2016 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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April 2017

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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 2016. In addition, a qualified biological monitor was present during all exotic vegetation removal activities during the breeding season to ensure that no impacts to nesting birds occurred (see Section 4.0). As a result, no 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 2016. 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 2016 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 2016 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 2016.

Work Areas and Vegetation Removal

Condition 13: Disturbance and removal of nonnative 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 three 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 2016, 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 when encountered 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, the landscape contractor, and volunteers during an organized Trail Cleanup Day (see Section 9.2).

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 2016.

Condition 27: Activities conducted within the Mitigation Area in 2016 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 2016.

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 (e.g., American bullfrogs [*Lithobates catesbeianus*], largemouth bass [*Micropterus salmoides*]) that pose a threat to
this species.

Permitting and Safeguards

Condition 31: The CDFW, United States Army Corps of Engineers (USACE), and Regional Water Quality Control Board (RWQCB) were consulted very early in the development of the implementation plan for the Mitigation Area (referred to as the Big Tujunga Conservation Area in the SAA). The USACE stated that they did not need to issue a permit because there would not be any fill within their jurisdiction. The continued implementation of the MMP and the Long-term Maintenance and Monitoring Plan (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 2016.

Administrative-Miscellaneous

Condition 33: No amendments to the SAA were submitted to CDFW during the 2016 reporting period. CDFW did not identify any breaches of the SAA during the 2016 period.

Condition 34: There were no violations of any terms or conditions of the SAA during the 2016 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 2016.

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 2016.

Conditions 40 through 42: CDFW did not issue a suspension or cancellation of the SAA in 2016.

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 2016. These activities were conducted in accordance with the Master Mitigation Plan (MMP) for the Mitigation Area (Chambers Group 2000). The MMP was first created in 2000 to serve as a five-year guide for implementation of various enhancement programs and to fulfill the California Department of Fish and Wildlife (CDFW) requirement for the preparation of a management plan for the site. The ultimate goal of the Mitigation Area is to provide for long-term preservation, management, and enhancement of biological resources for the benefit of the state's fish and wildlife resources. The MMP encompasses strategies to enhance and protect existing habitat for wildlife and to create additional natural areas that could be used by native wildlife and numerous user (recreational) groups. In addition, the MMP includes programs for the removal of exotic fishes and reptiles, American bullfrogs (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*) from the Tujunga Ponds; 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 2016.

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.

Map Date: 1/24/2017
Source: ESRI

Figure 1-1. Project Location

2014-003.015 Big Tujunga Wash Mitigation Area

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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 a Los Angeles County Significant Ecological Area (Designation No. 25, Tujunga Valley/Hansen Dam), and the biological resources found on the site are of local, regional, and statewide significance (Safford and Quinn 1998; CDFW 2016). The Mitigation Area also falls within designated Critical Habitat for the federally listed Santa Ana sucker and the federally and state listed southwestern willow flycatcher (*Empidonax traillii extimus*). The nearby Tujunga Ponds and surrounding habitat are located adjacent to the northeast corner of the site. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds, and other geographic features as well as designated Critical Habitat in the Mitigation Area can be found in Figure 1-2.

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 2016. Certain tasks in the MMP were not conducted in 2016 because the scope of work requires that they be done once during a three-year period and that they be conducted during an average or better than average rainfall year. Examples of these include the focused surveys for sensitive native fishes, arroyo toad (*Anaxyrus californicus*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher. This suite of surveys was not conducted in 2016 because these surveys were last conducted in 2015. Four additional tasks were performed under the Special Assessment task in 2016, which included providing a memo documenting damage to the site after a series of major rain events in January 2016, two damage assessments of small fires in and adjacent to the Mitigation Area, and organizing an email blast to community members regarding a recent increase in unauthorized activities in the Mitigation Area. Compendia of all plant and wildlife species observed in the Mitigation Area in 2016 are included as Appendix C.

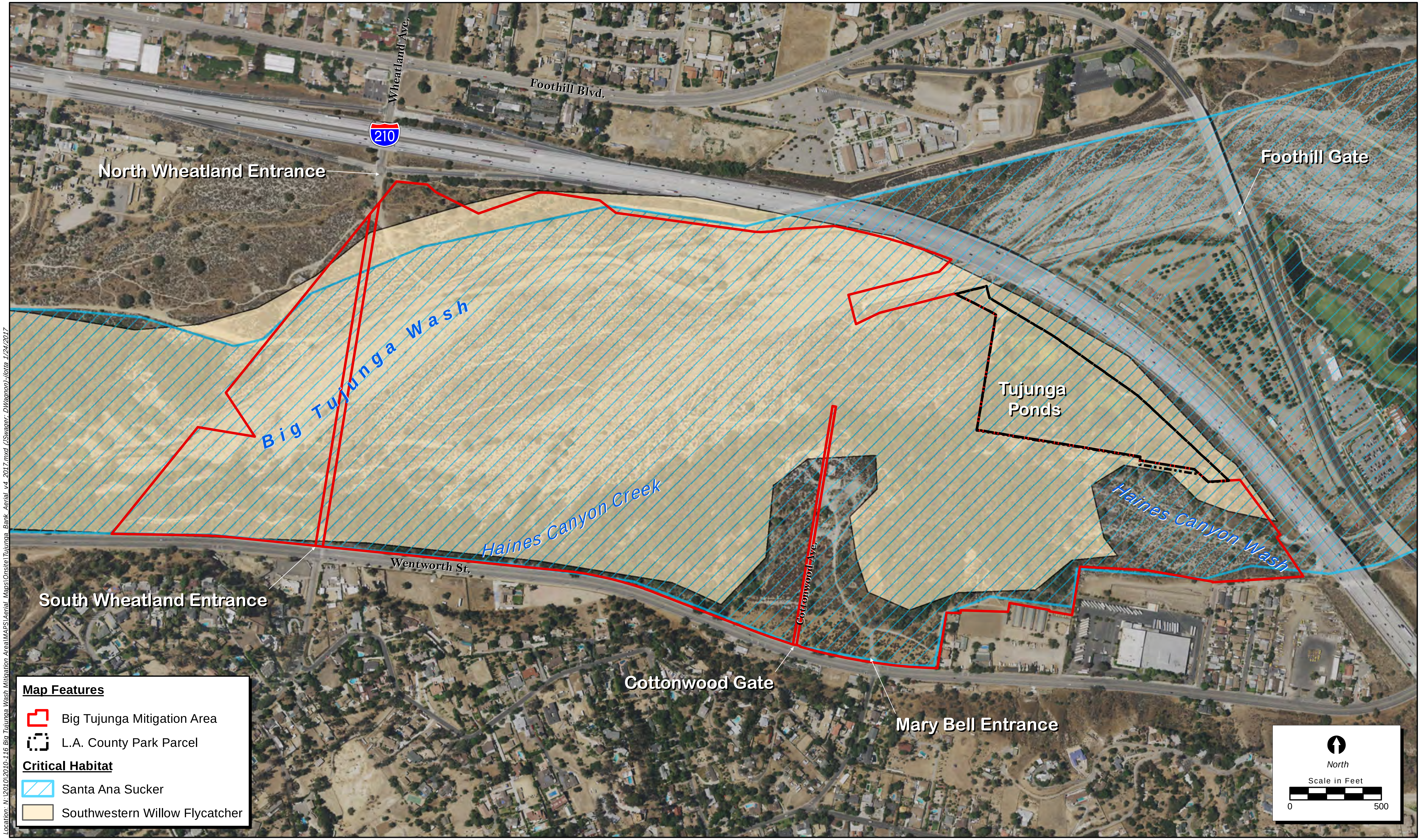

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Figure 1-2. Big Tujunga Wash Mitigation Area

2014-003.015 Big Tujunga Wash Mitigation Area

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Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2016

Implemented and/or Continued in 2016	
	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
x	Trail Cleanup Day
	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	2016 Draft Annual Report
x	2016 Final Annual Report
	TASK 11 – Meetings
x	Meetings with LACDPW, Agencies, Public, and Consultants
	TASK 12 – Coordination with LACDPR
x	Coordination with LACDPR

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 2016. 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 133 cowbirds were removed from the four traps between March 30 and June 29, 2016. 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 2016 period was treating exotic plant species (such as black mustard [*Brassica nigra*], castor bean [*Ricinus communis*], nonnative thistles, and nonnative brome grasses) with CDFW-approved herbicides. The exotic plant species eradication activities that were conducted in 2016 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 nonnative plant in the Tujunga Ponds. Following manual removal in early January 2012, remaining patches of water lettuce were treated with CDFW-approved herbicide in January, July, August, and September 2012, and again in July and August 2013. A small amount of water lettuce was observed on site in June and August 2016 but was manually removed from the ponds in by biologists and maintenance crews. Spraying was not necessary. Removal activities were documented in the respective exotic wildlife and exotic plant removal memos. No herbicide treatments were applied in 2016. 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 nonnative, invasive wildlife species. Efforts were focused on removal of exotic aquatic wildlife species, primarily American bullfrogs, largemouth bass (*Micropterus salmoides*), red swamp crayfish, and green sunfish (*Lepomis* cyanellus) from perennial waters at the Tujunga Ponds and Haines Canyon Creek. Exotic wildlife removal efforts targeted all life stages of American bullfrogs in an effort to maximize the efficiency of the removal program. Exotic wildlife removal methods were revised in 2016 to increase effectiveness through the addition of removal efforts. A total of eight exotic wildlife removal efforts occurred during the 2016 reporting period. Exotic wildlife removal tasks implemented in 2016 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 7, 2016. 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 2016 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*). Three of these visits were conducted during the regular trails maintenance visits and one visit was conducted during the Trail Cleanup Day site visit to assess fire damage to trails. 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 and reported to LACDPW for repair at a later time. The Tenth Annual Trail Cleanup Day was held on Saturday October 15, 2016. Trail maintenance tasks implemented in 2016 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 2016 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 2016 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 2016, 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 January 18, 2016, during which a damage assessment was conducted after heavy rains occurred in the Mitigation Area on January 5 through 7, 2016. Other damage assessments were conducted in the Mitigation Area after two small fires occurred in and near the Mitigation Area in September and October of 2016. Other activities conducted under this task included coordination with LACDPW to send out an email blast and update signs in the Mitigation Area in response to increased on-site issues. 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 December 8, 2016, with LACDPW to introduce the new Mitigation Area project manager to the Mitigation Area and provide a short tour and explanation of the different ongoing restoration services ECORP is providing. 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.

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 2015. 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 2016, 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, 2016. The methodology, results, and discussion of the 2016 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. At the beginning of the 2016 trapping effort, Trap 2 was moved from the previous location northwest of Cottonwood Avenue to a new location north of Big Tujunga Wash and south of Wheatland Avenue due to the low performance and high instances of vandalism at the previous location.

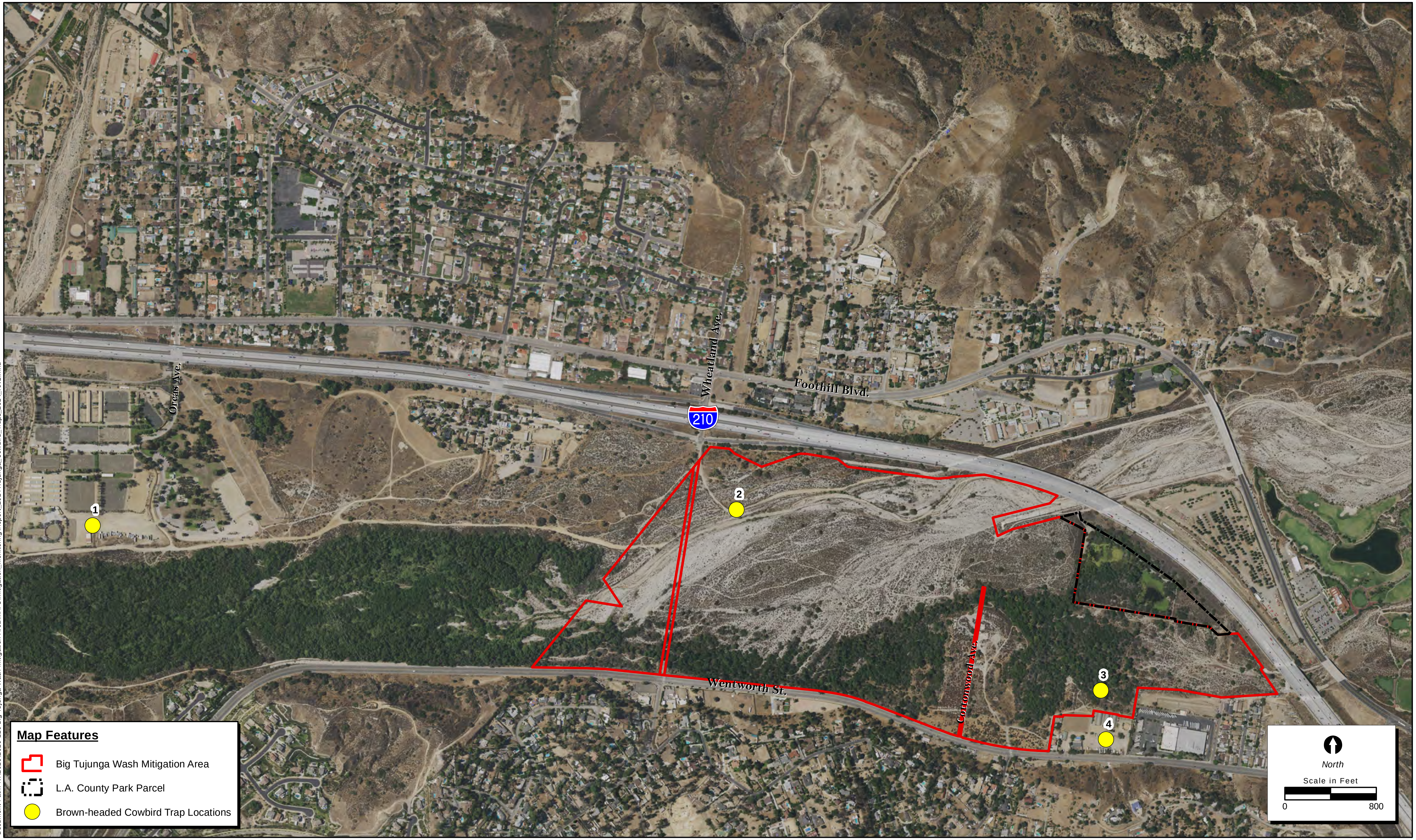

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Figure 2-1. Brown-headed Cowbird Trap Locations

2014-003.015 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 3, 2016. As of April 4, 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, 2016. 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, 2016. 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 133 cowbirds were removed during the 2016 trapping season (47 males, 86 females, and 0 juveniles). Most cowbirds were captured and removed between weeks one and seven (March 30 and May 19) of the 13-week trapping period. No traps were vandalized in 2016.

A total of 134 non-target birds (i.e., all species except brown-headed cowbirds) of four native bird species were captured in the traps. The four non-target species that were captured included California towhee (*Pipilo crissalis*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), and red-winged blackbird (*Agelaius phoeniceus*). Banded cowbirds and/or banded non-target species were not captured during the trapping season. Most non-target birds (133 individuals) captured during the trapping period were released unharmed and in good health. One non-target individual (house finch) was classified as a mortality due to intraspecific competition inside the trap. 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 2016 season is within the range of 2001-2016 numbers. Almost exactly the same number of males were removed in 2016 and 2015, but more than double the number of females were removed in 2016 than 2015. 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. No juvenile brown-headed cowbirds were captured during the 2016 trapping season, indicating that cowbird parasitism was substantially reduced in the study area in 2016.

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 (four), or the dates and duration of cowbird trapping (13 weeks, April 1 to June 30).

3.0 HABITAT RESTORATION PROGRAM

The habitat restoration program was originally established to preserve, improve, and create habitat for Santa Ana sucker, Santa Ana speckled dace (*Rhinichthys osculus* ssp.3), arroyo chub (*Gila orcuttii*), arroyo toad, least Bell's vireo, and southwestern willow flycatcher, all 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, nonnative, 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 nonnative 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). 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 2016 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*
Nonnative weedy thistles	*Cirsium* sp.
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*
Nonnative annual grasses Wild oat Slender wild oats Foxtail chess Ripgut brome Soft chess Mouse barley Italian ryegrass Rabbitfoot grass	 *Avena fatua* *Avena barbata* *Bromus madritensis* *Bromus diandrus* *Bromus hordeaceus* *Hordeum murinum* *Lolium multiflorum* *Polypogon monspeliensis*

Common Name	Scientific Name
Nonnative 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*
Wild lettuce	*Lactuca virosa*
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*

Common Name	Scientific Name
Nonnative annual grasses Red brome Barnyard grass Common wheat	 *Bromus madritensis* ssp. *rubens* *Echinochloa crus-galli* *Triticum aestivum*
Nonnative perennial grasses Perennial veldtgrass Italian rye grass	 *Ehrharta calycina* *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, nonnative 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 2016, Figure 4-1 shows the areas that are considered high priority for targeting exotic plant species.

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2014\Tujunga_Exotic_Plants_2014_rev1.mxd (jlotta 1/24/2017)

Aerial Date: NAIP 2016
1/17/2017

Figure 4-1. High Priority Exotic Plant Removal Locations

2014-003.015 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 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 nonnative grasses during the growing season and prior to deposition of new seeds in the restoration area.

4.2 Exotic Plant Eradication Efforts in 2016

Site-wide exotic plant eradication occurred during three different efforts in 2016: May 9 through 13, May 16 through 19, and May 23 through 24 (first effort); August 16 through 19 and August 22 through 24 (second effort); and November 29 through 30, December 1 through 2, and December 5 through 8 (third effort). ECORP biologists Taylor Dee, Lauren Dorough, and Carley Lancaster 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, active bird nests and/or birds behaving territorial and exhibiting nesting activity were discovered at twelve locations during exotic plant removal activities. The nests were determined to belong to house wren (*Troglodytes aedon*), Bewick's wren (*Thryomanes bewickii*), red-winged blackbird, lesser goldfinch (*Spinus psaltria*), Nuttall's woodpecker (*Picoides nuttallii*) ash-throated flycatcher (*Myiarchus cinerascens*), western bluebird (*Sialia mexicana*), additionally a pair of song sparrows (*Melospiza melodia*) were observed behaving territorially. No birds were observed exhibiting any breeding or nesting behavior during the second exotic plant removal effort. The third exotic plant removal effort took place outside of the nesting season.

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 2013; 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 observed in the East Tujunga pond on two occasions during the 2016 exotic wildlife removal efforts conducted at the site. On the first occasion (June 23, 2016), one of the aquatic biologists observed a patch of water lettuce and the patch was removed by hand. No water lettuce was observed in that location on a follow-up visit on June 30. On August 18, one of the aquatic biologists observed a patch of water lettuce on the northwestern edge of the East Pond. The aquatic biologists immediately reported it to the exotic plant removal biological monitor and the biological monitor had the exotic plant removal crew manually remove the water lettuce from that pond on August 22, 2016. The area was monitored during each subsequent site visit for the remainder of 2016. No other water lettuce was observed during 2016.

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 nonnative fishes, American bullfrogs, turtles, and red swamp crayfish from the Tujunga Ponds (East Pond and West Pond) and Haines Canyon Creek.

In an ongoing effort to protect and enhance the existing habitat at the Mitigation Area for native wildlife species, 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 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.

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

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

In addition, a Santa Ana Sucker Working Group was formed which included representatives from the California Department of Fish and Wildlife (CDFW) and United

States Fish and Wildlife Service (USFWS). The goal of this group is to discuss issues pertaining to the Santa Ana sucker in Haines Canyon Creek and brainstorm on solutions to better aid in the species recovery. After some discussion within the group, a decision was made to allow electrofishing as a removal method for capturing exotic aquatic species in Haines Canyon Creek in 2016, a technique which had not been previously allowed for exotic wildlife removal.

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

The 2016-2017 exotic wildlife removal effort that began in May 2016 is ongoing, with the final effort of the 2016-2017 cycle to take place in April 2017. The data presented in this section of the annual report summarize the results of the exotic wildlife removal efforts conducted in 2016. A full report will be submitted at the end of the contract in April 2017. Copies of each of the 2016 removal effort memos have been compiled and can be found in Appendix F.

6.1 Methodology

The 2016 removal of exotic aquatic species from the Mitigation Area was conducted monthly from May to December, with each month consisting of two to six days for each effort. A wide range of removal methods were used during the 2016 exotic aquatic species removal efforts, including spearfishing, dip-netting, hand capturing, two-person seining, minnow trapping, turtle trapping, and electrofishing. All removal efforts were conducted under the direction of ECORP biologists and USFWS 10(a)(1)(A) Recovery Permit holders for Santa Ana sucker Brian Zitt (TE-27460A-2) and Todd Chapman (TE-110094-3).

Removal efforts in the Tujunga Ponds were conducted from May through November and the removal methods included spearfishing, dip-netting, hand capture, two-person seining, turtle trapping, and electrofishing. Dip-netting, two-person seining, and electrofishing were conducted at the confluence with Haines Canyon Creek and the West Tujunga Pond. Turtle traps were baited with an attractant (i.e., sardines) and remained open overnight. Hand capturing was conducted when necessary while using the other methods. Additionally, during spearfishing activities, any Centrarchid (Sunfish Family) nests were destroyed or removed.

Removal efforts in Haines Canyon Creek were conducted from May through December and the removal methods utilized included spearfishing, dip-netting, hand capturing, two-person seining, minnow trapping, and electrofishing. Prior to using any specific gear types, reconnaissance surveys (visual snorkel surveys) were conducted to identify the locations and relative abundance of both target and non-target species. Occupied Santa Ana sucker reaches were not sampled between March 1 and July 31, 2016 in order to avoid disturbances during the breeding season or potential impacts to juvenile individuals. After July 31st, when Santa Ana sucker were absent within a reach, backpack electrofishing was the preferred removal method; when Santa Ana sucker were present with nonnative species within a reach, the less invasive seining and dip-netting sampling techniques were used. Minnow traps were baited with an attractant (e.g., cat food) and remained open overnight. Hand capturing was conducted when necessary while performing the other methods.

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. All wetted portions of the Mitigation Area were surveyed to locate and remove exotic wildlife (Figure 6-1). The results of the 2016 removal efforts were summarized in monthly exotic wildlife removal memos (Appendix F).

6.2 Results

A total of 22,828 individuals consisting of ten exotic aquatic species (seven fishes, one amphibian, one reptile, and one invertebrate) and three native species were captured during the 2016 removal efforts (Table 6-1). Of the total, 96.5 percent (number of individuals [n]=22,035) of the individuals captured were exotic and removed from the site. Haines Canyon Creek accounted for 98.3 percent of the total catch (n=22,439), while the remaining 1.7 percent were captured in other water features: West Pond (n=173) and East Pond (n=216). Table 6-2 shows the taxonomic groups of individuals captured by month.

Table 6-1. Species Captured During the Exotic Aquatic Species Removal Efforts, 2016

Exotic Species		
Common Name	**Scientific Name**	**Total**
Red swamp crayfish	*Procambarus clarkii*	15,328
Goldfish	*Carassius auratus*	1
Common carp	*Cyprinus carpio*	4
Western mosquitofish	*Gambusia affinis*	5,872
Green sunfish	*Lepomis cyanellus*	290
Bluegill	*Lepomis macrochirus*	126
Largemouth bass	*Micropterus salmoides*	400
Mozambique tilapia	*Oreochromis mossambicus*	1
American bullfrog	*Lithobates catesbeianus*	9
Red-eared slider	*Trachemys scripta elegans*	4
Subtotal		**22,035**
Native Species		
Common Name	**Scientific Name**	**Total**
Santa Ana Sucker	*Catostomus santaanae*	745
Western toad	*Anaxyrus boreas*	8
Baja California treefrog	*Pseudacris hypochondriaca hypochondriaca*	40
Subtotal		**793**
TOTAL		**22,828**

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2014\Tujunga_SamplingLocations_2017.mxd (jlotta 4/19/2017)

Aerial Date: NAIP 2016
4/19/2017

Figure 6-1. Exotic Aquatic Wildlife Survey Locations

2014-003.016 Big Tujunga Wash Mitigation Area

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Table 6-2. Summary of Species Captured by Month, 2016

SPECIES CAPTURED	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Exotic Species									
Red swamp crayfish	1,082	4,696	548	1,551	2,613	1,872	1,142	1,824	**15,328**
Goldfish	1								**1**
Common carp	1	2			1				**4**
Western mosquitofish	139	173	159	376	1,529	909	350	2,237	**5,872**
Green sunfish	16	18	113	62	1	8	43	29	**290**
Bluegill	7	6	5	5	34	20	49		**126**
Largemouth bass	41	51	30	46	40	47	97	48	**400**
Mozambique tilapia					1				**1**
Red-eared slider						3	1		**4**
American bullfrog		5		3				1	**9**
Subtotal	**1,287**	**4,951**	**855**	**2,043**	**4,219**	**2,859**	**1,682**	**4,139**	**22,035**
Native Species									
Santa Ana Sucker	461	44	3	16	164	26	14	17	**745**
Western toad	6	2							**8**
Baja California treefrog	4	36							**40**
Subtotal	**471**	**82**	**3**	**16**	**164**	**26**	**14**	**17**	**793**
TOTAL	**1,758**	**5,033**	**858**	**2,059**	**4,383**	**2,885**	**1,696**	**4,156**	**22,828**

The removal efforts resulted in the capture and removal of 15,328 red swamp crayfish, 5,872 western mosquitofish (*Gambusia affinis*), 400 largemouth bass, 290 green sunfish, 126 bluegill (*Lepomis macrochirus*), 9 American bullfrogs (6 adults and 3 tadpoles), 4 common carp (*Cyprinus carpio*), 4 red-eared sliders (*Trachemys scripta elegans*), 1 Mozambique tilapia (*Oreochromis mossambicus*), and 1 goldfish (*Carassius auratus*).

Additionally, three native species were captured and released during the removal efforts (Santa Ana sucker [n=745], Baja California treefrog [*Pseudacris hypochondriaca hypochondriaca*] [n=40], and western toad [*Anaxyrus boreas*] [n=8]). An additional 972 Santa Ana sucker were observed during the removal efforts in 2016, most notably 121 of these individuals were incidentally observed during the December 2016 removal efforts.

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 have not been 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 2016. 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 APPL Labs in Clovis, California. Analytical results for chlorpyrifos and organophosphorous pesticides via EPA method 8141 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 and in Haines Canyon Creek (leaving the site) 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 2016 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 2016

Results of laboratory analyses conducted by Eurofins, APPL, and Emax 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 7, 2016)

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	18.9	17.5	NA	17.5
Dissolved Oxygen	mg/L	3.1	6.4	NA	9.9
pH	std units	7.03	7.22	NA	8.27
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	0.21	ND	NA	0.27
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	7.9	6.0	NA	4.7
Orthophosphate-P	mg/L	0.019	ND	NA	0.021
Total phosphorus-P	mg/L	ND	0.15	NA	ND
Glyphosate	µg/L	ND	ND	NA	ND
Chloropyrifos*	µg/L	ND	ND	NA	ND
Pesticides (EPA 608)**	µg/L	ND	ND	NA	ND
Turbidity	NTU	0.3	0.4	NA	0.2
Fecal Coliform Bacteria	(MPN/100 ml)	94	79	NA	920
Total Coliform Bacteria	(MPN/100 ml)	240	170	NA	1600

NA – data not available; station dry on the sample date
NTU – nephelometric turbidity units MPN – most probable number ND – non-detect
* The analytical method used for chloropyrifos (EPA 8141A) also tests for the following chemicals: azinphos-methyl, bolster, coumaphos, diazinon, demeton, dichlorvos, disulfoton, ethoprop, fensulfothion, fenthion, mevinphos, naled, phorate, runnel, 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 2016 are summarized in Table 8-3.

Table 8-3. Estimated Flows for November 2016

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
11/7/16	0.4	0.8	station dry on sample date

8.2.2 Comparison of Results with Aquatic Life Criteria

Table 8-4 provides the results of the November 2016 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 2016 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 3.1 mg/L in the Tujunga Ponds to 9.9 mg/L in Haines Canyon Creek leaving the site. DO levels at two stations (outflow from the ponds and Haines Canyon Creek leaving the site) were above the recommended minimum (5.0 mg/L) for warmwater fish species. DO levels in the ponds were below the minimum recommended level for warmwater fish species.
pH	• Lowest pH was observed in the Tujunga Ponds (7.03), with highest pH observed in Haines Canyon Creek leaving the site (8.27). 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 was detectable only in the outflow from the ponds. The observed concentration, 0.15 mg/L, is above 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 (<1 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). Observed fecal coliform levels were below the standard in the ponds and in the outflow from the ponds. On this date, fecal coliform levels in Haines Canyon Creek leaving the site were 920 MPN/100 ml. Sampling specifically for *E. coli* was not conducted. It should be noted that in-creek bathing was observed at this sampling location. • Total coliform levels ranged from 170 MPN/100 ml in the outflow from the ponds to 1,600 MPN/100 ml in Haines Canyon Creek leaving the site. [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.

Three regular trails maintenance site visits were conducted in 2016. These visits occurred on May 6, 2016 (first visit), August 15, 2016 (second visit), and November 28, 2016 (third visit). ECORP biologists Adam Schroeder, Taylor Dee, and Lauren Dorough conducted the trails monitoring visits. A fourth site visit occurred during the Trail Clean-Up Day on October 15, 2016, to assess the damage to trails resulting from a fire in the Mitigation Area. The results of this site visit were included as a memo in the Special Assessments (See Section 12.0).

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.

Aerial Date: NAIP 2016
Map Date: 1/24/2017

Figure 9-1. Trails in the Mitigation Area

2014-003.015 Big Tujunga Wash Mitigation Area

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

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 held on Saturday October 15, 2016. ECORP worked together with LACDPW to modify the flyers that provided the information for the Tenth Annual Trail Cleanup Day. The flyer was posted on LACDPW's website and was also distributed to other interested parties. The flyer was mailed to the people and organizations on the mailing list that is used for the CAC meetings and newsletters. A copy of the flyer distributed to the public is included as Figure 9-2.

The Trail Cleanup Day event was attended by approximately twenty-four volunteers and two project managers from LACDPW. Three biologists from ECORP attended the event to ensure that sensitive resources were not affected by the activities. Various portions of the site were targeted for trash removal during the event, including Haines Canyon Creek and all trails throughout the Mitigation Area. A large amount of trash was removed from throughout the entire Mitigation Area. Some of the larger items removed included a shopping cart, a suitcase, and a piece of picket fence. Photographs taken during the event are included as Figures 9-3 and 9-4.

2016 Trail Cleanup Day

Big Tujunga Wash Mitigation Area

10th Annual Volunteer Event

  

Please join the County of Los Angeles Department of Public Works & ECORP Consulting for a day of service!

DATE: **Saturday, October 15, 2016**

TIME: **8 AM to Noon**
(Please arrive by 8 AM to beat the heat!)

MEETING LOCATION: **Mitigation Area Cottonwood Entrance**
(Located at intersection of Wentworth St. and Cottonwood Ave. Thomas Guide Page 503, C2/3)

Remember to wear comfortable clothing and closed-toed shoes; bring your hat, gloves, sun block and insect repellant!

Water, snacks and trash bags will be provided. Children under 18 years of age must be accompanied by an adult.

<u>Event will be RESCHEDULED for Saturday, October 22, 2016 if there is a National Weather Service forecast of rain.</u> An email blast will be sent to confirm the cancellation. Please contact BTWMA@dpw.lacounty.gov to be added to the list.

Your help and efforts to maintain the habitat restoration of the Mitigation Area are much appreciated! For more information on the Mitigation Area please visit www.dpw.lacounty.gov/wrd/projects/BTWMA.

Figure 9-3. ECORP biologist removing trash from Haines Canyon Creek

Figure 9-4 . Group photo with trash removed from 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 2016, 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 28, 2016. 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 representative 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 2015 and April 2016 (Figure 10-1). The map included locations of rock dams, popular 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 2016 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 2015 to April 2016

Big Tujunga Wash Mitigation Area
L.A. County Park Parcel
Trails

Violation Category

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

Violation ID and Description

1 - Vandalism
2 - Vandalism to Wheatland north fence
3 - Fishing and alcohol drinking
4 - Rock dam
5 - Fallen tree
6 - Trash
7 - Down trees blocking trail
8 - Homeless encampment
9 - Rock dam and trash
10 - Trash (pile of spray cans)
11 - Rock dam and fire pit
12 - Rock dam, rope swing and trash
13 - Branch across trail
14 - Exposed roots and erosion
15 - Homeless encampment
16 - Cut tree
17 - Cut tree
18 - Cut tree
19 - Cut tree
20 - Trash dumping
21 - Rock dam with fake grass
22 - Minor erosion
23 - Minor erosion
24 - Horse circle
25 - Cut tree
26 - Cut tree
27 - Cut tree
28 - Cut tree
29 - Cut tree
30 - Cut tree
31 - Cut tree
32 - Cut tree
33 - Cut tree
34 - Cut tree
35 - Cut tree
36 - Cut tree
37 - Cut tree
38 - Cut tree
39 - Cut tree
40 - Trash and rock dam
41 - Downed tree blocking trail
42 - Trail erosion
43 - Rock dam
44 - 2 rock dams
45 - Cans and painting on tree
46 - Bike tracks
47 - Swing
48 - Rock dam, trash, fire circles
49 - Inundation from storm event
50 - Inundation from storm event
51 - Log blocking trail
52 - Erosion
53 - Erosion
54 - Horse circle
55 - Horse circle

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Photo Source: NAIP 2016
Map Date: 1/24/2017

2014-003.015 Big Tujunga Wash Mitigation Area

Scale in Feet
0 1,000

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Meeting_Maps_and_Analysis\2016-04-19_Violations\BigT_Violations_20160419_ver1.mxd (MAG, DW):jlotta 1/24/2017

Below is a list of major issues discussed during the 2016 CAC meeting.

