2013 Annual Report for the Big Tujunga Wash Mitigation Area Los Angeles County, California

Prepared for:

County of Los Angeles
Department of Public Works
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April 2014

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Table of Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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 Expires 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 remains in effect through March 31, 2014. 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 2013. In addition, a qualified biological monitor was present during all exotic vegetation removal activities to ensure that no impacts to nesting birds occurred (see Section 4.0). As a result, no impacts occurred to breeding/nesting birds within the Big Tujunga Wash Mitigation Area (Mitigation Area).

Condition 2: Nesting raptor surveys were conducted prior to all vegetation removal activities occurring within the Mitigation Area in 2013. There were no active raptor nests identified within the active work areas, and 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 2013 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. There were no other listed species observed in the Mitigation Area in 2013.

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 2013 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, no application was made for a State Incidental Take Permit.

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 2013.

Work Areas and Vegetation Removal

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

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

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

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

Equipment and Access

Condition 17: Vehicles and equipment were neither operated 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 2013, 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 carefully removed them to restore the natural flow in the creek (see Section 11.0)

Pollution, Sedimentation, and Litter

Condition 24: All litter and pollution laws were adhered to by the contractors, subcontractors, and employees of LACDPW. Trash pickup was conducted regularly by the site users and the landscape contractor (see Section 9.2).

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 2013.

Condition 27: Activities conducted within the Mitigation Area in 2013 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) were not conducted in the Mitigation Area in 2013 that would have resulted in the production of water containing mud, silt, or other pollutants.

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 (see Section 11.0). These activities were conducted with as little silt generation as possible, and the rocks were placed back into the stream in a natural arrangement. Removal of the rock dams is critical for the

federally listed (threatened) and California Species of Special Concern (SSC) Santa Ana sucker (*Catostomus santaanae*) that occurs in Haines Canyon Creek. Rock dam removal eliminates habitat that is better suited for exotic wildlife (bullfrogs [*Lithobates catesbeianus*], largemouth bass [*Micropterus salmoides*], etc.) that pose a threat to this species.

Permitting and Safeguards

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

Condition 32: LACDPW submitted the Conservation Easement (CE) on December 23, 2010. Additional work on the CE was not conducted in 2013.

Administrative-Miscellaneous

Condition 33: No amendments to the SAA were submitted to CDFW during the 2013 reporting period. CDFW did not identify any breaches of the SAA during the 2013 period.

Condition 34: There were no violations of any terms or conditions of the SAA during the 2013 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 2013.

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: A site visit was conducted with CDFW on January 14, 2013.

Conditions 40 through 42: CDFW did not issue a suspension or cancellation of the SAA in 2013.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to provide a summary of the management activities conducted at the Mitigation Area from January to December 2013. These activities were conducted in accordance with the 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 requirement for the preparation of a management plan for the site. The ultimate goal of the Mitigation Area is to provide for long-term preservation, management, and enhancement of biological resources for the benefit of the state's fish and wildlife resources. The MMP encompasses strategies to enhance and protect existing habitat for wildlife and to create additional natural areas that could be used by native wildlife and numerous user (recreational) groups. In addition, the MMP includes programs for the removal of exotic fishes and amphibians, bullfrogs, 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 LACDPW in July 2007 to continue MMP activities as part of implementation of the LTMMP (Chambers Group 2006). This report summarizes all activities conducted in the Mitigation Area between January and December 2013.

1.2 Location and Setting

The Mitigation Area is located in Big Tujunga Wash, just downstream of the Interstate (I-) 210 Freeway overcrossing, near the City of Los Angeles' Sunland community in the San Fernando Valley, Los Angeles County. The site is bordered on the north by I-210, on the east by I-210 and the County of Los Angeles Department of Parks and Recreation (LACDPR) Tujunga Ponds, and on the south by Wentworth Street (Figure 1-1). The west side of the site is contiguous with the downstream portion of Big Tujunga Wash.

The Mitigation Area supports two watercourses: Big Tujunga Wash and Haines Canyon Creek. Big Tujunga Wash, in the northern portion of the site, is partially controlled by Big Tujunga Dam. Flow is intermittent based on rainfall amounts and water releases from the Dam. Haines Canyon Creek, located in the southern portion of the site, is a tributary that conveys water flow from Haines Canyon to Big Tujunga Wash. Flow is perennial and may be fed by groundwater and/or runoff from adjacent residential areas. The two drainages merge near the western boundary of the property and continue into the Hansen Dam Flood Control Basin, located approximately one-half mile downstream of the site. The site is located within a state-designated Significant Natural Area (LAX-018) and the biological resources found on the site are of local, regional, and statewide significance (Safford and Quinn 1998; CDFW 2012). The nearby Tujunga Ponds and surrounding habitat are located adjacent to the northeast corner of the site. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds, and other geographic features can be found in Figure 1-2.

Map Date: 3/20/2013
Source: ESRI

Figure 1-1. Project Location

2010-116 Big Tujunga Wash Mitigation Area

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Aerial Date: March 2008
Map Date: 2010

Figure 1-2. Big Tujunga Wash Mitigation Area

2010-116 Big Tujunga Wash Mitigation Area

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1.3 Summary of the Annual Report

Table 1-1 provides a list of the tasks described in the MMP that were implemented between January and December 2013. Certain tasks in the MMP were not conducted in 2013 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 (*Empidonax traillii extimus*). This suite of surveys was not conducted in 2013 because these surveys were last conducted in 2012. An additional task was added in 2013 to conduct site tours with City and County officials; one such visit occurred during 2013 (see Section 14.0). Compendia of all plant and wildlife species observed in the Mitigation Area in 2013 are included as Appendix C.

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2013

Implemented and/or Continued in 2013	
	TASK 1 – Continue Brown-headed Cowbird Trapping Program
x	Brown-headed Cowbird Trapping Program
x	Final Trapping Report
x	Trap Storage
	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
x	Water Lettuce Herbicide Application
x	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 9 – Water Quality Monitoring Program
x	Water Quality Monitoring
x	Water Quality Results Report
	TASK 10 – Trails Monitoring Program
x	Trails Maintenance and Monitoring Site Visits and Memos
x	Trail Cleanup Day

Implemented and/or Continued in 2013	
	TASK 11 – Community Awareness Program
x	Biannual Newsletters
x	Community Advisory Committee Meetings
x	Community Advisory Committee Meeting Minutes
	TASK 12 – Public Outreach Program
x	Public Outreach Weekend Site Visits
x	Public Outreach Final Memo
	TASK 17 – Annual Report
x	2013 Draft Annual Report
x	2013 Final Annual Report
	TASK 18 – Meetings
x	Meetings with LACDPW, Agencies, Public, and Consultants
	TASK 19 – Site Tour
x	Site Tour with City and County Officials

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 2013. 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. One cowbird trap was placed within the Mitigation Area and three traps were placed outside the Mitigation Area in suitable cowbird foraging habitat. A total of 97 cowbirds were removed from the four traps between April 2 and June 30, 2013. 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 actual 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 2013 period was monitoring the exotic trees that were cut or girdled in 2012 and treating exotic plant species (such as giant reed [*Arundo donax*] and eupatory [*Ageratina adenophora*]) with CDFW-approved herbicides. The exotic plant species eradication activities that were conducted in 2013 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 infestation of this non-native plant in the Tujunga Ponds. Following manual removal in early January 2012, remaining patches of water lettuce were treated with CDFW-approved herbicide in January, July, August, and September 2012. Herbicide was applied again in July and August 2013 after water lettuce was observed in the Tujunga Ponds. Activities associated with this program are summarized in Section 5.0.

1.3.4 Continuation of Exotic Wildlife Eradication Program

This task consists of the continued removal of non-native, invasive wildlife species. Efforts were focused on removal of exotic aquatic wildlife species, primarily bullfrogs, largemouth bass, crayfish, and Mozambique tilapia (*Oreochromis mossambicus*), from perennial waters at the Tujunga Ponds and Haines Canyon Creek. Exotic wildlife removal efforts targeted both life stages of bullfrogs (tadpoles and adults) in an effort to maximize the efficiency of the removal program. A total of three exotic removal efforts occurred during the 2013 reporting period. Exotic wildlife removal tasks implemented in 2013 are summarized in Section 6.0.

1.3.5 Native Fish Monitoring

Native fish monitoring surveys were not conducted within the Mitigation Area during 2013.

1.3.6 Least Bell's Vireo and Southwestern Willow Flycatcher Surveys

Least Bell's vireo and southwestern willow flycatcher surveys were not conducted within the Mitigation Area during 2013.

1.3.7 Arroyo Toad Surveys

Arroyo toad surveys were not conducted within the Mitigation Area during 2013.

1.3.8 Functional Assessment and Success Monitoring

The functional assessment and success monitoring studies were not conducted in the Mitigation Area in 2013. This is discussed further in Section 7.0.

1.3.9 Water Quality Monitoring Program

Water quality sampling for the Mitigation Area was conducted by MWH Global, Inc. (MWH) on October 30, 2013. A summary of the results of this monitoring is included in Section 8.0.

1.3.10 Continuation of 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 2013 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. Areas that required minor erosion repairs were remedied during the visit or in combination with other task site visits. More extensive problem areas were mapped for repair at a later time. The Ninth Annual Trail Cleanup Day, scheduled for Saturday, October 5, 2013, was cancelled due to high winds and was not rescheduled. Trail maintenance tasks implemented in 2013 and further information about the Trail Cleanup Day is summarized in Section 9.0.

1.3.11 Continuation of Community Awareness Program

This program consists of the continued implementation of the semiannual Community Advisory Committee (CAC) meetings that are held in spring and fall of each year. ECORP assisted LACDPW with development of meeting agendas and any supporting handouts (including a new 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 2013 are summarized in Section 10.0.

1.3.12 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 2013 due to its past success. On-site interviews and education about the Mitigation Area were conducted on ten 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 permitted 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 2013, are included in Section 11.0.

1.3.13 Long-term Management Plan

ECORP submitted a draft version of the Long-term Management Plan (LTMP) to LACDPW in October 2012. Further coordination with LACDPW and CDFW is necessary to finalize this document.

1.3.14 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.

1.3.15 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 January 14, 2013 with CDFW, LACDPW, and LACDPR. This is discussed in Section 13.0.

1.3.16 Site Tour

In conjunction with LACDPW, ECORP's staff conducted a site tour of the Mitigation Area on August 22, 2013 with the City of Los Angeles Councilmember (Council District 7) Felipe Fuentes. This is discussed in Section 14.0.

2.0 CONTINUATION OF BROWN-HEADED COWBIRD TRAPPING PROGRAM

The brown-headed cowbird trapping program was established at the Mitigation Area to decrease and ultimately eliminate nest parasitism on sensitive songbird species present or potentially present in the Mitigation Area, such as least Bell's vireo and southwestern willow flycatcher. Trapping and eradicating brown-headed cowbirds increases the ecological value of the site by enhancing the reproductive success of these sensitive riparian songbirds and promoting general breeding activity within the Mitigation Area. Trapping in the Mitigation Area was conducted yearly between 2001 and 2006 and again between 2009 and 2012. 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 new SAA issued for the site (dated January 29, 2009). In 2013, Griffith Wildlife Biology operated one cowbird trap within the Mitigation Area and three traps adjacent to the Mitigation Area between April 1 and June 30, 2013. The methodology, results, and discussion of the 2013 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 in 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). Trap 2 was placed adjacent to riparian and coastal sage scrub habitat, while Traps 1, 3, and 4 were placed in cowbird foraging areas.

Aerial Date: USGS Dec 2010
12/19/2012

Figure 2-1. Brown-headed Cowbird Trap Locations

2010-116 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 wide, 8 feet long, and 6 feet 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 at least two male decoy cowbirds as of April 3. As of April 13, the preferred ratio of male to female decoys was established, with at least two males for every three females (up to 3 males and 5 females). The traps were opened on April 1 and operated every day (including holidays) until June 30, 2013. 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;
- Making repairs to the traps, shade cloths, and warning signs;
- 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 30, 2013. 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 97 cowbirds were removed during the 2013 trapping season (54 males, 42 females, and 1 juvenile). Most cowbirds were captured and removed during the first seven weeks of the 13-week trapping period (between April 1 and June 30). Trap vandalism did not occur during the 2013 trapping season so there were no losses of decoys or trapping days.

A total of 325 non-target birds (i.e., all species except brown-headed cowbirds) of six native bird species were captured in the traps. The six non-target species that were captured included California towhee (*Pipilo crissalis*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*; a CDFW Species of Special Concern [SSC]) and tricolored blackbird (*Agelaius tricolor*; also a CDFW SSC). Banded cowbirds and/or banded non-target species were not captured during the trapping season. Most non-target birds (320 individuals) captured during the trapping period, including the CDFW SSC individuals captured, were released unharmed and in good health. There were no mortalities of decoy or non-target birds due to the lack of water, food, shade, or unclean conditions in the trap. Five non-target individuals (four California towhees and one house sparrow) were classified as mortalities due to predation inside the traps. 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 2013 season is low compared to other trapping years but within the range of 2001-2013 numbers. Locally-raised juveniles are relatively easy to capture within their natal habitat and can be a good indication of the success of a trapping program. Only one juvenile brown-headed cowbird was removed during the 2013 trapping season, possibly indicating that nest parasitism levels were low but not eliminated during the breeding season.

In order to effectively reduce regional cowbird populations, brown-headed cowbird trapping would need to be conducted on a yearly basis until the number of cowbirds captured decreases each year. Yearly trapping has been effective at reducing nest parasitism on native host species present in the riparian habitat at the Mitigation Area. Griffith Wildlife Biology recommended no change in the protocol, the number of traps (4), or the dates and duration of cowbird trapping (13 weeks, April 1 to June 30). They do, however, recommend relocating Trap 2 within the Mitigation Area to increase trapping success.

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, non-native, and weedy species, such as giant reed, and to replant these areas with native riparian species. The enhancement plan consisted of various tasks designed to remove the non-native species, prepare the areas prior to planting, install cuttings and container plant materials, and monitor the success of the plantings. Initial installation of willow riparian habitat along Haines Canyon Creek occurred in 2000 and 2001. The habitat restoration program was ongoing through the first part of 2007, when the last plantings were installed. Failure of the plantings due to environmental conditions and vandalism initiated a reevaluation of the restoration program in late 2007.

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

3.1 Summary of the Original Habitat Restoration Efforts

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

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

3.2 Current Status of the Habitat Restoration Program

The planting and maintenance portions of the habitat restoration program were terminated in 2010 (ECORP 2011). The exotic plant removal component of the habitat restoration program, however, was continued and the exotic plant removal task was absorbed into the new exotic plant eradication and maintenance program during the contract revision in 2012. The exotic plant eradication and maintenance program activities conducted in 2013 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 the 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
Eupatory	*Ageratina adenophora*
Palms	*Arecastrum* sp., *Washingtonia* sp., etc.
Giant reed	*Arundo donax*
Mustards	*Brassica* sp.
Italian thistle	*Carduus pycnocephalus*
Non-native weedy thistles	*Cirsium* sp.
Umbrella plant	*Cyperus involucratus*
Water hyacinth	*Eichhornia crassipes*
Eucalyptus	*Eucalyptus* sp.
Fennel	*Foeniculum vulgare*
Sweet clover	*Melilotus albus*
Tree tobacco	*Nicotiana glauca*
Common plantain	*Plantago major*
Castor bean	*Ricinus communis*
Pepper trees	*Schinus* sp.
Milk thistle	*Silybum marianum*
Tamarisk	*Tamarix ramosissima*
Non-native annual grasses	
Wild oat	*Avena fatua*
Slender wild oats	*Avena barbata*
Foxtail chess	*Bromus madritensis* ssp. *rubens*
Ripgut brome	*Bromus diandrus*
Soft chess	*Bromus hordeaceus*

Common Name	Scientific Name
Mediterranean barley	*Hordeum murinum*
Italian ryegrass	*Lolium multiflorum*
Annual beard grass	*Polypogon monspeliensis*
Non-native perennial grasses	
Pampas grass	*Cortaderia selloana*
Bermuda grass	*Cynodon dactylon*
Fountain grass	*Pennisetum setaceum*
Smilo grass	*Piptatherum miliaceum*

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

Common Name	Scientific Name
Bentgrass	*Agrostis viridis*
Tree of heaven	*Ailanthus altissima*
Aloe vera	*Aloe* sp.
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*
Shortpod mustard	*Hirschfeldia incana*
Smooth cat's ear	*Hypochaeris glabra*
Glossy privet	*Ligustrum lucidum*
Sweet alyssum	*Lobularia maritima*
Cheeseweed	*Malva parviflora*
High mallow	*Malva sylvestris*
Horehound	*Marrubium vulgare*
Alfalfa	*Medicago sativa*
Marvel of Peru	*Mirabilis jalapa*
Sand plantain	*Plantago psyllium*
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*

Common Name	Scientific Name
Feverfew	*Tanacetum parthenium*
Common dandelion	*Taraxacum officinale*
Puncture vine	*Tribulus terrestris*
Chinese elm	*Ulmus parvifolia*
Wand mullein	*Verbascum virgatum*
Water speedwell	*Veronica anagallis-aquatica*
Periwinkle	*Vinca major*
Non-native annual grasses	
Red brome	*Bromus rubens*
Barnyard grass	*Echinochloa crus-galli*
Common wheat	*Triticum aestivum*
Non-native perennial grasses	
Perennial veldtgrass	*Ehrharta calycina*
Perennial ryegrass	*Lolium perenne*

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

Table 4-3. Invasive Exotic Tree Species

Common Name	Scientific Name
Acacia species	*Acacia dealbata* and *Acacia* spp.
Common catalpa	*Catalpa bignonioides*
Eucalyptus	*Eucalyptus* spp.
Ornamental fig	*Ficus carica*
Evergreen ash	*Fraxinus uhdei*
Japanese privet	*Ligustrum japonicum*
Liquidambar	*Liquidambar stryraciflua*
Mulberry	*Morus alba*
Wild tobacco	*Nicotiana glauca*
Castor bean	*Ricinus communis*
California pepper	*Schinus molle*
Brazilian pepper	*Schinus terebinifolius*
Chinese elm	*Ulmus parvifolius*
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 previously part of the areas 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.] species) 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 2013, Figure 4-1 shows the areas that are considered high priority for targeting exotic plant species.

Pre-activity surveys were conducted by qualified biologists prior to each exotic plant eradication effort to document exotic plant locations and any sensitive biological resources to avoid during the removal efforts. During the pre-activity surveys, the biologists conducted a walkthrough of all trails in the riparian and upland areas. Coordinates of new exotic plant species locations or sensitive biological resources (such as active bird nests) were taken with a global positioning system unit (GPS) 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 daily tailgate sessions to remind the crews about the sensitive biological resources present in the Mitigation Area. A bilingual worker education brochure that contained general information and guidelines pertaining to the site was distributed to all new workers entering the site (see Appendix B). The biological monitor was responsible for showing the removal crews locations of exotic plant species that had been recorded during previous site visits and pre-activity surveys. Newly identified stands of exotic vegetation were treated as they were discovered. Plants and trees treated with herbicide were flagged with survey flagging and GPS points 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, as well as the presence of any sensitive biological resources. All exotic plant removal efforts were conducted according to the terms and conditions of the SAA.

Aerial Date: USGS Dec 2010
12/19/2012

Figure 4-1. High Priority Exotic Plant Removal Locations

2010-116 Big Tujunga Wash Mitigation Area

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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 were treated by girdling the trunk of the tree with a saw or hand tool and painting herbicide on the area that was girdled. Locations within a 15-foot distance from permanent (Haines Canyon Creek, Tujunga Ponds) or temporary (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 not allow for re-growth or establishment of new stands. The cuttings were placed in areas that would not impede visitor traffic or pose a safety hazard.

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

4.2 Exotic Plant Eradication Efforts in 2013

Site-wide exotic plant eradication occurred during four different efforts in 2013: April 10 through 12 and 15 through 19 (first effort); June 24 through 26 (second effort); September 4 through 6 and 9 through 11 (third effort); and December 16 through 20 and 23 (fourth effort). ECORP biologists Tania Asef, Emily Graf, Carley Lancaster, Sonya Steckler, Amy Trost, Rebecca Valdez, and Phillip Wasz 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. One western bluebird (*Sialia mexicana*) nest was observed in a cavity of a sycamore (*Platanus racemosa*) tree located west of the Cottonwood gate to the Mitigation Area on April 18, 2013. Crews were removing weeds in this area, therefore the biologist established a 100-foot no work area around this active nest so as to not disrupt nesting activities. Exotic plant removal and spraying activities did not occur within this buffer. During the removal efforts on April 19, 2013, one active song sparrow (*Melospiza melodia*) nest with nestlings was identified near the Big Tujunga Wash. A 100-foot no work buffer was established around the nest location and no exotic plant removal or spraying activities occurred within this buffer.

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 were becoming 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 habitat 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, as well as 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 2012a; 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. 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, 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.

In 2013, water lettuce was observed in the Tujunga Ponds and Connector Channel during the exotic plant removal effort in June. An herbicide application effort was conducted on July 2 and 3, 2013 to combat the regrowth. Following the herbicide application, ECORP biologist Amy Trost conducted a site visit on July 19, 2013 to inspect the water lettuce. During the visit, water lettuce was observed in the Connector Channel and along the edges of the east pond.

A second herbicide application effort was conducted on August 6 and 7, 2013. Following the herbicide application, Amy Trost conducted a site visit on August 20, 2013. Water lettuce was not observed in the Tujunga Ponds or Connector Channel and there was no need to conduct additional water lettuce herbicide application efforts for the remainder of the year. It will be important, however, to be diligent about monitoring for this plant

as temperatures begin to warm up in the early spring months because an infestation can occur very quickly once the plants begin active reproduction again.

Memos documenting herbicide application efforts and follow-up site visits are included as Appendix F.

6.0 EXOTIC AQUATIC WILDLIFE ERADICATION PROGRAM

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

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

ECORP fisheries biologists conducted an initial site survey when ECORP was issued the contract to continue implementation of the MMP. The purpose of the site assessment survey was to determine the most appropriate methods for continuing the exotic aquatic wildlife eradication program. The goal was to identify those methods that would produce the most significant impacts on the eradication of exotic aquatic wildlife species and ultimately result in the enhancement of habitat for the native fishes in Haines Canyon Creek. The data presented in this section of the annual report summarize the results of three exotic removal efforts conducted during 2013. A copy of the full report can be found in Appendix G.

6.1 Methodology

A wide range of removal methods were used during the 2013 exotic aquatic species removal efforts, including fyke net trapping, spearfishing, dip-netting/hand capturing, bullfrog gigging, two-person seining, minnow trapping, turtle trapping, and gillnetting. Electrofishing was not a method employed during 2013 to capture exotic aquatic species.

Fyke net trapping was conducted solely in the Connector Channel. All spearfishing and hand-capturing efforts were conducted while snorkeling. Dip-netting was performed in Haines Canyon Creek during diurnal removal efforts and at night in combination with bullfrog gigging and spearfishing surveys. Bullfrog gigging was primarily done at night by patrolling the perimeter of the ponds and throughout Haines Canyon Creek. Seining was accomplished using both 9- and 16-foot un-bagged seines mounted on poles within Haines Canyon Creek. Turtle and crayfish/minnow traps were baited with small cans of sardines and cat food with small holes punched into them. All traps remained open overnight. Gillnets were used in the ponds and were checked every eight hours during the removal efforts. Additionally, during snorkeling activities any Centrarchid (Sunfish Family) nests or bullfrog egg masses observed were destroyed or removed.

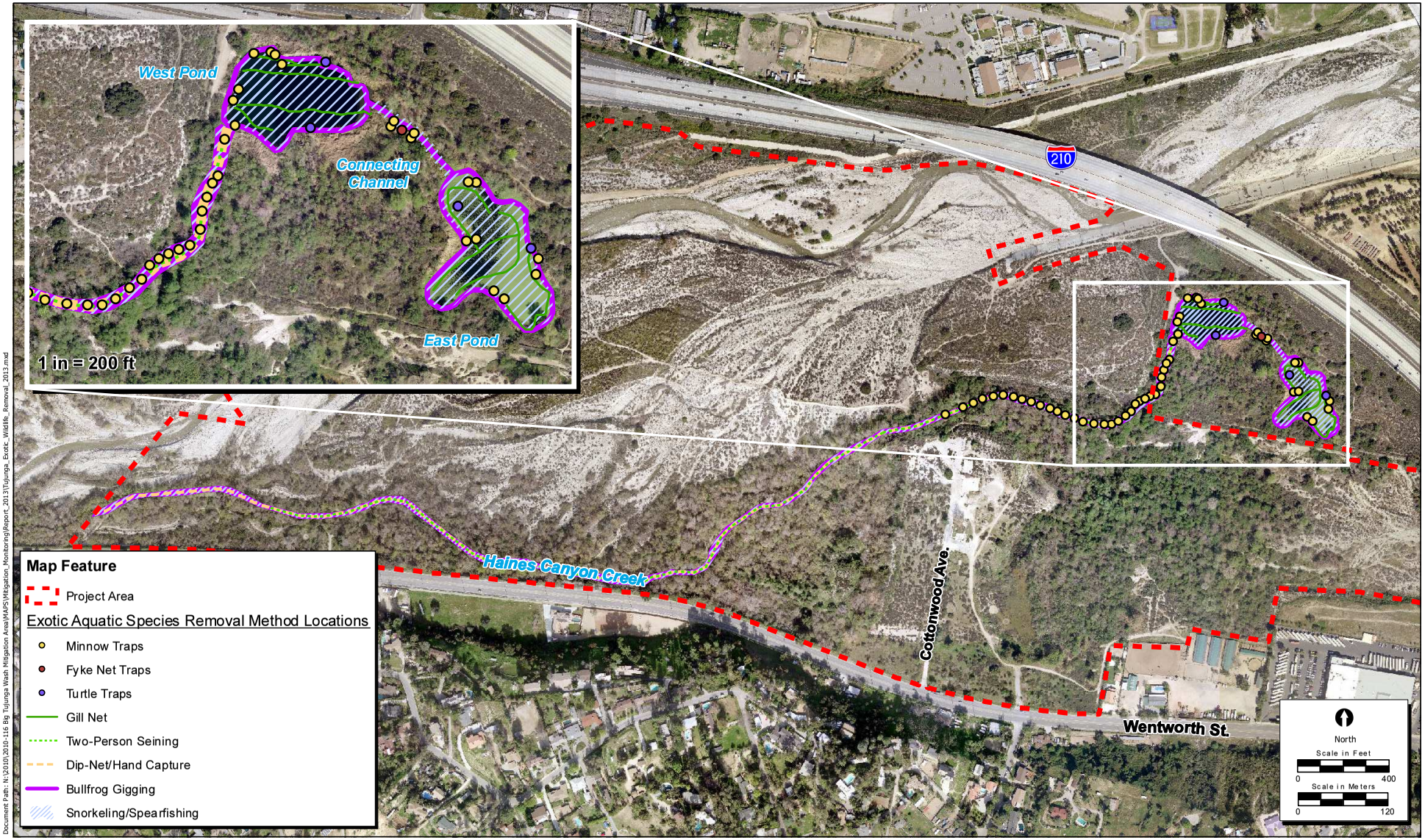
Prior to each removal effort, all potential sampling methods were evaluated for efficacy based upon the current site conditions and information derived from previous removal efforts. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the trap locations were often strategically deployed into areas that were inaccessible to the public. Sampling locations and the various sampling methods utilized during 2013 are shown in Figure 6-1.

The 2013 removal of exotic aquatic species from the Mitigation Area was conducted over three removal efforts: May 28 through 31 (effort number one), September 16 through 19 (effort number two), and December 9 through 13 (effort number three). All removal efforts were conducted under the direction of ECORP biologist Brian Zitt, U.S. Fish and Wildlife Service (USFWS) 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-27460A-0). Results of the sampling efforts were summarized in Exotic Wildlife Removal Memos following each of the surveys. The locations of aquatic removal efforts are displayed in Figure 6-1.

6.2 Results

A total of 2,122 individuals consisting of 10 exotic aquatic species (seven fishes, one amphibian, one reptile, and one invertebrate) and two native fishes were captured during the 2013 removal efforts (Table 6-1). Of the total, 99.7 percent (number of individuals [n]=2,116) of the individuals captured were exotic and removed from the site. Haines Creek accounted for 59.3 percent of the total catch (n=1,258), while the remaining 40.7 percent were captured in other water features: West Pond (n=321), Connector Channel (n=389), and East Pond (n=154). The two native fishes (Santa Ana sucker [n=4] and arroyo chub [n=2]) were collected in Haines Creek. These individuals were in good overall health and immediately released back into the creek. Additionally, several Santa Ana sucker (n=6) were incidentally observed while sampling in Haines Creek.

The three removal efforts resulted in the capture and removal of 941 red swamp crayfish, 985 largemouth bass, 90 common carp (*Cyprinus carpio*), 37 green sunfish (*Lepomis cyanellus*), 22 bullfrog (20 adults and 2 tadpoles), 13 bluegill (*L. macrochirus*), 9 western mosquitofish (*Gambusia affinis*), 8 red-eared slider (*Trachemys scripta elegans*), 6 Mozambique tilapia, and 5 goldfish (*Carassius auratus*). A complete listing of all aquatic species captured during the 2013 sampling efforts is included in the full report in Appendix G.



Aerial Date: USGS Dec 2010
12/20/2013

Figure 6-1. Exotic Aquatic Wildlife Species Sampling Locations

2010-116.010 Big Tujunga Wash Mitigation Area

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Table 6-1. Summary of Exotic Aquatic Species Removal by Location and Method, 2013.

Removal Location	Removal Dates	Exotic Species											Native Species		Total
		Goldfish	Common Carp	Western Mosquitofish	Green Sunfish	Bluegill	Largemouth Bass	Mozambique Tilapia	American Bullfrog Adult	American Bullfrog Tadpole	Red-eared Slider	Red Swamp Crayfish	Arroyo Chub	Santa Ana Sucker	
Haines Canyon Creek	May 28 - May 31, 2013	1			1		12		4			152			170
	September 16 - September 19, 2013	1			1		13					58			73
	December 9 - December 13, 2013			8	19	1	359					622	2	4	1,015
	Subtotal	**2**		**8**	**21**	**1**	**384**		**4**			**832**	**2**	**4**	**1,258**
West Pond	May 28 - May 31, 2013				1	3	52		5			9			70
	September 16 - September 19, 2013				3	8	130	1	3	1	2	26			174
	December 9 - December 13, 2013				9		66	1	1						77
	Subtotal				**13**	**11**	**248**	**2**	**9**	**1**	**2**	**35**			**321**
Connector Channel	May 28 - May 31, 2013	2		1			100		2			37			142
	September 16 - September 19, 2013						70			1		22			93
	December 9 - December 13, 2013				1		139					14			154
	Subtotal	**2**		**1**	**1**		**309**		**2**	**1**		**73**			**389**
East Pond	May 28 - May 31, 2013	1	79		1	1	33	4	5		4				128
	September 16 - September 19, 2013		9				6					1			16
	December 9 - December 13, 2013		2		1		5				2				10
	Subtotal	**1**	**90**		**2**	**1**	**44**	**4**	**5**		**6**	**1**			**154**
Total		**5**	**90**	**9**	**37**	**13**	**985**	**6**	**20**	**2**	**8**	**941**	**2**	**4**	**2,122**

7.0 FUNCTIONAL ASSESSMENT AND SUCCESS MONITORING

Annual functional analyses in the Mitigation Area are used to quantitatively assess the progress of the restoration effort. A functional analysis was conducted on the site in 1997 to establish baseline functional values for the riparian habitats (Chambers Group 1998). ECORP conducted the functional analyses annually between 2007 and 2012 to determine whether the site had met success criteria that were outlined in Table 2-2 of the MMP (Chambers Group 2000). In 2012, it was determined that the site had, indeed, met the success criteria goals outlined in the MMP. Therefore, the functional assessment and success monitoring studies were not conducted in 2013.

In order to determine the Functional Units (FU) per acre of the willow riparian habitat system, nine evaluation variables are 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 U.S. Fish and Wildlife Service 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 Functional Units (FU) for the Mitigation Area increased by .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 was 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, conducted the annual water quality sampling for the site in 2013. 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 550A Field dissolved oxygen (DO) meter with thermometer and an Orion 230A pH meter with HACH 51935 electrode. Samples were taken at mid-depth, along a transect perpendicular to the stream channel alignment. Laboratory analysis of pesticides was performed at Emax Laboratories in Torrance, California. All other analyses were performed by Eurofin Eaton Laboratories in Monrovia, California. Quality assurance/quality control (QA/QC) procedures in each laboratory followed the methods described in their respective Quality Assurance Manuals. In addition to the water quality monitoring, flows in the outlet from the Tujunga Ponds, in Haines Canyon Creek (leaving the site), and in Big Tujunga Wash were estimated using a simple field procedure. A float (a small plastic ball) is 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 2013 Water Quality Monitoring Report that is included as Appendix H. 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 2013

Results of analyses conducted by Emax and Eurofin Eaton Laboratories are summarized in Table 8-2. Note that the yields (percent recoveries) of QC 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 (October 30, 2013)

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	18.3	17.8	NA	15.6
Dissolved Oxygen	mg/L	6.8	8.0	NA	8.9
pH	std units	7.3	7.28	NA	8.21
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	0.37	0.38	NA	ND
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	7.6	5.5	NA	5.0
Orthophosphate-P	mg/L	ND	ND	NA	0.015
Total phosphorus-P	mg/L	0.037	ND	NA	ND
Glyphosate	µg/L	ND	ND	NA	ND
Chloropyrifos*	ng/L	ND	ND	NA	ND
Pesticides (EPA 8081A)**	µg/L	ND	ND	NA	ND
Turbidity	NTU	1.5	2.2	NA	0.30
Fecal Coliform Bacteria	(MPN/100 ml)	79	22	NA	79
Total Coliform Bacteria	(MPN/100 ml)	490	790	NA	700

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 8081A 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 October 2013 are summarized in Table 8-3.

