an unauthorized trail were observed (NAD 83, UTM 375365 E, 3792550 N) between the Cottonwood Avenue and South Wheatland entrances (Figure 5). The trail was blocked using previously trimmed vegetation.

A rock dam was observed (NAD 83, UTM 376443 E, 3792732 N) near the Tujunga ponds (Figure 6). The rocks were spread out and the large logs were removed from the water.

A tree fell across the trail (Figure 7) west of the Cottonwood Avenue entrance (NAD 83, UTM 375746 E, 3792483 N). It will be removed during the exotic plant removal effort planned for April 2015.

Poison oak (*Toxicodendron diversilobum*) was observed encroaching on the trail east of the South Wheatland entrance (NAD 83, UTM 375510 E, 3792543 N). The poison oak will be trimmed during the exotic plant removal effort planned for April 2015.

Grasses were also observed encroaching on the trail north of the Cottonwood Avenue entrance (NAD 83, UTM 376371 E, 3792464 N; Figure 8). These grasses will be trimmed and/or sprayed during the exotic plant removal effort planned for April 2015.

One person playing a saxophone could be heard between the Cottonwood Avenue and South Wheatland entrances (NAD 83, UTM 376103 E, 3792682 N). The person was not observed during the survey. The activity is not expected to cause adverse impacts but was reported for documentation purposes.

The biologist did not observe any homeless encampments during the survey.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: May 22, 2015

Amy Leigh Trost
Associate Biologist

Figure 1. Rope swing at the popular picnic area located near the South Wheatland entrance.

Figure 2. Trash at the popular picnic area located near the South Wheatland entrance.

Figure 3. Rock dam at the popular picnic area located near the South Wheatland entrance.

Figure 4. Unauthorized trail blocked near the Cottonwood Avenue entrance.

Figure 5. Fire pit between Cottonwood Avenue and South Wheatland entrances.

Figure 6. Rock dam located near the Tujunga Ponds before it was removed.

Figure 7. A fallen tree across the trail west of the Cottonwood Avenue entrance.

Figure 8. Overgrown brome grasses near the Cottonwood Avenue entrance.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

July 28, 2015
(2014-003.005/006/6)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Second Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (July 2015) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in July 2015.

All trails within the Mitigation Area were surveyed on July 24, 2015 by ECORP Consulting, Inc. (ECORP) biologist, Amy Trost and Carley Lancaster, to identify any problem areas along the trail system at the Mitigation Area. The biologist surveyed for areas of erosion, fallen trees, poison oak overgrowth, and potential safety hazards present on and adjacent to the trails. The biologist noted any rock or debris dams observed in Haines Canyon Creek. The current condition of the trails and trail system was documented and representative site photographs were taken.

The popular picnic area (noted in previous memos) located near the South Wheatland entrance (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 11 S 375184 E, 3792585 N) still showed signs of use including the presence of a rope swing (Figure 1), trash, and a rock dam (Figure 2). These issues were noted in previous memos and continue to be a problem in this area.

A small tree branch and pieces of debris were observed blocking the trail (NAD 83, UTM 11 S 376292 E, 3792603 N) near Haines Canyon Creek (Figure 3). They appear to have washed down from upstream, and are likely the result of recent heavy rain events in the area. These will be removed during the exotic plant removal effort planned for July and August 2015.

A small amount of erosion and exposed tree branches were observed on the trail (NAD 83, UTM 11 S 376330 E, 3792617 N) near Haines Canyon Creek (Figure 4). The erosion appears to be the result of recent heavy rain events in the area. The exposed tree branches will be removed during the exotic plant removal effort planned for July and August 2015. ECORP will work with the County of Los Angeles Department of Public Works (LACDPW) to resolve any erosion issues observed in the Mitigation Area.

An unidentified man was encountered during the site visit carrying multiple cutting/trimming tools including a chainsaw, axe, and Pulaski near the northeast end of the Tujunga Ponds. He indicated that he was clearing vegetation from the trails to help eliminate hazards for recreational users. One area of native riparian vegetation was observed to have been trimmed recently near the location of the encounter (NAD 83, UTM 11 S 376698 E, 3792680 N) (Figure 5).

One potential homeless encampment was encountered near Haines Canyon Creek (NAD 83, UTM 11S 375244 E, 3792514 N). Several people were observed; however, the area was not approached to confirm the presence of a camp.

Poison oak (*Toxicodendron diversilobum*) was observed minimally encroaching on the trail in several locations near Haines Canyon Creek. The poison oak will be trimmed during the exotic plant removal effort planned for July and August 2015.

While multiple species of non-native vegetation were observed throughout the Mitigation Area, no severely problematic areas were observed during the site visit.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: July 28, 2015

Carley Lancaster
Assistant Biologist

Figure 1. Rope swing at the popular picnic area located near the South Wheatland entrance.

Figure 2. Rock dam at the popular picnic area located near the South Wheatland entrance.

Figure 3. Branches and debris blocking trail near Haines Canyon Creek.

Figure 4. Minor erosion and exposed roots near Haines Canyon Creek

Figure 5. Recently trimmed riparian vegetation near Tujunga Ponds.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 19, 2015
(2014-003.005/006/6)

Melanie Morita
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Third Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (October 2015) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Morita:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in October 2015.

All trails within the Mitigation Area were surveyed on October 14, 2015 by ECORP Consulting, Inc. (ECORP) biologist Carley Lancaster, to identify any problem areas along the trail system at the Mitigation Area. The biologist surveyed for areas of erosion, fallen trees, poison oak overgrowth, and potential safety hazards present on and adjacent to the trails. The biologist noted any rock or debris dams observed in Haines Canyon Creek. The current condition of the trails and trail system was documented and representative site photographs were taken.

The popular picnic area (noted in previous memos) located near the South Wheatland entrance (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 11 S 375184 E, 3792585 N) still showed signs of use including the presence of trash (Figure 1) and a rock dam (Figure 2). These issues were noted during previous site visits and continue to be a problem in this area.

An unidentified man was encountered during the site visit conducted in July of 2015, carrying multiple cutting/trimming tools including a chainsaw, axe, and Pulaski near the northeast end of the Tujunga Ponds. He indicated that he was clearing vegetation from the trails to help eliminate hazards for recreational users. The County of Los Angeles Department of Public Works (LACDPW) was immediately notified at the time. During the site visit conducted on October 14, 2015, a total of 14 areas with freshly cut trees were observed along Haines Canyon Creek, around the Tujunga Ponds, and in the riparian woodland north of Gibson Ranch (Figures 3-8). Tree species observed with freshly cut branches and or trunks included several species of willow (*Salix sp.*), white alder (*Alnus rhombifolia*), and non-native eucalyptus (*Eucalyptus sp.*). Several of the trees appeared to have died and fallen over prior to being cut (Figure 9). Others were still rooted and alive at the time of the cutting.

Poison oak (*Toxicodendron diversilobum*) was observed minimally encroaching on the trail in several locations near Haines Canyon Creek. The poison oak will be trimmed during the exotic plant removal effort.

A large amount of castor bean (*Ricinus communis*) has been proliferating throughout the Mitigation Area (Figure 10). The castor bean will be removed and treated with herbicide during the exotic plant removal effort.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: October 19, 2015

Carley Lancaster
Assistant Biologist

Figure 1. Trash at the popular picnic area located near the South Wheatland entrance.

Figure 2. Rock dam at the popular picnic area located near the South Wheatland entrance.

Figure 3. Cut tree trunks and branches along trail near Haines Canyon Creek.

Figure 4. Cut tree trunks and branches along trail near Haines Canyon Creek.

Figure 5. Cut tree trunks and branches in riparian area north of Gibson Ranch.

Figure 6. Cut tree trunks and branches near Tujunga Ponds.

Figure 7. Locations of cut trees in eastern portion of Mitigation Area.

Figure 8. Locations of cut trees in western portion of Mitigation Area.

Figure 9. Cut tree trunk that appears to have fallen prior to cutting.

Figure 10. Castor bean along trail near Tujunga Ponds

December 10, 2015
(2014-003.005/006/6)

Mayra Cabrera
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Fourth Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (December 2015) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Cabrera:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in December 2015.

All trails within the Mitigation Area were surveyed on December 9, 2015 by ECORP Consulting, Inc. (ECORP) biologists, Carley Lancaster and Amy Trost, to identify any problem areas along the trail system at the Mitigation Area. The biologists surveyed for areas of erosion, fallen trees, poison oak overgrowth, and potential safety hazards present on and adjacent to the trails. The biologists noted any rock or debris dams observed in Haines Canyon Creek. The current condition of the trails and trail system was documented and representative site photographs were taken.

The popular picnic area (noted in previous memos) located near the South Wheatland entrance (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 11 S 375187 E, 3792579 N; Figure 1) still showed signs of use. A small blue bin was discovered filled with trash (Figure 2) and a rock dam was observed again, this time with many larger branches used for the dam structure (Figure 3). The bin appears to have been placed there by recreational users. There also appeared to have been multiple small fire circles setup next to the creek (Figure 4). Issues at this site have been noted during previous site visits and continue to be a problem in this area.

A rope swing with a wooden seat was observed, tied to a large willow (11 S 376303 E, 3792579 N; Figures 1 and 5). The swing was next to one of the trails along Haines Canyon Creek northeast of the Cottonwood upland area.

Bicycle tracks were observed on the trails throughout the Mitigation Area, particularly along Haines Canyon Creek and in Haines Canyon Wash (Figure 6).

While walking the trails along Haines Canyon Creek, the biologists spoke with some equestrians who questioned whether or not a homeless man had been removed from near the ponds. The

biologists ascertained that the individual was living in a tent towards the northeast corner of the Tujunga Ponds property (near 11 S 376729 E, 3792725 N; Figure 1). The biologists did not observe a tent or homeless encampment when they walked the trails around this area earlier, but it is likely that the encampment could have been hidden by dense vegetation. The equestrians did not indicate whether or not the homeless man had been hostile to them but seemed concerned about his presence. The biologists assured the equestrians that the County of Los Angeles Department of Public Works would be notified.

During the site visit, the biologists surveyed the areas where the recent exotic plant removal effort had been conducted to determine if the recent removal activities had been successful. One plant, castor bean (*Ricinus communis*), was a particular focus during this effort because it had been observed in multiple locations throughout the Mitigation Area. The biologists found that the majority of the castor bean plants that were treated during the recent effort were either dead or in the process of dying off. A few castor bean plants were observed interspersed between the dead or dying plants. These plants were small and had likely sprouted since the exotic plant removal effort. Areas of tree tobacco (*Nicotiana glauca*) that were treated during the recent removal effort were also dead, indicating a successful removal effort.

An exotic plant removal effort in late winter/early spring should be performed again to target any castor bean (or other exotic species) that has sprouted due to the fall and winter rains.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: December 10, 2015

Amy Leigh Trost
Associate Biologist

Figure 1. Map of Issues Observed During the Site Visit.

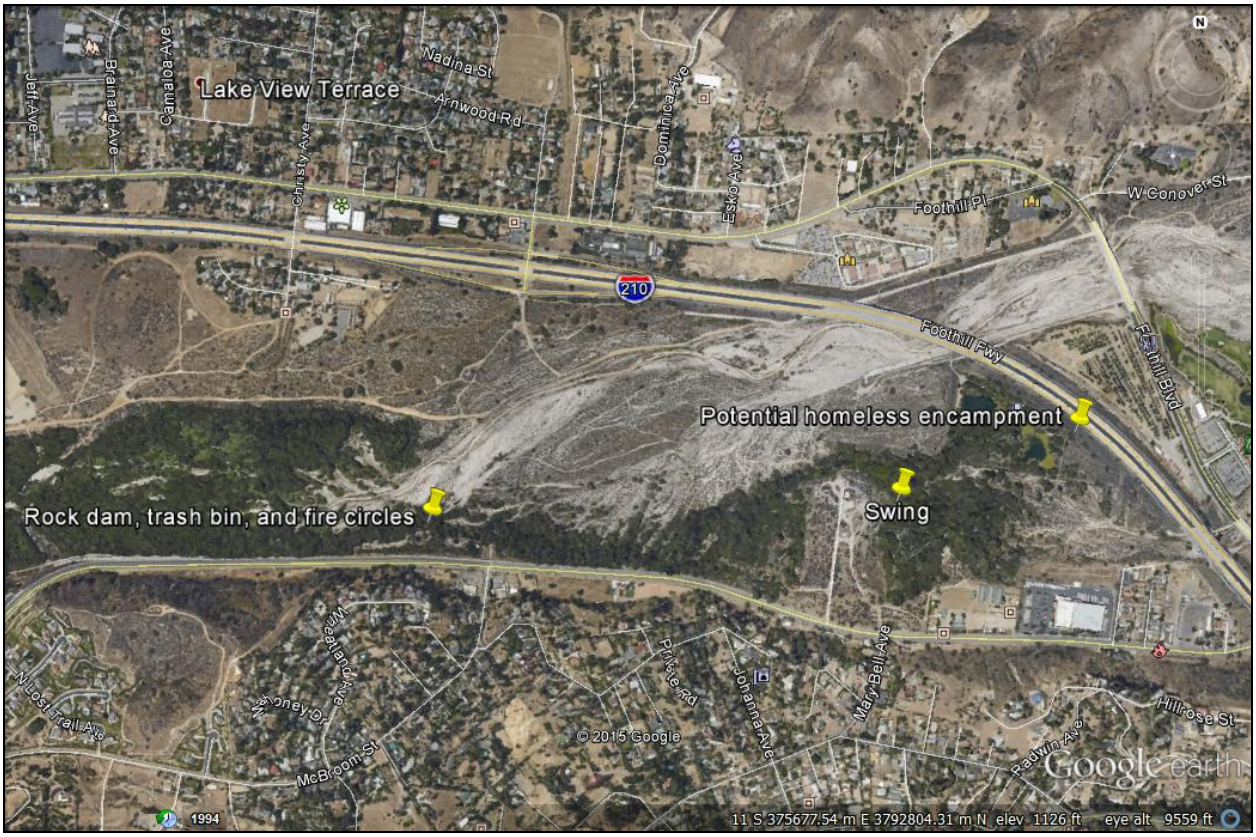

Figure 2. Bin with trash at the popular picnic area.

Figure 3. Rock dam with large branches at the popular picnic area.

Figure 4. Evidence of several fire circles at the popular picnic area.

Figure 5. Swing next to trail near Haines Canyon Creek.

Figure 6. Bicycle tracks in Haines Canyon Wash.

APPENDIX I

Stakeholder Mailing List

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APPENDIX J

Newsletters

Big T Wash Line

April 2015

A Publication of the
County of Los Angeles
Department of Public Works
(LACDPW)

Announcements

Report suspicious activity occurring at Big T! If you see something occurring at Big T that shouldn't be, call LA County Sheriff Department Dispatch immediately to report it. LACDPW can't respond to emergencies; however, please notify us at BTWMA@dpw.lacounty.gov of any incidences reported to law enforcement and we will gladly follow up. *LA County Sheriff Department Dispatch: 1-800-834-0064.*

Bilingual visits- Be sure to say Hola, Hello, Howdy, or Hi to our bilingual biologists this summer! Biologists will be on site over the weekends between Memorial Day and Labor Day to talk with people about all things Big T. They will be happy to answer any questions you have. They also carry cool pamphlets that show all the things you can and can't do in the Mitigation Area.

Big T has its own email! Feel free to contact **BTWMA@dpw.lacounty.gov** with any questions or concerns about Big T or any of the activities occurring in it.

View past newsletters- To view Big T's past water quality reports, annual reports, newsletters, CAC meeting minutes, or just to find out more information, check out the Big T website at: www.dpw.lacounty.gov/wrd/projects/BTWMA/

Brown-headed cowbirds- It's time again to begin the trapping program for brown-headed cowbirds that parasitize the nests of other birds. The cowbirds lay their eggs in nests of other birds but never provide care. In order to eliminate cowbird nest parasitism, traps will be placed in and around Big T again in 2015. These traps contain food, water, shade and have a slot on the top where the birds fly in, but can't get out. Don't worry about the other species that might get in because a biologist checks the traps daily and releases the non-target birds! Traps will be in Big T from April to June. Remember to let the traps be!

Nesting Bird Season- The breeding season for most bird species has begun so make sure to save all of your tree trimming activities for the fall! Most bird species are protected under the Migratory Bird Treaty Act, a federal law that was established to protect birds, their nests, and their habitat. Violation of this law can lead to fines or even jail time. So do that hummingbird in your hibiscus a favor and wait until September or later to trim your trees and shrubs.

Exotic Wildlife Removal

Over 2,000 individual exotics of 11 different species were removed from Big T in 2014! The most common species removed were red swamp crayfish, largemouth bass, and mosquitofish. Two different species of turtles were also removed. Removing exotic aquatic wildlife from the waterways directly benefits the native fish species present in Haines Canyon Creek, so the more exotics removed, the merrier for our native fishes!

Biologist removes a swamp crayfish (left). A red-eared slider from the Ponds (right).

ABOUT THE BIG TUJUNGA WASH MITIGATION AREA

Big T is a parcel of land located in the City of Los Angeles' Sunland area (see Page 4). Big T covers an area of approximately 210 acres of sensitive habitat. The site was purchased by LACDPW in 1998 for the purpose of compensating for habitat loss for other LACDPW projects.

LACDPW's implementation of the Master Mitigation Plan for the Big Tujunga Wash Mitigation Area (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 (Santa Ana sucker, Santa Ana speckled dace, arroyo chub) and contains habitat for sensitive bird species (least Bell's vireo, 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 (spring and fall).

More information can be found at

www.dpw.lacounty.gov/wrd/projects/BTWMA

What's going on at Big T this Spring? Focused surveys!

Keep an eye out for more of ECORP's biologists this spring and summer at Big T because this is a year when focused surveys for sensitive species will be conducted. Every three years, the Master Mitigation Plan requires specific surveys for wildlife species that are listed as endangered or threatened under the Federal and State Endangered Species Acts. Big T was established to preserve and improve habitat for sensitive species, so the focused surveys provide a periodic glimpse of the wildlife population at Big T. The target species for the focused surveys are the southwestern willow flycatcher, least Bell's vireo, Santa Ana sucker, and arroyo toad.

Southwestern willow flycatcher and least Bell's vireo are birds that are both federally- and state-listed as endangered. These birds occupy the riparian habitats near the creek and the Tujunga Ponds. The vireo likes a dense, shrubby understory and the willow flycatcher prefers the tall trees near water. If they are there, the biologists will easily identify them by their songs and calls because they both make very unique sounds. Migrating willow flycatchers have been observed at Big T in the past but they didn't stop and establish a nesting territory. Least Bell's vireos are known to occur just downstream of Big T at Hansen Dam so hopefully, they will one day call Big T home too!

During the focused surveys for the Santa Ana sucker, you will likely see wetsuit-clad biologists moving around in the creek. This fish species is federally listed as threatened and occurs in the creek at Big T. Santa Ana suckers live mostly in the shallow portions of the creek where the bottom has a lot of rocks and cobbles. During the survey, the biologists will capture and quickly measure each Santa Ana sucker and then return them to the creek without harming them. By conducted surveys every three years, the biologists can get an idea of whether the population of Santa Ana suckers is increasing or decreasing at Big T.

The arroyo toad, which is federally listed as endangered, likely occurred in Big T Wash long ago. It has not been observed at Big T since the Mitigation Area was established but the surveys are conducted just to keep a look out for this species. Arroyo toads tend to occupy the sandy banks along streams where willows and other riparian plant species occur. Their sandy coloration provides excellent camouflage and it takes a trained eye to spot them! The biologists will conduct surveys along the creek and Big T Wash during the day to look for toads and then they will also conduct nighttime surveys to listen for the toad's calls.

Conducting periodic focused surveys at Big T helps to monitor and protect this rapidly diminishing habitat type found in Southern California. If you see the biologist conducting these surveys, ask them what interesting species of wildlife they have observed and hopefully, they will tell you they have found some of the target sensitive species!

***LEFT**: An ECORP biologist surveys trails at Big T.*
***RIGHT:** Santa Ana sucker found in the creek at Big T.*

Animal Corner: Amphibians

Big T is home to many different types of wildlife, including amphibians, which are animals that spend their lives both in the water and on the land, such as frogs, toads, and salamanders. These amphibians begin their lives as eggs that are laid in the water. When the egg hatches, it grows into a larva, which is the "baby" stage of amphibians. The larval stage of a frog or toad is called a tadpole, which has a tail but it doesn't have legs. The larval stage of a salamander is sometimes called a waterdog or mud puppy. These larva can only live in the water where they breathe air through gills like a fish does. When the larva grows to a point where it is ready to leave the water, it has to go through a process called "metamorphosis". Metamorphosis allows the larva to change shape, grow legs, and grow lungs so it can walk on land and breathe air. Frogs spend a lot of time in the water as well as on the land but many species of toads only return to the water once in a while. Since amphibians usually have soft, moist skin, they have to spend their time on land in areas where it is wet, such as under the cover of leaves, or they will dig down into the damp soil.

Baja California Treefrog

Now that you know what an amphibian is you might ask, "What kinds of amphibians call Big T home?" Amphibians that have been found at Big T include the California toad, California treefrog, Pacific treefrog, and American bullfrog. The amphibian that is most commonly seen or heard at Big T is the American bullfrog because they are large and they like to float near the plants at the edge of the Tujunga Ponds. The American bullfrog is one of the largest frogs found in North America with an average length between 4 to 7 inches and weighing up to 1 pound. In contrast, the California treefrog and the Pacific treefrog are small frogs that grow up to 2 inches long. If you would like to know more about our native amphibians (California toad, California treefrog, or Pacific treefrog) or the American bullfrog, please visit the California Herps website: www.californiaherps.com.

California Treefrog

American Bullfrog
(public-image-domain.com)

California Toad

The Birds are Migrating

Have you ever noticed an increase in bird activity in the spring or fall? Every year migratory birds travel from their nonbreeding territories (winter homes) to their breeding territories (summer homes). In the fall, temperatures drop, weather conditions can be harsh, and resources, such as food and shelter, are less available. As winter approaches many birds migrate south to areas where food is more readily available and the weather is less harsh. In the spring, insect populations increase, plants start budding, and birds that have gone south for the winter will migrate north to take advantage. This means that a lot of the birds we find at Big T migrate south in the fall and then return to Big T in the spring time. On the other hand, you may see some birds at Big T in the fall that head north for the spring.

There are three main types of migrating birds: short, medium, and long-distance migrants. Short-distance migrants may travel from a mountain top to the foothills. The medium-distance migrants may move from Northern California to Southern California. Long-distance migrants may travel as far as Canada to South America. The distance a bird migrates varies depending on the size, the genetic make-up, and the habitat and diet preferences of the bird.

Photos from public-domain-image.com

Birds migrate using several techniques, some of which are not fully understood. These techniques include using the stars, changes in the earth's magnetic field, and even smell to help navigate their journeys. Often, birds will use the same annual migration path year after year. Birds migrate at different times, but generally the larger, soaring birds migrate by day, and the smaller songbirds migrate by night. Some birds make stops each day to recover from the long flights, while others may fly directly from their breeding territories to their wintering territories without stopping.

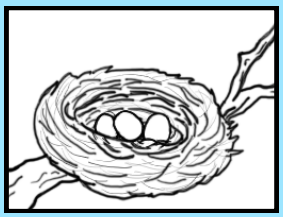
We are currently in the spring migration season as well as nesting season for some species. Migration season is a wonderful time to observe beautiful migrating birds. The creek and ponds at Big T make for a nice resting spot for migrating birds that may need recovery time, or great habitat for birds that are getting ready to nest. You may notice the birds in the area becoming more vocal and active during this time period. When you are walking the trails at Big T, keep an eye and an ear out! You never know what you may see or hear.

Birds Clockwise from Top Left: Yellow Warbler, Lazuli Bunting, Cedar Waxwing

What kind of nest is that?!

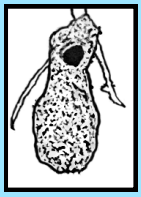
Bird nests come in all shapes and sizes and some are easy to find while others are hidden quite well. Unless you are specifically looking for nests, you probably don't even realize when you are passing one while walking on the trails at Big T. However, with a little knowledge about nests shapes and locations, and with a little insight on the parent bird's behavior, you may soon realize how numerous nests are at Big T.

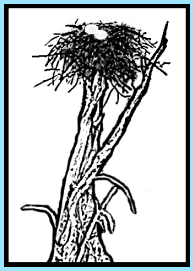
One of the most common nests you will see is a "**cup nest,**" which is named for its shape. Cup nests can range in size from very small, such as a hummingbird nest that is no bigger than a golf ball, to a common raven nest, which is often a couple feet wide and a few feet tall. This type of nest is usually secured where the branches fork in a shrub or tree and they are typically well-hidden and difficult to see.



"**Cavity nests**" may appear as holes in the trunk or larger branches of a tree. The most common cavity nesters are woodpeckers and with their tough beaks, they can excavate a cavity large enough to fit several young. If you see a suspicious hole in the side of a tree, take some time to quietly observe it and you may be treated to a view of the baby birds as they peek out and wait for mom or dad to bring them food.

"**Pendant nests**" are very unusual in that they are an elongated sac woven of soft grasses or plant fibers that hang down from a tree limb. When the birds build the nest, they leave a small opening at the top so they can climb inside where they lay their eggs. Common pendant nest builders are bushtits and orioles. These species are very good at camouflaging their nests, which makes them very difficult to locate. Keep an eye out for old pendant nests that may have been blown out of a tree because they are real engineering masterpieces!





Large birds, such as hawks and eagles, use "**platform nests"** made high up in a tree, on a cliff edge, or on a power pole. These nests, which the birds return to almost every year, are typically piled with many layers of sticks and can be very noticeable. In addition, the chicks are noisy when they are hungry so it isn't hard to find these sorts of nests.

When hiking on the trails, be aware of birds in your vicinity. Many bird species will become agitated if you get too close to their nest or young. If you hear scolding calls or if a bird is flitting around in the vegetation close to you, then stop, look around to make sure you aren't going to damage a nest, and then slowly and quietly move out of the area. When you get to a safe distance and the bird doesn't appear agitated, take time to watch the bird and you may discover the location of the nest. Let's give our feathered friends the best chance at successfully raising their young so the young birds will return to nest next year at Big T!

Big Tujunga Word Scramble

Kid's Corner

Use the scrambled word bank to fill in the blanks. Hint: the newsletter will have clues in the articles you can use to find the right words.

YORARO SADOT	**DSORWICB**
PANIRARI	**NPSOD**
VAARL	**ANTPNED**
TAMROFLP	**ALFL**

1) A _ _ _ _ _ _ _ nest hangs from a tree limb.

2) It is best to trim your trees in the _ _ _ _, when the birds are not nesting.

3) The _ _ _ _ _ at Big T attract migrating birds.

4) _ _ _ _ _ _ _ _ lay their eggs in other bird's nests.

5) Large birds such as hawks and eagles make _ _ _ _ _ _ _ _ nests.

6) Amphibians typically start out living in the water as _ _ _ _ _ .

7) Most of the sensitive species at Big T prefer _ _ _ _ _ _ _ _ habitats.

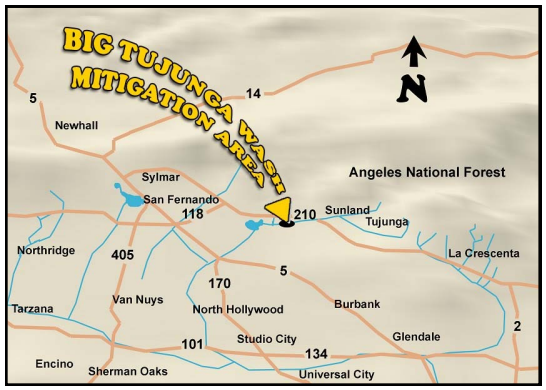
8) _ _ _ _ _ _ _ _ _ _ _ live within sandy banks in riparian woodlands.

Image Search

Can you find all of California Poppies throughout the newsletter?
How many do you see? *Hint: look on all 4 pages of the newsletter*

Where is Big T?

Downstream of Big Tujunga Canyon, right in the heart of Sun Valley, 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: www.dpw.lacounty.gov/wrd/projects/BTWMA.



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/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:

Grace Yu, Water Resources Division
County of Los Angeles Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803
Email: BTWMA@dpw.lacounty.gov
Phone: (626) 458-6139

WORD SCRAMBLE *1)pendant 2)fall 3)ponds 4)cowbirds 5)platform 6)larva 7)riparian 8)arroyo toads* ***IMAGE SEARCH*** *There are 27 poppies throughout the newsletter.*

Big T Wash Line

September 2015

A Publication of the
County of Los Angeles Department of Public Works
(LACDPW)

Announcements

- **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: **1 (800) 834-0064**

- **Time to Trim Those Trees!** Late fall is the best time to trim back the trees and shrubs in your yard because the breeding bird season is over! You can safely prune without fear of disturbing birds nesting in your yard. Most birds are protected under the Migratory Bird Treaty Act, which is a federal law that protects birds, their nests, and their habitat. Violating the law can lead to fines, or even jail time! So don't forget to trim your trees this fall.

- **Brown-headed what…** Brown-headed cowbirds are a parasitic species of bird that occupy Big T. They are nest parasites, meaning they do not build their own nests to lay their eggs. Instead, they lay eggs in nests of other unsuspecting, native bird species so they don't have to raise their own young. To help our native bird population thrive, we trap and remove these pesky cowbirds. We have been successfully trapping brown-headed cowbirds at Big T for 13 years! This year we managed to trap over 90 cowbirds.

- **Horse Circles —** Newly created horse circles are becoming a problem at Big T. Please refrain from using or creating horse circles at the site. When they are created, native vegetation can't grow, which takes away from the beauty of Big T! Horse training involving horse circles or any other activity that involves trampling or removing vegetation should be kept to your local equestrian center.

- **Fires at Big T —** Many fires have been reported to LACDPW in 2015. Luckily, only one has occurred in Big T this year. As you know, fire danger is a serious concern. LACDPW is very aware of this safety issue and is working hard to address it. **If you ever see a fire call 911.** Please also email us at **BTWMA@dpw.lacounty.gov** so it can be investigated. Biologists and other county workers frequently visit Big T to keep an eye out for fires, suspicious activity, graffiti, rock dams, trail safety hazards, and other dangers in the area but we also rely on your eyes and ears at the site. Remember, fires of any kind are not permitted within Big T.

Trail Cleanup Day

A special thank you to everyone for helping to keep Big T trash-free and looking good! As a result of your hard work, the 2015 Trail Cleanup Day has been cancelled. We appreciate everyone's effort and ask that you continue to leave Big T as you found it — or better!

ABOUT THE BIG TUJUNGA WASH MITIGATION AREA

Big T is a parcel of land located in the City of Los Angeles' Sunland area (see Page 4). Big T covers an area of approximately 210 acres of sensitive habitat. The site was purchased by LACDPW in 1998 to compensate for habitat loss for other LACDPW projects.

LACDPW's implementation of the Master Mitigation Plan for the Big Tujunga Wash Mitigation Area (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 (Santa Ana sucker, Santa Ana speckled dace, arroyo chub) and contains habitat for sensitive bird species (least Bell's vireo, southwestern willow flycatcher).

The purpose of this newsletter is to provide updates on current programs and to explain upcoming enhancement measures that will be implemented on the site. Newsletters are published on a semi-annual basis (spring and fall).

More information can be found at:

www.dpw.lacounty.gov/wrd/projects/BTWMA

"Look How Far We've Come!"

Happy 15-Year Anniversary, Big T! In 2000, the Big Tujunga Wash Mitigation Area officially began its journey as a mitigation site for LACDPW's flood maintenance projects. What has happened over the past 15 years? We're glad you asked!

Imagine, if you will, being back in the year 2000. LACDPW had just purchased Big T and the daunting task of improving the site loomed overhead. Tunnels of giant reed surrounded the trails, hiding homeless encampments from view; large exotic trees prevented native vegetation from sprouting; native bird species were being overrun by brown-headed cowbirds; thousands of exotic fishes filled the ponds and creek; and exotic water hyacinth covered the Tujunga Ponds.

Shortly after purchasing, LACDPW undertook the overwhelming task of cleaning up the site to make it live up to the strict and high standards of becoming a mitigation area! In the beginning, quarterly meetings were held to listen to questions and concerns from Big T's many neighbors and visitors. Many different types of surveys were also conducted, including mapping the existing vegetation, assessing the trails system, surveying for special status wildlife species including arroyo toad, southwestern willow flycatcher, least Bell's vireo, and native fishes. Then the enhancements began!

Before giant reed removal

After giant reed removal

A whopping 15 acres of giant reed – that's enough to fill 15 football fields – were present on the site when LACDPW first purchased Big T. After several large scale removal efforts and years of maintenance, we are proud to report that only small areas of re-growth remain and are visited frequently during exotic plant removal efforts. In fact, the tiny stands are so small that they weren't even mapped during a vegetation community mapping effort in 2014!