- Outreach to local Boy Scouts and Girl Scouts for educational outreach opportunities
- High Speed Rail Project
- Site Safety and Security Issues
  - Map of incidents reported within the Mitigation Area
  - Illegal fishing activity in ponds
  - Homeless encampments
  - Sink hole in mitigation area
- General site maintenance activities
  - Creating a rating system for interpreting water quality monitoring results
  - 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

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 2016. 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 2016 contract year because of its success in the years from 2009 to 2015.

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 weekend site visits (Appendix B).

On-site interviews and education about the Mitigation Area were conducted on twelve separate occasions in 2016 by ECORP's bilingual biologists, Alfredo Aguirre, Jerry Aguirre, and Gabriel Nunez. These efforts occurred from May to September 2016. 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 135 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, 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 four non-equestrian users occurred on July 18, 2016. The users were interviewed near the popular picnicking area west of the South Wheatland entrance. Three of them were observed wading in the water with a cooler, appearing to trap fish. The group was not completely receptive during the interview, but accepted pamphlets and left the site shortly after. In general, people that were fishing understood the site rules, but some showed hesitation and were observed continuing to fish at a later time.

A total of 55 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. 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. 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, unauthorized fishing, vegetation removal, and unauthorized fire pits and campfires.

Equestrian site visitors have affected sensitive habitat by traveling off of the established trail system. 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 2016 are included in Appendix L.

12.0 SPECIAL ASSESSMENTS

Four special assessment-related tasks were performed in 2016, including a site visit to document site damage from a heavy rain event, two site visits to document site damage from a nearby brush fire, and a community outreach effort in response to an increase in unauthorized activities in the Mitigation Area.

Heavy rains occurred in the Mitigation Area between January 5 and January 7, 2016. On January 18, 2016, a site assessment was conducted by ECORP biologists Carley Lancaster and Amy Trost to determine if damage had occurred in the Mitigation Area from the rain event. In general, Haines Canyon Creek appeared to have been scoured by the recent rains and the excess sediment was pushed onto the banks in some areas. Natural debris and trash, which appeared to have been washed downstream, was observed throughout the Mitigation Area. In some areas it was apparent that water had flowed across trails but did not appear to have caused any issues. Both Haines Canyon Wash and Tujunga Wash appeared to have been minimally affected by the heavy rains. Native vegetation within the flood path did not appear to be adversely affected by the heavy rains. Vector (mosquito) issues were not observed, nor were any areas of heavy exotic plant species regrowth. A memo documenting the results of the assessment is included in Appendix M.

On September 26, 2016, a small fire broke out near the west end of the Mitigation area. Following the fire, ECORP biologists Lauren Dorough and Ryan Villanueva conducted a site visit on September 30, 2016 to determine if the extent of the fire damage encroached upon the Mitigation Area. Based on the extent of the observed burn area, no fire damage appeared to be evident within the boundary of the Mitigation Area. Because the fire did not appear to impact the Mitigation Area, no immediate actions were necessary. A memo documenting the results of the assessment is included in Appendix M.

On October 9, 2016, a small fire broke out in the southern portion of the Mitigation area. Following the fire, ECORP biologists Carley Lancaster and Taylor Dee conducted a site visit on October 15, 2016, to determine if the extent of the fire damage encroached upon the Mitigation Area and to assess the damage to the trails within the Mitigation Area. Based on the extent of the burn area, fire damage appeared to be evident within the Mitigation Area. The vegetation that was burned included 19 trees and 17 shrubs. Because of the small extent of the fire, ECORP recommended that no additional action be taken and determined that the burned are will likely recover naturally. The area was monitored during subsequent visits for evidence of exotic plant growth, erosion, and unauthorized trail construction. A memo documenting the results of the assessment is included in Appendix M.

In response to an increase in unauthorized activities observed by community members and ECORP staff in the Mitigation Area, ECORP coordinated with LACDPW to send out an email blast on November 10, 2016, to all newsletter recipients requesting their help in reporting unauthorized activities. ECORP also worked with LACDPW to develop new signage to be posted in the Mitigation Area reminding users of the regulations requiring them to refrain from swimming, fishing, or building rock dams in the creek. Copies of the email blast, and signs in English and Spanish are included in Appendix M.

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 December 8, 2016, with Sara Samaan and a LACDPW representative and Lauren Dorough and Kristen (Mobraaten) Wasz from ECORP to introduce the new LACDPW project manager of the Mitigation Area (Ms. Samaan) to the site. ECORP biologists provided a tour of the Mitigation Area, discussed ongoing issues and restoration efforts in the Mitigation Area, provided a site history, and described ongoing programs that ECORP is implementing in the Mitigation Area.

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

14.0 CITY OF LOS ANGELES FIRE DEPARTMENT NOTICE OF NONCOMPLIANCE

On November 27, 2017, LACDPW received a Notice of Noncompliance (NoN) from the City of Los Angeles Fire Department (Fire Dept.) regarding brush clearing requirements for the Mitigation Area. The NoN stipulated that all weeds and other vegetation must be maintained within 10 ft of any roadway and 200 ft of all structures. Areas of concern within the Mitigation Area include areas adjacent to Wentworth Avenue and north of Gibson Ranch. On October 13, 2015, a reconnaissance level-site visit was conducted by ECORP biologist Amy Trost and Natures Image senior technician Luis Lopez to determine the level of effort that would be required to fulfill the Fire Dept. request while also preserving the site's integrity as an area designated for LACDPW's mitigation requirements. A memo detailing the Fire Dept. requirements and ECORP's recommendations were included in Appendix Q of the 2015 annual report (ECORP 2015). ECORP's staff continued to provide recommendations on weeding and trimming activities in response to the NoN in 2016. LACDPW is currently working with CDFW on this matter.

15.0 REFERENCES

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2016 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.

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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.

[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.

2016 2015 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. March 2016.

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Safford, J. M., and R. Quinn

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[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.

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

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.

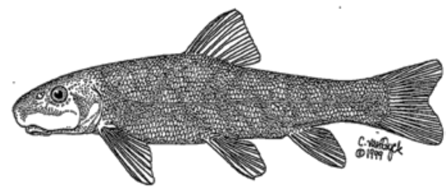
Con el tiempo la isla se ha hecho más pequeña. Big T es sensible a los cambios de su hábitat. Estos cambios pueden causar que un hábitat tan importante desaparezca. Cuando esto sucede los animales y las plantas también pueden desaparecer.

There is no place like Big T

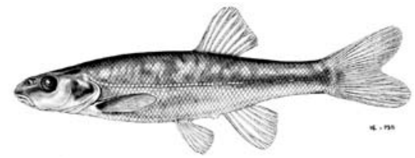
Big T is unique because of the plants and animals that live here. Several of these animals are so rare that regulations have been made to protect where they live. This means that the plants, water, soil, and rocks that make up their homes (or habitat) must not be disturbed or altered.

No hay lugar como Big T

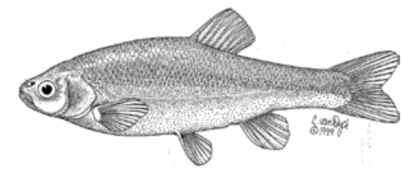
Big T es único por las plantas y los animales que viven aquí. Varios de estos animales son tan únicos que se han hecho regulaciones para proteger el lugar donde viven. Esto significa que las plantas, el agua, la tierra, y las piedras que componen sus hogares (o hábitat) no debe ser dañado.



Santa Ana sucker
(*Catostomus santaanae*)

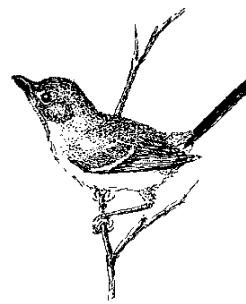


Santa Ana speckled dace
Carpita pinta
(*Rhinichthys osculus*)



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?

No dams/No presas

APPENDIX C

Plant and Wildlife Compendia

2016 Big Tujunga Wash Mitigation Area Master Plant List

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
*Euphorbia maculata * (=Chamaesyce maculata)*	spotted spurge
Croton californicus	croton
*Euphorbia peplus**	petty spurge
*Ricinus communis**	castor bean
FABACEAE	**LEGUME FAMILY**
Acmispon glaber (= Lotus scoparius)	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 apiana	white sage
Salvia mellifera	black sage
Stachys sp.	hedge nettle
LOASACEAE	**LOASA FAMILY**
Mentzelia laevicaulis	smoothstem blazingstar
MALVACEAE	**MALLOW FAMILY**
Malacothamnus davidsonii (List 1.B2)	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**
Argemone munita	prickly poppy
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

Scientific Name	**Common Name**
Pterostegia drymarioides	California thread-stem
Rumex sp.	dock
*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

Scientific Name	**Common Name**
ASPHODELACEAE	**ALOE FAMILY**
Aloe sp.*	aloe vera
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
Pennisetum setaceum	African fountain grass
*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	

2016 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*
INSECTA	**INSECTS**
DIPTERA	**FLIES**
Culicidae family	Mosquito sp.
HYMENOPTERA	**ANTS, BEES, AND WASPS**
Apis mellifera	Honey bee
Formicidae family	Red ant
Pepsis chrysothymus	Tarantula hawk
ODONATA	**DRAGONFLIES AND DAMSELFLIES**
Anisoptera suborder	Dragonfly sp.
VERTEBRATES	
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*
POECILIIDAE	**LIVEBEARERS**
Gambusia affinis	western mosquitofish*
AMPHIBIANS	
BUFONIDAE	**TRUE TOADS**
Anaxyrus boreas	western toad
HYLIDAE	**TREEFROGS**
Pseudacris hypochondriaca	Baja California treefrog
RANIDAE	**TRUE FROGS**
Lithobates catesbeianus	American bullfrog*

Scientific Name	**Common Name**
REPTILES	
COLUBRIDAE	**EGG-LAYING SNAKES**
Masticophis flagellum	coachwhip
Pituophis catenifer	gopher snake
EMYDIDAE	**SLIDERS**
Trachemys scripta elegans	red-eared slider*
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
ALCIDINIDAE	**KINGFISHERS**
Megaceryle alcyon	belted kingfisher
ANATIDAE	**DUCKS, GEESE AND SWANS**
Anas americana	American wigeon
Anas platyrhynchos	mallard
Aythya collaris	ring-necked duck
Branta canadensis	Canada goose
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
Egretta thula	snowy egret
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**

Scientific Name	**Common Name**
Columba livia	rock pigeon*
Zenaida macroura	mourning dove
CORVIDAE	**JAYS, CROWS, AND THEIR ALLIES**
Aphelocoma californica	California scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
EMBERIZIDAE	**SPARROWS AND THEIR ALLIES**
Aimophila ruficeps	rufous-crowned sparrow
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculatus	spotted towhee
Zonotrichia leucophrys	white-crowned sparrow
FRINGILLIDAE	**FINCHES**
Carduelis psaltria	lesser goldfinch
Carpodacus mexicanus	house finch
HIRUNDINIDAE	**SWALLOWS**
Hirundo rustica	barn swallow
Petrochelidon pyrrhonota	cliff swallow
Stelgidopteryx serripennis	northern rough-winged swallow
Tachycineta bicolor	tree swallow
ICTERIDAE	**BLACKBIRDS AND ORIOLES**
Agelaius phoeniceus	red-winged blackbird
Molothrus ater	brown-headed cowbird*
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
PARULIDAE	**WOOD-WARBLERS**
Geothlypis trichas	common yellowthroat
Setophaga coronata	yellow-rumped warbler
Setophaga petechial	yellow warbler
Setophaga townsendii	Townsend's warbler
Wilsonia pusilla	Wilson's warbler
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

Scientific Name	**Common Name**
Picoides villosus	hairy woodpecker
PODICIPEDIDAE	**GREBES**
Podilymbus podiceps	pied-billed grebe
POLIOPTILIDAE	**CREEPERS AND GNATCATCHERS**
Polioptila caerulea	blue-gray gnatcatcher
RALLIDAE	**RAILS**
Fulica americana	American coot
REGULIDAE	**KINGLETS**
Regulus calendula	ruby-crowned kinglet
STRIGIDAE	**OWLS**
Bubo virginianus	great horned owl
STURNIDAE	**STARLINGS AND MYNAS**
Sturnus vulgaris	European starling*
SYLVIIDAE	**WRENTITS**
Chamaea fasciata	wrentit
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna’s hummingbird
Selasphorus sasin	Allen’s hummingbird
TROGLODYTIDAE	**WRENS**
Campylorhynchus brunneicapillus	cactus wren
Thryomanes bewickii	Bewick’s wren
Troglodytes aedon	house wren
TURDIDAE	**BLUEBIRDS**
Catharus guttatus	hermit thrush
Sialia mexicana	western bluebird
Turdus migratorius	American robin
TYRANNIDAE	**TYRANT FLYCATCHERS**
Contopus sordidulus	western wood-pewee
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say’s phoebe
Tyrannus vociferans	Cassin’s 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*

Scientific Name	**Common Name**
LEPORIDAE	**HARES AND RABBITS**
Syvilagus audubonii	desert cottontail
MURIDAE	**MICE AND RATS**
Neotoma fuscipes	dusky-footed woodrat
SCIURIDAE	**SQUIRRELS**
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

2016 Brown-headed Cowbird Trapping Report

2016 BIG TUJUNGA WASH MITIGATION AREA

BROWN-HEADED COWBIRD CONTROL PROGRAM

GRIFFITH WILDLIFE BIOLOGY

2016 BIG TUJUNGA WASH MITIGATION AREA

BROWN-HEADED COWBIRD CONTROL PROGRAM

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EXECUTIVE SUMMARY

Four cowbird traps were operated in the vicinity of the Big Tujunga Wash Mitigation Area near Hansen Dam in 2016. 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 3, and 3 males and 5-6 female decoys as of April 4 and subsequently.

One hundred thirty-three (133) cowbirds were removed, including 47 males, 86 females, and 0 juveniles. The 2001-2016 average is 116.1 (54.9 males, 57.8 females, 3.8 juveniles; r=20-211).

The male: female capture ratio was 0.55:1. Most of the adult cowbirds were captured in weeks 1-7 (54% of the trapping period): 44/47 males (93.6%) and 85/86 females (98.8%). No banded cowbirds or other banded birds were captured. The traps were not vandalized in 2016.

In addition to cowbirds, 134 non-target birds of 4 different species were captured, of which all but 1 (0.75%) 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.

<u>Key words:</u> 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*).

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INTRODUCTION

The objective of this study was to remove brown-headed cowbirds (*Molothrus ater*, cowbird) from riparian habitat at Big Tujunga Wash Mitigation Area near Hansen Dam to decrease or eliminate cowbird brood parasitism among the federally endangered least Bell's vireo (*Vireo bellii pusillus*, vireo) and southwestern willow flycatcher (*Empidonax traillii extimus*), and other riparian host species present. Similar mitigation trapping was previously performed in 2001-2006 and 2009-2015.

Least Bell's Vireo

The least Bell's vireo is a small gray and white migratory songbird that winters in the Cape District of Baja California Sur, Mexico and nests in willow-dominated riparian habitat in central and southern California and northwestern Baja California, Mexico. Vireos arrive in breeding habitat in mid March through early April, initiate most nests by mid to late April, and fledge most young by late May to mid June. Multiple nesting attempts (2-7) after nest failure are common. Very few nests are initiated in July, although early August fledge dates are not unusual. Double brooding is not uncommon. Nest building usually takes 4 days. The typical clutch of 3-4 eggs is incubated for 14 days; the young fledge 12 days after hatching. Young vireos can forage on their own after 2-3 weeks, although family groups may remain associated into August or September, when they depart for points south (Griffith and Griffith 2000).

The vireo was formerly abundant and bred as far north as Red Bluff in Tehama County (about 130 miles north of Sacramento, and about 500 miles north of the Hanson Dam Basin) (Cooper 1874), but due to habitat loss (agriculture, flood control, livestock) (Smith 1977, USFWS 1986, Wilbur 1981) and brood parasitism by the brown-headed cowbird, by the 1940's there was "a noticeable decline in numbers... apparently coincident with an increase of cowbirds" (Grinnell and Miller 1944). Due to their nest size, shape, and location "No birds are more frequently parasitized either absolutely or relatively [than the least Bell's vireo]" reported Dawson (1923), an observation echoed by Hanna (1928) and Rowley (1930). Meanwhile, in 1933 Willet observed that "the increase of the cowbird in southern California during the past 20 years has been remarkable, in fact unparalleled by any of our native birds", a situation that was true statewide by 1944 (Grinnell and Miller). By 1970, cowbirds had extirpated vireos from the Central Valley, and vireos were found in only a few locations in southern California (Gains 1974). Surveys of 158 locations where vireos were abundant prior to 1915 were performed in 1977-78; only 90 breeding territories were located in 31 of the 158 sites (all in southern California), and half of the nests located contained cowbird eggs (Goldwasser et al 1980). Because of the persistent cowbird parasitism and associated low reproductive success causing local extirpations of populations already reduced and fragmented by habitat loss, the least Bell's vireo was declared an endangered species by the California Department of Fish and Wildlife (CDFW) in 1980 and by the United States Fish and Wildlife Service (USFWS) in 1986.

After listing and with habitat protection and cowbird trapping, first-year vireos dispersed from extant populations and began to reoccupy drainages and habitat that had been vacant for decades, expanding slowly northward, with colonizers usually settling within 10 km of their natal home ranges (Griffith and Griffith 2000). New colonizers in suitable habitat established new populations, existed in low numbers, or were extirpated within a few years, depending upon two factors: distance from source populations, and more importantly, whether or not cowbird trapping was implemented.


Willow-dominated vireo habitat at the Santa Ana River.


Former vireo habitat at the lower Santa Ana River


Adult male vireo on nest.


Vireo nest hung in mulefat (*Bacharis salicifolia*)


Hatch-day vireo chick


Hatch-day cowbird chick in vireo nest

Habitat is a critical component for any species, and habitat loss decidedly decimated the historic vireo population. However, throughout the decades-long decline, at the time the vireo was listed as endangered, and today, there were and are thousands of acres of vacant, vireo-quality riparian habitat available. It appears that persistent cowbird brood parasitism, not habitat loss or degradation, caused the endangered status of the least Bell's vireo, and that cowbird trapping (in suitable/ protected habitat) is the primary cause of the ongoing recovery. The goal of the vireo recovery plan is the reestablishment of the vireo in the Central Valley, the center of the vireo's historic range (USFWS 1998).


Vireo nestlings 3 days after hatching


12-day-old vireo chicks ready to fledge.

Southwestern Willow Flycatcher

The southwestern willow flycatcher (swfl) was listed as endangered by the USFWS in February 1995 for reasons similar to those cited for the least Bell's vireo: severe habitat loss and degradation exacerbated by cowbird brood parasitism. Other factors (wintering habitat, more specific habitat needs, more sensitivity to disturbance) also contributed to the decline of the swfl.

Southwestern willow flycatcher (image courtesy of Utah Dept. of Natural Resources)

The swfl is one of four *Empidonax traillii* subspecies that occur in the United States and one of three that occur in Southern California during migration. The only reliable way to discern between the three subspecies in the field is by breeding chronology and geography: if a willow flycatcher breeds in Southern California or is reliably territorial after 21 June, it is *E. t. extimus*. All other sightings before or after could be, and likely are (based upon their much larger populations) northbound or southbound migratory *E. t. brewsteri* or *E. t. adastus*.

In southern California, flycatchers nest in habitat similar to that of the least Bell's vireo, although often near running water and with larger canopy trees, and their general breeding biology is similar but 1-2 months "behind" the vireo. Willow flycatchers arrive on breeding grounds from late April through mid-June. Nests are active from mid to late May through early August. Double brooding is uncommon. Most breeding habitat is vacated by mid-September. Extensive information regarding flycatcher natural history and legal status is available in Tibbetts et al (1994) and USFWS (1995).

Yellow-breasted Chat and Yellow Warbler

The yellow-breasted chat and yellow warbler are migratory songbirds that breed in willow-dominated riparian woodland in southern California. Both are listed by the CDFW as California Species of Special Concern (SSC) (CDFW 2009) due to declining numbers and local extirpations, again associated with habitat loss and cowbird brood parasitism. The USFWS and CDFW consider the yellow-breasted chat and yellow warbler as "indicator species" for the vireo and to a lesser degree, the flycatcher. That is, their presence indicates that the habitat is of a type and quality suitable for use by the vireo and flycatcher.


yellow-breasted chat nest


yellow-breasted chat nestlings

Brown-headed Cowbird

The brown-headed cowbird is an obligate 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 loosely 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, including the vireo, generally do not.

Cowbirds were first documented in California at Borrego Springs, San Diego County, in 1896; the first cowbird egg found in California was in a 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 likely would not have reached the Far West without the unwitting aid of man. 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 often hatch but then are simply smothered or starve to death. 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, flycatcher, and California gnatcatcher (*Polioptila californica californica*) can raise only a cowbird chick and none of their own young from parasitized nests (Grzybowski 1995). For these small hosts, parasitism and predation have the same result (no young produced), but after predation or other natural nest failures, the host pair often successfully re-nest in 2-14 days, while a parasitism event consumes the time and energy of an entire breeding season (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.

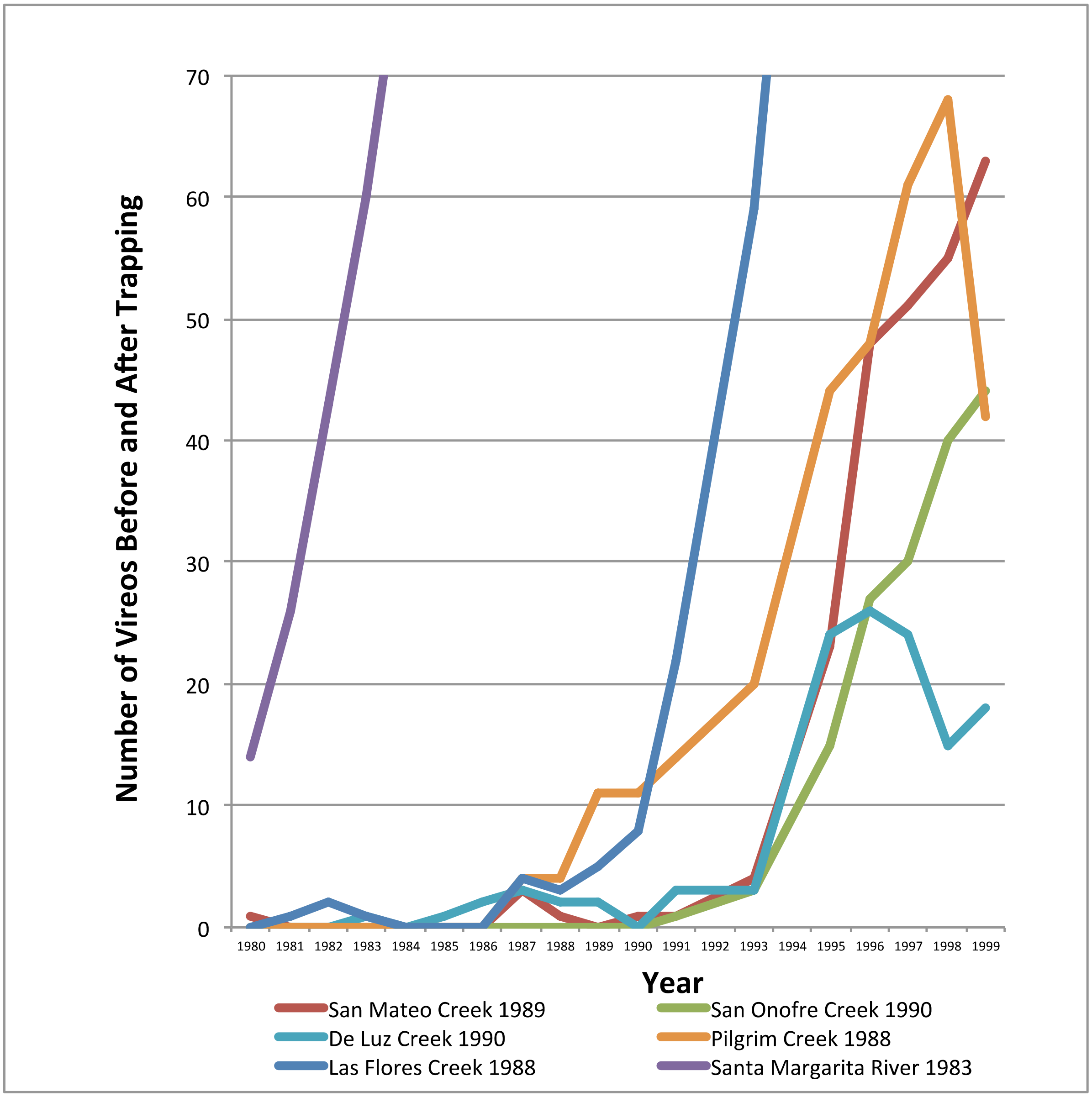
Cowbird chick and smothered/starved gnatcatcher chick.

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. As regards the vireo, each effort is almost meaningless without the other. Cowbird parasitism can be eliminated from any targeted area by topical trapping: operating about one cowbird trap per mile along a typical riparian corridor during the vireo breeding season (minimally 1 April – 30 June; non-breeding season trapping can also be helpful). More traps are used 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 at or near 0%. The entire avian host community benefits from trapping, not just the primary target species (unlike nest monitoring and cowbird egg removal). For vireos, cowbird trapping increases per-pair productivity from ~1.3 young per pair to ~3.5 per pair; the difference between decreasing populations/ extinction and increasing populations/ recovery (Griffith and Griffith 2000).

The effectiveness of topical trapping (and the limited range of each trap) is best illustrated with data from Marine Corps Base Camp Pendleton, California, where every individual and pair of vireo, and nearly every vireo nest, was known from 1980-1999 (Griffith and Griffith 2000). During the same period, the number and location of cowbird traps grew from 5 traps on one drainage to 40 traps on 6 drainages. Data from these de facto experiments established that about one trap per mile eliminates parasitism and fewer traps do not (e.g., the effective range of each trap is about ½ mile radius). The data conclusively demonstrate that without trapping, vireos are absent or sporadically present in low numbers in suitable habitat for years, even when quite near to occupied habitat where parasitism has been eliminated and the vireo population is large and growing (Santa Margarita River). Conversely, with trapping (see following page; year begun at each drainage shown), new subpopulations become established: dispersing vireos protected from parasitism reproduce successfully, increase in number until the drainage capacity is reached, and ultimately become "source populations" themselves (produce more fledglings each year than settle in the drainage).

Exhibit 1. Vireo population growth at six drainages before and after cowbird trapping at Marine Corps Base Camp Pendleton, California. Note nearly identical growth slopes as vacant habitat is occupied.



Data from 1980-1999 (GWB 1987-1999), when Base-wide vireo surveys were performed annually. All individuals and pairs were located, and nearly all nests were located and monitored. Cowbird trapping was performed starting in 1983, at first only at the SMR (5 traps) and ultimately at all 6 major drainages on Base (40 traps). The number of vireos increased from 15 on 2 drainages in 1980 to 779 on 6 drainages in 1999. These comprehensive distribution, nesting, parasitism, and trapping data and experiments, repeated elsewhere, conclusively demonstrate that vireos do not recover without cowbird trapping (about 1 trap per mile of linear habitat).

Cowbird 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 breeding. Female cowbirds must mate prior to laying each egg. 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 and remove as many females as possible and achieve a capture sex ratio at or below 1:1.

“Cowbird Control” has not been accomplished unless 1) Few or no cowbirds are detected during the breeding season in trapped areas during formal or informal surveys, censuses, and point counts, and 2) The parasitism rate among host species decreases from pre-trapping levels to near zero, as evidenced by finding few/no cowbird eggs or young in host nests, few/no cowbird fledglings in host family groups, and few/no juvenile cowbirds are captured in the trapped area in June, resulting in 3) The absence of cowbird parasitism, increases in host productivity, and increasing/ expanding/ recovering rather than decreasing/ extirpated/ endangered populations. If the three consequences noted above are not recorded (the first two immediately), then efforts to reduce cowbird parasitism (trapping, shooting, netting) may have been performed, to some positive effect, but “cowbird control” has not been accomplished (Griffith and Griffith 2000).

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; and fewer non-target species enter traps when large numbers of decoys are utilized (GWB 1992). Therefore, at least 2 male and 3 female decoy cowbirds are utilized in each trap (often 3m/5-6f).

The capture of non-target birds (non-cowbirds) is undesirable yet unavoidable. Many non-target birds are less hardy than cowbirds and can die due to the stress of confinement or handling. To reduce non-target captures, the capture slot is only 1 3/8 inches wide (large enough for cowbirds, small enough to exclude many larger 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), bait seed without sunflower seed is utilized (sunflower seed attracts some non-target species but not cowbirds; cowbirds prefer millet), and as possible, large decoy flocks are utilized. To reduce non-target mortality and per state live-trap law, the traps are checked daily and non-target species are handled with care and released immediately.

The goal of trapping programs is to achieve 0% non-target species mortality; when >100 individuals are captured, 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 2009-2016. 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.

Additional cowbird traps were also operated downstream of the study area at Hansen Dam Basin (2 traps) in 1996, 1997, and 2001-2016 (GWB 2016), and upstream of Interstate 210 at Angeles National Golf Course (3 traps) in 2008-2016 (GWB 2016a).

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 stable 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 (Figures 2-4). 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 3, and 3 males/ 5-6 females as of April 4 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 on 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.T. Griffith, K. Griffith, and E. Sanchez.

RESULTS

One hundred thirty-three (133) cowbirds were removed in 2016, including 47 males, 86 females, and 0 juveniles (Table 1, Table 2). The male: female capture ratio was 0.55:1. No banded cowbirds or other banded birds were captured. The first cowbirds were captured on April 2 in Trap 3 (4 males, 1 female) and Trap 4 (4 females). 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 (March 30 – May 19; 54% of the trapping period), 44/47 males (93.6%) and 85/86 females (98.8%) were removed (Figure 5).

All trap sites except Trap 2 performed well and should be utilized in 2016. Trap 3 removed the most total cowbirds (75) and females (54); Trap 4 removed the most males (22, one more male than Trap 3) as well as 30 females.

In addition to cowbirds, 134 non-target birds of 4 species were captured, of which all but 1 (0.75%) were released unharmed (Table 3). 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.

The traps were not vandalized in 2016. 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

Almost exactly the same number of males were removed in 2016 (47) and 2015 (48), but more than double the number of females were removed in 2016 (86) than 2015 (41). The 2001-2016 average is 54.9 males (r=9-103), 57.8 females (r=11-111), and 3.8 juveniles (r=0-18). 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 = Traps 3 and 4) and not along the river (where cowbird density is low, but where the females captured are those breeding in the immediate area = Traps 1 and 2). The Mitigation Area foraging area traps are immediately adjacent to the riparian habitat, so they are also defacto riparian area traps so their abundant captures are hugely impactful.

The removal of 86 females in 2016 precluded up to 3,440-5,160 parasitism events (40-60 eggs per female) allowing the production of as many as 13,760-20,640 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, especially for the disproportionately targeted vireo.

Locally raised cowbirds are easily and quickly captured after fledging, and are therefore good indicators of the efficacy of a trapping program. No juveniles were captured in 2016, indicating that cowbird parasitism was eliminated in the study area in 2016.

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 immediately return to extirpation-causing 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. <u>Note: Traps 1 and 2 (downstream riparian areas) capture fewer cowbirds than Traps 3 and 4 (upstream foraging and riparian areas), but Traps 1 and 2 are targeting the cowbirds breeding in the immediate area of these two downstream traps, cowbirds not likely be captured in the two upstream traps; see discussion above.</u>

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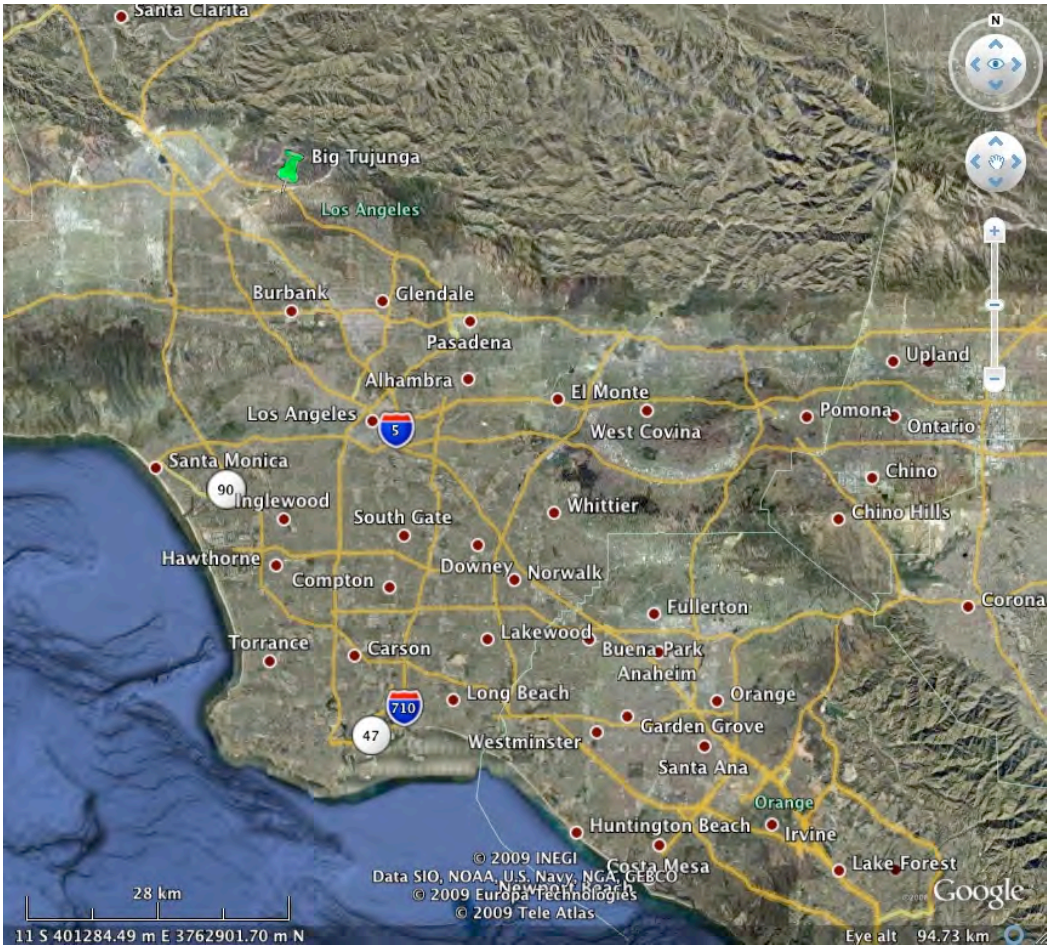
Figure 1. 2016 Big Tujunga Wash Mitigation Area brown-headed cowbird control project study area.