Table 8-3. Estimated Flows for October 2013

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
10/30/2013	2	3	station dry on sample date

8.2.2 Comparison of Results with Aquatic Life Criteria

Table 8-4 provides the results of the October 2013 water quality sampling when compared to objectives established by the Los Angeles Regional Water Quality Control Board for protection of beneficial uses in Big Tujunga Wash (including wildlife habitat) and the Environmental Protection Agency (EPA) criteria for freshwater aquatic life.

Table 8-4. Discussion of October 2013 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 6.8 mg/L in the inflow to the Tujunga Ponds to 8.9 in Haines Canyon Creek leaving the site. DO levels at all stations were above the recommended minimum (5.0 mg/L) for warmwater fish species. DO levels in the Tujunga Ponds were close to the recommended mean (7.0 mg/L) for warmwater fish species.
pH	• Lowest pH was observed in the inflow to Tujunga Ponds (7.23), with highest pH observed in Haines Canyon Creek leaving the site (8.21). On this date, pH readings in Haines Canyon Creek and the Tujunga Ponds were within the 6.5 to 8.5 range identified in the Basin Plan (CRWQCB 1994).
Total residual chlorine	• No residual chlorine was detected at any station.
Nitrogen	• Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. • Ammonia was below the detection limit at all stations.
Phosphorus	• Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range at these three stations was <0.02 to 0.037 mg/L; recommended range is <0.05 – 0.1 mg/L).
Glyphosate	• Glyphosate was not detected at any station.
Chloropyrifos	• Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.
Pesticides	• Pesticides analyzed by EPA Method 8081A were not detected at any station.
Turbidity	• Turbidity levels were very low (2.2 NTU or less) at all stations.
Bacteria	• The fresh water bacteria standard for water contact recreation is for E. coli (126 MPN/100 ml geometric mean, 235 MPN/100 ml single sample limits). The observed fecal coliform levels were below the standard at the three stations with flow on the sample date. Previously, the water contact standard was 200 MPN/100 ml fecal coliform. Sampling specifically for E. coli was not conducted. • Total coliform levels ranged from 490 in Haines Canyon Creek inflow to Tujunga Ponds to 790 MPN/100 ml in the outflow from the ponds. [Note that recreation standards are for E. coli. Total coliform standards apply to waterbodies where shellfish can be harvested for human consumption.]

9.0 TRAILS MONITORING PROGRAM

9.1 Trails System Maintenance

The goal of maintaining a formal trails system at the Mitigation Area is to allow recreational use of the Mitigation Area while still preserving sensitive wildlife and their habitats. The Mitigation Area contains both equestrian and hiking trails (Figure 9-1). The preservation of authorized trails is an essential component in the success of original restoration and enhancement of the site. This program has been continued in order to discourage the establishment of any new trails in the Mitigation Area. By ensuring that the authorized trails are kept clear and can be readily used by equestrians and hikers, the amount of unauthorized creation of new trails and illegal use of the Mitigation Area (e.g., camping, making fires) will be reduced. Maintenance and monitoring of the trail system is a necessary component of the overall restoration and enhancement program.

Four site visits plus an additional visit to maintain poison oak encroachment along the trails were conducted in 2013. These visits occurred on April 9, 2013 (first visit), May 15, 2013 (poison oak removal), June 6, 2013 (second visit), September 3, 2013 (third visit), and October 8, 2013 (fourth visit). ECORP biologists Carley Lancaster, Amy Trost, Rebecca Valdez, Katherine Vienne, and Phillip Wasz conducted the trails monitoring visits.

The focus of these site visits was to look for areas that might qualify for trail closure, identify areas where trails were blocked by trash or debris, and mark locations of extensive stands of poison oak. Assessment of trail signs, information kiosks, portable toilets, site fencing, and gated entrances was included in each survey. Areas that required minor repairs were remedied during the four sets of 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 Natures Image and supervised by ECORP biologists that were present on site at the time of maintenance. During the site visits, the biologists assessed trail conditions and identified locations that were in need of maintenance. Examples of maintenance issues identified during these site visits included:

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

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

Aerial Date: USGS Dec 2010
Map Date: 2012

Figure 9-1. Trails in the Mitigation Area

2010-116 Big Tujunga Wash Mitigation Area

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

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). ECORP worked together with LACDPW to modify the flyers that provided the information for the Ninth 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 Ninth Annual Trail Cleanup Day was scheduled for Saturday, October 5, 2013; however, the event was cancelled due to the National Weather Service's warning of high winds on the event date. The cancellation notice distributed to the public is included as Figure 9-3. Due to drought conditions over the past 2 years and an increase in community organized cleanup events throughout the year, it was determined that the Mitigation Area was fairly clear of debris and a make-up date was not scheduled.

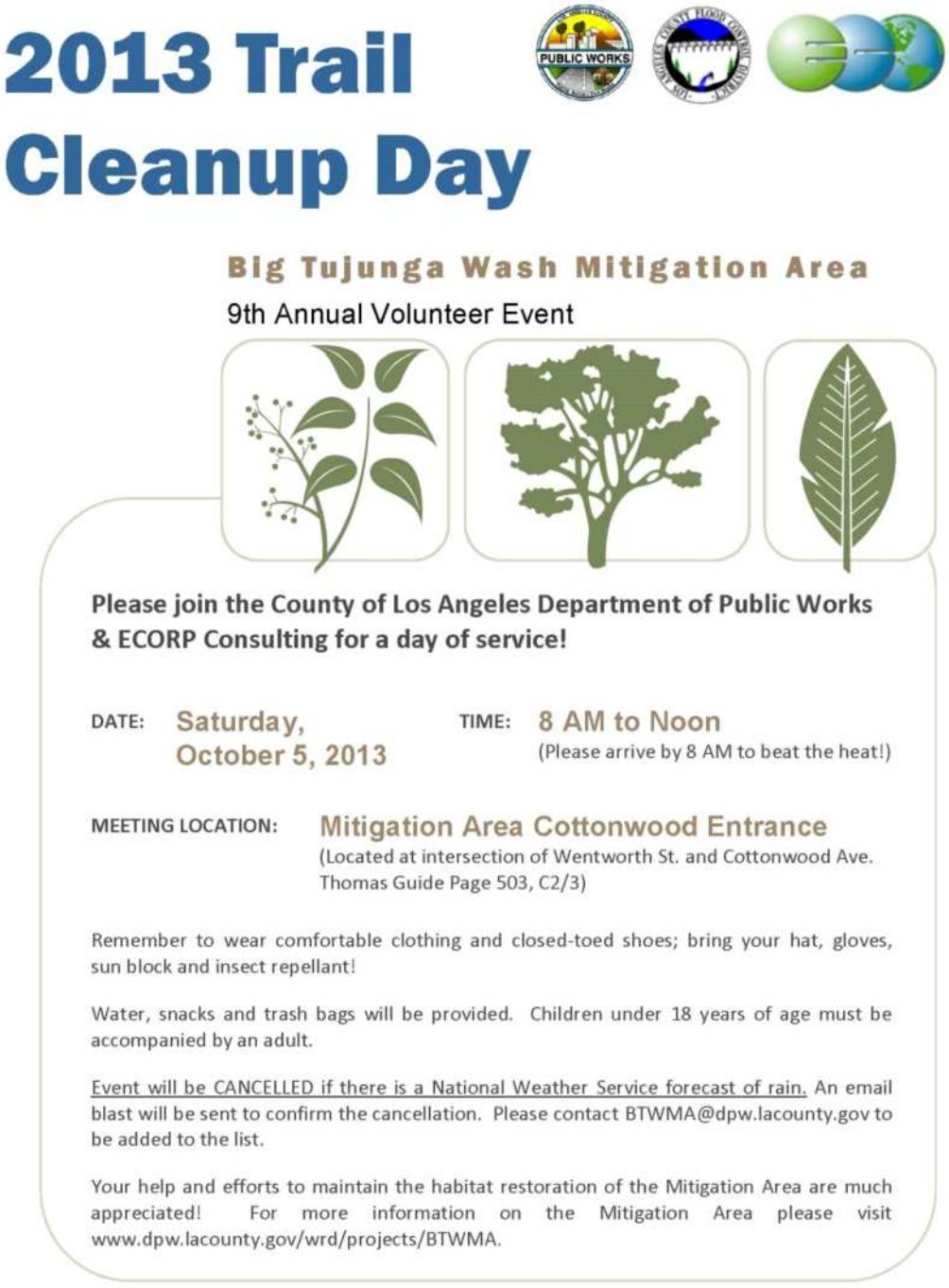

Figure 9-2. 2013 Trail Cleanup Day Flyer

EVENT CANCELLED!!!

2013 Trail Cleanup Day

~~*Saturday, October 5, 2013 at 8:00am*~~

Due to National Weather Service **warning of high winds**, Saturday's Trail Cleanup Day is **cancelled**. Strong Santa Ana winds are expected in this area late Friday through Saturday morning. Please take precaution as these strong winds could cause downed trees and power lines. We will provide notice if another date is scheduled for this event. We apologize for this inconvenience.

Figure 9-3. Cancellation Notice

10.0 COMMUNITY AWARENESS PROGRAM

The CAC was formed in early 2001 as part of MMP requirements for a community awareness program. The CAC has been meeting on a semiannual basis 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 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. Semiannual CAC meetings were conducted in April and September 2013 to be consistent with the Spring and Fall schedule already established by LACDPW. 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 J.

10.1 Newsletters (Spring, Fall)

ECORP drafted two newsletters during 2013, 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 K.

10.2 CAC Meetings (Spring, Fall)

Spring and fall CAC meetings were held on Thursday, April 25, 2013, and Thursday, September 26, 2013. CAC meetings were held from 6:30 pm to 8:30 pm 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 each scheduled meeting. Additionally, the meeting agenda and the minutes from the previous CAC meeting were posted to the Mitigation Area website. One week prior to the CAC meeting, a final meeting reminder was sent via electronic mail (e-mail) that included a link to the materials posted on the Mitigation Area website.

ECORP representatives Mari Quillman, Kristen Mobraaten, and Amy Trost attended the meetings 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 submitted draft meeting minutes to LACDPW for review and commenting prior to posting on the LACDPW web page. The proceedings at the Spring and Fall 2013 CAC meetings are summarized in the meeting minutes, which are included as Appendix L.

A new item was prepared for distribution at the Fall CAC meeting, a Mitigation Area Incident Map (Figure 10-1). ECORP prepared a map that documented the location and nature of all incidents that occurred within the Mitigation Area since the Spring 2013 CAC meeting. The map included locations of rock dams, picnicking spots, sites where people are often seen fishing or swimming, and public safety concerns such as homeless encampments and loose, aggressive dog encounters. Even though the Incident Map was only distributed at the Fall meeting in 2013, it is expected that this type of map will be distributed at all upcoming meetings in the future.

Aerial Date: USGS December 2010
12/24/2013

Figure 10-1. Big Tujunga Wash Mitigation Area Map of Frequently Observed Violations May to September 2013

2010-116.010 Big Tujunga Wash Mitigation Area

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Below is a list of major issues discussed during the 2013 CAC meetings.

- Formalizing CAC Meeting Membership List
- CAC distribution list survey
- Status of Mitigation Area website and new email address
- Updating the Streambed Alteration Agreement with CDFW which expires on March 31, 2014
- Site Safety and Security Issues
    - Changes in law enforcement patrolling of the site
    - Increased coordination with and response from the Los Angeles County Sheriff's Department and Los Angeles Police Department
    - Maintaining access roads and entrances for law enforcement vehicles
    - Locks on the gates at the entrances to the Mitigation Area
    - Equestrian safety at new crosswalks at the Mary Bell and South Wheatland entrances
    - Unauthorized mountain biking in the Mitigation Area
- General site maintenance activities
    - Equestrian-friendly gates at Mitigation Area entrances
    - Permitting for organized events
    - City of Los Angeles Council District representative change
    - General site signage and maintenance of signs throughout the Mitigation Area
    - Homeless encampments in the Mitigation Area
    - Mozambique tilapia in the Tujunga ponds
    - Installation of fish screens to prevent further exotic species migration from ponds to Haines Canyon Creek
- Establishing permitting guidelines for organized events occurring in the Mitigation Area
- Updates on MMP Programs
    - Brown-headed cowbird trapping
    - Exotic plant removal activities
    - Exotic wildlife removal activities
    - Water quality monitoring
    - Trail restoration and maintenance
    - Water lettuce removal activities
    - Bilingual community outreach efforts
    - Trail Cleanup Day

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 into 2013. 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 2013 contract year because of its success in the years from 2009 to 2012.

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. These types of recreational activities resulted in damage to the waterways and native riparian habitats and had 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 weekly site visits conducted by a bilingual biologist on peak use weekends in the spring and summer to educate the various user groups about the approved and prohibited activities within the Mitigation Area. A bilingual educational brochure was developed and distributed to the various user groups during the weekly site visits (Appendix B).

On-site interviews and education about the Mitigation Area were conducted on ten separate occasions in 2013 by ECORP's bilingual biologists Alfredo Aguirre, Jerry Aguirre, and Israel Marquez. These efforts occurred from May to September 2013. All outreach efforts took place on weekends, during peak visiting hours between 10:00 AM and 3:00 PM. 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 natural history information, the purpose of Mitigation Area rules and regulations, and use of social media to increase awareness of outreach efforts.

Visitors that were interviewed fell into one of two groups: non-equestrian family groups or equestrian user groups. More than 100 non-equestrian family groups were encountered during the ten outreach visits. These groups were monolingual (Spanish only) or bilingual (Spanish and English). Larger family groups used the Mitigation Area for swimming, fishing, and picnicking. Issues such as alcohol consumption, campfires, rock dams in the creek, littering, and dogs off leash were observed in some cases. Nearly all groups were receptive after receiving information about the Mitigation Area. One aggressive individual, who appeared to be under the influence of alcohol, left the site soon after an encounter with the biologist.

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

ECORP biologists documented several effects of visitors on sensitive habitats in the Mitigation Area. The largest impacts by non-equestrian family groups were caused by swimming and rock dam construction within Haines Canyon Creek. Adolescents and adults were observed swimming and wading in an unauthorized swimming area located approximately 1,000 feet 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 for prompt removal. Additional adverse effects of non-equestrian family groups included increased littering within the popular picnic areas, vegetation removal, and unauthorized fire pits and campfires

Equestrian site visitors have affected sensitive habitat by traveling off of the established trail system; evidence of this was observed on one occasion along the trail adjacent to Haines Canyon Creek during the outreach visits. One equestrian rider was observed riding her horse within Haines Canyon Creek instead of the adjacent trail in order to connect with an adjacent trail. This type of activity typically occurs when a portion of the trail is impassible due to fallen trees and branches or if the trail is extremely muddy or flooded from recent rains. 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 2013 are included in Appendix M.

12.0 LONG-TERM MANAGEMENT PLAN

The draft version of the LTMP was submitted to LACDPW for review on October 26, 2012 (ECORP 2012b). Further coordination with LACDPW and CDFW is necessary to finalize this document.

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 January 14, 2013 with CDFW, LACDPW, and LACDPR to discuss future permitting needs in the Mitigation Area to plan ahead for the upcoming expiration of the SAA in March 2014. Grace Yu and Melanie Morita from LACDPW, Debbie Pepe from LACDPR, and ECORP biologists Mari Quillman and Kristen Mobraaten met with Sarah Rains from CDFW.

Additional conference calls and meetings were held throughout the year between LACDPW and ECORP.

14.0 SITE TOURS WITH CITY AND COUNTY OFFICIALS

On August 22, 2013 representatives from LACDPW, LACDPR, and ECORP met with City of Los Angeles Councilmember Felipe Fuentes of City Council District 7 and his associates on a tour of the Mitigation Area to discuss current programs and issues (Figure 14-1). As the chair of the City's Energy and the Environment Committee, Councilmember Fuentes was highly interested in this conservation site located right within his District. ECORP was able to provide much of the biological background that demonstrated the unique characteristics of this site as opposed to other properties within his District. LACDPW raised concerns regarding security and safety including homeless encampments, wildfires, fishing, and rock dams. At the conclusion of the meeting, the Councilmember agreed that the Mitigation Area was worth preserving and to improve law enforcement within the Mitigation Area to help address these concerns.

Figure 14-1. Councilmember Felipe Fuentes with representatives from LACDPW, LACDPR, and ECORP

15.0 REFERENCES

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APPENDIX A

Streambed Alteration Agreement #1600-2008-0253-R5

Big T Draft 1600

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

January 29, 2009

Notification No. 1600-2008-0253-R5

AGREEMENT REGARDING PROPOSED STREAM OR LAKE ALTERATION

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

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

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

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

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

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

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

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

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

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

Project Location:

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

Project Description:

The Final Master Mitigation Plan for the Big Tujunga Wash Conservation Area (FMMP), dated April 2000, prepared for the County of Los Angeles Department of Public Works, prepared by Chambers Group, shall be implemented as proposed. The FMMP proposes the long-term mitigation and management guidelines for the 247 acre Big Tujunga Site. Proposed works described within the FMMP includes elements designed to restore and enhance existing habitats on the Big Tujunga Wash site by removing non-native plant, fish, amphibian, and reptile species. In addition, the FMMP includes future plans to create a diverse coast live oak-California sycamore woodland and coastal sage scrub habitat in an area that is currently heavily disturbed. The FMMP proposes to target the Haines Canyon Creek and Big Tujunga Wash for removal of invasive plant (Arundo (*Arundo donax*), tamarisk (*Tamarix* spp.), eucalyptus (*Eucalyptus* spp.), pepper tree (*Schinus molle*), castor bean (*Ricinus communis)*, umbrella sedge (*Cyperus eragrostis* Nutsedge), mustards (*Brassica* spp.), tree tobacco (*Nicotiana* glauca), water hyacinth (*Eichornia crassipes*), cape ivy (*Delairea odorata*), etc.) and animal (brown-headed cowbird (*Molothrus ater*), bull frog (*Rana catesbeiana*), crayfish (*Theragra Chalcormma*)) species, management, enhancement, and reclamation of existing equestrian and hiking trails, brown-headed cowbird eradication, water quality monitoring, riparian habitat enhancement, site inspection and maintenance, and success monitoring (fish and wildlife) for the Big Tujunga Conservation Area. Contact: Mr. Christopher Stone at Phone: (626) 458-6102 for additional information.

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

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

- Conservation Credits Remaining.

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

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

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

- Existing Public Use

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

- Functional Analysis Ratings

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

- Invasive Plants

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

- Patrolling

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

- Water Quality Monitoring

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

- Section 3.4- Contingency Measures-wildfire related

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

- Site Maintenance Issues:

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

- Arroyo toad surveys:

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

- Santa Ana Sucker

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

- Cowbird trapping

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

- Reporting

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

- Costs

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

IMPACTS

Temporary Impacts:

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

MITIGATION

Mitigation for all Temporary Impacts:

The Applicant shall implement the FMMP as proposed.

CONDITIONS

Resource Protection:

1. The Applicant shall not remove, or otherwise disturb vegetation or conduct any other project-related activities on the project site, to avoid impacts to breeding/nesting birds from March 1st to September 1st, the recognized breeding, nesting and fledging season for most bird species in the San Gabriel Valley.

2. Prior to any project-related activities during the raptor nesting season, January 31st to August 1st, a qualified biologist shall conduct a site survey for active nests two weeks prior to any scheduled project-related activities. If breeding activities and/or an active bird nest(s) are located and concurrence has been received from the Department, the breeding habitat/nest site shall be fenced a minimum of 500 feet in all directions, and this area shall not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the project.

3. Be advised, migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918(50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). This Agreement therefore does not allow the Applicant, any employees, or agents to destroy or disturb any active bird nest (§3503 Fish and Game Code) or any raptor nest (§3503.5) at any time of the year.

4. Due to the potential presence of arroyo chub, Santa Ana speckled dace, Santa Ana sucker, arroyo southwestern toad, California red-legged frog, mountain yellow-legged frog, southwestern pond turtle, San Diego horned lizard, black-crowned night heron, great blue heron, great egret, snowy egret, Cooper's hawk, southwestern willow flycatcher, California gnatcatcher loggerhead shrike, and least Bell's vireo, pre-restoration and enhancement field surveys for these species must be concluded no sooner than three-days prior to any site preparation, clearing, or other project-related activities. Findings, including negative findings, shall be submitted to the Department in written format prior to any site preparation activities.

5. If any of the species identified in condition 4 of this Agreement, any other threatened or endangered species or species of special concern are found within 150 feet of the Haines Canyon Creek or Big Tujunga Wash, the Applicant shall contact the Department immediately of the sighting and shall request an on-site inspection by Department representatives (to be done at the discretion of the Department) to determine if work shall begin/proceed. If work is in progress when sightings are made,

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

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

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

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

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

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

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

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

Work Areas and Vegetation Removal:

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

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

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

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

Equipment and Access:

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

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

Fill and Spoil:

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

Structures:

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

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

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

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

Pollution, Sedimentation, and Litter:

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

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

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

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

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

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

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

Permitting and Safeguards:

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

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

Administrative:

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

34. If the Applicant or any employees, agents, contractors and/or subcontractors violate any of the terms or conditions of this Agreement, all work shall terminate immediately and shall not proceed until the Department has taken all of its legal actions.

35. The Applicant shall provide a copy of this Agreement, and all required permits and supporting documents provided with the notification or required by this Agreement, to all contractors, subcontractors, and the Applicant's project supervisors. Copies of this Agreement and all required permits and supporting documents, shall be readily available at work site at all times during periods of active work and must be presented to any Department personnel, or personnel from another agency upon demand. All contractors shall read and become familiar with the contents of this Agreement.

36. A pre-enhancement restoration meeting/briefing shall be held involving all the contractors and subcontractors, concerning the conditions in this Agreement.

37. The Applicant shall notify the Department, in writing, at least five (5) days prior to initiation of restoration enhancement (project) activities and at least five (5) days prior to completion of enhancement and restoration (project) activities. Notification shall be sent to the Department at PO Box 92890, Pasadena, California, 91109. Attn: Jamie Jackson. FAX Number (626) 296-3430, Reference # 1600-2008-0253-R5.

38. The Applicant herein grants to Department employees and/or their consultants (accompanied by a Department employee) the right to enter the project site at any time, to ensure compliance with the terms and conditions of this Agreement and/or to determine the impacts of the project on wildlife and aquatic resources and/or their habitats.

39. The Department reserves the right to enter the project site at any time to ensure compliance with terms/conditions of this Agreement.

40. The Department reserves the right to cancel this Agreement, after giving notice to the Applicant, if the Department determines that the Applicant has breached any of the terms or conditions of the Agreement.

41. The Department reserves the right to suspend or cancel this Agreement for other reasons, including but not limited to, the following:

a. The Department determines that the information provided by the Applicant in support of this Agreement/Notification is incomplete or inaccurate;

b. The Department obtains new information that was not known to it in preparing the terms and conditions of this Agreement;

c. The condition of, or affecting fish and wildlife resources change; and

d. The Department determines that project activities have resulted in a substantial adverse effect on the environment.

42. Before any suspension or cancellation of the Agreement, the Department will notify the Applicant in writing of the circumstances which the Department believes warrant suspension or cancellation. The Applicant will have seven (7) working days from the date of receipt of the notification to respond in writing to the circumstances described in the Department's notification. During the seven (7) day response period, the Applicant shall immediately cease any project activities which the Department specified in its notification as resulting in a substantial adverse effect on the environment and which will

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

CONCURRENCE

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

_____
Name (signature) Date

_____
Name (printed)

_____
Title

California Department of Fish and Game

_____
Helen R. Birss Date
Environmental Program Manager
South Coast Region

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

APPENDIX B

Public Outreach and Worker Education Brochure

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

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

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

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

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

All visitors must obey these regulations or a citation will be given:
a. Hours of Operation: Sunrise to Sunset
b. No fires of any kind
c. No swimming
d. No wheeled vehicles or bicycles
e. No camping
f. Dogs must be on leashes.

Todos los visitantes del Big T deben obedecer todas las reglas, los que no observan las reglas serán multados.
a. Horas de visita: Salida del sol al Atardecer
b. No fogatas de ningún tipo
c. No nadar
d. No vehículos o bicicletas
e. No acampar
f. Los perros deben estar con correas.

¿Preguntas? / Questions?

LADPW: 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*** *(LADPW). Big T is so unique that there are regulations to protect it from destruction and abuse. We hope that by learning more about Big T, you'll agree that these regulations make sense.*

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

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.

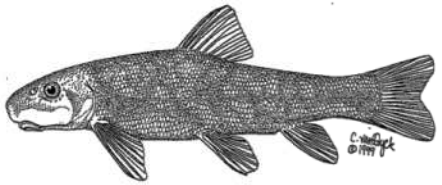
Con el tiempo la isla se ha hecho más pequeña. Big T es sensible a los cambios de su hábitat. Estos cambios pueden causar que un hábitat tan importante desaparezca. Cuando esto sucede los animales y las plantas también pueden desaparecer.

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.

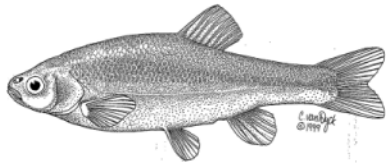
No hay lugar como Big T

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*)

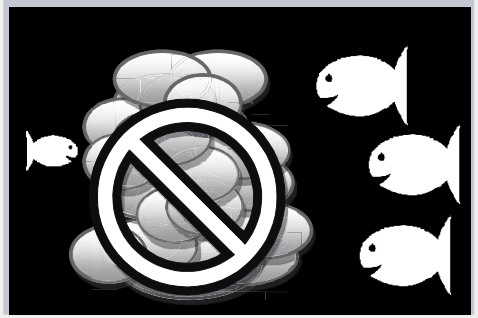
California Sycamore
(*Platanus racemosa*)

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



LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

APPENDIX C

Plant and Wildlife Compendia

2013 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
*Chamaesyce maculata**	spotted spurge
Croton californicus	croton
*Euphorbia peplus**	petty spurge
*Ricinus communis**	castor bean
FABACEAE	**LEGUME FAMILY**
Acmispon scoparius (= Lotus s.)	common deerweed
*Medicago sativa**	alfalfa
*Melilotus albus**	sweet clover
*Spartium junceum**	Spanish broom
FAGACEAE	**OAK FAMILY**
Quercus agrifolia	California live oak
Quercus berberidifolia	scrub oak
GERANIACEAE	**GERANIUM FAMILY**
*Erodium cicutarium**	red-stemmed filaree
*Geranium rotundifolium**	roundleaf geranium
GROSSULARIACEAE	**GOOSEBERRY FAMILY**
Ribes aureum	golden currant
HYDROPHYLLACEAE	**WATERLEAF FAMILY**

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

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

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

2013 Big Tujunga Wash Mitigation Area Master Wildlife List

Scientific Name	**Common Name**
INVERTEBRATES	
MALACOSTRACA	**CRABS, LOBSTERS, SHRIMP**
Cambaridae	**Freshwater Crayfish**
Procambarus clarkia	red swamp crayfish*
MOLLUSCA	**MOLLUSKS**
Corbiculidae	**Basket Clams**
Corbicula fluminea	Asiatic Clam*
OSTEICTHYES (BONY FISHES)	
ACTINOPTERYGII	**RAY-FINNED FISHES**
Catostomidae	**Sucker Fishes**
Catostomus santaanae	Santa Ana sucker***
Rhinichthys osculus ssp. 3	Santa Ana speckled dace**
Centrarchidae	**Sunfishes**
Lepomis cyanellus	green sunfish*
Lepomis macrochirus	bluegill *
Micropterus salmoides	largemouth bass*
Cichlidae	**Cichlids**
Oreochromis mossambicus	Mozambique tilapia*
Cyprinidae	**True Minnows**
Carassius auratus	gold fish*
Cyprinus carpio	common carp*
Gila orcuttii	Arroyo chub**
Pimephales promelas	fathead minnow*
Poeciliidae	**Livebearers**
Gambusia affinis	western mosquitofish*
AMPHIBIANS	
RANIDAE	**TRUE FROGS**
Lithobates catesbeianus	American bullfrog*
REPTILES	
EMYDIDAE	**SLIDERS**
Trachemys scripta elegans	red-eared slider*
PHRYNOSOMATIDAE	**SPINY LIZARDS**
Sceloporus graciosus vandenburgianus	southern sagebrush lizard
Sceloporus occidentalis	western fence lizard
Uta stansburiana	side-blotched lizard
TEIIDAE	**WHIPTAILS AND RACERUNNERS**
Aspidoscelis hyperythrus	orange-throated whiptail**

Scientific Name	**Common Name**
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
ANATIDAE	**DUCKS, GEESE AND SWANS**
Anas platyrhynchos	mallard
ARDEIDAE	**HERONS AND EGRETS**
Ardea alba	great egret
Ardea herodias	great blue heron
Butorides virescens	green heron
Nycticorax nycticorax	black-crowned night heron
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
CORVIDAE	**JAYS, CROWS, AND THEIR ALLIES**
Aphelocoma californica	western scrub-jay
Corvus corax	common raven
Pica pica hudsonia	black-billed magpie
EMBERIZIDAE	**SPARROWS AND THEIR ALLIES**
Junco hyemalis	dark-eyed junco
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Zonotrichia leucophrys	white-crowned sparrow
FRINGILLIDAE	**FINCHES**
Carduelis psaltria	lesser goldfinch
Carduelis tristis	American goldfinch
Carpodacus mexicanus	house finch
HIRUNDINIDAE	**SWALLOWS**
Hirundo rustica	barn swallow
Stelgidopteryx serripennis	northern rough-winged swallow
ICTERIDAE	**BLACKBIRDS AND ORIOLES**
Agelaius phoeniceus	red-winged blackbird
Agelaius tricolor	tri-colored blackbird**
Icterus xanthinus	yellow-headed blackbird**
Molothrus ater	brown-headed cowbird*
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher

Scientific Name	**Common Name**
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
PARULIDAE	**WOOD-WARBLERS**
Dendroica coronata	yellow-rumped warbler
Geothlypis trichas	common yellowthroat
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow
PICIDAE	**WOODPECKERS**
Melanerpes formicivorus	acorn woodpecker
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	downy woodpecker
PODICIPEDIDAE	**GREBES**
Podilymbus podiceps	pied-billed grebe
POLIOPTILIDAE	**Creepers and Gnatcatchers**
Polioptila caerulea	blue-gray gnatcatcher
RALLIDAE	**RAILS**
Fulica americana	American coot
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**
Cistothorus palustris	marsh wren
Troglodytes aedon	house wren
TURDIDAE	**BLUEBIRDS**
Sialia mexicana	western bluebird
Turdus migratorius	American robin
TYRANNIDAE	**TYRANT FLYCATCHERS**
Sayornis nigricans	black pheobe
Tyrannus vociferans	Cassin's kingbird
MAMMALS	
CANIDAE	**DOGS**
Canis latrans	coyote
EQUIDAE	**HORSES AND ALLIES**
Equus caballus	domestic horse*
FELIDAE	**CATS**
Lynx rufus	Bobcat
LEPORIDAE	**HARES AND RABBITS**

Scientific Name	**Common Name**
Syvilagus audubonii	desert cottontail
MURIDAE	**MICE AND RATS**
Neotoma sp.	woodrat
PROCYONIDAE	**RACCOONS AND RINGTAILS**
Procyon lotor	Northern raccoon
SCIURIDAE	**SQUIRRELS**
Sciurus niger	fox squirrel*
Spermophilus beecheyi	California ground squirrel

*Non-native species
**CDFW California Species of Special Concern/Watch List Species/FP Species
***State and/or Federally Listed Species

APPENDIX D

2013 Brown-headed Cowbird Trapping Report

2013 BIG TUJUNGA WASH MITIGATION AREA

BROWN-HEADED COWBIRD CONTROL PROGRAM

GRIFFITH WILDLIFE BIOLOGY

2013 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 Big Tujunga Wash Mitigation Area in 2013. The purpose of the trapping was to reduce the incidence of brown-headed cowbird (*Molothrus ater*) brood parasitism among local host species, particularly endangered, threatened, or sensitive host species. The traps were operated from April 1 to June 30 (13 weeks). Each trap contained at least 2 male decoys as of April 3, and the preferred 2-3 male and 3-5 female decoys as of April 13 and subsequently.

Ninety-seven (97) cowbirds were removed, including 54 males, 42 females, and 1 juvenile, which is below the 2001-2013 average of 121.

The male: female capture ratio was 1.29:1. Most of the adult cowbirds were captured in weeks 2-7: 45/54 males (83%) and 36/42 females (86%). No banded cowbirds or other banded birds were captured and the traps were not vandalized.

In addition to cowbirds, 325 non-target birds of 6 species were captured, of which all but 5 (1.5%) were released unharmed. This total includes the multiple capture, release, and recapture of a smaller number of individuals. Two (2) tricolored blackbirds (*Agelaius tricolor*) and 3 yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), both California Species of Special Concern (CDFG 2011), were captured and released. No other sensitive or endangered, threatened, or candidate non-target species were captured. No decoy or non-target birds died due to lack of food or water, or because of unclean conditions.