Exotic trees were girdled (a ring was cut around the trunk of each tree and painted with herbicide so that it died) to open up the canopy. This allowed more light and water to reach the ground, allowing native vegetation to grow in the understory. Cottonwood trees were planted in the riparian areas and oaks, sycamores, and native shrubs were planted in the area just west of Gibson Ranch, which was formerly a sand and gravel mine (for more info about Big T's history before becoming a mitigation area check out the September 2014 newsletter).

In 2000 and 2001, thousands of pounds of water hyacinth were removed from the Tujunga Ponds, mostly by hand. In 2011, another outbreak of an exotic plant was discovered in the ponds, water lettuce. Water lettuce and water hyacinth are both problems because they block oxygen and light from entering the water, killing fish and plants. A contractor removed enough water lettuce to fill thirty 40-yard dumpsters! The ponds are checked frequently, but no water hyacinth has been seen since 2001 and no water lettuce has been seen since 2013!

Before water lettuce removal

After water lettuce removal

Brown-headed cowbird trapping began in 2001 and 70 cowbirds, including 9 juveniles, were removed from Big T that year! Trapping is conducted each year at Big T resulting in a decline in the number of cowbird juveniles (meaning the adults aren't breeding very successfully). In 2015, over 90 cowbirds were trapped, including 3 juveniles. In 1997, the first year that surveys were conducted at Big T and before the site was purchased by LACDPW, 51 different species of birds were observed at Big T. As of August 2015, 76 species of birds have been observed – and we still have three months to go!

Between 2000 and 2015, a total of 25 different species of exotic invertebrates, fish, amphibians, and reptiles were removed from Big T including bass, tilapia, catfish, bullfrogs, softshell turtles, and snapping turtles. Twelve of those exotic species have not been observed for at least the last 3 years!

To keep up with all of the improvements, each year biologists conduct brown-headed cowbird trapping, exotic plant removal efforts, exotic wildlife removal efforts, trails maintenance and monitoring site visits, water quality monitoring, bilingual public outreach visits, attend a Community Advisory Committee meeting, provide spring and fall newsletters, conduct surveys for special-status wildlife species (which occur every three years), and conduct special assessments when issues occur (such as fires).

Now, look at our beautiful gem! It is an oasis for native plants and wildlife surrounded by a sea of urban development. It provides important stopover habitat for migratory birds traveling to and from their wintering and breeding grounds. It is one of the last places in Southern California where all three of our native fishes coexist (Santa Ana sucker, Santa Ana speckled dace, and arroyo chub). We have documented a total of 124 bird species over the last 17 years of wildlife surveys and the site provides habitat for three federally and state listed birds (least Bell's Vireo, southwestern willow flycatcher, and western yellow-billed cuckoo), although they haven't been observed at Big T we are still hoping they will move in!

What to Expect in an El Niño Year

Be aware of potential heavy rainfall during an El Niño year!

An El Niño occurs when winds along the equator in the Pacific Ocean weaken, causing surface temperatures of the ocean to warm up slightly. The warmer water can cause warmer-than-average temperatures over the western and northern United States during the winter season, and has the potential to cause wetter-than-average weather. This phenomenon occurs approximately every 2 to 7 years. Many people assume that an El Niño year means heavy rains, and while some El Niño years have brought higher than average rainfall to California, this is not always the case. El Niños are still not well understood and their effects vary in strength, intensity and location. While many meteorologists (scientists who study the weather) expect a strong El Niño year this coming winter, it is not yet certain that one will occur. Even if an El Niño does occur, that does not necessarily mean that our area will receive higher-than-average rainfall. The opposite could be just as likely.

During the 2009/2010 winter, we received a moderately strong El Niño, which brought some heavy rainfall. The heavy rainfall, coupled with lack of vegetation caused by the Station Fire earlier in 2009, resulted in sediment deposits building up within the washes. Watersheds typically take around five years to recover from fires like the Station Fire. Since the fire occurred approximately six years ago, it is likely that rains caused by a strong El Niño this winter will not affect the watershed any more than a typical rain year, and the LACDPW doesn't expect rainfall to cause any damage other than typical nuisance flows. If the site receives unusually high rainfall this winter season, Big T is expected to easily withstand it. The washes may fill as water is channeled through the site and some minor erosion may occur, but no major concerns or damages are expected.

Just as a reminder, recreational trails within Big T are closed to the public during national weather forecasts of rain or high water flows. You may find barricades and signs placed at trail entrances indicating that they are temporarily closed during and after storms. Please respect these closures as they are for your safety. Muddy trails can be unsafe to use and flowing water may be stronger than it looks. For more information about El Niños and what causes them, check out these websites:

http://www.pmel.noaa.gov/tao/elnino/nino-home.html

http://meteora.ucsd.edu/~pierce/elnino/whatis.html

Animal Corner: Western Pond Turtle

Southwestern pond turtle. Photo: Ben Smith

Western pond turtles are freshwater turtles native to California. You may have seen one poking its head up from the ponds, or basking on a log at Big T. They are olive green or dark brown with brown to black markings on their shells. Unlike the non-native red-eared sliders that are also found at Big T, western pond turtles do not have any distinct ear patches of red, orange, or yellow. Western pond turtles prefer calm waters such as the streams and the ponds found at Big T. These turtles may be found in the vegetation adjacent to their water sources when they are nesting. They will lay their eggs by digging a hole and burying them underground, sometimes as much as 1,300 feet away from their water source. Western pond turtles can be timid and secretive, usually diving underwater or hiding behind plants when approached. They are omnivorous, meaning their diet is made up of many types of food. Although they prefer fishes and aquatic invertebrates, they will also eat plants.

Southwestern Pond Turtle

Red-eared Slider

The western pond turtle is considered a Species of Special Concern by the California Department of Fish and Wildlife and as sensitive by both the Bureau of Land Management and the U.S. Forest Service. In April of 2015, the U.S. Fish and Wildlife Service announced that the western pond turtle may warrant protection under the Endangered Species Act, and now a one-year status review of the turtle is underway.

In 2014, it was determined that the western pond turtle is two different species, the northwestern pond turtle (*Actinemys marmorata*) and the southwestern pond turtle (*A. pallida*). The northwestern pond turtle occurs from British Columbia to Central California. The southwestern pond turtle tends to be more coastal and occurs from northern Mexico to the San Francisco Peninsula.

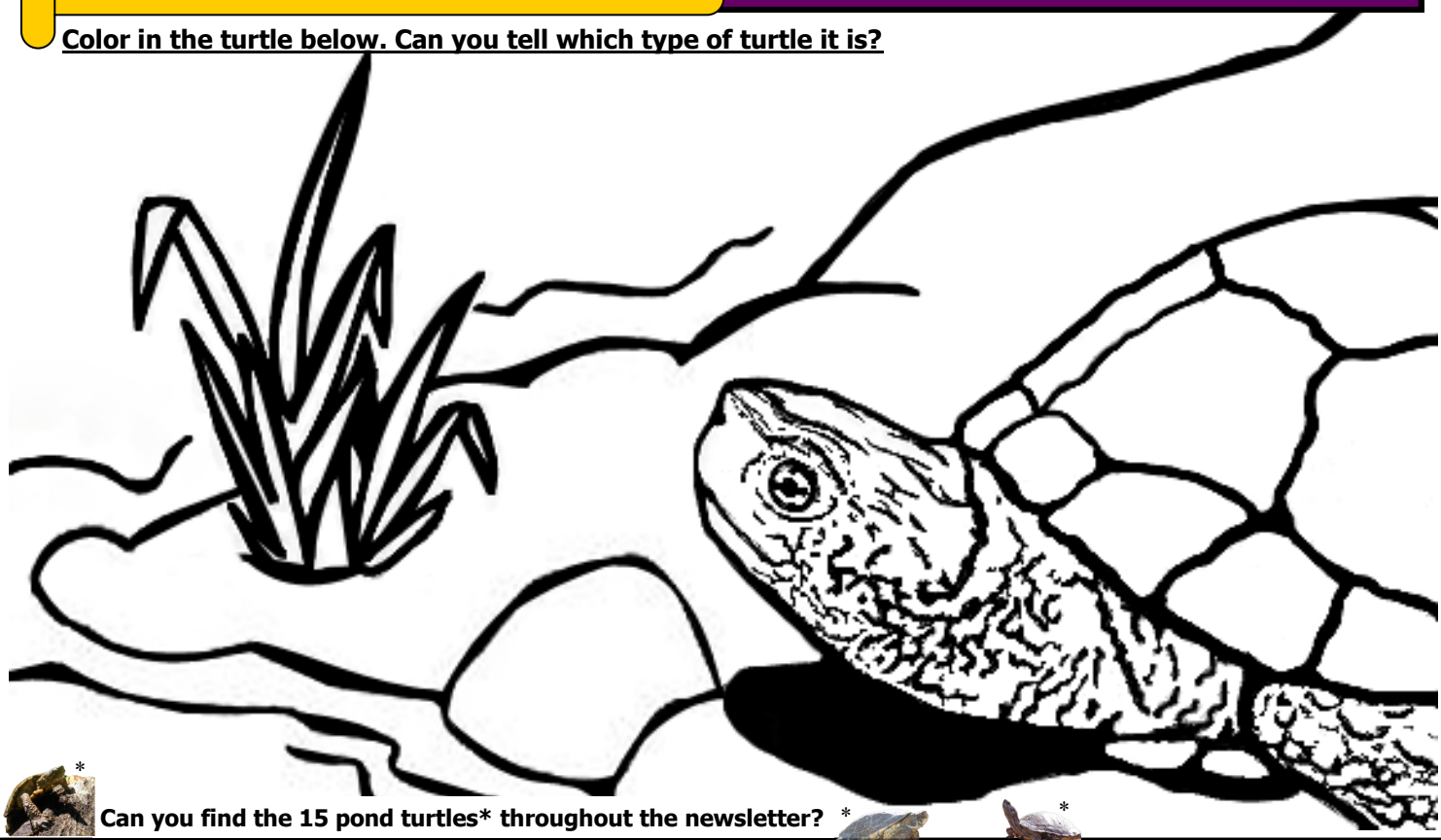
The species you may see at Big T is the southwestern pond turtle. It is important to leave these turtles in their natural habitat. You may see a turtle wandering on dry land but do not pick it up. It could be foraging for food or laying eggs. Returning turtles to the water could potentially disrupt their natural behaviors. Consider yourself lucky if you happen to spot one of these cool turtles at Big T, but make sure not to disturb it or pick it up!

Southwestern pond turtle. Photo: Max Murray

Big Tujunga Coloring page

Kid's Corner

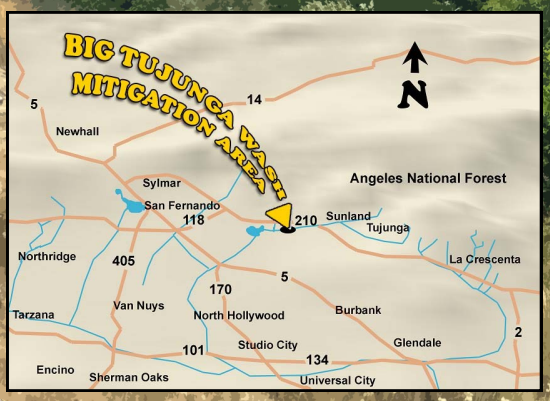
Color in the turtle below. Can you tell which type of turtle it is?



Can you find the 15 pond turtles* throughout the newsletter?

Where is Big T?

Downstream of Big Tujunga Canyon, right in the heart of Sun Valley, 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: www.dpw.lacounty.gov/wrd/projects/BTWMA.



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Melanie Morita, Water Resources Division
County of Los Angeles Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803
Email: BTWMA@dpw.lacounty.gov
Phone: (626) 456-6196

APPENDIX K

Community Advisory Committee Meeting Agenda 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 30, 2015
6:30 p.m. to 8:30 p.m.
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 (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
COMMUNITY ADVISORY COMMITTEE MEETING

AGENDA

Thursday, April 30, 2015
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
ECORP Consulting, 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. Exotic Plant Eradication Program
2. Exotic Wildlife Removal/Monitoring
3. Focused Surveys for Listed Wildlife Species
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
2015 Spring Meeting Minutes
April 30, 2015

I. Welcome / Introduction

Meeting attendance sign-in sheet attached.

II. Review of Meeting Agenda

Grace Yu (County of Los Angeles Department of Public Works [LACDPW]) reviewed the meeting agenda.

III. Discussion of Action Items from the April 24, 2014 Meeting

Action items from the last meeting were reviewed. Each action item is listed followed by the discussion about each item. New action items generated from the discussions are listed in Section VII.

1. **LACDPW will discuss the possibility of moving the Trail Cleanup Day to a late summer date with ECORP.** Trail Cleanup Day was canceled the last two years due to decreased debris accumulation resulting from existing drought conditions. In addition, trash pick-up and other problem areas are regularly addressed during maintenance efforts and privately-organized community cleanup events conducted on the site. Therefore, a Trail Cleanup Day is not scheduled for this year. The need for a Trail Cleanup Day will be assessed annually. *This action item is complete, but will be an ongoing task.*

2. **ECORP will send the locations and coordinates of the homeless encampments found in the Mitigation Area to LACDPW**. ECORP sent the locations and coordinates to LACDPW and will continue to report homeless encampments. *This action item is complete, but will be an ongoing task.*

3. **LACDPW will work with ECORP and CDFW to renew the Streambed Alteration Agreement.** LACDPW, ECORP, and CDFW are still working closely on this item. *This action item is an ongoing task.*

4. **Grace Yu will inform the CAC of the rescheduled community walk with Councilmember Felipe Fuentes.** The community walk with Councilmember Felipe Fuentes took place on May 31, 2014. The community walk was a success. *This action item is complete.*

5. **ECORP will schedule a trails visit in the coming weeks to assess the undercut trail in near the South Wheatland Entrance. They will contact Terry Kaiser to confirm the exact location of the issue**. *This action item is complete.*

6. **LACDPW will work with Mary Benson to provide GIS data for the trail system at the Mitigation Area.** *This action item is complete.*

7. **ECORP will confirm with its biologists if yucca stalks are being cut before they flower or after they have dried up.** Yucca stalks appear to be cut before flowering, according to ECORP biologists. *This action item is complete.*

IV. Ongoing and New Discussion Items

1. Site and Security Issues

- A map of the incidents that have occurred in the Mitigation Area since the last CAC meeting was distributed. This map will continue to be updated prior to each CAC meeting and distributed at the meeting to inform the community about homeless encampments and other site issues within the Mitigation Area. Heather Driscoll, County of Los Angeles Department of Parks and Recreation (LADPR), said that LADPR is currently keeping track of incidents reported on their properties. LACDPW, ECORP, and LADPR will work together to combine the reported incidents from both properties. The incident map will be included with the meeting minutes that are posted to the Mitigation Area website to notify site users of safety concerns.

- Terry Kaiser, a local resident, observed a fire outside the Mitigation Area associated with a homeless encampment during the week of April 20, 2015. The fire was approximately one acre in size and Mr. Kaiser called the Fire Department. Fire issues have been abundant lately and are expected to be problematic this year with the current drought conditions. Fires associated with homeless encampments are becoming a more serious safety concern. One idea to help the site users become more aware of the issue is to coordinate with the group that has posted the laminated bilingual "no trash" signs at the site and see if they would post similar signs to discourage fire building. Mr. Kaiser knows the group and is willing to coordinate with them if "no fire" signs are provided.

- Identifying and removing homeless encampments is an ongoing task. The camps are getting elaborate and are very well hidden from the trails. Locations of homeless encampments are regularly reported to LACDPW so they can send crews to remove the encampments. Typically, a notice is posted in the area of the encampment that allows sufficient time for the occupants to voluntarily relocate. After allotted timeframe ends, LACDPW cleans the encampment out with assistance of local law enforcement. Ms. Driscoll has worked with homeless people in the past and has offered to help with the situation if needed.

- Ms. Driscoll reported observing an equestrian galloping at unsafe speeds through the Mitigation Area recently.

- Ms. Driscoll requested an update on the proposed fish screen installation project. The fish screen would be installed at the outlet of the West Tujunga Pond to prevent exotic fish species from entering Haines Canyon Creek. The

application for the Endangered Species Act Section 6 grant was not awarded that year; therefore, the project was put on hold. A new grant application can be submitted since the grant program is refunded every year. But, the fish screen would not be on LACDPW property. The project would need to be proposed by LADPR.

- Major trail obstructions have been reported just outside of the Mitigation Area boundary. Recreational site users should be aware of the safety issues if they travel off the Mitigation Area parcel.

2. Public Education Opportunities

The 2014 public hike with Councilmember Felipe Fuentes was such a success that there is an increased interest in hosting more public hikes or educational outreach opportunities at the Mitigation Area. Mr. Kaiser will provide Ms. Yu's business card to the new Area Director to allow for continued coordination between City Council District 7 and LACDPW.

There was additional interest in contacting the Boy Scouts or Girl Scouts for educational outreach opportunities at the Mitigation Area. Ms. Driscoll will contact the Boy Scouts and Girl Scouts to gauge interest for education opportunities.

3. Mountain Bikers

Mr. Kaiser reported that there have been mountain bike races in the area scheduled one day per week for eight weeks. The signs at Hansen Dam have been taken down, so law enforcement cannot enforce the codes that prohibit mountain bike riding on the trails at Hansen Dam. Mr. Kaiser has observed mountain bike tracks recently at the Mitigation Area, entering the Mitigation Area from Foothill Boulevard near the church or under the Foothill Boulevard Bridge by the golf course.

4. Mosquitos

ECORP biologists observed mosquitos in the Haines Canyon Creek area during a survey in April. The observation was reported to Los Angeles County Vector Control. During a survey on April 27, 2015, ECORP biologists observed two vector control traps in the Mitigation Area. Mosquitos carrying dengue fever have not been found in the area, but the mosquito species *known to carry* dengue fever has recently been identified at the Tujunga Ponds. Residents are encouraged to report mosquito infestations at the Mitigation Area to Vector Control via their reporting website (www.glacvcd.org/Contact/Service-Request.aspx).

5. Drought Conditions

There was some concern that water levels in Haines Canyon Creek would be affected by the current drought conditions. The water in Haines Canyon Creek comes from water exiting from the West Tujunga Pond, which is fed by an underground spring, so ECORP does not expect the water levels in the creek to be substantially affected by the drought conditions. ECORP's aquatic biologists monitor water flow rates in the creek during exotic wildlife removal efforts, so they will monitor flow rates and report any changes detected.

V. Current Status of Programs

1. Exotic Plant Eradication Program

The first effort was conducted between April 1 and 15, 2015. Next effort is scheduled for summer 2015. Site maintenance will also be conducted at this time (trail cleanup, trash pick-up, etc.)

2. Water Lettuce Control/Monitoring

Water lettuce has not been observed in the Tujunga Ponds since August 2013. The Tujunga Ponds are monitored regularly for presence of water lettuce.

3. Exotic Wildlife Removal/Monitoring

The first aquatic wildlife removal effort was conducted from March 23 to 26, 2015. The second of four efforts will occur May 12 through 15, 2015. Female and male Mozambique tilapia (5 total) were observed during the first removal effort in March 2015. No evidence of breeding observed yet, but there is concern that the potential for this species to breed is present. The tilapia situation will continue to be monitored by ECORP.

4. Water quality monitoring

Results were normal for 2014 water quality sampling on site. The next water quality monitoring will be conducted in October/November 2015.

5. Focused Surveys

Focused wildlife surveys have been tentatively scheduled for 2015.

- Riparian bird (least Bell's vireo and southwestern willow flycatcher) started on April 23, 2015 and will continue through July 16, 2015.
- Arroyo toad surveys started on March 19, 2015 and will continue through June 15, 2015.
- Two native fish surveys will be conducted between May 18, 2015 and October 6, 2015.

Least Bell's vireo have been reported downstream of the Mitigation Area in the past. ECORP will find out if focused surveys for least Bell's vireo are being conducted at Hansen Dam this year. ECORP will also search the California Natural Diversity Database (CNDDB), a database published and maintained by California Department of Fish and Wildlife (CDFW), to see where the closest least Bell's vireo observation has occurred in relation to the Mitigation Area.

6. Brown-headed cowbird Trapping

The trapping for 2015 began on April 1 and will continue through June 30. All four traps were placed in the same locations as previous years throughout the Mitigation Area. In 2014 and 2013, Trap #2 was not as successful as in previous years, likely due to decreasing cowbird populations and the overall success of the program. It may be beneficial to relocate the Trap #2. ECORP will find out why Trap #2 was placed in the same location despite low success rate. There was some discussion about brown-headed cowbird trapping downstream of the Mitigation Area in Hansen Dam. ECORP will find out how many traps were placed in Hansen Dam this year.

7. Trails Restoration / Maintenance

The last trails assessment site visit was conducted on March 31, 2015. Problem areas identified included unauthorized trails, poison oak encroachment on trails, narrowed trails from vegetation overgrowth, rock dams in Haines Canyon Creek, and fallen trees. ECORP biologists worked with their landscaping contractor to address the site and trail maintenance issues. The next trails assessment site visit is scheduled for summer 2015.

8. Public Outreach Program

The public outreach program will be starting on Memorial Day weekend. ECORP's bilingual biologists will conduct weekend site visits throughout the summer (and on holiday weekends) to speak with equestrian and non-equestrian site users. Ms. Driscoll requested that ECORP send her and Debbie Pepe (LADPR) the schedule of weekend outreaches so that LADPR can coordinate outreach efforts on the same weekends.

VI. Schedule Next CAC Meeting

The next CAC meeting is scheduled for Thursday, April 28, 2016, from 6:30 p.m. to 8:30 p.m. at Hansen Yard, 10179 Glen Oaks Boulevard, Sun Valley, California 91352.

VII. New Action Items

1. LACDPW, ECORP, and LADPR will work together to combine the reported incidents from both the Mitigation Area and the Tujunga Ponds properties.

2. The updated incident map will be included in the CAC meeting minutes that are posted to the Mitigation Area website to notify site users of safety concerns.

3. Mr. Kaiser will provide Ms. Yu's business card to the new Area Director to allow for continued coordination between City Council District 7 and LACDPW.

4. LADPR will contact Boy Scouts and Girl Scouts to see if they are interested in educational outreach opportunities at the Mitigation Area.

5. ECORP's aquatic biologists will monitor the water flow rates of Haines Canyon Creek and report any changes detected.

6. ECORP will find out if least Bell's vireo surveys are being conducted downstream of the Mitigation Area. ECORP will also search CDFW's CNDDB to determine where the closest least Bell's vireo observation has been reported in relation to the Mitigation Area.

7. ECORP will find out why brown-headed cowbird Trap #2 was kept in the same location for 2015 despite low trapping success in 2014 and 2013. ECORP will also find out how many traps have been placed at Hansen Dam.

8. ECORP will send the schedule of weekend bilingual outreach site visits to LADPR so they can coordinate outreach efforts.

Big Tujunga Mitigation Banking Community Advisory Meeting

April 30, 2015

	Attendees	Organization	Phone	Email
1	Heather A. Driscoll	Parks + Recreation	661 944 2743	heatheradriscoll@gmail.com
2	GRACE YU	LACDPW	626 458 6139	gyu@dpw.lacounty.gov
3	Melanie Morita	LACDPW	626 458 6196	mmorita@dpw.lacounty.gov
4	RANDY HAMMOCK	ETT	818-612-7421	rhammock.4an@gmail.com
5	TERRY KAISER	140 PARK ADVISORY BOARD	8182620315	HDCONCERNS@CA.RR.COM
6	Mari Quillman	ECORP Consulting, Inc.	714 648-0630	mquillman@ecorpconsulting.com
7	Kristen Wasz	ECORP Consulting, Inc.	714.648.0630	KWASZ@ECORPCONSULTING.COM
8				
9				
10				
11				
12				
13				
14				

Figure 10-1.
Big Tujunga Wash Mitigation Area Incident Map, April 2014 to April 2015

Big Tujunga Wash Mitigation Area

L.A. County Park Parcel

Trails

Violation Category

- Creek Obstructions
- Homeless Encampment
- Miscellaneous Incidents
- Prohibited Activity
- Site Safety/Maintenance Issue
- Trash/Dumping
- Trail Obstructions
- Vandalism

Violation ID and Description

1 Homeless encampment
2 Homeless encampment
3 Zip line
4 Downed tree
5 Downed tree
6 Downed tree
7 Rock dam
8 Homeless encampment with dog
9 Homeless man with fishing pole
10 Downed tree
11 Rock dam
12 Rock dam
13 Graffiti on signs near Ponds
14 Rock dam
15 Rock dam
16 Rock dam
17 Equestrians drinking alcohol observed
18 Downed tree
19 Rock dam
20 Downed tree
21 Homeless encampment
22 Homeless encampment
23 Rock dam
24 Vandalism
25 Dumping
26 Dumping
27 Log dam
28 Trail erosion
29 Homeless encampment
30 Tree branch obstruction
31 Homeless encampment
32 Homeless encampment
33 Trail erosion
34 Vandalism
35 Vandalism
36 Dumping
37 Vandalism
38 Rock dam
39 Unauthorized trails
40 Rock dam
41 Unauthorized trails
42 Fire pit and trash
43 Rock dam
44 Downed branch
45 Poison oak encroaching trail
46 Non-native grasses encroaching on trail
47 Person playing saxophone near creek
48 Vandalism
49 Homeless encampment
50 Horse circle
51 Child's clothing
52 Fire, April 9 2015
53 Homeless encampment
54 Rock Dam

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2014-003.005 Big Tujunga Wash Mitigation Area

Scale in Feet
0 1,000

Photo Source: NAIP 2014

Map Date: 4/29/2015

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Weeting_Maps_and_Analysis\2015-04-21_Violations\Tujunga_Bank_Violations_2014Apr-2015Apr_v2.mxd (MAG)-mguidry 4/29/2015

Big Tujunga Wash Mitigation Area Incidents
Table Accompaniment for Incident Map

Updated April 29, 2015

#	Date Observed	Incident	Notes
1	4/23/2014	Homeless encampment	At least 1 homeless person inside; LACDPW notified 4/23/14.
2	4/23/2014	Homeless encampment	LACDPW notified 4/23/14.
3	4/29/2014	Zip line	Removed 4/30/14.
4	5/5/2014	Downed tree	Removed 5/6/14.
5	5/5/2014	Downed tree	Removed 5/6/14.
6	5/5/2014	Downed tree	Removed 5/6/14.
7	5/5/2014	Rock dam	Removed 5/7/14.
8	5/5/2014	Homeless encampment with dog	At least 1 dog inside; LACDPW notified 5/5/14.
9	5/12/2014	Homeless man with fishing pole	LACDPW notified.
10	5/25/2014	Downed tree	Removed 5/29/14.
11	5/25/2014	Rock dam	Removed 5/29/14.
12	5/25/2014	Rock dam	Removed 5/29/14.
13	5/25/2014	Graffiti on signs near Ponds	LACDPW notified.
14	5/25/2014	Rock dam	Removed 5/29/14.
15	5/25/2014	Rock dam	Removed 5/29/14.
16	5/25/2014	Rock dam	Removed 5/29/14.
17	5/25/2014	Equestrians drinking alcohol observed	
18	5/29/2014	Downed tree	Removed 5/29/14.
19	5/29/2014	Rock dam	Removed 5/29/14.
20	8/8/2014	Downed tree	Removed 8/13/14.
21	8/11/2014	Homeless encampment	LACDPW notified 8/11/14.
22	8/11/2014	Homeless encampment	LACDPW notified 8/11/14.
23	8/13/2014	Rock dam	Removed 8/13/14.
24	8/13/2104	Vandalism	Trash can with spray paint.
25	11/17/2014	Dumping	Dumping near entrance to Cottonwood entrance. LACDPW notified.
26	12/1/2014	Dumping	Dumping near entrance to Cottonwood entrance. LACDPW notified.
27	12/1/2014	Log dam	Removed 12/1/14.
28	12/1/2014	Trail erosion	LACDPW notified 12/4/15.
29	12/1/2014	Homeless encampment	Presence of encampment could not be confirmed. LACDPW notified 12/1/14.
30	12/1/2014	Tree branch obstruction	Branches obstructing equestrian crossing sign. Addressed during Dec 2014 maintenance effort.
31	12/4/2014	Homeless encampment	LACDPW notified 12/4/14.
32	12/4/2014	Homeless encampment	LACDPW notified 12/4/14.
33	12/4/2014	Trail erosion	LACDPW notified 12/4/14.
34	12/8/2014	Vandalism	Spray paint on signs and base of tower.
35	12/8/2014	Vandalism	Spray paint on gate.
36	12/8/2014	Dumping	Christmas tree with ornaments -- possible encampment nearby.
37	12/8/2014	Vandalism	Spanish sign missing.
38	12/10/2014	Rock dam	Removed 12/10/14.
39	12/10/2014	Unauthorized trails	Blocked with sticks and branches 12/10/14.
40	3/31/2015	Rock dam	Removed on 4/13/15.
41	3/31/2015	Unauthorized trails	Trail was blocked on 4/15/15.
42	3/31/2015	Fire pit and trash	Area was addressed on 4/15/15.
43	3/31/2015	Rock dam	Large logs were removed, very few rocks.
44	3/31/2015	Downed branch	Removed on 4/8/15.
45	3/31/2015	Poison oak encroaching trail	Removed on 4/8/15 or 4/9/14.
46	3/31/2015	Non-native grasses encroaching on trail	Removed on 4/8/15 or 4/9/14.
47	3/31/2015	Person playing saxophone near creek	Person not actually observed.
48	4/1/2015	Vandalism	LACDPW notified 4/20/15.
49	4/1/2015	Homeless encampment	LACDPW notified 4/20/15.
50	4/15/2015	Horse circle	Horse circle with two recently trampled California sagebrush in center.
51	11/11/2014	Child's clothing	LACDPW notified 11/11/14, LASD notified 11/12/14.
52	4/9/2015	Fire, April 9 2015	ECORP documented fire with memo and map; area will be monitored.
53	4/23/2015	Homeless encampment	LACDPW notified 4/28/15.
54	4/23/2015	Rock dam	LACDPW notified 4/28/15.

APPENDIX L

Public Outreach Memo

December 23, 2015
(2014-003.005/008/8)

Mayra Cabrera
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave
Alhambra, CA 91803-1331

SUBJECT: Public Outreach for May through September 2015 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Cabrera:

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Area (Mitigation Area) for native wildlife species, ECORP Consulting, Inc. (ECORP) has continued its bilingual public outreach efforts to non-equestrian and equestrian user-groups who regularly visit the Mitigation Area for recreational purposes.

Outreach Efforts

On-site interviews and education about the Mitigation Area were conducted by ECORP biologists, Alfredo Aguirre and Jerry Aguirre, on twelve separate occasions. Outreach efforts took place on May 24 and 25, June 7 and 21, July 4, 5, and 19, August 2, 16, and 29, and September 6 and 7, 2015. All outreach efforts took place during the peak hours of 10:00 AM to 3:00 PM.

ECORP biologists walked the established 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 these twelve 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, ECORP 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. In addition to questions, social media awareness of the outreach efforts was a topic discussed frequently amongst the equestrian users. Equestrian site users expressed their

interest in displaying our brochure on their Facebook page and bringing up topics among the Hansen Dam equestrian rider community. Most equestrian and non-equestrian users were responsive to the public outreach efforts.

Non-Equestrian Family Groups

A total of 112 non-equestrian site users were encountered during the twelve outreach visits in 2015. Most of these individuals were encountered along the trails around Haines Canyon Creek and the Tujunga Ponds. The larger family groups were observed arriving on the site at the South Wheatland entrance with the intent to picnic, swim, and fish. All site users were offered an informational brochure about the site, informed about activities that are prohibited in the Mitigation Area, and asked if they had any questions on any of the information presented. Some of the issues observed during the outreach users included alcohol consumption, rock dam construction in the creek, swimming in the creek, littering, smoking, and fishing (Figures 1 through 7).

All of the groups and individuals that were encountered were mostly receptive after being educated on the resources and informed about the rules within the Mitigation Area. One encounter with a group of two males fishing at the Tujunga Ponds occurred on May 25, 2015. The two males were observed with fishing rods near the Western Pond and were given a brochure. The gentlemen understood the site rules, but were observed fishing later during the visit. On September 6, 2015, one non-equestrian user was observed smoking a cigarette within the Mitigation Area. After the informal interview and discussion the user was observed putting the cigarette out and throwing it in the nearby trash can. Most of the non-equestrian users were observed bringing in cooked food and trash bags. Of the non-equestrian users, children were most frequently seen using the creek for swimming. Adults were mainly on the site preparing food and supervising. Many of the site users agreed to not use grills, start fires, smoke cigarettes, fish, or litter; however, many continued to fish, swim, and wade in the creek.