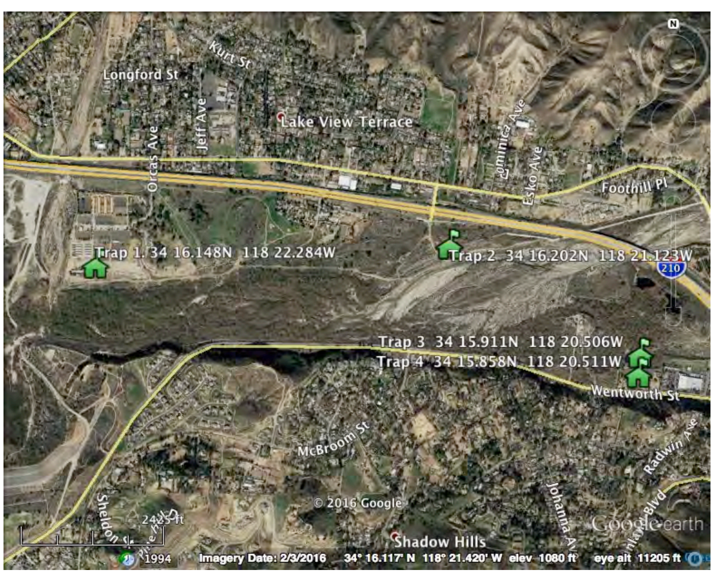


Figure 2. 2016 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 1 location.

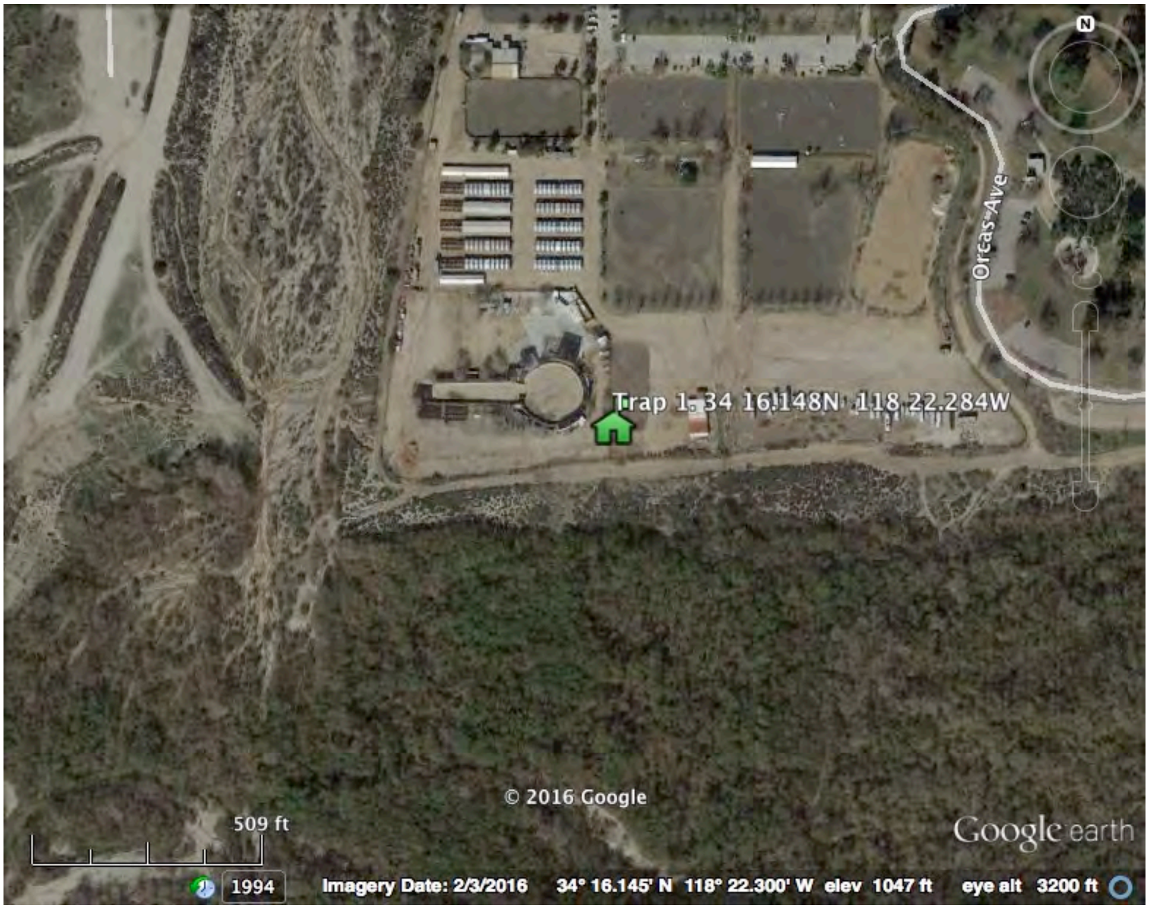


Figure 3. 2016 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 2 location.

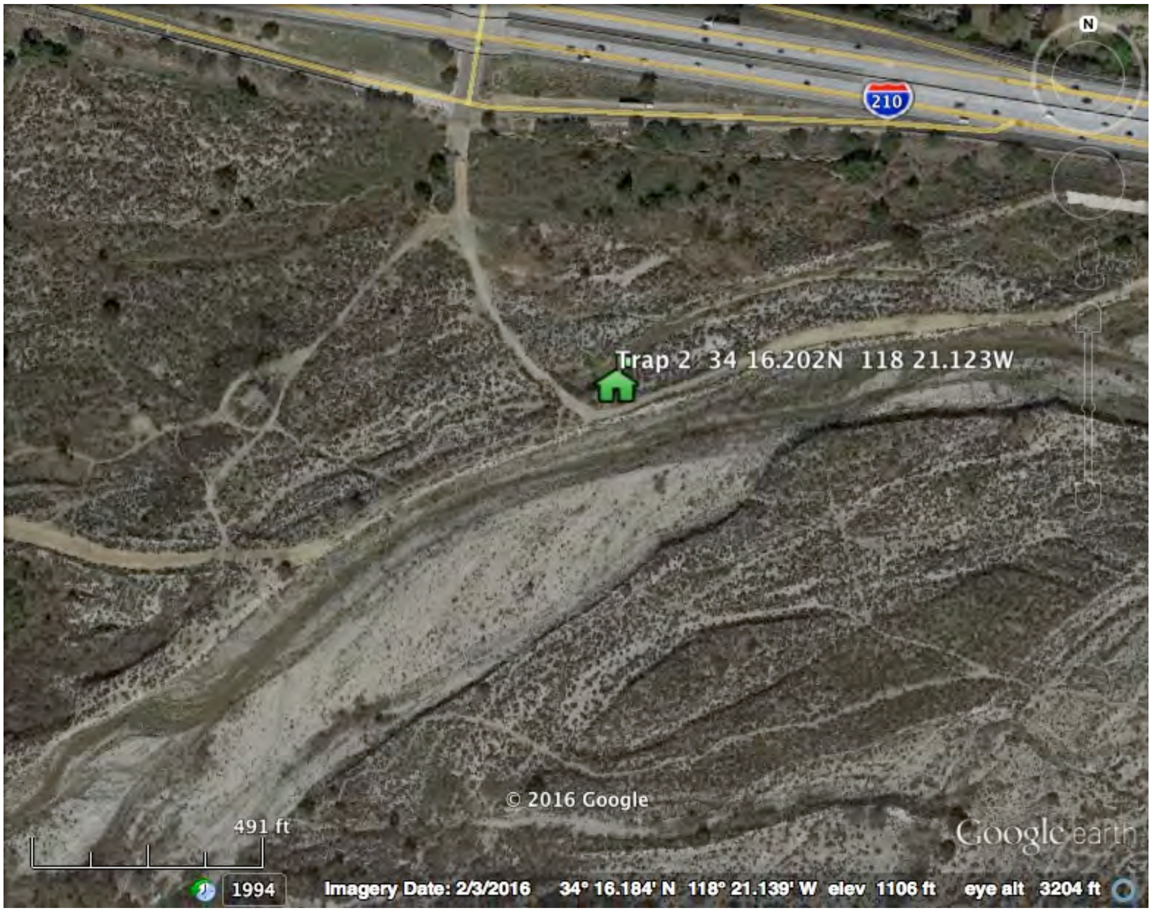
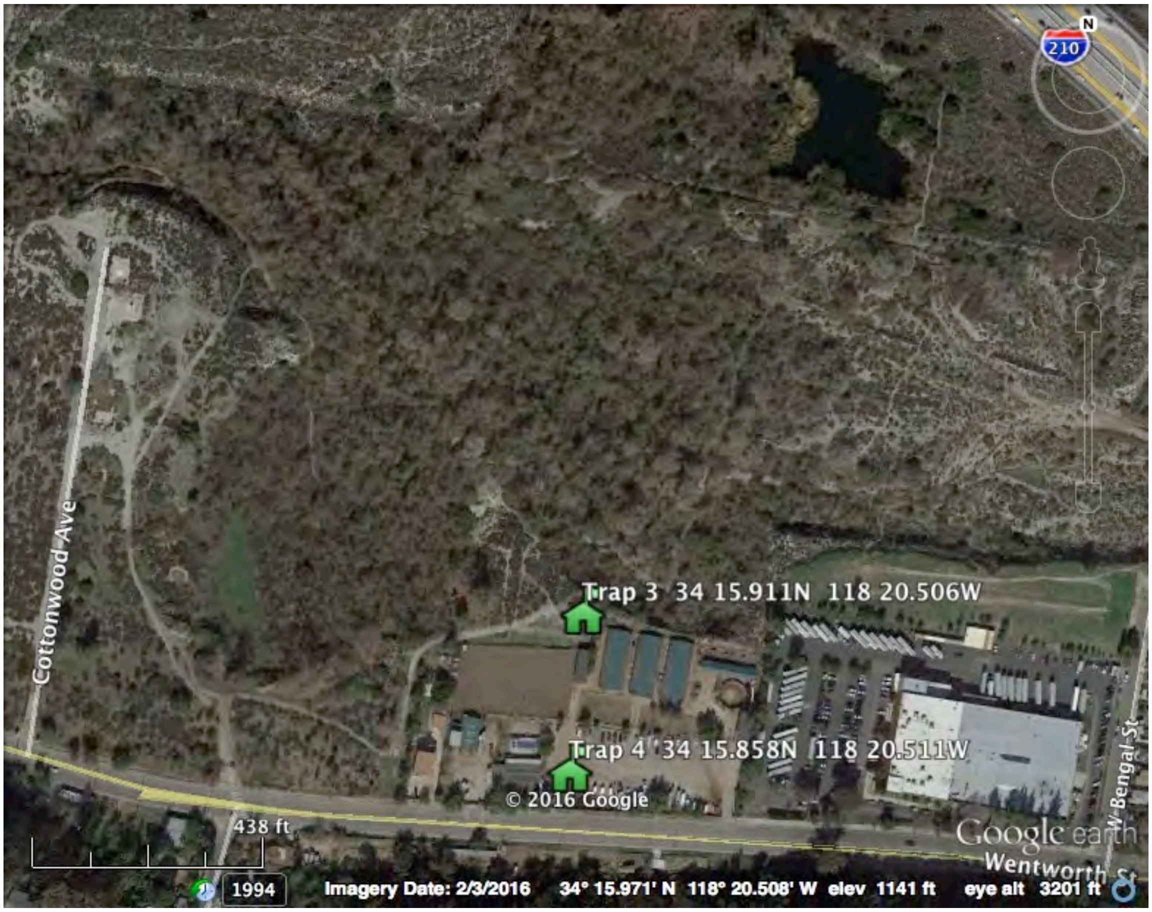


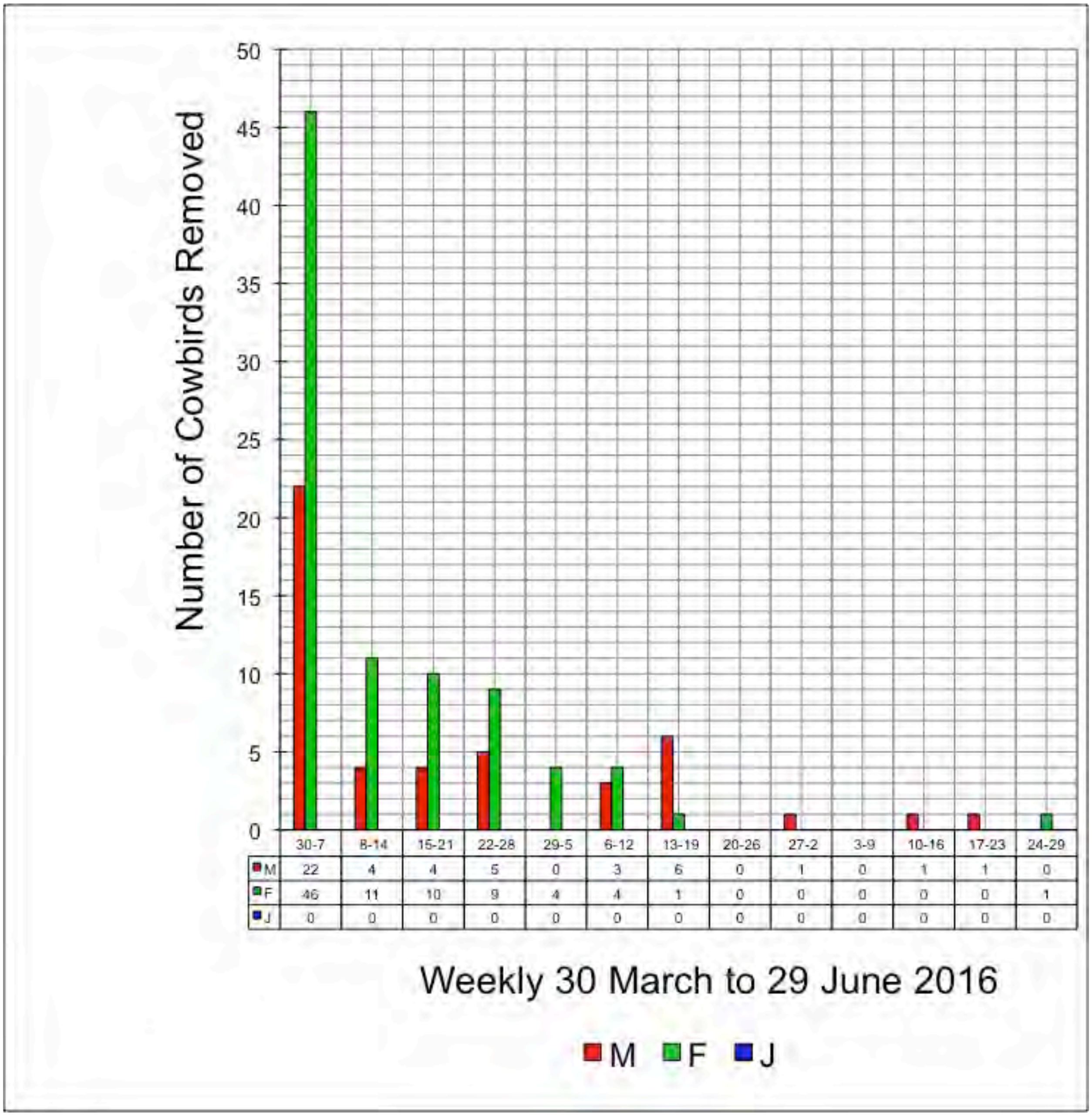
Figure 4. 2016 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 3-4 locations.



T3

T4

Figure 5. 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 2016.



	30-7	8-14	15-21	22-28	29-5	6-12	13-19	20-26	27-2	3-9	10-16	17-23	24-29
M	22	4	4	5	0	3	6	0	1	0	1	1	0
F	46	11	10	9	4	4	1	0	0	0	0	0	1
J	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 1. Number of brown-headed cowbirds captured at and in the vicinity of Big Tujunga Wash Mitigation Area, 2001-2016.

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
2016	4	3/30 - 6/29	47	86	0	133	33.25	0.55
TOTAL	71		768	805	53	1626	22.90	0.95
AVG	5.5		54.9	57.5	3.8	116.1	21.3	1.0

2001-2005: Chambers Group, Inc. 2005
2006-2015: Griffith Wildlife Biology (GWB) 2006-2015

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 2016.

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							4	11			4		4	15	0
3							4	11		1			5	11	0
4							6	10		2	1		8	11	0
5										4	5		4	5	0
6							1						1	0	0
7		1						2			1		0	4	0
wk 1	0	1	0	0	0	0	15	34	0	7	11	0	22	46	0
8								1					0	1	0
9								2					0	2	0
10													0	0	0
11											1		0	1	0
12										2	1		2	1	0
13							2	2			2		2	4	0
14											2		0	2	0
wk 2	0	0	0	0	0	0	2	5	0	2	6	0	4	11	0
15											1		0	1	0
16								1					0	1	0
17											1		0	1	0
18										1	1		1	1	0
19								1		1	2		1	2	1
20													0	0	0
21							2	3					2	3	0
wk 3	0	0	0	0	0	0	2	5	0	2	5	0	4	10	0
22								1		1			1	1	0
23													0	0	0
24								1					0	1	0
25										1			1	0	0
26								1		2	3		2	4	0
27				1	1			1			1		1	3	0
28													0	0	0
wk 4	0	0	0	1	1	0	0	4	0	4	4	0	5	9	0
29								2					0	2	0
30													0	0	0
May 1													0	0	0
2								1					0	1	0
3													0	0	0
4													0	0	0
5								1					0	1	0
wk 5	0	0	0	0	0	0	0	4	0	0	0	0	0	4	0
6										1	1		1	1	0
7											1		0	1	0
8													0	0	0
9	1							1			1		1	2	0
10													0	0	0
11										1			1	0	0
12													0	0	0
wk 6	1	0	0	0	0	0	0	1	0	2	3	0	3	4	0
13													0	0	0
14							1	1					1	1	0
15													0	0	0
16													0	0	0
17													0	0	0
18										5			5	0	0
19													0	0	0
wk 7	0	0	0	0	0	0	1	1	0	5	0	0	6	1	0
20													0	0	0
21													0	0	0
22													0	0	0
23													0	0	0
24													0	0	0
25													0	0	0
26													0	0	0
wk 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27													0	0	0
28													0	0	0
29													0	0	0
30													0	0	0
31													0	0	0
Jun 1													0	0	0
2							1						1	0	0
wk 9	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
3													0	0	0
4													0	0	0
5													0	0	0
6													0	0	0
7													0	0	0
8													0	0	0
9													0	0	0
wk 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10													0	0	0
11													0	0	0
12													0	0	0
13	1												1	0	0
14													0	0	0
15													0	0	0
16													0	0	0
wk 11	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
17													0	0	0
18	1												1	0	0
19													0	0	0
20													0	0	0
21													0	0	0
22													0	0	0
23													0	0	0
wk 12	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
24													0	0	0
25													0	0	0
26											1		0	1	0
27													0	0	0
28													0	0	0
29													0	0	0
30													0	0	0
wk 13	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
TOTAL	**3**	**1**	**0**	**1**	**1**	**0**	**21**	**54**	**0**	**22**	**30**	**0**	**47**	**86**	**0**

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 2016.

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					3									
RWBL											1			
HOFI							1						2	
HOSP	6		7		3		7		20		15		26	
TOTAL	6	0	7	0	6	0	8	0	20	0	16	0	28	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			1		3		1						**8**	**0**
RWBL													**1**	**0**
HOFI			1					1					**4**	**1**
HOSP	16		4		4		4		6		2		**120**	**0**
TOTAL	16	0	6	0	7	0	5	1	6	0	2	0	**133**	**1**

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

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

Appendix 1. Warning/informational sign placed on cowbird traps at Big Tujunga Wash Mitigation Area in 2016.

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

June 3, 2016
(2014-003.015/002/2)

Mayra Cabrera
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 (May 2016) 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 first phase exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during May 2016. A pre-activity reconnaissance site visit and nesting bird survey was conducted on May 6, 2016 by ECORP Consulting, Inc. (ECORP) biologist Carley Lancaster. 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. Two areas were documented to contain active bird nests or birds exhibiting breeding behavior within the weeding areas during the pre-activity survey. A house wren (*Troglodytes aedon*) was observed singing near and entering and exiting a tree-hole within a western sycamore (*Platanus racemosa*) in the upland area west of the Cottonwood Avenue entrance, an active nest was presumed to be located inside (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 376241 E, 3792358 N). In addition, a red-winged blackbird (*Agelaius phoeniceus*) was observed acting territorial near Tujunga Ponds. It is presumed that a nest was located within or near the peripheral cattails (*Typha* sp.). These areas were marked on field maps and their locations were shared with the biological monitor(s) on site during exotic plant removal for the establishment of appropriate no-work buffers. Also 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 shortpod mustard (*Hirschfeldia incana*), poison hemlock (*Conium maculatum*), crimson fountaingrass (*Pennisetum setaceum*), 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.) May 9 through 13, May 16 through 19, and May 23 and 24, 2016. 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 Lauren Dorough monitored all exotic plant removal activities. A pre-activity notification was emailed to Matt Chirdon, California Department of Fish and Wildlife, on April 28, 2016.

The removal effort began southeast of Tujunga Ponds on May 9, 2016 and continued west throughout the day. The removal efforts were focused on removing species such as brome grasses (*Bromus* sp.), black mustard (*Brassica nigra*), castor bean, tree tobacco, giant reed, crimson fountain grass, tree of heaven (*Ailanthus altissima*) and various species of thistle from the understory (Figure 1). 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 homeless man that had been encountered during the pre-activity survey was observed again riding his All-Terrain Vehicle (ATV). The County of Los Angeles Department of Public Works (LACDPW) and the Los Angeles Police Department (LAPD) were immediately notified.

The removal effort continued on May 10, 2016, with work continuing around Tujunga Ponds and in the area north of Gibson Ranch. The main species of focus were black mustard, filaree (*Erodium cicutarium*), umbrella sedge (*Cyperus* sp.), annual beardgrass (*Polypogon monspeliensis*), sow thistle (*Sonchus* sp.), poison hemlock, crimson fountaingrass, tocalote (*Centaurea melitensis*), Italian thistle (*Carduus pycnocephalus*), castor bean, giant reed, and brome grasses. 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. The biologist noted that one of the crew member's herbicide applicator nozzles was leaking. The crew leader was notified immediately and the applicator was fixed by the following day.

The removal effort continued on May 11, 2016, with work continuing south of Tujunga Ponds, working west toward the riparian woodland and along Haines Creek. Work concluded east of the Cottonwood Avenue entrance and north of Gibson Ranch. The main species of focus were black mustard, sweet clover, sow thistle, poison hemlock, Italian thistle, wild lettuce (*Lactuca virosa*), castor bean, giant reed, tree of heaven, wild rye (*Elymus* sp.), and brome grasses. 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 homeless encampment was discovered and LACDPW was immediately notified of the location via email (Figure 2).

The removal activities continued on May 12, 2016 where the crews worked in the riparian area south of the Tujunga Ponds, along Haines Creek, and north of Haines Creek in the upland habitat working toward the South Wheatland gate. 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. Along the creek the target species were black mustard, sow thistle, poison hemlock, Italian thistle, wild castor bean, giant reed, tree of heaven, wild rye, and brome grasses (Figure 3). In the upland habitat the primary target species was black mustard.

The crew continued to work along Haines Creek on May 13, 2016 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, poison hemlock, wild rye, brome grasses, and non-native thistle (Figure 4). The crew also used a weed whacker to clear tall weedy vegetation along the trail (Figure 5).

On May 16, 2016 the crew removed exotic plants in the riparian and upland areas north of Haines Creek, and in the east portion of Haines Canyon Wash west of Tujunga Ponds toward the Wheatland south gate. Targeted species included black mustard, poison hemlock, non-native thistle, salt cedar (*Tamarisk* spp.), tree tobacco, giant reed, and castor bean. 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 May 17, 2016, where the crew started work at the Wheatland gate and worked east along the southern edge of I-210, primarily spraying black mustard with herbicide and clearing large stands with machetes (Figure 6). The crew continued back along Haines Canyon Wash heading west towards the western edge of the Mitigation Area. Targeted species included black mustard, salt cedar, and giant reed. During the latter half of the day, the crew used weed whackers and machetes to clear the overgrown grasses and poison oak along the trail in the riparian areas including from Cottonwood Avenue to the western border of the Mitigation Area (Figures 7 and 8). Trail maintenance activities also included trimming overhanging branches that may obstruct equestrian users.

Exotic plant removal activities continued on May 18, 2016, where the crews also used weed whackers and chainsaws to remove overgrown vegetation and fallen trees and debris along the trails from the Cottonwood entrance, to the Ponds, and towards the South Wheatland Entrance (Figure 9). 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. During the latter half of the day, the crew moved to the upland habitat east of Cottonwood Avenue and west of Gibson Ranch. The crew used weed whackers and herbicide to remove large stands of mustard and brome grasses. While the crew was working near the Cottonwood Avenue entrance, three Los Angeles County Sheriff's Department deputies approached on horseback to discuss recent homeless encampment issues in the Mitigation Area. The biologist exchanged information with the deputies and LACDPW was notified via email.

On May 19, 2016 the crew continued clearing black mustard and brome grasses in the upland areas near Cottonwood Avenue entrance using weed whackers, hand tools, and herbicide. On May 23, 2016 the crew continued clearing black mustard and brome grass east of the Cottonwood Avenue entrance working toward Gibson Ranch using weed whackers and herbicide. A red racer snake (*Coluber flagellum piceus*), was observed by the biologist in the area where the crew was using weed whackers. The snake was moved out of harm's way by the biologist. While the crew was working east of the Cottonwood Avenue entrance, four LAPD vehicles containing eight LAPD officers approached to discuss recent homeless encampment issues in the Mitigation Area. The biologist exchanged information with the officers and LACDPW was notified via email. On May 24, 2016 the crew completed clearing the black mustard and brome grass from Cottonwood Avenue east to Gibson Ranch and west to the riparian area, as well as along the fence line bordering Wentworth Street using weed-whackers and herbicide (Figure 10).

On May 9, 2016 a Bewick's wren (*Thryomanes bewickii*) was observed showing signs of distress near a cavity within a dead tree. The crew was instructed to quickly move out of the area to avoid encroaching on a potential nest, but no nest was confirmed. On May 10, 2016 a red-winged blackbird pair was observed behaving aggressively within the cattails along Tujunga ponds. The pair were likely nesting in the cattails although no nest was confirmed. The crew was instructed to quickly move out of the area to avoid encroaching on a potential nest. On May 11, 2016 a pair of lesser goldfinches (*Spinus psaltria*) were observed building a nest in a cottonwood (*Populus* sp.) tree (11S 373313 E, 3792680 N) along Haines Creek. The nest was not complete. The crew did not encroach on the birds so a no-work buffer was not needed. Later that same day, a pair of song sparrows (*Melospiza melodia*) were observed behaving territorially along Haines Creek but no nest was confirmed. The crew was advised to move through the area quickly and avoid spraying in the area close to the birds.

On May 16, 2016 a house wren was observed singing and entering and exiting a tree hole in large dead tree just north of Haines Creek (11 S 376156 E, 3792700 N). A nest was presumed to be located within the tree hole and a 50-foot no work buffer was established around the nest. Later that same day a Bewick's wren was observed to be acting territorial near a sycamore tree east of Tujunga ponds (11 S 376268 E, 3792855 N). A 50-foot no work buffer was established around the tree to avoid encroachment upon an active nest. On May 17, 2016, an unidentified wren was observed entering and exiting a tree hole in a sycamore tree in the upland habitat south of I-210 (11 S 375664 E, 3793040 N). A nest was presumed to be located within the tree hole and a 50-foot no work buffer was established around the nest.

May 18, 2016, the biologist discovered that the lesser goldfinch nest that was being built on May 11 had been completed and a female lesser goldfinch was observed sitting on the nest in an incubating position. A 100-foot no work buffer was established around the nest. Later that same day, a sycamore tree in the upland habitat just west of the Cottonwood Avenue entrance was observed to have a pair of Nuttall's woodpeckers (*Picoides nuttallii*) and a pair of ash-throated flycatchers (*Myiarchus cinerascens*) visiting tree holes at two locations on the same tree (11S 376079, E 3792379 N). Both pairs were acting territorial and were observed visiting the tree holes with food items. The biologist presumed that an active nest was present inside each tree hole and a 50-foot no work buffer was established around the tree. On May 19, 2016, a western bluebird (*Sialia mexicana*) was observed visiting tree hole with nesting material at a sycamore tree immediately adjacent to the east of the tree containing the Nuttall's woodpecker and ash-throated flycatcher nests. The no-work buffer was expanded to 100 feet around these trees.

On May 23, 2016 the house wren nest that was observed during the pre-activity survey was determined to still be active. A 50-foot no work buffer was established around the nest. Later that same day, a western bluebird was observed repeatedly visiting a tree hole in a sycamore tree just south of Wentworth Street (11 S 376315 E, 3792318 N). The biologist presumed that an active nest was present inside and a 50-foot no work buffer was established around the tree.

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 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: June 3, 2016

Lauren Dorough
Associate Biologist

Figure 1. Mustard and castor bean plants after herbicide application.

Figure 2. Homeless encampment discovered on May 11, 2016.

Figure 3. Crew spraying poison hemlock along Haines Creek.

Figure 4. Crew spraying mustard south of Haines Creek.

Figure 5. Crew clearing overhanging branches along trail.

Figure 6. Crew spraying mustard south of I-210.

Figure 7. Crew using weed whacker to clear poison oak from trail.

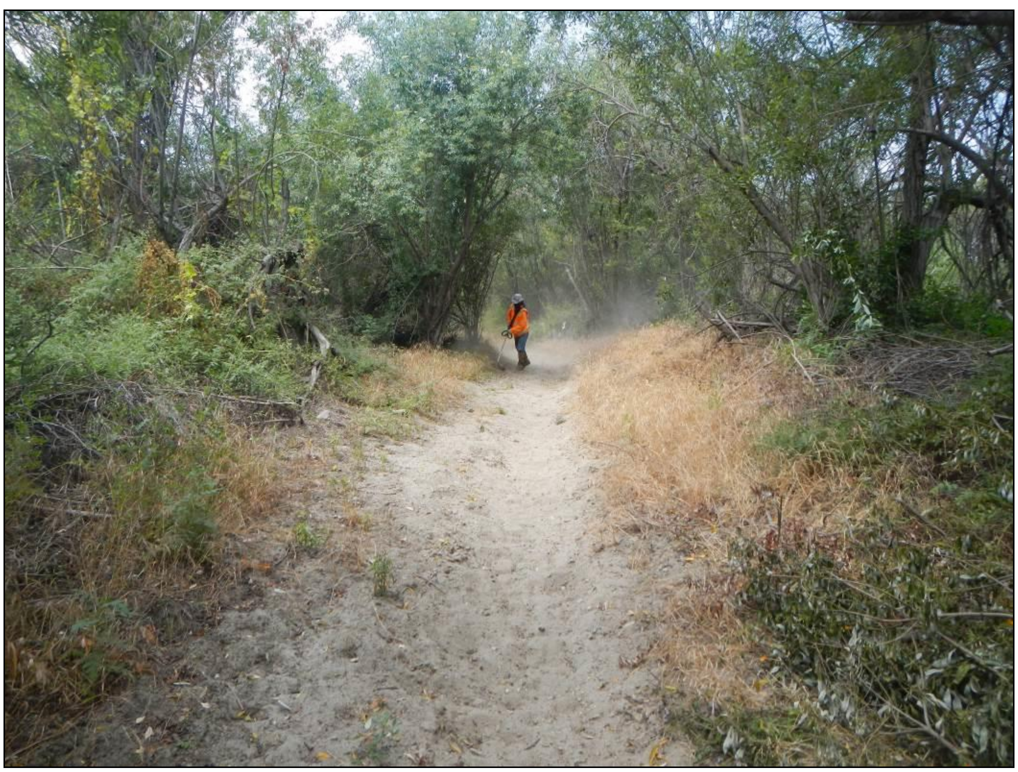


Figure 8. Crew using weed whacker to clear brome grass from trail.

Figure 9. Crew using chainsaw and hand tools to clear fallen tree and debris obstruction from trail.

Figure 10. Crew clearing mustard and brome grass north of Gibson Ranch.