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

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

Table of Contents

List of Figures

List of Tables

List of Appendices

INTRODUCTION

The brown-headed cowbird (*Molothrus ater*, cowbird) is a small blackbird native to the Great Plains. Cowbirds are brood parasites; they do not make nests or raise young. Instead, cowbirds deposit their eggs into the nests of other birds, called hosts, which then incubate, hatch, and raise the cowbird chick. The first cowbird in California was documented at Borrego Springs in 1896 (Unitt 1984). By 1930, cowbirds were "well established" throughout the region (Willett 1933); by 1955 they had reached British Columbia (Flahaut and Schultz 1955). Cowbird numbers soared as the species occupied new year-round foraging areas (agricultural and grazing land and even suburban parks and lawns), while native bird stocks declined due to their dependence upon increasingly reduced, fragmented, and degraded native habitats in which they were less productive and more susceptible to predation and parasitism (Gaines 1974, Goldwasser et al 1980). This inverse relationship between cowbird and host numbers resulted in significant if not catastrophic impact upon hosts in the region.

Brown-headed cowbirds (male dark, female light).

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

Female cowbirds establish and defend breeding territories (Darley 1968, 1983; Raim 2000) and lay 40-100 eggs during a two- to four-month breeding season (Scott and Ankney 1983, Holford and Roby 1993, Smith and Arces 1994). Even a single female cowbird can impact local host reproductive success and are the primary targets of trapping programs. 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 host species without harm to the cowbird.

The sex-ratio of the at-large cowbird population is presumed to be 1 male: 1 female. The captured-cowbird sex ratio at properly placed and operated traps should at worst approximate the at-large ratio and preferably be lower (remove more females than males).

Cowbird eggs hatch sooner than host eggs (10-12 days versus 12-16 days) and cowbird young develop faster than host young. Large host species can raise a cowbird and most or all of their own young (Weatherhead 1989, Robinson et al. 1995). Small host species raise only the cowbird, if that, and none of their own young, which are simply smothered by the older, larger

cowbird chick (Grzybowski 1995). Nest failure from predation or weather results in re-nesting and normal reproductive success. Brood parasitism, however, consumes the time and energy of an entire breeding season and results in complete reproductive failure.

Decreased productivity caused by persistent cowbird parasitism has caused or contributed to the decline of several small host species, including the federally endangered least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*), and the federally threatened California gnatcatcher (*Polioptila californica californica*) (USFWS 1986, 1993, 1995).

Cowbird chick in California gnatcatcher nest.

Cowbird chick with smothered gnatcatcher chick.

It has been repeatedly demonstrated that parasitism can be dramatically reduced or eliminated, even over large areas, by removing cowbirds from targeted host habitat during the host breeding season using several traps spaced at roughly 1 km intervals within host habitat and at nearby cowbird foraging areas ("topical trapping") (Griffith and Griffith 2000). In areas where such topical trapping has been performed for several years, the abundance and diversity of all host species present (not just the intended beneficiary endangered species) has increased markedly (Griffith and Griffith 2000).

The cowbird control project at Big Tujunga Wash Mitigation Area was initiated in 2001 and performed in 2001-2006 and 2009-2013. Its purpose is to enhance reproductive success among the least Bell's vireo and other host species by decreasing or eliminating cowbird brood parasitism by removing cowbirds from riparian habitat.

Cowbird traps have also been operated immediately downstream at Hansen Dam Basin in 1996, 1997, and 2001-2013 (GWB 2013), and immediately upstream of Interstate 210 at Angeles National Golf Course in 2008-2013 (GWB 2013a).

STUDY AREA

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

A growing population of least Bell's vireo is found immediately downstream within the Hansen Dam Basin. In 2009, 44 sites occupied by vireos (39 pairs, 5 single males) were detected (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) and Traps 3 and 4 (Gibson Ranch) were in foraging areas. Trap 2 was within the Big Tujunga Wash Mitigation Area adjacent to riparian and coastal sage habitat. The traps were placed and assembled on March 29, and operated from April 1 to June 30, 2013 (91 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 (*Arundo donax*) stalks 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/ informative 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.

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.

Male cowbirds are more active and vocal when at least 2 males are present; female cowbirds are more likely to enter traps containing more females than males (GWB 1992). Therefore, at least 2 male and 3 female decoy cowbirds were utilized to maximize female captures. Each trap contained at least 2 male decoy cowbirds as of April 3; decoy numbers were built to the preferred 2-3 male and 3-5 female live decoys as of April 13 and subsequently. The right primary wing feathers of each female decoy were kept clipped to ensure their demise upon accidental release or escape. Many of the live decoys used to stock the traps in the early season were captured off-site.

The traps were serviced daily from April 1 to June 30. 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 faxed daily to the GWB Project Manager. The traps were deactivated, disassembled, and transported to off-site storage on June 30.

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. 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, and K. Griffith.

RESULTS

Ninety-seven (97) cowbirds were removed in 2013, including 54 males, 42 females, and 1 juvenile (Table 1, Table 2). The male: female capture ratio was 1.29:1. No banded cowbirds or other banded birds were captured.

The first cowbirds, a male and female, were captured in Trap 4 on April 6. Most of the adult cowbirds were captured in weeks 2-7 (April 8 – May 19): 45/54 males (83%) and 36/42 females (86%) (Figure 5). The first (and only) juvenile was captured on June 6 in Trap 1.

In addition to cowbirds, 325 non-target birds of 6 species were captured, of which all but 5 (1.5%) were released unharmed (Table 3). This total includes the multiple capture, release, and recapture of a smaller number of individuals. Two (2) tricolored blackbirds (*Agelius tricolor*) and 3 yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), both California Species of Special Concern (CDFG 2011), were captured and released unharmed. No other 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 2013.

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

DISCUSSION AND CONCLUSIONS

The number of cowbirds removed from Big Tujunga Wash Mitigation Area and from each trap site varies year to year, sometimes independently. The number of cowbirds removed in 2013 (54 males, 42 females, 1 juvenile = 97) is at the low end but within the range of 2001-2013 numbers: males r= 9-103 avg= 56.6; females r= 11-111 avg 59.5; juveniles r= 0-18 avg 4.73.

Female cowbirds are territorial and extremely fecund (typically 40-60 eggs per season; some studies show as high as 100 eggs per season). Even a single female can significantly decrease the reproductive success of host species in a given area. Therefore, to reduce or eliminate parasitism, cowbird traps must be deployed at regular intervals throughout occupied host habitat, and with respect to target host density. Traps deployed solely at cowbird foraging or roosting areas might remove large numbers of cowbirds, but with little impact upon the rate of parasitism among nearby hosts. At Big Tujunga Wash Mitigation Area, the foraging areas are immediately adjacent to the host habitat, so the foraging area traps are just as effective in decreasing parasitism as are the riparian traps. The removal of 42 females in 2013 precluded up to 1,680 parasitism events (40 per female) allowing the production of up to 6,720 songbird young (4 per otherwise parasitized nest) in the study area. Because not all parasitism events are viable and not all cowbird eggs are laid in the nests of small hosts, the actual numbers of cowbird eggs and songbird young are likely much lower but still significant.

Locally raised cowbirds are easily and quickly captured after fledging, and are therefore good indicators of the efficacy of a trapping program. Only a single juvenile cowbird was removed in 2013, suggesting that cowbird parasitism was essentially eliminated in the study area in 2013.

The use of multiple cowbird traps deployed at regular intervals throughout targeted host habitat during the breeding season (topical trapping) is highly successful in reducing or eliminating brood parasitism among targeted host species and other incidentally protected host species (Griffith and Griffith 2000). Despite such annual success, however, topical trapping does not 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 (in fact, 2009-2012 were the highest per-trap capture totals ever, even with a 91 day vs 122 day trapping season). If cowbirds were not removed each year, the parasitism rate among hosts would likely immediately return to pre-trapping levels.

In the absence of proven regional cowbird control, the Big Tujunga Wash Mitigation Area cowbird control project, which successfully removes the local cowbirds and reduces parasitism in the study area to near 0%, will be required indefinitely to reduce or eliminate cowbird parasitism and enhance reproductive success among host species in the study area.

MANAGEMENT RECOMMENDATIONS

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

2. Trap 2, the sole non-foraging area trap, could be resituated within the Mitigation Bank Area in hopes of increasing efficacy. It removed 1 male and 0 females in 2013 at the current location. In 2012, the same trap/ same location removed 2 males and 4 females; any non-foraging area trap that removes 1 or more females is considered successful.

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Figure 1. 2013 Big Tujunga Wash Mitigation Area brown-headed cowbird control project study area.

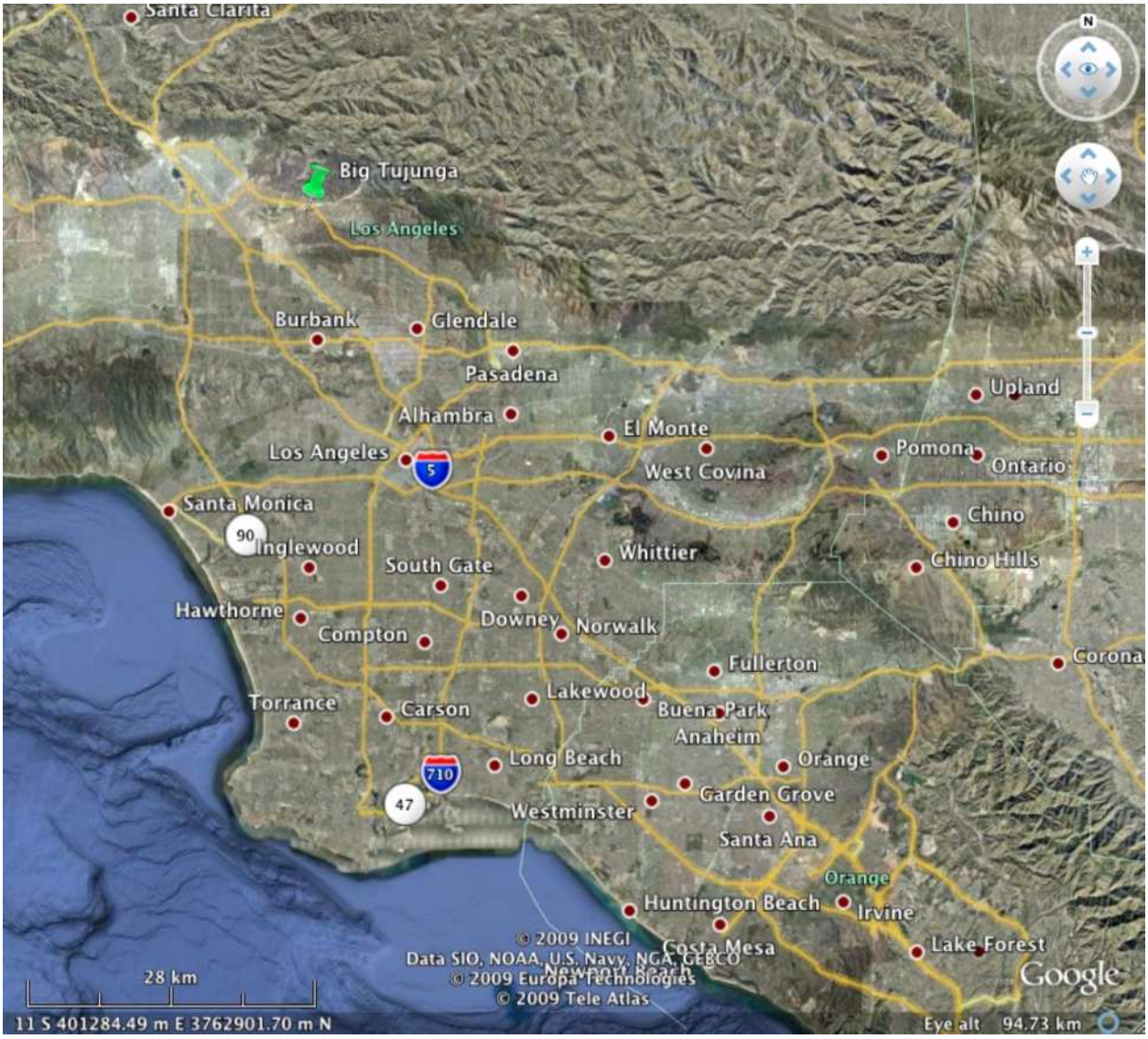


Figure 2. 2013 Big Tujunga Wash Mitigation Area brown-headed cowbird trap locations.

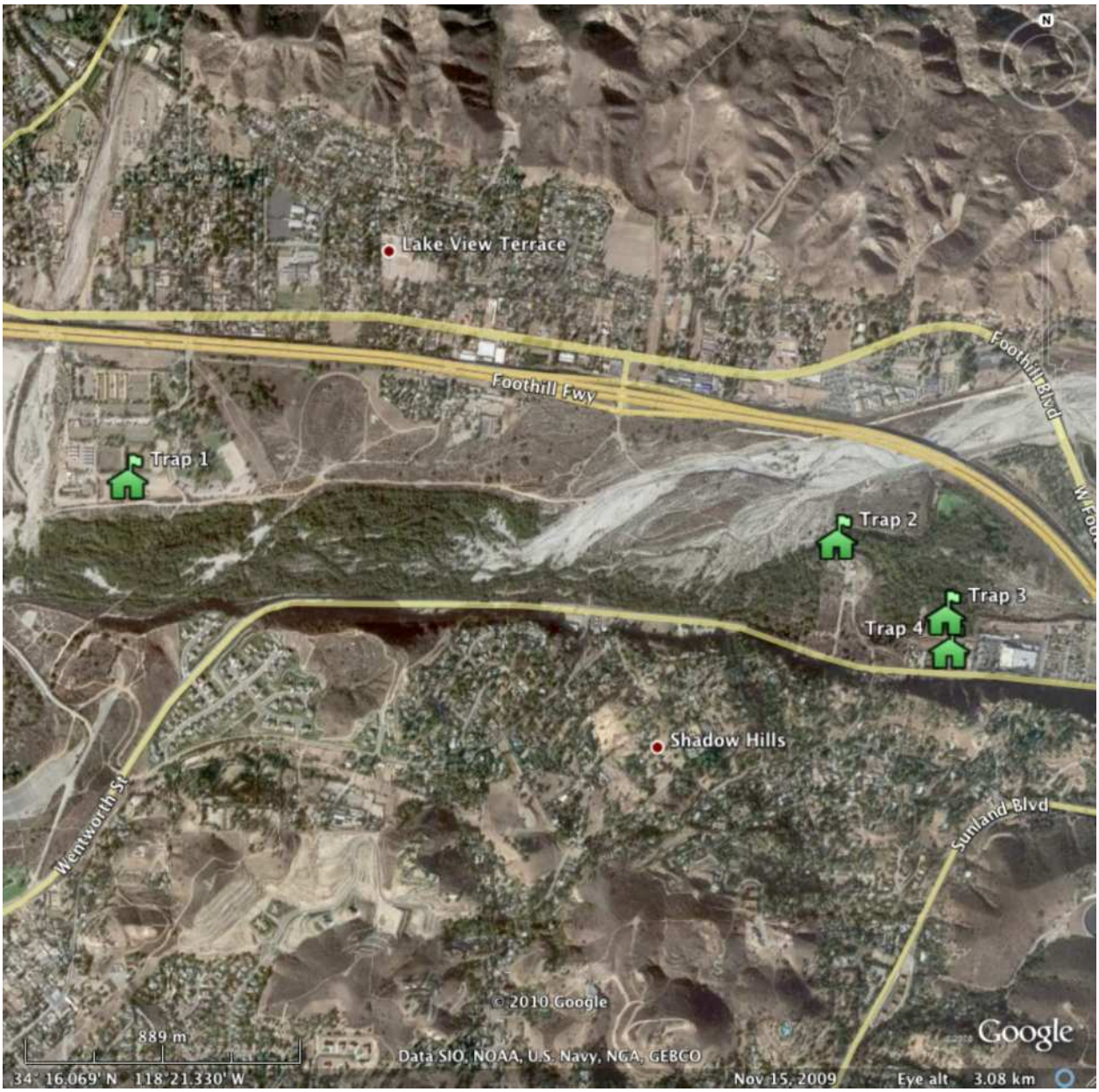
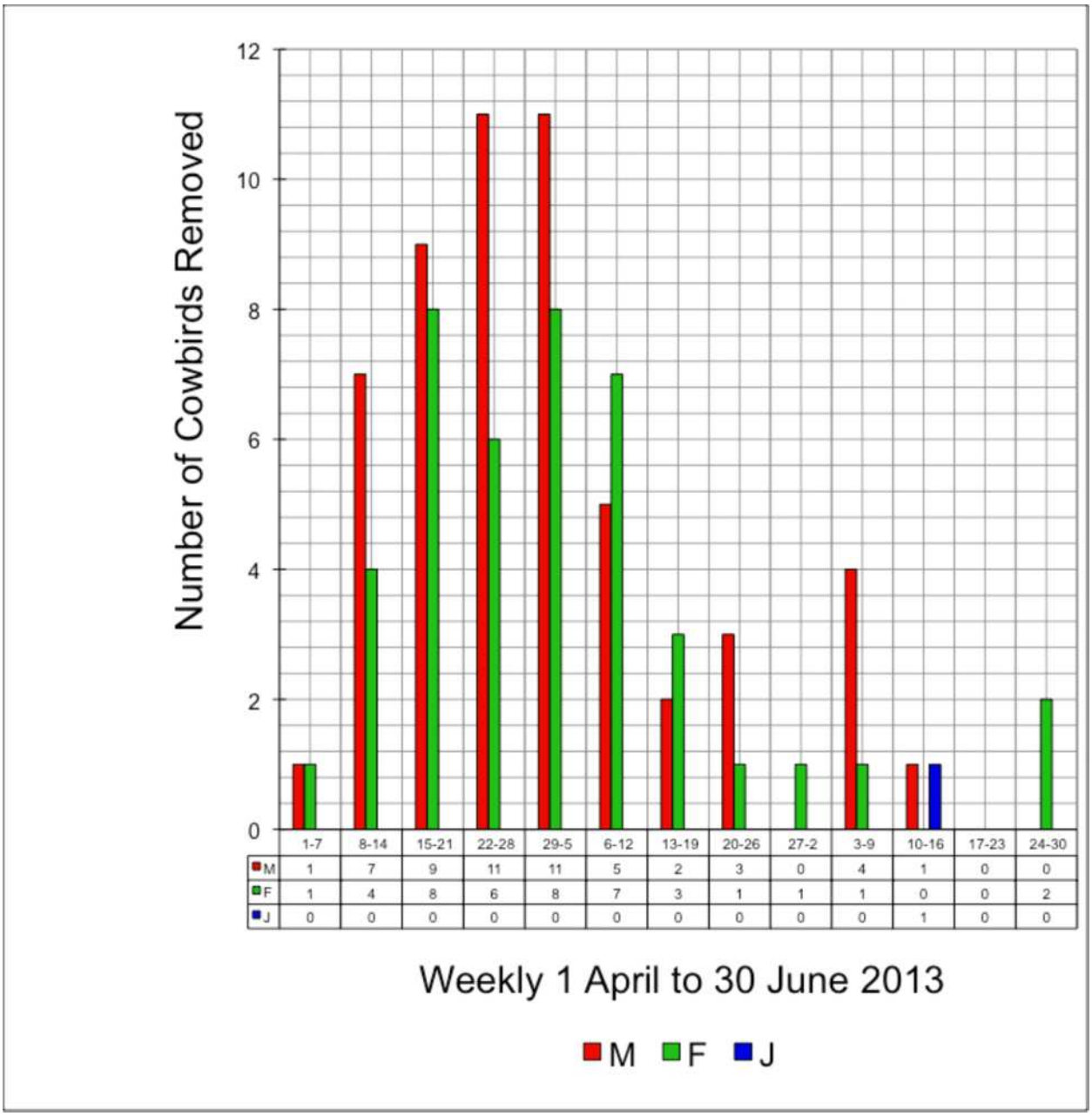


Figure 3. 2013 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 1 (top) and Trap 2 (bottom).

Figure 4. 2013 Big Tujunga Wash Mitigation Area brown-headed cowbird Trap 3 (top) and Trap 4 (bottom).

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 2013.



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

Table 1. Number of brown-headed cowbirds captured at and in the vicinity of Big Tujunga Wash Mitigation Area, 2001-2013.

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[a]	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
TOTAL	59		622	654	52	1328	22.51	0.95
AVG	5.36		56.55	59.45	4.73	120.73	22.51	0.95

2001-2005: Chambers Group, Inc. 2005
2006-2012: Griffith Wildlife Biology (GWB) 2006-2012
a: Trap 4 operated 2-29 June only

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 2013.

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

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

	Trap 1			Trap 2			Trap 3			Trap 4			TOTAL		
	M	F	J	M	F	J	M	F	J	M	F	J	M	F	J
TOTAL	8	7	1	1	0	0	10	8	0	35	27	0	54	42	1

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 2013.

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	27	3	21		23	1	20		12		8		5	
WCSP	4													
YHBL													3	
TRBL														
HOFI	15		5		13		18				3		2	
HOSP	19		7		7		9				3		4	
TOTAL	65	3	33	0	43	1	47	0	12	0	14	0	14	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	13		2		4		7		8		3		**153**	**4**
WCSP													**4**	**0**
YHBL													**3**	**0**
TRBL			2										**2**	**0**
HOFI	2						1		2		9		**70**	**0**
HOSP	14		8		7	1	6		4				**88**	**1**
TOTAL	29	0	12	0	11	1	14	0	14	0	12	0	**320**	**5**

CATO	California towhee
WCSP	white-crowned sparrow
YHBL	yellow-headed blackbird
TRBL	tricolored blackbird
HOFI	house finch
HOSP	house sparrow

Note: all HOSP euthanized as required by permit; not counted as such so as to not skew preyed-upon data.

Appendix 1. Warning/informational sign placed on cowbird traps at Big Tujunga Wash Mitigation Area in 2013.

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

THANK YOU FOR YOUR COOPERATION

GRIFFITH WILDLIFE BIOLOGY

APPENDIX E

Exotic Plant Removal Memos and CDFW Notifications

Exotic Plant Removal Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

June 27, 2013
(2010-116.010/002/2)

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

SUBJECT: First Phase Memorandum for the Exotic Plant Removal (April 2013) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a documentation of the exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during April 2013.

A pre-removal reconnaissance site visit and nesting bird survey was conducted on April 9, 2013 by ECORP Consulting, Inc. (ECORP) biologists Shannan Shaffer and Emily Graf. This site visit was conducted to identify any sensitive biological resources (such as bird nests because the timing of the event occurred during the breeding bird season) and to identify areas with high densities of exotic plant species. Active bird nests were not recorded within the weeding areas and sensitive resources were not recorded during the survey. Large areas of exotic plant species were flagged and recorded using a global positioning system (GPS). These areas included re-growth of giant reed (*Arundo donax*), tree of heaven (*Ailanthus altissima*) and various other weeds and exotic plant species.

The actual removal of the invasive exotic plant species was conducted by the landscape contractor Natures Image, Inc. from April 10 through 12, 2013 and April 15 through 19, 2013. Prior to any work, all members of the landscape contractor's 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 Tania Asef, Carley Lancaster, Amy Trost, and Phil Wasz monitored exotic plant removal activities occurring between April 10 and 19, 2013.

The removal effort began at the eastern-most portion of Haines Canyon Wash on April 10, 2013. The removal efforts were focused on removing species such as tree tobacco (*Nicotiana glauca*), black mustard (*Brassica nigra*), and milk thistle (*Silybum marianum*) from the understory (Figures 1, 2, and 3). The crew used machetes to chop down large stands of vegetation and then sprayed the exposed cut stems with herbicide.

The removal effort continued on April 11 and 12, 2013, with work continuing in the eastern portion of Haines Canyon Wash near the southern end of the Tujunga ponds. The main species of focus were giant reed, tree of heaven, black mustard, castor bean (*Ricinus communis*), and various species of thistle (Figure 4). A modified weed whacker with a mechanical blade was used to cut down giant reed and tree of heaven. Large stands of exotic species were cut down and then sprayed with herbicide, while smaller solitary plants were either sprayed or pulled out by hand.

Exotic plant removal activities continued on April 15, 2013, where crews worked along Haines Canyon Creek and Big Tujunga Wash in the western portion of the Mitigation Area. Crews finished working in the western portion of the site and began working around the Tujunga Ponds on April 16, 2013. One fairly large homeless encampment was discovered on April 16, 2013 (Figure 5). The County of Los Angeles Department of Public Works (LACDPW) was immediately notified of the location of this encampment via email.

Trails maintenance activities (clearing existing trails, removing trash and debris, etc.) were conducted along the trails adjacent to Haines Canyon Creek on April 15 and 16, 2013. Many trees and branches had fallen down due to the recent high wind events and were obstructing the trails. The landscape contractor's crew used chainsaws and weed whackers to trim and/or remove trail obstructions.

One western bluebird (*Sialia mexicana*) nest was observed by biologist Phillip Wasz in a cavity of a sycamore (*Platanus racemosa*) tree located west of the Cottonwood Avenue entrance to the Mitigation Area on April 18, 2013. Crews were removing weeds in this area, therefore the biologist established a 100-foot no work area around this active nest so as to not disrupt nesting activities. Exotic plant removal and spraying activities did not occur within this buffer.

The removal effort extended to April 19, 2013 with the crews continuing to work their way throughout the site to target any areas that needed extra attention. During the removal efforts on April 19, 2013, one active song sparrow (*Melospiza melodia*) nest with nestlings was identified by biologist Amy Trost near the Big Tujunga Wash. A 100-foot no work buffer was established around the nest location and no exotic plant removal or spraying activities occurred within this buffer. Evidence of a second homeless encampment was observed; however, it appeared that this was old and not currently in use (Figure 6). The crews cleaned this area and disposed of the trash.

During the removal process the following protocols were conducted to minimize disturbance to sensitive habitat and species.

- Nesting bird surveys were conducted prior to the start of removal activities and again 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.

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 27, 2013

Carley Lancaster
Assistant Biologist

Figure 1. Tree Tobacco Sprayed with Herbicide

Figure 2. Black Mustard Sprayed with Herbicide

Figure 3. Thistle Sprayed with Herbicide

Figure 4. Crew Conducting Exotic Plant Removal in Upland Area

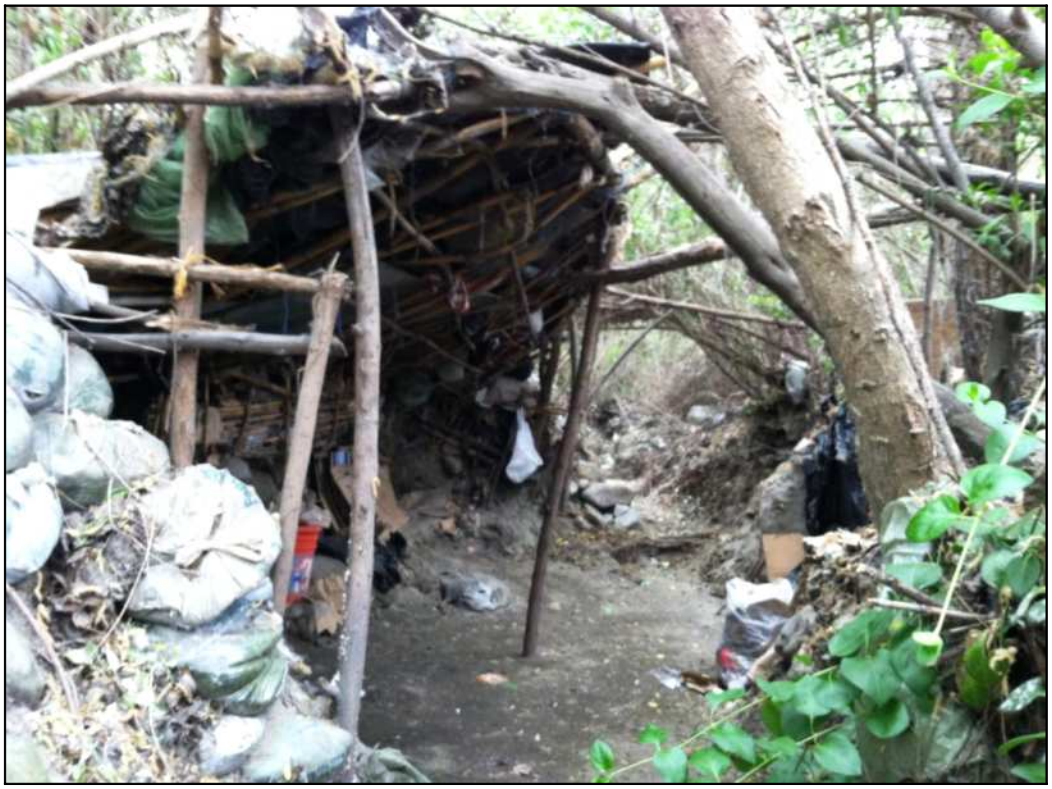


Figure 5. Large Homeless Encampment Near Western Boundary of the Mitigation Area.

Figure 6. Older Homeless Encampment Near Big Tujunga Wash.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

July 22, 2013
(2010-116.010/002/2)

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

SUBJECT: Second Phase Memorandum for the Exotic Plant Removal (June 2013) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a documentation of the exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during June 2013.

The removal of the invasive exotic plant species was conducted by the landscape contractor Natures Image, Inc. from June 24 through 26, 2013. Prior to any work, all members of the landscape contractor's 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 Consulting, Inc. (ECORP) biologist Amy Trost monitored exotic plant removal activities.

The removal effort began at the eastern-most portion of Haines Canyon Wash on June 24, 2013. The removal efforts were focused on removing species such as giant reed (*Arundo donax*), tree tobacco (*Nicotiana glauca*), black mustard (*Brassica nigra*), and milk thistle (*Silybum marianum*) (Figure 1). The crew used machetes to chop down large stands of vegetation and then sprayed the exposed cut stems with herbicide. The work then moved south of the Tujunga Ponds where crews sprayed along the existing trail system. In both areas the crew also spent some time maintaining the trail system by removing downed branches and clearing low-hanging vegetation (Figure 2).

The removal effort continued on June 25, 2013, with work moving along Haines Canyon Wash starting from the eastern portion near the southern end of the ponds. The main species of focus were giant reed, tree of heaven (*Ailanthus altissima*), black mustard, and castor bean (*Ricinus communis*), and various species of thistle. Large stands of exotic species were cut down and then sprayed with herbicide, while smaller solitary plants were either sprayed or pulled out by hand. A passerine nest was found on the ground along Haines Canyon Creek. The nest looked as though it had previously been in a tree but it was empty and had fallen before the biological monitor swept the area (Figure 3). The crew then moved to the upland area near the Cottonwood entrance and the adjacent wooded areas and began spraying for black mustard and castor bean.

On June 25, 2013 the crew also removed two tree branches that had fallen across the trails, blocking them from use. One of these branches was noted during the trails maintenance and monitoring visit conducted in May 2013 and the other was reported by an equestrian on June 24, 2013 (Figures 4 through 7; UTM 11 S 376211/3792675). Both blockages were located along the eastern portion of Haines Canyon Creek near the Tujunga Ponds. The branches were removed using chainsaws and the debris was placed in front of unauthorized trails that were created around the blockages.

During the removal effort on June 25, 2013 the biologist and crew was visited by representatives from the Los Angeles County Department of Parks and Recreation (LACDPR). After a tour of the Mitigation Area, specifically the Tujunga Ponds, the LACDPR representatives expressed concerns at the amount of umbrella sedge (*Cyperus* sp.) around the ponds. After consulting with Los Angeles County Department of Public Works (LACDPW), the crew was given the approval to spray the umbrella sedge around the Tujunga Ponds.

Exotic plant removal activities continued on June 26, 2013 with crews focused on spraying the umbrella sedge near the Tujunga Ponds (Figure 8). During the removal activities, the biological monitor noticed small water lettuce (*Pistia stratoides*) plants floating in the West Pond (Figures 9 and 10; UTM 11 S 376112/3792623). It was determined upon further inspection that both ponds contained water lettuce, especially around the edges and mixed in with the algae; however, it appeared that the West Pond was the most heavily inundated with water lettuce. LACDPW was immediately notified and a water lettuce herbicide application effort was planned for the first week of July 2013 (results of the application effort will be reported in a subsequent memorandum).

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

- Nesting bird surveys were conducted prior to the start of removal activities and again 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; and
- 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.

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

SIGNED: _____ DATE: July 22, 2013

Amy Leigh Trost
Assistant Biologist

Figure 1. Crew spraying stand of giant reed in the eastern portion of the Mitigation Area.

Figure 2. Crew clearing vegetation along trail.

Figure 3. Passerine nest found near Haines Canyon Creek.

Figure 4. Tree branch blocking trail along Haines Canyon Creek.

Figure 5. Tree branch blocking trail along Haines Canyon Creek after being cut with chainsaw.

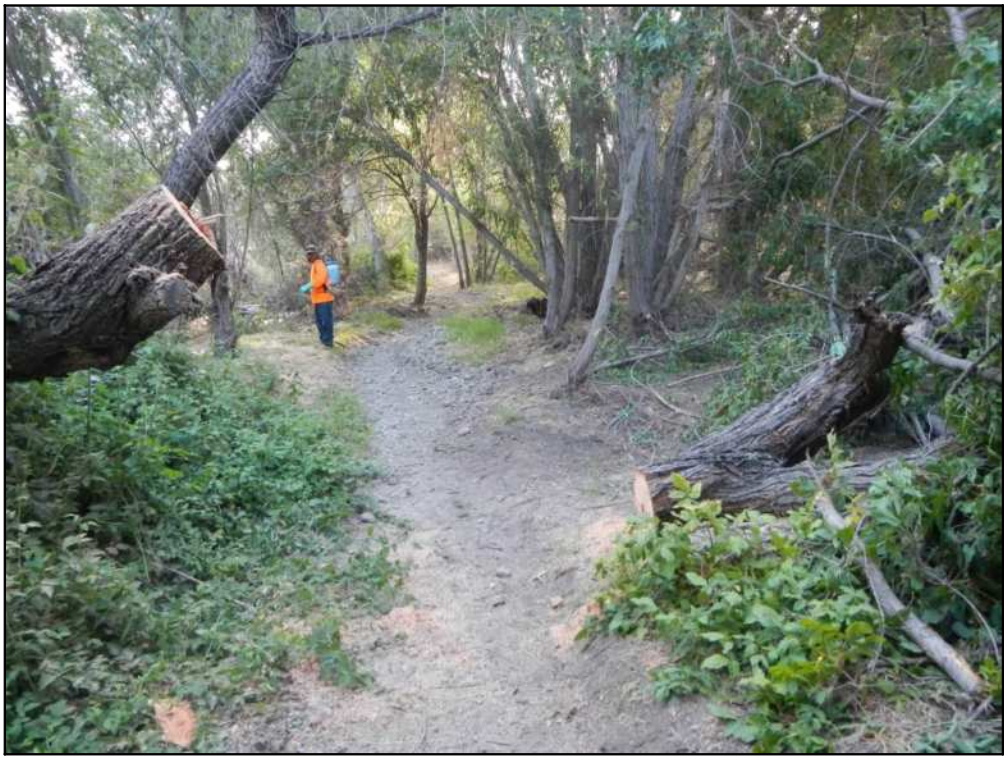


Figure 6. Tree branch found during May 2013 trails visit after removal.