Effects on Sensitive Habitat by Non-Equestrian Family Groups

The most substantial impacts on sensitive habitat by non-equestrian family groups were caused by swimming and building rock dams within Haines Canyon Creek. There are a few unauthorized swimming areas that have become popular spots for non-equestrian family groups to congregate, picnic, and swim. The most popular location for picnickers and swimmers is the unauthorized swimming area situated approximately 1,000 feet west of the South Wheatland entrance. During the outreach site visit conducted on June 7, 2015 it was noted that this area had a large rock dam. On the final visit on September 7, 2015 the large rock dam was still present on the site and had been reinforced with gravel/soil (Figure 8).

One of the most detrimental activities associated with the popular swimming hole is the creation of rock dams designed to make the swimming areas deeper. The construction of these rock dams has persisted despite the outreach efforts and constant removal of the dams. The dams in this area consist of large dead branches, boulders, debris, trash, and plastic placed across a narrow portion of the creek that reduce the natural flow and create a buildup of water. This year the introduction of soil and gravel to the dam building was documented. The changes to the natural flow of the creek can be detrimental to the sensitive species of fish

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 (*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 family groups were approached and educated during the outreach site visits. All rock dams were documented and reported to LACDPW for removal.

Equestrian User Groups

A total of 60 equestrian users were approached and interviewed along the established trails, in the upland areas of the Mitigation Area, and near the Tujunga Ponds. Equestrians were offered a brochure and informed about many of the unique aspects of the Mitigation Area. Outreach events with equestrians were usually brief, as most of the equestrian site visitors were receptive to the outreach efforts. Most questions to the ECORP biologists were about trail maintenance efforts taking place at the Mitigation Area. Several riders, including an equestrian site activist, stated that they were interested in establishing connections through social media to communicate information about on-site efforts conducted at the Mitigation Area by ECORP, LACDPW, and various equestrian groups. Some of the issues observed by equestrian users included trash and downed trees that obstructed the trails.

Riders were reminded to cross the creek single file to minimize erosion along the banks, and to stay on the established trails. Additional educational awareness was provided to the riders regarding their horses leaving excrement in the waterways and the effects this has on the sensitive habitat. Riders were asked to contact LACDPW if they notice any suspicious activity in the Mitigation Area.

Effects on Sensitive Habitat by Equestrian Site Visitors

Equestrian site users can affect sensitive terrestrial habitat by traveling off of the established trail systems and disturb sensitive aquatic habitat when traveling through Haines Creek. One encounter with a group of equestrian site users with beer in hand occurred during the site visit conducted on July 5, 2015. The group was observed carrying beer along the trails in the Mitigation Area and was given a brochure. The cans could contribute to litter accumulation if not properly disposed. Additionally, a group of equestrian riders was observed swimming in the Tujunga Ponds. Their horses were left unattended and brochures were not provided as the riders were unreachable in the water (Figure 9). The creation of new trails and traveling off of the established trails can be avoided with continued trail maintenance and equestrian site visitor education.

I hereby certify that the statements furnished above present the data and information required for this memo, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

SIGNED: DATE: December 23, 2015

Jerry Aguirre
Assistant Environmental Scientist

Figure 1. A large rock dam composed of rocks and branches near the South Wheatland entrance on June 21, 2015.

Figure 2. Extinguished fire pit near the popular swimming area near the South Wheatland entrance on June 21, 2015.

Figure 3. Trash present on the trail heading west to the popular swimming area near the South Wheatland entrance on July 5, 2015 (Independence Day Weekend).

Figure 4. Trash near popular swimming area on June 7, 2015.

Figure 5. Trash pick-up sign (in Spanish) and bilingual waterway obstruction sign on August 2, 2015.

Figure 6. Trash Can being used on site on September 7, 2015.

Figure 7. Cigarette on the trail on September 6, 2015.

Figure 8. A large dam composed of rocks, sand, and gravel near the South Wheatland entrance on August 29, 2015.

Figure 9. Horses left unattended while riders swim in the Tujunga Ponds on July 19, 2014.

APPENDIX M

Special Assessment Memo

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

May 22, 2015
(2014-003.005/009)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Memorandum for Post-fire Damage Assessment (April 2015) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a damage assessment of a fire that burned in the Big Tujunga Wash Mitigation Area (Mitigation Area) on April 9, 2015 near the east end of the Mitigation Area adjacent to Interstate 210. The fire was reported to have started by "careless smoking at a homeless encampment" (Attachment 1).

The site visit was conducted by ECORP Consulting, Inc. (ECORP) biologists, Shannan Shaffer and Rebecca Valdez, on April 23, 2015. Based on the extent of the burn area, it appeared that fire damage was evident within the eastern boundary of the Mitigation Area, California Department of Transportation (Caltrans) Interstate 2015 right-of way, and the County of Los Angeles, Department of Parks and Recreation Property located on the northeast portion of the Mitigation Area (Figures 1 through 4). The burn area within the Mitigation Area was approximately 0.03 acre in size and vegetation that was burned included California buckwheat (*Eriogonum fasciculatum*), coastal sagebrush (*Artemisia californica*), and non-native grasses. Additional plants that were burned but were located outside of the Mitigation Area include chaparral yucca (*Hesperoyucca whipplei*) and an arroyo willow (*Salix lasiolepis*). Some areas were completely burned and devoid of any sign of remaining vegetation that could be identified. ECORP recommends that no action needs to be taken; the burned area will likely recover naturally. This area will be monitored during future visits to the site.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: Shannan Shaffer DATE: May 22, 2015

Shannan Shaffer
Senior Biologist

ECORP Consulting, Inc.
1801 Park Court Place, Building B Suite 103, Santa Ana, California 92701
Phone: (714) 648-0630 ● Fax: (714) 648-0935 ● Email: Ecorp@ecorpconsulting.com

Attachment 1. News Article

ABOUT STAFF CONTACT ADVERTISE FAQ PRIVACY POLICY TERMS OF SERVICE

mynewsLA.com

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LATEST NEWS Mother charged with stabbing 3-year-old son during domestic dispute

Home » Crime » This Article

Small brush fire closes 210 Freeway in Lakeview Terrace

POSTED BY JOHN SCHREIBER ON APRIL 9, 2015 IN CRIME | 274 VIEWS | LEAVE A RESPONSE

Recommend Share 1

A small, smoking-related brush fire caused a big traffic backup on the Foothill (210) Freeway in Lakeview Terrace Thursday afternoon.

The fire, which scorched less than acre along the eastbound side of the freeway at Wheatland Avenue, was reported about 3:50 p.m., said Brian Humphrey of the Los Angeles Fire Department.

The blaze, which caused no injuries and threatened no structures, was knocked down in 25 minutes by 64 firefighters, Humphrey said. The fire was sparked by careless smoking at a homeless encampment, he said.

All eastbound lanes of the freeway were closed for more than an hour, with traffic diverted at the Wheatland Avenue offramp onto Foothill Boulevard as firefighters mopped up.

Two lanes were reopened about 5 p.m., according to the California Highway Patrol. By then, eastbound traffic was backed up to the Ronald Reagan (118) Freeway. All lanes were reopened about 5:30 p.m., the CHP reported.

— *City News Service*

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Figure 1. Map

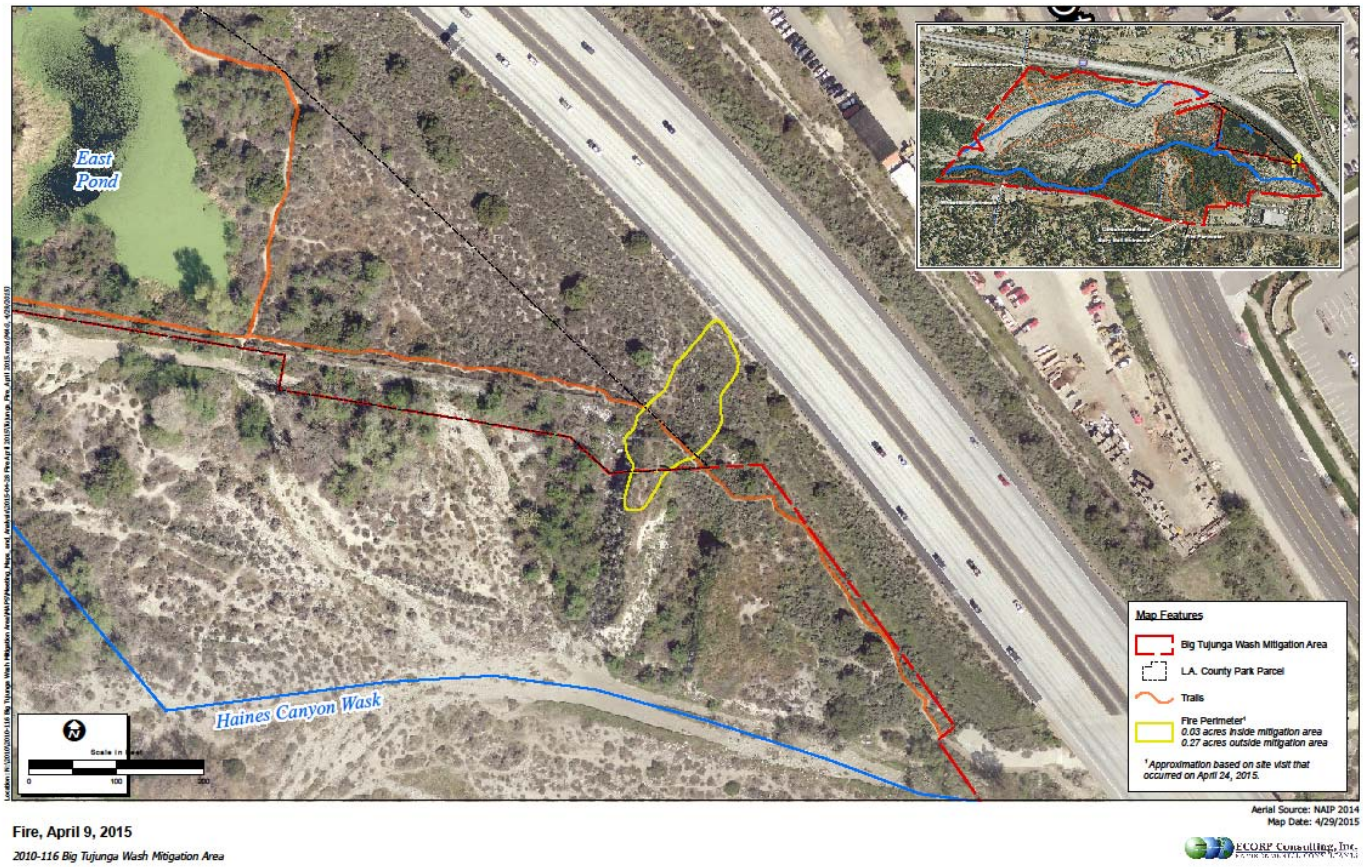

East Pond
Haines Canyon Wask
Map Features
Big Tujunga Wash Mitigation Area
L.A. County Park Parcel
Trails
Fire Perimeter[1]
0.03 acres inside mitigation area
0.27 acres outside mitigation area
[1]Approximation based on site visit that occurred on April 24, 2015.
Aerial Source: NAIP 2014
Map Date: 4/29/2015
Fire, April 9, 2015
2010-116 Big Tujunga Wash Mitigation Area
ECORP Consulting, Inc.

Figure 2. Mitigation Area damaged by fire, facing northeast.

Figure 3. Mitigation Area damaged by fire, facing southwest.

Figure 4. The burned area adjacent to Mitigation Area, facing northeast.

APPENDIX N

Least Bell's Vireo and Southwestern Willow Flycatcher Focused Survey Report

Final
2015 Riparian Bird Survey Report
Big Tujunga Wash Mitigation Area
Los Angeles County, California

Prepared for:

County of Los Angeles
Department of Public Works
900 S. Fremont Avenue
Alhambra, California 91803

Prepared by:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1801 Park Court Place
Building B, Suite 103
Santa Ana, California 92701

August 2015

CONTENTS

2015 Riparian Bird Survey Report Big Tujunga Wash Mitigation Area

1.0 Introduction 1
1.1 Description of Project 1
1.2 Project Area Description 1
2.0 Riparian bird Habitat 4
2.1 Vegetation Communities 4
2.1.1 Southern Cottonwood-willow Riparian Woodland 4
2.1.2 Southern Willow Scrub 4
2.1.3 Mulefat Scrub 4
2.1.4 Cattail Wetlands 5
2.2 Suitable Least Bell's Vireo Habitat 5
2.3 Suitable Southwestern Willow Flycatcher Habitat 5
2.4 Disturbances 5
3.0 Methods 7
3.1 Least Bell's Vireo Surveys 7
3.2 Southwestern Willow Flycatcher Surveys 7
4.0 Results 7
4.1 Least Bell's Vireo Surveys 7
4.2 Southwestern Willow Flycatcher Surveys 8
4.3 Brown-headed Cowbird Trapping 9
5.0 Recommendations 9
6.0 Certification 10
7.0 Literature Cited 11

LIST OF TABLES

Table 1. Survey Dates, Personnel, and Conditions 8
Table 2. Survey Dates, Personnel, and Conditions 9

LIST OF FIGURES

Figure 1. Project Vicinity 2
Figure 2. Project Location 3
Figure 3. Riparian Bird Survey Location 6

LIST OF APPENDICES

Appendix A - Representative Habitat Photographs
Appendix B - Completed Least Bell's Vireo Survey Forms
Appendix C - Wildlife Compendium
Appendix D - Completed Southwestern Willow Flycatcher Survey and Detection Forms

1.0 INTRODUCTION

The County of Los Angeles Department of Public Works' (LACDPW) Big Tujunga Wash Mitigation Area (Mitigation Area) in Sunland, California falls within the breeding range and contains suitable nesting habitat for the least Bell's vireo (*Vireo bellii pusillus*; LBVI) and southwestern willow flycatcher (*Empidonax traillii extimus*; SWFL). Both species are federally and state-listed as endangered (CDFW 2015a). ECORP Consulting, Inc. (ECORP) conducted surveys within the Mitigation Area in suitable habitat to determine the presence or absence of the LBVI and SWFL in order to minimize potential impacts to these species.

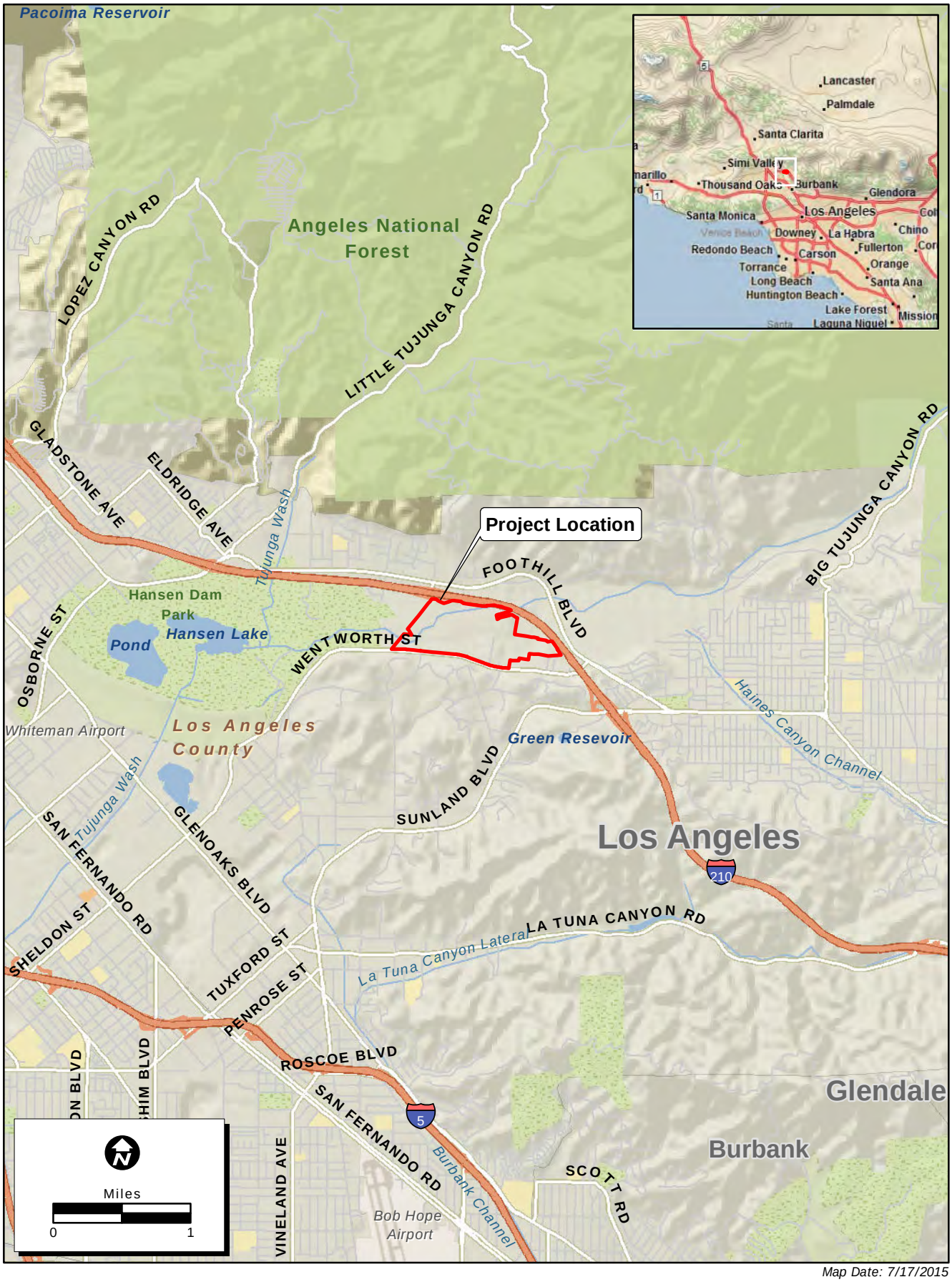
1.1 Description of Project

ECORP was contracted by LACDPW in July 2007 to continue activities outlined in the Master Mitigation Plan (MMP) (Chambers Group, Inc. 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. A Long-term Monitoring and Maintenance Plan (LTMMP) was created to ensure the continued success of the MMP in perpetuity (Chambers Group, Inc. 2006). While the MMP encompassed 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, it also provides direction for the monitoring of existing endangered species populations. Suitable habitat for LBVI and SWFL is present in the Mitigation Area; therefore, protocol-level surveys for LBVI and SWFL were conducted as part of the execution of the LTMMP (Chambers Group, Inc. 2006).

1.2 Project Area Description

The Mitigation Area is an approximately 210-acre site 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). 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. 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 County-designated Significant Natural Area (LAX-018) and the biological resources found on the site are of local, regional, and statewide significance (Safford and Quinn 1998; CDFW 2015b). The nearby Tujunga Ponds and surrounding habitat are located adjacent to the northeast corner of the site (Figure 2).



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_Location_2015.mxd (ECK, KO, DW)-KOrtega 7/17/2015

Map Date: 7/17/2015
Source: ESRI

Figure 1. Project Location

2014-003.005 Big Tujunga Wash Mitigation Area

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Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Aerial Maps\Onsite\Tujunga_Bank_Aerial_v3_2015.mxd (SSwagger; DWagner) KOrtega 7/17/2015

Aerial Date: USGS 2014
7/17/2015

Figure 2. Big Tujunga Wash Mitigation Area

2014-003.005 Big Tujunga Wash Mitigation Area

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2.0 RIPARIAN BIRD HABITAT

2.1 Vegetation Communities

Vegetation communities within the survey area were identified during a vegetation mapping survey in 2014 (ECORP 2014) and were classified according to *A Manual of California Vegetation* (Sawyer et al. 2009). Vegetation within the survey area consisted of riparian communities including southern cottonwood-willow riparian woodland (*Populus fremontii* forest alliance), southern willow scrub (*Salix lasiolepis* shrubland alliance), mulefat scrub (*Baccharis salicifolia* shrubland alliance), and cattail wetlands (*Typha domingensis* herbaceous alliance). Southern cottonwood-willow riparian woodland was the dominant community throughout the survey area. Southern willow scrub communities were generally found in sandy and gravely areas throughout the survey area, typically adjacent to mulefat scrub communities. Cattail wetlands were present in the survey area near the Tujunga Ponds. Dominant species observed in the survey area include Fremont's cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix exigua*), mulefat (*Baccharis salicifolia*), and southern cattail (*Typha domingensis)*. Habitat photographs are included as Appendix A.

2.1.1 Southern Cottonwood-willow Riparian Woodland

Southern cottonwood-willow riparian woodland within the survey area consisted of stands of Fremont's cottonwood and tree willows, such as red willow. Other associated tree species of southern cottonwood-willow riparian woodland include California sycamore (*Platanus racemosa)* and coast live oak (*Quercus agrifolia*). The shrub layer is typically dominated by willows and the understory herbaceous layer may contain rushes, sedges, stinging nettle (*Urtica diotica*), and mugwort (*Artemisia douglasiana*) (Holland 1986). Southern cottonwood-willow riparian woodland was present throughout the survey area along Haines Canyon Creek and around the Tujunga Ponds.

2.1.2 Southern Willow Scrub

Southern willow scrub within the survey area consisted of dense stands of shrubby willows with scattered emergent cottonwood and California sycamore. The dominant willow species typically associated with southern willow scrub are arroyo willow and sandbar willow. These stands typically occur near stream channels on sandy or gravelly alluvial soils (Holland 1986). In addition to the two willow species, mulefat is present throughout this vegetation community. Rushes, sedges, stinging nettle, and mugwort are all present in the herbaceous understory layer. Southern willow scrub was present throughout the survey area along Haines Canyon Creek and around the Tujunga Ponds.

2.1.3 Mulefat Scrub

Mulefat scrub within the survey area consisted of strands of mulefat as a dominant or co-dominant in the shrub canopy accompanied by a sparse herbaceous layer. Emergent trees such as California sycamore, Fremont's cottonwood, oaks (*Quercus* spp.), and willows may be present in mulefat scrub at low cover. Mulefat scrub is found in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels; soils are mixed alluvium (Sawyer et al.

2009). Mulefat scrub is present throughout the Mitigation Area typically adjacent to areas of southern willow scrub.

2.1.4 Cattail Wetlands

Cattail wetlands within the survey area consisted of southern cattail as a dominant or co-dominant in the herbaceous layer. The herbaceous canopy of cattail wetlands is intermittent to continuous with individual plants less than 5 feet (ft) (1.5 meter [m]) tall. Emergent trees such as willows may be present in cattail wetlands at low cover. Cattail wetlands are found in flooded freshwater or brackish marshes that contain clayey or silty soil (Sawyer et al. 2009). Other species present in the cattail wetlands include creeping bentgrass (*Agrostis stolonifera*), sedges, saltgrass (*Distichlis spicata*), barnyard grass (*Echinochloa crus-galli*), rushes, broad-leaved peppergrass (*Lepidium latifolium*), common knotweed (*Persicaria lapathifolia*), and rough cocklebur (*Xanthium strumarium*). Cattail wetlands are present at the northeast portion of the survey area surrounding the Tujunga Ponds.

2.2 Suitable Least Bell's Vireo Habitat

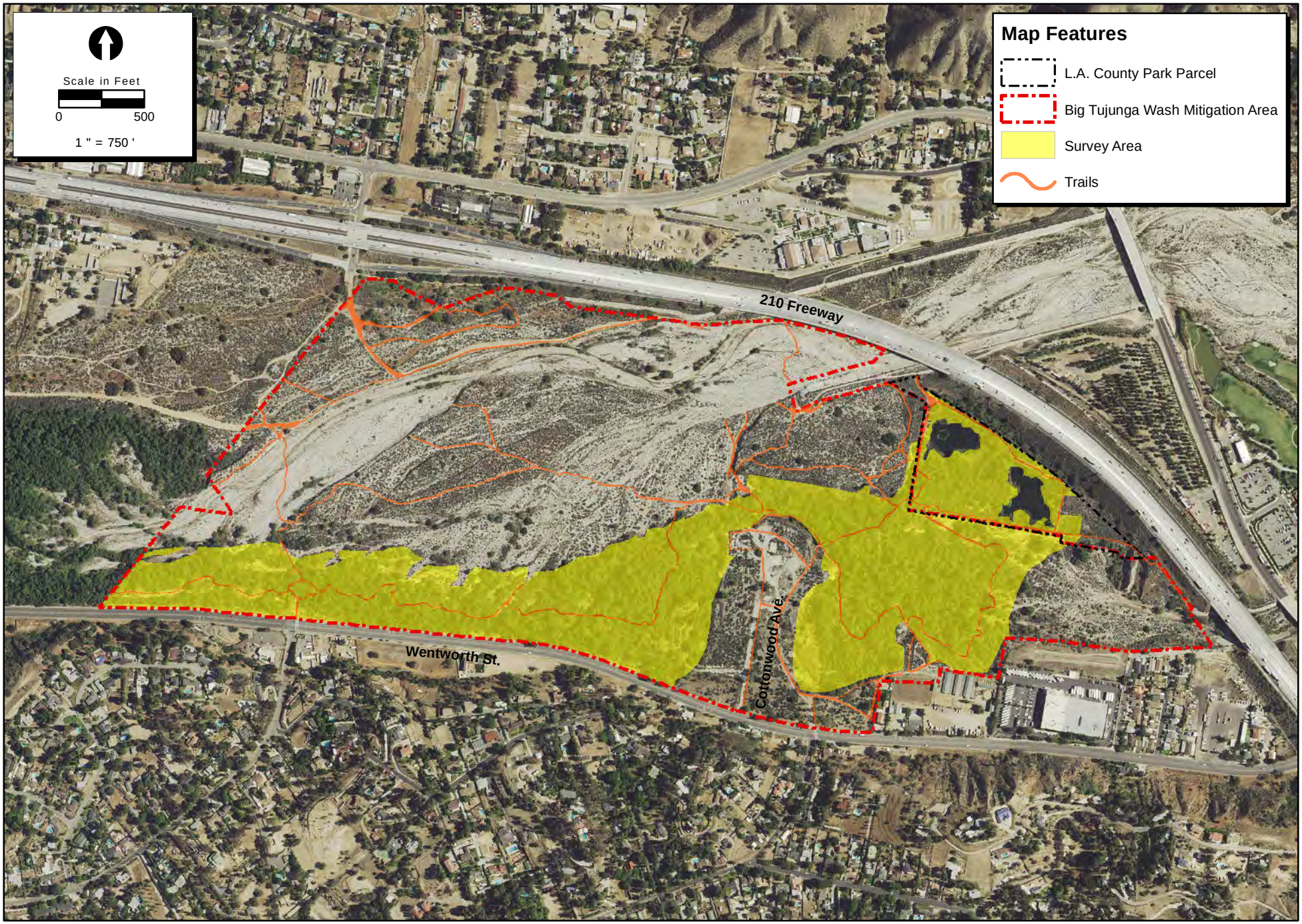
The LBVI typically breeds in dense, shrubby riparian vegetation, often dominated by willows (Franzreb 1989). Suitable LBVI breeding habitat was located near the Tujunga Ponds at the northeast end of the Mitigation Area, along Haines Creek, and in adjacent riparian woodland throughout the southern and middle portions of the Mitigation Area. Upland areas, including those consisting of California sycamore-coast live oak woodland, Riversidian alluvial fan sage scrub, and California buckwheat scrub, were determined to contain no suitable habitat and were not surveyed (Figure 3).

2.3 Suitable Southwestern Willow Flycatcher Habitat

The SWFL is a riparian obligate that typically breeds within dense riparian vegetation near surface water, or soils with enough moisture to sustain suitable breeding vegetation (Sogge et al 2010). The Mitigation Area contained approximately 60 acres of potentially suitable SWFL breeding habitat, which was located along Haines Creek and in adjacent riparian woodland throughout the southern and middle portions of the Mitigation Area. Upland areas consisting of Riversidian alluvial fan sage scrub, oak woodland, sycamore woodland, and California buckwheat scrub were determined to contain no suitable habitat and was therefore not surveyed (Figure 3).

2.4 Disturbances

Disturbances observed within the survey area included moderate volumes of public recreational use including hiking, swimming, picnicking, and equestrian use. Several homeless encampments were observed within the survey area. Additionally, low numbers of brown-headed cowbirds (*Molothrus ater*) were heard vocalizing in the survey area. Brown-headed cowbird trapping was conducted during 2015 within the Mitigation Area (Griffith Wildlife Biology 2015, in prep).



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2015\Tujunga_LBVISurveyArea_2015.mxd *(MGuidry, 7/17/2015)* - KOrtega

Map Date: 7/17/2015
Photo Source: USGS 2014

Figure 3. Riparian Bird Survey Area

2014-003.005 Big Tujunga Wash Mitigation Area

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3.0 METHODS

3.1 Least Bell's Vireo Surveys

United States Fish and Wildlife Service (USFWS) protocol for LBVI surveys specifies eight surveys spaced at least ten days apart between April 10 and July 31 (USFWS 2001). The surveys were conducted in accordance with the published survey protocol by biologists experienced with LBVI habitat, identification, vocalizations, and ecology. All areas of suitable LBVI habitat within the survey area were traversed on foot with frequent stops to look and listen for LBVIs. The locations of LBVI observations were recorded using a handheld global positioning system (GPS) unit capable of 3- to 10-ft (1- to 3-m) accuracy. Survey data were recorded onto a survey form.

3.2 Southwestern Willow Flycatcher Surveys

Surveys for the SWFL followed the protocol outlined by Sogge et al. (2010) and were conducted by a biologist in possession of a federal recovery permit and state authorization to survey for SWFL. The 2010 protocol recommends five surveys during three survey periods, with two surveys occurring within each of the last two survey periods. These three survey periods are May 15 to 31 (Period 1), June 1 to 24 (Period 2), and June 25 to July 17 (Period 3). All successive surveys were conducted at least five days apart from one another, and precautions were taken to limit damage to surrounding vegetation. Surveys were conducted within the approximately 60 acres of suitable habitat in the Mitigation Area along transects spaced approximately 65 to 100 ft (20 to 30 m) apart. SWFL vocalizations were played at approximately 65- to 100-ft (20- to 30-m) intervals along each transect using an MP3 player and speaker system. The vocalization was played following an initial approximate one-minute period of listening. The period of listening followed by audio playback was repeated with another period of listening at the end before moving to the next 65- to 100-ft (20- to 30-m) interval. Survey data were recorded in a field notebook and copied onto Willow Flycatcher Survey and Detection Forms.

4.0 RESULTS

4.1 Least Bell's Vireo Surveys

Surveys were performed by ECORP biologist Ben Smith (Federal Recovery Permit: TE-67390A-0; CDFW Scientific Collecting Permit: SCP-10933) and Shannan Shaffer (CDFW Scientific Collecting Permit: SCP-007758). Table 1 below lists the times, dates, weather conditions, and assisting personnel that were present.

Table 1. Survey Dates, Personnel, and Conditions

Date	Surveyors (Assistant)	Time		Temperature (˚F)		Cloud Cover (%)		Wind Speed (mph)	
		start	end	start	end	start	end	start	end
4/23/15	Shannan Shaffer (Rebecca Valdez)	0615	1115	48	59	100	100	1-4	1-8
5/4/15	Shannan Shaffer (Wendy Turner)	0645	1100	54	68	0	10	0-2	1-4
5/19/15	Ben Smith (Rebecca Valdez)	0550	1115	53	70	0	30	0	1-3
6/4/15	Ben Smith (Emily Graf)	0540	1215	59	75	100	10	0-2	1-3
6/15/15	Ben Smith (Kevin Cornell)	0700	1140	65	82	100	0	0	3-5
6/26/15	Ben Smith (Carley Lancaster)	0530	1110	63	81	10	5	0	1-3
7/6/15	Ben Smith (Jerry Aguirre)	0535	1200	70	82	100	0	0	1-3
7/16/15	Shannan Shaffer (Amy Trost)	0600	1115	64	79	100	0	0-2	0-5

LBVI was neither observed nor detected during the surveys, despite the presence of suitable riparian habitat. Weather conditions were suitable during all surveys. Completed LBVI survey forms are included in Appendix B. A complete list of wildlife species observed during the surveys is included as Appendix C.

Although the majority of the habitat within the Mitigation Area appeared to be suitable during surveys, LBVI was not detected during the eight focused surveys conducted between April 23, 2015 and July 16, 2015. However, focused LBVI surveys conducted downstream of the Mitigation Area in the Hansen Dam Basin in 2009 resulted in the observation of 44 occupied sites by LBVI; 39 locations were occupied by pairs and five sites occupied by single males (Griffith Wildlife Biology 2009). Based on historical range information of LBVI in the area, it appears that the population is expanding upstream from Hansen Dam Basin (Griffith Wildlife Biology 2009). As long as the dense riparian habitat remains suitable in the Mitigation Area, there is potential for LBVI to occupy the site in the future.