September 13, 2016
(2014-003.015/002/2)

Mayra Cabrera
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 (August 2016) 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 second phase exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during August 2016. A pre-activity reconnaissance site visit and nesting bird survey was conducted on August 15, 2016 by ECORP Consulting, Inc. (ECORP) biologist Carley Lancaster. This site visit was conducted to identify any sensitive biological resources (including 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. No active bird nests or birds exhibiting breeding behavior were observed or detected during the pre-activity survey. Large areas of exotic plant species identified during the pre-activity survey were flagged, photographed, and recorded using a global positioning system (GPS) unit. These areas included re-growth of white sweetclover (*Melilotus albus*), crimson fountaingrass (*Pennisetum setaceum*), 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) from August 16 through 19 and August 22 through 24, 2016. 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, Lauren Dorough, and Taylor Dee monitored all exotic plant removal activities. A pre-activity notification was emailed to Matt Chirdon, California Department of Fish and Wildlife, on August 10, 2016.

The removal effort began in Haines Canyon Wash northwest of Tujunga Ponds on August 16, 2016 and continued along Haines Canyon Creek east of Cottonwood Avenue. The removal efforts were focused on removing species such as white sweetclover, castor bean, tree tobacco, giant reed, common plantain (*Plantago major*), flax-leaved horseweed (*Erigeron bonariensis*), short podded mustard (*Hirschfeldia incana*), umbrella sedge (*Cyperus squarrosus*), prickly wild lettuce (*Lactuca serriola*), Russian thistle (*Salsola sp.*), and prickly sow thistle (*Sonchus asper spp. asper*) (Figure 1). 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. Vegetation within a one-foot buffer of the creek's edge was not sprayed because aquatic biologists were performing an exotic wildlife species removal effort at the time.

The removal effort continued on August 17, 2016, with work continuing in the riparian sycamore woodland west of Haines Canyon Wash and along Haines Canyon Creek (Figure 2). The main species of focus included white sweetclover, castor bean, tree tobacco, giant reed, common plantain, flax-leaved horseweed, short podded mustard, umbrella sedge, prickly wild lettuce, Russian thistle, and prickly sow thistle, and eupatory (*Ageratina adenophora*). 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. Vegetation within a one-foot buffer of the creek's edge was not sprayed.

The removal effort continued on August 18, 2016, with the crew working in the cottonwood willow thicket west of the Cottonwood Avenue entrance and south of Haines Canyon Creek with the crew working west. The crew also worked near the South Wheatland entrance along the creek and moving westward until they reached the border of the Mitigation Area. Work concluded with the crew working east along the southern edge of the site. The main species of focus were black mustard and castor bean. 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. The biologist noted that one of the crew member's herbicide applicator nozzles was leaking. The crew leader was notified immediately and the herbicide tank and applicator was replaced. No sensitive biological resources were affected by the leaky nozzle. Vegetation within a one-foot buffer of the creek's edge was not sprayed. A substantial amount of trash and a shopping cart was observed along the creek (Figure 3). The location of the trash was later reported to LACDPW.

The removal activities continued on August 19, 2016, with the crew working along the southern fence line from the Cottonwood Avenue entrance moving west. Crews also focused on removing vegetation along the edges of Haines Canyon (Figure 4). 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. Along the creek, the target species were black mustard, castor bean, and various thistle species. Vegetation within a one-foot buffer of the creek's edge was not sprayed. Large accumulation of garbage was present in the creek near a fallen log (Figure 5). The location of the garbage was later reported to LACDPW.

On August 22, 2016 the crew removed exotic plants in Haines Canyon Wash west of the Tujunga Ponds toward the northwest corner of the site. Targeted species included black mustard and the removal of a Brazilian peppertree (*Schinus terebinthifolius*). Removal efforts continued to the north most edge of the site near Interstate 210, where the crew targeted tamarisk (*Tamarix sp.*), giant reed, castor bean, and black mustard. 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. Vegetation within a one-foot buffer of the pond's edge was not sprayed.

During the concurrent exotic wildlife removal effort conducted at the site, one of the aquatic biologists observed a patch of water lettuce (*Pistia stratiotes*) on the northwestern edge of the East Pond. The aquatic biologists immediately reported it to the biological monitor and the biological monitor had the crew remove the water lettuce from that pond the following day (August 22, 2016). No other water lettuce was observed during the removal effort.

Exotic plant removal activities continued on August 23, 2016, where the crews used machetes to remove overgrown vegetation and fallen trees and debris along the trails from the Cottonwood Avenue entrance, to the ponds, and towards the South Wheatland Entrance (Figure 6). The main focus was low-hanging branches, fallen branches, and poison oak (*Toxicodendron diversilobum*) encroaching on the trails. Trails maintenance activities (clearing existing trails and removing debris, etc.) were also conducted on this day along the trails adjacent to Haines Canyon Creek, from the Cottonwood Avenue entrance to the Tujunga Ponds, and also from the Cottonwood Avenue entrance east toward the South Wheatland entrance.

On August 24, 2016 the crew worked in the upland areas near Cottonwood Avenue entrance and west of Gibson Ranch using weed whackers to cut down black mustard (Figure 7). In the latter half of the morning, the crew worked along Haines Canyon Creek south of Haines Canyon Wash and west of the Tujunga Ponds. The crew members also worked towards the South Wheatland gate and used rakes to clear nonnative vegetation from the base of young cottonwood trees (Figure 8). Work concluded with the crew members returning to the upland area to cut down black mustard. Exotic plant removal and trail maintenance efforts were completed for the site on August 24, 2016.

No birds were observed exhibiting any breeding or nesting behavior during the exotic plant removal effort. Overall the bird activity on the site was low.

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 of 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: Taylor Dee DATE: September 13, 2016

Taylor Dee
Assistant Biologist

Figure 1. Tree tobacco after cut and herbicide application.

Figure 2. Crew working along Haines Canyon Creek.

Figure 3. Some of the trash along Haines Canyon Creek.

Figure 4. Crew spraying on banks of Haines Canyon Creek.

Figure 5. Large accumulation of trash in Haines Canyon Creek.

Figure 6. Crew clearing overhanging branches along trail.

Figure 7. Crew using weed whacker to cut down mustard.

Figure 8. Crew clearing debris around young cottonwood tree.

December 21, 2016
(2014-003.015/002/2)

Sara Samaan
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/December 2016) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Samaan:

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 and December 2016. A pre-activity reconnaissance site visit was conducted on November 28, 2016 by ECORP Consulting, Inc. (ECORP) biologist Carley Lancaster. This site visit was conducted to identify any sensitive biological resources and to identify areas with high densities of exotic plant species. Large areas of exotic plant species identified during the pre-activity survey were flagged, photographed, and recorded using a global positioning system (GPS) unit. These areas included re-growth of crimson fountaingrass (*Pennisetum setaceum*), 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) from November 29 through November 30, December 1 through December 2, and December 5 through December 8, 2016. 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, Lauren Dorough, and Taylor Dee monitored all exotic plant removal activities. A pre-activity notification was emailed to Matt Chirdon, California Department of Fish and Wildlife, on November 18, 2016.

The removal effort began on November 29, 2016. The crew started the removal effort at the Tujunga Ponds and moved from east to west along the upland area in Haines Canyon Wash (Figure 1). The removal efforts were focused on removing species such as white sweetclover (*Melilotus albus*), castor bean, and English ivy (*Hedera helix*) (Figure 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. The crew also removed a fallen tree from the trail downstream of the fish screen.

The removal effort continued on November 30 and December 1 2016, with work continuing in Haines Canyon Wash and extending into Big Tujunga Wash. On December 1, 2016 the crew was instructed by the biologist to focus efforts on the crimson fountaingrass north of Haines Canyon Creek. The crew spent the first half of the day focusing on the large concentrated areas of fountaingrass in this upland area (Figure 3). During the latter part of the day, the crew focused their efforts along Haines Canyon Creek, moving east to west (Figure 4). The main species of focus included white sweetclover, castor bean, common plantain (*Plantago major*), prickly wild lettuce (*Lactuca serriola*), tree tobacco, and poison hemlock (*Conium maculatum*). 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.

The removal activities continued on December 2 and December 5, with work beginning in the Big Tujunga Wash south of Interstate 210 and continuing towards the Tujunga Ponds. The main species of focus were short podded mustard (*Hirschfeldia incana*), red stemmed filaree (*Erodiuim cicutarium*), giant reed (*Arundo donax*), crimson fountaingrass, and white sweetclover (Figure 5). On December 6, the crew continued removal activities with efforts focused on spraying exotic species around the Cottonwood Avenue entrance, clearing nonnative vegetation from the around the base of young cottonwood trees (*Populus* sp.) using rakes, and clearing the trails of fallen trees and debris throughout the Mitigation Area (Figures 6 and 7). Trail maintenance activities consisted of using machetes and chainsaws to remove overgrown vegetation, low-hanging branches, and fallen trees and debris encroaching on the trails.

On December 7, 2016 the crew worked in the upland areas near the Cottonwood Avenue entrance and west and north of Gibson Ranch applying herbicide to new nonnative grass growth and using machetes to cut down larger exotic species such as tree tobacco (Figure 8). During the removal activities on December 7, the biologist noticed a new homeless encampment located northwest of the Cottonwood entrance as well as two shopping carts filled with trash and personal belongings in the Mitigation Area, one just outside and one inside the Cottonwood gate (Figure 9). Near the shopping cart inside the gate the biologist noted several small coast live oak (*Quercus agrifolia*) trees with lower limbs that had been removed by what appeared to be a chainsaw (Figures 10 and 11). The limbs of the trees were gathered in small piles next to each tree. In all, the biologist counted 13 trees with this damage, all located in the upland area between Cottonwood Avenue and the horse entrance on Mary Bell Avenue. As the crew was working near Gibson Ranch the biologist also noted that two of the County Mitigation Area informational signs had been removed and were on the ground (Figure 12). The incidents were immediately reported to LACDPW.

The crew continued work on December 8, 2016 using weed-whackers and focusing on cutting down black mustard (*Brassica nigra*) and nonnative grasses in the upland area around Cottonwood Avenue. Exotic plant removal and trail maintenance efforts were completed for the site on December 8, 2016.

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 2016 and the next exotic plant removal effort will be in spring of 2017.

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 21, 2016

Lauren Dorough
Associate Biologist

Figure 1. Crew working along Haines Canyon Wash.

Figure 2. Castor bean after cut and herbicide application.

Figure 3. Crew applying herbicide to large areas of crimson fountaingrass.

Figure 4. Crew spraying along banks of Haines Canyon Creek.

Figure 5. Short podded mustard after herbicide application

Figure 6. Debris cleared from base of young cottonwood tree.

Figure 7. Trail cleared of fallen trees and debris.

Figure 8. Crew applying herbicide to nonnative grass regrowth near Cottonwood Avenue.

Figure 9. Shopping cart located near Cottonwood entrance.

Figure 10. Small oak trees with lower limbs removed and gathered in piles.


Figure 11. Chainsaw incisions on oak trees.


Figure 12. County signs removed near Gibson Ranch.

CA Department of Fish and Wildlife Notifications

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

April 28, 2016
(2014-003.015/002/2)

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 May 3, 2016 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 May 2, 2016. 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

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

August 10, 2016
(2014-003.015/002/2)

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 August 16, 2016 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 August 15, 2016. 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

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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

November 18, 2016
(2014-003.015/002/2)

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 from November 29 to December 9, 2016 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 28, 2016. 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. 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

APPENDIX F

Exotic Wildlife Removal Memos

June 6, 2016
(2014-003.016)

Mayra Cabrera
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **May 2016 - Exotic Aquatic Species Removal Effort 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 in May 2016 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 19 through May 27, 2016. The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), and American bullfrog (*Lithobates catesbeianus*). 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.

During this removal effort, two-person seine, dip-netting, and minnow trapping were conducted in various locations in Haines Canyon Creek, while spearfishing was conducted in the Tujunga Ponds.

The exotic aquatic species captured and removed during this effort included 1,082 red swamp crayfish, 139 western mosquitofish (*Gambusia affinis*), 41 largemouth bass, 16 green sunfish (*Lepomis cyanellus*), 7 bluegill (*Lepomis macrochirus*), 1 common carp (*Cyprinus carpio*), and 1 goldfish (*Carassius auratus*). ECORP biologists also destroyed several Centrarchid nests in the Tujunga Ponds during this removal effort.

Santa Ana sucker (*Catostomus santaanae*) recruitment was documented in Haines Canyon Creek, below the Wheatland crossing, with over four hundred young-of-the-year

ECORP Consulting, Inc.
1801 Park Court Place, Building B Suite 103, Santa Ana, California 92701
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observed during this effort. Six western toads and four Baja California treefrogs were also observed in Haines Canyon Creek during this effort.

During this removal effort biologists observed a group of people drinking beers and wading in the Tujunga Ponds. Additionally in Haines Canyon Creek, a man was observed bathing in the stream channel. The Los Angeles Sheriff's Department was notified of each observation but by the time they arrived on site both parties had already departed. 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 in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, and various plastic containers.

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 6, 2016

Brian Zitt
Fisheries Biologist

July 11, 2016
(2014-003.016)

Mayra Cabrera
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **June 2016 - Exotic Aquatic Species Removal Effort 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 in June 2016 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 weekly from June 1 to June 30, 2016. The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Brian Zitt, Max Murray, and Adam Schroeder conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek and the Tujunga Ponds.

During this removal effort, two-person seine, dip-netting, spearfishing, and minnow trapping were conducted in various locations in Haines Canyon Creek, while spearfishing was conducted in the Tujunga Ponds.

The exotic aquatic species captured and removed during this effort included 4,396 red swamp crayfish, 173 western mosquitofish (*Gambusia affinis*), 67 largemouth bass, 18 green sunfish (*Lepomis cyanellus*), 6 bluegill (*Lepomis macrochirus*), 5 American bullfrogs, 2 common carp (*Cyprinus carpio*), and 2 goldfish (*Carassius auratus*). ECORP biologists also destroyed several Centrarchid nests in the Tujunga Ponds and in Haines Canyon Creek during these removal efforts.

A total of 44 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured in Haines Canyon Creek during these efforts. All individuals were immediately released unharmed. In addition to those native species captured, several hundred Santa Ana sucker were observed from just upstream of the Wheatland crossing to the downstream boundary of the site. No other sensitive aquatic species were detected.

On several occasions biologists encountered groups of people drinking beers and wading in the creek. Rock dams were also observed with evidence of fire pits along open areas of the bank at these locations. The Los Angeles Sheriff's Department was notified of these observations and, on a few occasions, the deputies were able to address the violations. Trash was prominent in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, and various plastic containers. On June 23 a small patch of water lettuce (approximately 2,436 plants covering 84 square feet of surface water) was observed and removed from the East Tujunga Pond. On a follow-up visit conducted on June 30 no water lettuce was observed.

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: July 11, 2016

Brian Zitt
Fisheries Biologist

August 6, 2016
(2014-003.016)

Mayra Cabrera
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **July 2016 - Exotic Aquatic Species Removal Effort 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 in July 2016 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 primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Brian Zitt and Adam Schroeder conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek and the Tujunga Ponds.

During this removal effort, two-person seining and dip-netting were conducted in various locations in Haines Canyon Creek and in the Tujunga Ponds. The exotic aquatic species captured and removed during this effort included 548 red swamp crayfish, 159 western mosquitofish (*Gambusia affinis*), 30 largemouth bass, 113 green sunfish (*Lepomis cyanellus*), and 5 bluegill (*Lepomis macrochirus*).

A total of 6 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured or observed in Haines Canyon Creek during these efforts. All individuals were immediately released unharmed. No other sensitive aquatic species were detected.

Rock dams were observed in several locations with evidence of swimming and bathing at these locations. Trash was prominent in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, and various plastic containers. No water lettuce was observed in the Tujunga ponds during any of the site visits in July.

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 6, 2016

Brian Zitt
Fisheries Biologist

September 13, 2016
(2014-003.016)

Mayra Cabrera
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **August 2016 - Exotic Aquatic Species Removal Effort 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 in August 2016 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 primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Todd Chapman, Brian Zitt, Max Murray, and Taylor Dee conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek and the Tujunga Ponds.

During this removal effort, two-person seining, backpack electrofishing, and dip-netting were conducted in various locations in Haines Canyon Creek and in the Tujunga Ponds. The exotic aquatic species captured and removed during this effort included 1,551 red swamp crayfish, 376 western mosquitofish (*Gambusia affinis*), 46 largemouth bass, 62 green sunfish, and 5 bluegill (*Lepomis macrochirus*).

A total of 22 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured or observed in Haines Canyon Creek during these efforts. All individuals were immediately released unharmed. No other sensitive aquatic species were detected.

Rock dams were observed in several locations with evidence of swimming and bathing at these locations. Trash was prominent in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, and various plastic containers. On August 18, 2016 a small patch of water lettuce (approximately 4 square feet of surface water) was observed in the East Tujunga Pond. The aquatic biologists immediately notified the exotic plant removal crew working on site that week and the water lettuce was removed.

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: September 13, 2016

Brian Zitt
Fisheries Biologist

October 4, 2016
(2014-003.016)

Mayra Cabrera
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **September 2016 - Exotic Aquatic Species Removal Effort 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 in September 2016 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 primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and American bullfrog (*Lithobates catesbeianus*). ECORP biologists Brian Zitt, Adam Schroeder, Lauren Dorough, and Taylor Dee conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek and the Tujunga Ponds.

During this removal effort, two-person seining, dip-netting, and spearfishing were conducted in various locations in Haines Canyon Creek and in the Tujunga Ponds. The exotic aquatic species captured and removed during this effort included 2,613 red swamp crayfish, 1,529 western mosquitofish (*Gambusia affinis*), 40 largemouth bass, 34 bluegill (*Lepomis macrochirus*), 1 green sunfish, 1 common carp (*Cyprinus carpio*), and 1 Mozambique tilapia (*Oreochromis mossambicus*).

A total of 194 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured or observed in Haines Canyon Creek during these efforts. All individuals were immediately released unharmed. No other sensitive aquatic species were detected.

Rock dams were observed in several locations with evidence of swimming and bathing at these locations. Trash was prominent in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, and various plastic containers. No water lettuce was observed in the Tujunga ponds during any of the site visits in September.

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: October 4, 2016

Brian Zitt
Fisheries Biologist

November 4, 2016
(2014-003.016)

Mayra Cabrera
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **October 2016 - Exotic Aquatic Species Removal Effort 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 in October 2016 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 primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and American bullfrog (*Lithobates catesbeianus*). ECORP biologists Brian Zitt, Adam Schroeder, and Taylor Dee conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek and the Tujunga Ponds.

During this removal effort, dip-netting, minnow trapping, and spearfishing were conducted throughout Haines Canyon Creek and in the Tujunga Ponds. The exotic aquatic species captured and removed during this effort included 1,872 red swamp crayfish, 909 western mosquitofish (*Gambusia affinis*), 47 largemouth bass, 20 bluegill (*Lepomis macrochirus*), 8 green sunfish, and 3 red-eared sliders (*Trachemys scripta elegans*).

A total of 26 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured, and an additional 215 were observed in Haines Canyon Creek during these efforts. All individuals were immediately released unharmed. No other sensitive aquatic species were detected.

On October 10, 2016, ECORP biologists noticed that Haines Canyon Creek had gone dry at the lower end of the Mitigation Area. Removal efforts conducted earlier in the year observed several Santa Ana sucker in this section of the Haines Canyon Creek that is now dry. Rock dams continued to be a problem and were observed in several locations with evidence of swimming and bathing at these locations. These dams were removed by ECORP biologists during the removal efforts only to be found built back up during subsequent site visits. Several locations were identified where dead trees had fallen into the creek channel. Most of these fallen trees were either diverting water flow or creating pooled habitat for exotic aquatic species, and in some cases have created barriers to fish movement.

On October 11, 2016, ECORP biologists noticed a hole cut in the fence surrounding the Mitigation Area along Wentworth Street between Cottonwood Avenue and Wheatland Avenue. Upon further investigation, ECORP biologists noticed that a fire had broken out in the Mitigation area and firefighters had cut holes in the fence to fight the fire. The fire occurred along the trail to the north of Haines Canyon Creek and burned approximately 5,000 square feet.

On October 13, 2016, ECORP biologists were conducting minnow trap checks in Haines Canyon Creek and noticed three of the traps were stolen. Trash was prominent in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, and various plastic containers. No water lettuce was observed in the Tujunga ponds during any of the site visits in October.

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: November 4, 2016

Brian Zitt
Fisheries Biologist

December 9, 2016
(2014-003.016)

Sara Samaan
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **November 2016 - Exotic Aquatic Species Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**

Dear Ms. Samaan:

This letter serves as a summary of the exotic aquatic species removal efforts conducted in November 2016 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 primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and bluegill (*Lepomis macrochirus)*. ECORP biologists Brian Zitt, Adam Schroeder, and Taylor Dee conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek and the Tujunga Ponds.

During this removal effort, dip-netting, minnow trapping, turtle trapping, and spearfishing were conducted throughout Haines Canyon Creek and in the Tujunga Ponds. The exotic aquatic species captured and removed during this effort included 1,142 red swamp crayfish, 350 western mosquitofish (*Gambusia affinis*), 97 largemouth bass, 49 bluegill, 43 green sunfish, and 1 red-eared slider (*Trachemys scripta elegans*).

A total of 14 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured, and an additional 10 were observed in Haines Canyon Creek during these efforts. All captured individuals were immediately released unharmed. No other sensitive aquatic species were detected during these surveys. Trash was prominent in Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, various plastic containers, articles of clothing, and sofa cushions. No water lettuce was observed in the Tujunga ponds during any of the site visits in November.

On November 2, 2016, ECORP biologists observed an adult male with an off-leash dog walking north on the trail towards State Highway 210 just west of the West Tujunga Pond. Within a few minutes the man returned on a motorcycle followed by the unleashed dog. He parked in front of the West pond and quickly jogged southwest down the trail until he was out of sight. After about a minute the man and dog returned to the motorcycle and departed the area the same way they came. The biologists were unable to determine if the man retrieved anything; however, later investigation into the area between the trail and southwest side of the West Tujunga Pond uncovered a fishing line with a hook and presumably fresh bait tied to vegetation out of the water. The Los Angeles County Parks and Recreation and the Los Angeles County Sheriffs were notified. A Los Angeles County Sheriff appeared on site and discussed the incident with ECORP biologists. Later the same day, several large fallen trees were observed blocking the trail near the Cottonwood entrance and the crossing in Haines Canyon Creek just downstream of the fish screen. The recently fallen trees and several snagged branches along the trail may have been the result of strong winds which occurred overnight. Any trees and snagged branches that were determined to be a potential safety hazard and/or blocked the trail were documented, photographed, and the GPS location was recorded. Later that evening at approximately 7:00 p.m., an unknown vehicle was observed within the Mitigation Area inside the Cottonwood entrance gate. After several minutes the car appeared to exit the site through the gate and ECORP biologists were unable to determine the identity of the unknown vehicle. After inspecting the locks at the Cottonwood gate, it appeared someone added a lock to the link which they were using to access the site.

On November 3, 2016 at approximately 6:00 p.m., ECORP biologists observed at least five adult males fishing in the West pond. The individuals fishing departed the area shortly after ECORP biologists called and reported the incident to the Los Angeles County Sheriff's office.

On the morning of November 4, 2016, ECORP biologists noticed a red Toyota Yaris parked within the Mitigation Area near the Cottonwood entrance. Los Angeles Police Department was notified and later arrived on site. ECORP biologists discussed the situation with the officers who apprehended the driver and discovered a large homeless encampment the man had been living in. The encampment is within the Mitigation Area northwest of the Cottonwood entrance gate. The driver of the Yaris informed police he and several others have been using the site for a few months. He also told police he was able to access the site with his own key because he had cut the chain and added his own lock to the link.

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 9, 2016

Brian Zitt
Fisheries Biologist

December 21, 2016
(2014-003.016)

Sara Samaan
Department of Public Works
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803

SUBJECT: **December 2016 - Exotic Aquatic Species Removal Effort in the Big Tujunga Wash Mitigation Area, Los Angeles County, California.**

Dear Ms. Samaan:

This letter serves as a summary of the exotic aquatic species removal efforts conducted in December 2016 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.

ECORP biologists Brian Zitt, Adam Schroeder, and Taylor Dee conducted the removal effort that focused on removing exotic aquatic species from Haines Canyon Creek. The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and western mosquitofish (*Gambusia affinis*).

During this removal effort, dip-netting, minnow trapping, and electrofishing were conducted throughout Haines Canyon Creek. The exotic aquatic species captured and removed during this effort included 2,237 western mosquitofish, 1,824 red swamp crayfish, 48 largemouth bass, 29 green sunfish, and 1 American bullfrog tadpole (*Lithobates catesbeianus*).

A total of 17 Santa Ana sucker (*Catostomus santaanae*) were incidentally captured, and an additional 121 were observed in Haines Canyon Creek during these efforts. All captured individuals were immediately released unharmed. No other sensitive aquatic species were detected during these surveys. Following the recent storm events, the creek showed signs of increased water flows (recent high water marks and inundated side channels) with increased trash and floating debris. Trash was prominent throughout Haines Canyon Creek and included numerous golf balls, cans, bottles, Styrofoam, butane and spray paint canisters, motor oil cans, various plastic containers, articles of clothing, and sofa cushions. Water level and flow in the creek, although lower than normal, do not appear to be decreasing which was seen during previous visits and is likely a result of the recent rain events.

In the afternoon on December 5, 2016, ECORP biologists inspected the large homeless encampment located to the northwest of the Cottonwood entrance gate, within the Mitigation Area, that was identified during the previous exotic wildlife removal effort. ECORP biologists found that the encampment was still in use at this location. In the afternoon of December 6, 2016, ECORP biologists observed a man with a suitcase walking toward the encampment. This appeared to be the person with a red Toyota Yaris who was reported to law enforcement authorities during the previous removal effort on November 4, 2016. This same person was later observed in the same general area in the evening on December 6, 2016 and leaving the site in the afternoon on December 8, 2016.

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 21, 2016

Brian Zitt
Fisheries Biologist

APPENDIX G

2016 Water Quality Monitoring Report

County of Los Angeles
Department of Public Works

November 2016 Water Quality Monitoring Report

for the

Big Tujunga Wash Mitigation Area

January 2017

MWH now part of Stantec

November 2016 Water Quality Monitoring Report

for the

Big Tujunga Wash Mitigation Area

January 2017

Prepared For:

ECORP Consulting, Inc.
1801 Park Court Place, Building B, Suite 103
Santa Ana, CA 92701

Prepared By:

MWH, now part of Stantec
300 North Lake Avenue, Suite 400
Pasadena, California 91101

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Distribution

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County of Los Angeles Department of Public Works
Ms. Grace Yu
Water Resources Division
900 South Fremont Avenue
Alhambra, California 91803-1331

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

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

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

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

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

Water Quality Monitoring
November 2016

EXECUTIVE SUMMARY

As part of a water quality monitoring program on-going since 2000, sampling of the Big Tujunga Ponds and Haines Canyon Creek was conducted on November 7, 2016. The results of the water quality sample are summarized below:

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

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, now part of Stantec, 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. Since that time, monitoring has been conducted once per year, in October or November. This report presents the results of the water quality sampling for November 2016.

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
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

Date	Activity
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
11/07/16	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 7, 2016.

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 2016

Date	November 7, 2016		
Air Temperature	Approximately 78 degrees Fahrenheit during sample collection period		
Skies	Sunny, clear		
Observations	Water clear at all locations; extensive *Lemna* cover on surface of ponds; in-creek bather observed 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	1330
Haines Canyon Creek, inflow to Tujunga Ponds	34 16’ 6.040’’ N	118 20’ 22.616’’ W	1120
Haines Canyon Creek, outflow from Tujunga Ponds	34 16’ 8.263’’ N	118 20’ 30.824’’ W	1215
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 APPL Labs, Clovis, California. Analytical results for chlorpyrifos and organophosphorous pesticides via EPA method 8141 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:

$$\text{Flow} = ALC / T$$

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 2016 Results

Water Quality

Results of analyses conducted by Eurofins, APPL 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 7, 2016

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	18.9	17.5	NA	17.5
Dissolved Oxygen	mg/L	3.1	6.4	NA	9.9
pH	std units	7.03	7.22	NA	8.27
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	0.21	ND	NA	0.27
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	7.9	6.0	NA	4.7
Orthophosphate-P	mg/L	0.019	ND	NA	0.021
Total phosphorus-P	mg/L	ND	0.15	NA	ND
Glyphosate	µg/L	ND	ND	NA	ND
Chloropyrifos*	µg/L	ND	ND	NA	ND
Pesticides (EPA 608)**	µg/L	ND	ND	NA	ND
Turbidity	NTU	0.3	0.4	NA	0.2
Fecal Coliform Bacteria	(MPN/100 ml)	94	79	NA	920
Total Coliform Bacteria	(MPN/100 ml)	240	170	NA	1600

NA – data not available; station dry on the sample date

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

* The analytical method used for chloropyrifos (EPA 8141A) also tests for the following chemicals: azinphos-methyl, bolster, coumaphos, diazinon, demeton, dichlorvos, disulfoton, ethoprop, fensulfothion, fenthion, mevinphos, naled, phorate, runnel, 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 2016 are summarized in **Table 7**.

Table 7
Estimated Flows for November 2016

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
11/7/16	0.4	0.8	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 (°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 2016 sampling are described by parameter in **Table 14**.

Table 14
Discussion of November 2016 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 3.1 mg/L in the Tujunga Ponds to 9.9 mg/L in Haines Canyon Creek leaving the site. DO levels at two stations (outflow from the ponds and Haines Canyon Creek leaving the site) were above the recommended minimum (5.0 mg/L) for warmwater fish species. DO levels in the ponds were below the minimum recommended level for warmwater fish species.
pH	• Lowest pH was observed in the Tujunga Ponds (7.03), with highest pH observed in Haines Canyon Creek leaving the site (8.27). 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 was detectable only in the outflow from the ponds. The observed concentration, 0.15 mg/L, is above 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 very low (<1 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). Observed fecal coliform levels were below the standard in the ponds and in the outflow from the ponds. On this date, fecal coliform levels in Haines Canyon Creek leaving the site were 920 MPN/100 ml. Sampling specifically for *E. coli* was not conducted. It should be noted that in-creek bathing was observed at this sampling location. • Total coliform levels ranged from 170 MPN/100 ml in the outflow from the ponds to 1,600 MPN/100 ml in Haines Canyon Creek leaving the site. [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 2016

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)

AT-1807

Laboratory Report

for

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

Date of Issue
12/19/2016

EUROFINS EATON ANALYTICAL

ORELAP 4034

Report: 620884
Project: BIG-TUJUNGA
Group: TO105697-OM Water
PO#: Quality Monitoring

DST: David S Tripp

Project Manager

* 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.

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STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	**Mississippi**	Certified
----------	--------	**Montana**	Cert 0035
Arizona	AZ0778	**Nebraska**	Certified
Arkansas	Certified	**Nevada**	CA00006-2016
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	**Puerto Rico**	Certified
Guam	16-003r	**Rhode Island**	LAO00326
Hawaii	Certified	**South Carolina**	87016
Idaho	Certified	**South Dakota**	Certified
Illinois *	200033	**Tennessee**	TN02839
Indiana	C-CA-01	**Texas ***	T104704230-15-9
Kansas *	E-10268	**Utah ***	CA000062016-10
Kentucky	90107	**Vermont**	VT0114
Louisiana *	LA16003	**Virginia ***	460260
Maine	CA0006	**Washington**	C838
Maryland	224	**----------**	----------
Commonwealth of Northern Marianas Is.	MP0004	**----------**	----------
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 Residual	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 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
NDMA	TQ In house method based on EPA 521 (2425)	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 SM 9223	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	Client ID:	MWH-ECORP
		Folder #:	620884
		Project:	BIG-TUJUNGA
		Sample Group:	TO105697-OM Water Quality Monitoring
Attn:	Sarah Garber	Project Manager:	David S Tripp
Phone:	626-568-6071	Phone:	(626) 386-1158
		PO #:	10509893.011801

The following samples were received from you on **November 07, 2016** at **1457**. 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
201611070465	PONDSIN110716	11/07/2016 1120

@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
201611070466	PONDSOUT110716	11/07/2016 1215

@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
201611070467	HCC110716	11/07/2016 1330

@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)

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CHAIN OF CUSTODY RECORD

620884

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

Lisa 15:44 NOV 07 2016

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: ____

SAMPLES CHECKED AGAINST COC BY: [initials]

SAMPLES LOGGED IN BY: [initials]

SAMPLE TEMP RECEIVED AT:

SAMPLES REC'D DAY OF COLLECTION? ☐ (check for yes)

☐ ____ (Other) IR Gun ID = ____ (Observation= ____ °C) (Corr.Factor ____ °C) (Final = ____ °C)

☒ Monrovia IR Gun ID = 461A (Observation= 4.2 °C) (Corr.Factor -0.3 °C) (Final = 3.9 °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:	PROJECT CODE:
MWH-ECORP	10509893.011801

EEA CLIENT CODE:	COC ID:	SAMPLE GROUP:

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

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
11/7	1120	PONDSIN110716		RSW			
11/7	1215	PONDSOUT110716		RSW			
11/7	1330	HCC110716		RSW			
							4th station Dry NO SAMPLES

* 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:	[signature]	SARAH GARBER	MWH Principal Env.Sci	11/7/16	1455
RELINQUISHED BY:					
RECEIVED BY:	[signature]	Joseph Byrnes	EEA	11/7/16	1457
RELINQUISHED BY:					
RECEIVED BY:					

QA FO 0029.2 (Version 2) (08/28/2014)

PAGE ____ OF ____

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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 #: 150581

Client ID: MWH-ECORP
Project Code: BIG-TUJUNGA Bottle Orders
Group Name: Water Quality Monitoring
PO#/JOB#: 10509893.011801

Created By: David S Tripp - [DST]
Deliver By: 11/04/2016
STG: Bottle Orders
Ice Type: W

Ship Sample Kits to	**Send Report to**	**Billing Address**
MWH Americas - Pasadena 300 N. Lake Avenue Suite 400 Pasadena, CA 91101 Attn: Sarah Garber Phone: 626-568-6071	MWH Americas - Pasadena 300 N. Lake Avenue Suite 400 Pasadena, CA 91101 Attn: Sarah Garber Phone: 626-568-6071	MWH Americas - Pasadena 300 N. Lake Avenue Suite 400 Pasadena, CA 91101 Attn: Sarah Garber Phone: 626-568-6071

# of Sample	Tests	Bottle Qty - Type [preservative information]	UN DOT #
4	Glyphosate	1 - 125ml amber glass [no preservative]	
4	Total Chlorine Residual 11.7.16	1 - 125ml amber glass [no preservative]	
4	Nitrate as Nitrogen by IC, Nitrate as NO3 (calc), Nitrite Nitrogen by IC, Orthophosphate as P, Turbidity 11.7.16	1 - 125ml poly [no preservative]	
4	Orthophosphate as PO4 11.7.16	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 11.7.16	1 - 250ml poly sterilized [0.25 ml Thio (8%)]	

Comments

SHIPPING: Please label "BIG T WASH" and include wet ice packing instructions. Client will pickup the sample kits on Friday 11/4/16
SAMPLER: Please return samples on fresh wet ice to the lab same day collected.