Figure 7. Unauthorized trail found during May 2013 trails visit blocked.

Figure 8. Stand of umbrella sedge near the Tujunga Ponds.

Figure 9. Water lettuce in a portion of the West Pond.

Figure 10. Close-up of water lettuce found in the West Pond.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 10, 2013
(2010-116.010/002/2)

Grace Yu
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 (September 2013) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a documentation of the exotic plant removal activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during September 2013.

A pre-removal reconnaissance site visit and survey was conducted on September 3, 2013 by ECORP Consulting, Inc. (ECORP) biologist Amy Trost. This site visit was conducted to identify any sensitive biological resources and to identify areas with high densities of exotic plant species. Sensitive biological resources were not observed during the survey, but large areas of exotic plant species were flagged and recorded using a global positioning system (GPS) unit. These areas included large stands of giant reed (*Arundo donax*), white sweet clover (*Meliotus albus*), broadleaf plantain (*Plantago major*), and other exotic plant species.

The removal of the exotic plant species was conducted by the landscape contractor's (Natures Image, Inc.) crews September 4, 5, 6, and 9, 2013. Prior to any work, all members of the landscape contractor's crew received an onsite orientation, a bilingual informational brochure, and instruction on the Mitigation Area's regulations and concerns related to the area's sensitive species and habitat by a qualified ECORP biologist.

The removal effort began on September 4, 2013 at the Tujunga Ponds. The crew worked around both ponds spraying sweet clover, plantago, giant reed, umbrella sedge (*Cyperus* sp.), and castor bean (*Ricinus communis*) (Figures 1 and 2). During the visit the biologist encountered a group of four homeless people with an unleashed dog swimming in the West Pond. The group temporarily restrained the dog and the biologist informed the group that swimming was prohibited and that all dogs must be on a leash. The biologist then left the immediate area to inform Natures Image of the problem. The biologist then called the Los Angeles Sheriff's Department and proceeded to meet with

the deputy at the parking area near the ponds. After relaying the incident to the officer, the biologist left the site.

Exotic plant removal continued on September 5, 2013. The crew sprayed exotic vegetation along the length of Haines Canyon Creek, on both sides of the creek.

On September 6, 2013 the crew worked within the Big Tujunga Wash. The crew started at the Foothill Boulevard Bridge and worked west to the power lines at the western edge of the Mitigation Area. Species targeted included tamarisk (*Tamarix* sp.), giant reed, tree tobacco, and castor bean (Figure 3).

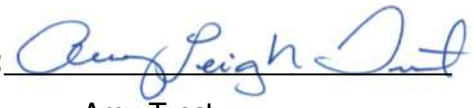
The removal effort continued on September 9, 2013 as the exotic plant removal crew worked in the riparian area north of the Cottonwood Avenue entrance by using machetes and chainsaws to clear overhanging and encroaching vegetation from the trails system (Figure 4). This included the removal of a tree that had fallen across a trail located south of the Tujunga Ponds, within the southern willow scrub area (Figures 5 and 6). This fallen tree was noted in the September 2013 trails maintenance memo. The crew continued removing exotic plant species within the upland area at the Cottonwood Avenue entrance (Figure 7). The bulk of the activities included spraying emergent weeds such as redstem fillaree (*Erodium circutarium*) and using a weed whacker on vegetation such as black mustard (*Brassica nigra*).The crew finished their day by conducting additional maintenance along the trail between the Cottonwood and South Wheatland Entrances, cutting overhanging branches and poison oak away from the trails..

ECORP biologists Phillip Wasz and Amy Trost monitored exotic plant removal activities occurring during the month of September. The following protocols were conducted to minimize disturbance to sensitive habitat and species during the exotic plant removal effort:

- Site visit and survey was conducted in work areas prior to the Natures Image crews beginning the removal process.
- Only water-soluble herbicide was used in areas within a 5-meter distance from all water sources. Water sources include Haines Canyon Creek, Tujunga Ponds, and any standing or ponded water. Outside of the 5-meter 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.

One additional exotic plant removal effort is planned for the end of the year for 2013.

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

SIGNED:  DATE: September 10, 2013

Amy Trost
Assistant Biologist

Figure 1. Sweet clover sprayed near west pond.

Figure 2. Plantains around the Tujunga Ponds.

Figure 3. Giant reed cut and sprayed in Big Tujunga Wash.

Figure 4. Trail along the creek north of the Cottonwood Avenue entrance after overhanging vegetation was cleared.

Figure 5. Fallen tree blocking a trail located south of the Tujunga Ponds.

Figure 6. Cleared trail after tree removal was conducted on the trail south of the Tujunga Ponds.

Figure 7. Weed whacking near the Cottonwood Avenue entrance.

March 4, 2014
(2010-116.010/002/2)

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

SUBJECT: Fourth Phase Memorandum for the Exotic Plant Removal and Trail Maintenance (December 2013) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a documentation of the exotic plant removal and trail maintenance activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) during December 2013.

A pre-removal reconnaissance site visit and survey was conducted on December 13, 2013 by ECORP Consulting, Inc. (ECORP) biologists Carley Lancaster and Rebecca Valdez. This site visit was conducted to identify any sensitive biological resources and to identify areas with high densities of exotic plant species. The biologists also 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. Sensitive biological resources were not recorded during the survey, but large areas of exotic plant species were flagged and recorded using a global positioning system (GPS) unit. These areas included stands tree tobacco (*Nicotiana glauca*), giant reed (*Arundo donax*), castor bean (*Ricinus communis*), and other exotic plant species.

The removal of the invasive exotic plant species was conducted by the landscape contractor's (Natures Image, Inc.) crews December 16, 17, 18, and 23, 2013. Prior to any work, all members of the landscape contractor's crew received an onsite orientation, a bilingual informational brochure, and instruction on the Mitigation Area's regulations and concerns related to the area's sensitive species and habitat by a qualified ECORP biologist.

The crew began removal efforts at the mouth of Haines Canyon Creek near the West Tujunga Pond on December 16, 2013 and continued down the stream removing exotic vegetation on either side of the Haines Canyon Creek. The removal efforts were focused on removing species such as giant reed, castor bean, umbrella sedge (*Cyperus* sp.), and pepper tree (*Schinus molle*) (Figure 1). The crew used machetes to chop down large stands of vegetation and then sprayed the exposed cut stems with herbicide. The crew worked along the stream, around the ponds, and in the southern willow scrub and Riversidean Alluvial Fan scrub west of the ponds for the entire day.

During this effort one occupied homeless encampment was observed approximately mid-way between the ponds and Gibson Ranch in the riparian vegetation (Figures 2 and 3). The area was surrounded by trash and a bicycle was present. The coordinates of this location were

recorded and County of Los Angeles Department of Public Works (LACDPW) was notified via email.

The removal effort continued on December 17, 2013 in the Big Tujunga Wash. The crew started on the southeast side of the Big Tujunga Wash and worked their way west. On December 18, 2013, the crew worked in the upland area near the Cottonwood gate (Figure 4). The crew sprayed herbicide of emergent weeds such as redstem fillaree (*Erodium circutarium*) and sweet clover (*Meliotus albus*). Afterward, the crew walked the trail system and conducted a general maintenance effort, picking up trash and debris along the trails and around the Tujunga Ponds. Additional removal activities were not conducted for the remainder of the week due to the rain event on December 19, 2013.

The removal effort continued on Monday December 23, 2013. The crew finished spraying in the upland area near the Cottonwood gate. After finishing spraying activities, the crew did a final check of the trail system to make sure no trees or branches had fallen to block the trails after the recent rain event. During the effort the biologist monitoring the crew noticed that one of the trails leading from the Cottonwood upland area to Haines Canyon Creek had eroded during the recent rain event and could potentially present a safety hazard (Figure 5). The soil surrounding the asphalt has washed away and deep depressions have formed which could cause people and horses to trip and fall. LACDPW was notified via email.

ECORP biologists Rebecca Valdez and Amy Trost monitored exotic plant removal activities occurring during the month of December. During the removal process the following protocols were conducted to minimize disturbance to sensitive habitat and species:

- Site visit and survey was conducted in work areas prior to the Natures Image crews beginning the removal process.
- Only water-soluble herbicide was used in areas within a 5-meter distance from all water sources. Water sources include Haines Canyon Creek, Tujunga Ponds, and any standing or ponded water. Outside of the 5-meter 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.

This is the final exotic plant removal effort for 2013. No additional exotic plant removal activities will be conducted in 2013.

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

SIGNED: Rebecca L Valdez DATE: March 4, 2014

Rebecca Valdez
Assistant Biologist

Figure 1. Castor bean sprayed with herbicide.

Figure 2. Homeless encampment south of the ponds.

Figure 3. Homeless encampment location south of the ponds.

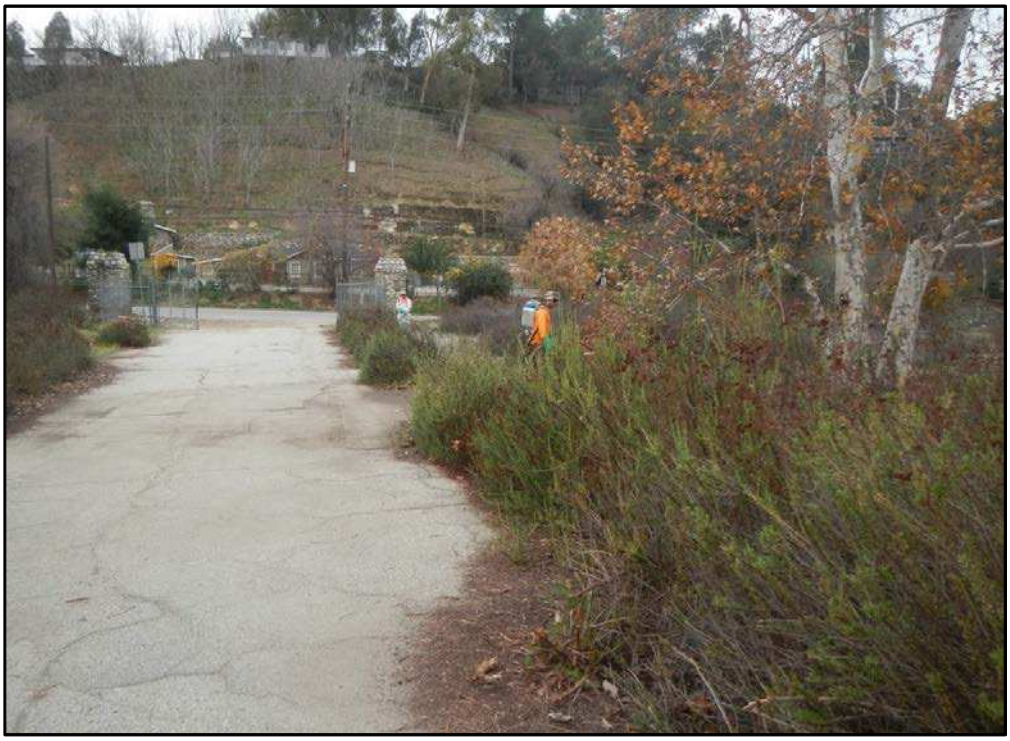


Figure 4. Crew spraying herbicide near Cottonwood entrance.

Figure 5. Eroded trail between Cottonwood upland area and Haines Canyon Creek.

CA Department of Fish and Wildlife Notifications

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

April 4, 2013
(2010-116.010/002/2)

Ms. Sarah Rains
California Department of Fish and Wildlife
P.O. Box 279
Newbury Park, CA 91319

RE: Notification No. 1600-2008-0253-R5 – Big Tujunga Wash Mitigation Area Exotic Plant Removal and Maintenance Activities (Sent via email to sarah.rains@wildlife.ca.gov)

Dear Ms. Rains:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning April 10, 2013 at the Los Angeles County Department of Public Works' Big Tujunga Mitigation Area near the City of Sunland in Los Angeles County. The activities will begin with the biologists conducting a pre-removal effort 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-removal effort survey will take place on either April 8 or 9, 2013. The locations of all sensitive biological resources that are found will be identified using a Global Positioning System (GPS) 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 maintenance and exotic plant removal activities.

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

Sincerely,

ECORP Consulting, Inc.

Mari Quillman

Mari (Schroeder) Quillman
Principal Biological Resources Program Manager

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

June 18, 2013
(2010-116.010/002/2)

Ms. Sarah Rains
California Department of Fish and Wildlife
P.O. Box 279
Newbury Park, CA 91319

RE: Notification No. 1600-2008-0253-R5 – Big Tujunga Wash Mitigation Area Exotic Plant Removal and Maintenance Activities (Sent via email to sarah.rains@wildlife.ca.gov)

Dear Ms. Rains:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning June 24, 2013 at the Los Angeles County Department of Public Works' Big Tujunga Mitigation Area near the City of Sunland in Los Angeles County. The activities will begin with the biologists conducting a pre-removal effort 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-removal effort survey will take place on either June 20 or 21, 2013. The locations of all sensitive biological resources that are found will be identified using a Global Positioning System (GPS) 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 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 27, 2013
(2010-116.010/002/2)

Ms. Sarah Rains
California Department of Fish and Wildlife
P.O. Box 279
Newbury Park, CA 91319

RE: Notification No. 1600-2008-0253-R5 – Big Tujunga Wash Mitigation Area Exotic Plant Removal and Maintenance Activities (Sent via email to sarah.rains@wildlife.ca.gov)

Dear Ms. Rains:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted beginning September 4, 2013 at the Los Angeles County Department of Public Works' Big Tujunga Mitigation Area near the City of Sunland in Los Angeles County. The activities will begin with the biologists conducting a pre-removal effort 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-removal effort survey will take place on September 3, 2013. The locations of all sensitive biological resources that are found will be identified using a Global Positioning System (GPS) and areas that will require maintenance will also be identified using a GPS. If any sensitive biological resource is identified during the survey, then an appropriately-sized buffer will be established as a "no work" zone. A biological monitor will be on site during 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

Water Lettuce Removal Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

July 31, 2013
(2010-116.010/003/3)

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

SUBJECT: Follow-up Site Visit for the July 2013 Water Lettuce Herbicide Application within the Tujunga Ponds adjacent to the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation of a follow-up site visit for the application of herbicide in the Tujunga Ponds under the Water Lettuce Control Program for the Big Tujunga Wash Mitigation Area (Mitigation Area). The herbicide application was conducted in response to water lettuce observations in the Tujunga Ponds and the Connector Channel that were made during the exotic plant removal effort on June 26, 2013.

ECORP Consulting, Inc. (ECORP) biologist Amy Trost conducted a site visit on July 19, 2013 as a follow up for water lettuce herbicide application events that occurred on July 1 and 2, 2013. The biologist walked along the perimeter of both ponds and inspected the waters for presence of water lettuce. Water lettuce was observed in the Connector Channel (North American Datum 1983 [NAD 83] Universal Transverse Mercator [UTM] coordinates 11 S 0376607/3792759; Figures 1, 2, and 3) between the two ponds and also in the northeast portion of the East Pond (NAD 83 UTM coordinates 11 S 0376675/3792710; Figure 4). It is recommended that another herbicide application be conducted in August 2013 to prevent an infestation of this species in the waterways.

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

SIGNED: _____ DATE: July 31, 2013

Amy Leigh Trost
Assistant Biologist

ECORP Consulting, Inc.
1801 Park Court Place, Building B Suite 103, Santa Ana, California 92701
Phone: (714) 648-0630 ● Fax: (714) 648-0935 ● Email: Ecorp@ecorpconsulting.com

Figure 1. Water lettuce in the Connector Channel between the East and West Ponds.

Figure 2. Water lettuce in the Connector Channel between the East and West Ponds.

Figure 3. Close-up of water lettuce in the Connector Channel.

Figure 4. Water lettuce in the northeast portion of the East Pond.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

August 26, 2013
(2010-116.010/003/3)

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

SUBJECT: Follow-up Site Visit for the August 2013 Water Lettuce Herbicide Application within the Tujunga Ponds adjacent to the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation of a follow-up site visit for the application of herbicide in the Tujunga Ponds under the Water Lettuce Control Program for the Big Tujunga Wash Mitigation Area (Mitigation Area). The herbicide application was conducted in response to water lettuce observations in the Tujunga Ponds and the Connector Channel that were made during a previous visit conducted on July 19, 2013.

ECORP Consulting, Inc. (ECORP) biologist Amy Trost conducted a site visit on August 20, 2013 as a follow up for water lettuce herbicide application events that occurred on July 2 and 3, 2013. The biologist walked along the perimeter of the Connector Channel and both ponds and inspected the waters for presence of water lettuce. Water lettuce was not observed in either of the ponds nor was it observed in the Connector Channel. The herbicide treatment appears to have been a success and no follow up herbicide treatments are recommended at this time.

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: August 26, 2013

Amy Leigh Trost
Assistant Biologist

ECORP Consulting, Inc.
1801 Park Court Place, Building B Suite 103, Santa Ana, California 92701
Phone: (714) 648-0630 ● Fax: (714) 648-0935 ● Email: Ecorp@ecorpconsulting.com

APPENDIX G

Exotic Wildlife Removal Memos and 2013 Report

Exotic Wildlife Removal Memos

June 27, 2013
(2010-116.010/004/4)

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

SUBJECT: **First Phase Exotic Aquatic Species Removal Effort (May 2013) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California**

Dear Ms. Yu:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds and Haines Canyon Creek 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 28 through 31, 2013. The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), and the American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Brian Zitt, Terrance Wroblewski, Adam Schroeder, and Max Murray conducted removal efforts using a variety of sampling methods. The timing of these surveys coincided with the breeding period for native fishes, so the sampling activities in Haines Canyon Creek were limited to reduce impacts to breeding native fishes. In addition, the Big Tujunga Wash was dry time during these surveys; therefore, removal efforts were focused in the Tujunga Ponds.

During this removal effort, nine gillnets of various lengths (100 to 500 feet) and monofilament mesh sizes (0.5 to 2 inches) were used in the Tujunga Ponds (four nets in the West Tujunga Pond and five in the East Tujunga Pond). The use of various mesh sizes targeted multiple size classes of exotic fishes. A total of 18 baited minnow/crayfish traps were deployed in the Tujunga Ponds and the Connector Channel located between the ponds. Bullfrog gigging surveys were conducted at night throughout Haines Canyon Creek and around the perimeter of the Tujunga Ponds. Bullfrogs were heard calling in both Tujunga Ponds. Spearfishing surveys were conducted in the Big Tujunga Ponds at night on May 28, 2013 and during the day on May 29, 2013; however, due to poor visibility (1 to 5 feet), few fish were captured using this method. Although visibility was somewhat

reduced during spearfishing surveys, biologists were able to disrupt several exotic fish nests in the Tujunga Ponds.

The exotic aquatic species captured and removed during this effort included 198 red swamp crayfish, 4 goldfish (*Carassius auratus auratus*), 78 common carp (*Cyprinus carpio*), 1 mosquitofish (*Gambusia affinis*), 3 green sunfish (*Lepomis cyanellus*), 4 bluegill (*Lepomis macrochirus*), 197 largemouth bass, 4 Mozambique tilapia (*Oreochromis mossambicus*), 16 American bullfrogs, and 4 red-eared sliders (*Trachemys scripta elegans*).

During these surveys ECORP biologists observed large numbers of young-of-the-year largemouth bass which indicates successful breeding in both ponds this year. During the bullfrog gigging survey in Haines Canyon Creek, numerous adult Santa Ana sucker were observed; however, no fry or juvenile Santa Ana sucker were observed. ECORP biologists were careful not to capture or disturb these fish as this removal effort fell within their breeding period. There were no other native fish species observed during the removal effort. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during the removal effort.

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 27, 2013

Adam Schroeder
Fisheries Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 22, 2013
(2010-116.010/004/4)

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

SUBJECT: **Second Phase Exotic Aquatic Species Removal Effort (September 2013) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California**

Dear Ms. Yu:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds and Haines Canyon Creek 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.

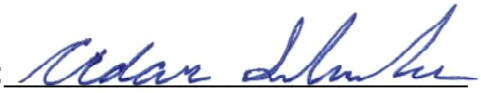
The exotic aquatic species removal effort took place September 16 through 19, 2013. The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), and the American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Max Murray, Adam Schroeder, Phil Wasz, and Terrance Wroblewski conducted the removal effort using a variety of sampling methods. The Big Tujunga Wash was dry during these surveys; therefore, removal efforts were focused in the Tujunga Ponds and Haines Canyon Creek.

During this removal effort, 11 gillnets of various lengths (100 to 500 feet) and monofilament mesh sizes (0.5 to 2 inches) were used in the Tujunga Ponds (seven nets in the West Tujunga Pond and four nets in the East Tujunga Pond). The use of various mesh sizes targeted multiple size classes of exotic fishes. A total of 31 baited minnow/crayfish traps were deployed in the Tujunga Ponds and the Connector Channel located between the ponds. One fyke net was deployed in the Connector Channel. Bullfrog gigging surveys were conducted at night throughout Haines Canyon Creek and around the perimeter of the Tujunga Ponds. Spearfishing was not conducted in the ponds because of poor visibility.

The exotic aquatic species captured and removed during this effort included 107 red swamp crayfish, 1 goldfish (*Carassius auratus auratus*), 9 common carp (*Cyprinus carpio*), 4 green sunfish (*Lepomis cyanellus*), 8 bluegill (*Lepomis macrochirus*), 219 largemouth bass, 1 Mozambique tilapia (*Oreochromis mossambicus*), 3 American bullfrogs, 2 American bullfrog tadpoles, and 2 red-eared sliders (*Trachemys scripta elegans*).

During these surveys ECORP biologists observed large numbers of young-of-the-year largemouth bass which indicates successful breeding in both ponds this year. The single juvenile Mozambique tilapia captured in the West Pond could indicate breeding in the ponds; this was the first observation in the West Pond, as other observations of adult Mozambique tilapia were in the East Pond. During the bullfrog gigging survey in Haines Canyon Creek, about seven adult Santa Ana sucker were observed; however, no fry or juvenile Santa Ana sucker were observed. ECORP biologists observed and disassembled many rock dams along the creek. There were many fallen trees in the creek. Red swamp crayfish numbers in the creek were lower than previous site visits. No other native fish species were observed during the removal effort. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during this removal effort.

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 22, 2013

Adam Schroeder
Fisheries Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

January 2, 2014
(2010-116.010/004/4)

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

SUBJECT: **Third/Fourth Phase Exotic Aquatic Species Removal Effort (December 2013) in the Big Tujunga Wash Mitigation Area, Los Angeles County, California**

Dear Ms. Yu:

This letter serves as a summary of the exotic aquatic species removal efforts conducted by ECORP Consulting, Inc. (ECORP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The purpose of this program is to remove exotic aquatic wildlife from the Tujunga Ponds and Haines Canyon Creek 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 December 9 through 13, 2013. This removal event combined efforts numbers 3 and 4 into one large effort to focus activities on the areas that usually harbor the most exotic wildlife. This would create much more of an impact on the exotic wildlife populations at the Mitigation Area and would also give the biologists a chance to remove fish before the adults reproduce in the spring.

The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), and the American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Brian Zitt, Max Murray, Adam Schroeder, Phil Wasz, and Terrance Wroblewski conducted the removal effort using a variety of sampling methods. The Big Tujunga Wash was dry during these surveys; therefore, removal efforts were focused in the Tujunga Ponds and Haines Canyon Creek.

During this removal effort 11 gillnets of various lengths (100 to 500 feet) and monofilament mesh sizes (0.5- to 2-inch) were used in the Tujunga Ponds (six nets in the West Tujunga Pond and five nets in the East Tujunga Pond). The use of various mesh sizes targeted multiple size classes of exotic fishes. A total of 32 baited minnow/crayfish traps were deployed in Haines Canyon Creek and the Connector

Channel located between the ponds. One fyke net was deployed in the Connector Channel. Seining surveys were conducted using a 15-foot seine with ¼-inch delta weave mesh throughout Haines Creek. Spearfishing was conducted in both ponds as visibility ranged from three to eight feet.

The exotic aquatic species captured and removed during this effort included 636 red swamp crayfish, 2 common carp (*Cyprinus carpio*), 30 green sunfish (*Lepomis cyanellus*), 1 bluegill (*Lepomis macrochirus*), 569 largemouth bass, 1 Mozambique tilapia (*Oreochromis mossambicus*), 8 western mosquitofish (*Gambusia affinis*), 1 American bullfrog, and 2 red-eared sliders (*Trachemys scripta elegans*).

ECORP biologists observed large numbers of juvenile/young-of-the-year largemouth bass and juvenile red swamp crayfish in Haines Canyon Creek during this removal effort. One juvenile Mozambique tilapia was captured in the West Pond during this effort. This capture could indicate that breeding occurred in the ponds since the last removal effort; however, at the time of the surveys no other individuals were observed.

In addition to these exotic aquatic species, 10 Santa Ana sucker (*Catostomus santaanae*), a federally listed (threatened) species and California Department of Fish and Wildlife Species of Special Concern (CDFW SSC) and 2 arroyo chub, CDFW SSC, were also detected in Haines Canyon Creek. When captured, these native fishes were enumerated and immediately released back into the creek unharmed. No other native aquatic species were observed during the surveys.

During the removal effort ECORP biologists observed several fallen trees and rock dams within the creek. In one location cut tree logs were stacked across the creek as a foot bridge. These rock dams and foot bridges were dissembled by the aquatic biologists to allow normal creek flow. Three minnow traps were tampered with and removed from the creek. Two of the three traps were found out of the water with their contents removed; the other trap was never recovered. Water lettuce was not observed in the Tujunga Ponds or in Haines Canyon Creek during this removal effort.

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: January 2, 2014

Terrance Wroblewski
Fisheries Biologist

2013 Exotic Wildlife Removal Report

[redacted]

Prepared for:

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

Prepared by:

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December 2013

CONTENTS

2013 Exotic Aquatic Species Removal Report for the Big Tujunga Wash Mitigation Area

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

ECORP Consulting, Inc. (ECORP) was contracted by the County of Los Angeles Department of Public Works (LACDPW) in July 2007 to continue the exotic aquatic species removal program that was set forth in the Master Mitigation Plan (MMP) for the Big Tujunga Wash Mitigation Area (Mitigation Area). The MMP was created to serve as a five-year guide for the implementation of various enhancement programs and to fulfill the California Department of Fish and Wildlife's (CDFW) (formerly California Department of Fish and Game [CDFG]) requirement for the preparation of a management plan for the Mitigation Area. The MMP includes multiple strategies to enhance and protect existing habitat for wildlife and to create additional natural areas that could be used by both native wildlife and numerous local groups. It also provides direction for the capture and removal of exotic aquatic species from the various watercourses located within the Mitigation Area in order to relieve some of the negative impacts that these individuals can have on natives. Implementation of the MMP initially began in August 2000, and a Long-term Management Plan (LTMP) is being developed to specifically address the continuation of this program into the future.

Historically, all southern California coastal freshwater fishes have experienced population and environmental impacts as a result of habitat alteration and dewatering and thus are greatly reduced in both their distribution and abundances (Moyle 2002; Swift et al. 1993). These impacts are further compounded by the effects exotic aquatic species can have on native fish assemblages. One such native freshwater fish assemblage in southern California is the South Coast Minnow-Sucker fish community (Ellison 1984), which is known to occur in the Mitigation Area. This assemblage consists of the following native fishes: Santa Ana sucker (*Catostomus santaanae*), a federally listed as threatened species and a CDFW Species of Special Concern (SSC) (USFWS 2000, CDFG 2011); Santa Ana speckled dace (*Rhinichthys osculus* spp. 3), a CDFW SSC; and arroyo chub (*Gila orcuttii*), a CDFW SSC. Compared to historical records, the current distribution for each of these species has been severely reduced. The Mitigation Area provides an important refuge for these native fish populations from habitat alteration and dewatering. Additionally, the Mitigation Area is considered to be one of the last remaining locations in the Los Angeles River Drainage where these three species of fish can still be found (Swift et al. 1993).

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

The purpose of implementing this exotic aquatic species removal program in the Mitigation Area is to restore, create, and maintain suitable habitat for native aquatic species. The program

focuses on the removal of exotic fishes, reptiles, amphibians, and invertebrates from all aquatic habitats using a suite of sampling techniques. This report provides the results of the exotic aquatic species removal efforts conducted at the Mitigation Area in 2013.

1.1 Location and Setting

The Mitigation Area is located in Big Tujunga Wash (Wash), just downstream of the Interstate 210 (I-210) freeway overcrossing, near the City of Los Angeles' Sunland community, Los Angeles County (Figure 1-1). The Mitigation Area is bordered on the north by I-210, on the east by I-210 and the Tujunga Ponds, and on the south by Wentworth Street. The western boundary is bordered by high voltage power lines crossing the Wash just upstream of Hansen Dam Park and Recreation Area. The Mitigation Area is located within a state-designated Significant Natural Area (LAX-018), and the biological resources are of local, regional, state, and federal significance (Safford and Quinn 1998; CDFG 2012).

The Mitigation Area contains two watercourses (Figure 1-2): The Wash and Haines Canyon Creek (Haines Creek), both of which are designated as critical habitat for Santa Ana sucker in the Los Angeles River basin (USFWS 2010). The Wash, located in the northern portion of the Mitigation Area, is a wide (greater than 30 meters [m] [98 feet {ft}]) partially-concrete lined tributary of the Los Angeles River. Water flow in the Wash originates from the Big Tujunga Dam (approximately 17.5 kilometers [km] [10.9 miles {mi}] upstream) and is dependent on controlled releases and from local rainfall. Flow is therefore intermittent, leaving it dry for large portions of the year. Haines Creek, located in the southern portion of the Mitigation Area, is a tributary that conveys water flow from Haines Canyon to Big Tujunga Wash. Water flow is perennial and is fed by groundwater and/or runoff from adjacent residential areas. Haines Creek and the Wash merge near the western boundary of the Mitigation Area and continue into the Hansen Dam Flood Control Basin, located approximately 0.8 km (0.5 mi) downstream of the site.

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

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

Map Date: 3/20/2013
Source: ESRI

Figure 1-1. Project Location

2010-116 Big Tujunga Wash Mitigation Area

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Aerial Date: USGS Dec 2010
12/20/2013

Figure 1-2. Project Area Watercourses

2010-116.010/004/04 Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

The West Pond lies adjacent to the I-210 freeway, approximately 60 m (200 ft) to the south, and connects directly to Haines Creek. The West Pond has a surface area of approximately 3,200 square meters (m^2) (10,500 square feet [ft^2]) providing a complex, heterogeneous space for many aquatic species. The water depths range from 1.8 to 3.7 m (5.9 to 12.1 ft), and the substrate consists primarily of fine silts and sands in the middle of the pond with cobble and gravel areas along portions of the perimeter. The West Pond is oblong in shape with a relatively uniform and less convoluted bank. The banks are heavily lined with emergent and riparian vegetation that provide both submerged and overhanging habitat. Variations in algal and emergent aquatic plant growth along the banks fluctuate according to seasonal changes, contributing to the habitat complexity within the West Pond.

The Connector Channel is a 70-m (230-ft) long, narrow channel that connects the Ponds. This channel has a maximum width of 5 m (16 ft), with dense stands of emergent vegetation along both banks. Water depths range from less than 1 m to 1.5 m (3.3 ft to 4.9 ft), with the deepest point near the connection with the West Pond.

The East Pond lies adjacent to the I-210 freeway, approximately 65 m (210 ft) to the south. The East Pond has a surface area of approximately 3,300 m^2 (10,800 ft^2) and, like the West Pond, it also provides a diverse combination of aquatic habitats. Water depths in this pond range from 1.8 to 3.7 m (5.9 to 12.1 ft) with substrates consisting mainly of fine silts and sands in the middle with cobble and gravel areas along portions of the perimeter. The banks are heavily lined with emergent and riparian vegetation that provide both submerged and overhanging habitat. Unlike the West Pond, the East Pond possesses more complexity along its banks with several shallow water coves.

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

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

1.2 Exotic Aquatic Species Ecology in Big Tujunga Wash Mitigation Area

Extremely favorable habitat conditions in the Ponds (i.e., clear, slow moving water; abundant vegetation; availability of prey items — both native and introduced) have allowed several exotic aquatic species to become established, either by following deliberate introductions or by natural range expansions from other locations. Furthermore, several of these species have persisted and proliferated due to the absence of natural predators and competitors. The presence of these exotic species in the Mitigation Area may be having both direct and indirect negative effects upon the resident native species.