4.2 Southwestern Willow Flycatcher Surveys

All surveys were performed by ECORP biologist Ben Smith (Federal Recovery Permit: TE-67390A-0; CDFW Scientific Collecting Permit: SCP-10933). Table 2 below lists the times, dates, survey area, weather conditions, and assisting personnel that were present.

Table 2. Survey Dates, Personnel, and Conditions

Date	Surveyors (Assistant)	Time		Temperature (˚F)		Cloud Cover (%)		Wind Speed (mph)	
		start	end	start	end	start	end	start	end
5/19	Ben Smith (Rebecca Valdez)	0550	1115	53	70	0	30	0	1-3
6/5/15	Ben Smith (Emily Graf)	0540	1215	59	75	100	10	0-2	1-3
6/15/15	Ben Smith (Kevin Cornell)	0700	1140	65	82	100	0	0	3-5
6/26/15	Ben Smith (Carley Lancaster)	0530	1110	63	81	10	5	0	1-3
7/6/15	Ben Smith (Jerry Aguirre)	0535	1200	70	82	100	0	0	1-3

Although the majority of the habitat within the Mitigation Area appeared to be suitable habitat, SWFL was not detected during the five focused surveys conducted from May 19, 2015 to July 6, 2015. Focused SWFL surveys conducted in the Mitigation Area in 2012 resulted in the observation of two willow flycatchers (ECORP 2012). Both flycatchers were observed only during the first survey on May 21, 2012 and were determined to likely be migrants (Leatherman 2012). Provided the riparian habitat remains suitable in the Mitigation Area, there is potential for SWFL to occupy the site in the future. Completed SWFL survey forms are included in Appendix D.

4.3 Brown-headed Cowbird Trapping

In accordance with the LTMMP for the Mitigation Area, brown-headed cowbird trapping was conducted in the Mitigation Area and surrounding areas between April and June 2015. The removal of this parasitic bird species increases the likelihood that sensitive riparian bird species, such as the LBVI and SWFL, will inhabit and breed in the Mitigation Area. Brown-headed cowbirds directly threaten survival of the species they parasitize by laying eggs in the host nest and leaving the host bird to raise the cowbird offspring. This usually results in the death of the offspring of the host species because the host is more likely to rear the larger and more aggressive cowbird chicks.

5.0 RECOMMENDATIONS

Although neither LBVI nor SWFL were found occupying the survey area, suitable breeding habitat is present within the site for both species. Continued preservation of the riparian vegetation along the river is recommended to allow the possibility of future expansion into the site.

6.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or the applicant's representative and that I have no financial interest in the project.

DATE: 8/11/2015 SIGNED: _____
Ben Smith (TE-67390A-0)
Wildlife Biologist

DATE: 8/11/2015 SIGNED: _____
Shannan Shaffer
Senior Wildlife Biologist

7.0 LITERATURE CITED

[CDFW] California Department of Fish and Wildlife. 2015a. Special Animals List. Retrieved on July 16, 2015 from: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf.

[CDFW] California Department of Fish and Wildlife. 2015b. California Fish and Game Code, Chapter 12, Section 1930-1940. Available at: http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=fgc&codebody=&hits=20.

Chambers Group, Inc. 2000. Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank. Unpublished Report. County of Los Angeles, Department of Public Works, Sunland, CA.

Chambers Group, Inc. 2006. Long Term Monitoring and Maintenance Plan for Big Tujunga Wash, Los Angeles California. County of Los Angeles, Department of Public Works, Alhambra, CA.

[ECORP] ECORP Consulting, Inc. 2012. Focused Surveys for Least Bell's Vireo for the Big Tujunga Wash Mitigation Area Los Angeles County, California. County of Los Angeles, Department of Public Works, Alhambra, CA.

[ECORP] ECORP Consulting, Inc. 2014. Vegetation Map Update for the Big Tujunga Wash Mitigation Area, Los Angeles County, California. County of Los Angeles, Department of Public Works, Alhambra, CA.

Franzreb, K. 1989. Ecology and conservation of the endangered least Bell's vireo. U.S. Fish and Wildlife Service, Biological Report 89(1). 17 pp.

Griffith Wildlife Biology. 2009. Big Tujunga Wash Mitigation Area Brown-headed Cowbird Control Program. Unpublished report prepared for ECORP Consulting, Santa Ana, California by Griffith Wildlife Biology, Calumet, MI.

Griffith Wildlife Biology. 2014. Big Tujunga Wash Mitigation Area Brown-headed Cowbird Control Program. Unpublished report prepared for ECORP Consulting, Santa Ana, California by Griffith Wildlife Biology, Calumet, MI.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. In: California Department of Fish and Game The Resources Agency, editor. Sacramento, CA. p. 156.

[Leatherman] Leatherman BioConsulting, Inc. 2012. Results of 2012 Focused Surveys for the Southwestern Willow Flycatcher and Least Bell's Vireo for the Big Tujunga Wash Mitigation Area. Unpublished report prepared for ECORP Consulting, Santa Ana California by Leatherman BioConsultants, Sunland, CA.

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 Deparment of Fish and Game, Region 5.

Sawyer, J.O., Keeler-Wolf, T., and Evens, J.M. 2009. A Manual of California Vegetation, 2nd Edition. California Native Plant Society, Sacramento, CA.

Sogge, M. K., Ahlers, Darrell, and Sferra, S.J. 2010. A natural history summary and survey protocol for the southwestern willow flycatcher: U.S. Geological Survey Techniques and Methods 2A-10. U.S. Geological Survey, Reston, VA.

[USFWS] U.S. Fish and Wildlife Service. 2001. Least Bell's Vireo Survey Guidelines. U.S. Department of the Interior. Carlsbad, CA, USFWS, 3 pp.

Appendix A

Representative Habitat Photographs

Photo 1 – Haines Canyon Creek.

Photo 2 - Haines Canyon Creek.

Photo 3 – Vegetation Surrounding Haines Canyon Creek.

Photo 4 -Trail near Haines Canyon Creek.

Photo 5 - Perspective of Riparian Vegetation near Haines Canyon Creek.

Photo 6 - Tujunga Ponds

Appendix B

Completed Least Bell's Vireo Survey Forms

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
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Date: 4/23/15
Project #: 2014-003.005/013/13
Surveyor(s): S. Shaffer, R. Valdez
Task(s): RBS - viero
Area(s) surveyed: riparian area ~~3rd~~
GPS File Name: —

	Start	End
Time (24 hr)	0615	1145
Temp (°F)	48	59
Wind (mph)	1-4	1-8
Cloud Cover (%)	100%	100%

1145 - 1315
60 61
1-4 1-4
100% 100%

1—RBS survey—1 1—fire survey—1

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☒ Rock Dams
- ☐ Poison Oak along Trails
- ☒ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

Issue Observed	Coordinates (NAD 83) Easting	Northing	Photo#/Camera	Description
rock dam	0375184	3792585		
burned area	0376822	3792603		2 way points
~~homeless camp~~			101→133	points for fire
homeless camp near fire				next to fire, has clothes line w/ wet towels white, blond long hair, younger blue pants, red t-shirt

Monitoring Notes:

Date: 2014-003.005/013/13 S

Project #: 4/23/15 L

Surveyor(s): S. Shaffer / R. Valdez

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
CALT	V	~~A coot~~	O					
WRTI	V	CLSW	O					
HOFI	V	MALL	O					
COYT	V	~~GAWA~~	O					
ALHU	O	Greenheron	O					
BLPH	V	rbdU	O					
opossum	O	RUDU	O					
BUSH	O/V	DCCO	O					
RWBB	O							
MODO	O/V							
WESJ	O/V							
SOSP	O/V							
SPTO	V							
~~BE~~ BEKI	V							
wefen lz	O							
side blotlz	O							
HOWR	V							
BEWR	V							
~~CATFC~~	~~V~~							
raccon	T							
CLSW	V/O							
ACWO	O							
NUWO	O							
AMCR	O							
CORA	O							
~~CAGO~~ (cnesda gaise)	~~V~~							
RWBB	V							
ROPI	O							
ANHU	O							
PBGR (pibilled grebe)	O →							
PHAI	V							
LEGO	V/O							
AMGO	V/O							
~~ST~~ ~~Sty~~								
Strip/cuuc	~~STHett~~ C							
CEWA	V/O							
CAQU	V							
NOMO	V/O							
MALL	V/O							
Belted kingfisher	V/O							
RTHA	V							
LAGO	V/O							
cottontail	O							
NRWS	V							
NOFL	V							
OTMO	V							
CALA	S							
BHCB	V/O							
CATH	V							
RTHA	V							
TUVU	O							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 5/4/15
Project #: 2014-063.005/013
Surveyor(s): S Shaffer W Turner
Task(s): LBVI Survey #2
Area(s) surveyed: Riparian / Ponds
GPS File Name:

	Start	End
Time (24 hr)	0645	1100
Temp (°F)	54	68
Wind (mph)	0-2	1-4
Cloud Cover (%)	0	10

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☐ Rock Dams
- ☐ Poison Oak along Trails
- ☐ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

	Coordinates (NAD 83)			
Issue Observed	**Easting**	**Northing**	**Photo#/Camera**	**Description**

Monitoring Notes: No issues documented / observed

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 5/4/15 LBVI #2

Project #: 2014-003.005/013

Surveyor(s): S. Shaffer, W. Turner

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
WREN	V	MALL	O					
SPTO	OV	AMCO	O					
BUSH	OV	COYE	OV					
CALT	O	NRWS	O					
BHGR	OV	BCHU	O					
ANHU	OV	WTSW	O					
WSJA	OV	AMCO	O					
NOMO	OV	RUDU	O					
SAPH	V	GRHE	O					
CORA	OV	RWBL	V					
CATH	OV	PacChor frog	V					
CAQU	V							
BEWR	OV	OCWA	V					
BLPH	OV							
MODO	O							
ATFL	V							
HOFI	VO							
DOWO	OV							
RSHA	O							
RTHA	O							
COHA	V							
TUVU	O							
HOWR	V							
LAGO	O							
SKUNK	C							
Coyote	ST							
OATI	V							
AMGO	O							
EUST	OV							
NOFL	V							
PHAI	O							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 5/19/15
Project #: 2014-003.005/013/13
Surveyor(s): B. Smith, R. Valdez
Task(s): RBS
Area(s) surveyed: riparian includ. ponds
GPS File Name: BigTSwf120150519RV

	Start	End
Time (24 hr)	0550	1115
Temp (°F)	53	70
Wind (mph)	calm	1-3
Cloud Cover (%)	0%	30%

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☐ Rock Dams
- ☐ Poison Oak along Trails
- ☐ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

Issue Observed	Coordinates (NAD 83) Easting	Northing	Photo#/Camera	Description
				NO ISSUES observed

Monitoring Notes:

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 5/19/15

Project #: 2014-003.005/013/13

Surveyor(s): B. Smith, R. Valdez

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
BEWR	v/o	PCCO	O					
YWAR	v/o	PBGR	O					
SOSP	v/o	AMCO	v/o					
NRSW	v/o	COYE	v/o					
LOYE	v/o	RWBL	v/o					
LRGO	v/o	~~NRSW~~						
CALT	v/o	NRSW	v/o					
NUWO	v/o	SOSP	v/o					
HUVI	v/o	YWAR	v/o					
WIWA	v/o	BEWR	v/o					
WESJ	v/o							
SWTH	v/o							
LEWA	v/o							
BUSH	v/o							
WAVI	v/o							
CORA	v/o							
SPTO	v/o							
ATFL	~~v~~/o							
MODO	v/o							
CATH	~~v~~/o							
WETA	v/o							
DOWO	v							
ACWO	v							
CLSW	v/o							
WEWP	o							
BHGR	v/o							
BLPH	v/o							
NOMO	v							
HOFI	v/o							
TOWA	o							
ANHU	v/o							
CAQU	v							
coyote	o							
BTPI	o							
woodrat	o							
RTOTA	o/v							
WREN	o							
PHAI	v							
wc fence liz	o							
CAgr.squ	o/v							
bullfrog	o							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 6/4/15
Project #: 2014-063.005 / 013
Surveyor(s): Ben Smith / Emily Graf
Task(s): Southwestern Willow Flycatcher #2, Least Bell's Vireo #4
Area(s) surveyed: Riparian habitat within Mitigation Area
GPS File Name:

	Start	End
Time (24 hr)	0540	1215
Temp (°F)	59	75
Wind (mph)	0-2	1-3
Cloud Cover (%)	100	10

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☐ Rock Dams
- ☐ Poison Oak along Trails
- ☒ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

	Coordinates (NAD 83)			
Issue Observed	**Easting**	**Northing**	**Photo#/Camera**	**Description**
homeless camp	376425	3792567		Elaborate camp site w/ dogs, bicycles, etc.

Monitoring Notes:

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 6/4/15
Project #: 2014-003.005/013

Surveyor(s): Ben Smith
Emily Graf

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
COYE	O/V	COYE	O/V					
YWAR	O/V	GTGR	O/V					
NRSW	O/V	YWAR	O/V					
SOSP	O/V	NRSW	O/V					
MODO	O/V	SOSR	O/V					
LEGO	O/V	BCNH	O					
DOWO	O/V	RWBL	O/V					
HUVI	V	fence lizard	O					
BUSH	O/V	whiptail	O					
BEWR	O/V							
WREN	O/V							
SPTO	O/V							
CAQU	O/V							
NUWO	O/V							
CALT	O/V							
HOFI	O/V							
WEST	O/V							
WTSW	O/V							
CORA	O/V							
CATH	V							
BHGR	V							
ANHU	O/V							
cottontail	O							
grandsparl	O/V							
RTHA	O/V							
AMCR	O/V							
COHA	O							
CEWA	V							
WETA	V							
PHAI	V							
NOMO	V							
ATFL	O/V							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 6/15/15
Project #: 2014-003.005/013
Surveyor(s): Ben Smith Kevin Cornell
Task(s): Southwestern Willow Flycatcher #3, Least Bells Vireo #5
Area(s) surveyed: riparian habitat within mitigation area
GPS File Name:

	Start	End
Time (24 hr)	0700	1140
Temp (°F)	65	82
Wind (mph)	0	3-5
Cloud Cover (%)	100	0

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☐ Rock Dams
- ☐ Poison Oak along Trails
- ☒ Homeless Camps
- ☐ Unauthorized Trails
- ☑ Something Else

Issue Observed	Coordinates (NAD 83) Easting	Northing	Photo#/Camera	Description
homeless camp loose dogs	376425	3792567		camp observed on 6/4/15 remains. Equestrian asked surveyors to keep an eye out for her dog. Said it had been attacked & possibly injured by another equestrian's dog and had run off. Both dogs were off leash.

Monitoring Notes:

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 6/15/15
Project #: 2014-003.005/013

Surveyor(s): Ben Smith
Kevin Cornell

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
BEWR	O/V	BEWR	O/V					
YWAR	O/V	YWAR	V					
NRSW	O/V	NRSW	O/V					
COYE	O/V	RWBL	O					
CALT	O/V	PBGR	O					
WEST	O/V	AMCO	O					
SRTO	O/V	fencelz	O					
LAZBU	V	COYE	O					
SOSP	O/V							
BUSH	O/V							
AMCR	V							
MoWo	O/V							
BHGR	V							
striped skunk	O							
COHA	O/V							
LEGO	O/V							
AMMA	O/V							
DOCO	O/V							
ATFL	O/V							
WTSW	V							
WREN	V							
NOMO	V							
MODO	O/V							
RSHA	O							
CAQU	O/V							
CATH	V							
RTHA	O							
fencelz	O							
PSFL	O							
BCHG	O							
woodrat	O							
CORA	O/V							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 6/26/15
Project #: 2014-003.005/013
Surveyor(s): Ben Smith and Carley Lancaster
Task(s): Southwestern Willow Flycatcher #4 Least Bell's
Area(s) surveyed: riparian habitat in Vireo #6
GPS File Name:

	Start	End
Time (24 hr)	0530	1110
Temp (°F)	63	81
Wind (mph)	calm	1-3
Cloud Cover (%)	10%	5%

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☐ Rock Dams
- ☐ Poison Oak along Trails
- ☒ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

Issue Observed	Coordinates (NAD 83) Easting	Coordinates (NAD 83) Northing	Photo#/Camera	Description
elaborate camp	376425	3799567		camp observed on 6/4 persists

Monitoring Notes:

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 6/26/15
Project #: 2014-0037.005/013

Surveyor(s): Ben Smith
Corley Lancaster

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
~~BTGR~~		GTGR	OV					
COYE	OV	COYE	OV					
CALT	V	CALT	OV					
YWAR	OV	bat sp.	O					
BUSH	V	YWAR	OV					
CLSW	OV	BUSH	OV					
BEWR	V	CLSW	OV					
SOSP	V	BEWR	V					
WTSW	OV	MALL	O					
WEST	OV	GRHE	O					
ANHU	OV	SOSP	OV					
ATFL	OV	WTSW	OV					
NUWO	OV	WEST	OV					
SPTO	OV	ANHU	O					
HUVI	OV	ATFL	V					
*BHCO	V	NUWO	V					* May have been bait birds heard in a trap
AMCR	OV							- fledglings, in drafting nest in mitigation area
LOAA	OV							
BCHU	OV							
DOWO	OV							
LEGO	OV							
RSHA	OV							
MODO	OV							
RBSW	OV							
CATH	V							
WREN	V							
CAQU	V							
HOFI	OV							
fence lizard	O							
BLPH	OV							
BHGR	V							
NOMO	V							
AMGO	DV							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 7/6/15
Project #: 2014-063.005/013
Surveyor(s): Ben Smith and Jerry Aguire
Task(s): Southwestern Willow Flycatcher #5 & Least Bell's Vireo #7
Area(s) surveyed: riparian habitat
GPS File Name:

	Start	End
Time (24 hr)	0535	1200
Temp (°F)	70	82
Wind (mph)	calm	1-3
Cloud Cover (%)	100	0

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☐ Rock Dams
- ☐ Poison Oak along Trails
- ☒ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

Issue Observed	Coordinates (NAD 83) Easting	Northing	Photo#/Camera	Description
homeless camp	376425	3792567		camp observed on 6/4 per #5

Monitoring Notes:

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 7/6/15

Project #: 2014-003.005/013

Surveyor(s): Ben Smith / Jenny Aguirre

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
LEGO	OV			LEGO	OV			
BEWR	V			BEWR	V			
COYE	OV			MRSW	OV			
BLPH	OV			GRHE	O			
SOSP	OV			COYE	OV			
NUWO	OV			AMCO	OV			
DOWO	OV			MALL	O			
YWAR	OV			BLPH	OV			
BHGR	V			SOSP	OV			
SPTO	OV							
WEST	OV							
CAQU	V							
RSHA	OV							
COHA	OV							
BUSH	OV							
HUV	V							
PHAI	OV							
ATFL	OV							
AMKE	OV							
BCHU	OV							
MOFI	OV							
MODO	OV							
CATH	V							
fox squirrel	O							
fence lizard	O							
alligator lizard	O							
CLSW	OV							
TUVU	O							
RTHA	O							
ALHU	O							
CORA	OV							
WREN	V							
western whiptail	O							
GBHE	O							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Big Tujunga Wash Mitigation Area Site Visit

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 7/16/15
Project #: 2014-003.005/013
Surveyor(s): S. Shaffer A Trost
Task(s): LBVI Survey #8
Area(s) surveyed: Riparian
GPS File Name:

	Start	End
Time (24 hr)	0600	1115
Temp (°F)	64	79
Wind (mph)	0-2	0-5
Cloud Cover (%)	100	0

Check boxes next to any issues encountered and discuss in section below:

- ☐ Trail or Site Erosion
- ☐ Exotic Plants/Water Lettuce
- ☐ Trail Issues
- ☐ Litter and Debris
- ☐ Fencing/Lock/Gate Issues
- ☐ Sign Issues
- ☐ Vandalism
- ☑ Rock Dams
- ☐ Poison Oak along Trails
- ☐ Homeless Camps
- ☐ Unauthorized Trails
- ☐ Something Else

	Coordinates (NAD 83)			
Issue Observed	**Easting**	**Northing**	**Photo#/Camera**	**Description**
Rock/branch Dam	375183	3792575	Dam 1 (2)	2-3 foot tall dam w/ gravel, boulders, branches

Monitoring Notes:

Tasks:
EPR - Exotic Plant Removal; EWR - Exotic Wildlife Removal; TMM - Trails Maintenance and Monitoring; WL - Water Lettuce Monitoring

Date: 7/16/15

Project #: 2014-003-005/013

Surveyor(s): S. Shaffer, A Trost

Riparian (creek)		Riparian (ponds)		Upland (wash/alluvial scrub)		Upland (oak-sycamore woodland)		Notes
Species	OB* Type	Species	OB* Type	Species	OB* Type	Species	OB* Type	
WSJA	OV	NRWS	O					
MODO	O	ALHU	O					
SPTO	V	GBHE	O					
BLPH	O	AMCO	O					
BUSH	OV	MALL	O					
CALT	OV	GREG	O					
NOMO	V	RUDU	O					
WREN	V	LEGO	O					
CORA	OV	PBGR	O					
ANHU	OV							
SOSP	O							
AMCR	OV							
EFoxSq	O							
SKUNK								
RTHA	O							
wfen112	O							
ROPI	O							
DOWO	OV							
RSHA	V							
HOFI	OV							
GCWA	V							

*OB Types: O=observed; V=vocalization; S=scat; B=burrow; C=carcass; T=tracks

Appendix C

Wildlife Compendium

2015 Big Tujunga Wash Mitigation Area Riparian Bird Surveys Wildlife List

Scientific Name	**Common Name**
AMPHIBIANS	
HYLIDAE	**NEW WORLD TREE FROGS**
Pseudacris hypochondriaca	Baja California treefrog
RANIDAE	**TRUE FROGS**
Lithobates catesbeianus	American bullfrog*
REPTILES	
ANGUIDAE	**ALLIGATOR LIZARDS**
Elgaria multicarinata	southern alligator lizard
IGUANIDAE	**IGUANAS**
Uta stansburiana	common side-blotched lizard
PHRYNOSOMATIDAE	**SPINY LIZARDS**
Sceloporus occidentalis	western fence lizard
TEIIDAE	**WHIPTAILS AND RACERUNNERS**
Aspidoscelous tigris	western whiptail
BIRDS	
ACCIPITRIDAE	**HAWKS**
Accipiter cooperii	Cooper's hawk**
Buteo jamaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	bushtit
ALCEDINIDAE	**KINGFISHERS**
Megaceryle alcyon	belted kingfisher
ANATIDAE	**DUCKS, GEESE, AND SWANS**
Anas platyrhynchos	mallard
Aythya collaris	ring-necked duck
Oxyura jamaicensis	ruddy duck
APODIDAE	**SWIFTS**
Aeronautes saxatalis	white-throated swift
ARDEIDAE	**HERONS AND EGRETS**
Ardea herodias	great blue heron
Butorides virescens	green heron
Nycticorax nycticorax	black-crowned night heron
BOMBYCILLIDAE	**WAXWINGS**
Bombycilla cedrorum	cedar waxwing
CARDINALIDAE	**CARDINALS AND GROSBEAKS**
Pheucticus melanocephalus	black-headed grosbeak
CATHARTIDAE	**NEW WORLD VULTURES**

Scientific Name	**Common Name**
Cathartes aura	turkey vulture
COLUMBIDAE	**DOVES AND PIDGEONS**
Columba livia	rock pigeon
Patagioenas fasciata	band-tailed pigeon
Zenaida macroura	mourning dove
CORVIDAE	**JAYS, CROWS, AND THEIR ALLIES**
Aphelocoma californica	western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
EMBERIZIDAE	**SPARROWS AND THEIR ALLIES**
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculatus	spotted towhee
FRINGILLIDAE	**FINCHES**
Carduelis lawrencei	Lawrence's goldfinch
Carduelis psaltria	lesser goldfinch
Carduelis tristis	American goldfinch
Carpodacus mexicanus	house finch
HIRUNDINIDAE	**SWALLOWS**
Petrochelidon pyrrhonota	cliff swallow
Stelgidopteryx serripennis	northern rough-winged swallow
ICTERIDAE	**BLACKBIRDS AND ORIOLES**
Agelaius phoeniceus	red-winged blackbird
Molothrus ater	brown-headed cowbird*
Quiscalus mexicanus	great-tailed grackle
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
PARIDAE	**TITMICE AND CHICKADEES**
Baeolophus inornatus	oak titmouse
PARULIDAE	**WOOD-WARBLERS**
Cardellina pusilla	Wilson’s warbler
Geothlypis trichas	common yellowthroat
Leiothlypis celata	orange-crowned warbler
Setophaga petechia	yellow warbler**
Setophaga townsendi	Townsend’s warbler
PHALACROCORACIDAE	**CORMORANTS**
Phalacrocorax auritus	Double-crested cormorant
PICIDAE	**WOODPECKERS**

Scientific Name	**Common Name**
Colaptes auratus	northern flicker
Melanerpes formicivorus	acorn woodpecker
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	downy woodpecker
PODICIPEDIDAE	**GREBES**
Podilymbus podiceps	pied-billed grebe
PTILOGONATIDAE	**SILKY FLYCATCHERS**
Phainopepla nitens	phainopepla
RALLIDAE	**RAILS**
Fulica americana	American coot
STURNIDAE	**STARLINGS AND MYNAS**
Sturnus vulgaris	European starling*
SYLVIIDAE	**WRENTITS**
Chamaea fasciata	wrentit
THRAUPIDAE	**TANAGERS**
Piranga ludoviciana	western tanager
TROCHILIDAE	**HUMMINGBIRDS**
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
TROGLODYTIDAE	**WRENS**
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
TURDIDAE	**BLUEBIRDS**
Catharus ustulatus	Swainson's thrush
TYRANNIDAE	**TYRANT FLYCATCHERS**
Contopus sordidulus	western wood-pewee
Empidonax difficilis	Pacific-slope flycatcher
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black pheobe
Sayornis saya	Say's phoebe
Tyrannus verticalis	western kingbird
VIREONIDAE	**VIREOS AND GREENLETS**
Vireo gilvus	warbling vireo
Vireo huttoni	Hutton's vireo
MAMMALS	
CANIDAE	**DOGS**
Canis lupus familiaris	domestic dog*
Canis latrans	coyote
EQUIDAE	**HORSES AND ALLIES**
Equus caballus	domestic horse*

Scientific Name	**Common Name**
LEPORIDAE	**HARES AND RABBITS**
Syvilagus audubonii	desert cottontail
MEPHITIDAE	**SKUNKS**
Mephitis mephitis	striped skunk
MURIDAE	**MICE AND RATS**
Neotoma sp.	woodrat
PROCYONIDAE	**RACCOONS AND RINGTAILS**
Procyon lotor	Northern raccoon
SCIURIDAE	**SQUIRRELS**
Sciurus niger	fox squirrel*
Spermophilus beecheyi	California ground squirrel
*Non-native species **CDFW Species of Special Concern/Watch List Species/FP Species ***State and/or Federally Listed Species	

Appendix D

Completed Southwestern Willow Flycatcher Survey and Detection Forms

Appendix 1. Willow Flycatcher Survey and Detection Form

Always check the U.S. Fish and Wildlife Service Arizona Ecological Services Field Office web site (http://www.fws.gov/southwest/es/arizona/) for the most up-to-date version.

Willow Flycatcher (WIFL) Survey and Detection Form (revised April 2010)

Site Name Big Tujunga Wash Mitigation Area State CA County Los Angeles
USGS Quad Name Sunland Elevation 338-347 (meters)
Creek, River, Wetland, or Lake Name Big Tujunga Creek
Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* X *No* ___

Survey Coordinates: Start: E 376477 N 3792856 UTM Datum WGS84 (See instructions)
Stop: E 374992 N 3792526 UTM Zone 11
If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.
*** Fill in additional site information on back of this page ****

Survey # / Observer(s) (Full Name)	Date (m/d/y) Survey time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N / If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s) B. Smith R. Valdez	Date 5/19/15 Start 0550 Stop 1115 Total hrs 5.5	ϕ	ϕ	ϕ	N					
Survey # 2 Observer(s) B Smith E. Graf	Date 6/4/15 Start 0540 Stop 1218 Total hrs 6.5	ϕ	ϕ	ϕ	N					
Survey # 3 Observer(s) B. Smith K. Cornell	Date 6/15/15 Start 0700 Stop 1140 Total hrs 4.75	ϕ	ϕ	ϕ	N					
Survey # 4 Observer(s) B. Smith C. Lancaster	Date 6/26/15 Start 0530 Stop 1110 Total hrs 5.75	ϕ	ϕ	ϕ	N					
Survey # 5 Observer(s) B. Smith J. Aguirre	Date 7/6/15 Start 0535 Stop 1200 Total hrs 6.5	ϕ	ϕ	ϕ	N					
Overall Site Summary Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total Survey Hrs 29		Total Adult Residents	Total Pairs	Total Territories	Total Nests	Were any Willow Flycatchers color-banded? Yes___ No ___ If yes, report color combination(s) in the comments section on back of form and report to USFWS.				
		ϕ	ϕ	ϕ	ϕ					

Reporting Individual Benjamin Smith Date Report Completed ___
US Fish and Wildlife Service Permit # TE-67390A State Wildlife Agency Permit # SCP-10933
Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Benjamin Smith Phone # 714-651-3021
Affiliation ECORP Consulting, Inc. E-mail bsmith@ecorpconsulting.com
Site Name Big Tujunga Mitigation Area Date Report Completed _____
Was this site surveyed in a previous year? Yes X No ___ Unknown ___
Did you verify that this site name is consistent with that used in previous years? Yes X No ___ Not Applicable ___
If site name is different, what name(s) was used in the past? _____
If site was surveyed last year, did you survey the same general area this year? Yes X No ___ If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes X No ___ If no, summarize below.

Management Authority for Survey Area: Federal___ Municipal/County X State___ Tribal ___ Private ___
Name of Management Entity or Owner (e.g., Tonto National Forest) Los Angeles Department of Water and Power

Length of area surveyed: 1.3 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

X Native broadleaf plants (entirely or almost entirely, > 90% native)

___ Mixed native and exotic plants (mostly native, 50 - 90% native)

___ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

___ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific names.

_____

Average height of canopy (Do not include a range): 15 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections; 2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests; 3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.

_____
_____
_____
_____
_____

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

APPENDIX O

Arroyo Toad Focused Survey Report

2015 Focused Arroyo Toad Surveys Report for The Big Tujunga Wash Mitigation Area

Prepared for:

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July 2015

2015 Focused Arroyo Toad Surveys Report for the Big Tujunga Wash Mitigation Area

CONTENTS

SUMMARY 1
1.0 INTRODUCTION 1
1.1 Purpose 1
1.2 Location and Setting 1
1.3 Arroyo Toad Natural History 2
2.0 METHODS 5
2.1 Literature Review 5
2.2 Arroyo Toad Survey Methodology 5
3.0 RESULTS 6
3.1 Literature Review 6
3.2 Arroyo Toad Survey Results 6
3.3 Incidental Observations 7
4.0 CONCLUSION 8
5.0 REFERENCES 9

List of Figures

Figure 1. Project Location 3
Figure 2. Arroyo Toad Survey Area 4

List of Tables

Table 1. Weather Data for the Arroyo Toad Surveys 7

List of Appendices

Appendix A. Representative Site Photos
Appendix B. Survey Data Sheets
Appendix C. Wildlife Species List

SUMMARY

Focused surveys were conducted in 2015 for the federally listed endangered arroyo toad (*Anaxyrus californicus*) as part of the endangered native wildlife monitoring program for the Big Tujunga Wash Mitigation Area. Focused surveys consisted of six paired daytime and nighttime surveys, following the U.S. Fish and Wildlife Service protocol. No arroyo toads were observed or detected on the site during these surveys. Incidental observations over the course of the surveys identified two special-status fish species and one special-status reptile species: Santa Ana sucker (*Catostomus santaanae*), a federally listed as threatened species and a California Department of Fish and Wildlife (CDFW) Species of Special Concern (SSC); arroyo chub (*Gila orcuttii*), a CDFW SSC; and coast horned lizard (*Phrynosoma coronatum*), a CDFW SSC.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to summarize the methods and findings of focused surveys for the federally listed endangered arroyo toad (*Anaxyrus californicus*) conducted by ECORP Consulting, Inc. (ECORP) at the Big Tujunga Wash Mitigation Area (Mitigation Area). The surveys were conducted to determine the presence/absence of arroyo toad as part of implementation of the endangered native wildlife monitoring program in accordance with the Master Mitigation Plan (MMP) for the site.

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 amphibians, bullfrogs (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*) from the Tujunga Ponds, 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 was contracted by the County of Los Angeles Department of Public Works (LACDPW) in July 2007 to continue MMP activities as part of implementation of the Long-term Maintenance and Monitoring Plan (LTMMP) (Chambers Group 2006).