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

Tel: (626) 386-1100
Fax: (626) 386-1101
1 800 566 LABS (1 800 566 5227)

Laboratory Comments
Report: 620884

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

Folder Comments

Analytical results for 8141 are submitted by Emax Laboratories, Inc. Torrance, CA, CAELAP 2672 exp 6-30-17
Analytical results for 608 are submitted by APPL Labs, Clovis, CA, CAELAP 1312

Flags Legend:

M2 - Matrix spike recovery was low; the associated blank spike recovery was acceptable.

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

Eaton Analytical

Tel: (626) 386-1100
Fax: (626) 386-1101
1 800 566 LABS (1 800 566 5227)

Laboratory Hits
Report: 620884

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

Samples Received on:
11/07/2016 1457

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
	201611070465	**PONDSIN110716**				
11/10/2016 15:10	Fecal Coliform Bacteria		94		MPN/100 mL	1.8
11/17/2016 14:56	Kjeldahl Nitrogen		0.21		mg/L	0.2
11/07/2016 21:28	Nitrate as Nitrogen by IC		7.9	10	mg/L	0.2
11/07/2016 21:28	Nitrate as NO3 (calc)		35	45	mg/L	0.88
11/08/2016 17:43	Orthophosphate as P		0.019		mg/L	0.01
11/09/2016 15:01	Orthophosphate as PO4		0.058		mg/L	0.031
11/11/2016 14:05	Total Coliform Bacteria		240		MPN/100 mL	1.8
11/09/2016 09:43	Turbidity		0.29	5	NTU	0.1
	201611070466	**PONDSOUT110716**				
11/10/2016 15:10	Fecal Coliform Bacteria		79		MPN/100 mL	1.8
11/07/2016 21:41	Nitrate as Nitrogen by IC		6.0	10	mg/L	0.2
11/07/2016 21:41	Nitrate as NO3 (calc)		26	45	mg/L	0.88
11/11/2016 14:05	Total Coliform Bacteria		170		MPN/100 mL	1.8
11/15/2016 22:25	Total phosphorus as P		0.15		mg/L	0.02
11/16/2016 19:59	Total phosphorus as PO4- Calc.		0.46		mg/L	0.031
11/09/2016 09:52	Turbidity		0.36	5	NTU	0.1
	201611070467	**HCC110716**				
11/10/2016 15:10	Fecal Coliform Bacteria		920		MPN/100 mL	1.8
11/17/2016 15:04	Kjeldahl Nitrogen		0.27		mg/L	0.2
11/07/2016 21:54	Nitrate as Nitrogen by IC		4.7	10	mg/L	0.2
11/07/2016 21:54	Nitrate as NO3 (calc)		21	45	mg/L	0.88
11/08/2016 17:42	Orthophosphate as P		0.021		mg/L	0.01
11/09/2016 15:01	Orthophosphate as PO4		0.064		mg/L	0.031
11/11/2016 14:05	Total Coliform Bacteria		1600		MPN/100 mL	1.8
11/09/2016 09:56	Turbidity		0.24	5	NTU	0.1

SUMMARY OF POSITIVE DATA ONLY

eurofins Eaton Analytical

Tel: (626) 386-1100
Fax: (626) 386-1101
1 800 566 LABS (1 800 566 5227)

Laboratory Data
Report: 620884

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

Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
PONDSIN110716 (201611070465)						**Sampled on 11/07/2016 1120**			
		SM 9221C - Fecal Coliform Bacteria							
	11/10/16 15:10		948923	(SM 9221C)	Fecal Coliform Bacteria	94	MPN/100 mL	1.8	1
		SM 9221B - Total Coliform Bacteria							
	11/11/16 14:05		948921	(SM 9221B)	Total Coliform Bacteria	240	MPN/100 mL	1.8	1
		S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/16/16 19:59			(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	ND	mg/L	0.031	1
		4500P-E/365.1 - Orthophosphate as PO4 (CALC)							
	11/09/16 15:01			(4500P-E/365.1)	Orthophosphate as PO4	0.058	mg/L	0.031	1
		EPA 547 - Glyphosate							
	11/10/16 17:31		949137	(EPA 547)	Glyphosate	ND	ug/L	6	1
		EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	11/07/16 21:28		947732	(EPA 300.0)	Nitrate as Nitrogen by IC	7.9	mg/L	0.2	2
	11/07/16 21:28		947732	(EPA 300.0)	Nitrate as NO3 (calc)	35	mg/L	0.88	2
	11/07/16 21:28		947732	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
		SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)							
	11/15/16 22:23		949661	(SM4500-PE/EPA 365.1)	Total phosphorus as P	ND	mg/L	0.02	1
		EPA 351.2 - Total Kjeldahl Nitrogen							
	11/17/16 14:56		949534	(EPA 351.2)	Kjeldahl Nitrogen	0.21	mg/L	0.2	1
		EPA 350.1 - Ammonia Nitrogen							
	11/14/16 13:07		949504	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
		EPA 8141A - Organophosphorous Pesticides (Sub)							
11/09/16	11/10/16 17:46			(EPA 8141A)	Azinphos methyl	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Bolstar	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Coumaphos	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Demeton	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Diazinon	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Dichlorvos	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Disulfoton	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Ethoprop	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Fensulfothion	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Fenthion	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Methyl Parathion	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Mevinphos	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Naled	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Phorate	ND	ug/L	1.1	1

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

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Laboratory Data Report: 620884

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

Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/09/16	11/10/16 17:46			(EPA 8141A)	Ronnel	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Stirophos	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Tokuthion	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Trichloronate	ND	ug/L	1.1	1
11/09/16	11/10/16 17:46			(EPA 8141A)	Tributylphosphate	99	%		1
11/09/16	11/10/16 17:46			(EPA 8141A)	Triphenyl Phosphate	96	%		1
		EPA 608 - Organochlorine Pesticides							
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDD	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDE	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDT	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Aldrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	alpha-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	alpha-Chlordane	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	beta-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	delta-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Dieldrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin Aldehyde	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin Ketone	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Gamma-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	gamma-Chlordane	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Heptachlor	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Methoxychlor	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Toxaphene	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	Decachlorobiphenyl	102	%		1
11/14/16	11/21/16 00:00			(EPA 608)	Tetrachlorometaxylene	61	%		1
		EPA 608 - Organochlorine PCBs							
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1016 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1221 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1232 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1242 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1248 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1254 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1260 Aroclor	ND	ug/L	1	1

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

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Laboratory Data
Report: 620884

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

Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/14/16	11/21/16 00:00			(EPA 608)	Decachlorobiphenyl	102	%		1
11/14/16	11/21/16 00:00			(EPA 608)	Tetrachlorometaxylene	61	%		1
		EPA 180.1 - Turbidity							
	11/09/16 09:43		947903	(EPA 180.1)	Turbidity	0.29	NTU	0.1	1
		4500P-E/365.1 - Orthophosphate as P (OPO4)							
	11/08/16 17:43		947503	(4500P-E/365.1)	Orthophosphate as P	0.019	mg/L	0.01	1
		SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	11/08/16 20:00		948895	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1

<u>PONDSOUT110716 (201611070466)</u> **Sampled on 11/07/2016 1215**

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
		SM 9221C - Fecal Coliform Bacteria							
	11/10/16 15:10		948923	(SM 9221C)	Fecal Coliform Bacteria	79	MPN/100 mL	1.8	1
		SM 9221B - Total Coliform Bacteria							
	11/11/16 14:05		948921	(SM 9221B)	Total Coliform Bacteria	170	MPN/100 mL	1.8	1
		S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/16/16 19:59			(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.46	mg/L	0.031	1
		4500P-E/365.1 - Orthophosphate as PO4 (CALC)							
	11/09/16 15:01			(4500P-E/365.1)	Orthophosphate as PO4	ND	mg/L	0.031	1
		EPA 547 - Glyphosate							
	11/10/16 17:44		949137	(EPA 547)	Glyphosate	ND	ug/L	6	1
		EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	11/07/16 21:41		947732	(EPA 300.0)	Nitrate as Nitrogen by IC	6.0	mg/L	0.2	2
	11/07/16 21:41		947732	(EPA 300.0)	Nitrate as NO3 (calc)	26	mg/L	0.88	2
	11/07/16 21:41		947732	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
		SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)							
	11/15/16 22:25		949661	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.15	mg/L	0.02	1
		EPA 351.2 - Total Kjeldahl Nitrogen							
	11/17/16 15:00		949534	(EPA 351.2)	Kjeldahl Nitrogen	ND (M2)	mg/L	0.2	1
		EPA 350.1 - Ammonia Nitrogen							
	11/14/16 13:09		949504	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
		EPA 8141A - Organophosphorous Pesticides (Sub)							
11/09/16	11/10/16 18:25			(EPA 8141A)	Azinphos methyl	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Bolstar	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Coumaphos	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Demeton	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Diazinon	ND	ug/L	1.2	1

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

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Laboratory Data Report: 620884

MWH Americas - Pasadena
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Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/09/16	11/10/16 18:25			(EPA 8141A)	Dichlorvos	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Disulfoton	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Ethoprop	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Fensulfothion	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Fenthion	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Methyl Parathion	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Mevinphos	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Naled	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Phorate	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Ronnel	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Stirophos	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Tokuthion	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Trichloronate	ND	ug/L	1.2	1
11/09/16	11/10/16 18:25			(EPA 8141A)	Tributylphosphate	95	%		1
11/09/16	11/10/16 18:25			(EPA 8141A)	Triphenyl Phosphate	91	%		1
		EPA 608 - Organochlorine Pesticides							
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDD	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDE	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDT	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Aldrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	alpha-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	alpha-Chlordane	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	beta-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	delta-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Dieldrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin Aldehyde	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin Ketone	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Gamma-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	gamma-Chlordane	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Heptachlor	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Methoxychlor	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Toxaphene	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	Decachlorobiphenyl	108	%		1

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(c) - indicates calculated results

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Laboratory Data Report: 620884

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Sarah Garber
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Pasadena, CA 91101

Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/14/16	11/21/16 00:00			(EPA 608)	Tetrachlorometaxylene	74	%		1
		EPA 608 - Organochlorine PCBs							
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1016 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1221 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1232 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1242 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1248 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1254 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1260 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	Decachlorobiphenyl	108	%		1
11/14/16	11/21/16 00:00			(EPA 608)	Tetrachlorometaxylene	74	%		1
		EPA 180.1 - Turbidity							
	11/09/16 09:52		947903	(EPA 180.1)	Turbidity	0.36	NTU	0.1	1
		4500P-E/365.1 - Orthophosphate as P (OPO4)							
	11/08/16 17:44		947503	(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)							
	11/08/16 20:00		948895	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1

<u>HCC110716 (201611070467)</u> — **Sampled on 11/07/2016 1330**

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
		SM 9221C - Fecal Coliform Bacteria							
	11/10/16 15:10		948923	(SM 9221C)	Fecal Coliform Bacteria	920	MPN/100 mL	1.8	1
		SM 9221B - Total Coliform Bacteria							
	11/11/16 14:05		948921	(SM 9221B)	Total Coliform Bacteria	1600	MPN/100 mL	1.8	1
		S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/16/16 19:59			(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	ND	mg/L	0.031	1
		4500P-E/365.1 - Orthophosphate as PO4 (CALC)							
	11/09/16 15:01			(4500P-E/365.1)	Orthophosphate as PO4	0.064	mg/L	0.031	1
		EPA 547 - Glyphosate							
	11/14/16 18:19		949390	(EPA 547)	Glyphosate	ND	ug/L	6	1
		EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	11/07/16 21:54		947732	(EPA 300.0)	Nitrate as Nitrogen by IC	4.7	mg/L	0.2	2
	11/07/16 21:54		947732	(EPA 300.0)	Nitrate as NO3 (calc)	21	mg/L	0.88	2
	11/07/16 21:54		947732	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
		SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)							
	11/15/16 22:26		949661	(SM4500-PE/EPA 365.1)	Total phosphorus as P	ND	mg/L	0.02	1
		EPA 351.2 - Total Kjeldahl Nitrogen							
	11/17/16 15:04		949534	(EPA 351.2)	Kjeldahl Nitrogen	0.27	mg/L	0.2	1

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

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Laboratory Data
Report: 620884

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Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
		EPA 350.1 - Ammonia Nitrogen							
	11/14/16 13:25		949508	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
		EPA 8141A - Organophosphorous Pesticides (Sub)							
11/09/16	11/10/16 19:04			(EPA 8141A)	Azinphos methyl	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Bolstar	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Coumaphos	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Demeton	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Diazinon	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Dichlorvos	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Disulfoton	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Ethoprop	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Fensulfothion	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Fenthion	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Methyl Parathion	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Mevinphos	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Naled	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Phorate	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Ronnel	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Stirophos	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Tokuthion	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Trichloronate	ND	ug/L	1.1	1
11/09/16	11/10/16 19:04			(EPA 8141A)	Tributylphosphate	0	%		1
11/09/16	11/10/16 19:04			(EPA 8141A)	Triphenyl Phosphate	0	%		1
		EPA 608 - Organochlorine Pesticides							
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDD	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDE	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	4,4-DDT	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Aldrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	alpha-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	alpha-Chlordane	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	beta-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	delta-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Dieldrin	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin	ND	ug/L	0.05	1

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

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Laboratory Data
Report: 620884

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

Samples Received on:
11/07/2016 1457

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
11/14/16	11/21/16 00:00			(EPA 608)	Endrin Aldehyde	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Endrin Ketone	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Gamma-BHC	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	gamma-Chlordane	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Heptachlor	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Methoxychlor	ND	ug/L	0.05	1
11/14/16	11/21/16 00:00			(EPA 608)	Toxaphene	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	Decachlorobiphenyl	97	%		1
11/14/16	11/21/16 00:00			(EPA 608)	Tetrachlorometaxylene	44	%		1
		EPA 608 - Organochlorine PCBs							
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1016 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1221 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1232 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1242 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1248 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1254 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	PCB 1260 Aroclor	ND	ug/L	1	1
11/14/16	11/21/16 00:00			(EPA 608)	Decachlorobiphenyl	97	%		1
11/14/16	11/21/16 00:00			(EPA 608)	Tetrachlorometaxylene	44	%		1
		EPA 180.1 - Turbidity							
	11/09/16 09:56		947903	(EPA 180.1)	Turbidity	0.24	NTU	0.1	1
		4500P-E/365.1 - Orthophosphate as P (OPO4)							
	11/08/16 17:42		947503	(4500P-E/365.1)	Orthophosphate as P	0.021	mg/L	0.01	1
		SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	11/08/16 20:00		948895	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1

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

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Orthophosphate as P (OPO4)

Analytical Batch: 947503		Analysis Date: 11/08/2016
201611070465	PONDSIN110716	Analyzed by: W8E1
201611070466	PONDSOUT110716	Analyzed by: W8E1
201611070467	HCC110716	Analyzed by: W8E1

Nitrate, Nitrite by EPA 300.0

Analytical Batch: 947732		Analysis Date: 11/07/2016
201611070465	PONDSIN110716	Analyzed by: 6Q4
201611070466	PONDSOUT110716	Analyzed by: 6Q4
201611070467	HCC110716	Analyzed by: 6Q4

Turbidity

Analytical Batch: 947903		Analysis Date: 11/09/2016
201611070465	PONDSIN110716	Analyzed by: OM5Q
201611070466	PONDSOUT110716	Analyzed by: OM5Q
201611070467	HCC110716	Analyzed by: OM5Q

Total Chlorine Residual (H3=past HT not compli

Analytical Batch: 948895		Analysis Date: 11/08/2016
201611070465	PONDSIN110716	Analyzed by: V3VN
201611070466	PONDSOUT110716	Analyzed by: V3VN
201611070467	HCC110716	Analyzed by: V3VN

Total Coliform Bacteria

Analytical Batch: 948921		Analysis Date: 11/11/2016
201611070465	PONDSIN110716	Analyzed by: KRF
201611070466	PONDSOUT110716	Analyzed by: KRF
201611070467	HCC110716	Analyzed by: KRF

Fecal Coliform Bacteria

Analytical Batch: 948923		Analysis Date: 11/10/2016
201611070465	PONDSIN110716	Analyzed by: E77P
201611070466	PONDSOUT110716	Analyzed by: E77P
201611070467	HCC110716	Analyzed by: E77P

Glyphosate

Analytical Batch: 949137		Analysis Date: 11/10/2016
201611070465	PONDSIN110716	Analyzed by: DYM
201611070466	PONDSOUT110716	Analyzed by: DYM

Glyphosate

Analytical Batch: 949390		Analysis Date: 11/14/2016
201611070467	HCC110716	Analyzed by: DYM

Ammonia Nitrogen

Analytical Batch: 949504		Analysis Date: 11/14/2016
201611070465	PONDSIN110716	Analyzed by: LUPE
201611070466	PONDSOUT110716	Analyzed by: LUPE

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Ammonia Nitrogen

Analytical Batch: 949508 — **Analysis Date: 11/14/2016**

201611070467	HCC110716	Analyzed by: LUPE

Total Kjeldahl Nitrogen

Analytical Batch: 949534 — **Analysis Date: 11/17/2016**

201611070465	PONDSIN110716	Analyzed by: MIA8
201611070466	PONDSOUT110716	Analyzed by: MIA8
201611070467	HCC110716	Analyzed by: MIA8

Total phosphorus as P (T-P)

Analytical Batch: 949661 — **Analysis Date: 11/15/2016**

201611070465	PONDSIN110716	Analyzed by: AZS
201611070466	PONDSOUT110716	Analyzed by: AZS
201611070467	HCC110716	Analyzed by: AZS

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Laboratory QC
Report: 620884

MWH Americas - Pasadena

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
Orthophosphate as P (OPO4) by 4500P-E/365.1									
Analytical Batch: 947503							**Analysis Date: 11/08/2016**		
LCS1	Orthophosphate as P		0.25	0.257	mg/L	103	(90-110)		
LCS2	Orthophosphate as P		0.25	0.263	mg/L	105	(90-110)	20	2.3
MBLK	Orthophosphate as P			<0.01	mg/L				
MRL_CHK	Orthophosphate as P		0.01	0.0120	mg/L	120	(50-150)		
MS_201611080217	Orthophosphate as P	ND	0.5	0.514	mg/L	102	(90-110)		
MSD_201611080217	Orthophosphate as P	ND	0.5	0.519	mg/L	103	(90-110)	20	0.97
Nitrate, Nitrite by EPA 300.0 by EPA 300.0									
Analytical Batch: 947732							**Analysis Date: 11/07/2016**		
LCS1	Nitrate as Nitrogen by IC		2.5	2.51	mg/L	100	(90-110)		
LCS2	Nitrate as Nitrogen by IC		2.5	2.55	mg/L	102	(90-110)	20	1.6
MBLK	Nitrate as Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrate as Nitrogen by IC		0.05	0.0508	mg/L	102	(50-150)		
MS_201611070208	Nitrate as Nitrogen by IC	ND	2.6	2.52	mg/L	101	(80-120)		
MS_201611070253	Nitrate as Nitrogen by IC	12	2.6	14.5	mg/L	98	(80-120)		
MSD_201611070253	Nitrate as Nitrogen by IC	12	2.6	14.6	mg/L	100	(80-120)	20	0.69
MSD_201611070208	Nitrate as Nitrogen by IC	ND	2.6	2.51	mg/L	100	(80-120)	20	0.40
LCS1	Nitrite Nitrogen by IC		1	0.934	mg/L	93	(90-110)		
LCS2	Nitrite Nitrogen by IC		1	0.937	mg/L	94	(90-110)	20	0.32
MBLK	Nitrite Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrite Nitrogen by IC		0.05	0.0443	mg/L	89	(50-150)		
MS_201611070208	Nitrite Nitrogen by IC	ND	1	0.792	mg/L	**79**	(80-120)		
MS_201611070253	Nitrite Nitrogen by IC	0.72	1	1.67	mg/L	95	(80-120)		
MSD_201611070208	Nitrite Nitrogen by IC	ND	1	0.795	mg/L	80	(80-120)	20	0.38
MSD_201611070253	Nitrite Nitrogen by IC	0.72	1	1.67	mg/L	95	(80-120)	20	0.0
Turbidity by EPA 180.1									
Analytical Batch: 947903							**Analysis Date: 11/09/2016**		
DUP1_201611080252	Turbidity	ND	0.1	0.0970	NTU		(0-20)	20	5.3
DUP2_201611080217	Turbidity	ND	0.1	0.0750	NTU		(0-20)	20	1.3
LCS1	Turbidity		20	21.7	NTU	109	(90-110)		
LCS2	Turbidity		20	21.8	NTU	109	(90-110)	20	0.46
MBLK	Turbidity			<0.10	NTU				
MRLHI	Turbidity		0.1	0.143	NTU	143	(50-150)		

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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QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%

Total Chlorine Residual (H3=past HT not compliant) by SM 4500-CL G

Analytical Batch: 948895 **Analysis Date: 11/08/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS1	Total Chlorine Residual		1	1.02	mg/L	102	(85-115)		
LCS2	Total Chlorine Residual			1.04	mg/L				
MBLK	Total Chlorine Residual			<0.1	mg/L				
MRL_CHK	Total Chlorine Residual		0.1	0.130	mg/L	130	(50-150)		

Glyphosate by EPA 547

Analytical Batch: 949137 **Analysis Date: 11/10/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
CCCH	Glyphosate		25	21.3	ug/L	85	(80-120)		
CCCM	Glyphosate		10	9.72	ug/L	97	(80-120)		
LCS1	Glyphosate		10	8.92	ug/L	89	(70-130)		
MBLK	Glyphosate			<6	ug/L				
MRL_CHK	Glyphosate		6	5.22	ug/L	87	(50-150)		
MS_201611030173	Glyphosate	ND	10	9.01	ug/L	90	(70-130)		
MS2_201611030062	Glyphosate	ND	10	9.71	ug/L	97	(70-130)		
MSD_201611030173	Glyphosate	ND	10	10.3	ug/L	103	(70-130)	20	13

Glyphosate by EPA 547

Analytical Batch: 949390 **Analysis Date: 11/14/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
CCCH	Glyphosate		25	24.9	ug/L	100	(80-120)		
CCCM	Glyphosate		10	9.54	ug/L	95	(80-120)		
LCS1	Glyphosate		10	11.1	ug/L	111	(70-130)		
MBLK	Glyphosate			<6	ug/L				
MRL_CHK	Glyphosate		6	6.49	ug/L	108	(50-150)		
MS_201611070074	Glyphosate	ND	10	9.44	ug/L	94	(70-130)		
MS2_201611080217	Glyphosate	ND	10	8.70	ug/L	87	(70-130)		
MSD_201611070074	Glyphosate	ND	10	9.13	ug/L	91	(70-130)	20	3.3

Ammonia Nitrogen by EPA 350.1

Analytical Batch: 949504 **Analysis Date: 11/14/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS3	Ammonia Nitrogen		1	0.993	mg/L	99	(90-110)		
LCS4	Ammonia Nitrogen		1	1.00	mg/L	100	(90-110)	20	0.70
MBLK	Ammonia Nitrogen			<0.025	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0530	mg/L	106	(79-126)		
MS1_201611100424	Ammonia Nitrogen	0.38	1	1.39	mg/L	101	(90-110)		
MS1_201611040551	Ammonia Nitrogen	0.061	1	1.11	mg/L	105	(90-110)		
MSD1_201611100424	Ammonia Nitrogen	0.38	1	1.33	mg/L	95	(90-110)	20	4.4

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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QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MSD1_201611040551	Ammonia Nitrogen	0.061	1	1.12	mg/L	105	(90-110)	20	0.90

Ammonia Nitrogen by EPA 350.1

Analytical Batch: 949508 **Analysis Date: 11/14/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS3	Ammonia Nitrogen		1	1.01	mg/L	101	(90-110)		
LCS4	Ammonia Nitrogen		1	1.03	mg/L	103	(90-110)	20	2.0
MBLK	Ammonia Nitrogen			<0.025	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0540	mg/L	108	(79-126)		
MS1_201611080616	Ammonia Nitrogen	ND	1	1.08	mg/L	107	(90-110)		
MS1_201611070467	Ammonia Nitrogen	ND	1	1.01	mg/L	99	(90-110)		
MSD1_201611080616	Ammonia Nitrogen	ND	1	1.05	mg/L	104	(90-110)	20	2.8
MSD1_201611070467	Ammonia Nitrogen	ND	1	1.04	mg/L	102	(90-110)	20	2.9

Total Kjeldahl Nitrogen by EPA 351.2

Analytical Batch: 949534 **Analysis Date: 11/17/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS1	Kjeldahl Nitrogen		4	3.92	mg/L	98	(90-110)		
LCS2	Kjeldahl Nitrogen		4	4.00	mg/L	100	(90-110)	20	2.0
MBLK	Kjeldahl Nitrogen			<0.1	mg/L				
MRL_CHK	Kjeldahl Nitrogen		0.2	0.188	mg/L	94	(50-150)		
MS_201611030369	Kjeldahl Nitrogen	ND	4	3.53	mg/L	**88**	(90-110)		
MS_201611070466	Kjeldahl Nitrogen	ND	4	3.74	mg/L	91	(90-110)		
MSD_201611030369	Kjeldahl Nitrogen	ND	4	3.76	mg/L	94	(90-110)	10	6.3
MSD_201611070466	Kjeldahl Nitrogen	ND	4	3.66	mg/L	**89**	(90-110)	10	2.2

Total phosphorus as P (T-P) by SM4500-PE/EPA 365.1

Analytical Batch: 949661 **Analysis Date: 11/15/2016**

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
LCS1	Total phosphorus as P		0.4	0.432	mg/L	108	(90-110)		
LCS2	Total phosphorus as P		0.4	0.417	mg/L	104	(90-110)	20	3.5
MBLK	Total phosphorus as P			<0.01	mg/L				
MRL_CHK	Total phosphorus as P		0.02	0.0213	mg/L	107	(50-150)		
MS_201611070244	Total phosphorus as P	0.021	0.4	0.441	mg/L	105	(90-110)		
MS2_201611080452	Total phosphorus as P	ND	0.4	0.396	mg/L	99	(90-110)		
MSD_201611070244	Total phosphorus as P	0.021	0.4	0.407	mg/L	96	(90-110)	20	8.0
MSD2_201611080452	Total phosphorus as P	ND	0.4	0.394	mg/L	98	(90-110)	20	0.51

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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State Certification Number: CA1312 (WW & DW)
NELAP Certification number: CA00046 (HW)

December 6, 2016

Eurofins Eaton Analytical
750 Royal Oaks Drive, Suite 100
Monrovia, California 91016

Attn: Jackie Contreras

Subject: Report of Data: Case 81439

Results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dear Ms. Contreras,

Three water sample for project "620884" were received on November 9, 2016, in good condition. The analytical method was changed as requested on November 10, 2016. Written results are being provided on this December 6, 2016, for the requested analyses. All holding times were met.

For the EPA 608 analysis, the samples were extracted according to EPA method 3510C.

No unusual problem or complication was encountered with this sample set.

If you have any questions or require further information, please contact us at your convenience. Thank you for choosing APPL, Inc.

I certify that this data package complies with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. These test results meet all requirements of NELAC. Release of the hard copy has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Paula McCartney

Paula McCartney, Laboratory Director
APPL, Inc.

PM/rp
Enclosure
cc: File

Number of pages in this report: ____

EPA 608 CHLORINATED PESTICIDES

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750 Royal Oaks Dr., Ste 100
Monrovia, CA 91016

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Jackie Contreras

Project: 620884

ARF: 81439

Sample ID: 201611070465

APPL ID: AZ45616

Sample Collection Date: 11/07/16

QCG: #608-161114A-214190

Method	Analyte	Result	PQL	MDL	Units	Extraction Date	Analysis Date
EPA 608	4,4'-DDE	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
EPA 608	4,4'-DDT	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	4,4'-TDE/DDD	Not detected	0.05	0.003	ug/L	11/14/16	11/21/16
EPA 608	A-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	A-CHLORDANE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	ALDRIN	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
EPA 608	B-BHC	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	CHLORDANE, TECH	Not detected	1.0	0.01	ug/L	11/14/16	11/21/16
EPA 608	D-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	DIELDRIN	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN I	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN II	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN SULFATE	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN ALDEHYDE	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN KETONE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
EPA 608	G-BHC (LINDANE)	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	G-CHLORDANE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
EPA 608	HEPTACHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	HEPTACHLOR EPOXIDE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	METHOXYCHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	PCB-1016	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1221	Not detected	1.0	0.08	ug/L	11/14/16	11/21/16
EPA 608	PCB-1232	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1242	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1248	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
EPA 608	PCB-1254	Not detected	1.0	0.20	ug/L	11/14/16	11/21/16
EPA 608	PCB-1260	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
EPA 608	TOXAPHENE	Not detected	1.0	0.38	ug/L	11/14/16	11/21/16
EPA 608	SURROGATE: DECACHLOROBIPHEN	102	27-110		%	11/14/16	11/21/16
EPA 608	SURROGATE: TCMX (S)	61.2	24-114		%	11/14/16	11/21/16

Quant Method:	OCL1024.M
Run #:	1121020
Instrument:	Ethel
Sequence:	161121
Dilution Factor:	1
Initials:	DPO

Printed: 12/06/16 12:32:21 PM

APPL-F1-SC-NoMC-REG MDLs

EPA 608 CHLORINATED PESTICIDES

Eurofins Eaton Analytical
750 Royal Oaks Dr., Ste 100
Monrovia, CA 91016

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Jackie Contreras

Project: 620884

ARF: 81439

Sample ID: 201611070466

APPL ID: AZ45617

Sample Collection Date: 11/07/16

QCG: #608-161114A-214190

Method	Analyte	Result	PQL	MDL	Units	Extraction Date	Analysis Date
EPA 608	4,4'-DDE	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
EPA 608	4,4'-DDT	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	4,4'-TDE/DDD	Not detected	0.05	0.003	ug/L	11/14/16	11/21/16
EPA 608	A-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	A-CHLORDANE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	ALDRIN	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
EPA 608	B-BHC	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	CHLORDANE, TECH	Not detected	1.0	0.01	ug/L	11/14/16	11/21/16
EPA 608	D-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	DIELDRIN	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN I	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN II	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN SULFATE	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN ALDEHYDE	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN KETONE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
EPA 608	G-BHC (LINDANE)	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	G-CHLORDANE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
EPA 608	HEPTACHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	HEPTACHLOR EPOXIDE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	METHOXYCHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	PCB-1016	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1221	Not detected	1.0	0.08	ug/L	11/14/16	11/21/16
EPA 608	PCB-1232	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1242	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1248	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
EPA 608	PCB-1254	Not detected	1.0	0.20	ug/L	11/14/16	11/21/16
EPA 608	PCB-1260	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
EPA 608	TOXAPHENE	Not detected	1.0	0.38	ug/L	11/14/16	11/21/16
EPA 608	SURROGATE: DECACHLOROBIPHEN	108	27-110		%	11/14/16	11/21/16
EPA 608	SURROGATE: TCMX (S)	73.5	24-114		%	11/14/16	11/21/16

Quant Method:	OCL1024.M
Run #:	1121021
Instrument:	Ethel
Sequence:	161121
Dilution Factor:	1
Initials:	DPO

Printed: 12/06/16 12:32:21 PM

APPL-F1-SC-NoMC-REG MDLs

EPA 608 CHLORINATED PESTICIDES

Eurofins Eaton Analytical
750 Royal Oaks Dr., Ste 100
Monrovia, CA 91016

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Jackie Contreras

Project: 620884

ARF: 81439

Sample ID: 201611070467

APPL ID: AZ45618

Sample Collection Date: 11/07/16

QCG: #608-161114A-214190

Method	Analyte	Result	PQL	MDL	Units	Extraction Date	Analysis Date
EPA 608	4,4'-DDE	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
EPA 608	4,4'-DDT	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	4,4'-TDE/DDD	Not detected	0.05	0.003	ug/L	11/14/16	11/21/16
EPA 608	A-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	A-CHLORDANE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	ALDRIN	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
EPA 608	B-BHC	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	CHLORDANE, TECH	Not detected	1.0	0.01	ug/L	11/14/16	11/21/16
EPA 608	D-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	DIELDRIN	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN I	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN II	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
EPA 608	ENDOSULFAN SULFATE	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN ALDEHYDE	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
EPA 608	ENDRIN KETONE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
EPA 608	G-BHC (LINDANE)	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
EPA 608	G-CHLORDANE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
EPA 608	HEPTACHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	HEPTACHLOR EPOXIDE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
EPA 608	METHOXYCHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
EPA 608	PCB-1016	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1221	Not detected	1.0	0.08	ug/L	11/14/16	11/21/16
EPA 608	PCB-1232	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1242	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
EPA 608	PCB-1248	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
EPA 608	PCB-1254	Not detected	1.0	0.20	ug/L	11/14/16	11/21/16
EPA 608	PCB-1260	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
EPA 608	TOXAPHENE	Not detected	1.0	0.38	ug/L	11/14/16	11/21/16
EPA 608	SURROGATE: DECACHLOROBIPHEN	97.2	27-110		%	11/14/16	11/21/16
EPA 608	SURROGATE: TCMX (S)	43.6	24-114		%	11/14/16	11/21/16