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

Santa Ana sucker, Santa Ana speckled dace, and arroyo chub feed primarily on filamentous algae, crustaceans, insects, and detritus. Their diet places them in direct competition with many of the juvenile exotic fishes found within the Mitigation Area. For example, juvenile bluegill (*Lepomis macrochirus*) feed on both algae and zooplankton, juvenile green sunfish (*Lepomis cyanellus*) eat insects and zooplankton, and western mosquitofish (*Gambusia affinis*) feed upon zooplankton. The juvenile life stages of largemouth bass also feed primarily on zooplankton and small aquatic invertebrates (red swamp crayfish), prior to their dietary transition to larger prey items, including fish. Further, in freshwater fisheries, competition for food during juvenile life stages can force what is termed a "juvenile bottleneck," wherein competition between juveniles of different species can cause a reduction in their successful transition from juvenile to pre-adult, affecting the number of individuals that eventually reach adulthood (Traxler and Murphy 1995).

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

2.0 METHODS

The 2013 removal of exotic aquatic species from the Mitigation Area was conducted over three removal efforts: May 28 through 31 (effort number one), September 16 through 19 (effort number two), and December 9 through 13 (effort number three). All removal efforts were conducted under the direction of ECORP biologist Brian Zitt, U.S. Fish and Wildlife Service (USFWS) 10(a)(1)(A) recovery permit holder for Santa Ana sucker (TE-27460A-0). Since the Mitigation Area is home to several special-status species, sampling methods were selected and deployed in habitats with the lowest potential for impacting native species, especially during their spawning/breeding season. In addition to the exotic aquatic species removal efforts in Haines Creek, efforts were also made to remove rock dams and foot bridges.

2.1 Removal Methods

A wide range of removal methods were used during the 2013 exotic aquatic species removal efforts, including fyke net trapping, spearfishing, dip-netting/hand capturing, bullfrog gigging, two-person seining, minnow trapping, turtle trapping, and gillnetting (Table 2-1). Prior to each removal effort, all potential sampling methods were evaluated for efficacy based upon the current site conditions and information derived from previous removal efforts. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the trap locations were often strategically deployed into areas that were inaccessible to the public. Sampling locations and the various sampling methods utilized during 2013 are shown in Figure 2-1. A description of each method used during the exotic aquatic species removal efforts is presented below.

2.1.1 Fyke Net Trapping

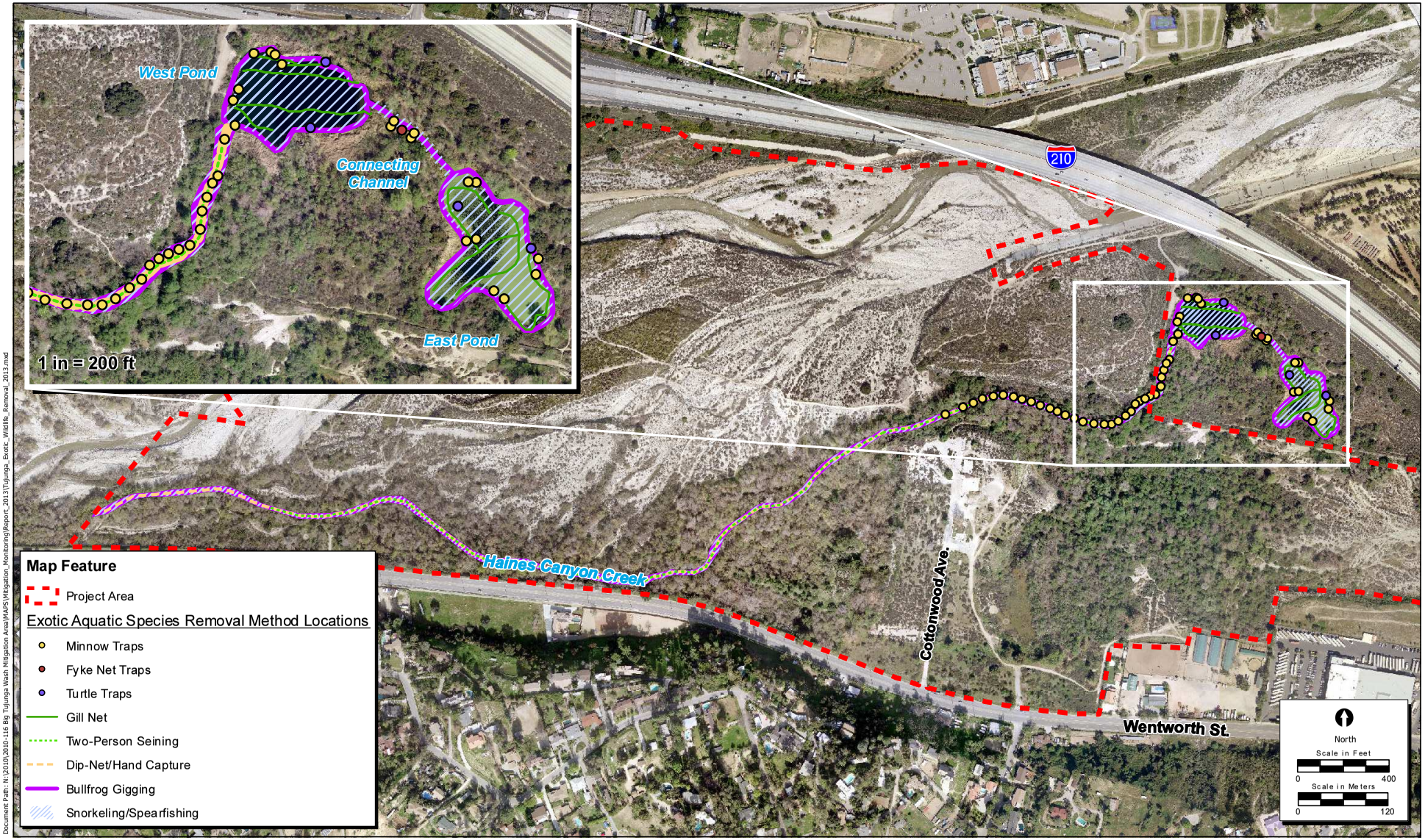
Fyke net traps are large hoop-style nets with detachable wings attached to the throat of the net. Each trap consisted of three steel frames (1.0-m^2 [3.3-ft^2]) wrapped with 6.35-millimeter (mm) (0.25-inch [in]) delta weave mesh, 4.57-m (15.0-ft) detachable wings (1.0-m [3.3-ft] high), and funnels (fykes) on the first, second, and third square frames. The wings provide the ability to block off channels or areas on either side of the trap, funneling fish to swim into the trap. Each trap was allowed to fish for a minimum of 12 hours prior to being checked. A single fyke net trap was set in the center of the Connector Channel in water depths ranging from 0.9 to 1.0 m (3.0 to 3.3 ft) for a total of 13 days during all three removal efforts.

2.1.2 Spearfishing Surveys

Spearfishing was conducted while snorkeling using either banded spear guns or pole spear slings equipped with barbed, five-prong trident tips. Surveys were conducted in Haines Creek and the Ponds during the day and at night and targeted exotic fishes. All sunfish nests and bullfrog egg masses were either destroyed or removed. These surveys provide biologists valuable insight into the current underwater habitat features, species specific habitat preferences, and approximate locations of exotic aquatic species aggregations. Spearfishing was utilized as a sampling method over the course of seven days during all three removal efforts.

Table 2-1. Removal Methods Used by Date, Big Tujunga Wash Mitigation Area, 2013.

Removal Location	Removal Dates	Fyke Net Trapping	Spearfishing	Dip-Netting/ Hand Capturing	Bullfrog Gigging	Two-Person Seining	Minnow Trapping	Turtle Trapping	Gillnetting
Haines Canyon Creek	May 29, 2013				x				
	May 30, 2013				x				
	September 17, 2013		x	x					
	December 9, 2013						x		
	December 10, 2013					x	x		
	December 11, 2013			x		x	x		
	December 12, 2013					x	x		
	December 13, 2013						x		
West Pond	May 28, 2013		x	x	x		x		x
	May 29, 2013		x				x		x
	May 30, 2013				x		x		x
	May 31, 2013						x		x
	September 16, 2013						x		x
	September 17, 2013			x			x		x
	September 18, 2013			x	x		x		x
	September 19, 2013						x		x
	December 9, 2013		x					x	x
	December 10, 2013		x					x	x
	December 11, 2013		x	x				x	x
	December 12, 2013		x					x	x
	December 13, 2013							x	x
Connector Channel	May 28, 2013	x					x		
	May 29, 2013	x					x		
	May 30, 2013	x					x		
	May 31, 2013	x					x		
	September 16, 2013	x					x		
	September 17, 2013	x					x		
	September 18, 2013	x					x		
	September 19, 2013	x					x		
	December 9, 2013	x					x		
	December 10, 2013	x					x		
	December 11, 2013	x					x		
	December 12, 2013	x					x		
	December 13, 2013	x					x		
East Pond	May 28, 2013			x	x				x
	May 29, 2013								x
	May 30, 2013			x					x
	May 31, 2013								x
	September 16, 2013						x		x
	September 17, 2013						x		x
	September 18, 2013						x		x
	September 19, 2013						x		x
	December 9, 2013		x					x	x
	December 10, 2013							x	x
	December 11, 2013							x	x
	December 12, 2013							x	x
	December 13, 2013							x	x



Aerial Date: USGS Dec 2010
12/20/2013

Figure 2-1. Exotic Aquatic Wildlife Species Sampling Locations

2010-116.010/004/04 Big Tujunga Wash Mitigation Area

ECORP Consulting, Inc.
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2.1.3 Dip-netting/Hand Capturing Surveys

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

2.1.4 Bullfrog Gigging Surveys

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

Adult and juvenile bullfrogs were captured either by hand or with the use of pole spear slings equipped with barbed, five-prong trident tips. Bullfrog gigging efforts were employed as a sampling method for four nights during removal efforts number one and two.

2.1.5 Two-person Seining Surveys

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

2.1.6 Minnow Trapping

Minnow traps are two-piece cylinders (41-centimeter [cm] [16-in] in height by 25-cm [10-in] in diameter) encased in 6.35-mm (0.250-in) wire mesh with 2.52-cm (1.00-in) diameter funnel openings at either end. Minnow traps were typically set in slow moving water under overhanging riparian vegetation and along undercut banks to target the following species: red

swamp crayfish, bullfrog tadpoles, and young-of-the-year (YOY) fishes. Minnow traps were baited with an attractant (i.e., Whiskas© brand tuna cat food), and secured to either the surrounding vegetation at various locations around the perimeter of both Ponds, in the connector channel, and in Haines Creek. Each trap was allowed to fish for a minimum of 12 hours prior to being checked. Minnow traps were used as a sampling method for a total of 13 days during all three removal efforts.

2.1.7 Turtle Trapping

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

2.1.8 Gillnetting

Gillnets are monofilament nets that sit vertically in the water column by means of a float line and a lead line. Fish swim into the net and become entrapped, usually at their gills. The mesh sizes vary from 1 to 10 cm (0.4 to 3.9 in) which allows for the capture of multiple size classes. Two different lengths of gillnet were deployed in the East and West Pond (30-m [98-ft] and 100-m [328-ft]). Gillnets were checked frequently during snorkeling and spearfishing surveys, with no longer than eight hours between checks. Due to the entanglement hazard involved with gillnetting, bilingual signs were posted around the access points to the West Pond to inform the public to stay out of the water. Gillnets were used as a sampling method for 13 days during all three removal efforts.

2.2 Processing Protocol

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

The locations of each sampling area and species encountered during the surveys were recorded using a handheld Geographic Positioning System (GPS) unit (Garmin 60CSx™) in Universal Transverse Mercator (UTM) coordinates, North American Datum 1983 (NAD83). Photographs were taken of representative individuals from each species captured, site locations, and removal methods. Field notes regarding weather conditions and other habitat features were also recorded.

3.0 RESULTS

The results of the exotic aquatic species removal efforts conducted in the Mitigation Area are listed below.

3.1 Exotic Aquatic Species Removal

A total of 2,122 individuals were captured, consisting of 10 exotic aquatic species (seven fishes, one amphibian, one reptile, and one invertebrate) and two native fishes during the 2013 removal efforts (Table 3-1). Of the total, 99.7 percent (number of individuals [n]=2,116) of the individuals captured were exotic and removed from the site. Haines Creek accounted for 59.3 percent of the total catch (n=1,258), while the remaining 40.7 percent were captured in other water features: West Pond (n=321), Connector Channel (n=389), and East Pond (n=154). The two native fishes (Santa Ana sucker [n=4] and arroyo chub [n=2]) were collected in Haines Creek. These individuals were in good overall health and immediately released back into the creek. Additionally, several Santa Ana sucker (n=6) were incidentally observed while sampling in Haines Creek. A complete listing of all aquatic species captured during the 2013 sampling efforts is included in Appendix A. Representative photographs of individuals representing each of these species, site locations, and removal methods are included in Appendix B.

The three removal efforts resulted in the capture and removal of 941 red swamp crayfish, 985 largemouth bass, 90 common carp (*Cyprinus carpio*), 37 green sunfish, 22 bullfrog (20 adults and 2 tadpoles), 13 bluegill, 9 western mosquitofish, 8 red-eared slider (*Trachemys scripta elegans*), 6 Mozambique tilapia (*Oreochromis mossambicus*), and 5 goldfish (*Carassius auratus*).

3.1.1 Exotic Aquatic Species Captured in Haines Canyon Creek

A total of 1,258 individuals, consisting of seven exotic and two native species were captured in Haines Creek during the 2013 removal efforts, including five fishes (goldfish, western mosquitofish, green sunfish, bluegill, and largemouth bass), bullfrog (adults) and red swamp crayfish (Table 3-2). Red swamp crayfish was the most abundant species captured, accounting for 66.1 percent (n=832) of the total catch at this location. Two-person seining was the most effective method for capturing exotic aquatic species accounting for 59.8 percent (n=752) of the exotic aquatic species captured at this location. Minnow trapping efforts accounted for 18.3 percent (n=230) of the exotic aquatic species, bullfrog gigging efforts accounted for 13.5 percent (n=170), dip-netting and hand capturing efforts accounted for 6.8 percent (n=85), and spearfishing efforts accounted for the remaining 1.1 percent (n=15) of the exotic aquatic species captured in Haines Creek. Native fishes, Santa Ana sucker (n=4) and arroyo chub (n=2), accounted for 0.5 percent of the total catch at this location.

Table 3-1. Summary of Exotic Aquatic Species Removal by Location and Method, 2013.

		Exotic Species											Native Species		
Removal Location	**Removal Dates**	**Goldfish**	**Common Carp**	**Western Mosquitofish**	**Green Sunfish**	**Bluegill**	**Largemouth Bass**	**Mozambique Tilapia**	**American Bullfrog Adult**	**American Bullfrog Tadpole**	**Red-eared Slider**	**Red Swamp Crayfish**	**Arroyo Chub**	**Santa Ana Sucker**	**Total**
Haines Canyon Creek	May 28 - May 31, 2013	1			1		12		4			152			170
	September 16 - September 19, 2013	1			1		13					58			73
	December 9 - December 13, 2013			8	19	1	359					622	2	4	1,015
	Subtotal	**2**		**8**	**21**	**1**	**384**		**4**			**832**	**2**	**4**	**1,258**
West Pond	May 28 - May 31, 2013				1	3	52		5			9			70
	September 16 - September 19, 2013				3	8	130	1	3	1	2	26			174
	December 9 - December 13, 2013				9		66	1	1						77
	Subtotal				**13**	**11**	**248**	**2**	**9**	**1**	**2**	**35**			**321**
Connector Channel	May 28 - May 31, 2013	2		1			100		2			37			142
	September 16 - September 19, 2013						70			1		22			93
	December 9 - December 13, 2013				1		139					14			154
	Subtotal	**2**		**1**	**1**		**309**		**2**	**1**		**73**			**389**
East Pond	May 28 - May 31, 2013	1	79		1	1	33	4	5		4				128
	September 16 - September 19, 2013		9				6					1			16
	December 9 - December 13, 2013		2		1		5				2				10
	Subtotal	**1**	**90**		**2**	**1**	**44**	**4**	**5**		**6**	**1**			**154**
Total		**5**	**90**	**9**	**37**	**13**	**985**	**6**	**20**	**2**	**8**	**941**	**2**	**4**	**2,122**

Table 3-2. Species Abundance Summary by Removal Method, Haines Canyon Creek, 2013.

		Exotic Species							Native Species		
Removal Method	Removal Dates	Goldfish	Western Mosquitofish	Green Sunfish	Bluegill	Largemouth Bass	American Bullfrog Adult	Red Swamp Crayfish	Arroyo Chub	Santa Ana Sucker	Total
Spearfishing	September 17, 2013	1		1		13					15
	Subtotal	**1**		**1**		**13**					**15**
Dip-Netting/Hand Capturing	September 17, 2013							58			58
	December 11, 2013					5		22			27
	Subtotal					**5**		**80**			**85**
Bullfrog Gigging	May 29, 2013			1		4	2	23			30
	May 30, 2013	1				8	2	129			140
	Subtotal	**1**		**1**		**12**	**4**	**152**			**170**
Minnow Trapping	December 10, 2013		5		1	9		75	1		91
	December 11, 2013							57	1		58
	December 12, 2013					2		42			44
	December 13, 2013							39			39
	Subtotal		**5**		**1**	**11**		**213**	**2**		**232**
Two-Person Seining	December 10, 2013		2	6		80		75			163
	December 11, 2013		1	1		73		130		3	208
	December 12, 2013			12		190		182		1	385
	Subtotal		**3**	**19**		**343**		**387**		**4**	**756**
	Total	**2**	**8**	**21**	**1**	**384**	**4**	**832**	**2**	**4**	**1,258**

3.1.2 Exotic Aquatic Species Captured in the West Pond

A total of 321 individuals, consisting of seven exotic aquatic species were captured in the West Pond during the 2013 removal efforts, including four fishes (green sunfish, bluegill, largemouth bass, and Mozambique tilapia), bullfrog (adults and tadpole), red-eared slider, and red swamp crayfish. (Table 3-3). Largemouth bass was the most abundant species captured, accounting for 77.3 percent (n=248) of the total catch at this location. Gillnetting was the most effective method for removing exotic fishes accounting for 73.2 percent (n=235) of the exotic aquatic species captured in the West Pond. Spearfishing accounting for 12.8 percent (n=41) of the catch at this location, while minnow trapping accounted for 11.5 percent (n=37) of the catch. Hand capturing and bullfrog gigging efforts around the perimeter of the West Pond combined to account for the remaining 2.5 percent (n=8) of the exotic aquatic species captured at this location.

3.1.3 Exotic Aquatic Species Captured in the Connector Channel

A total of 389 individuals, consisting of six exotic aquatic species were captured in the Connector Channel during the 2013 removal efforts, including four fishes (goldfish, western mosquitofish, green sunfish, and largemouth bass), bullfrog (adults and tadpole), and red swamp crayfish (Table 3-4). Largemouth bass was the most abundant species captured, accounting for 79.4 percent (n=309) of the total catch at this location. Fyke net trapping accounted for 85.1 percent of (n=331), while minnow trapping accounted for the remaining 14.9 percent (n=58) of the total catch at this location.

3.1.4 Exotic Aquatic Species Captured in the East Pond

A total of 154 individuals, consisting of nine exotic aquatic species were captured in the East Pond during the 2013 removal efforts, including six fishes (goldfish, common carp, green sunfish, bluegill, largemouth bass, and Mozambique tilapia), bullfrog (adults), red-eared slider, and red swamp crayfish. (Table 3-5). Common carp was the most abundant species captured, accounting for 58.4 percent (n=90) of the total catch at this location. Gillnetting accounted for 93.5 percent (n=144) of the total catch, while spearfishing, hand capturing, bullfrog gigging, and minnow trapping combined to account for the remaining 6.5 percent (n=10) of the total catch at this location.

Table 3-3. Species Abundance Summary by Removal Method, West Pond, 2013.

Removal Method	Removal Dates	Exotic Species								Total
		Green Sunfish	Bluegill	Largemouth Bass	Mozambique Tilapia	American Bullfrog Adult	American Bullfrog Tadpole	Red-eared Slider	Red Swamp Crayfish	
Spearfishing	May 28, 2013	1		3		1				**5**
	May 29, 2013			3						**3**
	December 9, 2013	2		10						**12**
	December 10, 2013	3		5						**8**
	December 11, 2013			5	1					**6**
	December 12, 2013	1		6						**7**
	Subtotal	**7**		**32**	**1**	**1**				**41**
Hand Capturing	May 28, 2013					2				**2**
	September 17, 2013					1				**1**
	September 18, 2013					1				**1**
	December 11, 2013					1				**1**
	Subtotal					**5**				**5**
Bullfrog Gigging	May 28, 2013					1				**1**
	May 30, 2013					1				**1**
	September 18, 2013					1				**1**
	Subtotal					**3**				**3**
Minnow Trapping	May 31, 2013								9	**9**
	September 17, 2013								8	**8**
	September 18, 2013								9	**9**
	September 19, 2013		1				1		9	**11**
	Subtotal		**1**				**1**		**35**	**37**
Gillnetting	May 28, 2013			21						**21**
	May 29, 2013		2	13						**15**
	May 30, 2013		1	8						**9**
	May 31, 2013			4						**4**
	September 16, 2013		1	51	1			1		**54**
	September 17, 2013		1	49				1		**51**
	September 18, 2013	2	3	12						**17**
	September 19, 2013	1	2	18						**21**
	December 9, 2013	1		13						**14**
	December 10, 2013			9						**9**
	December 11, 2013	2		9						**11**
	December 12, 2013			9						**9**
	Subtotal	**6**	**10**	**216**	**1**			**2**		**235**
	Total	**13**	**11**	**248**	**2**	**9**	**1**	**2**	**35**	**321**

Table 3-4. Species Abundance Summary by Removal Method, Connector Channel, 2013.

Removal Method	Removal Dates	Exotic Species							Total
		Goldfish	Western Mosquitofish	Green Sunfish	Largemouth Bass	American Bullfrog Adult	American Bullfrog Tadpole	Red Swamp Crayfish	
Fyke Net Trapping	May 28, 2013	1			10			2	**13**
	May 30, 2013				50	2		4	**56**
	May 31, 2013	1	1		38			11	**51**
	September 17, 2013				13				**13**
	September 18, 2013				28		1		**29**
	September 19, 2013				28			2	**30**
	December 10, 2013				30				**30**
	December 11, 2013				69			1	**70**
	December 12, 2013				31			1	**32**
	December 13, 2013				7				**7**
	Subtotal	**2**	**1**		**304**	**2**	**1**	**21**	**331**
Minnow Trapping	May 30, 2013							9	**9**
	May 31, 2013				2			11	**13**
	September 17, 2013							3	**3**
	September 18, 2013				1			4	**5**
	September 19, 2013							13	**13**
	December 10, 2013							4	**4**
	December 11, 2013			1				3	**4**
	December 12, 2013				2			3	**5**
	December 13, 2013							2	**2**
	Subtotal			**1**	**5**			**52**	**58**
	Total	**2**	**1**	**1**	**309**	**2**	**1**	**73**	**389**

Table 3-5. Species Abundance Summary by Removal Method, East Pond, 2013.

Removal Method	Removal Dates	Exotic Species									Total
		Goldfish	Common Carp	Green Sunfish	Bluegill	Largemouth Bass	Mozambique Tilapia	American Bullfrog	Red-eared Slider	Red Swamp Crayfish	
Spearfishing	December 9, 2013			1		3					**4**
	Subtotal			**1**		**3**					**4**
Hand Capturing	May 28, 2013							1			**1**
	May 30, 2013							3			**3**
	Subtotal							**4**			**4**
Bullfrog Gigging	May 28, 2013							1			**1**
	Subtotal							**1**			**1**
Minnow Trapping	September 18, 2013									1	**1**
	Subtotal									**1**	**1**
Gillnetting	May 28, 2013		17		1	13					**31**
	May 29, 2013	1	57			8	2		2		**70**
	May 30, 2013		4	1		10	1		2		**18**
	May 31, 2013		1			2	1				**4**
	September 16, 2013		1								**1**
	September 17, 2013		5			2					**7**
	September 18, 2013		2			2					**4**
	September 19, 2013		1			2					**3**
	December 9, 2013					2					**2**
	December 10, 2013		2						1		**3**
	December 13, 2013								1		**1**
	Subtotal	**1**	**90**	**1**	**1**	**41**	**4**		**6**		**144**
	Total	**1**	**90**	**2**	**1**	**44**	**4**	**5**	**6**	**1**	**154**

4.0 DISCUSSION

The three exotic aquatic species removal efforts conducted in 2013 captured and removed 2,122 individuals, representing 10 exotic aquatic species. Haines Creek accounted for 59.2 percent of the exotic species captured, while the Ponds and Connector Channel accounted for the remaining 40.8 percent. The size classes of fishes captured in the Ponds were far larger than those captured in Haines Creek and the Connecting Channel, which can be partly attributed to sampling bias ($mean_{Ponds}$=200 mm, $mean_{Connector\ Channel}$=69 mm, $mean_{Haines\ Creek}$=76 mm). Sampling methods used in the Ponds primarily targeted larger adult fishes (e.g., spearfishing, gillnetting), while sampling methods used in Haines Creek and the Connecting Channel (e.g., seining, fyke net trapping) were not size selective. Conversely, the habitat present in the Connecting Channel is similar to sampling locations in Haines Creek. These locations both contain relatively shallow (wadeable) water, a silt bottom, undercut banks, and moderate emergent and bank vegetation which provide ideal refuge for juvenile exotic fishes.

The slow moving, deep water habitat that exists in the Ponds provides an ideal location for exotic aquatic species to forage, breed, and take up shelter. In contrast, Haines Creek is a swift moving, shallow water stream that contains a limited number of pools. The majority the habitat within Haines Creek would not be considered ideal for exotic aquatic species; however, in recent years (2011-2013 removal efforts) antidotal evidence suggest exotic fish densities have become more prolific and widespread throughout the creek. Data collected from exotic species removal efforts during this same time frame appears to show a similar trend with the proportion of relative species abundance between native fishes and exotic aquatic species (Figure 4-1, Note: 2009 electrofishing results from native fishes surveys were also included in figure). Although this is not a direct indicator for success/failure, it may illustrate a community shift in Haines Creek with fewer native fishes being detected compared to the number of exotic aquatic species. The increases in exotic aquatic species densities can be attributed to increases in juvenile largemouth bass and red swamp crayfish numbers. In 2013, largemouth bass and red swamp crayfish dominated the relative abundance in Haines Creek; combined these two species represent nearly 97 percent of the total catch in the creek.

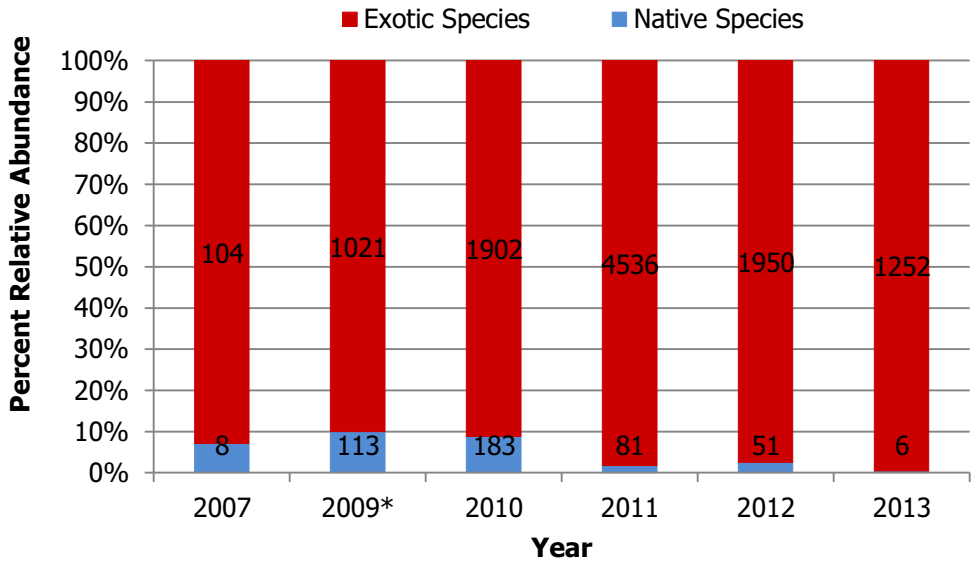

Figure 4-1. Relative Species Abundance of Native versus Exotic Species Collected During Exotic Species Removal in Haines Canyon Creek in 2007 and 2009 through 2013.
*Year 2009 includes native fishes survey data using 3-pass depletion methods. Data collected during the 2008 removal efforts were excluded because the only method used was minnow trapping in the upper portion of the creek.

One of the reasons for this shift may be due to environmental conditions. Since 2011 annual rainfall totals for Los Angeles County have been below average. In general, large winter storm events which produce scouring and sediment dispersal into Haines Creek can also cause die-offs of red swamp crayfish. It may be possible that these winter storm events have been suppressing the population of red swamp crayfish. Another factor that may have influenced this shift is the outbreak of water lettuce (*Pistia stratiotes*) in 2011. During this period, the Pond's surfaces were completely covered with this noxious aquatic plant which could have decrease the productivity within the ponds. Two large scale water lettuce removal efforts took place in 2011 and 2012, and these efforts were followed by several spot treatments using an approved aquatic herbicide. The infestation and removal of this plant may have had an effect on downstream migration of exotic aquatic species into the creek.

Haines Creek contains a variety of complex instream habitats complexity (e.g., undercut banks, woody debris, overhanging vegetation, and boulder/cobble substrate) which can preclude the complete capture and removal of exotic aquatic species in certain habitat types. An effective tool for removing exotic aquatic species sampling in this type of environment is backpack electrofishing. Although effective, this method has the potential to cause stress/injury to native fishes (i.e., Santa Ana sucker, Santa Ana speckled dace, and arroyo chub). As a condition of ECORP biologists Todd Chapman's and Brian Zitt's USFWS 10(a)(1)(A) permits for Santa Ana sucker, sampling must be conducted in a manner that avoids impacts to the species during the spawning season and to any YOY. The condition specifically states that "no electrofishing shall be conducted in areas where Santa Ana suckers are known to exist between March 1 and July 31." In addition to these seasonal restrictions, 2013 had below average rainfall totals. In an effort to minimize stress to native fishes, electrofishing was not used as a sampling method in 2013. Furthermore, all sampling conducted in Haines Creek, with the exception of bullfrog

gigging/spearfishing surveys, was conducted outside of the breeding season during the December removal effort.

Two-person seining continues to be the most effective tool, in lieu of electrofishing, to target pools and shallow undercuts of Haines Creek. Although seining was limited to open water habitats in the creek, free of woody debris and other obstructions, it proved to be an effective removal method and accounted for more individuals captured than any other method. Dip-netting was used in locations where seines were not capable of sampling (e.g., small pockets in woody debris piles, deep undercut banks, under overhanging or instream vegetation). This method was used sparingly and in combination with other methods to primarily capture and remove red swamp crayfish.

Bullfrog gigging continues to be the most effective method for capturing adult and juvenile bullfrogs. The gig, used to capture bullfrogs, is used dual-purpose as it is also used for spearfishing. This flexibility allows biologists to spear exotic fishes underwater or gig bullfrogs along the banks using the same equipment. In general, fish are less active at night, while red swamp crayfish appear to be more active. When water visibility is good, both of these scenarios allow for greater capture rates at night than during daytime surveys. In prior years (2010 and 2011) bullfrog tadpoles were observed in large aggregations (estimates of over 1,000 individuals) in the Ponds (ECORP 2011, ECORP 2012); however, during the 2012 and 2013 removal efforts there were no observations of bullfrog tadpoles in the Ponds. Although bullfrog tadpoles and egg masses were not observed during snorkeling surveys, two bullfrog tadpoles were captured in minnow traps in the West Pond and Connecting Channel.

When visibility allows for spearfishing to take place, it is one of the most effective methods for capturing and removing large exotic fishes. Spearfishing surveys gave the biologists opportunities to observe the current underwater habitat features, species- specific habitat preferences, and approximate locations of exotic aquatic species aggregations. These surveys also provide information on species behavior and allowed biologists the opportunity to identify and capture elusive individuals (e.g., common snapping turtle [*Chelydra serpentine*]) that may avoid being captured through other conventional methods. Spearfishing surveys were limited in 2013 due to poor visibility/water clarity. A single Mozambique tilapia was removed from the West Pond during removal effort number three. This species was first documented at the Mitigation Area in 2012 when it was captured by spear in the East Pond. Five additional Mozambique tilapia were captured in gillnets during the 2013 removal efforts (ECORP 2013). This invasive species, if left unchecked, has the potential to flourish within the Ponds of the Mitigation Area and can migrate downstream and become established in the creek.

A large portion of the 2013 removal efforts incorporated gillnetting. Past surveys have shown high success in capturing and removing large adult fishes, especially when combined with spearfishing surveys. Spearfishing, in conjunction with gillnetting, often caused fish to flush into the nets. Gillnetting accounted for the majority of the catch in the Ponds in 2013 (79.8 percent). The majority of individuals captured were adult largemouth bass. In addition to those individuals removed, snorkeling surveys allowed for several sunfish nests to be destroyed, and areas around downed trees, snags, and undercut banks to be examined for the presence of exotic turtles. Six exotic turtles (red-eared sliders) were captured in gillnets over the course of the three removal efforts. Although turtle traps were set in the Ponds during removal effort number 3, the traps did not yield a single catch. One of the reasons for this may be attributed to timing. This removal effort was conducted in December when turtles are typically less active. In past sampling years, exotic turtles have been captured using various other methods, while

turtle trapping has not proven to be effective. No turtles (native or exotic) were observed aside from the captured individuals in 2013. The last record of a southwestern pond turtle detected in the Mitigation Area was in 2011 (ECORP 2012).