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). 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. 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 the biological resources found on the site are of local, regional, and statewide significance (Safford and Quinn 1998; CDFW 2014). 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 can be found in Figure 2. Between the two watercourses, suitable breeding habitat for arroyo toad is only found in the Big Tujunga Wash.

1.3 Arroyo Toad Natural History

The arroyo toad is federally listed as endangered and is a CDFW Species of Special Concern(SSC) (CDFW 2015). Formerly considered a subspecies of the western toad (*Anaxyrus boreas*), the arroyo toad was afforded full species status in the 1990s (USFWS 1999). The arroyo toad is a riverine amphibian of coastal streams and waterways of southern California, occurring from the Salinas River Basin in Monterey and San Luis Obispo Counties south to northern Baja California, Mexico. They are often associated with shallow, slow-moving stream and riparian habitats often bordered by sand and gravel terraces. Sandy river washes are an integral component of their breeding habitat and they typically prefer an open, rather than closed, riparian canopy containing sandy braided streambeds with stands of cottonwood (*Populus* spp.), western sycamores (*Plantus racemosa*), and willows (*Salix* spp.). In late winter to early spring, when flood waters have receded, these exposed shallow, slow current pools and rivulets provide suitable breeding habitat for arroyo toads (Stebbins 2003). A wide range of upland habitats (e.g., sycamore-cottonwood woodlands, oak woodlands, coastal sage scrub, chaparral, and grasslands) are used by arroyo toads outside of the breeding season (Holland 1995, Griffin et al. 1999). Although little is known about their habits outside of their breeding season, these upland habitats can be used for foraging, dispersal, and aestivation (Holland and Sisk 2001, Ramirez 2003).

Key identification features for arroyo toads are a light-colored, v-shaped stripe between the eyelids, light coloration on the sacral humps, and a faded coloration on the frontal portion of the parotid glands (Camp 1915). Adult arroyo toads are nocturnal and breed within gently flowing portions of stream habitats. The males vocalize the breeding call, a long and high-pitched trill, from their breeding streams. Females locate the males and then lay eggs in shallow, sandy parts of streams having sandy or small gravel beds (Jennings and Hayes 1994). Eggs are small, dark, and deposited in strings in streams along shallow, quiet rivulets, and along the edges of pools with little or no water movement. Listening for calling male toads is a reliable way to detect this species.

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_Location_2015.mxd (ECK, KO, DW)-dwagnon 6/15/2015

Map Date: 6/15/2015
Source: ESRI

Figure 1. Project Location

2014-003.005 Focused Arroyo Toad Surveys
Big Tujunga Wash Mitigation Area

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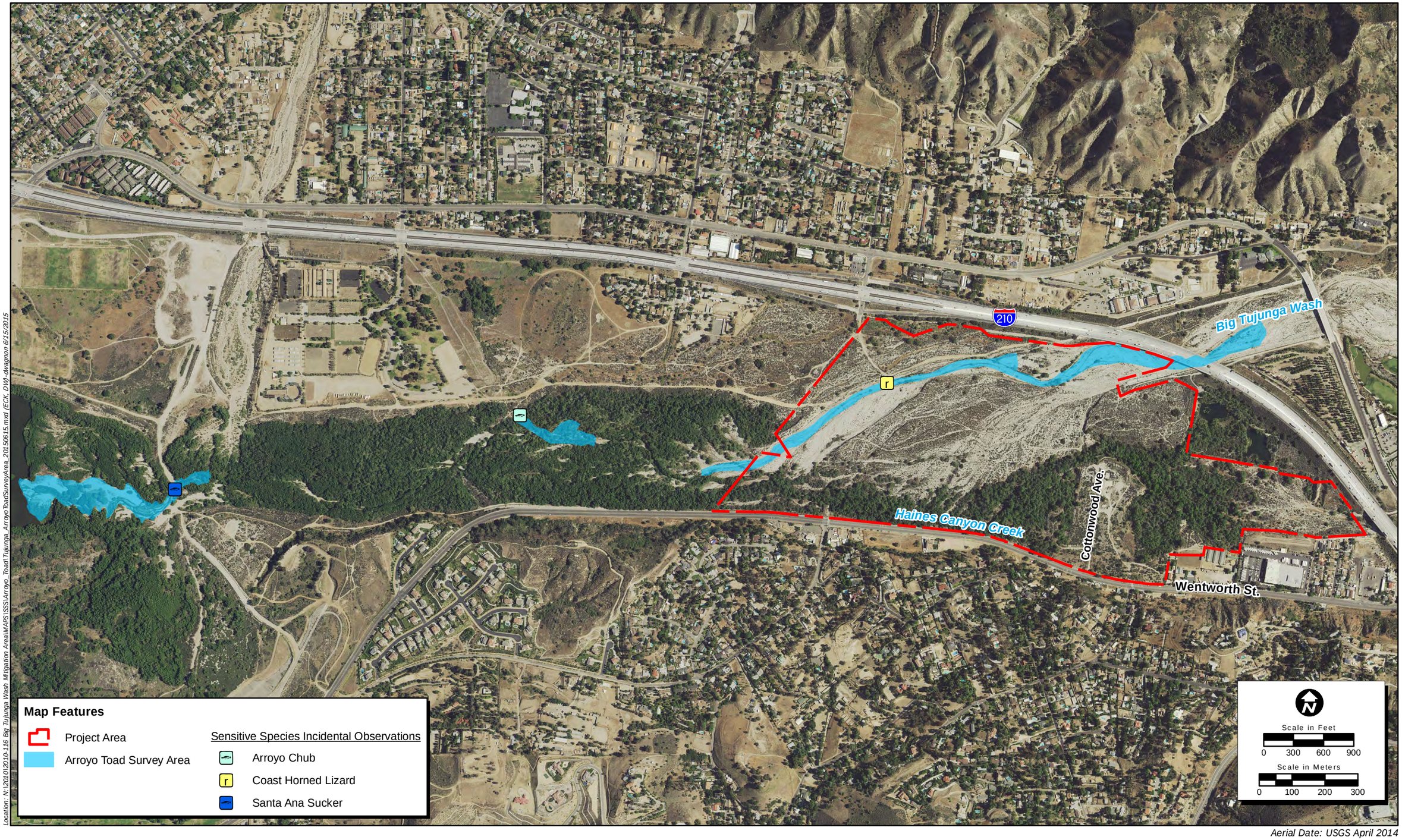

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\SSS\Arroyo_Toad\Tujunga_ArroyoToadSurveyArea_20150615.mxd (ECK, DW)-dwagnon 6/15/2015

Aerial Date: USGS April 2014
Map Date: 6/15/2015

Figure 2. Arroyo Toad Survey Area

2014-003.005 Focused Arroyo Toad Surveys
Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Females lay eggs from March to July; however, the season may be extended during exceptionally wet years. Tadpoles develop within 65 to 85 days, during which they are vulnerable to predation and water quality disturbances (Stebbins 2003). Tadpoles tend to be quite sedate, generally resting in shallow and quiet portions of the stream. Juvenile toads, which look like smaller versions of the adults, forage within sandy and sunny portions of their natal floodplain.

2.0 METHODS

2.1 Literature Review

A review of the CDFW's California Natural Diversity Database (CNDDB) was performed before surveys were conducted to determine the nearest recorded location of arroyo toads to the survey area. In addition, a review of any known special-status species that have been documented in the Sunland and the eight surrounding USGS 7.5-minute topographic quadrangles was conducted.

2.2 Arroyo Toad Survey Methodology

Focused surveys were conducted in the Big Tujunga Wash following the U.S. Fish and Wildlife Service (USFWS) Survey Protocol for the Arroyo Southwestern Toad (USWFS 1999), requiring both daytime and nighttime survey components to be conducted within the same 24-hour period. The presence of other vertebrates within the survey reach was also recorded. Six field surveys were conducted between March and June, with at least seven days between each survey and at least one survey performed in April, May, and June. Surveys were conducted by ECORP biologists Brian Zitt (USFWS Arroyo Toad Recovery Permit TE-27460A-1), Adam Schroeder, Max Murray, and Todd Chapman. The locations of biological observations were recorded using a handheld Geographic Positioning System (GPS) unit (Garmin 60CSx™) in Universal Transverse Mercator (UTM) coordinates, North American Datum (NAD) 1983. The daytime survey component included an assessment of arroyo toad habitat suitability, as well as documenting the presence of any arroyo toad eggs, larvae, or juveniles. The entire portion of the stream channel was surveyed and appropriate routes for the nighttime survey were selected. Selected routes provided the most efficient access to allow for suitable listening stations for toad calls.

The nighttime surveys were conducted between one hour after dusk and midnight, when air temperatures at dusk were 55 degrees Fahrenheit (°F) or greater. These surveys consisted of walking slowly and carefully along stream banks to avoid impacting eggs and/or creation of excess siltation that could affect water clarity. The arroyo toad is sensitive to both light and sound, and requires special survey methods. Headlights and flashlights were used sparingly during the survey to reach suitable listening stations. Once there surveyors remained still and silent for approximately 15 minutes listening for the toad's call. If no calls were detected, surveyors searched along the stream channel to visually locate toads by eye-shine. During the surveys, every precaution was taken not to disturb potential breeding pools by stirring up excess silt deposits and care was taken to avoid injury to potentially occurring arroyo toads.

A digital camera was used to document toads and other wildlife during the surveys. Surveys were not conducted during adverse weather conditions such as rain, high winds, or flood flows or when a full or near-full moon would illuminate the survey area.

3.0 RESULTS

This section summarizes the results of the arroyo toad surveys, including a literature review, site characteristics, and incidental wildlife species. Representative photographs taken during the survey are included as Appendix A.

3.1 Literature Review

Results from the CNDDB records search of Sunland and the eight surrounding quadrangles found the closest record to the Mitigation Area approximately 11 miles away in the Agua Dulce quadrangle within the Santa Clara River drainage in 2001. The nearest location in the same watershed was recorded upstream of the Big Tujunga Reservoir, approximately 14 miles from the Mitigation Area (CDFW 2015).

3.2 Arroyo Toad Survey Results

Within the boundaries of the Mitigation Area, surface water was extremely limited in the Big Tujunga Wash with just a few isolated pools and no connectivity or flow. Immediately downstream of the Mitigation Area, the Big Tujunga Wash contained a low-gradient stream channel that varied in width (approximately 10 to 40 feet) and depth (from a few inches to 2 feet) with a mix of substrate types consisting of boulder, cobble, gravel, sand, and fine sediments. Flow habitats were characterized as a combination of riffle and glide with low-flow side channels containing algal mats.

The stream channel of the Big Tujunga Wash supports a variety of plants generally categorized as southern willow scrub and mule fat scrub (Holland 1986). Although dominated by willows and mule fat (*Baccharis salicifolia*) these plant communities included a mix of cottonwood, white alder (*Alnus rhombifolia*), western sycamore, elderberry (*Sambucus mexicana*), tree tobacco (*Nicotiana glauca*), and tamarisk (*Tamarix* sp.). The upland habitat immediately adjacent to the stream channel consisted of sandy benches and a sparsely vegetated alluvial fan sage community.

During the survey period and within the boundaries of the Mitigation Area, the Big Tujunga Wash lacked suitable breeding habitat for arroyo toads; however, immediately downstream of the Mitigation Area suitable breeding habitat was present within the Big Tujunga Wash. No arroyo toads were observed or detected during these surveys. Table 1 below shows the weather conditions during each survey. Field data sheets from each survey are included as Appendix B.

Table 1. Weather Data for the Arroyo Toad Surveys

Date	Survey #	Surveyors*	Survey Type	Time		Air Temp. (°F)		Cloud Cover (%)		Wind Speed (mph)		Moon Phase
				Start	End	Start	End	Start	End	Start	End	
			Day	1515	1830	80.6	77.0	100	75	2-4	3-5	
3/17/15	1	BZ, AS	Night	2004	2311	64.4	62.6	75	70	3-5	3-5	New
			Day	1456	1730	80	82	0	0	1-3	0-2	
4/14/15	2	BZ, AS	Night	2023	2230	72	70	0	0	3-5	3-5	New
			Day	1530	1735	64	64	100	100	1-3	1-3	
4/22/15	3	BZ, AS	Night	2029	2315	60	58	100	100	1-3	1-3	1/4
			Day	1805	1935	81	81	0	0	1-3	1-3	
5/11/15	4	BZ, MM	Night	2043	2305	69	60	0	0	1-3	2-4	3/4
			Day	1230	1500	74	73	5	10	1-3	1-3	
5/20/15	5	BZ, MM	Night	2054	2300	63	57	0	0	0-3	0-3	1/4
			Day	1500	1623	95	92	0	0	1-3	3-5	
6/17/15	6	BZ, TC	Night	2130	2240	76	72	0	0	2-4	2-4	New

* BZ = Brian Zitt, AS = Adam Schroeder, MM = Max Murray, TC = Todd Chapman

3.3 Incidental Observations

Wildlife species recorded during the surveys were characteristic of wash and riparian habitats in the region. Three native and one non-native amphibian species, none of which possess state or federal protection status, were commonly observed during the course of the surveys. Native species observed included the western toad, Baja California treefrog (*Pseudacris hypochondriaca hypochondriaca*), and California treefrog (*Pseudacris cadaverina*). A dried string of western toad eggs was observed in Big Tujunga Wash during the first survey. American bullfrog was the only non-native amphibian species observed. When observed, American bullfrogs were captured by-hand, processed (i.e., sexed, weighed, measured, and checked for stomach content), and removed from the site.

Five native reptile species were observed during the surveys: side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*), San Diegan tiger whiptail (*Aspidoscelis tigris stejnegeri*), and San Diego gopher snake (*Pituophis catenifer annectens*). A single adult coast horned lizard (*Phrynosoma blainvillii*), a CDFW SSC, was observed adjacent to the stream channel during survey #1.

Two fish were identified in the stream channel during the surveys. These included the federally threatened and CDFW SSC Santa Ana sucker (*Catostomus santaanae*) and CDFW SSC arroyo chub (*Gila orcutti*). Red swamp crayfish, a non-native invertebrate, were also observed during the surveys. A complete listing of the species recorded during the surveys is included in Appendix C.

Throughout the course of the surveys evidence of human activities in the stream channel were observed, including trash, remnant paint from graffiti, and foot and horse trails.

4.0 CONCLUSION

California is currently experiencing a drought and water levels throughout the state remain below average. At the time of the surveys, suitable breeding habitat for arroyo toads was not present within the Mitigation Area and no arroyo toads were observed. Incidentally, western toads were observed during the majority of the surveys and during the first survey a dried egg string was found in the stream channel within the Mitigation Area. This indicates that breeding habitat may have been present prior to the first survey, but was unable to persist throughout the breeding period and, therefore, not capable of supporting reproduction. Although suitable breeding habitat was present immediately downstream of the Mitigation Area, arroyo toads were not detected immediately outside the Mitigation Area.

A search of the CNDDB resulted in no recent records for the species within the Big Tujunga watershed, and the closest extant record for the species was recorded in the Santa Clara watershed in 2001, approximately 11 miles away (CDFW 2015). With the most recent Los Angeles County Natural History Museum (LACNHM) records dating from 1951 for this species in the Big Tujunga drainage, it is likely that extirpation of the species took place decades ago. With no viable populations present downstream of the Big Tujunga Dam, natural re-colonization of the Big Tujunga Wash by the species is considered highly unlikely.

The arroyo toad is a habitat specialist, relying on specific features associated with larger river and wash systems in southern California. These features include seasonal flooding and inundation following drying periods. This natural cycle (hydroperiod) provides breeding opportunities for the species as winter flooding retracts and exposes shallow, slow moving breeding pools appropriate for the larval development of the toad's life cycle. High magnitude flood events can be very important for setting up and maintaining physical characteristics within the stream channel that the arroyo toad is dependent upon. These physical characteristics include the deposition of loose sand and fine substrates in and adjacent to the wettest stream channel. These sand deposits form benches where adult toads forage and burrow during periods of activity, and aestivate during periods of reduced rainfall. In addition, the pumping of groundwater from a stream channel may lower the water tables and alter the presentation of surface water habitat.

Due to the arroyo toad's particular habitat needs, they are vulnerable to several types of disturbances within floodplains (USFWS 2009). Most southern California riverine systems possess a modified hydrology due to placement of dams and water diversion structures. Unseasonal water releases (outside of the normal rainy season) from reservoirs are common occurrences with manipulated river systems. Any modification of the hydroperiod can have a negative effect on arroyo toad populations, potentially scouring deposited eggs and tadpoles that may be present, or reducing flows during periods when larvae are not yet ready to metamorphose.

Other forms of disturbance that affect arroyo toad populations include off-highway vehicle activity, pollution in the form of litter and hazardous waste contamination, human activity within drainage courses, and the introduction of invasive aquatic predators such as the American bullfrog or African clawed frog (*Xenopus laevis*). Multiple years of such manipulation may result in the extirpation of some arroyo toad populations.

Arroyo toad eggs, larvae, and metamorphs are highly susceptible to trampling by humans on streamside flats at popular recreational sites (Sweet 1992). During the surveys, biologists

observed trash, remnant paint from graffiti, and foot and horse trails within the stream channel. All of which have the potential to negatively impact arroyo toads.

5.0 REFERENCES

Camp, C. L. 1915. Batrachoseps major and Bufo cognatus californicus, new Amphibia from southern California. University of California Publications in Zoology 12(12):327-334

[CDFW] California Department of Fish and Wildlife. 2015. California Natural Diversity Database (CNDDB), Biogeographic Data Branch, Department of Fish and Wildlife, Rarefinder Version 5.1.1.

[CDFW] California Department of Fish and Wildlife. 2015. Natural Diversity Database. Special Animals List. Periodic publication. 51 pp.

California Natural Diversity Database (CNDDB) 2014. RareFind Version 3. Sacramento, CA: California Department of Fish and Wildlife, Biogeographic Data Branch.

[Chambers Group] Chambers Group, Inc. 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.

Griffin, P.C., T.J. Case, and R.N. Fisher. 1999. Radio telemetry study of *Bufo californicus*, arroyo toad movement patterns and habitat preferences. Contract Report to California Department of Transportation Southern Biology Pool.

Holland, D.C., and N.R. Sisk. 2001. Habitat use and population demographics of the Arroyo Toad (*Bufo californicus*) on MCB Camp Pendleton, San Diego County, California: Final report for 1998–2000. AC/S Environmental Security, U.S. Marine Corps, Camp Pendleton, CA.

Holland, D.C. 1995. Sensitive Species Hydroecological Evaluation – Santa Margarita River: Arroyo Southwestern Toad (*Bufo microscaphus californicus*) Camp. Camp Pendleton. 14 pp.

Holland, Robert F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Department of Fish and Game. October 1986.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final Report to California Department of Fish and Game, Rancho Cordova, California.

Ramirez, R.S., Jr. 2003. Arroyo toad (*Bufo californicus*) hydrogeomorphic habitat baseline analysis/radio telemetry study - Rancho Las Flores San Bernardino County, California. Final report to Rancho Las Flores Limited Partnership by Cadre Environmental, Carlsbad, California. vi + 101 pp.

Stebbins, R.C. 2003. Western Amphibians and Reptiles. Boston: Houghton-Mifflin Co. 533 pp.

Stephenson, J.R. and G.M. Calcarone. 1999. Southern California mountains and foothills assessment: habitat and species conservation issues. General Technical Report GTRPSW-175. Albany, California: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 402 pp.

Sweet, S.S. 1992. Initial report on the ecology and status of the arroyo toad (*Bufo microscaphus californicus*) on the Los Padres National Forest of southern California, with management recommendations. Report to United States Department of Agriculture, Forest Service, Los Padres National Forest, Goleta, California. 198 pp.

[USFWS] U.S. Fish and Wildlife Service. 2009. Arroyo Toad (*Bufo californicus* (=*microscaphus*) 5-Year Review: Summary and Evaulation. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California. August 2009. 55 pp.

[USFWS] U.S. Fish and Wildlife Service. 2005. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the Arroyo Toad (*Bufo californicus*). Federal Register: Volume 70, Number 29 (Proposed Rules), February 14, 2005.

[USFWS] U.S. Fish and Wildlife Service. 1999. Arroyo Southwestern Toad (*Bufo microscaphus californicus*) Recovery Plan. July 24, 1999.

[USFWS] U.S. Fish and Wildlife Service. 1999. *Survey Protocol for the Arroyo Southwestern Toad*.

APPENDIX A

Representative Site Photos

A) The upper portion of the survey area looking downstream on March 17, 2015.

B) The lower portion of the survey area looking upstream on April 14, 2015.

C) Shopping cart observed on March 17, 2015.

D) Paint jugs and trash observed on April 22, 2015.

E) Western toad tadpoles observed within the Mitigation Area on March 17, 2015.

F) Desiccated western toad tadpoles observed on March 17, 2015.

G) A coast horned lizard observed on March 17, 2015.

H) A Baja California treefrog observed on March 17, 2015.

I) Western toad tadpoles observed downstream of the Mitigation Area April 14, 2015.

J) A western toad observed on April 22, 2015.

K) An American bullfrog tadpole captured on May 11, 2015.

L) An adult and a first year Santa Ana sucker observed on May 11, 2015.

M) A western toad observed June 17, 2015.

APPENDIX B

Survey Data Sheets

ARROYO TOAD (*Anaxyrus californicus*) SURVEY

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 17MAR2015 Project Name: BIG T
Sunset Time (hrs): 1904 Project Number: 2014-003.005 | 014 | 14
Survey Number: 1 Moon Phase (circle one): (New) ¼ ½ ¾ Full
Lead Surveyor Name (s): B Zitt, A Schroeder
Other Personnel:

DAYTIME SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F) AIR	WIND (MPH)	SKY (% Clouds)
START	1515	80.6	2-4	100
STOP	1830	77.0	3-5	75

NIGHT SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	2004	64.4	3-5	75
STOP	2311	62.6	3-5	70

ARROYO TOAD RESULTS			
EGGS	LARVAE	JUVENILES	ADULTS with S/V LENGTH (If permitted)
Ø	Ø	Ø	Ø

SITE INFORMATION		
SURFACE WATER PRESENT (Y)/N: 72.5°F	SURVEY ACREAGE %:	PROPERY ACREAGE:
NEAREST CROSS STREET(S): Foothill Blvd / Wentworth / Wheatland		
OTHER AMPHIBIANS OBSERVED/HEARD: Western Toad adult and tads* * tads found in dried pool (photo)		
DISTURBANCES OBSERVED: trash, paints (discarded in wash)		
VEGETATION COMMUNITIES: Cottonwood, mulefat, willow, sycamore along banks; Alluvial fan scrub adj / upland		
COMMENTS (Continue on back if needed, including sketch maps): Happy St. Patrick's Day! ☘ Mr. Bryce Schroeder obs. a coast horned lizard, Mr. Brian Zitt captured it by hand for identification purposes. Isolated pools/pockets of water, no flow.		

ARROYO TOAD (*Anaxyrus californicus*) SURVEY

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 14APR2015 Project Name: BIG T MIT AREA
Sunset Time (hrs): 1923 Project Number: 2014-003.005/014/14
Survey Number: 2 Moon Phase (circle one): (New) ¼ ½ ¾ Full
Lead Surveyor Name (s): BZith, ASchroeder
Other Personnel:

DAYTIME SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	1456	80	1-3	0
STOP	1730	82	0-2 mph	0

NIGHT SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	2023	72	3-5	0
STOP	2230	70	3-5	0

ARROYO TOAD RESULTS			
EGGS	LARVAE	JUVENILES	ADULTS with S/V LENGTH (If permitted)
Ø	Ø	Ø	Ø

SITE INFORMATION		
SURFACE WATER PRESENT Y/(N)	SURVEY ACREAGE %:	PROPERY ACREAGE:
NEAREST CROSS STREET(S):		
OTHER AMPHIBIANS OBSERVED/HEARD: D/S of Mitigation Area at Confluence w/ Haines Creek Bullfrogs & treefrogs (P. hyprocondriacca) obs / heard adults and tadpoles		
DISTURBANCES OBSERVED: Trash		
VEGETATION COMMUNITIES:		
COMMENTS (Continue on back if needed, including sketch maps): Mitigation Area - Wash dry upto Foothill bridge Water only present at confluence of Haines Creek ~ 30 YOY SAS obs (20-30mm) d/s of MArea (confluence w/ creek)		

ARROYO TOAD (*Anaxyrus californicus*) SURVEY

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 22APR2015 Project Name: BIG T
Sunset Time (hrs): 1929 Project Number: 2014-003.005/014/14
Survey Number: 3 Moon Phase (circle one): New (1/4) 1/2 3/4 Full
Lead Surveyor Name (s): BZitt Aschroeder
Other Personnel:

DAYTIME SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	1530	64	1-3	100
STOP	1735	64	1-3	100

NIGHT SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	2029	60	1-3	100
STOP	2315	58	1-3	100

ARROYO TOAD RESULTS			
EGGS	LARVAE	JUVENILES	ADULTS with S/V LENGTH (If permitted)
Ø	Ø	Ø	Ø

SITE INFORMATION		
SURFACE WATER PRESENT Y/N: within MA	SURVEY ACREAGE %:	PROPERY ACREAGE:
NEAREST CROSS STREET(S):		
OTHER AMPHIBIANS OBSERVED/HEARD: W. toad (adult) under 210 Fwy; ☆BF (adult/tads) & W toad (adult/tads) Baja Ca treefrog (adult/tads)		
DISTURBANCES OBSERVED: Trash		
VEGETATION COMMUNITIES:		
COMMENTS (Continue on back if needed, including sketch maps): Forecasted rain, but none observed. ☆ several 404 SAS obs. ☆ outside MA in ref location		

ARROYO TOAD (*Anaxyrus californicus*) SURVEY

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 11 MAY 2015 Project Name: Big Tujunga Wash Mitigation Area
Sunset Time (hrs): 1943 Project Number: 2014-003.005 / 014 / 14
Survey Number: 4 Moon Phase (circle one): New ¼ ½ (¾) Full
Lead Surveyor Name (s): BZitt
Other Personnel: MMurray

DAYTIME SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	1805	81	1-3	0
STOP	1935	81	1-3	0

NIGHT SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	2043	69	1-3	0
STOP	2305	60	2-4	0

ARROYO TOAD RESULTS			
EGGS	LARVAE	JUVENILES	ADULTS with S/V LENGTH (If permitted)
Ø	Ø	Ø	Ø

SITE INFORMATION		
SURFACE WATER PRESENT Y/N: Ø	SURVEY ACREAGE %:	PROPERY ACREAGE:
NEAREST CROSS STREET(S):		
OTHER AMPHIBIANS OBSERVED/HEARD: * WW toad (adult / tads), treefrog (adult / tad), BF (adult / tad) * also obs 2 SAS (~90mm) and 1 SAS (~120mm) w/ 300-500 YOY (~8-22mm)		
DISTURBANCES OBSERVED: trash		
VEGETATION COMMUNITIES:		
COMMENTS (Continue on back if needed, including sketch maps): Wash dry within Mitigation Area, but areas appear to have received rain during recent storm event. Obs. 2 people graffitting on the abutments of 210 fwy (photos). * at confluence w/ Haines Creek		

ARROYO TOAD (*Anaxyrus californicus*) SURVEY

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: 20 MAY 2015 Project Name: Big T
Sunset Time (hrs): 1951 Project Number: 2014-003.005/014/14
Survey Number: ~~1~~ 5 Moon Phase (circle one): New (¼) ½ ¾ Full
Lead Surveyor Name (s): BZitt
Other Personnel: MMurray

DAYTIME SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	1230	74	1-3	5
STOP	1500	73	1-3	10

NIGHT SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	2054	63	0-3	~~0~~
STOP	2300	57	0-3	~~0~~

ARROYO TOAD RESULTS			
EGGS	LARVAE	JUVENILES	ADULTS with S/V LENGTH (If permitted)
~~0~~	~~0~~	~~0~~	~~0~~

SITE INFORMATION		
SURFACE WATER PRESENT Y/N: NO	SURVEY ACREAGE %:	PROPERY ACREAGE:
NEAREST CROSS STREET(S): Wheatland & I210		
OTHER AMPHIBIANS OBSERVED/HEARD: Western toad 2 adult		
DISTURBANCES OBSERVED: trash		
VEGETATION COMMUNITIES: alluvial fan scrub upland.		
COMMENTS (Continue on back if needed, including sketch maps):		

ARROYO TOAD (*Anaxyrus californicus*) SURVEY

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Date: JUN 17, 2015 Project Name: BIG T M/A BANK AT SURVEYS
Sunset Time (hrs): 2030 Project Number: 2014-003.005
Survey Number: _____ Moon Phase (circle one): (New) ¼ ½ ¾ Full
Lead Surveyor Name: BZ.H
Other Personnel: T Chapman

DAYTIME SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	1500	95	1-3	0
STOP	1623	92	3-5	0

NIGHT SURVEY CONDITIONS				
	TIME (Hrs)	TEMP (°F)	WIND (MPH)	SKY (% Clouds)
START	2130	76	2-4	0
STOP	2240	72	2-4	0

ARROYO TOAD RESULTS			
EGGS	LARVAE	JUVENILES	ADULTS with S/V LENGTH (If permitted)
0	0	0	0

SITE INFORMATION		
SURFACE WATER PRESENT Y/N:	SURVEY ACREAGE %:	PROPERY ACREAGE:
NEAREST CROSS STREET(S):		
OTHER AMPHIBIANS OBSERVED/HEARD: W. toad (adults)		
DISTURBANCES OBSERVED: Trash		
VEGETATION COMMUNITIES:		
COMMENTS (Continue on back if needed, including sketch maps):		

APPENDIX C

Wildlife Species List

Appendix C. Wildlife Species Observed Within and Adjacent to the Project Site

Scientific Name	**Common Name**
INVERTEBRATES	
CAMBARIDAE	**FRESHWATER CRAYFISH**
Procambarus clarkia	red swamp crayfish*
BONY FISHES	
ACTINOPTERYGII	**RAY-FINNED FISHES**
CATOSTOMIDAE	**SUCKER FISHES**
Catostomus santaanae	Santa Ana sucker***
CYPRINIDAE	**CARPS & TRUE MINNOWS**
Gila orcuttii	Arroyo chub**
AMPHIBIANS	
AMPHIBIA	**AMPHIBIANS**
BUFONIDAE	**TRUE TOADS**
Anaxyrus boreas	western toad
HYLIDAE	**TREEFROGS AND ALLIES**
Pseudacris cadaverina	California treefrog
Pseudacris hypochondriaca	Baja California treefrog
RANIDAE	**TRUE FROGS**
Lithobates catesbeianus	American bullfrog*
REPTILES	
REPTILIA	**REPTILES**
PITUOPHIS	**BULLSNAKES, PINESNAKES, & GOPHER SNAKES**
Pituophis catenifer annectens	San Diego gopher snake
PHRYNOSOMATIDAE	**SPINY LIZARDS/SIDE-BLOCHED LIZARDS**
Sceloporus occidentalis	western fence lizard
Phrynosoma coronatum	coast horned lizard**
Uta stansburiana	side-blotched lizard
TEIIDAE	**WHIPTAILS AND RACERUNNERS**
Aspidoscelous tigris stejnegeri	San Diegan tiger whiptail

*Non-native species

**CDFW Species of Special Concern

***State and/or Federally Listed Species

APPENDIX P

Native Fishes Survey Report

FINAL
2015 NATIVE FISHES REPORT
FOR THE
BIG TUJUNGA WASH MITIGATION AREA

Prepared for:

County of Los Angeles
Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803-1331

Prepared by:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1801 Park Court Place
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Santa Ana, CA 92701

January 2016

CONTENTS

Draft
2015 Native Fishes Report
for the
Big Tujunga Wash Mitigation Area

SUMMARY 1
1.0 INTRODUCTION 1
1.1 Location and Setting 3
1.2 South Coast Minnow-Sucker Fish Community 3
1.2.1 Santa Ana Sucker 6
1.2.2 Santa Ana Speckled Dace 7
1.2.3 Arroyo Chub 8
1.3 Previous Studies Conducted within the Mitigation Area 8
2.0 METHODS 10
2.1 Physical Habitat Characterization 10
2.2 Native Fishes Surveys 11
3.0 RESULTS 12
3.1 Physical Habitat Characterization 12
3.2 Native Fish Surveys 15
4.0 DISCUSSION 18
5.0 CONCLUSIONS AND RECOMMENDATIONS 20
6.0 REFERENCES 22

LIST OF TABLES

Table 3-1. Physical Habitat Characterization of Sites Containing Santa Ana Sucker in Haines Creek, October 2015. 12
Table 3-2. Water Quality Data within Haines Creek, 2015. 14
Table 3-3. Number of Individuals Observed in Haines Creek during Native Fishes Surveys, 2015. 15
Table 3-4. Number of Individuals Captured in Haines Creek during Native Fishes Survey, 2015. 15

LIST OF FIGURES

Figure 1-1. Project Location Map 2
Figure 1-2. Survey Area Map 4
Figure 3-1. Length frequency distribution of Santa Ana sucker in Haines Canyon Creek within the Big Tujunga Wash Mitigation Area, May and October 2015. 16
Figure 3-2. Distribution of Santa Ana Sucker within the Big Tujunga Wash Mitigation Area, 2015. 17

APPENDICES

APPENDIX A — Native Fishes Survey Photographs

SUMMARY

ECORP Consulting, Inc. (ECORP) was contracted by the County of Los Angeles Department of Public Works to conduct native fishes surveys to determine the population status of the Santa Ana sucker (*Catostomus santaanae*), a federally listed threatened species and a California Department of Fish and Wildlife (CDFW) Species of Special Concern (SSC), within the Big Tujunga Wash Mitigation Area located in the City of Los Angeles, Los Angeles County. The native fishes surveys consisted of physical habitat (PHAB) characterizations and visual fish counts within Haines Canyon Creek in May and October 2015. Overall, the number of Santa Ana sucker observed in Haines Creek declined from May (*n*=109) to October (*n*=15). Santa Ana speckled dace (*Rhinichthys osculus* spp.3) and arroyo chub (*Gila orcuttii*), both CDFW SSC, were not observed during these surveys. Exotic aquatic species were widespread throughout the survey area, these included: red swamp crayfish (*Procambarus clarkii*), western mosquitofish (*Gambusia affinis*), green sunfish (*Lepomis cyanellus*), and largemouth bass (*Micropterus salmoides*).