Quant Method:	OCL1024.M
Run #:	1121022
Instrument:	Ethel
Sequence:	161121
Dilution Factor:	1
Initials:	DPO

Printed: 12/06/16 12:32:21 PM

APPL-F1-SC-NoMC-REG MDLs

Method Blank
EPA 608 CHLORINATED PESTICIDES

Blank Name/QCG: **161114W-45616 - 214190**
Batch ID: #608-161114A

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	PQL	MDL	Units	Extraction Date	Analysis Date
BLANK	4,4'-DDE	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
BLANK	4,4'-DDT	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
BLANK	4,4'-TDE/DDD	Not detected	0.05	0.003	ug/L	11/14/16	11/21/16
BLANK	A-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
BLANK	A-CHLORDANE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
BLANK	ALDRIN	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
BLANK	B-BHC	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
BLANK	CHLORDANE, TECH	Not detected	1.0	0.01	ug/L	11/14/16	11/21/16
BLANK	D-BHC	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
BLANK	DIELDRIN	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
BLANK	ENDOSULFAN I	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
BLANK	ENDOSULFAN II	Not detected	0.05	0.004	ug/L	11/14/16	11/21/16
BLANK	ENDOSULFAN SULFATE	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
BLANK	ENDRIN	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
BLANK	ENDRIN ALDEHYDE	Not detected	0.05	0.009	ug/L	11/14/16	11/21/16
BLANK	ENDRIN KETONE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
BLANK	G-BHC (LINDANE)	Not detected	0.05	0.005	ug/L	11/14/16	11/21/16
BLANK	G-CHLORDANE	Not detected	0.05	0.006	ug/L	11/14/16	11/21/16
BLANK	HEPTACHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
BLANK	HEPTACHLOR EPOXIDE	Not detected	0.05	0.007	ug/L	11/14/16	11/21/16
BLANK	METHOXYCHLOR	Not detected	0.05	0.008	ug/L	11/14/16	11/21/16
BLANK	PCB-1016	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
BLANK	PCB-1221	Not detected	1.0	0.08	ug/L	11/14/16	11/21/16
BLANK	PCB-1232	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
BLANK	PCB-1242	Not detected	1.0	0.12	ug/L	11/14/16	11/21/16
BLANK	PCB-1248	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
BLANK	PCB-1254	Not detected	1.0	0.20	ug/L	11/14/16	11/21/16
BLANK	PCB-1260	Not detected	1.0	0.09	ug/L	11/14/16	11/21/16
BLANK	TOXAPHENE	Not detected	1.0	0.38	ug/L	11/14/16	11/21/16
BLANK	SURROGATE: DECACHLOROBIPHEN	85.7	27-110		%	11/14/16	11/21/16
BLANK	SURROGATE: TCMX (S)	54.0	24-114		%	11/14/16	11/21/16

Quant Method: OCL1024.M
Run #: 1121013
Instrument: Ethel
Sequence: 161121
Initials: DPO

GC SC-Blank-REG MDLs
Printed: 12/06/16 12:32:20 PM

Laboratory Control Spike Recovery
EPA 608 CHLORINATED PESTICIDES

APPL ID: **161114W-45616 LCS - 214190**
Batch ID: #608-161114A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Level ug/L	SPK Result ug/L	SPK % Recovery	Recovery Limits
4,4'-DDE	0.300	0.229	76.3	30-145
4,4'-DDT	0.300	0.243	81.0	25-160
4,4'-TDE/DDD	0.300	0.241	80.3	31-141
A-BHC	0.300	0.215	71.7	37-134
A-CHLORDANE	0.300	0.237	79.0	63-112
ALDRIN	0.300	0.135	45.0	42-122
B-BHC	0.300	0.249	83.0	17-147
CHLORDANE, TECH	2.00	1.91	95.5	45-119
D-BHC	0.300	0.242	80.7	19-140
DIELDRIN	0.300	0.246	82.0	36-146
ENDOSULFAN I	0.300	0.248	82.7	45-153
ENDOSULFAN II	0.300	0.229	76.3	1-202
ENDOSULFAN SULFATE	0.300	0.255	85.0	26-144
ENDRIN	0.300	0.243	81.0	30-147
ENDRIN ALDEHYDE	0.300	0.270	90.0	56-114
ENDRIN KETONE	0.300	0.251	83.7	53-119
G-BHC (LINDANE)	0.300	0.234	78.0	32-127
G-CHLORDANE	0.300	0.237	79.0	61-115
HEPTACHLOR	0.300	0.199	66.3	34-111
HEPTACHLOR EPOXIDE	0.300	0.247	82.3	37-142
METHOXYCHLOR	0.300	0.286	95.3	62-121
PCB-1016	1.0	0.852	85.2	50-114
PCB-1260	1.0	0.944	94.4	8-127
TOXAPHENE	2.00	1.38	69.0	41-126
SURROGATE: DECACHLOROBIPHENYL	0.300	0.220	73.3	27-110
SURROGATE: TCMX (S)	0.300	0.195	65.0	24-114

Comments: ______________________

Primary	**SPK**
Quant Method :	OCL1024.M
Extraction Date :	11/14/16
Analysis Date :	11/21/16
Instrument :	Ethel
Run :	1121014
Initials :	DPO

Printed: 12/06/16 12:32:21 PM
APPL Standard LCS

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Submittal Form & Purchase Order 99-43760

81439

Date: 11/8/2016

2.4

*REPORTING REQUIRMENTS: *Do Not Combine Reports with any other samples submitted under different Folder Numbers!*
Report & Invoice must have the Folder# 620884 Sub PO# 99-43760 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

Ship To:
Appl, Inc.
908 N. Temperance

Clovis, CA 93611

Phone: 559-275-2175 Fax: 559-275-4422

Folder #:	**Report Due:**	**Sub PO #:**
620884	**11/23/2016**	**99-43760**

JLS	Use Lab Order # for ID	*Client Sample ID for reference only*	Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
EPA 8081A	201611070465 @8081A	PONDSIN110716	Organochlorine Pesticides	11/07/16 1120	DW		
EPA 8081A	201611070466 @8081A	PONDSOUT110716	Organochlorine Pesticides	11/07/16 1215	DW		
EPA 8081A	201611070467 @8081A	HCC110716	Organochlorine Pesticides	11/07/16 1330	DW		

Relinquished by: Sample Control MAV Date 11-8-16 Time 16:03
Received by: Yang Zor Date 11/9/16 Time 10:05
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

750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016 Tel (626) 386-1100 Fax (626) 386-1101 www.EurofinsUS.com/Eaton

EMAX

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

Date: 11-17-2016
EMAX Batch No.: 16K065

Attn: Jackie Contreras

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

Subject: Laboratory Report
Project: 620884

Enclosed is the Laboratory report for samples received on 11/08/16.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
201611070465	K065-01	11/07/16	WATER	PESTICIDES ORGANOPHOSPHORUS
201611070466	K065-02	11/07/16	WATER	PESTICIDES ORGANOPHOSPHORUS
201611070467	K065-03	11/07/16	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

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

NELAP Accredited Certificate Number CA002912016-11
L-A-B Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672

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Submittal Form & Purchase Order 99-43758

Date: 11/8/2016

*REPORTING REQUIRMENTS: *Do Not Combine Reports with any other samples submitted under different Folder Numbers!*
Report & Invoice must have the Folder # **620884** Sub PO# **99-43758** 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

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

Torrance, CA 90501

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

16K065

Folder #:	Report Due:	Sub PO #:
620884	11/23/2016	99-43758

JLS		Use Lab Order # for ID	*Client Sample ID for reference only*	Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
EPA 8141A	1	201611070465 @8141EDD	PONDSIN110716	Organophosphorous Pesticides (Sub)	11/07/16 1120	DW		
EPA 8141A	2	201611070466 @8141EDD	PONDSOUT110716	Organophosphorous Pesticides (Sub)	11/07/16 1215	DW		
EPA 8141A	3	201611070467 @8141EDD	HCC110716	Organophosphorous Pesticides (Sub)	11/07/16 1330	DW		

Relinquished by: [signature] Sample Control Theodore Ng Date 11/8/16 Time 1352
Received by: ______ Date ______ Time ______
Relinquished by: Sample Control Date ______ Time ______
Received by: [signature] Date 11/8/16 Time 13:52

NOTIFICATION REQUIRED IF RECEIVED OUTSIDE OF 0-6 CELSIUS

An Acknowledgement of Receipt is requested to attn: Jackie Contreras

T-1.6°C

Page 1 of 1

750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016 Tel (626) 386-1100 Fax (626) 386-1101 www.EurofinsUS.com/Eaton

SAMPLE RECEIPT FORM 1

Reference: EMAX-SM02 Rev.8
Form: SM02F1

Type of Delivery	Airbill / Tracking Number	ECN 16K065	
☐ Fedex ☐ UPS ☐ GSO ☐ Others		Recipient Cecilia	
☐ EMAX Courier ☑ Client Delivery		Date 11/08/16	Time 13:52

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	☑ Cooler 1 1.6 °C	☐ Cooler 2 ___ °C	☐ Cooler 3 ___ °C	☐ Cooler 4 ___ °C	☐ Cooler 5 ___ °C
(Cool, ≤6 °C but not frozen)	☐ Cooler 6 ___ °C	☐ Cooler 7 ___ °C	☐ Cooler 8 ___ °C	☐ Cooler 9 ___ °C	☐ Cooler 10 ___ °C
Thermometer:	~~*A-S/N* 120538505~~	*B-S/N* ______	*C-S/N* 140252067	*D-S/N* 150555630	FW 11/7/16

Comments: ☐ **Temperature is out of range. PM was informed IMMEDIATELY.**

Note: ______

DISCREPANCIES

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action
			cu 11/8/16	

☐ pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

NOTES/OBSERVATIONS:

LEGEND:

☐ **Continue to next page.**

Code	Description- Sample Management	Code	Description-Sample Management	Code	Description-Sample Management
D1	Analysis is not indicated in ______	D13	Out of Holding Time	R1	Proceed as indicated in ☐ COC ☐ Label
D2	Analysis mismatch COC vs label	D14	Bubble is >6mm	R2	Refer to attached instruction
D3	Sample ID mismatch COC vs label	D15	No trip blank in cooler	R3	Cancel the analysis
D4	Sample ID is not indicated in ______	D16	Preservation not indicated in ______	R4	Use vial with smallest bubble first
D5	Container -[improper] [leaking] [broken]	D17	Preservation mismatch COC vs label	R5	Log-in with latest sampling date and time+1 min
D6	Date/Time is not indicated in ______	D18	Insufficient chemical preservative	R6	Adjust pH as necessary
D7	Date/Time mismatch COC vs label	D19	Insufficient Sample	R7	Filter and preserved as necessary
D8	Sample listed in COC is not received	D20	No filtration info for dissolved analysis	R8	______
D9	Sample received is not listed in COC	D21	No sample for moisture determination	R9	______
D10	No initial/date on corrections in COC/label	D22	______	R10	______
D11	Container count mismatch COC vs received	D23	______	R11	______
D12	Container size mismatch COC vs received	D24	______	R12	______

REVIEWS:

Sample Labeling [signatures] **Date** 11/08/16 11/8/16

SRF [signature] **Date** 11/8/16

PM NB **Date** 11/8/16

EMAX **Laboratories, Inc. 1835 W. 205th St., Torrance, Ca 90501**

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
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
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
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

620884

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

SDG#: 16K065

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project: 620884

SDG : 16K065

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

A total of three (3) water samples were received on 11/08/16 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 out on a frequency specified by the project. All calibration requirements were within acceptance criteria except Naled was bias high in both columns of closing CCV - ZK10012. However, the analyte was not detected in the sample J065-01. 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. NPK003WB - 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. NPK003WL/NPK003WC 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.

LAB CHRONICLE
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL
Project : 620884

SDG NO. : 16K065
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	NPK003WB	1	NA	11/10/1615:48	11/09/1614:15	ZK10003A	ZK10002A	NPK003W	Method Blank
LCS1W	NPK003WL	1	NA	11/10/1616:27	11/09/1614:15	ZK10004A	ZK10002A	NPK003W	Lab Control Sample (LCS)
LCD1W	NPK003WC	1	NA	11/10/1617:06	11/09/1614:15	ZK10005A	ZK10002A	NPK003W	LCS Duplicate
201611070465	K065-01	1.08	NA	11/10/1617:46	11/09/1614:15	ZK10006A	ZK10002A	NPK003W	Field Sample
201611070466	K065-02	1.2	NA	11/10/1618:25	11/09/1614:15	ZK10007A	ZK10002A	NPK003W	Field Sample
201611070467	K065-03	1.08	NA	11/10/1619:04	11/09/1614:15	ZK10008A	ZK10002A	NPK003W	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

==

Client : EUROFINS EATON ANALYTICAL
Project : 620884
Batch No. : 16K065
Sample ID: 201611070465
Lab Samp ID: K065-01
Lab File ID: ZK10006A
Ext Btch ID: NPK003W
Calib. Ref.: ZK10002A

Date Collected: 11/07/16
Date Received: 11/08/16
Date Extracted: 11/09/16 14:15
Date Analyzed: 11/10/16 17:46
Dilution Factor: 1.08
Matrix : WATER
% Moisture : NA
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	(1.603)|1.574	1.620	(98.9)|97.1	30-130
TRIPHENYL PHOSPHATE	(1.560)|1.512	1.620	(96.3)|93.3	50-130

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 11/07/16
Project : 620884	Date Received: 11/08/16
Batch No. : 16K065	Date Extracted: 11/09/16 14:15
Sample ID: 201611070466	Date Analyzed: 11/10/16 18:25
Lab Samp ID: K065-02	Dilution Factor: 1.2
Lab File ID: ZK10007A	Matrix : WATER
Ext Btch ID: NPK003W	% Moisture : NA
Calib. Ref.: ZK10002A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)		RL (ug/L)	MDL (ug/L)	
DICHLORVOS	(ND)	ND	1.2	0.60	0.60
MEVINPHOS	(ND)	ND	1.2	0.60	0.60
DEMETON	(ND)	ND	1.2	0.60	0.60
ETHOPROP	(ND)	ND	1.2	0.60	0.60
PHORATE	(ND)	ND	1.2	0.60	0.60
NALED	(ND)	ND	1.2	0.60	0.60
DIAZINON	(ND)	ND	1.2	0.60	0.60
DISULFOTON	(ND)	ND	1.2	0.60	0.60
RONNEL	(ND)	ND	1.2	0.60	0.60
CHLORPYRIFOS	(ND)	ND	1.2	0.60	0.60
FENTHION	(ND)	ND	1.2	0.60	0.60
TRICHLORONATE	(ND)	ND	1.2	0.60	0.60
METHYL PARATHION	(ND)	ND	1.2	0.60	0.60
TOKUTHION	(ND)	ND	1.2	0.60	0.60
STIROPHOS	(ND)	ND	1.2	0.60	0.60
BOLSTAR	(ND)	ND	1.2	0.60	0.60
FENSULFOTHION	(ND)	ND	1.2	0.60	0.60
AZINPHOS-METHYL	(ND)	ND	1.2	0.60	0.60
COUMAPHOS	(ND)	ND	1.2	0.60	0.60

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY		QC LIMIT
TRIBUTYL PHOSPHATE	(1.706)	1.684	1.800	(94.8)	93.5	30-130
TRIPHENYL PHOSPHATE	(1.642)	1.608	1.800	(91.2)	89.3	50-130

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 11/07/16
Project : 620884	Date Received: 11/08/16
Batch No. : 16K065	Date Extracted: 11/09/16 14:15
Sample ID: 201611070467	Date Analyzed: 11/10/16 19:04
Lab Samp ID: K065-03	Dilution Factor: 1.08
Lab File ID: ZK10008A	Matrix : WATER
Ext Btch ID: NPK003W	% Moisture : NA
Calib. Ref.: ZK10002A	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	(1.483)|1.568	1.620	(91.5)|96.8	30-130
TRIPHENYL PHOSPHATE	(1.503)|1.499	1.620	(92.8)|92.5	50-130

QC SUMMARIES

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client	: EUROFINS EATON ANALYTICAL	Date Collected:	NA
Project	: 620884	Date Received:	11/09/16
Batch No.	: 16K065	Date Extracted:	11/09/16 14:15
Sample ID:	MBLK1W	Date Analyzed:	11/10/16 15:48
Lab Samp ID:	NPK003WB	Dilution Factor:	1
Lab File ID:	ZK10003A	Matrix	: WATER
Ext Btch ID:	NPK003W	% Moisture	: NA
Calib. Ref.:	ZK10002A	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	(1.364)|1.372	1.500	(90.9)|91.5	30-130
TRIPHENYL PHOSPHATE	(1.360)|1.359	1.500	(90.7)|90.6	50-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: EUROFINS EATON ANALYTICAL
PROJECT: 620884
BATCH NO.: 16K065
METHOD: METHOD 3520C/8141A

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK1W				
LAB SAMP ID:	NPK003WB	NPK003WL	NPK003WC		
LAB FILE ID:	ZK10003A	ZK10004A	ZK10005A		
DATE EXTRACTED:	11/09/1614:15	11/09/1614:15	11/09/1614:15	DATE COLLECTED:	NA
DATE ANALYZED:	11/10/1615:48	11/10/1616:27	11/10/1617:06	DATE RECEIVED:	11/09/16
PREP. BATCH:	NPK003W	NPK003W	NPK003W		
CALIB. REF:	ZK10002A	ZK10002A	ZK10002A		

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	(1.18)|1.13	(79)|75	1.50	(1.22)|1.22	(81)|81	(3)|8	10-130	30
Ronnel	(ND)|ND	1.50	(1.22)|1.30	(81)|87	1.50	(1.27)|1.32	(85)|88	(4)|2	30-140	30
Chlorpyrifos	(ND)|ND	1.50	(1.19)|1.36	(79)|91	1.50	(1.27)|1.38	(85)|92	(7)|1	40-140	30
Tokuthion	(ND)|ND	1.50	(1.21)|1.23	(81)|82	1.50	(1.28)|1.22	(85)|81	(6)|1	40-130	30
Bolstar	(ND)|ND	1.50	(1.25)|1.20	(83)|80	1.50	(1.34)|1.14	(89)|76	(7)|5	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	(1.322)|1.648	(88.1)|110	1.500	(1.187)|1.425	(79.1)|95.0	30-130
Triphenyl Phosphate	1.500	(1.507)|1.387	(100)|92.5	1.500	(1.360)|1.314	(90.7)|87.6	50-130

APPENDIX H

Trails Maintenance and Monitoring Memos

May 23, 2016
(2014-003.015/006/6)

Mayra Cabrera
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 (May 2016) 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 May 2016.

All trails within the Mitigation Area were surveyed on May 6, 2016 by an ECORP Consulting, Inc. (ECORP) biologist, Adam Schroeder, 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 375194 E, 3792582 N; Figure 1) still showed signs of use. A rock dam was observed again; however, it was smaller than the rock dam observed in December 2015 (Figure 2). There also appeared to have been small fire circles set up next to the creek (Figure 3). Use at this area appeared to be lighter than what was observed during previous visits. A fallen willow tree was observed blocking the trail to the picnic area; this may explain the apparent reduction in use (Figure 4). Issues at this site have been noted during previous site visits and continue to be a problem in this area.

Willow branches were observed extending out into the trail in two locations in such a way that would be disruptive to equestrian users (11 S 376235 E, 3792648 N and 11 S 376467 E, 3792456 N; Figures 1 and 5).

Major trail erosion was observed in three locations along the trail (11 S 376395 E, 3792562 N; 11 S 376450 E, 3792453 N; and 11 S 376538 E, 3792403 N; Figures 1, 6–8). Erosion at one location has resulted in the pooling of stagnant water, caution tape was observed at this location (Figure 7). This area was reported by local residents at the recent Community Advisory Committee meeting in April. As a result of the pooling water, high densities of mosquitoes were observed by biologists near this eroded trail location. Another location with substantial erosion was observed to have large boulders blocking the trail (Figure 8).

During the site visit, biologists noted a homeless encampment underneath the Interstate 210 freeway bridge. While the encampment is located outside of the Mitigation Area, the occupant was observed riding an All-Terrain Vehicle (ATV) through the Mitigation Area. He was observed riding back and forth up on the berm under the bridge, and had created a trail down the berm toward the Tujunga Ponds (Figure 9). The ATV tire tracks continued towards Haines Canyon Creek and came to a point where biologists observed trees cut down as well as stockpiles of wood and branches (Figures 10 and 11). This is causing erosion that is affecting Haines Canyon Creek. When the man noticed the biologists documenting this evidence, he made a threatening gesture to the biologists with the chainsaw he was holding. ECORP has notified the County of Los Angeles Department of Public Works and local law enforcement of these issues and an investigation is underway.

Recent fire damage was observed northeast of ponds (11 S 376638 E, 3792516 N; Figures 1 and 12), and may be linked to the activity of the aforementioned homeless man, as several empty cans of butane were observed along the path of his ATV (Figure 13).

During the site visit, the biologists noted several areas where exotic plants had increased in density since previous visits (11 S 376563 E, 3792470 N; 11 S 376654 E, 3792623 N; 11 S 375769 E, 3792615 N; and 11 S 376390 E, 3792372 N; Figures 1, 14-15). Shortpod mustard (*Hirschfeldia incana*), poison hemlock (*Conium maculatum*), and castor bean (*Ricinus communis*) were observed along the trails in the riparian areas and large amounts of crimson fountaingrass (*Pennisetum setaceum*) were observed along the trails in the upland alluvial scrub regions. Further, some regrowth of giant reed (*Arundo donax*) were observed within the Mitigation Area via binoculars. An exotic plant removal and trails maintenance effort will begin on May 9, 2016 to target these and any other exotic species that have sprouted due to the fall and winter rains.

Lastly, an area along the trail was observed to be densely covered in poison oak (*Toxicodendron diversilobum*) to the extent that the poison oak was protruding into the trail walkway (11 S 375741 E, 3792493 N; Figure 16). It is anticipated that this area of poison oak will be trimmed back during the current 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: Adam Schroeder ______________ DATE: May 23, 2016

Adam Schroeder
Associate Biologist

Figure 1. Map of Issues Observed During the Site Visit.

Figure 2. Rock dam at the popular picnic area.

Figure 3. Evidence of several fire circles at the popular picnic area.

Figure 4. Fallen willow tree blocking trail to the popular picnic area.

Figure 5. Willow branch blocking trail.

Figure 6. Heavy erosion on trail.

Figure 7. Heavy erosion causing stagnant water.

Figure 8. Heavy erosion and large boulders blocking trail.

Figure 9. Trail from berm to Haines Canyon Creek created by ATV use.


Figure 10. Evidence of ATV use on trail.


Figure 11. Cut down tree and stockpile of wood.

Figure 12. Recent burn area.

Figure 13. Empty butane cans observed along ATV trail.

Figure 14. Dense shortpod mustard, poison hemlock, and brome grass along trail.

Figure 15. Dense shortpod mustard cover along trail.


Figure 16. Poison oak encroaching upon trail.

August 31, 2016
(2014-003.015/006/6)

Mayra Cabrera
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 (August 2016) 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 August 2016.

All trails within the Mitigation Area were surveyed on August 15, 2016 by an ECORP Consulting, Inc. (ECORP) biologist, Taylor Dee, 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 375194 E, 3792582 N; Figure 1) still showed signs of use. A rock dam was observed again and it was larger than the rock dam observed in May 2016 (Figure 2). There also appeared to have been another small fire circle set up next to the creek (Figure 3). Use at this area appeared to be lighter than what was observed during prior visits. Issues at this site have been noted during previous site visits and continue to be a problem in this area.

Trail erosion was observed in one location along the trail (11 S 376450 E, 3792453 N; Figures 1 and 4). The erosion at this location appeared greatly improved compared to the preceding visit in which stagnant water and mosquitos were present (Figure 4).

Recent fire damage was observed southwest of the ponds (11 S 375765 E, 3792564 N; Figures 1 and 5), and may be linked to the activity of homeless populaces using the area for refuge and resources. Fire damage was observed in May 2016 and was presumably associated with empty butane cans and one of the homeless inhabitants, both of which were observed in May 2016.

During the site visit, the biologists noted several areas where exotic plants were present (11 S 375874 E, 3792620 N and 11 S 376878 E, 3792486 N; Figures 1, 6 and 7). Crimson fountain grass (*Pennisetum setaceum*) with seeds and new regrowth of giant reed (*Arundo donax*) were observed near the trail in the upland alluvial scrub. Despite the presence of some exotic plants, the coverage of exotic vegetation, along the trail, appeared less extensive than previous visits. A maintenance effort is planned for August 2016 to address these problem areas and to remove the exotic plant species. LACDPW will be notified of other trail-related issues identified during the maintenance 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: Taylor Dee ____________________ DATE: August 31, 2016

Taylor Dee
Assistant Biologist

Figure 1. Map of Issues Observed During the Site Visit.

Figure 2. Rock dam at the popular picnic area.

Figure 3. Evidence of fire circle at the popular picnic area.


Figure 4. Erosion along trail.


Figure 5. Recent burn area southwest of ponds.

Figure 6. Crimson fountain grass with seeds along trail.

Figure 7. Giant reed regrowth near trail.

December 14, 2016
(2014-003.015/006/6)

Sara Samaan
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 (November 2016) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Samaan:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in November 2016.

All trails within the Mitigation Area were surveyed on November 28, 2016 by an ECORP Consulting, Inc. (ECORP) biologist, Lauren Dorough, to identify any problem areas along the trail system at the Mitigation Area. The biologist surveyed for areas of erosion, fallen trees, poison oak (*Toxicodendron diversilobum*) 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 2016 Trail Cleanup Day took place on October 15, 2016. As a result, the amount of trash in the Mitigation Area was less than what was observed during prior visits. 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 375194 E, 3792582 N) still showed signs of use. However, use at this area appeared to be lighter than what was observed during prior visits. Issues in this area have been noted during previous site visits.

In the days preceding the monitoring site visit, the Mitigation Area experienced heavy rains and high winds. As a result, downed trees and branches were observed fully or partially blocking the trail in several locations (11 S 376402 E, 3792662 N; 376401 E, 3792618 N; 376178 E, 3792657 N; 375997 E, 3792618 N; 375965 E, 3792486 N; Figures 1 and 2 through 6). Furthermore, branches and debris that had been washed downstream were noted to have created a blockage in the creek which had reduced flow (11 S 375799 E, 3792438 N; Figures 1 and 7).

Trail erosion was observed in two locations along the trail (11 S 376158 E, 3792648 N and 376415 E, 3792500 N; Figures 1, 8, and 9). The trail erosion shown in Figure 8 is located south of the ponds and east of the Cottonwood entrance. This area of trail erosion was initially observed during the first 2016 trail monitoring visit (in May) and has continued to erode further with each rain event. The trail erosion shown in Figure 9 is located at the start of the trail into the Mitigation Area at Cottonwood Avenue. Both trail erosion locations are within areas that have had repeated erosion issues after rain events.

Recent fire damage was observed southwest of the ponds (11 S 376672 E, 3792497 N; Figures 1 and 10), and may be linked to the activity of homeless populaces using the area for refuge and resources. The fire damage covered an approximately 10 by 10 foot area and burned dead annuals and a single unidentified shrub. Fire damage was observed in this same general area in May and August 2016 and was presumably associated with empty butane cans and one of the homeless inhabitants that were previously observed.

During the site visit, the biologists noted exotic plant regrowth in relatively low densities scattered throughout the Mitigation Area. Exotic plant species observed included crimson fountain grass (*Pennisetum setaceum*), castor bean (*Ricinus communis*), white sweet-clover (*Melilotus albus*), tree tobacco (*Nicotiana glauca*), non-native mustard (*Brassica* sp.), common plantain (*Plantago major*), red-stemmed filaree (*Erodium cicutarium*), prickly sowthisle (*Sonchus asper*), and wild lettuce (*Latuca serriola*) (Figure 11). Despite the presence of some exotic plants, the coverage of exotic vegetation along the trail appeared less extensive than previous visits. An exotic plant removal and maintenance effort is planned for November/December 2016. During this effort the crew will attempt to address all trail blockage issues. Anything that cannot be addressed during this effort will be reported to LACDPW in order to arrange for follow up visits to complete trail blockage removal. LACDPW will be notified of any other trail-related issues identified during the maintenance effort.

Upon arrival at the Cottonwood entrance, biologists noted a posted "Notice to Abate a Public Nuisance and Fire Hazard" at the gate entrance from the Los Angeles City Fire Department (Figure 12). ECORP notified LACDPW of this observation on Monday November 28, 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: December 14, 2016

Lauren Dorough
Associate Biologist

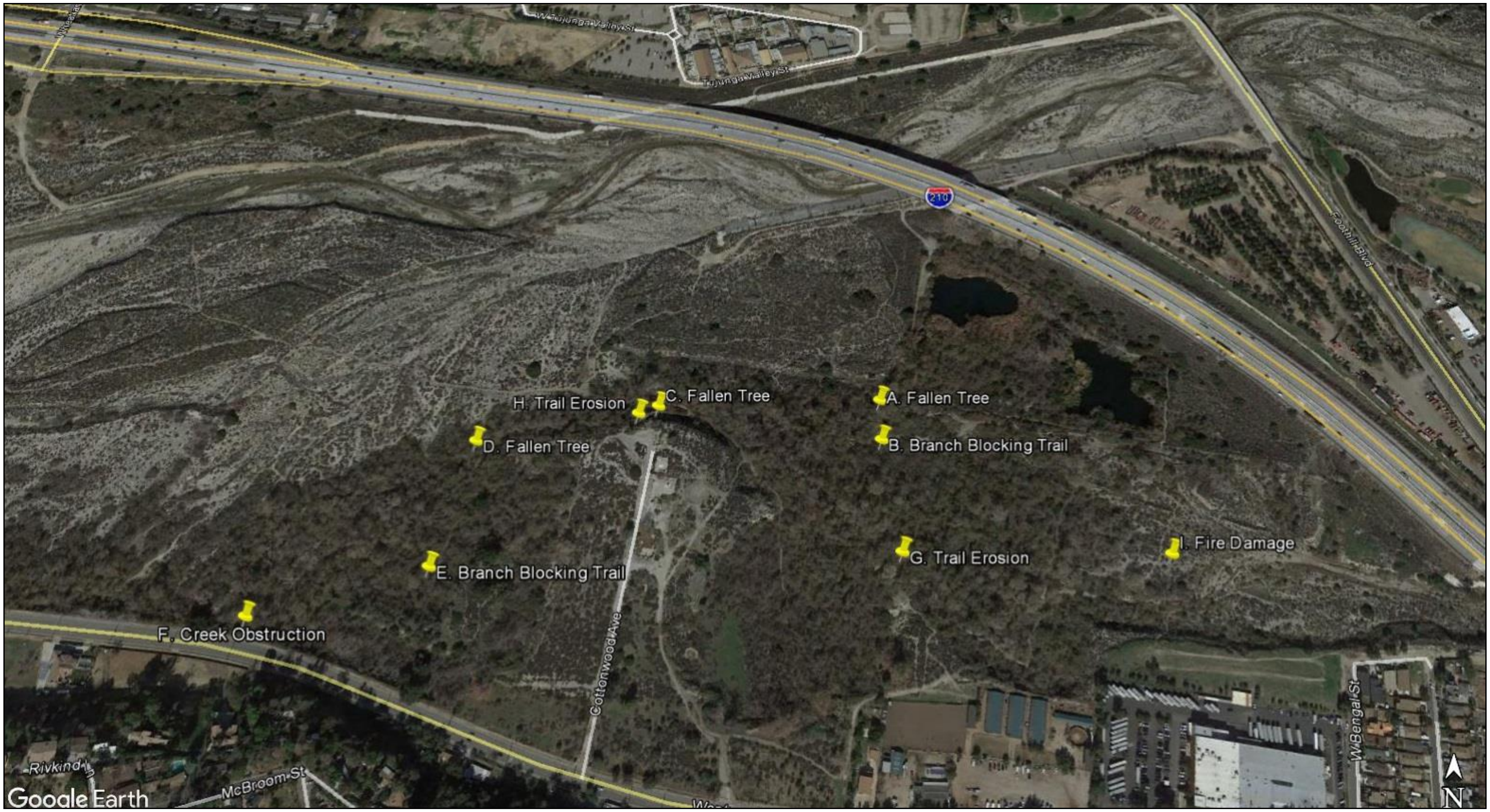

Figure 1. Map of Issues Observed During the Site Visit

Figure 2. Fallen tree obstructing trail – Map Location A.

Figure 3. Fallen branches obstructing trail – Map Location B.

Figure 4. Fallen tree obstructing trail – Map Location C.

Figure 5. Fallen branches obstructing trail – Map Location D.

Figure 6. Fallen branches obstructing trail – Map Location E.

Figure 7. Debris obstructing creek flow – Map Location F.

Figure 8. Trail Erosion – Map Location G.

Figure 9. Trail erosion – Map Location H.