A single fyke net was deployed in the Connecting Channel during each removal effort. This method alone accounted for a greater number of individuals captured when compared to all other methods used in the West Pond or the East Pond. As stated before, the size classes of individuals captured in the Connecting Channel were far smaller than those captured in either of the Ponds. The Connecting Channel also accounted for a greater number of red swamp crayfish captured compared to the Ponds.

4.1 Problems Encountered During Removal

During each removal effort, care was taken regarding the placement of all sampling equipment in an attempt to reduce the potential for theft, removal, or vandalism. Bilingual signs were posted at the access points to the East and West Ponds. The signs stated that a biological study was taking place with nets in the water and instructed people to not swim or fish in the water or to let their pets swim in the water. Trap locations were generally chosen based upon the availability of suitable habitat for exotic species, as well as the ability to keep the traps concealed and inaccessible to the public. Despite these efforts, two minnow traps were stolen during removal effort number 3.

Spearfishing removal efforts in the East and West Ponds were limited in 2013 due to poor visibility conditions. Spearfishing was only utilized during removal effort number 3 as water visibility was slightly better (four to six feet) than removal efforts 1 and 2 (one to three feet). When checking gillnets, poor visibility also made it difficult to see fish that were trapped in the gillnets. Fishing tackle and bait containers were observed in open areas with access to the water. On a few occasions ECORP biologists encountered people fishing in both the creek and Ponds. When approaching these recreational users, ECORP biologists educated them about the rules of the Mitigation Area and advised them of approved fishing locations within the region.
In addition to the exotic aquatic species removal efforts conducted in the creek, several rock dams, log dams, and foot bridges were also removed. Several trees have also fallen into Haines Creek resulting in similar effects as these man-made barriers. These barriers can change both the stream habitat type (from riffle or glide to deep pools) and instream habitat complexity (i.e., filamentous algae, aquatic macrophytes, and overhanging vegetation). These altered habitats often created suitable foraging and breeding habitat for exotic aquatic species. Removal efforts in these areas are difficult due to the presence of woody debris which consistently snags nets and allows exotic species to escape. The removal of these man-made structures restored the natural flow of the creek, and removes the potential for adverse impacts to native fishes; however, many of the fallen trees remain in the creek as they are too large to move by hand.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The keys to enhancing and maintaining a successful exotic aquatic species removal program are: 1) maintain a systematic sampling approach that allows for dynamic variation with regard to changes in target species, site conditions, and seasonal variations, 2) eliminate habitat for exotic aquatic species to breeding, foraging, or take up shelter, 3) eliminate the potential for migration and/or introductions, 4) educate the public on exotic species and provide opportunities for them to get involved, and 5) provide continuous monitoring efforts to ensure long-term success. Due to the various intricacies associated with the exotic aquatic species removal program (e.g., potential for migration, habitat complexity, sensitivity of avoiding impacts to native species who share the same habitat as targeted species) within the Mitigation Area, the complete eradication of exotic aquatic species will not be possible without extensive measures.

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

Prior exotic species reports have suggested transforming the Ponds into a stream-type system to coincide with the habitat in Haines Creek which would benefit the native aquatic species of the Mitigation Area. Another suggestion was to install a fish screen at the confluence of the West Pond and Haines Creek in an effort to reduce the migration of exotic aquatic species downstream into the creek. Transforming the ponds into a stream-type habitat would greatly reduce the available habitat for exotic aquatic species to breeding, foraging, or take up shelter; however, it would also eliminate habitat that may be used by migratory bird species. Fish screens do not address the problem, are costly to maintain, and only restrict size classes larger than the mesh size of the screen. In most instances, juvenile and YOY fishes would still be able to swim past fish screens and become established downstream.

Rather than completely eliminate both Ponds, another alternative may be to divert the water feeding the Ponds directly into Haines Creek with controls that allow for periodic filling of the Ponds, as needed. The area retaining the Ponds would need to be engineered to reduce the overall surface area to allow for redirection of water flow. The Ponds would also need to be engineered to allow for periodic draining or pumping of water from one pond to the other in order to eliminate the potential for exotic species recruitment. By having the Ponds completely isolated from the creek, chemical treatments could also be used. Engineering plans should ensure adequate berm height to account for increase water levels following large storm events. This alternative would increase the amount of suitable habitat for native fishes, remove habitat that is highly favorable for exotic aquatic species, and maintain habitat for migratory birds.

In addition to altering the Ponds, continuous monitoring efforts should be conducted in order to monitor the distribution, densities, and changes in exotic species assemblages. Continuous

monitoring will allow for early detection of new invasive species, range extensions, predation rates on native species, or changes in distributions or densities of already established species. Rock dams, foot bridges, and other obstructions that impede the natural flow of the creek can be problematic to native fishes and often create favorable conditions for exotic aquatic species. Efforts should continue to monitor for these types of obstruction and when observed they should be removed. Public outreach regarding the biological resources of the Mitigation Area should continue in an effort to educate recreational users of the approved and prohibited recreational activities at the site and how to report infractions.

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

ECORP remains committed to providing an effective and scientifically-based exotic aquatic species removal program and will continue to strive to conduct efficient, targeted, and humane removal of these species from the Mitigation Area.

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APPENDIX A

Species Captured During the Exotic Aquatic Species Removal Efforts, 2013

Appendix A: Species Captured During the Exotic Aquatic Species Removal Efforts, 2013.

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

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

APPENDIX B

Exotic Aquatic Species Removal Photographs

B-1) A log dam observed and removed in Haines Canyon Creek.

B-2) An ECORP biologist dip-netting in Haines Canyon Creek.

B-3) Gillnets deployed in the West Pond along with an entanglement hazard sign at an access point to the pond.

B-4) An ECORP Biologist checking a gillnet in the East Pond.

Exotic Aquatic Species Removal Photographs

B-5) A Mozambique tilapia captured with a gillnet deployed in the East Pond.

B-6) ECORP biologist measuring a red-eared slider captured with a gillnet deployed in the East Pond.

Exotic Aquatic Species Removal Photographs

B-7) ECORP biologists two-person seining in Haines Canyon Creek.

B-8) Young-of-the-year largemouth bass captured while two-person seining in Haines Canyon Creek.

Exotic Aquatic Species Removal Photographs

B-9) A green sunfish captured while two-person seining in Haines Canyon Creek.

B-10) A common carp (top), a scale-less common carp (mirror) (middle), and a goldfish (bottom) captured with a gillnet deployed in the East Pond.

B-11) A goldfish captured in a fyke net deployed in the Connector Channel.

B-12) Red swamp crayfish captured with minnow traps in Haines Canyon Creek.

Exotic Aquatic Species Removal Photographs

B-13) Two red-eared sliders captured with a gillnet deployed in the East Pond.

B-14) A Mozambique tilapia captured while spearfishing in the West Pond.

APPENDIX H

2013 Water Quality Monitoring Report

County of Los Angeles
Department of Public Works

October 2013 Water Quality Monitoring Report

for the

Big Tujunga Wash Mitigation Area

December 2013

MWH

October 2013 Water Quality Monitoring Report

for the

Big Tujunga Wash Mitigation Area

December 2013

Prepared For:

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Table of Contents

Section Name **Page Number**

LIST OF FIGURES

Figure Number **Page**

LIST OF TABLES

Table Number **Page**

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Water Quality Monitoring
October 2013

BACKGROUND

The County of Los Angeles Department of Public Works (LACDPW) purchased an approximately 210-acre parcel in Big Tujunga Wash as a mitigation area for Los Angeles County Flood Control District (LACFCD) projects throughout Los Angeles County. In coordination with local agencies, the LACDPW defined a number of measures to improve habitat quality at the site. A Final Master Mitigation Plan (FMMP) was prepared to guide the implementation of these enhancements. The FMMP also includes a monitoring program to gather data on conditions at the site during implementation of the improvements. The FMMP was prepared and is currently being implemented by ECORP Consulting, Inc. (ECORP). MWH, a subconsultant to ECORP, is responsible for the water quality monitoring program described in the FMMP. Water quality monitoring was conducted on a quarterly basis from the fourth quarter of 2000 through the fourth quarter of 2005. In 2006, monitoring was conducted on a semi-annual basis. In 2007 through 2009 monitoring was conducted annually, in December. In 2010, monitoring was conducted in November; pesticide sampling was conducted in early December. In 2012, monitoring was conducted in February and November, and in 2013, monitoring was conducted in October. This report presents the results of the water quality sampling for October 2013.

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

Project Site Activities

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

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

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

Date	Activity
10/2001 to 11/2001	Fish Sampling at Haines Canyon Creek
12/2001	Water quality sampling
1/2002	Final riparian planting
2/2002	Upland replacement planting
3/2002	Water quality sampling
6/2002	Water quality sampling
7/2002	Fish Sampling at Haines Canyon Creek
9/2002	Water quality sampling
10/2002	Grading at Canyon Trails Golf Club begins
11/2002	Fish Sampling at Haines Canyon Creek
12/2002	Water quality sampling
3/2003	Water quality sampling
4/2003	Meeting with Canyon Trails Golf Club to discuss future use of herbicides and fertilizers
6/2003	Water quality sampling
8/2003	Fish Sampling at Haines Canyon Creek
9/2003	Water quality sampling
Fall 2003	Completion of the golf course construction
12/2003	Water quality sampling
1/2004	Fish Sampling at Haines Canyon Creek
4/2004	Water quality sampling
4/2004	Rock Dam Removal Day
6/2004	Angeles National Golf Club (previously named Canyon Trails) opens to the public
7/2004	Water quality sampling
10/2004	Water quality sampling
12/2004	Water quality sampling
4/2005	Water quality sampling
6/2005	Water quality sampling
10/2005	Water quality sampling
12/2005	Water quality sampling
7/2006	Water quality sampling
12/2006	Water quality sampling
12/2007	Water quality sampling
12/2008	Water quality sampling
8/2009 to 10/2009	The Station Fire was the largest fire in the recorded history of Angeles National Forest and the 10th largest fire in California since 1933. The fire burned a total of 160,577 acres. The fire was fully contained on October 16, 2009. (Source: Angeles National Forest Incident Update available - http://www.inciweb.org/incident/1856/)
12/2009	Water quality sampling
11/2010	Water quality sampling
12/2010	Water quality sampling for pesticides
9/2011 to 1/2012	Water lettuce removal
2/2012	Water quality sampling
11/2012	Water quality sampling
10/2013	Water quality sampling

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, and organophosphorous 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 October 30, 2013.

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 October 2013

Date	October 30, 2013		
Air Temperature	Approximately 65-67 degrees Fahrenheit during sample collection period		
Skies	Clear, sunny		
Observations	Water clear at all locations, relatively low turbidity		
Sampling Locations	**Latitude**	**Longitude**	**Time of sample**
Haines Canyon Creek	34 16' 0.092'' N	118 21' 25.716' 'W	1145
Haines Canyon Creek, inflow to Tujunga Ponds	34 16' 6.040'' N	118 20' 22.616'' W	1030
Haines Canyon Creek, outflow from Tujunga Ponds	34 16' 8.263'' N	118 20' 30.824'' W	1100
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 meters were used in the field:

- Dissolved oxygen – YSI 550A Field DO meter and thermometer
- pH and temperature – Orion 230A pH meter with HACH 51935 electrode

Pesticides were analyzed by Emax Laboratories, Inc., Torrance, California. All other analyses were performed at Eurofin 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[2]	laboratory	EPA 8141A
Organophosphorous Pesticides[3]	laboratory	EPA 8081A
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 8081A tests for aldrin, BHC, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, and toxaphene.

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

Calculating flow then involves solving the following equation:

$$Flow = ALC / T$$

Where:

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

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

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

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

RESULTS

Baseline Water Quality

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

October 2013 Results

Water Quality

Results of analyses conducted by Eurofin Eaton 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 – October 30, 2013

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	18.3	17.8	NA	15.6
Dissolved Oxygen	mg/L	6.8	8.0	NA	8.9
pH	std units	7.23	7.28	NA	8.21
Total residual chlorine	mg/L	ND	ND	NA	ND
Ammonia-Nitrogen	mg/L	ND	ND	NA	ND
Kjeldahl Nitrogen	mg/L	0.37	0.38	NA	ND
Nitrite-Nitrogen	mg/L	ND	ND	NA	ND
Nitrate-Nitrogen	mg/L	7.6	5.5	NA	5.0
Orthophosphate-P	mg/L	ND	ND	NA	0.015
Total phosphorus-P	mg/L	0.037	ND	NA	ND
Glyphosate	µg/L	ND	ND	NA	ND
Chloropyrifos*	ng/L	ND	ND	NA	ND
Pesticides (EPA 8081A)**	µg/L	ND	ND	NA	ND
Turbidity	NTU	1.5	2.2	NA	0.30
Fecal Coliform Bacteria	(MPN/100 ml)	79	22	NA	79
Total Coliform Bacteria	(MPN/100 ml)	490	790	NA	700

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 8081A 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 October 2013 are summarized in **Table 7**.

Table 7
Estimated Flows for October 2013

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
10/30/13	2	3	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 October 2013 sampling are described by parameter in **Table 14**.

Table 14
Discussion of October 2013 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 6.8 mg/L in the inflow to the Tujunga Ponds to 8.9 in Haines Canyon Creek leaving the site. DO levels at all stations were above the recommended minimum (5.0 mg/L) for warmwater fish species. DO levels in the Tujunga Ponds were close to the recommended mean (7.0 mg/L) for warmwater fish species.
pH	• Lowest pH was observed in the inflow to Tujunga Ponds (7.23), with highest pH observed in Haines Canyon Creek leaving the site (8.21). 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 levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range at these three stations was <0.02 to 0.037 mg/L; recommended range is <0.05 – 0.1 mg/L).
Glyphosate	• Glyphosate was not detected at any station.
Chloropyrifos	• Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.
Pesticides	• Pesticides analyzed by EPA Method 8081A were not detected at any station.
Turbidity	• Turbidity levels were very low (2.2 NTU or less) at all stations.
Bacteria	• The fresh water bacteria standard for water contact recreation is for *E. coli* (126 MPN/100 ml geometric mean, 235 MPN/100 ml single sample limits). The observed fecal coliform levels were below the standard at the three stations with flow on the sample date. Previously, the water contact standard was 200 MPN/100 ml fecal coliform. Sampling specifically for *E. coli* was not conducted. • Total coliform levels ranged from 490 in Haines Canyon Creek inflow to Tujunga Ponds to 790 MPN/100 ml in the outflow from the ponds. [Note that recreation standards are for *E. coli*. Total coliform standards apply to 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
October 2013

eurofins | Eaton Analytical

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

NELAP ACCREDITED TNI LABORATORY 01114CA

ilac-MRA

ACLASS ACCREDITED TESTING AT-1807

Laboratory Report

for

MWH Americas - Arcadia
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007
Attention: Sarah Garber

Date of Issue
11/22/2013

EUROFINS EATON ANALYTICAL

DST: David S Tripp

Project Manager

Report: 455275
Project: BIG-TUJUNGA
Group: Water Quality Monitoring
PO#: PO#: 10503619.011601

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

STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	**Mississippi**	Certified
Alaska	CA00006	**Montana**	Cert 0035
Arizona	AZ0778	**Nebraska**	Certified
Arkansas	Certified	**Nevada**	CA00006-2012-1
California – NELAP	01114CA	**New Hampshire**	2959
California – ELAP	2813	**New Jersey**	CA 008
Los Angeles County Sanitation Districts	10264	**New Mexico**	Certified
Colorado	Certified	**New York**	11320
Connecticut	PH-0107	**North Carolina**	06701
Delaware	CA 006	**North Dakota**	R-009
Florida	E871024	**Oregon**	CA 200003-011
Georgia	947	**Pennsylvania**	68-565
Guam	12-006r	**Rhode Island**	LAO00326
Hawaii	Certified	**South Carolina**	87016001
Idaho	Certified	**South Dakota**	Certified
Illinois	200033	**Tennessee**	TN02839
Indiana	C-CA-01	**Texas**	T104704230-13-5
Kansas	E-10268	**Utah**	CA000062013
Kentucky	90107	**Vermont**	VT0114
Louisiana	LA130008	**Virginia**	00210
Maine	CA0006	**Washington**	C838
Maryland	224	**West Virginia**	9943 C
Commonwealth of Northern Marianas Is.	MP0004	**Wisconsin**	998316660
Massachusetts	M-CA006	**Wyoming**	8TMS-L
Michigan	9906	**EPA Region 5**	Certified

NELAP/TNI Recognized Accreditation Bodies - in 'BLUE'

The tests listed below are accredited and meet the requirements of ISO 17025 as verified by the ANSI-ASQ National Accreditation Board/ACLASS.
Refer to Certificate and scope of accreditation (AT 1807) found at: http://www.eatonanalytical.com

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Drinking Water	Food & Beverage	Waste Water
1,4-Dioxane	EPA 522	x	x	
2,3,7,8-TCDD	Modified EPA 1613B	x	x	
Acrylamide	In House Method	x	x	
Alkalinity	SM 2320B	x	x	x
Ammonia	EPA 350.1		x	x
Ammonia	SM 4500-NH3 H (18th)		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		
Bicarbonate Alkalinity as HCO3	SM 2330B	x	x	x
BOD / CBOD	SM 5210B		x	x
Bromate	In House Method	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	
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	x	x	
Diquat and Paraquat	EPA 549.2	x	x	
DBP/HAA	SM 6251B	x	x	
Dissolved Oxygen	SM 4500-O G		x	x
E. Coli	(MTF/EC+MUG)	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	x	x	
Endothall	EPA 548.1	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
Glyphosate	EPA 547	x	x	
Gross Alpha/Beta	EPA 900.0	x	x	x
HAAs/ Dalapon	EPA 552.3	x	x	
Hardness	SM 2340B	x	x	x
Heterotrophic Bacteria	In House Method	x	x	
Heterotrophic Bacteria	SM 9215 B	x	x	
Hexavalent Chromium	EPA 218.6	x	x	x
Hexavalent Chromium	EPA 218.7	x	x	
Hexavalent Chromium	SM 3500-Cr B or C (20th)			x

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Drinking Water	Food & Beverage	Waste Water
Hormones	EPA 539	x	x	
Hydroxide as OH Calc.	SM 2330B	x	x	
Kjeldahl Nitrogen	EPA 351.2			x
Mercury	EPA 245.1	x	x	x
Metals	EPA 200.7 / 200.8	x	x	x
Microcystin LR	ELISA	x	x	
NDMA	EPA 521	x	x	
Nitrate/Nitrite Nitrogen	EPA 353.2	x	x	x
OCL, Pesticides/PCB	EPA 505	x	x	
Ortho Phosphate	EPA 365.1	x	x	
Ortho Phosphate and Total Phosphorous	EPA 365.1/SM 4500-P E			x
Ortho Phosphorous	SM 4500P E	x	x	
Oxyhalides Disinfection Byproducts	EPA 317.0	x	x	
Perchlorate	EPA 331.0	x	x	
Perchlorate	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	x	x	
Pseudomonas	IDEXX Pseudalert	x	x	
Radium-226	RA-226 GA	x	x	
Radium-228	RA-228 GA	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	x
Silica	SM 4500-Si D	x	x	x
Silica	SM 4500-SiO2 C	x		x
Sulfide	SM 4500-$S^{=}$ D			x
Surfactants	SM 5540C	x	x	x
Taste and Odor Analytes	SM 6040E	x	x	
Total Coliform	SM 9221 A, B	x	x	
Total Coliform (Enumeration)	SM 9221 A, B, C	x	x	
Total Coliform / E. coli	Colisure	x	x	
Total Coliform	SM 9221B			x
Total Coliform with Chlorine Present	SM 9221B			x
Total Coliform / E.coli	SM 9223	x	x	
TOC	SM 5310C		x	x
TOC/DOC	SM 5310C	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 F			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	x
VOC	EPA SW 846 8260	x	x	
VOC	In House Method	x	x	
Yeast and Mold	SM 9610	x	x	

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Acknowledgement of Samples Received

Addr: **MWH Americas - Arcadia**
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Attn: Sarah Garber
Phone: 626-568-6910

Client ID: MWH-ECORP
Folder #: 455275
Project: BIG-TUJUNGA
Sample Group: Water Quality Monitoring

Project Manager: David S Tripp
Phone: (626) 386-1158
PO #: 10503619.011601

The following samples were received from you on **October 30, 2013**. 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
201310300570	TJPIN103013	10/30/2013 1030

@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
201310300571	TJPOUT103013	10/30/2013 1100

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

Sample #	Sample ID	Sample Date
201310300572	HCC103013	10/30/2013 1145

@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

455275

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

Phone: 626 386 1100
Fax: 626 386 1101

800 566 LABS (800 566 5227)

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: _____

SAMPLES CHECKED AGAINST COC BY: _____

SAMPLES LOGGED IN BY: _____

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

SAMPLE TEMP RECEIVED AT:

[ ] Colton / No. California / Arizona _____ °C (Compliance: 4 ± 2 °C)

[X] Monrovia 13.4 °C (Compliance: 4 ± 2 °C)

CONDITION OF BLUE ICE: Frozen ✓ Partially Frozen _____ Thawed _____ Wet Ice _____ No Ice _____

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

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: MWH-ECORP

PROJECT CODE: 105036 19.01160 BIG-TUJUNGA

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

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

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

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

REGULATION INVOLVED: _____

Type of samples (circle one): ROUTINE SPECIAL CONFIRMATION (eg. SDWA, Phase V, NPDES, FDA,...)

SEE ATTACHED BOTTLE ORDER FOR ANALYSES [X] (check for yes), *OR*

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

SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX *	FIELD DATA	FIELD DATA	Coli	Tot. Cl	NO3 by N	NO2 by N	oPO4	SAMPLER COMMENTS
10/30	1030	TJPIN103013	1	RSW			X	X	X	X	X	JC 10/30/13
10/30	1100	TJPOUT103013	2	RSW			X	X	X	X	X	1356
10/30	1145	HCC103013 ✓	3	RSW			X	X	X	X	X	
												4th station dry
												NO samples

2013

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

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
SAMPLED BY:		SARAH GARBER	MWH / PRIN ENV SCI	10/30/13	1330
RELINQUISHED BY:					
RECEIVED BY:	Per Mayo	Paul Mayo	EEA	10/30/13	1335
RELINQUISHED BY:					
RECEIVED BY:					

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formerly MWH Laboratories

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

Kit Order for MWH Americas - Arcadia

David S Tripp is your Eurofins Eaton Analytical Project Manager

Note: Sampler Please return this paper with your samples

Kit #: 78270
Created By: DST
Deliver By: 10/25/2013
STG: Bottle Orders

Client ID: MWH-ECORP
Project Code: BIG-TUJUNGA Bottle Orders
Group Name: Water Quality Monitoring
PO#/JOB#: ~~1050161O.011601~~ 10503619.011601

Ship Sample Kits to	Send Report to	Billing Address
MWH Americas - Arcadia 618 Michillinda Ave. Suite 200 Arcadia, CA 91007 Attn: Sarah Garber Phone: 626-568-6910	MWH Americas - Arcadia 618 Michillinda Ave. Suite 200 Arcadia, CA 91007 Attn: Sarah Garber Phone: 626-568-6910	MWH Americas Inc PO Box 6610 Broomfield, CO 80021 Attn: Accounts Payable

# of Samples	Tests	Bottles - Qty for each sample, type & preservative if ai	UN DOT #
4	@8081A	2 1L amber glass no preservative	
4	@8141EDD	2 1L amber glass 8141WRD_NO_PRESERVATIVE	
4	Ammonia Nitrogen, Total Kjeldahl Nitrogen, Total phosphorus as P	1 250ml poly 0.5ml H2SO4 (50%)	UN1830
4	Fecal Coliform Bacteria, Total Coliform Bacteria	1 250ml poly sterilized 0.25ml thio (8%)	
4	Glyphosate	1 125ml amber glass no preservative	
4	Nitrate as Nitrogen by IC, Nitrate as NO3 (calc), Nitrite Nitrogen by IC, Orthophosphate as P, Turbidity	1 125ml poly no preservative	
4	Orthophosphate as PO4	1 125ml poly OPO4_no preservative	
4	Total Chlorine Residual	1 125ml amber glass CHL_no preservative	

Comments

SHIPPING: Please label "BIG T WASH"
Client will pickup the sample kits on Friday 10/25 in the AM.

SAMPLER: Please place ice packs in a freezer over night and return samples on ice packs or wet ice to the lab same day collected.

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

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750 Royal Oaks Drive, Suite 100
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Fax: (626) 386-1101
1 800 566 LABS (1 800 566 5227)

Laboratory Comments
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Folder Comments

Analytical results for 608 and 8141 are submitted by Emax Laboratories, Inc. Torrance, CA, CA Certification No. 02116CA

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

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750 Royal Oaks Drive, Suite 100
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Laboratory Hits
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Samples Received on:
10/30/2013

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
	201310300570	**TJPIN103013**				
10/30/2013 14:27	Fecal Coliform Bacteria		79		MPN/100 mL	1.8
11/06/2013 11:58	Kjeldahl Nitrogen		0.37		mg/L	0.2
10/30/2013 21:17	Nitrate as Nitrogen by IC		7.6	10	mg/L	0.2
10/30/2013 21:17	Nitrate as NO3 (calc)		33	45	mg/L	0.88
10/30/2013 14:27	Total Coliform Bacteria		490		MPN/100 mL	1.8
11/06/2013 13:32	Total phosphorus as P		0.037		mg/L	0.02
11/06/2013 14:10	Total phosphorus as PO4- Calc.		0.11		mg/L	0.031
10/30/2013 17:11	Turbidity		1.5	5	NTU	0.05
	201310300571	**TJPOUT103013**				
10/30/2013 14:27	Fecal Coliform Bacteria		22		MPN/100 mL	1.8
11/06/2013 11:59	Kjeldahl Nitrogen		0.38		mg/L	0.2
10/30/2013 21:30	Nitrate as Nitrogen by IC		5.5	10	mg/L	0.2
10/30/2013 21:30	Nitrate as NO3 (calc)		24	45	mg/L	0.88
10/30/2013 14:27	Total Coliform Bacteria		790		MPN/100 mL	1.8
10/30/2013 17:10	Turbidity		2.2	5	NTU	0.05
	201310300572	**HCC103013**				
10/30/2013 14:27	Fecal Coliform Bacteria		79		MPN/100 mL	1.8
10/30/2013 21:43	Nitrate as Nitrogen by IC		5.0	10	mg/L	0.2
10/30/2013 21:43	Nitrate as NO3 (calc)		22	45	mg/L	0.88
10/30/2013 18:01	Orthophosphate as P		0.015		mg/L	0.01
10/30/2013 19:11	Orthophosphate as PO4		0.046		mg/L	0.031
10/30/2013 14:27	Total Coliform Bacteria		700		MPN/100 mL	1.8
10/30/2013 17:06	Turbidity		0.30	5	NTU	0.05

SUMMARY OF POSITIVE DATA ONLY

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Monrovia, California 91016-3629
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1 800 566 LABS (1 800 566 5227)

Laboratory Data
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
TJPIN103013 (201310300570)						**Sampled on 10/30/2013 1030**		
			EPA 8141A - Organophosphorous Pesticides (Sub)					
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Azinphos methyl	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Bolstar	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Chlorpyrifos	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Coumaphos	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Demeton	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Diazinon	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Dichlorvos	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Disulfoton	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Ethoprop	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Fensulfothion	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Fenthion	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Methyl Parathion	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Mevinphos	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Naled	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Phorate	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Ronnel	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Stirophos	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Tokuthion	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Trichloronate	ND	ug/L	0.98	1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Tributylphosphate	82	%		1
11/4/2013	11/05/2013	15:30	(EPA 8141A)	Triphenyl Phosphate	83	%		1
			EPA 608 - Organochlorine Pesticides					
11/4/2013	11/06/2013	18:25	(EPA 608)	4,4-DDD	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	4,4-DDE	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	4,4-DDT	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	Aldrin	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	alpha-BHC	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	alpha-Chlordane	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	beta-BHC	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	delta-BHC	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	Dieldrin	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.099	1
11/4/2013	11/06/2013	18:25	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.099	1

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

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

Laboratory Data
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/4/2013	11/06/2013 18:25		(EPA 608)	Endrin	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Endrin Aldehyde	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Endrin Ketone	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Gamma-BHC	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	gamma-Chlordane	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Heptachlor	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.099	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Methoxychlor	ND	ug/L	0.99	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Toxaphene	ND	ug/L	2	1
11/4/2013	11/06/2013 18:25		(EPA 608)	Decachlorobiphenyl	121	%		1
11/4/2013	11/06/2013 18:25		(EPA 608)	Tetrachlorometaxylene	111	%		1
	EPA 608 - Organochlorine PCBs							
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1016 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1221 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1232 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1242 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1248 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1254 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	PCB 1260 Aroclor	ND	ug/L	0.99	1
11/4/2013	11/05/2013 17:28		(EPA 608)	Decachlorobiphenyl	102	%		1
11/4/2013	11/05/2013 17:28		(EPA 608)	Tetrachlorometaxylene	84	%		1
	SM 9221C - Fecal Coliform Bacteria							
	10/30/2013 14:27	734789	(SM 9221C)	Fecal Coliform Bacteria	79	MPN/100 mL	1.8	1
	SM 9221B - Total Coliform Bacteria							
	10/30/2013 14:27	734932	(SM 9221B)	Total Coliform Bacteria	490	MPN/100 mL	1.8	1
	S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/06/2013 14:10		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.11	mg/L	0.031	1
	4500P-E/365.1 - Orthophosphate as PO4 (CAL)							
	10/30/2013 19:11		(4500P-E/365.1)	Orthophosphate as PO4	ND	mg/L	0.031	1
	SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	10/31/2013 12:00	734247	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1
	EPA 547 - Glyphosate							
	10/31/2013 20:08	734694	(EPA 547)	Glyphosate	ND	ug/L	6	1
	EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	10/30/2013 21:17	734685	(EPA 300.0)	Nitrate as Nitrogen by IC	7.6	mg/L	0.2	2
	10/30/2013 21:17	734685	(EPA 300.0)	Nitrate as NO3 (calc)	33	mg/L	0.88	2

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

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1 800 566 LABS (1 800 566 5227)

Laboratory Data
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	10/30/2013 21:17	734685	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
			SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)					
	11/06/2013 13:32	735197	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.037	mg/L	0.02	1
			EPA 351.2 - Total Kjeldahl Nitrogen					
	11/06/2013 11:58	735524	(EPA 351.2)	Kjeldahl Nitrogen	0.37	mg/L	0.2	1
			EPA 350.1 - Ammonia Nitrogen					
	11/04/2013 15:35	735119	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
			EPA 180.1 - Turbidity					
	10/30/2013 17:11	734425	(EPA 180.1)	Turbidity	1.5	NTU	0.05	1
			4500P-E/365.1 - Orthophosphate as P (OPO4)					
	10/30/2013 18:02	734447	(4500P-E/365.1)	Orthophosphate as P	ND	mg/L	0.01	1
TJPOUT103013 (201310300571)						**Sampled on 10/30/2013 1100**		
			EPA 8141A - Organophosphorous Pesticides (Sub)					
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Azinphos methyl	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Bolstar	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Chlorpyrifos	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Coumaphos	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Demeton	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Diazinon	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Dichlorvos	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Disulfoton	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Ethoprop	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Fensulfothion	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Fenthion	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Methyl Parathion	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Mevinphos	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Naled	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Phorate	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Ronnel	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Stirophos	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Tokuthion	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Trichloronate	ND	ug/L	1	1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Tributylphosphate	90	%		1
11/4/2013	11/05/2013 16:04		(EPA 8141A)	Triphenyl Phosphate	94	%		1
			EPA 608 - Organochlorine Pesticides					

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Laboratory Data
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/4/2013	11/06/2013	18:45	(EPA 608)	4,4-DDD	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	4,4-DDE	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	4,4-DDT	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Aldrin	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	alpha-BHC	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	alpha-Chlordane	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	beta-BHC	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	delta-BHC	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Dieldrin	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Endrin	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Endrin Ketone	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Gamma-BHC	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	gamma-Chlordane	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Heptachlor	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.095	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Methoxychlor	ND	ug/L	0.95	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Toxaphene	ND	ug/L	1.9	1
11/4/2013	11/06/2013	18:45	(EPA 608)	Decachlorobiphenyl	119	%		1
11/4/2013	11/06/2013	18:45	(EPA 608)	Tetrachlorometaxylene	113	%		1
		EPA 608 - Organochlorine PCBs						
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1016 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1221 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1232 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1242 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1248 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1254 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	PCB 1260 Aroclor	ND	ug/L	0.95	1
11/4/2013	11/05/2013	17:52	(EPA 608)	Decachlorobiphenyl	100	%		1
11/4/2013	11/05/2013	17:52	(EPA 608)	Tetrachlorometaxylene	90	%		1
		SM 9221C - Fecal Coliform Bacteria						
	10/30/2013	14:27 734789	(SM 9221C)	Fecal Coliform Bacteria	22	MPN/100 mL	1.8	1
		SM 9221B - Total Coliform Bacteria						

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Laboratory Data
Report: 455275