1.0 INTRODUCTION

The Big Tujunga Wash Mitigation Area (Mitigation Area) is an approximately 210-acre parcel located in the City of Los Angeles Sunland area (Figure 1-1). The Mitigation Area was purchased in 1998 by the County of Los Angeles Department of Public Works (LACDPW) for the purpose of compensating for habitat loss from other LACDPW projects.

In 2000, a Master Mitigation Plan (MMP) was created for the Mitigation Area to serve as a five-year guide for implementation of various enhancement programs and to fulfill the California Department of Fish and Wildlife's (CDFW's, formerly California Department of Fish and Game's) requirement for the preparation of a management plan for the site (Chambers Group 2000). The MMP encompassed strategies to enhance and protect the existing habitat for fish and wildlife and to create additional natural areas that could be used by native wildlife and numerous user (recreational) groups. The ultimate goal of establishing the Mitigation Area was to provide for the long-term preservation, management, and enhancement of biological resources.

Implementation of the MMP initially began in August 2000, and a Long-term Management Plan (LTMP) is currently being developed. The LTMP provided a summary of the restoration actions and planning that had taken place since 2000 and sketched the outline for actions and planning efforts that will take the management of the Mitigation Area into the long-term maintenance phase in association with the goals of the site. Based on site's MMP (Chambers Group 2000) and a draft Streambed Alteration Agreement (SAA) (#1600-2008-0253-R5) from CDFW on January 29, 2009, surveys to monitor the population of Santa Ana sucker (*Catostomus santaanae*) within the Mitigation Area have been required every three years. The SAA remained in effect through March 31, 2014. Since the expiration of the SAA, activities conducted at the Mitigation Area have been under the direct supervision of CDFW biologist Matthew Chirdon. In accordance with the LTMP, ECORP was contracted by LACDPW to conduct surveys in 2015 to assess the population of Santa Ana sucker within the Mitigation Area.

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_Location_2015.mxd (ECK, KO, DW)-KOrtega 11/20/2015

Map Date: 11/20/2015
Source: ESRI

Figure 1-1. Project Location

2014-003.005 Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1.1 Location and Setting

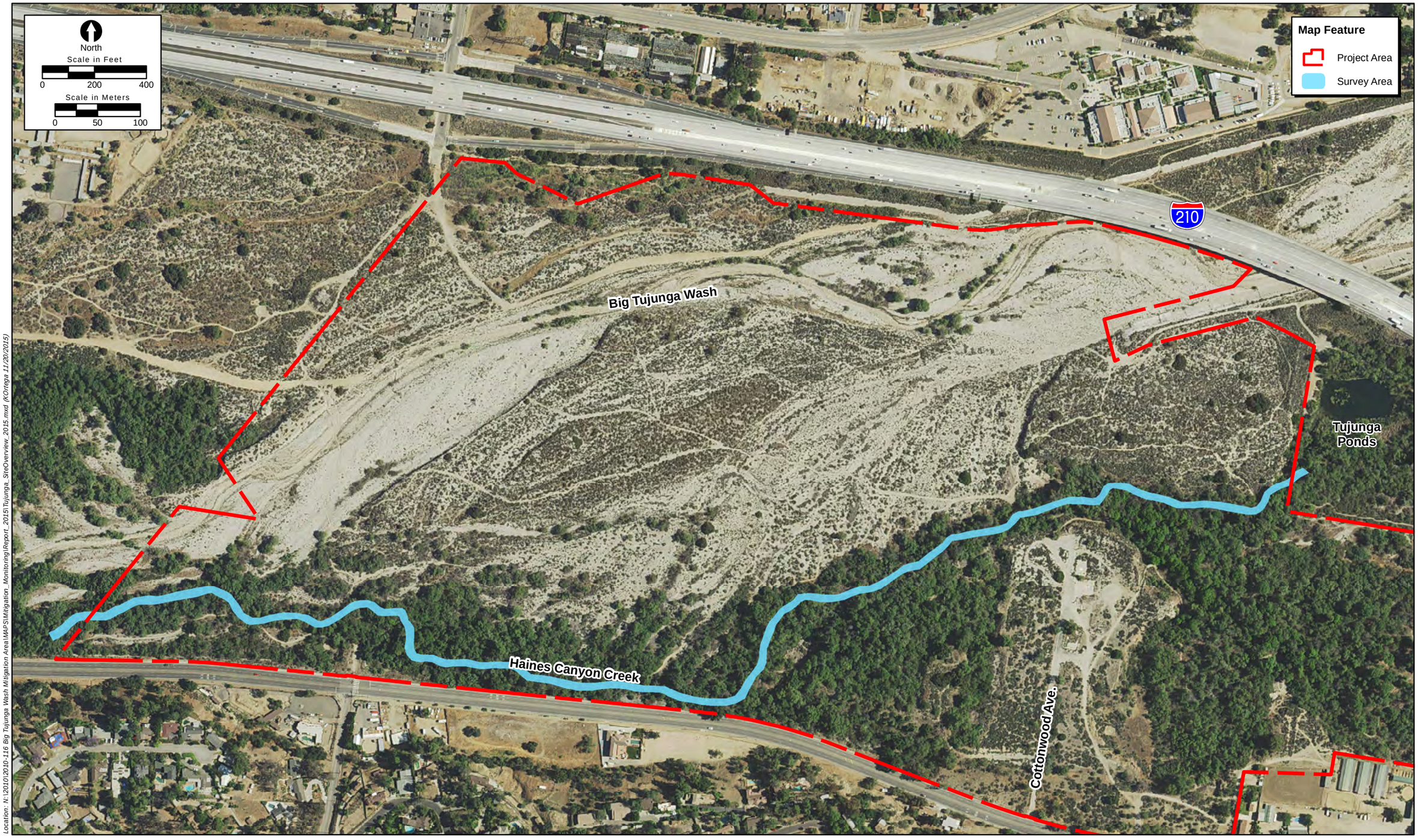
The Mitigation Area is located in the Big Tujunga Wash (Wash), just downstream of the Interstate 210 (I-210) freeway overcrossing, near the City of Los Angeles' Sunland community in San Fernando Valley, Los Angeles County. The Mitigation Area is bordered on the north by I-210, on the east by I-210 and the Tujunga Ponds, and on the south by Wentworth Street. The western boundary is contiguous with high power lines crossing the Wash just upstream (approximately 2 kilometers [km] or 1.2 miles [mi]) of Hansen Dam Park and Recreation Area. The Mitigation Area is located within a state-designated Significant Natural Area (LAX-018), and the biological resources are of local, regional, state, and federal significance (Safford and Quinn 1998; CDFG 2012).

The Mitigation Area contains two watercourses, the Wash and Haines Canyon Creek (Haines Creek), both of which are designated as critical habitat for Santa Ana sucker in the Los Angeles River basin (USFWS 2010) (Figure 1-2). The Wash, located in the northern portion of the Mitigation Area, is a wide (greater than 30 meters [m] or 98 feet [ft]) partially concrete lined tributary of the Los Angeles River. Water flow in the Wash originates from the Big Tujunga Dam (approximately 17.5 km [10.9 mi] upstream) and is dependent on controlled releases and local rainfall. Flow is therefore intermittent, leaving it dry for large portions of the year. Haines Creek, located in the southern portion of the Mitigation Area, is a relatively narrow (less than 10 m [33 ft] wide) and densely vegetated fourth order stream that conveys water flow from Haines Canyon to the Wash. Water flow is perennial and is fed by groundwater and/or runoff from adjacent residential areas. Haines Creek and the Wash merge near the western boundary of the Mitigation Area and continue into the Hansen Dam Flood Control Basin, located approximately 0.8 km (0.5 mi) downstream of the Mitigation Area.

The Tujunga Ponds are located northeast of the Mitigation Area and consist of two large, interconnected bodies of water each being approximately 100 m (330 ft) across at their widest point. Haines Creek and the Tujunga Ponds are in fact part of the same watercourse, but when taking into consideration the ecological requirements of the native fish assemblage, these two systems are extremely different in the amount of suitable habitat they can each provide for native fishes. Historically, perennial deep-water habitats (i.e., ponds and lakes) were uncommon in southern California and thus, this type of habitat is not well suited for native southern California fishes (Moyle 2002). Over the years, the Tujunga Ponds have been illegally stocked with exotic aquatic species (exotic species) by the public. The deep water and heavily vegetated banks provide excellent breeding, foraging, and refuge habitat for several species of exotic fishes, amphibians, and reptiles. Due to the perennial nature of the Tujunga Ponds, they act as a nursery for exotic species that could eventually move downstream into Haines Creek and compete or prey on the native fish community.

1.2 South Coast Minnow-Sucker Fish Community

Historically, all southern California coastal freshwater fishes have experienced population and environmental impacts as a result of habitat destruction, alteration, and dewatering, and thus are greatly reduced in both their overall distribution and abundances (Moyle 2002; Swift et al. 1993).



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2015\Tujunga_SiteOverview_2015.mxd (KOrtega 11/20/2015)

Aerial Date: NAIP 2014
11/20/2015

Figure 1-2. Survey Area

2014-003.005/015/15 Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

These impacts are further compounded by the effects exotic species can have on native fish assemblages. One such native freshwater fish assemblage located in southern California is the South Coast Minnow-Sucker fish community (SCMC) (Ellison 1984), which is known to occur in the Mitigation Area. This assemblage consists of the following native fishes: Santa Ana sucker, Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), and arroyo chub (*Gila orcuttii*). Compared to historical records, the current distribution for each of these species has been severely reduced. The Mitigation Area provides an important refuge for this native fish community from the impacts of habitat alteration and dewatering. The Mitigation Area is considered to be one of the last remaining locations in the Los Angeles River Drainage where these three species of fish can still be found (Swift et al. 1993).

Threats to the SCMC within the Mitigation Area coincide with prohibited uses and activities at the site, which include habitat modifications and stream flow changes due to the creation of rock dams, foot bridges, or other in-stream barriers that could impede the natural water flow, restrict the movements of native fishes, and potentially dewater stream sections downstream. Recreational use of the Mitigation Area in the form of prohibited activities, such as swimming, bathing, fishing, and hunting, could also pose a threat to the SCMC. Fire and prolonged periods of drought, chemical contamination of the creek (e.g., detergents, pesticides, and paints), exotic species introductions, and homeless encampments continue to pose a threat to the SCMC community within the Mitigation Area. Predation and competition with exotic species has been a major concern in managing the Mitigation Area and the SCMC. In an effort to counteract these ongoing threats, LACDPW has continued to monitor the Mitigation Area for any unsanctioned activities. Bilingual public outreach efforts continue to be a proactive component for educating the various recreational groups that use the Mitigation Area of its sensitive biological resources.

Over the years, exotic aquatic species removal efforts have been conducted under the MMP for the Mitigation Area in an effort to control exotic species populations and reduce their negative impact on the SCMC. Although these efforts remove a large number of individuals, exotic species persist due to source populations both upstream and downstream of Haines Creek. The spawning period for the SCMC occurs from late spring to late fall, coinciding with that of largemouth bass (*Micropterus salmoides*). Largemouth bass are known to cease feeding during their spawning period, but in the weeks just prior to reproduction, largemouth bass feed voraciously in both shallow waters and along vegetated banks (Moyle 2002). There is, therefore, a high risk of predation to gravid female and mature male native fishes during this largemouth bass pre-spawning period. Furthermore, there is a high risk of predation on newly hatched fish larvae during the post-spawning period, when largemouth bass resume their normal feeding activity.

Members of the SCMC are primarily omnivorous feeders; their diet often includes filamentous algae, crustaceans, insects, and detritus. Their diet places them in direct trophic competition with several exotic species currently known to occur in the Mitigation Area. Juvenile bluegill (*Lepomis macrochirus*) feed on algae and zooplankton; green sunfish (*Lepomis cyanellus*) feed on insects and zooplankton; western mosquitofish (*Gambusia affinis*) feed upon zooplankton, and juvenile largemouth bass feed on zooplankton and small aquatic invertebrates. Competition for food resources during the juvenile life stage can force a phenomenon known as “juvenile bottleneck,” where interspecific competition between juveniles of various species can cause a reduction in overall recruitment that can adversely affect year-class strength (Traxler and Murphy 1995).

Red swamp crayfish (*Procambarus clarkii*) also compete for the same food resources as native fishes. They are opportunistic omnivores with a diet that consists mainly of macrophytes, detritus, crustaceans, snails, and insect larvae (Alcorlo et al. 2004). In addition to competing for the same food resources, they may also be a predator. Red swamp crayfish are most active at night, which is when native fishes are least active. Native fishes typically take refuge along the bottom or in rock crevices at night, and this makes them more susceptible to predation by red swamp crayfish. Studies have shown that fish make up an important part of the red swamp crayfish's winter diet with males consuming fish at higher rates than females, which may be attributed to difference in claw sizes (Ilheu and Bernardo 1993; Pérez-Bote 2004). Red swamp crayfish can also modify the stream habitat through the construction of burrows along the banks (Correia and Ferreira 1995; Huner and Barr 1991; Jaspers and Avault 1969). These burrows can weaken the stream bank and increase the potential for scouring, which introduces more fine sediments into the stream channel and can fill in or reduce the amount of available habitat for native fishes. Red swamp crayfish have considerable ecological plasticity (known to tolerate wide ranges in salinity, pH, dissolved oxygen [DO], and temperature) and with their high fecundity, short generation time, and ability to rapidly reach sexual maturity, they are a major threat to the survivorship of the native fishes community (Huner and Barr 1991). The ability of the red swamp crayfish to not only outcompete, but also predate native fishes, could eventually cause the extirpation of native fishes from this system, as has been documented with native amphibians in other southern California streams (Gamradt and Kats 1996).

1.2.1 Santa Ana Sucker

The Santa Ana sucker is a native member of the Catostomidae (Sucker) Family. Originally described as *Pantosteus santa-anae* (Snyder 1908) from the Santa Ana River in Riverside County, this species is native to southern California and was historically found throughout the Los Angeles, San Gabriel, and Santa Ana River systems. Populations have been extirpated from several portions of these rivers and they are now primarily restricted to larger stream sections that still exist in the headwater areas of these systems (Swift et al. 1993).

This species of sucker is small, usually less than 16 centimeters (cm) (7 inches [in]) standard length (SL; measured from snout tip to the anterior portion of the caudal fin), and has deep notches at the junctions of the upper and lower lips, with a shallow median notch in the lower lip and three to four rows of papillae extending in a convex arc across each lobe (Moyle 2002). Their caudal peduncle is thick (8 to 11 percent of SL); they are silvery white below with dark grayish brown on their sides and back, with irregular dorsal blotches and faint pigmentation patterns arranged in lateral stripes along their sides (Moyle 2002; Smith 1966). The membrane between the rays of the caudal fin is pigmented, whereas the anal and pelvic fins lack pigment, during periods of active spawning Santa Ana sucker develop tubercles on their fins and bodies (Moyle 2002).

They are typically found in pools and runs of small to medium-sized (less than 7 m [23 ft] wide) shallow streams, creeks, and rivers with cool (less than 22 degrees Celsius [°C] or 71.6 degrees Fahrenheit [°F]), unpolluted water; they have a strong affinity for coarse substrates, such as boulders, cobbles, and gravels, although they can sometimes be found in areas with sandy/mud bottoms. They do not form schools, but will often form loose aggregations during breeding or periods of limited water resources. They feed primarily on algae (especially diatoms) and

detritus, which they scrape from rocks and other wetted surfaces. Larger individuals tend to feed more predominantly on aquatic insects than do smaller individuals (Greenfield et al. 1970). The sucker's natal streams are subject to severe flooding, though these fish are well adapted to re-colonize through early maturity, high fecundity, and extended spawning periods. Santa Ana sucker rarely live more than four years, but they reach sexual maturity in their second summer. Spawning typically occurs from mid-March until early June in riffle habitats possessing gravel substrates.

Recent studies indicate that the spawning season may be more protracted in the San Gabriel River system, beginning as early as November (Saiki 2000). Females deposit their eggs in the substrates, where they stick to the gravel and incubate for approximately 36 hours (Greenfield et al. 1970). Larvae remain in the gravel until they reach their post-gravel emergent stage, when they move into low flow shallow areas with silty bottoms often containing emergent aquatic vegetation (Swift 2001). This is a microhabitat exploited by young stream fishes, where they are less vulnerable to predators and possibly where elevated water temperatures accelerate development (Haglund et al. 2003).

The Santa Ana sucker was petitioned for listing under the Endangered Species Act in 1997, and although final judgment found that listing was warranted, it was precluded by other listing actions. The species was eventually federally listed as threatened (USFWS 2000), and it is currently designated as a SSC (CDFW 2015). The Wash and Haines Creek are designated as critical habitat for Santa Ana sucker and both are currently occupied.

1.2.2 Santa Ana Speckled Dace

The Santa Ana speckled dace is a native member of the Cyprinidae (Minnow) Family and is thought to represent a unique subspecies or form in the widespread speckled dace species complex. Recent genetic studies support this status and have shown that Santa Ana speckled dace represent a distinct Evolutionarily Significant Unit (ESU; Smith and Dowling 2008). Speckled dace (the entire species complex) are the most widespread native fish west of the Rocky Mountains (McGinnis 1984) and are the only native fish to occupy all major western drainages from Canada south to Sonora, Mexico (Moyle 2002). The Santa Ana speckled dace is restricted to the headwaters of the Los Angeles River, San Gabriel River, and Santa Ana River drainages (Feeney and Swift 2008).

Santa Ana speckled dace are small minnows rarely exceeding 7 cm (3 in) SL, with a slightly inferior (more ventrally oriented) mouth. Coloration on their back and sides is typically dusky yellow to olive with variable dark speckles and blotches. These small minnows usually possess single barbels at the end of each jaw, a defined frenum (flap of skin attaching snout to upper lip), and a thick caudal peduncle at the base of the tail. Both juvenile and adult Santa Ana speckled dace occur in riffles and closely associated pools in low-gradient stream habitats (0.5 to 2.5 percent slope) with sand, gravel, cobble, rock, and boulder substrates or within higher-gradient streams (up to 5 percent slope) along the margins or near obstructions (Feeney and Swift 2008). Speckled dace are generally bottom browsers, feeding on a variety of small invertebrates, and are known to forage both day and night. Populations that forage at night are thought to do so as a means of avoiding avian predation; populations that occur in streams with few avian predators tend to be more active during the day (Moyle 2002). Speckled dace typically do not form large schools (except during spawning); however, they do form small

loose groups when foraging close to the bottom. This behavior coupled with their coloration and pigmentation patterns can help them effectively blend into the surrounding habitats. Spawning occurs throughout the summer months, and adhesive eggs are attached to rocks or gravel in shallow flowing water (Feeney and Swift 2008).

The Santa Ana speckled dace was petitioned for listing as a federally endangered species in 1994, but the petition was denied because the species had not been formally described (Moyle 2002). This unique subspecies is currently designated as a SSC (CDFW 2015).

1.2.3 Arroyo Chub

The arroyo chub is another native member of the Cyprinidae (Minnow) Family that has also been designated as a SSC (CDFW 2015). This small minnow is native to the streams and rivers of the Los Angeles Plain in southern California, including the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita Rivers, and Malibu and San Juan Creeks.

Most adult arroyo chubs are 8 to 10 cm (3 to 4 in) long, with large individuals occasionally reaching 12 cm (5 in) SL. Coloration in this species ranges from silver-gray to olive green above, shading to white below, usually with a dull gray band along each side. Arroyo chub have relatively large eyes for a Cyprinid and small mouths, with a deep body and peduncle. Arroyo chub are adapted to survive in cool to warm (10° to 25° C [50° to 75° F]) streams that fluctuate between large winter storm flows, and low summer flows, with the low DO and wide temperature fluctuations associated with this hydrologic regime. They are most common in slow moving backwater and side-pool areas with sand or mud substrates. They can also inhabit areas with water velocities in excess of 0.8 m (2.6 ft) per second over coarse substrates. Arroyo chub are omnivorous, feeding on plants, such as water fern (*Azolla* sp.), algae, and invertebrates, such as tiny mollusks, crustaceans, and insect larvae. Studies of this species within warm water streams show that algae dominates the diet (60 to 80 percent), and in cooler streams caddis fly larvae and mollusks are the dominant food items (Moyle 2002). Female arroyo chub reach reproductive age by year one, and spawning takes place in pools and edge habitat from February through August, reaching a peak in June and July. Fertilized eggs are deposited on plants or bottom substrates until they hatch in about four days (UC ANR 2011).

1.3 Previous Studies Conducted within the Mitigation Area

Previous surveys have been conducted within the Mitigation Area to assess the population of native fishes, in particular the Santa Ana sucker. In the fall of 2009, ECORP conducted a native fishes population study at five equally distributed (25-m [82-ft]) sites within Haines Creek. The study employed backpack electrofishers and three-pass depletion methods to obtain estimates on the population size of each captured fish species. In addition to the fish sampling, PHAB data was collected at each site. During the study, a total of 41 Santa Ana sucker were captured at four of the five sites and, following data analysis, the population at these five sites was estimated at 42 individuals. Nearly 82 percent of the individuals captured during this study were exotic species, with the majority of the catch represented by red swamp crayfish and largemouth bass (accounting for over 76 percent of the total) (ECORP 2009).

Following the Station Fire of 2009, ECORP fisheries biologists Manna Warburton and Brian Zitt conducted a visual survey of Haines Creek within the boundaries of the Mitigation Area. This survey was conducted in June 2010, at the request of CDFW, in order to obtain estimates on the abundance, age structure, and distribution of Santa Ana sucker and assess their response to the post-fire conditions within the system. No Santa Ana sucker larvae were observed during the surveys; however, small juveniles (less than 70 millimeters [mm] [2.8 in] total length [TL]) were observed throughout the survey area in relatively high numbers (*n*=250). Approximately 400 adult Santa Ana sucker were also observed during this survey. Exotic aquatic species were present in high densities throughout the survey area and included goldfish (*Carassius auratus*), green sunfish, largemouth bass, and red swamp crayfish.

Based on the visual survey results from June 2010, the CDFW and USFWS authorized electrofishing to remove these exotic species from Haines Creek in October 2010. The survey parameters consisted of working from the downstream boundary of the Mitigation Area upstream to the Tujunga Ponds in short segments, approximately 50 m (164 ft) in length, and avoiding riffle habitats where Santa Ana sucker were likely to occur. In general, backpack electrofishing is one of the most efficient techniques for capturing fishes, but due to its invasive nature there is an increased risk of mortality. Using the information obtained from the visual surveys in June, areas suspected to contain high densities of native fishes were avoided. Although these precautions were taken, 150 Santa Ana sucker (106 adult, 44 juvenile), 14 Santa Ana speckled dace, and 13 arroyo chub were captured during these surveys. All native species appeared in good overall health and were returned to their area of capture unharmed. A total of 1,356 individuals comprising six exotic species were captured and removed from Haines Creek during these surveys. Red swamp crayfish and largemouth bass were the most abundant species captured, representing 83.2 percent of the total catch.

Over the years, exotic aquatic species removal efforts have been performed at the Mitigation Area in order to reduce some of the negative impacts to sensitive native species. Generally, four efforts (each three to four days) a year have been spent conducting exotic aquatic species removals at the Mitigation Area. During these removal efforts, a small number of native fishes are incidentally captured or observed each year, making up just a fraction of the overall catch. The removal methods used over the years have been tailored to have the greatest impact on the targeted exotic aquatic species while minimizing the take of any non-target species.

One of the most effective methods used in Haines Creek has been backpack electrofishing; however, this method has only been used when prior permission has been granted by both the CDFW and USFWS. In 2012, ECORP coordinated with CDFW and USFWS to use electrofishing to assess the population of Santa Ana sucker in Haines Creek. Both agencies raised concerns regarding potential impacts to native fishes associated with electrofishing and strongly urged ECORP to explore alternative methods. Due to their less invasive nature, snorkeling and seining were chosen as the preferred methods to monitor the native fish community at the Mitigation Area in 2012. ECORP has not used electrofishing as a survey method since October 2010.

In December 2012, native fishes surveys were conducted in Haines Creek and the Wash. Santa Ana sucker were the most abundant native species observed in Haines Creek, totaling 592 individuals (502 adults and 90 juveniles), while only four adults were observed in the Wash. Santa Ana speckled dace were observed in both Haines Creek (*n*=74) and the Wash (*n*=14); however, arroyo chub were only observed in the Wash (*n*=145). Exotic aquatic species were

widespread throughout the survey areas, and included red swamp crayfish (*n*=1,159), largemouth bass (*n*=833), western mosquitofish (*n*=80), bluegill (*n*=24), green sunfish (*n*=5), goldfish (*n*=3), common carp (*Cyprinus carpio*) (*n*=1), brown bullhead (*Ameiurus nebulosus*) (*n*=1), and American bullfrog (*Lithobates catesbeianus*) (*n*=1).

2.0 METHODS

For the purposes of assessing the native fish community within the Mitigation Area in 2015, visual encounter surveys were conducted in Haines Creek over two periods: May 18 through 20, and October 7 through 9, 2015. Unlike the 2012 native fishes surveys, these surveys were conducted over two periods (May and October) to document native fishes recruitment in Haines Creek and variations in the survey timing. Sites were sampled in continuous 25 m (82 ft) segments, beginning at the downstream boundary (Site 1) and continuing upstream to the Tujunga Ponds (Site 69). PHAB characterization of the stream channel was only collected during the October survey period. Surveys were conducted under the direction of ECORP biologist Brian Zitt, USFWS 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-27460A-2). The sampling area and species encountered during the surveys were recorded using a handheld Geographic Positioning System (GPS) unit (Garmin 60CSx™) in Universal Transverse Mercator (UTM) coordinates, North American Datum 1983 (NAD83).

2.1 Physical Habitat Characterization

In an effort to minimize any anomalous readings, water quality readings were collected prior to instream surveys. A multi-probe water quality meter (HORIBA Model U-52) was used to record water temperature, conductivity, salinity, DO, total dissolved solids, pH, turbidity, and oxidation-reduction potential. The water quality meter was calibrated according to the manufacturer's instructions prior to the survey, and the data were tabulated according to site location and date following collection. Water discharge velocity data were collected at the upstream and downstream extent of the survey area along Haines Creek and in the Wash. Water discharge was measured using a Marsh-McBirney Flo-Mate 2000 electromagnetic flowmeter. The flowmeter was calibrated according to the manufacturer's instructions prior to the survey, and the data were tabulated according to site location and date following collection. PHAB measurements were recorded using a modified version of California's State Water Resources Control Board (SWRCB) Surface Waters Ambient Monitoring Program (SWAMP) procedures (Fetscher et al. 2009).

PHAB data were collected within each 25-m (82 ft) reach where Santa Ana sucker were detected during the October survey period. The following PHAB data were collected: average water depth, maximum water depth, wetted stream width at the center of each site, and visual estimations of instream habitat complexity including: filamentous algae, aquatic macrophytes/emergent vegetation, boulders, woody debris (greater than 0.3 m [1.0 ft]), woody debris (less than 0.3 m [1.0 ft]), undercut banks, overhanging vegetation, live tree roots, and artificial structures. The evaluation of instream habitat complexity was provided using the SWAMP Stream Habitat Characterization form's rating scale from 4 to 0. The rating scale is arranged as follows:

4 = Very Heavy (greater than 75 percent of the wetted stream channel)

3 = Heavy (greater than 40 to 75 percent of the wetted stream channel)
2 = Moderate (10 to 40 percent of the wetted stream channel)
1 = Sparse (less than 10 percent of the wetted stream channel)
0 = Absent (0 percent of the wetted stream channel)

Visual estimates were made on the amount of still edgewater habitat, flow habitats, and substrate type. Flow habitats were categorized based on the following criteria: cascade/falls (high gradient drop in stream bed elevation), rapids (swiftly flowing water with considerable surface turbulence, larger substrate than riffles), riffles (less than 0.5 m [1.6 ft] deep, greater than 0.3 m per second [m/s] [1.0 ft per second {ft/s}]), runs (greater than 0.5 m [1.6 ft] deep, greater than 0.3 m/s [1.0 ft/s]), glides (less than 0.5 m [1.6 ft] deep, less than 0.3 m/s [1.0 ft/s]), pools (greater than 0.5 m [1.6 ft] deep, less than 0.3 m/s [1.0 ft/s]), and dry. Substrate types were categorized based on the following criteria: bedrock (greater than 4 m [13.1 ft]), large boulder (1 to 4 m [3.3 to 13.1 ft]), small boulder (25 cm to 1 m [0.8 to 3.3 ft]), cobble (64 to 250 mm [2.5 to 9.8 in]), coarse gravel (16 to 64 mm [0.6 to 2.5 in]), fine gravel (2 to 16 mm [0.08 to 0.6 in]), sand (0.06 to 2 mm [0.002 to 0.08 in]), fine sediment/silt (less than 0.06 mm [0.002 in]), and wood/other. Canopy cover of overhanging riparian vegetation was recorded at the center of each site in four directions (left bank, right bank, upstream, and downstream) using a densiometer. Photographs and coordinate data were taken at each site. Any human disturbances present, including exotic species, rock dams, trail crossings, trash, fishing, and swimming/wading, were also recorded.

2.2 Native Fishes Surveys

Native fishes surveys were conducted by ECORP fisheries biologists Brian Zitt, Todd Chapman, Adam Schroeder, and Max Murray. Surveys were conducted throughout the entire portion of the survey area during daylight hours when water visibility was ideal. Surveys were conducted by one to two biologists, using a mask and snorkel, and one data recorder. Biologists entered the water downstream of each site and proceeded slowly in an upstream direction, identifying fish species and providing size class and count data throughout the site. The biologists worked parallel to one another, covering the entire wetted width of the stream channel in a systematic manner. The data recorder followed closely behind and recorded their observations onto standardized data sheets. In addition to the visual surveys, long-handled dipnets and two-person seines were used to sample shallow water habitats (generally less than 15 cm depth) or algal/vegetated mats (generally along the edgewaters) where visual surveys were precluded.

Biologists were outfitted with underwater writing slates to assist them in obtaining counts, especially in areas where multiple individuals, species, or size classes were present. Estimates of total length were categorized into the following mm [in] size groups:

- Less than 50 [2.0]
- 51 to 75 [2.0 to 2.9]
- 76 to 100 [2.9 to 3.9]
- 101 to 125 [3.9 to 4.9]
- 126 to 150 [4.9 to 5.9]
- Greater than 150 [5.9]

Quality control on fish length estimates were achieved by biologists carrying foldable meter sticks during the visual/snorkeling surveys, and also through a comparison of visual estimates to actual length measurements collected from fish captured in the dipnets or seines. All of the animals captured were identified to species, enumerated, and examined for any observable health conditions (e.g., parasites, lesions, fin erosion) which were noted and recorded. All native fishes were measured to the nearest mm SL and weighed to the nearest gram before being returned unharmed to their original point of capture. All exotic aquatic species captured were humanely euthanized and buried on site. The gut contents of all exotic fishes greater than 150 mm SL were inspected for native species predation.

3.0 RESULTS

The results of the native fishes surveys conducted in the Mitigation Area are listed below.