Figure 10. Small burn area southwest of ponds – Map Location I.

Figure 11. Castor bean regrowth near creek.

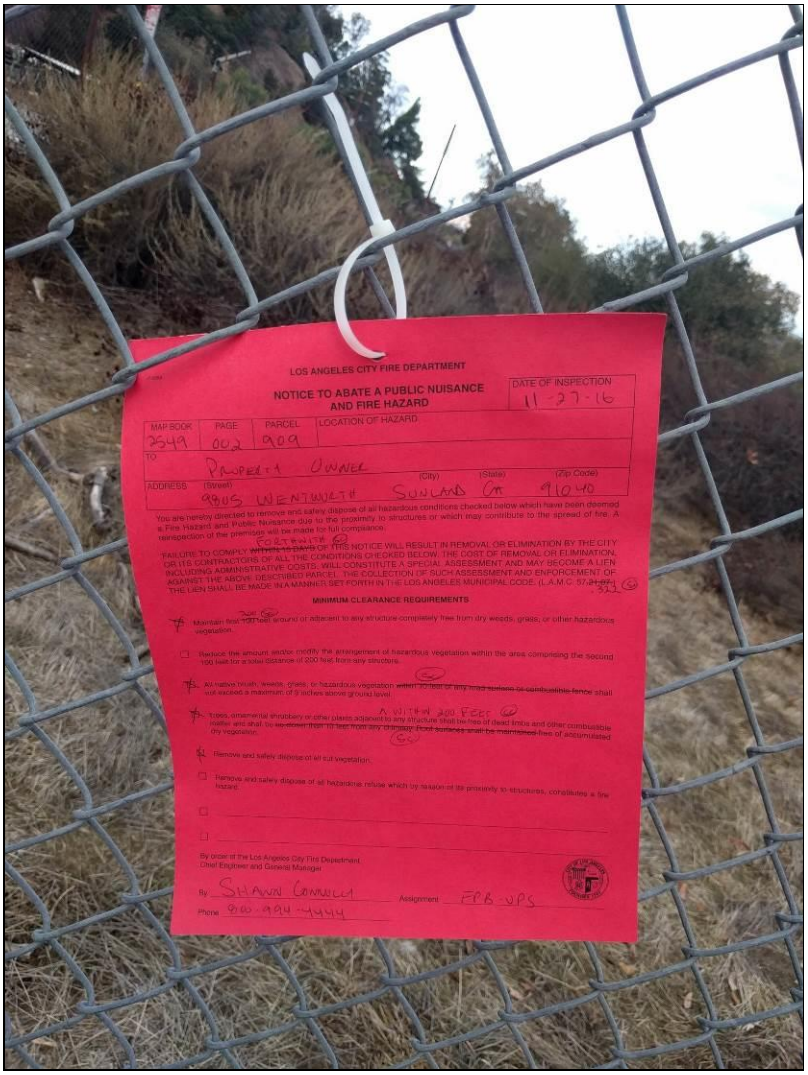

Figure 12. Los Angeles City Fire Department Fire Abatement Notice at Cottonwood Gate.

APPENDIX I

Stakeholder Mailing List

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APPENDIX J

Newsletters

Big T Wash Line

April 2016

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**

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.

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 2016. 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!

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.

Fires at Big T — As you know, fire danger is a serious concern. LACDPW is very aware of this safety issue and is working hard to address it. 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. **<u>If you ever see a fire call 911.</u>** Please also email us at **BTWMA@dpw.lacounty.gov** so it can be investigated.

California High Speed Rail Alternative Alignment Revised!

The California High Speed Rail E2 Alternative was recently revised to avoid crossing through the Big Tujunga Wash Mitigation Area! LACDPW is closely following new developments for this proposed project, but you can view the revised proposed alternatives here: http://www.hsr.ca.gov/docs/newsroom/maps/Palmdale_to_Burbank.pdf

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

Hey Predators, Try to Get Past This!

Many animals have developed adaptations in order to survive attacks from predators. Adaptations can range from camouflage to help them hide, bright colors to warn predators that they are poisonous or dangerous, or unique reactions to threats to keep themselves safe.

One adaptation lizards have developed to avoid predators is to drop their tails when they are attacked. When a lizard drops its tail, it looks like the animal is injured because the tail is completely detached from its body, but the lizard is perfectly fine! The ability to drop its tail is called caudal autonomy. Once the tail is dropped, it will twitch and wiggle for several minutes. The wiggling, tail distracts the predator, allowing the lizard to safely escape. After a lizard drops its tail it can take weeks for the tail to grow back. Oftentimes the tail that regrows is not as colorful as the original and may lack the original pattern on pattern compared to the rest of the body. However, growing back an unattractive tail is much better than losing your life! As you enjoy Big T, keep an eye out for lizards and check out their tails. If you can see a difference in color or pattern or if they have a short, stubby-looking tail, those are signs that the lizard you are admiring has survived an encounter with a potential predator!

Different color pattern in a lizard's tail regrowth. Photo: Glenn Upton-Fletcher

Rattlesnakes are another animal with unique adaptations. They have developed hollow segments on the ends of their tails that, when shaken or rubbed together, create the famous rattling sound. The snake uses this sound to warn predators that they are dangerous. When a rattlesnake shakes its tail, it is announcing, "Beware! I am dangerous and you shouldn't mess with me!" This defense mechanism has worked so well for the rattlesnake that other snake species take advantage of it too! Gopher snakes have picked up on this defense mechanism and will actually mimic the posture of an angry rattlesnake when threatened and can recreate the rattle sound by vibrating its tail in a nearby shrub or leaf litter.

A western rattlesnake rattles to warn predators. Photo: USFWS

Monarch butterfly

Bright colors can also be a survival tactic. Many brightly colored animals sure are beautiful to look at but those bright colors often present a fair warning that the animal is poisonous! The Monarch butterfly is a perfect example of poisonously beautiful color. As a caterpillar, it feeds entirely on milkweed leaves. The milkweed contains a poison called cardiac glycosides that the insect ingests and stores within its tissues, making it poisonous and even harmful to many predators, such as lizards, birds, and frogs. Because of this stockpiled poison, the Monarch butterfly does not need to worry about camouflaging itself against predators – one look at its beautiful coloration is warning enough!

How Do You Stop the Bad Fish From Moving In? Build a Fish Screen!

Big T is undergoing some updates in order to better conserve and protect the sensitive species that make their home here! Haines Creek is one of the few tributaries in the Los Angeles River Watershed still known to support the federally-threatened Santa Ana sucker. Haines Creek provides important habitat for all life stages of the Santa Ana sucker, as well as other sensitive native fish species. The primary source of water to Haines Creek comes from the Tujunga Ponds, but unfortunately these ponds provide excellent habitat for several non-native species that are known to prey on, and compete with, the Santa Ana sucker. The Tujunga Ponds act as a source population for many of these non-native species, including largemouth bass, green sunfish, and red swamp crayfish. Large populations of these species in the ponds reproduce and individuals can disperse into the creek. Complete removal of the non-natives from the creek becomes impossible with the continual repopulation of individuals from the ponds.

A blocking net (shown here during a fish survey) works similarly to the permanent fish screen that will be installed in May!

In order to limit the impacts of these non-native species on the native fish community, the United States Fish and Wildlife Service recently provided a grant for the installation of a fish screen between the Tujunga Ponds and Haines Creek. The purpose of the screen is to prevent the dispersal of non-native species from the ponds into Haines Creek. This screen will be constructed of galvanized steel mesh held in place with metal T-posts and it will still allow water to freely flow through it. The fish screen will be installed sometime in May of 2016. If you come across this screen while enjoying Big T, please leave it in place, undisturbed, so that it can continue protecting the sensitive wildlife downstream. Maintenance crews will be stopping by periodically to clear any vegetation or debris that builds up against the screen. If you see someone disturbing the fish screen or discover that it is in need of immediate maintenance, please notify LACDPW at BTWMA@dpw.lacounty.gov.

Riversidean Alluvial Fan Sage Scrub: a Plant Community Sculpted by Flooding

Big T is made up of many different types of plant communities that are unique to southern California. One such community is the Riversidean alluvial fan sage scrub (RAFSS). This plant community is unique in that it only occurs on alluvial fans, which are made up of sand, gravel, and other sediments that are deposited where water interacts with mountains or hills during flood events, often creating a large triangle-shaped deposit.

A snapshot of the RAFSS plant community at Big T.

The RAFSS is typically made up of three stages of plant growth that are determined by the period of time since the last major flood event: pioneer, intermediate, and mature. The pioneer stage is the youngest in the RAFSS community, with minimal vegetation and wildlife as a result of a recent flood clearing the area. This stage will often have small plants made up of buckwheat and scale broom. The intermediate stage typically takes three to five years to develop following the last major flood event, and will have higher plant diversity. Plants typically found in the intermediate stage include white sage, yerba santa, chaparral yucca, and prickly pear cactus. The mature stage develops after several years without a major flood event and is typically dominated by large perennial plants that are commonly found in a chaparral community. Some of these plants include holly leaf cherry, laurel sumac and scrub oak.

This plant community is becoming more and more rare with increased urban and residential development. Big T is very unique in that it protects approximately 99 acres of this sensitive vegetation community, which is almost half of the entire property! Next time you're at Big T, be sure to stay on the trail and keep an eye out for these plants in this unique RAFSS plant community in the Big Tujunga Wash.

Scalebroom

Prickly Pear Cactus

Chaparral Yucca

Animal Corner: Belted Kingfisher

Belted kingfisher.
Photo: USFWS

If you've ever wandered through Big T and come across a small blue-gray bird with an overly large-looking head, a stylish feather mohawk, and a long beak, chances are you were looking at a belted kingfisher. These unique birds are common during the winter months in southern California near areas with ponds, creeks, or lakes and can regularly be spotted at Big T.

The belted kingfisher gets its name from the blue band that crosses the white part of their chest. This species spends most of its time perched on trees and branches along the edges of ponds and streams, searching the clear water for fish, crayfish, or small aquatic insects to eat. Once the belted kingfisher spots its prey, it will dive head first into the water where it uses its long straight beak to grab its unsuspecting victim. It then flies back up to its perch and gives its prey a couple shakes, or hits the prey item against its perch a couple times before swallowing it head first.

Although belted kingfishers don't nest in southern California, they are very unusual in that they nest in burrows! Nesting burrows are dug in soft banks located immediately adjacent to open water. Both males and females will construct the burrow; however, males are the ones that perform most of the construction work. The burrow slopes upward from the entrance, presumably to prevent flooding during unexpected changes in water levels, and may be up to eight feet in length!

The belted kingfisher is a welcomed bird at Big T because they prey on many of the non-native species that eat or compete with the native fishes in Haines Creek. The ideal habitat for many of these non-native species (open ponds with clear water and little vegetation) happens to be the ideal hunting ground for the belted kingfisher. Because of this, many of the non-native species are easy prey for the belted kingfisher. The likelihood of a Santa Ana sucker or other sensitive native fish falling victim to a belted kingfisher is low because these fish don't occur in the ponds where the kingfisher prefers to hunt. In addition, the Santa Ana sucker is also a "cryptic species," meaning it blends into its environment, which makes it much more difficult for predators to locate and capture.

Don't just keep an eye out for the belted kingfisher at Big T, be sure to listen for them too! They have a characteristically loud, penetrating, rattle-like call that is unmistakable. You can listen to it here: https://www.allaboutbirds.org/guide/Belted_Kingfisher/sounds.

Juvenile belted kingfisher
Photo: USFWS

Big Tujunga Word Search

Kid's Corner!

Can you find all the words listed below?

ALLUVIAL

CAMOUFLAGE

CRYPTIC

DISPERSAL

KINGFISHER

MOHAWK

MONARCH

PIONEER

PREDATOR

SCREEN

G	A	U	J	I	X	W	C	I	S	B	N	S	R	G	E	V	R	P	G
B	F	N	Y	T	H	F	L	H	A	T	P	P	M	S	W	Q	S	R	I
X	O	E	N	M	O	N	A	R	C	H	X	V	J	F	L	O	D	R	B
S	I	L	W	A	D	L	E	T	D	C	U	H	N	M	R	S	A	C	K
Z	W	W	S	V	L	B	Q	Z	R	M	C	K	A	O	C	D	P	J	E
J	D	I	I	U	Z	D	M	Q	F	L	X	B	T	R	Q	M	H	V	B
W	P	G	V	B	G	B	I	C	X	G	Z	A	E	E	Y	C	R	G	L
B	Q	I	C	I	H	K	F	C	O	H	D	E	K	H	V	L	Y	S	I
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L	K	N	A	V	O	B	A	Y	R	B	I	I	T	I	O	B	H	N	C
D	N	E	M	V	Y	X	K	P	L	E	G	A	L	F	U	O	M	A	C
I	A	D	S	K	V	P	B	T	I	T	Q	I	Z	G	Y	X	Y	Q	Y
S	S	S	Q	L	N	Z	X	I	R	O	T	M	M	N	D	L	Y	X	Y
P	Y	G	U	M	C	T	X	C	Z	I	N	X	F	I	E	Q	C	I	V
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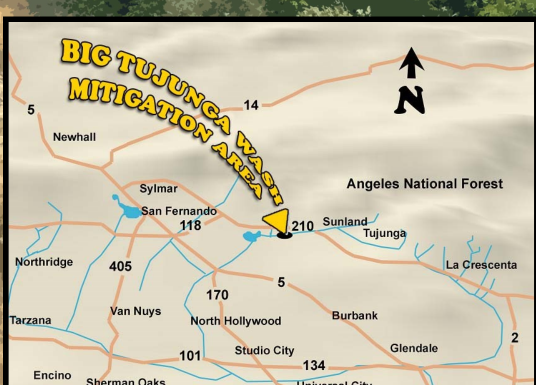
R	G	J	G	T	V	E	F	X	S	E	F	G	E	Q	T	Q	Y	A	Q
S	X	W	B	U	L	C	J	Q	B	X	O	E	B	R	E	Q	J	V	E
A	U	K	O	O	P	Q	P	R	S	M	R	L	O	S	H	S	O	L	Y
L	K	Z	J	Q	G	K	H	M	O	U	D	W	J	U	V	E	Q	Q	V
E	X	M	Y	K	W	A	H	O	M	N	O	E	K	P	N	E	J	H	G

Where is the Big T Mitigation Area?

Downstream of Big Tujunga Canyon, right in Lake View Terrace and south of the 210 freeway, you'll find a native riparian (water loving plant) natural area filled with cottonwoods, willows, and pools of water that support many native aquatic species. Check out the Big T website for more information at: 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:

Mayra Cabrera, 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) 458-6327

Big T Wash Line

September 2016

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 get busy and trim your trees this fall.

Brown-headed cowbirds — Our trapping efforts for these nest parasites are over for the year. To help our native bird population thrive, we have been trapping and removing these pesky cowbirds at Big T for 14 years! This year we managed to trap over 130 cowbirds.

Exotics Got-to-Go — It's been a busy year for Big T. So far in 2016, two exotic plant and four exotic aquatic wildlife removal efforts have been conducted on site. Many exotic plants were removed during the two efforts and weeding was performed as part of the general upkeep of the existing trails system. The frequency of exotic wildlife removal efforts have been increased in 2016 to create a greater benefit for the native fishes at Big T.

California High Speed Rail Update — According to the California High Speed Rail, the E2 Alternative, which is proposed to cross through the Big Tujunga Wash Mitigation Area, is still under consideration. Los Angeles County is planning to submit comments to the California High Speed Rail Authority including the potential impacts to biological resources in the Mitigation Area.

Wildlife Alert! A mountain lion was reportedly spotted at Big T earlier this year! Recent nearby fires may have displaced wildlife into the unburned areas. Be aware of your surroundings and watch for wildlife!

10th Annual Trail Cleanup Day!

Please join us for the 10th Annual Trail Cleanup Day on October 15, 2016! Come out and give a helping hand by cleaning up litter along Big T's beautiful trails. Meet us at the Cottonwood entrance (Wentworth St. and Cottonwood Ave.) at 8 am. Water, snacks, and trash bags will be provided. Suggested items to wear or bring: comfortable clothes, gloves, hat, sun block, and bug repellant. *Note: Trail Cleanup Day will be rescheduled for October 22 if there is rain or poor weather.

ABOUT THE BIG TUJUNGA WASH MITIGATION AREA

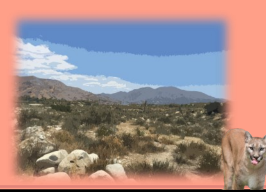
Big T is a parcel of land located in the City of Los Angeles' Sunland area (see Page 4). Big T covers an area of approximately 210 acres of sensitive habitat. The site was purchased by LACDPW in 1998 for the purpose of compensating for habitat loss for other LACDPW projects.

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



Nature After Fire: There's Still Hope!

Have you ever thought about what might happen to plants and wildlife when a wildfire occurs? The vast areas burned by the recent Sand Fire in July of 2016 appear to be dead from a distance and the impression is they can't possibly support animals for a long time. Actually, wildfires can play a critical role in nature by increasing opportunities for plants and animals to repopulate burned areas. Many native plants are adapted to fires and can recover if the fire isn't too hot and if it burns quickly through the area. Unfortunately, most of the recent wildfires in southern California have burned very intensely as a result of the drought and the abundance of very dry vegetation. But don't lose hope! Habitats that have experienced a wildfire always undergo a succession of changes as organisms recolonize the area.

A small burned area in upland area at Big T. The fire was fairly cool-burning and the area is expected to fully recover on its own.

Plants

A recently burned area is anything but barren. Nutrients that were once bound in woody material are released and are incorporated into the soil when the ash falls on the ground. The bare ground present after the fire will be populated by a large variety of plant species over time through a process called succession. Those that typically show up first are the pioneer species, such as mosses and lichens. These pioneer species are then followed by grasses, annual flowering plants, and small shrubs that are fast-growing and don't require much water to survive. The next stage of succession includes the establishment of larger, perennial shrubs that grow rapidly and provide cover and food resources for even more wildlife species. Depending upon the type of habitat, the next stages in the succession may include the establishment of small trees, followed by larger tree species. The climax community stage of succession is when the plant species within the community achieve an "equilibrium" that will remain the same until conditions change. The most common climax community burned in the Sand Fire was chaparral and ultimately, the burned hills will go through a succession and end up as chaparral again in the future.

Burned pinecone. Photo: National Park Service

Young plant sprouting

Plant species that have developed strategies for surviving wildfires tend to be among the first to recolonize. Strategies include obligate resprouters, obligate seeders, and facultative seeders. Obligate resprouters, like toyon, rely on their underground root systems, thick trunks, and branches that have heat resistant buds that resprout after a fire. Obligate seeders, such as California lilac, perish in a fire but they resprout from the seeds buried in the soil or encapsulated in woody fruits. After a fire, facultative seeders, like chamise and manzanita, resprout while seed germination is enhanced by a fire's intense heat. The fire cracks or weakens the seed coat and that allows water to hydrate the seed so it can grow. Other plants, known as fire followers, require fire for germination and without a fire, the seeds can stay dormant in the soil for many years.

Animals

Most animals immediately respond to a fire by fleeing ahead of the fire or by seeking shelter. Birds and larger mammals are mobile and will attempt to move out of harm's way. Small mammals, amphibians, and reptiles will typically hide in burrows, under debris, or in rock crevices. Unfortunately, not all wildlife will survive a wildfire. Small animals are at the greatest risk because if they do not retreat to a deep burrow, they will become defenseless against deadly temperatures or smoke.

The succession of the plant communities over time in the burned area will result in a progression of the types of wildlife species that eventually move in and use the recovering vegetation in a variety of ways. The new vegetation attracts insects, which provide food for reptiles, amphibians, and insect-eating birds (wrens, swallows, and phoebes). The new vegetation also produces seeds that become food for more insects, seed-eating birds, and mammals that include seeds and plant materials in their diets (mice, woodrats, and kangaroo rats). After smaller wildlife species move in and repopulate in the burned area, they are followed by larger species of wildlife that typically prey upon the smaller species (owls, hawks, foxes, bobcats, and coyotes). As the vegetation fills in it provides more cover, so wildlife will begin to use the area for shelter and nesting. In addition, as the vegetation becomes denser, those wildlife species that originally moved into the burned area and those that prefer to live in areas with less vegetation will move on to other areas. The wildlife species that prefer the dense vegetation will be the ones that eventually continue to use the habitat in the climax community.

Mule deer
Photo: USFWS

To see plant and wildlife succession in action, take the opportunity to visit a newly burned area and look for the small annual plants and the sprouting from the remnants of the burned shrubs. Also, look for evidence of the presence of wildlife, like tracks and trails made by small mammals. You will be very surprised at how quickly the burned area will support plants and show evidence of wildlife use!

Coyote
Photo: Don Mitchell

Fire Prevention and Safety

According to Smokey the Bear, last year, over 2 million acres burned from human-caused wildfires. Nobody wants to see Big T lumped into that statistic for 2016! Fires are especially a concern at Big T during late summer and fall. Even though fires and burning of any kind are not permitted within Big T, there is always the risk of a fire breaking out on or adjacent to Big T. We've included some fire prevention steps from Los Angeles Fire Department and CA Department of Forestry and Fire Protection that you can take to help reduce the risk of fire around your home.

Home fire prevention: (1) 30-foot fire resistant space. Keep flammable materials at least 30 feet away from your home, garages, and sheds. This includes dry vegetation, oily or waxing plants (e.g., eucalyptus trees), organic mulch, dry plant clippings, firewood, and propane tanks. (2) Maintain your yard: Prune low hanging branches so that there is 6-10 feet of space between the tree/shrub canopy and the ground. Maintain lawns by keeping them hydrated and mowed to reduce fuel for a fire. Brown/dead lawns should be mowed to reduce fire intensity. (3) Prevent ember and spark entry: Check your roof; and if necessary, fix and replace roof tiles and shingles. Cover eaves and exterior vents with 1/8-inch or smaller metal wire mesh.

In case of a wildfire: (1) Be prepared to evacuate. Back your car into the garage with the windows closed and the garage door unlocked with the automatic door opener disabled in case of power failure. If possible, keep your medicines and valuables (including important documents, photographs, and emergency contact information) near the door so you can quickly pick them up on your way out. Keep your keys, a flashlight, and portable radio with you at all times and stay up-to-date with the local news station. (2) Close all windows and doors. Close exterior windows and doors to prevent embers from entering the house. If the house catches fire, closing interior doors can slow the spread of the fire. (3) Move furniture. Avoid furniture catching fire from radiant heat by moving it away from windows and sliding glass doors. (4) Turn on all lights. If there is smoke, lighting will help with visibility. Be sure to have a flashlight on hand in case of power failure.

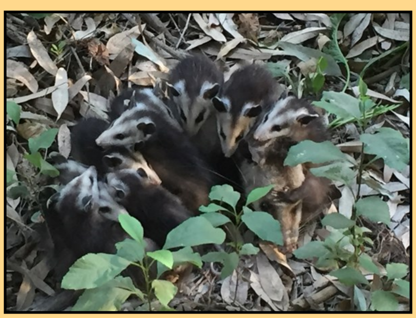
General wildfire prevention: (1) Smoking. If smoking, keep a 3-foot clearing from dry vegetation. Grind out cigarettes in the dirt or in an ash tray; do not use a stump or log and never throw smoking materials into brush or leaves or out your window while driving. Smoking on any trail (including the ones at Big T) is never safe because you cannot predict where the ash will land. (2) Controlled Burns. Fires of any kind are never allowed at Big T; however, if you need to conduct a controlled burn on your property or if you are camping at a campground that allows fires, be sure to always supervise the fire until it is completely out. Drown it with water, turn over the ashes with a shovel, drown again, and repeat multiple times. Please check if fires are allowed in your area and if a permit is required. Never burn if it is windy or surrounding vegetation is very dry.

Immediately call 911 if you detect smoke or fire in your area and report the location. If you see a fire on or near the Mitigation Area, please email us at BTWMA@dpw.lacounty.gov after reporting it to authorities so it can be investigated.

For more information see:
http://www.lafd.org/safety/fire-safety
http://www.fire.ca.gov
http://www.fs.fed.us/managing-land/fire

Animal Corner: Opossum

Meet North America's only marsupial: the Virginia opossum! Marsupials, or pouched mammals like koalas and kangaroos, are born prematurely, crawl into their mother's pouch, and then continue to grow and mature in their mother's pouch. Opossums can give birth to around twenty hairless, bee-sized young that crawl to their mother's pouch after a very short gestation period of only 12 days! Inside the pouch, the young opossums nurse and grow for about 100 days. Typically, eight to ten of the babies will survive and grow into juveniles. By two and half months, the young outgrow the pouch and will ride on their mother's back until they can climb and walk for themselves.



Opossum with young on back. Photo: Brian Leatherman

Opossums are typically short-lived, with a lifespan of only one to two years. They are not known to be very aggressive, although when confronted by a predator, opossums may growl, hiss, show their full mouth of very sharp teeth, or try to escape. If escape is not an option, opossums will play dead and release a substance that smells like decay from glands near the tail in an attempt to deter the predator. Opossums feed on slugs, insects (including cockroaches!), bird eggs, mice, fruits, grains, dead animals, and dog and cat food left outside! Opossums are unable to store abundant body fat and are more vulnerable to freezing and starvation if their fat reserves become low. As a result, they must spend a lot of time looking for food.

Opossums are sometimes viewed as pest animals, but they actually can serve as pest control in neighborhoods by eating roaches and even reducing tick populations! Though they may carry hundreds of ticks on their bodies, about 95% of those ticks will die from the opossum's extraordinarily efficient grooming habits. Because they kill so many ticks that try to feed on them, opossums can be considered an ally in the fight against Lyme disease. Other superhero-type feats held by these creatures include immunity to honeybee and scorpion stings, toxins (such as botulism), and rattlesnake venom! Opossums have been known to prey on rattlesnakes, which may account for their immunity to rattlesnake venom. Talk about one interesting mammal!

Photo: Kim Chandler, WDFW

Opossums found in the western United States were originally introduced to the west in the early part of the 20th century, likely as a source of food, as pets, and as novelties. They are now naturalized throughout the west and are quite common. Even though opossums are not native to the west, they do not pose a threat to the environment like many other nonnative or invasive species. Next time you see an opossum in your neighborhood, remember that they're fascinating creatures that are helping to eliminate unwanted bugs like cockroaches and ticks!

Big Tujunga Match the Critter!

Kid's Corner!

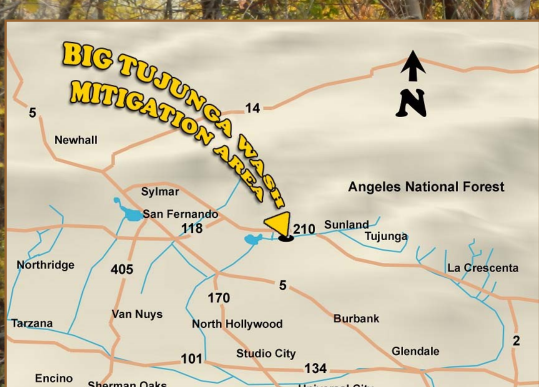
Match the body parts of the critters. What critters did you match?

Image Search

Can you find all of the mountain lions throughout the newsletter?
How many do you see? *Hint: look on all 4 pages of the newsletter*

Where is the Big T Mitigation Area?

Downstream of Big Tujunga Canyon, right in Lake View Terrace and south of the 210 freeway, you'll find a native riparian (water loving plant) natural area filled with cottonwoods, willows, and pools of water that support many native aquatic species. Check out the Big T website for more information at: www.dpw.lacounty.gov/wrd/projects/BTWMA



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Email: BTWMA@dpw.lacounty.gov
Phone: (626) 458-6327

Image Search Answer: 10 Mountain lions

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 28, 2016
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 28, 2016
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
2016 Spring Meeting Minutes
April 28, 2016

I. Welcome/Introduction

Meeting attendance sign-in sheet attached.

II. Review of Meeting Agenda

Mayra Cabrera (County of Los Angeles Department of Public Works [LACDPW]) reviewed the meeting agenda.

III. Discussion of Action Items from the April 30, 2015 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, ECORP, and County of Los Angeles Department of Parks and Recreation (LADPR) will work together to combine the reported incidents from both the Mitigation Area and the Tujunga Ponds properties.** LADPR identified several homeless encampments on their property since the last meeting. LACDPW and ECORP will continue to coordinate with LADPR. *This action item is complete, but will be an ongoing task.*

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.** The updated incident map was distributed at the 2016 CAC meeting and will be posted to the Mitigation Area website. *This action item is complete, but will be an ongoing task.*

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.** There has been no update to this action item.

4. **LADPR will contact Boy Scouts and Girl Scouts to see if they are interested in educational outreach opportunities at the Mitigation Area.** LADPR made a list of Boy Scouts and Girl Scouts organizations for the Crescenta Valley. LAPDR mentioned that their next move would be to coordinate with Crescenta Parks District to see if they have any other student or youth organizations interested in educational outreach. *This action item is complete.*

5. **ECORP's aquatic biologists will monitor the water flow rates of Haines Canyon Creek and report any changes detected.** ECORP's aquatic biologists measured flow rates during the native fishes study conducted in 2012 and 2015.

The rates were the same in both years around the upstream boundaries of Haines Canyon Creek, but the 2015 rates were lower around the downstream boundaries of the creek than they were in 2012. *This action item is complete.*

6. **ECORP will find out if least Bell's vireo surveys are being conducted downstream of the Mitigation Area. ECORP will also search California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) to determine where the closest least Bell's vireo observation has been reported in relation to the Mitigation Area.** ECORP could not find out whether least Bell's vireo surveys are being conducted downstream of the Mitigation Area in 2015 or 2016. The nearest recorded least Bell's vireo observation within the CNDDB was in Hansen Dam. *This action item is complete.*

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.** Trap 2 was kept in the same location in 2015 to ensure one additional year of low trap success before moving. Trap 2 was moved for the 2016 trapping year to a location near Big Tujunga Wash just south of the North Wheatland entrance. ECORP could not find out how many traps were placed at Hansen Dam. *This action item is complete.*

8. **ECORP will send the schedule of weekend bilingual outreach site visits to LADPR so they can coordinate outreach efforts.** The 2015 bilingual outreach schedule was sent to LACDPW and LADPR prior to the first outreach event. The 2016 bilingual outreach was sent to LACDPW on April 20, 2016 and will be forwarded to LADPR prior to the first outreach event. *This action item is complete.*

IV. Ongoing and New Discussion Items

1. Site and Security Issues

- Residents have been noticing a lot of illegal fishing activity at the site recently. One resident has observed people carrying white buckets into the site using the South Wheatland entrance off of Wentworth Avenue. The meeting attendees asked if LADPR has the authority to issue tickets to offenders; however, LADPR does not have that authority. The issue of site patrolling was discussed because illegal fishing on site has been an ongoing problem. Ms. Driscoll stated that Park Rangers from the City of Los Angeles occasionally patrol the site.

- The group discussed the watershed in which the Mitigation Area resides and what the relationship of Haines Canyon Creek is to the Los Angeles River. LACDPW stated that Haines Canyon Creek is a tributary to Tujunga Wash, which is a tributary to the Los Angeles River.

- The group reported a large sink hole in the Mitigation Area just north of Gibson Ranch (near point #29 on the incident map). A tree fell over and a large hole was created where the root ball used to be. The hole has filled with water from recent storms, creating a trail hazard. Furthermore, someone has dumped a wheelbarrow in the hole. ECORP and LACDPW will visit the area and make plans for maintenance.

2. **Brown-headed Cowbirds and Native Riparian Birds**

   The group inquired about the number of bird species that have been documented at the Mitigation Area. ECORP has documented approximately 130 bird species on the property since 2007. The group requested that LACDPW review the Hansen Dam Master Plan (2010) because there is a comprehensive avian species list in this document. The group also asked for LACDPW to check with Audubon Society about the species they have documented in the area.

   The group also asked whether United States Army Corps of Engineers (USACE) is currently conducting brown-headed cowbird trapping on the Hansen Dam property. ECORP will inquire about that.

3. **Spring Newsletter**

   The group stated that the recent announcement in the Spring 2016 newsletter about the revised route of the proposed E2 Alignment for the High Speed Rail (HSR) avoiding the Mitigation Area was misleading. They requested that the wording be revised. LACDPW agreed to revise the wording as soon as possible.

   The group also had an issue with the site location verbiage on the back of the newsletter. LACDPW will revise this as well.

4. **High Speed Rail Project**

   The group expressed frustration about the project and requested that LACDPW develop a list of potential impacts resulting from the project to the Mitigation Area and submit it to the HSR. LACDPW stated it understands the group's concerns and is closely following the project, but LACDPW can only address issues that directly affect its facilities. LACDPW's concerns about the proposed project's impacts to the Mitigation Area were conveyed to the HSR Project Team, and the HSR Project Team moved the E2 Alignment out of the Mitigation Area.

   The group discussed potential indirect impacts related to construction and operation to the Mitigation Area and was concerned about the degradation of the site due to these indirect impacts despite the relocation of the E2 Alignment out of the Mitigation Area. LACDPW stated it has received very little information from HSR Project Team on the design, construction, and operations of the proposed project, and is awaiting the CEQA document that should provide more information that can form the basis of substantive comments. LACDPW also stated that the new E2 Alignment is on USACE-owned land with similar wash habitat, and, based on LACDOPW's experience with these agencies, CDFW, USACE, and United States Fish and Wildlife Service (USFWS) will therefore very likely bring up the same concerns and issues about the project to the HSR Project Team that LACDPW did when the proposed alignment was in the Mitigation Area.

   The group requested contact information from USACE from Hansen Dam because they have had issues contacting representatives from USACE's environmental personnel but have had more success with their regulatory personnel.