MWH Americas - Arcadia
Sarah Garber
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Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	10/30/2013 14:27	734932	(SM 9221B)	Total Coliform Bacteria	790	MPN/100 mL	1.8	1
	S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/06/2013 14:10		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	ND	mg/L	0.031	1
	4500P-E/365.1 - Orthophosphate as PO4 (CAL)							
	10/30/2013 19:11		(4500P-E/365.1)	Orthophosphate as PO4	ND	mg/L	0.031	1
	SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	10/31/2013 12:00	734247	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1
	EPA 547 - Glyphosate							
	10/31/2013 20:18	734694	(EPA 547)	Glyphosate	ND	ug/L	6	1
	EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	10/30/2013 21:30	734685	(EPA 300.0)	Nitrate as Nitrogen by IC	5.5	mg/L	0.2	2
	10/30/2013 21:30	734685	(EPA 300.0)	Nitrate as NO3 (calc)	24	mg/L	0.88	2
	10/30/2013 21:30	734685	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
	SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)							
	11/06/2013 13:34	735197	(SM4500-PE/EPA 365.1)	Total phosphorus as P	ND	mg/L	0.02	1
	EPA 351.2 - Total Kjeldahl Nitrogen							
	11/06/2013 11:59	735524	(EPA 351.2)	Kjeldahl Nitrogen	0.38	mg/L	0.2	1
	EPA 350.1 - Ammonia Nitrogen							
	11/04/2013 15:36	735119	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
	EPA 180.1 - Turbidity							
	10/30/2013 17:10	734425	(EPA 180.1)	Turbidity	2.2	NTU	0.05	1
	4500P-E/365.1 - Orthophosphate as P (OPO4)							
	10/30/2013 18:00	734447	(4500P-E/365.1)	Orthophosphate as P	ND	mg/L	0.01	1
HCC103013 (201310300572)						**Sampled on 10/30/2013 1145**		
	EPA 8141A - Organophosphorous Pesticides (Sub)							
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Azinphos methyl	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Bolstar	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Chlorpyrifos	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Coumaphos	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Demeton	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Diazinon	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Dichlorvos	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Disulfoton	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Ethoprop	ND	ug/L	0.99	1
11/4/2013	11/05/2013 16:38		(EPA 8141A)	Fensulfothion	ND	ug/L	0.99	1

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Laboratory Data
Report: 455275

MWH Americas - Arcadia
Sarah Garber
618 Michillinda Ave.
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Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Fenthion	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Methyl Parathion	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Mevinphos	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Naled	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Phorate	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Ronnel	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Stirophos	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Tokuthion	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Trichloronate	ND	ug/L	0.99	1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Tributylphosphate	86	%		1
11/4/2013	11/05/2013	16:38	(EPA 8141A)	Triphenyl Phosphate	90	%		1
			EPA 608 - Organochlorine Pesticides					
11/4/2013	11/06/2013	19:05	(EPA 608)	4,4-DDD	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	4,4-DDE	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	4,4-DDT	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Aldrin	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	alpha-BHC	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	alpha-Chlordane	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	beta-BHC	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	delta-BHC	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Dieldrin	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Endrin	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Endrin Ketone	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Gamma-BHC	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	gamma-Chlordane	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Heptachlor	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.093	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Methoxychlor	ND	ug/L	0.93	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Toxaphene	ND	ug/L	1.9	1
11/4/2013	11/06/2013	19:05	(EPA 608)	Decachlorobiphenyl	115	%		1
11/4/2013	11/06/2013	19:05	(EPA 608)	Tetrachlorometaxylene	110	%		1
			EPA 608 - Organochlorine PCBs					

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Samples Received on:
10/30/2013

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1016 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1221 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1232 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1242 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1248 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1254 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	PCB 1260 Aroclor	ND	ug/L	0.93	1
11/4/2013	11/05/2013 18:16		(EPA 608)	Decachlorobiphenyl	98	%		1
11/4/2013	11/05/2013 18:16		(EPA 608)	Tetrachlorometaxylene	84	%		1
	SM 9221C - Fecal Coliform Bacteria							
	10/30/2013 14:27	734789	(SM 9221C)	Fecal Coliform Bacteria	79	MPN/100 mL	1.8	1
	SM 9221B - Total Coliform Bacteria							
	10/30/2013 14:27	734932	(SM 9221B)	Total Coliform Bacteria	700	MPN/100 mL	1.8	1
	S4500PE/ 365.1 - Total phosphorus as PO4- Calc.							
	11/06/2013 14:10		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	ND	mg/L	0.031	1
	4500P-E/365.1 - Orthophosphate as PO4 (CAL)							
	10/30/2013 19:11		(4500P-E/365.1)	Orthophosphate as PO4	0.046	mg/L	0.031	1
	SM 4500-CL G - Total Chlorine Residual (H3=past HT not compliant)							
	10/31/2013 12:00	734247	(SM 4500-CL G)	Total Chlorine Residual (H3=past HT not compliant)	ND	mg/L	0.1	1
	EPA 547 - Glyphosate							
	10/31/2013 20:29	734694	(EPA 547)	Glyphosate	ND	ug/L	6	1
	EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	10/30/2013 21:43	734685	(EPA 300.0)	Nitrate as Nitrogen by IC	5.0	mg/L	0.2	2
	10/30/2013 21:43	734685	(EPA 300.0)	Nitrate as NO3 (calc)	22	mg/L	0.88	2
	10/30/2013 21:43	734685	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
	SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)							
	11/06/2013 13:35	735197	(SM4500-PE/EPA 365.1)	Total phosphorus as P	ND	mg/L	0.02	1
	EPA 351.2 - Total Kjeldahl Nitrogen							
	11/06/2013 12:01	735524	(EPA 351.2)	Kjeldahl Nitrogen	ND	mg/L	0.2	1
	EPA 350.1 - Ammonia Nitrogen							
	11/04/2013 15:38	735119	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
	EPA 180.1 - Turbidity							
	10/30/2013 17:06	734425	(EPA 180.1)	Turbidity	0.30	NTU	0.05	1
	4500P-E/365.1 - Orthophosphate as P (OPO4)							
	10/30/2013 18:01	734447	(4500P-E/365.1)	Orthophosphate as P	0.015	mg/L	0.01	1

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QC Ref # 734247 - Total Chlorine Residual (H3=past HT not complian **Analysis Date: 10/31/2013**

201310300570	TJPIN103013	Analyzed by: A4H
201310300571	TJPOUT103013	Analyzed by: A4H
201310300572	HCC103013	Analyzed by: A4H

QC Ref # 734425 - Turbidity **Analysis Date: 10/30/2013**

201310300570	TJPIN103013	Analyzed by: ADV
201310300571	TJPOUT103013	Analyzed by: ADV
201310300572	HCC103013	Analyzed by: ADV

QC Ref # 734447 - Orthophosphate as P (OPO4) **Analysis Date: 10/30/2013**

201310300570	TJPIN103013	Analyzed by: AF1
201310300571	TJPOUT103013	Analyzed by: AF1
201310300572	HCC103013	Analyzed by: AF1

QC Ref # 734685 - Nitrate, Nitrite by EPA 300.0 **Analysis Date: 10/30/2013**

201310300570	TJPIN103013	Analyzed by: CYP
201310300571	TJPOUT103013	Analyzed by: CYP
201310300572	HCC103013	Analyzed by: CYP

QC Ref # 734694 - Glyphosate **Analysis Date: 10/31/2013**

201310300570	TJPIN103013	Analyzed by: SZZ
201310300571	TJPOUT103013	Analyzed by: SZZ
201310300572	HCC103013	Analyzed by: SZZ

QC Ref # 734789 - Fecal Coliform Bacteria **Analysis Date: 10/30/2013**

201310300570	TJPIN103013	Analyzed by: GPM
201310300571	TJPOUT103013	Analyzed by: GPM
201310300572	HCC103013	Analyzed by: GPM

QC Ref # 734932 - Total Coliform Bacteria **Analysis Date: 10/30/2013**

201310300570	TJPIN103013	Analyzed by: FHC
201310300571	TJPOUT103013	Analyzed by: FHC
201310300572	HCC103013	Analyzed by: FHC

QC Ref # 735119 - Ammonia Nitrogen **Analysis Date: 11/04/2013**

201310300570	TJPIN103013	Analyzed by: MYH
201310300571	TJPOUT103013	Analyzed by: MYH
201310300572	HCC103013	Analyzed by: MYH

QC Ref # 735197 - Total phosphorus as P (T-P) **Analysis Date: 11/06/2013**

201310300570	TJPIN103013	Analyzed by: MYH
201310300571	TJPOUT103013	Analyzed by: MYH
201310300572	HCC103013	Analyzed by: MYH

QC Ref # 735524 - Total Kjeldahl Nitrogen **Analysis Date: 11/06/2013**

201310300570	TJPIN103013	Analyzed by: KXS
201310300571	TJPOUT103013	Analyzed by: KXS
201310300572	HCC103013	Analyzed by: KXS

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1 800 566 LABS (1 800 566 5227)

Laboratory QC
Report: 455275

MWH Americas - Arcadia

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
QC Ref# 734247 - Total Chlorine Residual (H3=past HT not compliant) by SM 4500-CL G						**Analysis Date: 10/31/2013**			
LCS1	Total Chlorine Residual		1.0	1.02	mg/L	102	(85-115)		
LCS2	Total Chlorine Residual			1.03	mg/L				
MBLK	Total Chlorine Residual			<0.1	mg/L				
MRL_CHK	Total Chlorine Residual		0.1	0.120	mg/L	120	(50-150)		
QC Ref# 734425 - Turbidity by EPA 180.1						**Analysis Date: 10/30/2013**			
DUP1_201310290819	Turbidity	0.10		0.0990	NTU		(0-20)	20	1.0
DUP2_201310300410	Turbidity	0.075		0.0760	NTU		(0-20)	20	1.3
LCS1	Turbidity		20	19.4	NTU	97	(90-110)		
LCS2	Turbidity		20	19.4	NTU	97	(90-110)	20	0.0
MBLK	Turbidity			<0.05	NTU				
MRL_CHK	Turbidity		0.05	0.0650	NTU	130	(50-150)		
QC Ref# 734447 - Orthophosphate as P (OPO4) by 4500P-E/365.1						**Analysis Date: 10/30/2013**			
LCS1	Orthophosphate as P		0.25	0.261	mg/L	104	(90-110)		
LCS2	Orthophosphate as P		0.25	0.255	mg/L	102	(90-110)	20	2.3
MBLK	Orthophosphate as P			<0.01	mg/L				
MRL_CHK	Orthophosphate as P		0.01	0.00900	mg/L	90	(50-150)		
MS_201310300024	Orthophosphate as P	0.014	0.5	0.522	mg/L	102	(90-110)		
MSD_201310300024	Orthophosphate as P	0.014	0.5	0.514	mg/L	100	(90-110)	20	1.5
QC Ref# 734685 - Nitrate, Nitrite by EPA 300.0 by EPA 300.0						**Analysis Date: 10/30/2013**			
LCS1	Nitrate as Nitrogen by IC		2.5	2.45	mg/L	98	(90-110)		
LCS2	Nitrate as Nitrogen by IC		2.5	2.52	mg/L	101	(90-110)	20	2.8
MBLK	Nitrate as Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrate as Nitrogen by IC		0.05	0.0523	mg/L	105	(50-150)		
MRLLW	Nitrate as Nitrogen by IC		0.013	0.0126	mg/L	101	(50-150)		
MS_201310310023	Nitrate as Nitrogen by IC	7.6	1.3	13.8	mg/L	100	(80-120)		
MS_201310300573	Nitrate as Nitrogen by IC	10	1.3	16.3	mg/L	98	(80-120)		
MSD_201310310023	Nitrate as Nitrogen by IC	7.6	1.3	13.9	mg/L	100	(80-120)	20	0.0
MSD_201310300573	Nitrate as Nitrogen by IC	10	1.3	16.3	mg/L	98	(80-120)	20	0.0
LCS1	Nitrite Nitrogen by IC		1.0	0.953	mg/L	95	(90-110)		
LCS2	Nitrite Nitrogen by IC		1.0	0.954	mg/L	95	(90-110)	20	0.11
MBLK	Nitrite Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrite Nitrogen by IC		0.05	0.0502	mg/L	100	(50-150)		
MRLLW	Nitrite Nitrogen by IC		0.013	0.0116	mg/L	93	(50-150)		
MS_201310310023	Nitrite Nitrogen by IC	ND	0.5	2.26	mg/L	91	(80-120)		
MS_201310300573	Nitrite Nitrogen by IC	ND	0.5	2.20	mg/L	88	(80-120)		

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.

eurofins | Eaton Analytical

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

Laboratory QC
Report: 455275

MWH Americas - Arcadia

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MSD_201310300573	Nitrite Nitrogen by IC	ND	0.5	2.18	mg/L	87	(80-120)	20	1.4
MSD_201310310023	Nitrite Nitrogen by IC	ND	0.5	2.22	mg/L	89	(80-120)	20	1.8
QC Ref# 734694 - Glyphosate by EPA 547						**Analysis Date: 10/31/2013**			
CCCH	Glyphosate		25	24.2	ug/L	97	(80-120)		
CCCM	Glyphosate		10	10.7	ug/L	107	(80-120)		
LCS1	Glyphosate		10	11.2	ug/L	113	(70-130)		
MBLK	Glyphosate			<6	ug/L				
MRL_CHK	Glyphosate		6.0	7.03	ug/L	117	(50-150)		
MS_201310300453	Glyphosate	ND	10	10.8	ug/L	108	(70-130)		
MS2_201310300533	Glyphosate	ND	10	10.9	ug/L	109	(70-130)		
MSD_201310300453	Glyphosate	ND	10	11.2	ug/L	112	(70-130)	20	3.6
QC Ref# 735119 - Ammonia Nitrogen by EPA 350.1						**Analysis Date: 11/04/2013**			
LCS1	Ammonia Nitrogen		1.0	1.06	mg/L	106	(90-110)		
LCS2	Ammonia Nitrogen		1.0	1.06	mg/L	106	(90-110)	20	0.0
MBLK	Ammonia Nitrogen			<0.05	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0350	mg/L	70	(53-118)		
MS_201310300566	Ammonia Nitrogen	0.27	1.0	0.978	mg/L	**28**	(90-110)		
MS2_201310300567	Ammonia Nitrogen	ND	1.0	0.678	mg/L	**68**	(90-110)		
MSD_201310300566	Ammonia Nitrogen	0.27	1.0	0.972	mg/L	**28**	(90-110)	20	0.62
MSD2_201310300567	Ammonia Nitrogen	ND	1.0	0.705	mg/L	**71**	(90-110)	20	3.9
QC Ref# 735197 - Total phosphorus as P (T-P) by SM4500-PE/EPA 365.1						**Analysis Date: 11/06/2013**			
LCS1	Total phosphorus as P		0.4	0.426	mg/L	107	(90-110)		
LCS2	Total phosphorus as P		0.4	0.413	mg/L	103	(90-110)	20	3.1
MBLK	Total phosphorus as P			<0.02	mg/L				
MRL_CHK	Total phosphorus as P		0.02	0.0203	mg/L	101	(50-150)		
MS_201311050138	Total phosphorus as P	ND	0.4	0.427	mg/L	107	(90-110)		
MS2_201311050220	Total phosphorus as P	0.064	0.4	0.508	mg/L	**111**	(90-110)		
MSD_201311050138	Total phosphorus as P	ND	0.4	0.412	mg/L	103	(90-110)	20	3.6
MSD2_201311050220	Total phosphorus as P	0.064	0.4	0.510	mg/L	**112**	(90-110)	20	0.39
QC Ref# 735524 - Total Kjeldahl Nitrogen by EPA 351.2						**Analysis Date: 11/06/2013**			
LCS1	Kjeldahl Nitrogen		4.0	3.65	mg/L	91	(90-110)		
LCS2	Kjeldahl Nitrogen		4.0	4.06	mg/L	101	(90-110)	20	11
MBLK	Kjeldahl Nitrogen			<0.1	mg/L				
MRL_CHK	Kjeldahl Nitrogen		0.2	0.151	mg/L	76	(50-150)		
MS_201310300294	Kjeldahl Nitrogen	56	4.0	90.8	mg/L	**88**	(90-110)		
MSD_201310300294	Kjeldahl Nitrogen	56	4.0	92.2	mg/L	91	(90-110)	10	1.5

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.

TABLE OF CONTENTS

CLIENT: **EUROFINS EATON ANALYTICAL**

PROJECT: **455275**

SDG: **13J240**

** - Not Requested

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

Date: 11-13-2013
EMAX Batch No.: 13J240

Attn: Jackie Contreras

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

Subject: Laboratory Report
Project: 455275

Enclosed is the Laboratory report for samples received on 10/31/13.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
201310300570	J240-01	10/30/13	WATER	PCBS
				PESTICIDES
				PESTICIDES ORGANOPHOSPHORUS
201310300571	J240-02	10/30/13	WATER	PCBS
				PESTICIDES
				PESTICIDES ORGANOPHOSPHORUS
201310300572	J240-03	10/30/13	WATER	PCBS
				PESTICIDES
				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.

NELAC Accredited Certificate Number 02116CA
L-A-B Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing

eurofins | Eaton Analytical

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

Torrance, CA 90501

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

Submittal Form & Purchase Order 99-25509 13J240

Date: 10/31/2013

REPORTING REQUIRMENTS:** ***Do Not Combine Reports with any other samples submitted under different Folder Numbers!
Report & Invoice must have the Folder # **455275** Sub PO# **99-25509** 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

[redacted]

Folder #:	Report Due:	Sub PO #:
455275	11/15/2013	99-25509

	JLS	Use Lab Order # for ID	Client Sample ID for reference only	Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
		201310300570	TJPIN103013		10/30/13 1030	DW		
(1)	EPA 608	@608_PEST		Organochlorine Pesticides				
	EPA 608	@608_PCBS		Organochlorine PCBs				
	EPA 8141A	@8141EDD		Organophosphorous Pesticides (Sub)				
		201310300571	TJPOUT103013		10/30/13 1100	DW		
(2)	EPA 608	@608_PEST		Organochlorine Pesticides				
	EPA 608	@608_PCBS		Organochlorine PCBs				
	EPA 8141A	@8141EDD		Organophosphorous Pesticides (Sub)				
		201310300572	HCC103013		10/30/13 1145	DW		
(3)	EPA 608	@608_PEST		Organochlorine Pesticides				
	EPA 608	@608_PCBS		Organochlorine PCBs				
	EPA 8141A	@8141EDD		Organophosphorous Pesticides (Sub)				

Page 21 of 54 pages

Relinquished by: Sample Control Date _____ Time _____

Received by: _____ Date 10/31/13 Time 15:40

NOTIFICATION REQUIRED IF RECEIVED OUTSIDE OF 0-6 CELSIUS

An Acknowledgement of Receipt is requested to attn: Jackie Contreras

Temp 3.1 C

eurofins | Eaton Analytical

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

Torrance, CA 90501

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

Submittal Form & Purchase Order 99-25509

Date: 11/1/2013

REPORTING REQUIRMENTS:** ***Do Not Combine Reports with any other samples submitted under different Folder Numbers!
Report & Invoice must have the Folder # **455275** Sub PO# **99-25509** and Job # **1000014**

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

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

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

Samples from: **CALIFORNIA**

Folder #:	Report Due:	Sub PO #:
455275	11/15/2013	99-25509

JLS	Use Lab Order # for ID	*Client Sample ID for reference only*	Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
	201310300570	TJPIN103013		10/30/13 1030	DW		
EPA 608	@608_PEST		Organochlorine Pesticides				
EPA 608	@608_PCBS		Organochlorine PCBs				
EPA 8141A	@8141EDD		Organophosphorous Pesticides (Sub)				
	201310300571	TJPOUT103013		10/30/13 1100	DW		
EPA 608	@608_PEST		Organochlorine Pesticides				
EPA 608	@608_PCBS		Organochlorine PCBs				
EPA 8141A	@8141EDD		Organophosphorous Pesticides (Sub)				
	201310300572	HCC103013		10/30/13 1145	DW		
EPA 608	@608_PEST		Organochlorine Pesticides				
EPA 608	@608_PCBS		Organochlorine PCBs				
EPA 8141A	@8141EDD		Organophosphorous Pesticides (Sub)				

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

EMAX LABORATORIES, INC.

SAMPLE RECEIPT FORM 1

Type of Delivery	Airbill / Tracking Number	ECN 133240
☐ Fedex ☐ UPS ☐ GSO ☐ Others		Recipient Cecilia
☐ EMAX Courier ☑ Client Delivery		Date 10/31/13 Time 15:40

COC Inspection

☑ Client Name	☑ Client PM/FC	☐ Sampler Name	☑ Sampling Date/Time/Location	☑ Sample ID	☑ Matrix
☑ Address	☑ Tel # / Fax #	☐ Courier Signature	☑ Analysis Required	☐ Preservative (if any)	☑ TAT

Safety Issues (if any) ☐ High concenurations expected ☐ Superfund Site samples ☐ Rad screening required

Comments: Not relinquished

Packaging Inspection

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☑ Custody Seal	☑ Intact	☐ Damaged		
Packaging	☑ Bubble Pack	☐ Styrofoam	☐ Popcorn	☑ Sufficient	☑ Plastic Bag
Temperatures (Cool, ≤6 °C but not frozen)	☑ Cooler 1 3.1 °C	☐ Cooler 2_____ °C	☐ Cooler 3_____ °C	☐ Cooler 4_____ °C	☐ Cooler 5_____ °C
	☐ Cooler 6_____ °C	☐ Cooler 7_____ °C	☐ Cooler 8_____ °C	☐ Cooler 9_____ °C	☐ Cooler 10_____ °C
Thermometer:	*A - S/N 101541371*	*B - S/N 101541382*	*C - S/N 122091701*	*D - S/N 122091758*	

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

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

DISCREPANCIES

LSID	LSCID	Description Code	Sample Label ID / Information	Corrective Action Code
1, 2, 3	1, 2, 3	H1 / G1		R2

10/31/13

☐ Continue to next page.

REVIEWS

Sample Labeling mc mf Date 10/31/13 10/31/13

SRF Date 10/01/13

PM RB Date 11/01/13

LEGEND:

Code	Description- Sample Management
A1	Analysis is not indicated in COC.
A2	Analysis is not indicated in label.
A3	Analysis is inconsistent in COC vis-à-vis label.
B1	Sample ID is not indicated in COC.
B2	Sample ID is not indicated in label.
B3	Sample ID is inconsistent in COC vis-à-vis label.
C1	Improper container
C2	Broken container
C3	Leaking container
D1	Date and/or time is not indicated in COC.
D2	Date and/or time is not indicated in label.
D3	Date and/or time is inconsistent in COC vis-à-vis label.
F1	Improper preservation
F2	Insufficient Sample
F3	Bubble is > 6mm. Use vial with smallest bubble first.
F4	Bubble is > 6mm in all vials.
F5	>20 % solid particle
F6	Out of Holding Time

Code	Description-Sample Management
G1	Sample indicated in COC is not received.
G2	MS/MSD is not indicated in COC.
G3	No identified trip blank, proceed as indicated in COC.
G4	Trip Blank is designated in SDG _____
G5	Trip Blank has no sampling date & time. Log-in with latest sampling date and 1 minute past the time of the last sample collected on the same date.
H1	Only received 8141 EDD for each sample

Code	Description-Project Management
R1	Hold sample(s); wait for further instructions
R2	Proceed as indicated in COC and inform client.
R3	Refer to attached instruction
R4	Cancel the analysis
R5	Inform client.
R6	Proceed as indicated in COC

→ Received the missing bottles for Pest/PCBs in 11-0143

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.
*	*	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

455275

METHOD 608
PESTICIDES

SDG#: 13J240

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project : 455275

SDG : 13J240

METHOD 608
PESTICIDES

A total of three (3) water samples were received on 10/31/13 for Pesticides analysis, Method 608 in accordance with USEPA Wastewater Test Methods at 40 CFR Part 136.

Holding Time
Samples were analyzed within the prescribed holding time.

Instrument Performance and Calibration
Instrument performance was checked prior to calibration. DDT and Endrin breakdown were within specification. Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using secondary source (ICV). Continuing calibration (CCV) was carried on at a frequency required by the project. All project calibration requirements were satisfied. Refer to calibration summary forms of ICAL, ICV and CCV for details.

Method Blank
Method blank was analyzed at the frequency required by the project. For this SDG, one method blank was analyzed with the samples. Results were compliant to project requirement.

Lab Control Sample
A set of LCS/LCD was analyzed with the samples in this SDG.
Percent recoveries for CPK002WL/C were all within QC limits.

Matrix QC Sample
No matrix QC sample was designated in this SDG.

Surrogate
Surrogates were added on QC and field samples. Surrogate recoveries were within project QC limits. Refer to sample result forms for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. All project requirements were met; otherwise, anomalies were discussed within the associated QC parameter. Positive sample results were confirmed by a second column. Relative percentage difference (RPD) between the two results was evaluated. If RPD is less than 40% and peaks are well defined the higher result is reported. Where RPD is greater than 40% the chromatogram is checked for anomalies and results are selected based on processed knowledge. If there is no evidence of any chromatographic ambiguity, the higher result is reported.

LAB CHRONICLE
PESTICIDES

Client : EUROFINS EATON ANALYTICAL
Project : 455275

SDG NO. : 13J240
Instrument ID : E8

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	CPK002WB	1	NA	11/06/1317:04	11/04/1312:30	MK06020A	MK06017A	CPK002W	Method Blank
LCS1W	CPK002WL	1	NA	11/06/1317:24	11/04/1312:30	MK06021A	MK06017A	CPK002W	Lab Control Sample (LCS)
LCD1W	CPK002WC	1	NA	11/06/1317:45	11/04/1312:30	MK06022A	MK06017A	CPK002W	LCS Duplicate
201310300570	J240-01	0.99	NA	11/06/1318:25	11/04/1312:30	MK06024A	MK06017A	CPK002W	Field Sample
201310300571	J240-02	0.95	NA	11/06/1318:45	11/04/1312:30	MK06025A	MK06017A	CPK002W	Field Sample
201310300572	J240-03	0.93	NA	11/06/1319:05	11/04/1312:30	MK06026A	MK06017A	CPK002W	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 608
PESTICIDES

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: 201310300570	Date Analyzed: 11/06/13 18:25
Lab Samp ID: J240-01	Dilution Factor: 0.99
Lab File ID: MK06024A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: MK06017A	Instrument ID : GCE8

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) | ND	0.099	0.0099 | 0.0099
GAMMA-BHC (LINDANE)	(ND) | ND	0.099	0.0099 | 0.0099
BETA-BHC	0.043J | (ND)	0.099	0.0099 | 0.0099
HEPTACHLOR	0.016J | (ND)	0.099	0.0099 | 0.0099
DELTA-BHC	(ND) | ND	0.099	0.0099 | 0.0099
ALDRIN	(ND) | ND	0.099	0.0099 | 0.0099
HEPTACHLOR EPOXIDE	(ND) | ND	0.099	0.0099 | 0.0099
GAMMA-CHLORDANE	(ND) | ND	0.099	0.0099 | 0.0099
ALPHA-CHLORDANE	(ND) | ND	0.099	0.0099 | 0.0099
ENDOSULFAN I	(ND) | ND	0.099	0.0099 | 0.0099
4,4'-DDE	(ND) | ND	0.099	0.0099 | 0.0099
DIELDRIN	(ND) | ND	0.099	0.0099 | 0.0099
ENDRIN	(ND) | ND	0.099	0.0099 | 0.0099
4,4'-DDD	(ND) | ND	0.099	0.0099 | 0.0099
ENDOSULFAN II	(ND) | ND	0.099	0.0099 | 0.0099
4,4'-DDT	(ND) | ND	0.099	0.0099 | 0.0099
ENDRIN ALDEHYDE	(ND) | ND	0.099	0.0099 | 0.0099
ENDOSULFAN SULFATE	(ND) | ND	0.099	0.0099 | 0.0099
ENDRIN KETONE	(ND) | ND	0.099	0.0099 | 0.0099
METHOXYCHLOR	(ND) | ND	0.99	0.099 | 0.099
TOXAPHENE	(ND) | ND	2.0	0.50 | 0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.4386 | (0.4412)	0.3960	111 | (111)	30-140
DECACHLOROBIPHENYL	0.4597 | (0.4808)	0.3960	116 | (121)	60-130

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

METHOD 608
PESTICIDES

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: 201310300571	Date Analyzed: 11/06/13 18:45
Lab Samp ID: J240-02	Dilution Factor: 0.95
Lab File ID: MK06025A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: MK06017A	Instrument ID : GCE8

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) | 0.0099J	0.095	0.0095 | 0.0095
GAMMA-BHC (LINDANE)	(ND) | ND	0.095	0.0095 | 0.0095
BETA-BHC	(ND) | ND	0.095	0.0095 | 0.0095
HEPTACHLOR	0.011J | (ND)	0.095	0.0095 | 0.0095
DELTA-BHC	(ND) | ND	0.095	0.0095 | 0.0095
ALDRIN	(ND) | ND	0.095	0.0095 | 0.0095
HEPTACHLOR EPOXIDE	(ND) | ND	0.095	0.0095 | 0.0095
GAMMA-CHLORDANE	(ND) | ND	0.095	0.0095 | 0.0095
ALPHA-CHLORDANE	(ND) | ND	0.095	0.0095 | 0.0095
ENDOSULFAN I	(ND) | ND	0.095	0.0095 | 0.0095
4,4'-DDE	(ND) | ND	0.095	0.0095 | 0.0095
DIELDRIN	(ND) | ND	0.095	0.0095 | 0.0095
ENDRIN	(ND) | ND	0.095	0.0095 | 0.0095
4,4'-DDD	(ND) | ND	0.095	0.0095 | 0.0095
ENDOSULFAN II	(ND) | ND	0.095	0.0095 | 0.0095
4,4'-DDT	(ND) | ND	0.095	0.0095 | 0.0095
ENDRIN ALDEHYDE	(ND) | ND	0.095	0.0095 | 0.0095
ENDOSULFAN SULFATE	(ND) | ND	0.095	0.0095 | 0.0095
ENDRIN KETONE	(ND) | ND	0.095	0.0095 | 0.0095
METHOXYCHLOR	(ND) | ND	0.95	0.095 | 0.095
TOXAPHENE	(ND) | ND	1.9	0.48 | 0.48

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.4145 | (0.4308)	0.3800	109 | (113)	30-140
DECACHLOROBIPHENYL	0.4314 | (0.4523)	0.3800	114 | (119)	60-130

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

METHOD 608
PESTICIDES

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: 201310300572	Date Analyzed: 11/06/13 19:05
Lab Samp ID: J240-03	Dilution Factor: 0.93
Lab File ID: MK06026A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: MK06017A	Instrument ID : GCE8

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) | ND	0.093	0.0093 | 0.0093
GAMMA-BHC (LINDANE)	(ND) | ND	0.093	0.0093 | 0.0093
BETA-BHC	(ND) | ND	0.093	0.0093 | 0.0093
HEPTACHLOR	(ND) | ND	0.093	0.0093 | 0.0093
DELTA-BHC	(ND) | ND	0.093	0.0093 | 0.0093
ALDRIN	(ND) | ND	0.093	0.0093 | 0.0093
HEPTACHLOR EPOXIDE	(ND) | ND	0.093	0.0093 | 0.0093
GAMMA-CHLORDANE	(ND) | ND	0.093	0.0093 | 0.0093
ALPHA-CHLORDANE	(NO) | ND	0.093	0.0093 | 0.0093
ENDOSULFAN I	(ND) | ND	0.093	0.0093 | 0.0093
4,4'-DDE	(ND) | ND	0.093	0.0093 | 0.0093
DIELDRIN	(ND) | ND	0.093	0.0093 | 0.0093
ENDRIN	(ND) | ND	0.093	0.0093 | 0.0093
4,4'-DDD	(ND) | ND	0.093	0.0093 | 0.0093
ENDOSULFAN II	(ND) | ND	0.093	0.0093 | 0.0093
4,4'-DDT	(ND) | ND	0.093	0.0093 | 0.0093
ENDRIN ALDEHYDE	(ND) | ND	0.093	0.0093 | 0.0093
ENDOSULFAN SULFATE	(ND) | ND	0.093	0.0093 | 0.0093
ENDRIN KETONE	(ND) | ND	0.093	0.0093 | 0.0093
METHOXYCHLOR	(ND) | ND	0.93	0.093 | 0.093
TOXAPHENE	(ND) | ND	1.9	0.47 | 0.47

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.3587 | (0.4077)	0.3720	96.4 | (110)	30-140
DECACHLOROBIPHENYL	0.4130 | (0.4291)	0.3720	111 | (115)	60-130

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

QC SUMMARIES

METHOD 608
PESTICIDES

Client : EUROFINS EATON ANALYTICAL	Date Collected: NA
Project : 455275	Date Received: 11/04/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: MBLK1W	Date Analyzed: 11/06/13 17:04
Lab Samp ID: CPK002WB	Dilution Factor: 1
Lab File ID: MK06020A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: MK06017A	Instrument ID : GCE8

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) | ND	0.10	0.010 | 0.010
GAMMA-BHC (LINDANE)	(ND) | ND	0.10	0.010 | 0.010
BETA-BHC	(ND) | ND	0.10	0.010 | 0.010
HEPTACHLOR	(ND) | ND	0.10	0.010 | 0.010
DELTA-BHC	(ND) | ND	0.10	0.010 | 0.010
ALDRIN	(ND) | ND	0.10	0.010 | 0.010
HEPTACHLOR EPOXIDE	(ND) | ND	0.10	0.010 | 0.010
GAMMA-CHLORDANE	(ND) | ND	0.10	0.010 | 0.010
ALPHA-CHLORDANE	(ND) | ND	0.10	0.010 | 0.010
ENDOSULFAN I	(ND) | ND	0.10	0.010 | 0.010
4,4'-DDE	(ND) | ND	0.10	0.010 | 0.010
DIELDRIN	(ND) | ND	0.10	0.010 | 0.010
ENDRIN	(ND) | ND	0.10	0.010 | 0.010
4,4'-DDD	(ND) | ND	0.10	0.010 | 0.010
ENDOSULFAN II	(ND) | ND	0.10	0.010 | 0.010
4,4'-DDT	(ND) | ND	0.10	0.010 | 0.010
ENDRIN ALDEHYDE	(ND) | ND	0.10	0.010 | 0.010
ENDOSULFAN SULFATE	(ND) | ND	0.10	0.010 | 0.010
ENDRIN KETONE	(ND) | ND	0.10	0.010 | 0.010
METHOXYCHLOR	(ND) | ND	1.0	0.10 | 0.10
TOXAPHENE	(ND) | ND	2.0	0.50 | 0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.3457 | (0.3815)	0.4000	86.4 | (95.4)	30-130
DECACHLOROBIPHENYL	0.4531 | (0.4661)	0.4000	113 | (117)	60-130

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: EUROFINS EATON ANALYTICAL
PROJECT: 455275
BATCH NO.: 13J240
METHOD: METHOD 608

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK1W				
LAB SAMP ID:	CPK002WB	CPK002WL	CPK002WC		
LAB FILE ID:	MK06020A	MK06021A	MK06022A		
DATE EXTRACTED:	11/04/1312:30	11/04/1312:30	11/04/1312:30	DATE COLLECTED:	NA
DATE ANALYZED:	11/06/1317:04	11/06/1317:24	11/06/1317:45	DATE RECEIVED:	11/04/13
PREP. BATCH:	CPK002W	CPK002W	CPK002W		
CALIB. REF:	MK06017A	MK06017A	MK06017A		

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 (%)
gamma-BHC (Lindane)	(ND) | ND	0.200	(0.205) | 0.233	(102) | 116	0.200	(0.202) | 0.224	(101) | 112	(1) | 4	70-130	30
Heptachlor	(ND) | ND	0.200	0.189 | (0.215)	94 | (108)	0.200	0.188 | (0.218)	94 | (109)	1 | (1)	60-130	30
Aldrin	(ND) | ND	0.200	0.198 | (0.223)	99 | (112)	0.200	0.195 | (0.219)	97 | (110)	2 | (2)	70-130	30
Dieldrin	(ND) | ND	0.200	0.189 | (0.221)	94 | (110)	0.200	0.190 | (0.222)	95 | (111)	1 | (0)	70-140	30
Endrin	(ND) | ND	0.200	0.185 | (0.209)	92 | (104)	0.200	0.189 | (0.215)	94 | (108)	2 | (3)	70-140	30
4,4'-DDT	(ND) | ND	0.200	(0.215) | 0.214	(108) | 107	0.200	0.216 | (0.217)	108 | (108)	0 | (1)	70-140	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 (%)
Tetrachloro-m-xylene	0.4000	0.3467 | (0.3964)	86.7 | (99.1)	0.4000	0.3646 | (0.4074)	91.1 | (102)	30-130
Decachlorobiphenyl	0.4000	0.4121 | (0.4353)	103 | (109)	0.4000	0.4245 | (0.4399)	106 | (110)	60-130

LABORATORY REPORT FOR

EUROFINS EATON ANALYTICAL

455275

METHOD 608
PCBs

SDG#: 13J240

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project : 455275

SDG : 13J240

METHOD 608
PCBS

A total of three (3) water samples were received on 10/31/13 for PCBs analysis, Method 608 in accordance with USEPA Wastewater Test Methods at 40 CFR Part 136.