3.1 Physical Habitat Characterization

PHAB data were collected from seven sites in Haines Creek during the October 2015 survey. These seven sites all contained adult Santa Ana sucker. The maximum water depths ranged from 21 cm to 70 cm (0.7 to 2.3 ft), and the wetted width ranged from 1.0 m to 3.6 m (3.3 to 11.8 ft) (Table 3-1). Flow habitat was characterized as a combination of riffles (52.9 percent) and glides (47.1 percent), while substrate type consisted of cobble (44.3 percent), sand (23.6 percent), gravels (20.4 percent), small boulder (9.3 percent), and large boulder (1.4 percent). Overhanging vegetation, live tree roots, boulders, and aquatic macrophytes/emergent vegetation were present at each site. Overhanging vegetation and live tree roots represented the majority of instream habitat complexity between the sites (15.4 and 10.7 percent, respectively). Undercut banks were present at all but one of the sites, while filamentous algae and artificial structures were only present at one site.

Table 3-1. Physical Habitat Characterization of Sites Containing Santa Ana Sucker in Haines Creek, October 2015.

	Site 4	Site 12	Site 17	Site 20	Site 28	Site 38	Site 55
Wetted Width (m)	2.4	1.0	1.4	1.3	1.7	2.6	3.6
Average Water Depth (cm)	18	21	28	26	11	20	29
Maximum Water Depth (cm)	36	36	36	44	21	38	70
Substrate Type (%)							
Large Boulder	0	0	5	0	0	5	0
Small Boulder	5	5	10	5	5	30	5
Cobble	80	60	40	75	10	10	35
Coarse Gravel	5	15	10	10	20	10	5
Fine Gravel	5	10	5	5	40	10	0
Sand	5	10	30	5	25	35	55
Flow Habitats (%)							
Rapid	0	0	0	0	0	0	0
Riffle	30	60	50	50	60	70	50
Run	0	0	0	0	0	0	0

	Site 4	Site 12	Site 17	Site 20	Site 28	Site 38	Site 55
Glide	70	40	50	50	40	30	50
Pool	0	0	0	0	0	0	0
Instream Habitat Complexity (%)							
Filamentous Algae	Absent	Absent	Absent	Absent	Absent	Sparse	Absent
Aquatic Macrophytes/ Emergent Vegetation	Sparse	Sparse	Sparse	Sparse	Sparse	Sparse	Sparse
Boulders	Sparse	Sparse	Sparse	Sparse	Sparse	Moderate	Sparse
Woody Debris (>0.3m)	Sparse	Absent	Absent	Absent	Absent	Absent	Absent
Woody Debris (<0.3m)	Absent	Sparse	Sparse	Sparse	Sparse	Sparse	Sparse
Undercut Bank	Sparse	Sparse	Sparse	Sparse	Absent	Moderate	Sparse
Overhanging Vegetation	Sparse	Moderate	Sparse	Sparse	Sparse	Heavy	Sparse
Live Tree Roots	Sparse	Moderate	Sparse	Sparse	Moderate	Sparse	Sparse
Artificial Structures	Absent	Absent	Absent	Sparse	Absent	Absent	Absent
Canopy (%)	81	91	100	90	97	100	93

The entire creek possessed a well-developed canopy of riparian vegetation, averaging 93.0 percent total cover. Human influence was ubiquitous and widespread throughout Haines Creek, found primarily in the form of trash and modifications to the stream channel in the form of rock dams. There was also evidence of fishing and swimming/wading in some areas within the creek.

Water discharge data were collected at the upstream and downstream boundaries of the Mitigation Area within Haines Creek. The discharge at the upstream end of Haines Creek was 0.08 cubic meter per second (cms) (2.68 cubic feet per second [cfs]) and the discharge at the downstream end was 0.04 cms (1.46 cfs). Water quality data were collected in seven locations during surveys in Haines Creek (Table 3-2). Water quality data remained relatively constant and were consistent with what is expected in this system. Temperature ranged from 16.3° to 19.7° C (61.3° to 67.5° F), DO values ranged from 7.32 to 10.21 milligrams per liter (mg/L), conductivity values ranged from 0.537 to 0.639 milliSiemens per cm (mS/cm), and pH values ranged from 7.77 to 8.35. Water clarity was ideal for conducting snorkel surveys with turbidity readings ranging from 0.0 to 1.5 nephelometric turbidity units (NTU).

Table 3-2. Water Quality Data within Haines Creek, 2015.

Survey Dates	Time	Temperature (°C)	pH	Conductivity (mS/cm)	Salinity (ppt)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Total Dissolved Solids (g/L)	Oxidation-Reduction Potential (mV)
May 18, 2015	06:50	16.3	8.03	0.636	0.3	9.46	1.3	0.407	113
May 19, 2015	07:08	16.6	8.11	0.639	0.3	7.32	1.5	0.409	115
May 19, 2015	13:04	18.6	7.88	0.636	0.3	7.76	0.1	0.407	150
May 20, 2015	06:57	17.3	7.77	0.638	0.3	7.93	1.5	0.409	136
October 8, 2015	09:10	17.9	7.98	0.537	0.3	10.04	1.4	0.343	256
October 8, 2015	12:54	19.7	8.35	0.542	0.3	10.21	0.0	0.346	133
October 9, 2015	08:29	18.1	8.09	0.547	0.3	8.42	0.1	0.350	123

3.2 Native Fish Surveys

A total of 1,963 individuals representing six species were observed during the native fishes surveys (Table 3-3). Additionally, 921 individuals representing six species were captured during these surveys (Table 3-4). Of the total fish observed during the visual surveys, 109 Santa Ana sucker were observed during the May survey, while only 15 Santa Ana sucker were observed during the October survey. Additionally, 32 Santa Ana sucker were captured using seines/dip-nets during the May survey, while only two Santa Ana sucker were captured during the October survey. Although the May survey consisted of 109 observed and 32 captured Santa Ana sucker, some of the individuals captured were also counted as observed based on their location and size data. Accounting for these recounted individuals, the total number of Santa Ana sucker detected during the May survey was estimated at 119 individuals. Unlike the May survey, recounted individuals were not associated with the October Santa Ana sucker totals. The total number of Santa Ana sucker detected in October was 17 individuals.

Table 3-3. Number of Individuals Observed in Haines Creek during Native Fishes Surveys, 2015.

	Native Species		Exotic Species				
Survey Dates	**Baja California treefrog tadpole**	**Santa Ana sucker**	**Red swamp crayfish**	**Western mosquitofish**	**Green sunfish**	**Largemouth bass**	**Total**
May 18 - 20, 2015	1	109	957	1	8	107	**1,183**
October 7 - 9, 2015	0	15	349	323	12	81	**780**
Total	**1**	**124**	**1,306**	**324**	**20**	**188**	**1,963**

Table 3-4. Number of Individuals Captured in Haines Creek during Native Fishes Survey, 2015.

	Native Species		Exotic Species				
Survey Dates	**Baja California treefrog tadpole**	**Santa Ana sucker**	**Red swamp crayfish**	**Western mosquitofish**	**Green sunfish**	**Largemouth bass**	**Total**
May 18 - 20, 2015	4	32	481	26	11	48	602
October 7 - 9, 2015	0	2	193	114	0	10	319
Total	**4**	**34**	**674**	**140**	**11**	**58**	**921**

Of the 119 Santa Ana sucker detected in May, 86 individuals were considered juvenile (55 mm [2.2 in] or less SL), while the remaining 33 individuals were considered adults (Figure 3-1). All Santa Ana sucker appeared to be in good health with no observable abnormalities. Baja California treefrog tadpoles were the only other native species observed or captured during the surveys (n=1 and n=4, respectively).

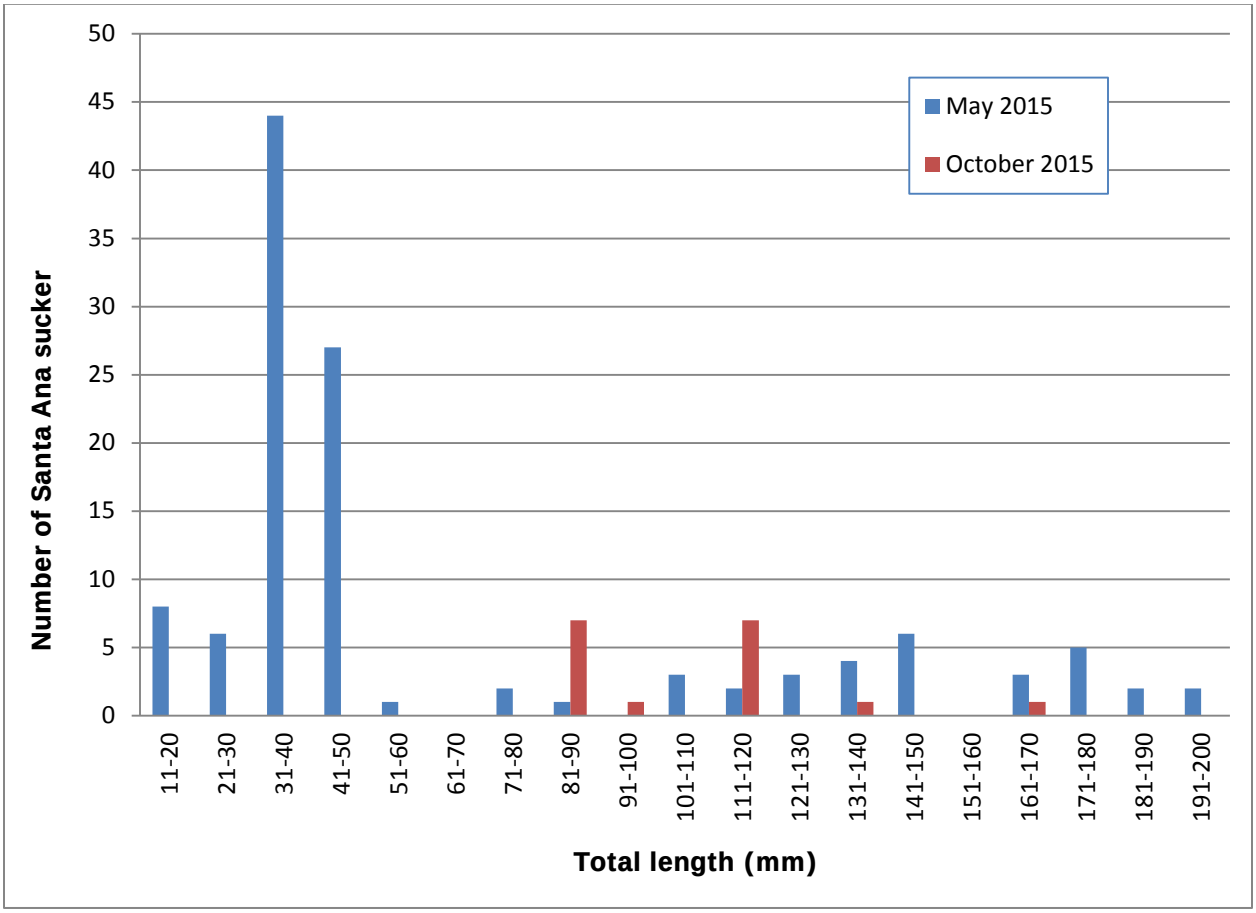


Figure 3-1. Length frequency distribution of Santa Ana sucker in Haines Canyon Creek within the Big Tujunga Wash Mitigation Area, May and October 2015.

Santa Ana sucker observed during the May survey were fairly widespread in the lower half of the survey area, and all observations were made downstream of the Cottonwood Avenue equestrian trail crossing (Figure 3-2). Individuals were found occupying a mix of glide and riffle habitats over sand, gravel, cobble, boulder, and bedrock with depths ranging from 15 to 65 cm (0.5 to 2.1 ft). In October, Santa Ana sucker were found in isolated pockets either in or immediately below riffles over a mix of sand, gravel, and cobble often associated with woody debris or overhanging vegetation with depths ranging from 16 to 65 cm (0.5 to 2.1 ft). The October survey locations of Santa Ana sucker were all found in areas previously occupied during the May survey. Largemouth bass and red swamp crayfish, both known predators of Santa Ana sucker, were often observed in these same habitat areas.

Figure 4-1. Distribution of Santa Ana Sucker within the Big Tujunga Wash Mitigation Area

2014-003.005/015/15 Big Tujunga Wash Mitigation Area

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Exotic species represented the majority of individuals observed and captured during both survey periods (*n*=1,838 and *n*=883, respectively). Red swamp crayfish were the most abundant species observed over both periods (*n*=1,306), followed by western mosquitofish (*n*=324), largemouth bass (*n*=188), and green sunfish (*n*=20). A total of 674 red swamp crayfish, 140 western mosquitofish, 58 largemouth bass, and 11 green sunfish were captured and removed from Haines Creek during both sampling periods. Native species were not identified in any of the gut content analyses. Representative site and species photographs are included in Appendix A.

4.0 DISCUSSION

The native fishes surveys were conducted over two periods (May and October) to document native fishes recruitment in Haines Creek and variations in the survey timing. Surveys were conducted under suitable sampling conditions for capturing/observing fish with both water quality parameters and PHAB conditions comparable between the two sampling periods.

Although these parameters were met, each method contained limitations which could have skewed the survey results. As mentioned, visual surveys are highly dependent on good water clarity and require suitable depths for the surveyor to be able to submerge their mask in order to see fish. Water depth is also important factor when transitioning through the survey areas. Being able to minimize disturbances and slowly transition through the survey areas allows surveyors the ability to locate and count fish without alerting them and causing them to flee the area.

In general, the average water depth in Haines Creek was optimal for visual surveys (above 20 cm) during the time of the surveys. Other factors can bias the survey results, including the size classes of the fishes, fish behavior, time of the year surveys are conducted, and physical habitat complexity (Thurow 1994). Thurow notes that smaller fish and bottom-dwelling fish that use camouflage are more difficult to count in a visual survey. Differences in fish behavior and the amount of cover available may also affect the accuracy of counts (Rodgers et al. 1992; Thurow 1994). In these instances, surveyors may misidentify fish, double-count fish, or fail to see all the fish. Visual counts of small juvenile and fry size fish are often underestimated because these fish tend to occupy shallower water that cannot be easily surveyed (Bozek and Rahel 1991).

Seining and dip-netting also have limitations. Seining is generally only conducted in habitats with a relatively even substrate lacking woody debris or overgrown vegetation, while dip-netting is best utilized for capturing slower moving species (e.g., red swamp crayfish and bullfrog tadpoles) in similar habitats. Although these surveys may not be comparable to the 2009 native fishes surveys based on survey methodology, they are directly comparable to the 2012 native fishes surveys.

The 2015 surveys resulted in the detection of just one of the three native fish species in the SCMC, Santa Ana sucker. Successful breeding of Santa Ana sucker was observed during the May survey with the presence of young-of-the-year (YOY) representing the majority of Santa Ana sucker detected during that survey period. The number of Santa Ana sucker detected during the October survey (*n*=17) decreased in comparison to the May survey (*n*=119), which was largely due to the absence of YOY being detected. As in previous years' surveys, Santa Ana

sucker continue to be the most abundant native fish observed; however, comparisons of the 2015 results to those from previous studies appear to show that the population is in steep decline. In December 2012, during the most recent and comparable native fishes survey, a total of 592 Santa Ana sucker were observed. The numbers of arroyo chub and Santa Ana speckled dace also appear to be in decline, with the last detections of arroyo chub occurring in 2013 (n=2) and Santa Ana speckled dace in 2012 (n=74) (ECORP 2012; ECORP 2013).

During the 2015 surveys, rock dams, foot bridges, and other in-stream barriers were observed in the stream channel. During previous surveys, biologists have observed recreational users and/or homeless residents bathing, swimming, and fishing in the creek. Homemade fish or crayfish traps were also identified and removed from the creek during these surveys. Over the years, efforts have been made by LACDPW to remove homeless encampments and educate the public regarding the biological significance of the Mitigation Area. Although there were no homeless encampments observed or discovered within the Mitigation Area at the time the native fishes surveys were conducted, several homeless camps are located nearby under the I-210 freeway bridge and upstream in Big Tujunga Creek. During the 2015 surveys, mature trees, which once lined the creek, were discovered cut down, quartered, and stacked into piles along the banks near the homeless encampments. Some of the downed trees have fallen across the creek, making surveying in these areas difficult. LACDPW was immediately notified of these incidents.

Streamflow readings dropped slightly in 2015 (2.68 cfs upstream and 1.41 cfs downstream) compared to those taken in 2012 during the last native fishes surveys (2.74 cfs upstream and 4.11 cfs downstream). Although the flow readings were taken at the same locations, the times of collection differed (2012 was collected in December and 2015 was collected in October). This decrease in discharge at the downstream location could be due to the complexity of the stream channel that was sampled (the downstream location had a greater abundance of cobble and boulders than the upstream location, which makes getting an accurate reading somewhat problematic), or because some of the water may have gone subsurface. The 2012 readings also took place following a measurable rain event where runoff sources connected with the creek below the upstream streamflow location, which may have caused the increase in discharge readings downstream. In addition to the flow readings in Haines Creek, water depths also appear to be slightly lower than what was recorded in 2012. Comparing the maximum and average depths from 2012 to 2015 for the seven PHAB sites, the 2015 depths were 5.2 to 8.2 cm (2.0 to 3.2 in) lower than those measured in 2012. Currently, California is experiencing its fourth year of severe drought conditions with the 2014 and 2015 Water Years being the warmest on record (ca.water.usgs.gov). These decreases in water flow and depth between survey years are likely attributed to the current drought conditions in the region.

Exotic species continue to be widespread throughout Haines Creek and represented over 98 percent of the species observed in the October survey. Although there was no evidence of predation on native species from the stomach contents examined of the captured exotic species, predation is still an expected byproduct of interspecific interactions in the creek. By contrast, exotic species abundance in Haines Creek represented over 75 percent of the species detected during the 2012 native fishes surveys (ECORP 2013). The number of exotic species observed in Haines Creek continues to remain relatively high, but the greatest abundances appeared to be nearest the Tujunga Ponds. Fewer exotic wildlife species were observed further away from the Tujunga Ponds. This coincides with the current distribution of Santa Ana sucker

in Haines Creek, which is patchy and restricted to the lower half of the Mitigation Area below the Cottonwood Avenue equestrian trail crossing.

Although, there are several threats (e.g., habitat modifications, predation and competition from exotic species, illegal harvesting, degradation of water quality, and drought) that can negatively impact the native fish populations in Haines Creek, it is unclear to what degree each threat may independently have on the overall population. The combination of several threats is likely to have the greatest impact on these populations with the ongoing drought possibly being the initial trigger for these more recently observed declines. At the time of these surveys, the Wash (within the Mitigation Area boundary) was dry with no connectivity to Haines Creek, whereas in 2012, the Big Tujunga Wash was flowing and connected with Haines Creek just downstream of the Mitigation Area. The Big Tujunga Wash contains a fairly large and stable number of native fishes (i.e., Santa Ana sucker, Santa Ana speckled dace, and arroyo chub) upstream, and connectivity with Haines Creek would allow for greater dispersal and exchange, repopulation and recruitment, and subsequently an increased gene flow between these populations.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this 2015 study, the native fishes within the Mitigation Area appear to be in decline and may be extirpated if additional actions are not taken. Exotic species continue to be widespread throughout Haines Creek with source populations located both upstream (Tujunga Ponds) and downstream (Hansen Dam). In addition to the ongoing threat of exotic species, the survival of native fishes in Haines Creek are also threatened by disturbances to habitat continuity through the construction of rock dams and destruction of riparian habitats (i.e., illegal tree cutting), changes in water quality through the introduction of toxins/chemicals (e.g., illegal dumping of paints, solvents, and various electronic or automotive products), and the dangers associated with drought and wildfire.

Currently, a public outreach program is in place to increase the user awareness and compliance regarding the rules of the Mitigation Area; however, this program has limitations because it is only an outreach program and not an enforcement program. Ideally, law enforcement should be more involved in enforcing the Mitigation Area's rules and regulations as soon as infractions are observed. Furthermore, it is recommended that the program continue to expand and reach out to additional stakeholders and to the public for their help to maintain and preserve this fragile ecosystem.

Native fishes surveys are currently conducted every three years, which makes assessing changes to this sensitive, isolated fish community difficult to address on a real-time basis. In addition, Haines Creek was only sampled within the boundaries of the Mitigation Area; however, the creek continues downstream for approximately one mile before terminating at the Hansen Dam Flood Control Basin. This portion of Haines Creek outside the Mitigation Area also supports Santa Ana sucker and other native fishes. Future surveys should incorporate this downstream portion of Haines Creek in order to identify whether Santa Ana sucker or other native fishes may have shifted outside of the current survey area. Studies should continue to assess and monitor the native fish populations, habitats, and movement patterns within the Mitigation Area. These studies allow managers to make informed decisions regarding future activities, and could also serve as a means for the early detection and monitoring of changes to water quality,

habitat, declines in native species populations, or new invasions of exotic species. It could also serve to document range extensions, predation rates on native species, and/or changes in distributions or densities of already established exotic species populations.

Channel alterations that impede the natural flow of surface water can isolate or restrict the movement of native fishes, potentially drying out sections downstream of the obstruction, and can also create favorable conditions for exotic species to proliferate and persist. Efforts should be made to monitor for these obstructions and when observed, these obstructions should be carefully removed. Exotic species continue to be one of the greatest threats to the recovery of native fishes in Haines Creek and removing them and their habitat should continue to be a top priority.

Prior suggestions for limiting the migration of exotic species into Haines Creek have been to install a fish screen at the confluence of the Tujunga Ponds. Although a fish screen could provide a benefit by restricting migration, it fails to address the overlying problem, which is that the ponds provide exceptional breeding habitat for exotic aquatic species. In addition, fish screens can be costly to maintain and can be subjected to tampering and vandalism. These screens are also limited by their ability to only restrict fishes larger than the mesh size, and in general, are not capable of withstanding high flows during storm events. In most instances, juvenile and YOY fishes would still be able to swim past the fish screens and become established downstream.

A more beneficial long-term approach would be re-engineer the Tujunga Ponds into a stream-type system to mirror the habitat currently in Haines Creek. Transforming the Tujunga Ponds into a stream-type habitat would reduce the available habitat for exotic species breeding, foraging, and refuge; however, it would also eliminate open water habitats that are currently used by migratory bird species. Another variation could be to re-engineer the ponds so that only one would be holding water at any given time, which would allow for the periodic draining of one pond into the other. This periodic draining could essentially eliminate exotic species from the ponds, while still providing the necessary habitat for migratory bird species.

6.0 REFERENCES

Alcorlo, P., W. Geiger, M. Otero. 2004. Feeding Preferences and Food Selection of the Red Swamp Crayfish, *Procambarus clarkii*, in Habitats Differing in Food Item Diversity. Crustaceana. 77(4):435-453.

Bozek, M. A., and F. J. Rahel. 1991. Comparison of Streamside Visual Counts to Electrofishing Estimates of Colorado River Cutthroat Trout Fry and Adults. *North American Journal of Fisheries Management*. 11:38-42.

California Department of Fish and Wildlife (CDFW), Natural Diversity Database. October 2015. Special Animals List. Periodic publication. 51 pp.

California Department of Fish and Game (CDFG). 2012. California Fish and Game Code Chapter 12, Section 1930-1940. Available at: http://www.leginfo.ca.gov/cgibin/calawquery?Codesection=fgc&codebody=&hits=20.

The California Drought. (November 30, 2015). California Water Science Center [website]. U.S. Department of Interior, U.S. Geological Survey. http://ca.water.usgs.gov.

Chambers Group, Inc. 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.

Correia, A.M., and O. Ferreira. 1995. Burrowing Behavior of the Introduced Red Swamp Crayfish *Procambarus clarkii* (Decapoda: Cambaridae) in Portugal. Journal of Crustacean Biology 15:248-257.

ECORP Consulting, Inc. (ECORP). 2009. 2009 Native Fishes Survey Report for the Big Tujunga Wash Mitigation Area, Los Angeles County, CA. Final Report Prepared for the Los Angeles County Department of Public Works. October 2009.

ECORP Consulting, Inc. (ECORP). 2012. 2012 Exotic Aquatic Species Removal Report for the Big Tujunga Wash Mitigation Area, Los Angeles County, CA. Final Report Prepared for the Los Angeles County Department of Public Works. December 2012.

Ellison, J. P. 1984. A Revised Classification of Native Aquatic Communities of California. No. 84-1. California State Resources Agency, Sacramento.

Feeney, R.F., and C.C. Swift. 2008. Description and Ecology of Larvae and Juveniles of Three Native Cypriniforms of Coastal Southern California. Ichthyological Research. 55(1):65-77.

Fetscher, A.E., L. Busse, and P.R. Ode. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 002.

Gamradt, S. C., L. B. Kats. 1996. Effects of Introduced Crayfish and Mosquitofish on California Newts. Conservation Biology. 10: 1155-1162.

Greenfield, D.W., S.T. Ross, and G.D. Deckert. 1970. Some Aspects of the Life History of the Santa Ana Sucker, *Catostomus* (*Pantosteus*) *santaanae* (Snyder). *Calif. Fish Game* 56(3):166–179.

Haglund, T.R., J.N. Baskin, and C.C. Swift. 2003. Results of the Year 2 Implementation of the Santa Ana Sucker Conservation Program for the Santa Ana River. Report Prepared for Santa Ana Sucker Conservation Team under Contract with Santa Ana Water Project Authority. 100pp.

Huner, J.V., and J.E. Barr. 1991. Red Swamp Crayfish, Biology and Exploitation (3rd edition). Louisiana State University, Baton Rouge, Louisiana.

Ilheu, M., and J.M. Bernardo.1993. Aspects of Trophic Ecology of Red Swamp Crayfish (*Procambarus clarkii*) in Alentejo, South of Portugal. Proceedings of IV Spanish Limnological Congress: 417-423. (Granada, Spain).

Jaspers, E. and J.W. Avault. 1969. Environmental Conditions in Burrows and Ponds of the Red Swamp Crawfish, *Procambarus clarkii*, near Baton Rouge, Louisiana. Proceedings of the Southeastern Association of Game and Fisheries Commission 23: 634-648.

McGinnis, S.M. 1984. Freshwater Fishes of California. Berkeley: University of California Press. Berkeley and Los Angeles, California. 316 pp.

Moyle, P.B. 2002. *Inland Fishes of California*. University of California Press, Berkeley.

Pérez-Bote, J.L. 2004. Feeding Ecology of the Exotic Red Swamp Crayfish, *Procambarus clarkii* (Girard, 1852) in the Guadiana River (SW Iberian Peninsula). Crustaceana 77(11): 1375-1387.

Rodgers, J. D., M. F. Solazzi, S. L. Johnson, and M. A. Buckman. 1992. Comparison of three techniques to estimate juvenile coho salmon populations in small streams. North American Journal of Fisheries Management 12:79–86.

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.

Saiki, M.K. 2000. *Water Quality and other Environmental Variables Associated with Variations in Population Densities of the Santa Ana Sucker*. Unpublished Report to Santa Ana Watershed Project Authority from USGS/BRD, Western Fisheries Research Center. 117pp.

Smith, G.R. 1966. Distribution and Evolution of the North American Catostomid Fishes of the Subgenus *Pantosteus*, Genus *Catostomus*. University of Michigan Museum of Zoology, Miscellaneous Publications. 129:1-33.

Smith, G.R., and Dowling, T.E. 2008. Correlating Hydrographic Events and Divergence Times of Speckled Dace (Rhinichthys: Teleostei: Cyprinidae) in the Colorado River drainage. The Geological Society of America, Special Paper 429, p. 301-317.

Snyder, J.O. 1908. Description of *Pantosteus santa-anae*, a New Species of Fish from the Santa Ana River, California. Proceedings United States National Museum. 34:33-34.

Swift, C.C., T.R. Haglund, M. Ruiz, and R.N. Fisher. 1993. The Status and Distribution of the Freshwater Fishes of Southern California. *Bulletin of the Southern California Academy of Sciences* 92(3):101-167.

Swift, C.C. 2001. The Santa Ana Sucker in the Santa Ana River: Distribution, Relative Abundance, Spawning Areas, and Impact of Exotic Predators. Submitted to the Santa Ana Water Project Authority, Riverside CA. 94 pp.

Thurow, R. F. 1994. Underwater methods for study of salmonids in the Intermountain West. U.S. Forest Service, Intermountain Research Station, General Technical Report INT-GTR-307, Odgen, Utah.

Traxler, S.L. and B. Murphy. 1995. Experimental Trophic Ecology of Juvenile Largemouth Bass, *Micropterus salmoides*, and Blue Tilapia, *Oreochromis aureus*.

University of California, Agriculture and Natural Resources (UC ANR). 2011. *Regents of the University of California, California Fish Website*. Last updated: 2011. Available: http://calfish.ucdavis.edu/species.

U.S. Fish and Wildlife Service (USFWS). 2000. Endangered and Threatened Wildlife and Plants; Threatened Status for the Santa Ana Sucker, Final Rule. Federal Register 65(71): 19686–19698.

U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for Santa Ana Sucker; Final Rule. *Federal Register* 75(239):77962-78027.

APPENDIX A

Native Fishes Survey Photographs

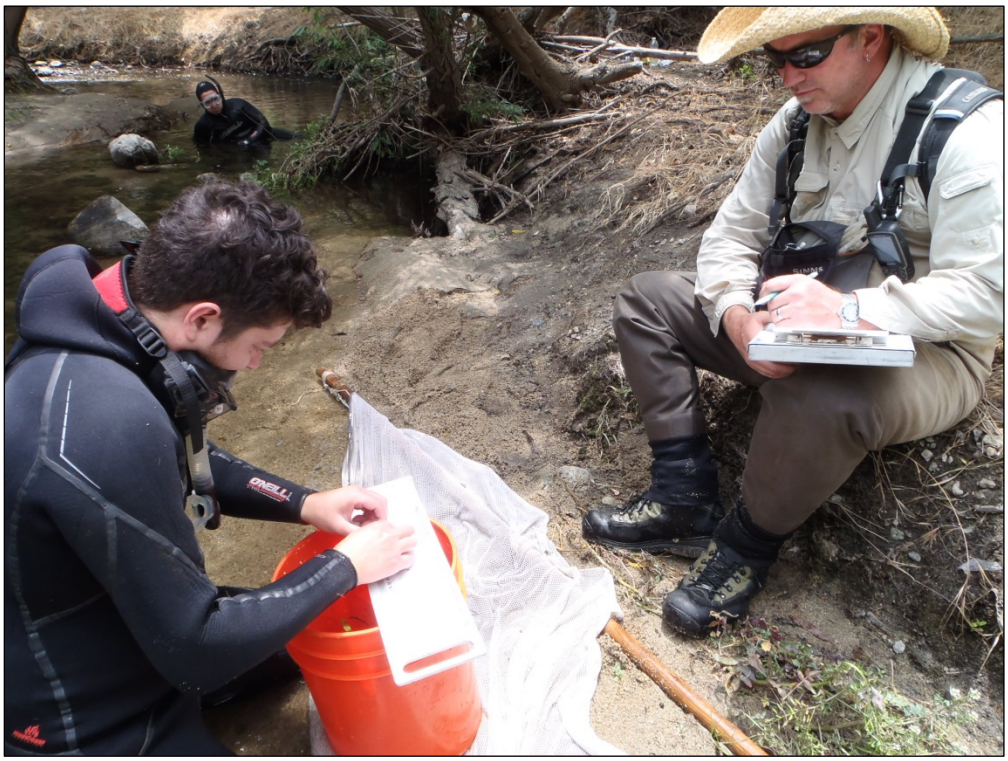
A) Riffle/glide complex observed in Haines Canyon Creek looking upstream from an equestrian trail crossing.

B) Riffle/glide complex observed in Haines Canyon Creek.

C) ECORP biologists surveying downstream of an equestrian trail crossing in Haines Canyon Creek.

D) ECORP biologists visually surveying a pool just upstream of a rock dam.

E) Several red swamp crayfish captured using a seine net in Haines Canyon Creek.



F) ECORP biologists processing exotic fishes captured using a seine net.

G) A largemouth bass captured in Haines Canyon Creek and an unidentified fish found inside its stomach.

H) Two Santa Ana suckers observed in Haines Canyon Creek.

I) A juvenile Santa Ana sucker captured in Haines Canyon Creek.

J) An adult Santa Ana sucker observed in Haines Canyon Creek.

K) Fallen trees obstructing Haines Canyon Creek.

L) Cut trees observed in Haines Canyon Creek.

M) Old paint pail observed in Haines Canyon Creek.

N) Rock dam and tree swing observed in Haines Canyon Creek.

APPENDIX Q

City of Los Angeles Fire Department Notice of Noncompliance Memo

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 20, 2015
(2014-003.011/001)

Melanie Morita
Water Resources Division
County of Los Angeles, Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: Memorandum for a Reconnaissance Site Visit to Assess Vegetation Clearing and Trimming Needs at the Big Tujunga Wash Mitigation Area, Los Angeles County, California.

Dear Ms. Morita:

This memorandum serves as documentation of the reconnaissance-level site visit to assess vegetation clearing and trimming needs at the Big Tujunga Wash Mitigation Area (Mitigation Area). The site visit is in response to a Notice of Noncompliance issued by the City of Los Angeles Fire Department (LAFD) (Attachment 1).