Michael Cano (Los Angeles County Supervisor Antonovich's office) requested a comprehensive report of expected impacts to the Mitigation Area from LACDPW. LACDPW said it would convey the request to its Administration.

5. **Save The Big Tujunga Wash**
   Residents notified LACDPW that they have formed an activist group called Save the Big Tujunga Wash and will be scheduling several programs to increase awareness over the next couple of months.

V. Current Status of Programs

1. **Exotic Plant Eradication Program**
   The first effort is scheduled for May 3 through 13, with a pre-activity survey on May 2 by two ECORP biologists. Site maintenance will also be conducted at this time (trail cleanup, etc.).

2. **Exotic Wildlife Removal/Monitoring**
   LACDPW and ECORP are in the process of developing different exotic wildlife removal and monitoring methods for 2016 in an effort to be more effective at removing exotic species and improving conditions for Santa Ana sucker. The first aquatic wildlife removal effort will likely occur in May.

3. **Focused Wildlife Surveys**
   Focused wildlife surveys were conducted in 2015. The next round of focused surveys will occur in 2018.
   - Least Bell's vireo and southwestern willow flycatcher were not detected.
   - Arroyo toad was not detected.
   - Native fish surveys: only Santa Ana sucker was detected; Santa Ana speckled dace and arroyo chub were not detected. A total of 119 sucker were observed during the May survey and only 17 were observed during the October survey. These numbers have drastically declined since the previous survey was conducted in December 2012, where 592 sucker were observed. Arroyo chub were last observed on site in 2013 and Santa Ana speckled dace were last observed in 2012. Possible reasons for decline include an increase in exotic species, drought, or other unknown factors.

4. **Water Quality Monitoring**
   Results were normal for 2015 water quality sampling on site. The group inquired about developing a type of rating system to give an overall assessment of the water quality results to the community. ECORP will work with its water quality monitoring subcontractor to see if a 1 to 10 rating system can be developed. The next water quality monitoring will be conducted in October/November 2016.

5. **Trails Restoration/Maintenance**
   The next trails assessment site visit will be conducted on May 2, 2016.

6. **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.

7. **Water Lettuce Control/Monitoring**
No water lettuce has been observed in the ponds since the previous meeting. ECORP is continuing to monitor the ponds for presence of water lettuce.

8. **Brown-headed Cowbird Trapping**
The trapping for 2016 began on April 1 and will continue through June 30. Three of the four traps were placed in the same locations as previous years throughout the Mitigation Area. Trap 2 was moved to the western portion of the Mitigation Area because it was unsuccessful in past years (original location was around Cottonwood gate). To date, Trap 1 has captured one female, Trap 2 has captured one male, Trap 3 has captured 19 males and 47 females, and Trap 4 has captured 13 males and 23 females.

9. **Special Assessment**
ECORP biologists performed a site visit on January 18 following a period of heavy rains to document any damage to the site. Minor issues were documented and reported to LACDPW.

VI. Schedule Next CAC Meeting

The next CAC meeting is scheduled for Thursday, April 28, 2017, 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. ECORP and LACDPW will visit the sink hole area along the trail north of Gibson Ranch and make plans for maintenance.

2. LACDPW and ECORP will review the Hansen Dam Master Plan (2010) and check with the Audubon Society for comprehensive regional avian species lists to compare to the species list for the Mitigation Area.

3. ECORP will find out if USACE is conducting brown-headed cowbird trapping on the Hansen Dam property.

4. LACDPW and ECORP will revise the wording in the HSR announcement on the first page of the Spring 2016 newsletter. They will also revise the verbiage on the back of the newsletter that describes where the Mitigation Area is located.

5. LACDPW will look into preparing a document that lists expected impacts to the Mitigation Area resulting from the revised E2 Alignment of the HSR.

6. ECORP will work with their water quality monitoring subcontractor to develop a 1 to 10 rating system to briefly summarize the results of the annual water quality monitoring.

APPENDIX L

Public Outreach Memo

September 16, 2016
(2014-003.015/008/8)

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 2016 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, Jerry Aguirre, and Gabriel Nunez on twelve separate occasions. Outreach efforts took place on May 29 and 30; June 12 and 26; July 3, 4, 18, and 31; August 14 and 27; and September 4 and 5, 2016. All outreach efforts took place during the peak site use hours of 9:00 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. Most equestrian users expressed appreciation towards the outreach efforts and agreed with the information presented on the pamphlets. In general, equestrian and non-equestrian users were responsive to the public outreach efforts.

Non-Equestrian Family Groups

A total of 135 non-equestrian site users were encountered during the twelve outreach visits in 2016. Most of these individuals were encountered along the trails around Haines Canyon Creek and the Tujunga Ponds. The larger family groups and friend gatherings were typically observed arriving on the site at the South Wheatland entrance with the intent to picnic, swim, and fish. All site users or groups 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, and fishing (Figures 1 through 6).

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. Individuals and groups unaware of and violating rules were mostly accepting and respective of the biologist. One encounter with a non-equestrian user was observed walking his bicycle onto the site on May 29 was an example of a recreational user being receptive to the outreach effort. During the interview, the bicyclist claimed he was not going to bike on site and was just using the area to rest before leaving. The gentleman appeared unaware of the site rule, but respected the request and continued to walk his bike. On May 30, a group of six adults and six children were picnicking in the beach area west of the South Wheatland entrance. The group was receptive to the discussion, but some of the children were swimming in the water. On June 12, some new trash around homeless encampments and newly formed rock dams were observed in Haines Canyon Creek. Fishing was observed during several encounters in 2016. On June 26, two teenagers were interviewed after the biologist observed them fishing for crawfish. Another incident was documented on July 18, where a group of four non-equestrian users were interviewed near the popular picnicking area west of the South Wheatland entrance. Three of them were observed wading in the water with a cooler, appearing to trap fish. The group was not completely receptive during the interview, but accepted pamphlets and left the site shortly after. In general, people fishing understood the site rules, but some showed hesitation and were observed continuing to fish at a later time. On July 31, a large group of 24 recreational users were observed in the popular picnicking area. Most of the group was wading in the water and appeared to be having a party with food, coolers, and music. The group was handed one pamphlet and its contents were explained to one member of the party who was somewhat receptive. The dams previously observed this season were still in place. All of the non-equestrian users and groups having picnics were observed bringing in cooked food and trash bags; littering was not observed but negligible amounts of trash were seen throughout the site. 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. On September 4, a cottonwood tree (*Populus fremontii*) was observed to have been knocked down; the reason could not be determined.

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 12, 2016 it was noted that this area had a large rock dam that would require multiple people to remove. On the final visit on September 5, 2016 the large rock dam was still present on the site and had been reinforced with sediment and materials.

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. 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 55 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 frequent users of the area and receptive to the outreach efforts. Many equestrian encounters commended the outreach efforts and contributed information to the biologists. Most questions to the ECORP biologists were about trail maintenance efforts taking place at the Mitigation Area. On June 12, an equestrian user expressed concern over drug paraphernalia being left on site by new homeless people. Trash was observed in the area later that day as well as newly formed rock dams in Haines Canyon Creek.

Riders were reminded to cross the creek single file to minimize erosion along the banks, and to stay on the established trails. 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. Equestrian users were not observed off-trail or breaking other rules during the 2016 outreach efforts. 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: September 16, 2016

Kevin Cornell
Associate Biologist

Figure 1. Area where the large rock dam was removed from last year near the South Wheatland entrance on May 29, 2016.

Figure 2. Rock dam near the popular swimming area near the South Wheatland entrance on July 3, 2016 (Independence Day Weekend).

Figure 3. Some trash and bananas present in the river on July 4, 2016 (Independence Day Weekend).

Figure 4. Logs and vegetation accumulating at reed on July 31, 2016.

Figure 5. Rock dam observed earlier in the season and picnickers wading with coolers on August 14, 2016.

Figure 6. Additional rocks and a fallen tree added to the dam on September 4, 2016.

APPENDIX M

Special Assessments

January Post-Rain Damage Assessment Memo

January 25, 2016
(2014-003.005/009)

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

SUBJECT: Memorandum for Post-rain Damage Assessment (January 2016) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Cabrera:

This memorandum serves to document the damage assessment conducted after heavy rains occurred in the Big Tujunga Wash Mitigation Area (Mitigation Area) on January 5 through 7, 2016. Videos and pictures of the initial impacts of the storms to Haines Canyon Creek were taken by local residents during the rain event and sent to County of Los Angeles Department of Public Works (LACDPW) to notify them of the conditions at the Mitigation Area (Figures 1 through 3).

The site visit was conducted by ECORP Consulting, Inc. (ECORP) biologists, Carley Lancaster and Amy Trost, on January 18, 2016. The biologists walked along the trails that followed Haines Canyon Creek as well as those within Haines Canyon Wash and Tujunga Wash. Two areas of inundation were noted. The first was located just downstream of the West Pond at the first creek crossing (Universal Transverse Mercator [UTM] North American Datum 1983 [NAD83] 11 S 376401 E, 3792674 N; Figures 4 through 7). The flooding was caused by a dam of logs and debris that had washed down during the rain even and blocked the flow within Haines Canyon Creek. The dam did not appear to have been human-created but was likely created by storm debris. The debris dam was too large for the biologists to remove themselves but ECORP recommends that this debris dam be removed before the next event to prevent further flooding. The second area of inundation was along Haines Canyon Creek between Cottonwood Gate and the South Wheatland Entrance (UTM NAD83 11 S 375403 E, 3792486 N; Figures 8 through 10). Equestrians appeared to be able to use the trail but the biologists needed to walk off-trail to pass. ECORP will monitor any off-trail impacts to this area, such as the creation of any new trails or damage to native vegetation. If necessary, ECORP will recommend remediation after the rainy season to prevent further damage or safety issues.

Minor areas of concern were also noted including a log which had been washed onto the trail (UTM NAD 83, 11 S 376452 E, 3792462 N; Figure 11). Due to the terrain and sandy nature of the trail in that area, the log was fairly easy to walk over and, based on the tracks present, did not appear to impede equestrians either. However, this log should be cut and removed from the trail to prevent any further hazards, particularly during future rain events. A small area of erosion was noted in the riparian habitat between the Cottonwood Gate and Haines Canyon Wash (UTM NAD83 11 S 376531 E, 3792450 N; Figures 12 and 13). The trail leading from the cottonwood upland area down to Haines Canyon Creek is eroding away at the top of the slope (UTM NAD83 11 S 376152 E, 3792642 N; Figure

14). This has been documented previously but the ruts have been deepened by the recent rains. ECORP recommends these areas be addressed by LACDPW for safety reasons.

Two new horse circles were observed in the upland area near Tujunga Wash (UTM NAD83 11S 375801 E, 3792735 N and 375354 E, 3792603 N; Figures 15 and 16). Two potentially homeless people, one with two dogs and one walking a bike, were observed during the site visit in the Mitigation Area.

In general, Haines Canyon Creek appeared to have been scoured by the recent rains and the excess sediment was pushed onto the banks in some areas (Figures 17 and 18). Natural debris and trash, which appeared to have been washed downstream, was observed throughout the Mitigation Area (Figures 19 and 20). In some areas it was apparent that water had flowed across trails but did not appear to have caused any issues (Figure 21). The water in this area was not associated with Haines Canyon Creek. Both Haines Canyon Wash and Tujunga Wash appeared to have been minimally affected by the heavy rains (Figures 22 and 23). Native vegetation within the flood path did not appear to be adversely affected by the heavy rains. Vector (mosquito) issues were not observed, nor were any areas of heavy exotic plant species regrowth.

The Mitigation Area will continue to be monitored throughout the 2016 storm season for additional damage, vector issues, any trail or erosion problems (including the creation of any new trails), exotic plant species locations, and any other issues.

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: Amy Leigh Trost DATE: January 25, 2016

Amy Leigh Trost
Associate Biologist

Figure 1. Heavy rains in Tujunga Wash. Photo taken by a local community member on January 6, 2016 in the Tujunga Wash.

Figure 2. Heavy rains in Haines Canyon Creek. Photo taken by Photo by a local community member on January 6, 2016 along Haines Canyon Creek.

Figure 3. Popular picnic area under water during heavy rains. Photo taken by a local community member on January 6, 2016 along Haines Canyon Creek.

Figure 4. Locations of issues documented during site visit on January 18, 2016.

Figure 5. Flooding near the West Pond on January 18, 2016.

Figure 6. Flooded trail near the West Pond on January 18, 2016.

Figure 7. Dam blocking Haines Canyon Creek near the West Pond on January 18, 2016.

Figure 8. Flooded trail between the Cottonwood Gate and South Wheatland Entrance on January 18, 2016.

Figure 9. Flooded trail between the Cottonwood Gate and South Wheatland Entrance on January 18, 2016.

Figure 10. Flooded trail between the Cottonwood Gate and South Wheatland Entrance on January 18, 2016.

Figure 11. Log partially blocking trail on January 18, 2016.

Figure 12. Eroded trail between the Cottonwood Gate and Haines Canyon Wash. Photo was taken facing north along the north-south oriented trail on January 18, 2016.

Figure 13. Eroded trail between the Cottonwood Gate and Haines Canyon Wash. Photo was taken facing east at the north-south oriented trail on January 18, 2016.

Figure 14. Eroded trail leading from cottonwood upland area to Haines Canyon Creek on January 18, 2016.

Figure 15. New horse circle (#1) near Tujunga Wash identified on January 18, 2016.

Figure 16. New horse circle (#2) near Tujunga Wash identified on January 18, 2016.


Figure 17. Sediment pushed onto the banks of Haines Canyon Creek on January 18, 2016.


Figure 18. Popular picnic area with sediment pushed onto beach on January 18, 2016.

Figure 19. Natural debris washed down during heavy rains. Photo taken on January 18, 2016.

Figure 20. Natural debris and trash washed down during heavy rains. Photo taken on January 18, 2016.


Figure 21. Trail with evidence of water flowing across it during heavy rains. Photo taken on January 18, 2016.


Figure 22. Haines Canyon Wash with debris wracking from heavy rains. Photo taken on January 18, 2016.

Figure 23. Tujunga Wash with minimal evidence that heavy rains had occurred. Photo taken on January 18, 2016.

September Post-Fire Damage Assessment Memo

October 3, 2016
(2014-003.015/009)

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

SUBJECT: Memorandum for Post-fire Site Visit (September 2016) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Cabrera:

This memorandum serves to document a site visit conducted to investigate potential damage resulting from a fire that burned in the vicinity of the Big Tujunga Wash Mitigation Area (Mitigation Area) on September 26, 2016. The fire was reported to have started on the evening of Monday September 26, 2016, and was one hundred percent contained by the early morning of Tuesday September 27, 2016 (Attachment 1). The fire was reported to have burned approximately 21 acres. The cause of the fire is unknown and is currently under investigation by the Los Angeles Fire Department arson unit.

The site visit was conducted by ECORP Consulting, Inc. (ECORP) biologists, Lauren Dorough and Ryan Villanueva, on September 30, 2016. The biologists arrived on site and attempted to enter the Mitigation Area through the Wheatland Avenue gate entrance. However, the Los Angeles County Department of Public Works (LACDPW) lock that had previously been located on the lock chain that secures the gate was absent, restricting vehicular access. Therefore, the biologists accessed the Mitigation Area on foot. The biologists noted that the LACDPW lock was also absent from the yellow fire gate located just inside the chain-link Wheatland Avenue entrance gate. LACDPW was notified of the missing locks.

Based on the extent of the burn area, no fire damage appeared to be evident within the boundary of the Mitigation Area (Figures 1 through 6). The closest extent of the burn area was approximately 350 feet to the west of the Mitigation Area boundary. The vegetation that was burned included California buckwheat (*Eriogonum fasciculatum*), coastal sagebrush (*Artemisia californica*), scalebroom (*Lepidospartum squamatum*), chaparral yucca (*Hesperoyucca whipplei*), arroyo willow (*Salix lasiolepis*), cottonwood (*Populus* sp.), giant reed (*Arundo donax*), eucalyptus (*Eucalyptus* sp.), and non-native grasses. Some areas were completely burned and devoid of any sign of remaining vegetation that could be identified. Evidence of a homeless encampment (burned mattress, cans, and other burned personal items) was found at the center of the burn area. ECORP recommends that no action needs to be taken because the extent of the fire did not encroach upon the Mitigation Area site boundary.

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 3, 2016

Lauren Dorough
Biologist

Attachment 1. News Article

Attachment 1. News Article

Brush fire contained near 210 Freeway in Lake View Terrace

Firefighters work to put out hot spots on a 21-acre brush fire that broke out late Monday night near the 210 freeway and Hansen Dam Tuesday, September 27, 2016. (Photo by David Crane, Los Angeles Daily News/SCNG)

Photos: Firefighters quell 21-Acre Brush Fire

By Daily News Staff and Wire Services

POSTED: 09/27/16, 6:05 AM PDT | UPDATED: 2 DAYS AGO | 0 COMMENTS

A slow-moving brush fire was contained Tuesday after scorching 21 acres in Lake View Terrace in the northeastern San Fernando Valley, according to the Los Angeles Fire Department.

A slow-moving brush fire burned 21 acres early Tuesday, Sept. 27, 2016, around the 10500 block of Woldrich Street near the 210 Freeway in the Shadow Hills area. (Image via Google Earth)

The fire was reported at 11:24 p.m. at 10516 Woldrich St., which is near the 210 Freeway, said Los Angeles Fire Department spokesman Erik Scott.

The fire was 100 percent contained at 8:47 a.m., Los Angeles Fire Department spokeswoman Margaret Stewart said.

Once it was contained, fire crews continued to douse hot spots during the day and into the evening, according to authorities.

No structures were damaged and no injuries were reported. The Los Angeles Fire Department's arson unit is investigating.

More than 100 firefighters were on the scene in over five hours.

The California Highway Patrol briefly closed the Wheatland Avenue onramps to the 210 Freeway.

According to the CHP website, a SigAlert for the eastbound 210 Freeway Wheatland Avenue offramp and westbound 210 Freeway Wheatland offramp was issued at 4:10 a.m. Tuesday.

The onramps reopened at 6:38 a.m.

City News Service and Wes Woods II contributed to this report.

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Man sought in hit-and-run that killed songwriter Rob Meurer in Studio City

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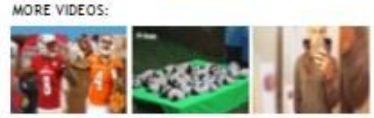

Video News Feed

J.P. Hoornstra 13hrs
Since the Dodgers won't announce their Game 4 starter until the morning of Game 4, here's what Dave Roberts is able to say about Julio Urias today:

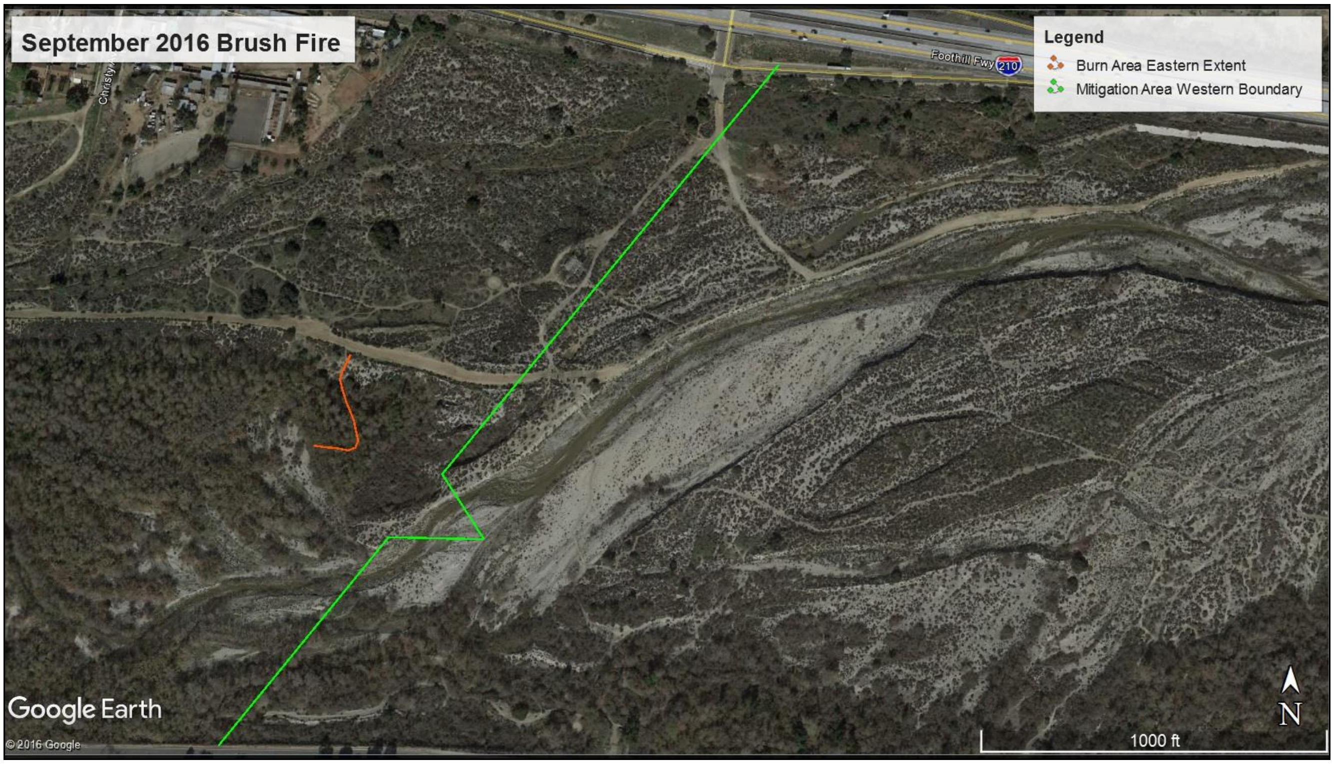

Figure 1. Location of eastern extent of the burn area relative to the western boundary of the Mitigation Area.

Figure 2. Eastern extent of burn area, approximately 350 feet from Mitigation Area boundary.

Figure 3. Burn Area facing north.

Figure 4. Burn area facing south.

Figure 5. Burn area facing west.

Figure 6. Burn area facing east (powerlines signify the western boundary of the Mitigation Area).

October Post-Fire Damage Assessment Memo

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 20, 2016
(2014-003.015/009)

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

SUBJECT: Memorandum for Post-fire Site Visit (October 2016) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Cabrera:

This memorandum serves to document a site visit conducted to investigate potential damage resulting from a fire that burned within the Big Tujunga Wash Mitigation Area (Mitigation Area) in October 2016. The fire was reported to have started on the early evening of Sunday October 9, 2016, and was one hundred percent contained within 30 minutes (Attachment 1). The fire was reported to have burned approximately 0.4 acres. The cause of the fire is unknown and is currently under investigation by the Los Angeles Fire Department arson unit.

The site visit was conducted by ECORP Consulting, Inc. (ECORP) biologists, Taylor Dee and Carley Lancaster, on October 15, 2016 following the Trail Cleanup Day. The biologists arrived on site and entered the Mitigation Area through an opening in the chain-link fence bordering the Mitigation Area along Wentworth Street that had been cut for firefighter access. Another opening in the fence in which fence posts appeared pulled out of the ground was observed between the Wheatland gate and the cut fence opening. The burned area was also accessible via the Wheatland Avenue entrance gate.

Based on the extent of the burn area, fire damage appeared to be evident within the Mitigation Area (Figures 1 through 6). The southeastern extent of the fire bordered the trail within the Mitigation Area. The vegetation that was burned included 19 trees and 17 shrubs. Burned trees included 16 mature willows (*Salix sp.*) approximately 18 to 20 feet in height, two smaller willows approximately 10 feet in height, and one cottonwood (*Populus* sp.) approximately 15 feet tall. Burned shrubs included 10 mature scalebroom (*Lepidospartum squamatum*) and seven mature mulefat shrubs approximately eight to 10 feet tall. There was evidence of chopped trees within the burned area, which was likely a result of firefighter activity. No sign of the cause of the fire was observed. ECORP recommends that no action needs to be taken; the burned are will likely recover naturally. The area will be monitored during subsequent visits for evidence of exotic plant growth, erosion, and unauthorized trail construction and LACDPW will be notified if any issues are observed.

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, 2016

Taylor Dee
Biologist

Attachment 1. LAFD Alerts

LOS ANGELES

311

TO REPORT AN EMERGENCY **CALL 9-1-1**

WELCOME TO THE

LOS ANGELES FIRE DEPARTMENT

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LOS ANGELES FIRE DEPARTMENT FOUNDED 1886

UPDATE VEGETATION FIRE 10/09/2016

Update Vegetation Fire; 4:52PM; 10050 Wentworth Bl; #Sunland; KNOCKDOWN: 65 LAFD Firefighters + LACoFD in 1 hour 11 minutes, kept to 3/4 acre. No Structures threatened. No injury. Address updated from 9411 Wentworth Bl to 10050 Wentworth St, in the Hansen Dam Area. Cause under invest; FS 24; Batt 12; Valley Bureau; Council District 7; Erik Scott

SHARE THIS:

VEGETATION FIRE 10/09/2016

Vegetation Fire; 4:22PM; 9411 Wentworth Bl; **https://goo.gl/maps/oty9NNQNfdS2**; Sunland; 1/2 acre of heavy brush in the basin. No structures threatened; FS 24; Batt 12; Valley Bureau; Council District 7; BC10 BC12 BC14 CM42 E260 E274 E289 E290 E298 E60 E7 E77 E86 EM14 H3 H5 H6 RA74 T60 T74 T89 T90 T98 WT77; 5; 12; Erik Scott

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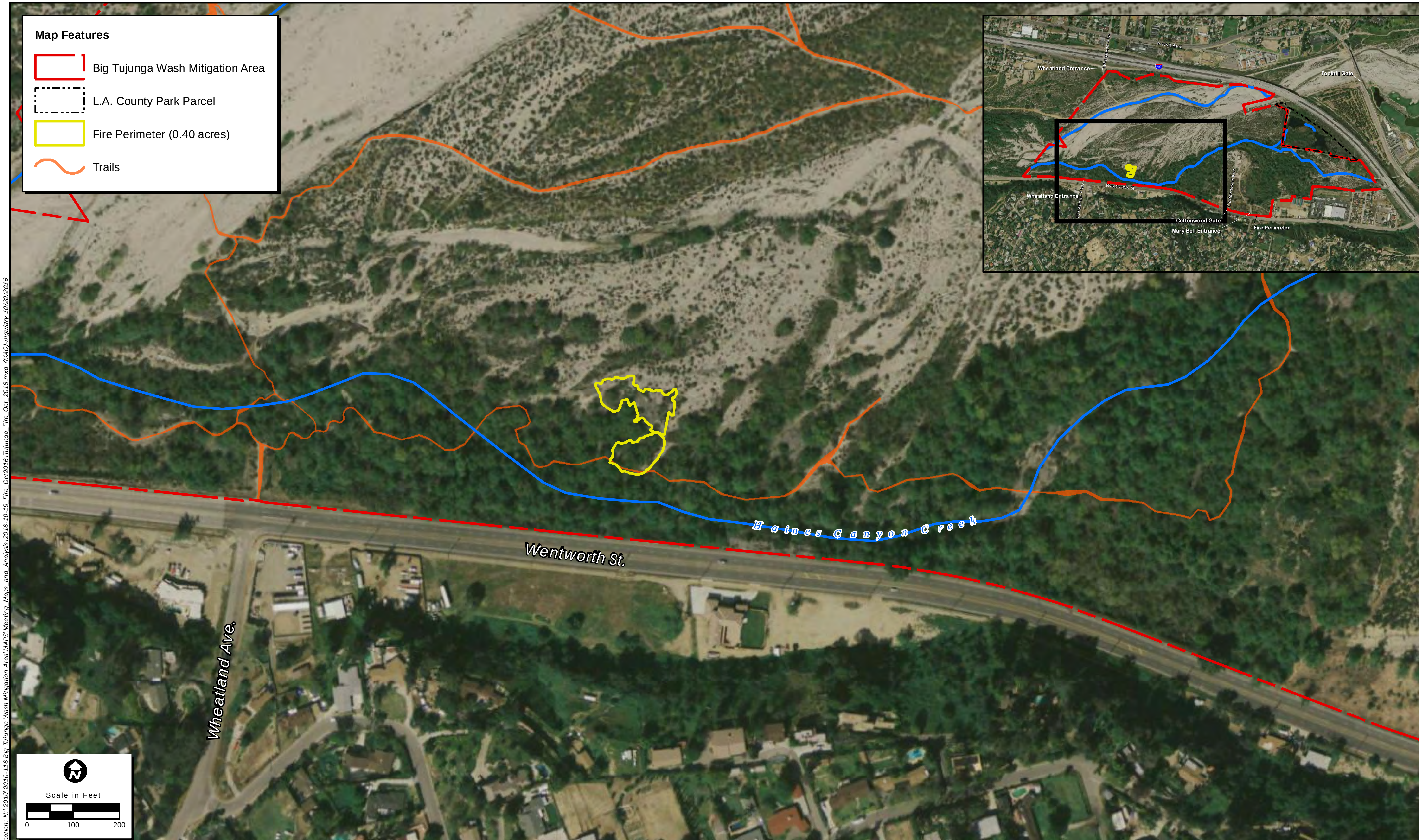

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Meeting_Maps_and_Analysis\2016-10-19_Fire_Oct2016\Tujunga_Fire_Oct_2016.mxd (MAG)-mguidry 10/20/2016

Map Date: 10/20/2016
Aerial Date: March 2008

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

DRAFT

Figure 1. Big Tujunga Mitigation Area Fire Damage October 2016

2010-116 Big Tujunga Wash Mitigation Area

Figure 2. Burn area facing northwest, approximately 200 feet from cut fence along Wentworth Street.

Figure 3. Burned mulefat shrubs, facing west.

Figure 4. Burned Cottonwood branch and other charred tree limbs.

Figure 5. Evidence of chopped trees, likely from firefighters containing the fire.

Figure 6. Remaining tree trunk and limbs after being chopped by firefighters.

Figure 7. Burned scalebroom, facing northwest.

Email Blast and New Mitigation Area Signs

ALERT: THE BIG TUJUNGA WASH MITIGATION AREA NEEDS YOUR IMMEDIATE HELP!!

Recently, unlawful activities and damage to habitats have become frequent problems in the Big Tujunga Wash Mitigation Area (BTWMA). The Los Angeles County Department of Public Works (LACDPW) needs your help to report any problems you see right away!

If you see any of the following types of activities or issues within the boundaries of the BTWMA, please report them IMMEDIATELY to either the Big T email address (BTWMA@dpw.lacounty.gov) or by phone to ECORP Consulting [Kristen Wasz (909) 307-0046 or Lauren Dorough (714) 648-0630]:

- Automobiles parked at the Cottonwood entrance or at the Tujunga Ponds parking area (other than County, ECORP Consulting, or Natures Image vehicles)
- Off-road vehicles
- Cutting or trimming of vegetation (other than the Natures Image crews)
- Damage to gates or fences
- Unlocked gates
- Man-made traps designed to harm horses or people
- Shooting of any type of weapon (including paintball and airsoft guns)
- Fishing or capturing of other wildlife species
- Bathing or swimming in the Tujunga Ponds or Haines Canyon Creek
- Rock Dams or other blockages in Haines Canyon Creek (other than the fish screen at the pond outlet)
- Homeless encampments
- Suspicious behaviors by people or the repeated presence of people in certain areas
- Building cooking fires or using a barbeque or camp stove
- Trash dumping
- Creation of new trails
- Any other issues or occurrences that seem out-of-place in the BTWMA

Please call 9-1-1 IMMEDIATELY to report wildfires or other emergencies. Do not call 911 for non-emergencies.

Please call the Los Angeles Sheriff's Department at 1-800-834-0064 to report non-emergencies, such as minor incidents or safety concerns. DO NOT use 911 for non-emergencies.

If you observe any health concerns, such as hypodermic needles, illegal paraphernalia, or unknown material or chemicals, please contact the Health Hazardous Materials Division (HHMD) of the LA County Fire Department. During business hours (8AM to 5/6PM) the number to contact is (323) 890-4317 and after hours the number is (323) 881-2455.

If you have any questions or you would like to report an issue, please contact the LACDPW at BTWMA@dpw.lacounty.gov or ECORP Consulting [Kristen Wasz (909) 307-0046 or Lauren Dorough

(714) 648-0630]. Also, it would be very helpful if you would notify LACDPW or ECORP if and when you contact law enforcement so LACDPW can follow up on the situation accordingly.

The BTWMA is an amazing natural area that is designed to protect the sensitive habitats and the wildlife that occur there. You, as the site users, are our best eyes and ears in the BTWMA and we need your help to identify and report problems or issues as soon as they happen. Please pass along this call for help to anyone you know who enjoys the BTWMA so we can build a bigger support system and have even more eyes on the ground!

Thank you for your participation in helping keep Big T a clean and safe place for people and wildlife alike.

The creek is critical habitat for federally protected fish.

Creating rock dams, fishing, or swimming in these waters are violations of the Endangered Species Act!

Violators can be fined up to $25,000 and/or spend 6 months in prison.

Video surveillance in progress

To report violations, please call ECORP Consulting:

Kristen Wasz at (909) 307-0046 or Lauren Dorough at (714) 648-0630

U.S.C. section 1540 ESA section 11(b)(1)

Este arroyo es un hábitat sensible para peces protegidos a nivel federal.

¡La creación de presas de roca, pescar, o la natación en este arroyo son violaciones de la Ley de Especies en Peligro de Extinción!

Los infractores pueden ser multados hasta $25,000 y/o pasar 6 meses en la cárcel.

Vigilancia de vídeo en curso

Para reportar infracciones, por favor llame a ECORP Consulting:

Jerry Aguirre (909) 307-0046

U.S.C. section 1540 ESA section 11(b)(1)