The areas outlined in the Notice of Noncompliance include an area spanning 200 feet (ft) behind the Gibson Ranch buildings (Figures 1 through 3), along the fence line between Gibson Ranch and Mary Bell Avenue (Figure 4), and along the fence line between Cottonwood Avenue and Wheatland Avenue (Figure 5). Vegetation within the areas generally consisted of California buckwheat (*Eriogonum fasciculatum*), black mustard (*Brassica nigra*), non-native grasses (*Bromus* sp.), thickleaf yerba santa (*Eriodictyon* crassifolium), chaparral yucca (*Hesperoyucca whipplei*), prickly pear (*Opuntia littoralis*), willows (*Salix* sp.), Fremont cottonwood (*Populus fremontii*), and western sycamore (*Plantanus racemosa*).

A site visit was conducted by ECORP Consulting, Inc. (ECORP) biologist, Amy Trost, and a landscape contractor senior technician, Luis Lopez (Natures Image), on October 13, 2015. Mr. Lopez was concerned about clearing all vegetation, particularly on the slope behind Gibson Ranch and on the slope along Wentworth Street near Wheatland Avenue. Removing all vegetation along these slopes would likely make them unstable, particularly if winter rains are as heavy as they are expected. He also stated that even having his crew members walk on the slope could increase erosion potential. Mr. Lopez suggested cutting back all vegetation that was not currently green and trimming trees up from the ground. He said that cutting back all vegetation, including taking out any trees, would be an incredibly expensive and time consuming task. He stated that, in order to remove any trees, they would likely need to rent heavy equipment. The equipment might cause more erosion problems behind Gibson Ranch and they would likely need a permit to block off Wentworth Street while removing trees along the fence line.

The meeting with Inspector Bernal from the City of Los Angeles Fire Department had to be rescheduled due to an unexpected change in her schedule. However, Ms. Trost was able to meet with her the following day, October 14, 2015. Inspector Bernal recommended the following actions:

Area behind Gibson Ranch

- Within 200 feet (ft) of the horse stables:
    - Area above the slope (directly behind Gibson Ranch)
        - Remove all dead vegetation
        - Cut all shrubs down to 3 inches
        - Trim all trees over 18 ft up to 6 ft off the ground
        - Trim all trees under 18 ft up to 1/3 of their height
    - Slope
        - Remove 30 to 50 percent of vegetation (dead or alive)
        - Trim all trees over 18 ft up to 6 ft off the ground
        - Trim all trees under 18 ft up to 1/3 of their height
    - Area beyond slope (within/adjacent to Haines Canyon Wash)
        - Remove all dead vegetation
        - Cut all shrubs down to 3 inches
        - Trim all trees over 18 ft up to 6 ft off the ground
        - Trim all trees under 18 ft up to 1/3 of their height

Area along the fence line between Gibson Ranch and Mary Bell Avenue

- Within 10 ft of Wentworth Street:
    - Remove all dead vegetation
    - Cut all shrubs down to 3 inches
- Within 200 ft of any structures (the noncompliance only stated that a 10 ft area needed to be cleared; however, Inspector Bernal requested this modification during the visit):
    - Remove all dead vegetation
    - Cut all shrubs down to 3 inches
    - Trim all trees over 18 ft up to 6 ft off the ground
    - Trim all trees under 18 ft up to 1/3 of their height
        - Including foliage that is growing on the other side of the fence and hanging into the Mitigation Area

Area along Wentworth Street between Cottonwood Avenue and Wheatland Avenue

- Within 10 ft of Wentworth Street:
    - Remove all dead vegetation
    - Cut all shrubs down to 3 inches
    - Trim all trees over 18 ft up to 6 ft off the ground
    - Trim all trees under 18 ft up to 1/3 of their height

Area along Cottonwood Avenue (this was not included in the noncompliance but Inspector Bernal requested it during the visit to provide a safe access route for firefighters that may need to enter the Mitigation Area)

- Within 10 ft on either side of Cottonwood Avenue:
    - Remove all dead vegetation
    - Cut all shrubs down to 3 inches
    - Trim all trees over 18 ft up to 6 ft off the ground
    - Trim all trees under 18 ft up to 1/3 of their height

Overall, Inspector Bernal's main concern was removing the type of vegetation that is easiest to ignite and burns hottest, such as California buckwheat. Inspector Bernal indicated that while she had the authority to issue Notices of Noncompliance, she could not enforce them on land owned by the

County. The noncompliance was a way to both inform the county of the risk to public safety and show that LAFD had done its due diligence and reported the issue. In the event that a fire occurs and damage occurs to adjacent properties, the landowner of the damaged property could sue the County for negligence. When questioned about why the Mitigation Area was cited this year and not in previous years, Inspector Bernal stated that her jurisdiction included a large area that could not be covered in a single year. She normally focused on areas of the greatest threat to public safety and included other areas when she had time.

ECORP Recommendations

ECORP is concerned about removing all vegetation in any area because it would affect the quality and amount of native habitat that is currently protected under the Streambed Alteration Agreement for the site, will likely increase erosion during storm events, and reduce available habitat for special-status wildlife species potentially occurring on the site. A map of all issue areas and ECORP's recommendations for each area has been included as Figure 6. ECORP recommends the following actions be taken as a compromise to the requirements of the Notice of Noncompliance:

- Clear away all dead vegetation along Wentworth Street between Cottonwood Avenue and Wheatland Avenue within 10 ft of Wentworth Street;
- Trim larger trees hanging over Wentworth Street up to 6 ft. Determine who is responsible for trimming vegetation outside of the Mitigation Area fence line and coordinate accordingly;
- Trim California buckwheat along Cottonwood Avenue to the edge of the roadway;
- Clear away all dead vegetation along Wentworth Street between Mary Bell Avenue and the property west of Gibson Ranch within 10 ft of Wentworth Street;
- Trim trees hanging into the Mitigation Area from the property west of Gibson Ranch;
- Clear away dead vegetation within 50 to 100 ft beyond the fence of the property west of Gibson Ranch;
- Clear away all dead vegetation on top of the slope behind Gibson Ranch;
- Trim the willow tree on top of the slope behind Gibson Ranch up to 1/3 of its height;
- Clear away dead vegetation beyond the slope and within 100 to 200 ft of Gibson Ranch;
- Trim trees up to 6 ft beyond the slope and within 100 to 200 ft of Gibson Ranch; and
- Warn the landowner of the parcel next to Gibson Ranch and the managers of Gibson Ranch that trimming activities will be taking place so close to their properties and will include vegetation hanging into the Mitigation Area.

I hereby certify that the statements furnished above present the data and information required for this memorandum, and that the facts, statements, and information are true and correct to the best of my knowledge and belief.

SIGNED: _____ DATE: October 20, 2015

Amy Leigh Trost
Biologist

Attachment 1: LAFD Notice of Noncompliance

City of Los Angeles
DEPARTMENT OF FIRE

NOTICE OF NONCOMPLIANCE !2549002909!

MapBook	Page	Parcel	Hazard Location
2549	002	909	

L A COUNTY FLOOD CONTROL DIST
00900 S FREMONT AVE
ALHAMBRA, CA 91803

Property Inspected	03/08/2015
Notice Printed	03/08/2015
Compliance Due	03/28/2015
Inspector ID	BERNAL

An inspection confirmed that brush clearance progress is not complete on your property as per L.A.M.C. SECTION 57.322. Please see comments below.

[ ] **1.** All native brush, weeds, grass, trees and hazardous vegetation on your property within 200 feet of all structure, whether those structures are on your property or adjoining properties, shall be maintained in accordance with the requirements.

[XX] **2.** Maintain all weeds and other vegetation located within 10 feet of any combustible fence or an edge of that portion of any highway, street, alley or paved driveway or used for vehicular travel.

[ ] **3.** Trees shall be trimmed so the foliage is no closer than 10 feet from the outlet of a chimney.

[ ] **4.** Remove any substantial accumulation of leaves, needles, twigs and all other combustible material from the roof of any structure on your property.

[ ] **5.** For trees that are taller than 18 feet shall have lower branches trimmed so that no foliage is within six feet of the ground. For trees and shrubs less than 18 feet tall shall have lower branches removed to the one-third of the height of the tree or shrub. Remove all dead material.

[ ] **6.** Maintain 5 feet of vertical clearance between roof surfaces and portions of overhanging trees.

[ ] **7.** All dead trees shall be removed from the property.

[ ] **8.** Hazardous vegetation on your property beyond 100 feet but within 200 feet of all structures shall be maintained as follows: Remove dead material from this area, except vegetation that is cut to 3" in height; Prune foliage from lower third of trees and shrubs up to a maximum of six feet.

[ ] **9.** Your property has been identified as having landscape vegetation that requires additional modification. You are directed to maintain your landscape vegetation in accordance with the requirements.

[XX] **10.** Remove and safely dispose of all cut or bagged vegetation, native or otherwise, all dead trees, and all debris. Cut vegetation may be machine processed and spread on site.

Diagram of Hazard/Location

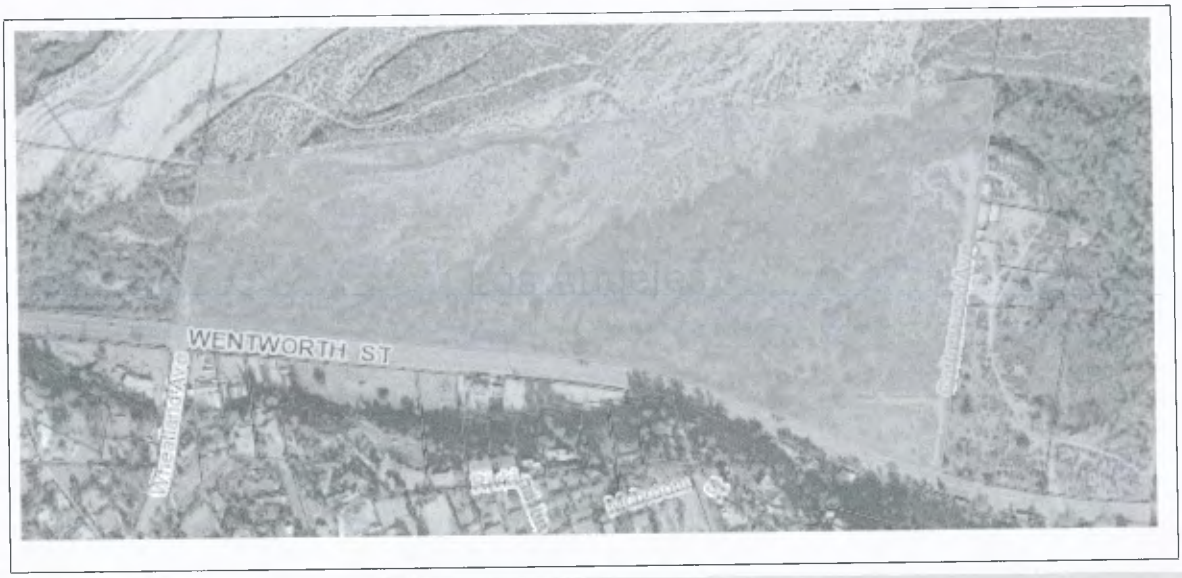
A reinspection of your property will occur on or after the Compliance due date. If found in compliance, you will receive a written "CLEANED BY OWNER INSPECTION RECORD" for your records. If your property is not in compliance at the time of reinspection, a $356.00 (subject to change) noncompliance reinspection fee will be assessed and the City may complete the work on your behalf. The cost, including an administrative fee and the noncompliance reinspection fee will become a special assessment. Upon City Council confirmation and recordation of that order, a lien may be attached to the above parcel to be collected on the next regular property tax bill.

Comments and Special Instructions:
None

TG 503-C2
Parcel belongs to LACFCD
But nothing major belong to us. at the area
at Wentworth st + Cottonwood ave

PARCEL INFORMATION REPORT

Parcel Number: 2549002909



OWNER INFORMATION

AIN/APN:	2549002909	**Site Address:**	0
Owner:	L A COUNTY FLOOD CONTROL DIST		0
Built:	0	**Mailing Address:**	900 FREMONT AVE
SQ Feet:	0		ALHAMBRA CA 91803
Land Value:	$0		
Improve Value:	$0		
Transferred:	11/10/1998		

SERVICE AREA INFORMATION

Jurisdiction:	Los Angeles	**Thomas Page:**	503 2-C
Sup. District:	5	**Sewer Map:**	1575
RD District:	N/A	**AMB:**	LOS ANGELES
BS District:	26	**Water Purveyor:**	CITY OF LOS ANGELES
BS Office:	N/A	**USGS Quad:**	51
FM Area:	Hansen Yard (West)	**HN Map:**	\\pwgisfile\dgn\2017\im204177.dgn

ZONING INFORMATION

Seismic Hazard:	LQ	**Near Srce Zone:**	B-2km
FEMA Flood Zone:	X	**Coastal Zone:**	N/A
Fire Zone:	Very High	**Zoning:**	N/A
Forest Code:	N/A	**CSD:**	N/A
SEA:	TUJUNGA VALLEY-HANSEN DAM		

NOTES:

Report prepared by the Los Angeles County Department of Public Works from ViewLA as of 6/4/2015 7:46:37 AM

WENTWORTH ST 1,583.18 ft
2,618.49 ft
Cottonwood Ave
191849.31 ft²
191849.31 sq ft

City of Los Angeles
DEPARTMENT OF FIRE

NOTICE OF NONCOMPLIANCE !2549004914!

W

MapBook	Page	Parcel	Hazard Location
2549	004	914	

L A COUNTY FLOOD CONTROL DIST
PO BOX 1460
ALHAMBRA CA 91802

Property Inspected	03/08/2015
Notice Printed	03/08/2015
Compliance Due	03/28/2015
Inspector ID	BERNAL

An inspection confirmed that brush clearance progress is not complete on your property as per L.A.M.C. SECTION 57.322. Please see comments below.

[XX] **1.** All native brush, weeds, grass, trees and hazardous vegetation on your property within 200 feet of all structure, whether those structures are on your property or adjoining properties, shall be maintained in accordance with the requirements.

[ ] **2.** Maintain all weeds and other vegetation located within 10 feet of any combustible fence or an edge of that portion of any highway, street, alley or paved driveway or used for vehicular travel.

[ ] **3.** Trees shall be trimmed so the foliage is no closer than 10 feet from the outlet of a chimney.

[ ] **4.** Remove any substantial accumulation of leaves, needles, twigs and all other combustible material from the roof of any structure on your property.

[ ] **5.** For trees that are taller than 18 feet shall have lower branches trimmed so that no foliage is within six feet of the ground. For trees and shrubs less than 18 feet tall shall have lower branches removed to the one-third of the height of the tree or shrub. Remove all dead material.

[ ] **6.** Maintain 5 feet of vertical clearance between roof surfaces and portions of overhanging trees.

[ ] **7.** All dead trees shall be removed from the property.

[ ] **8.** Hazardous vegetation on your property beyond 100 feet but within 200 feet of all structures shall be maintained as follows: Remove dead material from this area, except vegetation that is cut to 3" in height; Prune foliage from lower third of trees and shrubs up to a maximum of six feet.

[ ] **9.** Your property has been identified as having landscape vegetation that requires additional modification. You are directed to maintain your landscape vegetation in accordance with the requirements.

[XX] **10.** Remove and safely dispose of all cut or bagged vegetation, native or otherwise, all dead trees, and all debris. Cut vegetation may be machine processed and spread on site.

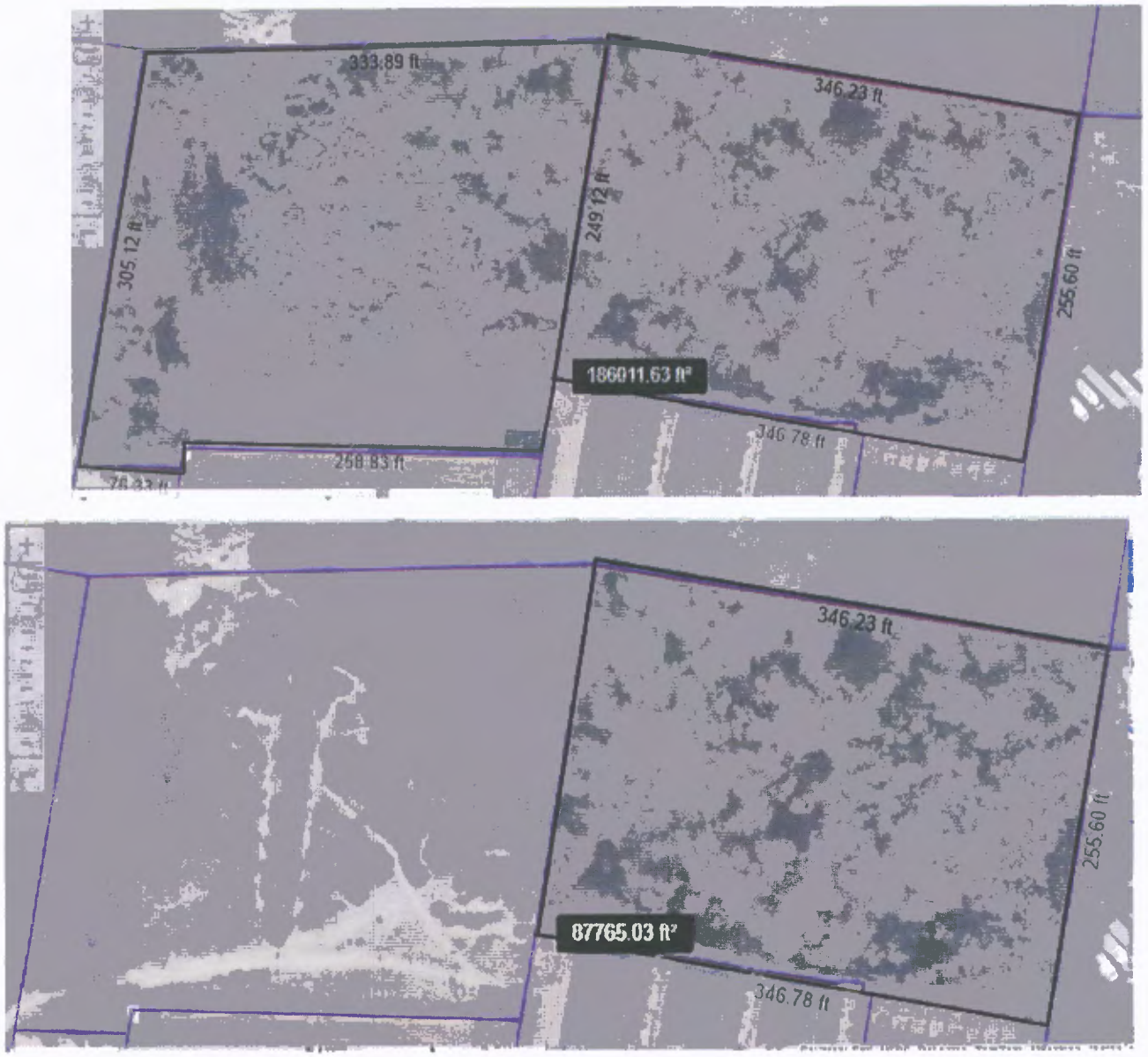
Diagram of Hazard/Location

A reinspection of your property will occur on or after the Compliance due date. If found in compliance, you will receive a written "CLEANED BY OWNER INSPECTION RECORD" for your records. If your property is not in compliance at the time of reinspection, a $356.00 (subject to change) noncompliance reinspection fee will be assessed and the City may complete the work on your behalf. The cost, including an administrative fee and the noncompliance reinspection fee will become a special assessment. Upon City Council confirmation and recordation of that order, a lien may be attached to the above parcel to be collected on the next regular property tax bill.

Comments and Special Instructions:
None

T6: 503-D2
nothing nearby
Cottonwood ave + Wentworth st.

Brush Clearance Unit | Phone (800)994-4444 | Mark Stormes, Fire Marshal



98246,6 sq.ft
on West side

87765.03 sq.ft
on East side

186011.63 sq.ft.
is total area
(see the image)

2549	4 SHEET	P. A. 1925 - 4	TRA 13	REVISED 1999011209012001-03 2008082704004001-03,24	2008082704006001-03,24 2012011105-03				SEARCH NO		OFFICE OF THE ASSESSOR COUNTY OF LOS ANGELES COPYRIGHT © 2002

2012

PARCEL INFORMATION REPORT

Parcel Number: 2549004914

OWNER INFORMATION

AIN/APN:	2549004914	**Site Address:**	0
Owner:	L A COUNTY FLOOD CONTROL DIST		0
Built:	0	**Mailing Address:**	0 PO BOX 1460
SQ Feet:	0		ALHAMBRA CA 91802
Land Value:	$0		
Improve Value:	$0		
Transferred:	05/07/2008		

SERVICE AREA INFORMATION

Jurisdiction:	Los Angeles	**Thomas Page:**	503 2-D
Sup. District:	5	**Sewer Map:**	1575
RD District:	N/A	**AMB:**	LOS ANGELES
BS District:	26	**Water Purveyor:**	CITY OF LOS ANGELES
BS Office:	N/A	**USGS Quad:**	51
FM Area:	Hansen Yard (West)	**HN Map:**	\\pwgisfile\dgn\2017\im204177.dgn

ZONING INFORMATION

Seismic Hazard:	LQ	**Near Srce Zone:**	B-2km
FEMA Flood Zone:	X	**Coastal Zone:**	N/A
Fire Zone:	Very High	**Zoning:**	N/A
Forest Code:	N/A	**CSD:**	N/A
SEA:	TUJUNGA VALLEY-HANSEN DAM		

NOTES:

Report prepared by the Los Angeles County Department of Public Works from ViewLA as of 6/4/2015 8:11:23 AM

City of Los Angeles
DEPARTMENT OF FIRE

NOTICE OF NONCOMPLIANCE !2549004907!

MapBook	Page	Parcel	Hazard Location
2549	004	907	

L A COUNTY FLOOD CONTROL DIST
00900 S FREMONT AVE
ALHAMBRA, CA 91803

Property Inspected	03/08/2015
Notice Printed	03/08/2015
Compliance Due	03/28/2015
Inspector ID	BERNAL

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[ ] **6.** Maintain 5 feet of vertical clearance between roof surfaces and portions of overhanging trees.

[ ] **7.** All dead trees shall be removed from the property.

[ ] **8.** Hazardous vegetation on your property beyond 100 feet but within 200 feet of all structures shall be maintained as follows: Remove dead material from this area, except vegetation that is cut to 3" in height; Prune foliage from lower third of trees and shrubs up to a maximum of six feet.

[ ] **9.** Your property has been identified as having landscape vegetation that requires additional modification. You are directed to maintain your landscape vegetation in accordance with the requirements.

[XX] **10.** Remove and safely dispose of all cut or bagged vegetation, native or otherwise, all dead trees, and all debris. Cut vegetation may be machine processed and spread on site.

Diagram of Hazard/Location

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Comments and Special Instructions:
None

T6: 503-D2, D3
nothing nearby.
Cottonwood ave + Wentworth st

124473.45 ft²
387.03 ft
764.84 ft
372.72 ft
387.03 ft
212756,7
580.51 ft
764.84 ft
337230.15 ft²

Figure 1. Area behind Gibson Ranch, facing east.

LAFD recommended removing all dead vegetation and trimming any native shrubs to 3 in within 200 ft of Gibson Ranch. LAFD also recommended and trimming the willow tree up to 1/3 of its height.

Figure 2. Area behind Gibson Ranch looking down on steep decline, facing north.

LAFD recommended removing/trimming 30-50% of the vegetation (dead or alive). This reduced level of effort should occur only along the slope.

Figure 3. Area behind Gibson Ranch, facing west.

LAFD recommended removing all dead vegetation and trimming any native shrubs to 3 in within 200 ft of Gibson Ranch. LAFD also recommended and trimming the willow tree up to 1/3 of its height.

Figure 4. Fence line west of Gibson Ranch, facing south.

LAFD recommended removing all dead vegetation, trimming any native shrubs to 3 in, and trimming trees up to 1/3 of their height within 200 ft of the structure.

Figure 5. Fence line along Wentworth Avenue, facing west.

LAFD recommended removing all dead vegetation, trimming any native shrubs to 3 in, and trimming the trees up to 1/3 of their heights within 10 ft of Wentworth Street.

Figure 6a. Recommended actions: Purple – remove dead vegetation and trim trees; Green – remove dead vegetation.

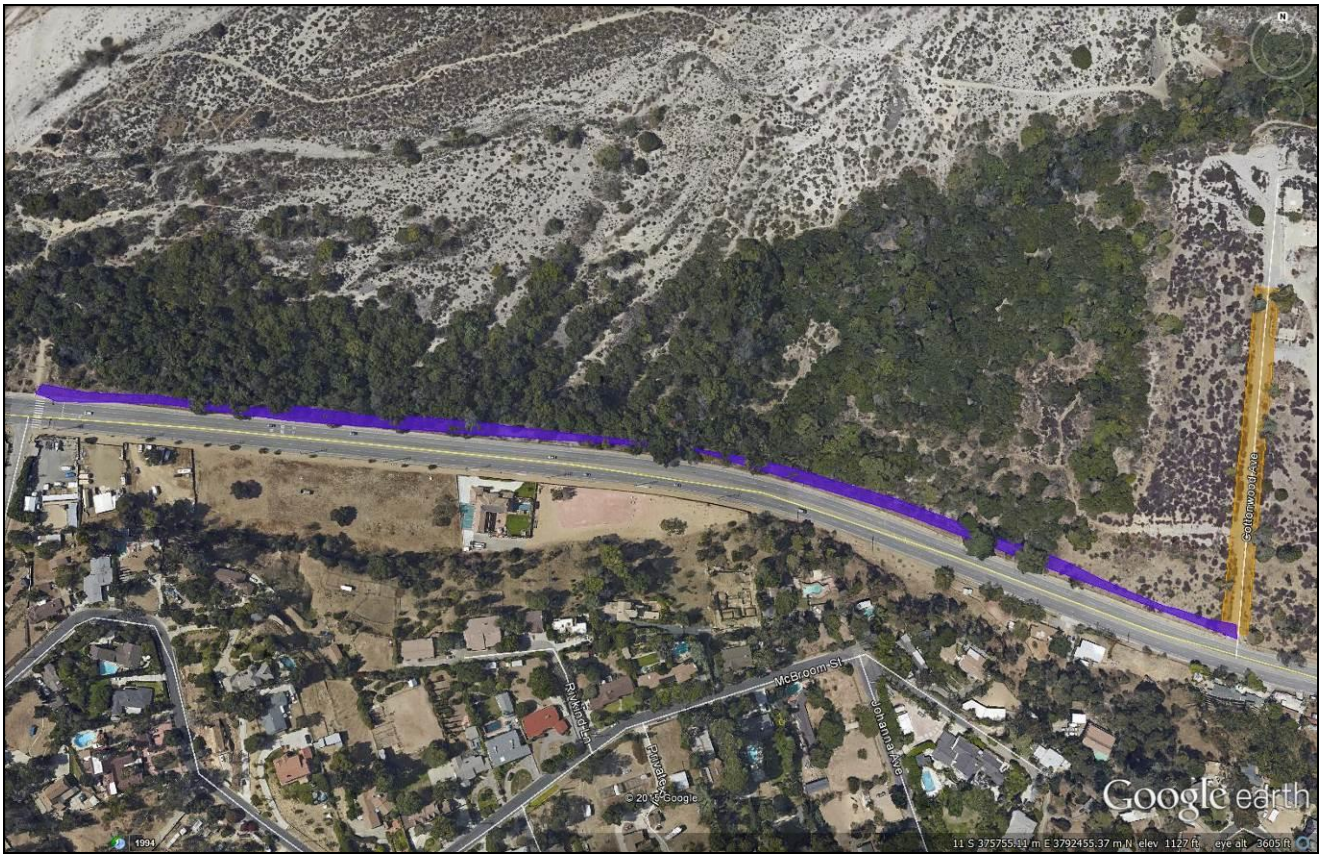


Figure 6b. Recommended actions: Purple – remove dead vegetation and trim trees; Orange – trim shrubs to edge of roadway.

Figure 6.
Big Tujunga Wash Mitigation Area
Fire Department Clearing
(Sheet 1 of 2)

Big Tujunga Wash

Haines Canyon Creek

Parcel
2549-002-909

Not included in noncompliance, but LAFD recommends trimming along Cottonwood Avenue

Cottonwood Ave

Sheet 2

Cottonwood Gate

Wentworth St.

Map Features

- Big Tujunga Wash Mitigation Area [1]
- Parcel Boundary [2]

Clearing Activities *

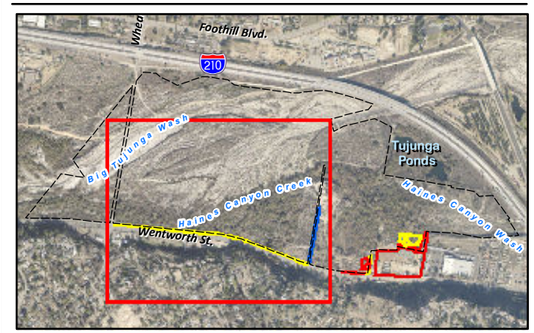
- Remove Dead Vegetation - 0.9 ac.
- Remove Dead Vegetation and Trim Trees - 1.5 ac.
- Trim Shrubs to 3" - 0.3 ac.

Reference

- Gibson Ranch

Vegetation Code - Vegetation Name

- California Buckwheat Scrub/California Sycamore-Coast Live Oak Woodland Restoration Area
- California Sagebrush-California Buckwheat Scrub
- Riversidian Alluvial Fan Sage Scrub
- Mulefat Scrub
- Southern Willow Scrub
- California Sycamore-Coast Live Oak Woodland
- Southern Cottonwood-Willow Riparian Woodland
- Developed, No Restoration
- Access Road



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2014-003 Big Tujunga Wash Mitigation Area

DRAFT

Scale in Feet
0 200

* **Work areas and acreage are approximate and are based on the best information available to date.**

[1] LADPW

[2] Los Angeles County GIS Parcels

Map Date: 12/23/2015
Photo Source: USGS 2013

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Meeting_Maps_and_Analysis\2015-11-23_Fire_Dept_Clearing\BigT_FireDept_Clearing_MapBook_20151123.mxd (JDS; MG; DW; LMH)-hayden 12/23/2015

Figure 6.
Big Tujunga Wash Mitigation Area
Fire Department Clearing
(Sheet 2 of 2)

Not included in noncompliance, but LAFD recommends trimming along Cottonwood Avenue

Cottonwood Ave.

Parcel 2549-002-909

Sheet 1

Parcel 2549-004-907

Parcel 2549-004-914

Haines Canyon Wash

Wentworth St.

Cottonwood Gate

Mary Bell Entrance

Gibson Ranch

Not included in noncompliance, but LAFD recommends vegetation clearance here

Map Features

- Big Tujunga Wash Mitigation Area [1]
- Parcel Boundary [2]

Clearing Activities *

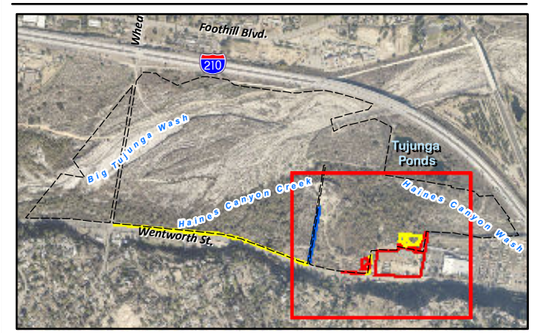
- Remove Dead Vegetation - 0.9 ac.
- Remove Dead Vegetation and Trim Trees - 1.5 ac.
- Trim Shrubs to 3" - 0.3 ac.

Reference

- Gibson Ranch

Vegetation Code - Vegetation Name

- California Buckwheat Scrub/California Sycamore-Coast Live Oak Woodland Restoration Area
- California Sagebrush-California Buckwheat Scrub
- Riversidian Alluvial Fan Sage Scrub
- California Buckwheat Scrub
- Mulefat Scrub
- Southern Willow Scrub
- California Sycamore-Coast Live Oak Woodland
- Southern Cottonwood-Willow Riparian Woodland
- Cattail Wetland
- Water
- Developed, No Restoration



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Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Meeting_Maps_and_Analysis\2015-11-23_Fire_Dept_Clearing\BigT_FireDept_Clearing_MapBook_20151123.mxd (JDS; MG; DW; LMH)-hayden 12/23/2015

2014-003 Big Tujunga Wash Mitigation Area

DRAFT

Scale in Feet
0 200

* **Work areas and acreage are approximate and are based on the best information available to date.**

[1] LADPW

[2] Los Angeles County GIS Parcels

Map Date: 12/23/2015
Photo Source: USGS 2013