Holding Time
Samples were analyzed within the prescribed holding time.

Instrument Performance and Calibration
Instrument performance was checked prior to calibration. DDT and Endrin breakdown were within specification. Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using secondary source (ICV). Continuing calibration (CCV) was carried on at a frequency required by the project. All project calibration requirements were satisfied. Refer to calibration summary forms of ICAL, ICV and CCV for details.

Method Blank
Method blank was analyzed at the frequency required by the project. For this SDG, one method blank was analyzed with the samples. Results were compliant to project requirement.

Lab Control Sample
A set of LCS/LCD was analyzed with the samples in this SDG.
Percent recoveries for 60K002WL/C were all within QC limits.

Matrix QC Sample
No matrix QC sample was designated in this SDG.

Surrogate
Surrogates were added on QC and field samples. Surrogate recoveries were within project QC limits. Refer to sample result forms for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. All project requirements were met; otherwise, anomalies were discussed within the associated QC parameter.

LAB CHRONICLE
PCBs

Client : EUROFINS EATON ANALYTICAL
Project : 455275
SDG NO. : 13J240
Instrument ID : 71

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	CPK002WB	1	NA	11/05/1315:27	11/04/1312:30	KK05006A	KK05003A	CPK002W	Method Blank
LCS1W	60K002WL	1	NA	11/05/1315:51	11/04/1312:30	KK05007A	KK05003A	CPK002W	Lab Control Sample (LCS)
LCD1W	60K002WC	1	NA	11/05/1316:15	11/04/1312:30	KK05008A	KK05003A	CPK002W	LCS Duplicate
201310300570	J240-01	0.99	NA	11/05/1317:28	11/04/1312:30	KK05011A	KK05003A	CPK002W	Field Sample
201310300571	J240-02	0.95	NA	11/05/1317:52	11/04/1312:30	KK05012A	KK05003A	CPK002W	Field Sample
201310300572	J240-03	0.93	NA	11/05/1318:16	11/04/1312:30	KK05013A	KK05003A	CPK002W	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 608
PCBs

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: 201310300570	Date Analyzed: 11/05/13 17:28
Lab Samp ID: J240-01	Dilution Factor: 0.99
Lab File ID: KK05011A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: KK05003A	Instrument ID : GCT071

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
PCB-1016	(ND) | ND	0.99	0.50 | 0.50
PCB-1221	(ND) | ND	0.99	0.50 | 0.50
PCB-1232	(ND) | ND	0.99	0.50 | 0.50
PCB-1242	(ND) | ND	0.99	0.50 | 0.50
PCB-1248	(ND) | ND	0.99	0.50 | 0.50
PCB-1254	(ND) | ND	0.99	0.50 | 0.50
PCB-1260	(ND) | ND	0.99	0.50 | 0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(0.3308) | 0.3099	0.3960	(83.5) | 78.3	40-140
DECACHLOROBIPHENYL	0.4030 | (0.4053)	0.3960	102 | (102)	60-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

METHOD 608
PCBs

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: 201310300571	Date Analyzed: 11/05/13 17:52
Lab Samp ID: J240-02	Dilution Factor: 0.95
Lab File ID: KK05012A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: KK05003A	Instrument ID : GCT071

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
PCB-1016	(ND) | ND	0.95	0.48 | 0.48
PCB-1221	(ND) | ND	0.95	0.48 | 0.48
PCB-1232	(ND) | ND	0.95	0.48 | 0.48
PCB-1242	(ND) | ND	0.95	0.48 | 0.48
PCB-1248	(ND) | ND	0.95	0.48 | 0.48
PCB-1254	(ND) | ND	0.95	0.48 | 0.48
PCB-1260	(ND) | ND	0.95	0.48 | 0.48

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(0.3431) | 0.3226	0.3800	(90.3) | 84.9	40-140
DECACHLOROBIPHENYL	0.3777 | (0.3817)	0.3800	99.4 | (100)	60-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

METHOD 608
PCBs

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: 20131030D0572	Date Analyzed: 11/05/13 18:16
Lab Samp ID: J240-03	Dilution Factor: 0.93
Lab File ID: KK05013A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: KK05003A	Instrument ID : GCT071

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
PCB-1016	(NO) | ND	0.93	0.47 | 0.47
PCB-1221	(ND) | ND	0.93	0.47 | 0.47
PCB-1232	(ND) | ND	0.93	0.47 | 0.47
PCB-1242	(ND) | ND	0.93	0.47 | 0.47
PCB-1248	(ND) | ND	0.93	0.47 | 0.47
PCB-1254	(ND) | ND	0.93	0.47 | 0.47
PCB-1260	(ND) | ND	0.93	0.47 | 0.47

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(0.3136) | 0.2980	0.3720	(84.3) | 80.1	40-140
DECACHLOROBIPHENYL	0.3630 | (0.3636)	0.3720	97.6 | (97.8)	60-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

QC SUMMARIES

METHOD 608
PCBs

Client : EUROFINS EATON ANALYTICAL	Date Collected: NA
Project : 455275	Date Received: 11/04/13
Batch No. : 13J240	Date Extracted: 11/04/13 12:30
Sample ID: MBLK1W	Date Analyzed: 11/05/13 15:27
Lab Samp ID: CPK002WB	Dilution Factor: 1
Lab File ID: KK05006A	Matrix : WATER
Ext Btch ID: CPK002W	% Moisture : NA
Calib. Ref.: KK05003A	Instrument ID : GCT071

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
PCB-1016	(ND)|ND	1.0	0.50|0.50
PCB-1221	(ND)|ND	1.0	0.50|0.50
PCB-1232	(ND)|ND	1.0	0.50|0.50
PCB-1242	(ND)|ND	1.0	0.50|0.50
PCB-1248	(ND)|ND	1.0	0.50|0.50
PCB-1254	(ND)|ND	1.0	0.50|0.50
PCB-1260	(ND)|ND	1.0	0.50|0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(0.2791)|0.2705	0.4000	(69.8)|67.6	20-140
DECACHLOROBIPHENYL	0.3940|(0.3965)	0.4000	98.5|(99.1)	70-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: EUROFINS EATON ANALYTICAL
PROJECT: 455275
BATCH NO.: 13J240
METHOD: METHOD 608

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK1W				
LAB SAMP ID:	CPK002WB	60K002WL	60K002WC		
LAB FILE ID:	KK05006A	KK05007A	KK05008A		
DATE EXTRACTED:	11/04/1312:30	11/04/1312:30	11/04/1312:30	DATE COLLECTED:	NA
DATE ANALYZED:	11/05/1315:27	11/05/1315:51	11/05/1316:15	DATE RECEIVED:	11/04/13
PREP. BATCH:	CPK002W	CPK002W	CPK002W		
CALIB. REF:	KK05003A	KK05003A	KK05003A		

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 (%)
PCB-1016	(ND) | ND	5.00	5.03 | (5.04)	101 | (101)	5.00	5.16 | (5.17)	103 | (103)	3 | (3)	60-140	30
PCB-1260	(ND) | ND	5.00	5.23 | (5.54)	105 | (111)	5.00	5.31 | (5.45)	106 | (109)	2 | (2)	70-140	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 (%)
Tetrachloro-m-xylene	0.4000	(0.3149) | 0.3081	(78.7) | 77.0	0.4000	(0.3236) | 0.3198	(80.9) | 79.9	20-140
Decachlorobiphenyl	0.4000	0.3927 | (0.3939)	98.2 | (98.5)	0.4000	0.3926 | (0.3929)	98.2 | (98.2)	70-130

LABORATORY REPORT FOR

EUROFINS EATON ANALYTICAL

455275

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

SDG#: 13J240

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project : 455275

SDG : 13J240

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

A total of three (3) water samples were received on 10/31/13 for Pesticides Organophosphorus analysis, Method 3520C/8141A in accordance with USEPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

Holding Time
Samples were analyzed within the prescribed holding time.

Calibration
Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using a secondary source (ICV). Continuing calibration (CCV) verifications were carried on a frequency specified by the project. All calibration requirements were within acceptance criteria. Refer to calibration summary forms of ICAL, ICV and CCV for details.

Method Blank
Method blank was analyzed at the frequency required by the project. For this SDG, one method blank was analyzed with the samples. Results were compliant to project requirement.

Lab Control Sample
A set of LCS/LCD was analyzed with the samples in this SDG.
Percent recoveries for NPK001WL/C were all within QC limits.

Matrix QC Sample
No matrix QC sample was designated in this SDG.

Surrogate
Surrogates were added on QC and field samples. Surrogate recoveries were within project QC limits. Refer to sample result forms for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. All project requirements were met; otherwise, anomalies were discussed within the associated QC parameter.

LAB CHRONICLE
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL
Project : 455275

SDG NO. : 13J240
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	NPK001WB	1	NA	11/05/1313:48	11/04/1310:45	ZK05003A	ZK05002A	NPK001W	Method Blank
LCS1W	NPK001WL	1	NA	11/05/1314:22	11/04/1310:45	ZK05004A	ZK05002A	NPK001W	Lab Control Sample (LCS)
LCD1W	NPK001WC	1	NA	11/05/1314:56	11/04/1310:45	ZK05005A	ZK05002A	NPK001W	LCS Duplicate
201310300570	J240-01	0.98	NA	11/05/1315:30	11/04/1310:45	ZK05006A	ZK05002A	NPK001W	Field Sample
201310300571	J240-02	1.03	NA	11/05/1316:04	11/04/1310:45	ZK05007A	ZK05002A	NPK001W	Field Sample
201310300572	J240-03	0.99	NA	11/05/1316:38	11/04/1310:45	ZK05008A	ZK05002A	NPK001W	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 10:45
Sample ID: 201310300570	Date Analyzed: 11/05/13 15:30
Lab Samp ID: J240-01	Dilution Factor: 0.98
Lab File ID: ZK05006A	Matrix : WATER
Ext Btch ID: NPK001W	% Moisture : NA
Calib. Ref.: ZK05002A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	0.98	0.49 | 0.49
MEVINPHOS	(ND) | ND	0.98	0.49 | 0.49
DEMETON	(ND) | ND	0.98	0.49 | 0.49
ETHOPROP	(ND) | ND	0.98	0.49 | 0.49
PHORATE	(ND) | ND	0.98	0.49 | 0.49
NALED	(ND) | ND	0.98	0.49 | 0.49
DIAZINON	(ND) | ND	0.98	0.49 | 0.49
DISULFOTON	(ND) | ND	0.98	0.49 | 0.49
RONNEL	(ND) | ND	0.98	0.49 | 0.49
CHLORPYRIFOS	(ND) | ND	0.98	0.49 | 0.49
FENTHION	(ND) | ND	0.98	0.49 | 0.49
TRICHLORONATE	(ND) | ND	0.98	0.49 | 0.49
METHYL PARATHION	(ND) | ND	0.98	0.49 | 0.49
TOKUTHION	(ND) | ND	0.98	0.49 | 0.49
STIROPHOS	(ND) | ND	0.98	0.49 | 0.49
BOLSTAR	(ND) | ND	0.98	0.49 | 0.49
FENSULFOTHION	(ND) | ND	0.98	0.49 | 0.49
AZINPHOS-METHYL	(ND) | ND	0.98	0.49 | 0.49
COUMAPHOS	(ND) | ND	0.98	0.49 | 0.49

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.188 | (1.204)	1.470	80.8 | (81.9)	30-130
TRIPHENYL PHOSPHATE	1.105 | (1.226)	1.470	75.2 | (83.4)	50-130

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 10:45
Sample ID: 201310300571	Date Analyzed: 11/05/13 16:04
Lab Samp ID: J240-02	Dilution Factor: 1.03
Lab File ID: ZK05007A	Matrix : WATER
Ext Btch ID: NPK001W	% Moisture : NA
Calib. Ref.: ZK05002A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	1.0	0.52 | 0.52
MEVINPHOS	(ND) | ND	1.0	0.52 | 0.52
DEMETON	(ND) | ND	1.0	0.52 | 0.52
ETHOPROP	(ND) | ND	1.0	0.52 | 0.52
PHORATE	(ND) | ND	1.0	0.52 | 0.52
NALED	(ND) | ND	1.0	0.52 | 0.52
DIAZINON	(ND) | ND	1.0	0.52 | 0.52
DISULFOTON	(ND) | ND	1.0	0.52 | 0.52
RONNEL	(ND) | ND	1.0	0.52 | 0.52
CHLORPYRIFOS	(ND) | ND	1.0	0.52 | 0.52
FENTHION	(ND) | ND	1.0	0.52 | 0.52
TRICHLORONATE	(ND) | ND	1.0	0.52 | 0.52
METHYL PARATHION	(ND) | ND	1.0	0.52 | 0.52
TOKUTHION	(ND) | ND	1.0	0.52 | 0.52
STIROPHOS	(ND) | ND	1.0	0.52 | 0.52
BOLSTAR	(ND) | ND	1.0	0.52 | 0.52
FENSULFOTHION	(ND) | ND	1.0	0.52 | 0.52
AZINPHOS-METHYL	(ND) | ND	1.0	0.52 | 0.52
COUMAPHOS	(ND) | ND	1.0	0.52 | 0.52

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.354 | (1.387)	1.545	87.7 | (89.8)	30-130
TRIPHENYL PHOSPHATE	1.271 | (1.452)	1.545	82.3 | (94.0)	50-130

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: 10/30/13
Project : 455275	Date Received: 10/31/13
Batch No. : 13J240	Date Extracted: 11/04/13 10:45
Sample ID: 201310300572	Date Analyzed: 11/05/13 16:38
Lab Samp ID: J240-03	Dilution Factor: 0.99
Lab File ID: ZK05008A	Matrix : WATER
Ext Btch ID: NPK001W	% Moisture : NA
Calib. Ref.: ZK05002A	Instrument ID : GCT012

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	(ND) | ND	0.99	0.50 | 0.50
MEVINPHOS	(ND) | ND	0.99	0.50 | 0.50
DEMETON	(ND) | ND	0.99	0.50 | 0.50
ETHOPROP	(ND) | ND	0.99	0.50 | 0.50
PHORATE	(ND) | ND	0.99	0.50 | 0.50
NALED	(ND) | ND	0.99	0.50 | 0.50
DIAZINON	(ND) | ND	0.99	0.50 | 0.50
DISULFOTON	(ND) | ND	0.99	0.50 | 0.50
RONNEL	(ND) | ND	0.99	0.50 | 0.50
CHLORPYRIFOS	(ND) | ND	0.99	0.50 | 0.50
FENTHION	(ND) | ND	0.99	0.50 | 0.50
TRICHLORONATE	(ND) | ND	0.99	0.50 | 0.50
METHYL PARATHION	(ND) | ND	0.99	0.50 | 0.50
TOKUTHION	(ND) | ND	0.99	0.50 | 0.50
STIROPHOS	(ND) | ND	0.99	0.50 | 0.50
BOLSTAR	(ND) | ND	0.99	0.50 | 0.50
FENSULFOTHION	(ND) | ND	0.99	0.50 | 0.50
AZINPHOS-METHYL	(ND) | ND	0.99	0.50 | 0.50
COUMAPHOS	(ND) | ND	0.99	0.50 | 0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.241 | (1.275)	1.485	83.6 | (85.9)	30-130
TRIPHENYL PHOSPHATE	1.196 | (1.339)	1.485	80.5 | (90.2)	50-130

QC SUMMARIES

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

Client : EUROFINS EATON ANALYTICAL	Date Collected: NA
Project : 455275	Date Received: 11/04/13
Batch No. : 13J240	Date Extracted: 11/04/13 10:45
Sample ID: MBLK1W	Date Analyzed: 11/05/13 13:48
Lab Samp ID: NPK001WB	Dilution Factor: 1
Lab File ID: ZK05003A	Matrix : WATER
Ext Btch ID: NPK001W	% Moisture : NA
Calib. Ref.: ZK05002A	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	(1.340) | 1.285	1.500	(89.3) | 85.7	30-130
TRIPHENYL PHOSPHATE	1.239 | (1.373)	1.500	82.6 | (91.5)	50-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: EUROFINS EATON ANALYTICAL
PROJECT: 455275
BATCH NO.: 13J240
METHOD: METHOD 3520C/8141A

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: NPK001WB NPK001WL NPK001WC
LAB FILE ID: ZK05003A ZK05004A ZK05005A
DATE EXTRACTED: 11/04/1310:45 11/04/1310:45 11/04/1310:45 DATE COLLECTED: NA
DATE ANALYZED: 11/05/1313:48 11/05/1314:22 11/05/1314:56 DATE RECEIVED: 11/04/13
PREP. BATCH: NPK001W NPK001W NPK001W
CALIB. REF: ZK05002A ZK05002A ZK05002A

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	0.969J | (0.995J)	65 | (66)	1.50	0.967J | (1.05)	64 | (70)	0 | (5)	10-130	30
Ronnel	(ND) | ND	1.50	(1.22) | 1.12	(81) | 75	1.50	1.09 | (1.13)	73 | (75)	11 | (1)	30-140	30
Chlorpyrifos	(ND) | ND	1.50	1.02 | (1.14)	68 | (76)	1.50	1.11 | (1.28)	74 | (85)	8 | (12)	40-140	30
Tokuthion	(ND) | ND	1.50	0.986J | (1.13)	66 | (75)	1.50	1.04 | (1.16)	69 | (77)	5 | (3)	40-130	30
Bolstar	(ND) | ND	1.50	(1.12) | 1.10	(75) | 73	1.50	1.11 | (1.17)	74 | (78)	1 | (6)	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	(1.332) | 1.327	(88.8) | 88.5	1.500	(1.775) | 1.260	(118) | 84.0	30-130
Triphenyl Phosphate	1.500	1.272 | (1.379)	84.8 | (91.9)	1.500	1.300 | (1.323)	86.7 | (88.2)	50-130

APPENDIX I

Trails Maintenance and Monitoring Memos

June 27, 2013
(2010-116.010/06/6A)

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

SUBJECT: First Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (April 2013) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in April 2013.

All trails within the Mitigation Area were surveyed on April 9, 2013 by ECORP Consulting, Inc. (ECORP) biologists Carley Lancaster and Katherine Vienne to identify any problem areas along the trail system at the Mitigation Area. The biologists surveyed for areas of erosion, fallen trees, and potential safety hazards present on and adjacent to the trails. The biologists also identified potential trails that needed to be closed to help maintain the ecological value of the Mitigation Area. The current condition of the trails and trail system was documented and representative site photographs were taken.

The trails within the Mitigation Area appeared to be in good condition. The biologists identified only one area of minimal erosion in the trails system. The erosion issue was located at the start of the trail northwest of the Cottonwood Avenue entrance (Figure 1). The erosion was present at the trailhead leading from the asphalt area down into the riparian area. This could be considered a minor safety concern for equestrians and recreationists and should be monitored. The biologists identified ten (10) areas of trail blockage caused by fallen logs and branches from surrounding vegetation (Figure 2). Recent winds appear to have contributed to the excess debris on the trails. These areas will be cleared by the landscape contractor, Natures Image, Inc., to improve trail functionality for equestrian and recreational use.

Trash and debris present within the Mitigation Area was minimal. The biologists observed a total of four unauthorized trails within the Mitigation Area. These unauthorized trails were observed near the Tujunga Ponds and seem to be associated with people trying to gain access to previously inaccessible portions of the Tujunga Ponds (Figure 3). Upon inspection it was evident that hand tools were used to cut

through thick portions of vegetation. These areas were identified and vegetation or natural debris (fallen branches, rocks, etc.) will be placed at the entrance to these trails by Nature's Image to block access and deter future use.

The biologists also inspected the trail closure that was conducted in August 2012 following removal of the illegal structure located west of the Cottonwood Avenue entrance (Figure 4). The trail leading to the illegal structure site was successfully closed by the County of Los Angeles Department of Public Works (LACDPW) immediately after the removal of the structure and it appears that the trail closure continues to be successful. There was no evidence of pedestrian or equestrian activity observed in the trail closure area.

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

SIGNED: _____ DATE: June 27, 2013

Carley Lancaster
Assistant Biologist

Figure 1. Trail Erosion Northeast of Cottonwood Gate.

Figure 2. Fallen Log Blocking Trail.

Figure 3. Unauthorized Trail on the South Side of the East Pond.

Figure 4. Successful Trail Closure Leading to Illegal Structure Site.

March 4, 2014
(2010-116.010/010/10)

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

SUBJECT: Memorandum for Poison Oak Removal Trail Maintenance (May 2013) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as a documentation of the poison oak (*Toxicodendron diversilobum*) removal trail maintenance activities at the Big Tujunga Wash Mitigation Area (Mitigation Area) on May 15, 2013.

The removal of overgrown branches of poison oak was conducted by the landscape contractor, Natures Image, Inc., on May 15, 2013. Prior to any work, all members of the crew received an onsite orientation and briefing on the Mitigation Area's regulations and concerns related to the area's sensitive species and habitat by the qualified biological monitor. ECORP Consulting, Inc. (ECORP) biologist Carley Lancaster monitored the poison oak removal activities that occurred on May 15, 2013.

The poison oak removal effort was focused on trails in the riparian area between the northwestern end of Cottonwood Avenue and the southwestern end of the Mitigation Area near the Wheatland Avenue south entrance. Prior to the start of the removal effort, Ms. Lancaster conducted a pre-removal effort nesting bird survey in the area where removal was going to take place. Breeding birds and/or active nests were neither detected nor observed.

The crew used machetes and weed whackers to trim and remove overgrown strands of poison oak (Figure 1). Other vegetation and trees obstructing trail use were trimmed and/or removed using machetes and weed whackers (Figure 2). During the removal process the following protocols were conducted to minimize disturbance to sensitive habitat and species.

- Nesting bird surveys were conducted prior to the start of removal activities and again by the biological monitors in specific areas that the crews planned to work.
- In the limited cases when the crew members and ECORP biologist entered Haines Canyon Creek, crossings were made only at established creek crossings to minimize disturbance to sensitive habitat and species.

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: March 4, 2014

Carley Lancaster
Assistant Biologist

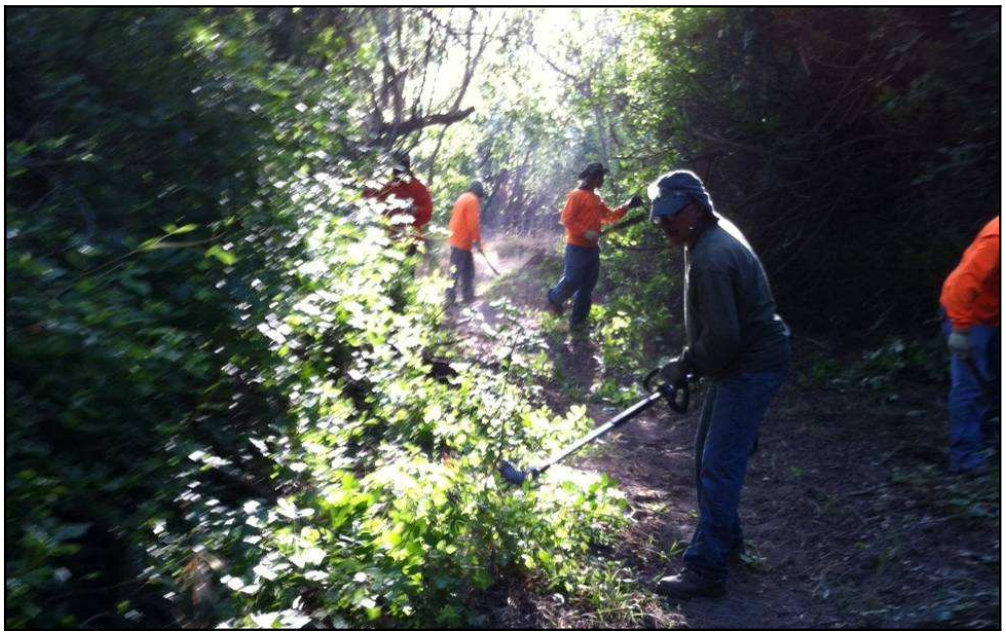

Figure 1. Trimming Overgrown Poison Oak.

Figure 2. Removal of Fallen Willow Tree Obstructing Trail.

March 12, 2014
(2010-116.010/06/6A)

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

SUBJECT: Second Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (June 2013) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in June 2013.

All trails within the Mitigation Area were surveyed on June 6, 2013 by ECORP Consulting, Inc. (ECORP) biologists Phillip Wasz and Amy Trost to identify any problem areas along the trail system at the Mitigation Area. The biologists surveyed for areas of erosion, fallen trees, poison oak overgrowth, and potential safety hazards present on and adjacent to the trails. The biologists also identified unauthorized trails that needed to be closed and noted any rock 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 (UTM 11S 375785E, 3792479N) showed evidence of recent use including a rock dam (Figure 1) and a small fire pit (Figure 2). A rope swing has also been placed above the small pool that was formed by the rock dam (Figure 3). A reference photo that was taken during the Bilingual Public Outreach Site visit over Labor Day Weekend last year (Sep 3, 2012) has been included in this memo to show the location of the rope swing in reference to the picnic area (Figure 4).

A new picnic area was discovered just east of the South Wheatland entrance (UTM 11 S 375271E, 3792554N). Rocks within Haines Canyon Creek had been removed and placed along the bank and a rock dam was constructed to form a pool (Figures 5). ECORP biologists removed the rock dam and placed the rocks from the bank back into Haines Canyon Creek (Figure 6 and 7). The trails leading to this new picnic area will need to be closed (UTM 11 S 375271E, 3792525N; Figures 8 and 9).

The large homeless encampment that was discovered near the southwestern border of the Mitigation Area was still intact. The encampment was reported to Los Angeles County Department of Public Works (LACDPW) on April 22, 2013. There appeared to be new trash in the encampment but no inhabitants were present at the time of the survey.

The area near the South Wheatland entrance that was cleared of poison oak (*Toxicodendron diversilobum*) on May 15, 2013 was checked. The poison oak appeared to be well maintained and is no longer encroaching on the trails (Figure 10).

A tree along the trail to the West Tujunga Pond has fallen and is suspended several feet over a trail (UTM 11 S 376384E, 3792653N). The tree was low enough that equestrians cannot comfortably ride under the tree and a new trail has been formed a few feet away (Figure 11). This fallen tree was cut during the next exotic plant removal effort that took place between June 24 and 26, 2013. The wood from the cut tree was placed across the new trail, which now blocks it from further use.

Several new unauthorized trails have been created, including one near the East Tujunga Pond (UTM 11 S 376700E, 3792691N; Figures 12 and 13). ECORP biologists closed these new trails with fallen branches and other natural debris adjacent to the trails (Figure 14) to block access and prevent future use.

A map of the locations of the issues identified in this memo is included as Figure 15.

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: March 12, 2014

Phillip Wasz
Associate Biologist

Figure 1. Rock dam at popular picnic area located near the South Wheatland entrance.

Figure 2. Fire pit observed at popular picnic area.

Figure 3. Rope observed swing at the popular picnic area.

Figure 4. Popular picnic area photo taken September 3, 2012 for reference purposes; location of the rope swing is marked by arrow.

Figure 5. Rocks along the creek bank at the newly identified picnic site along Haines Canyon Creek.

Figure 6. Haines Canyon Creek after rock dam removal.

Figure 7. Haines Canyon Creek after the rocks along the bank were removed.

Figure 8. Trail to new picnic site located near the South Wheatland entrance.

Figure 9. Additional trail to new picnic site located near the South Wheatland entrance.

Figure 10. Trail that was cleared of poison oak in May 2013.

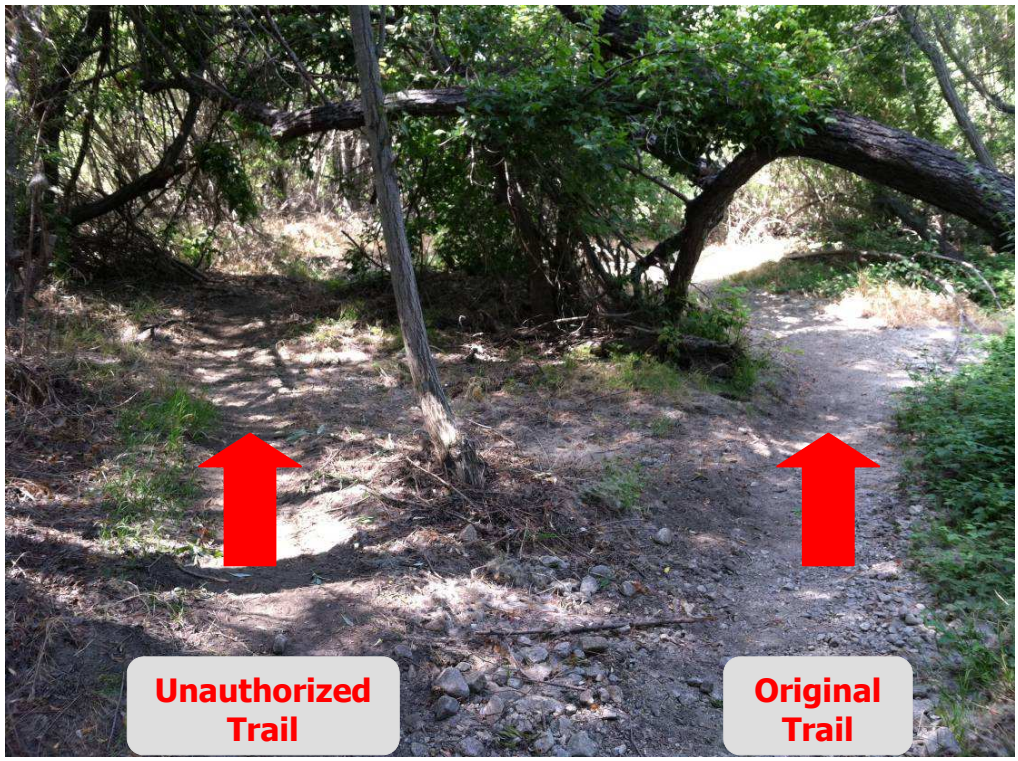

Figure 11. Tree fallen over the original trail and the unauthorized trail around it near the Tujunga Ponds.

Figure 12. Unauthorized trail near East Tujunga Pond.

Figure 13. Unauthorized trail along Haines Canyon Creek and north of Cottonwood Gate before being blocked off by biologists.

Figure 14. Unauthorized trail along Haines Canyon Creek and north of Cottonwood Gate after being blocked off by biologists.

Figure 15. Map of Issue Areas within the Mitigation Area.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 30, 2013
(2010-116.010/06/6A)

Grace Yu
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 (September 2013) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in September 2013.

All trails within the Mitigation Area were surveyed on September 3, 2013 by ECORP Consulting, Inc. (ECORP) biologist Rebecca Valdez 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 375786E, 3792573N) showed evidence of recent use including a dam across Haines Canyon Creek consisting of a fallen log (Figure 1) and a small piece of wood was added to the existing rope swing (Figure 2).

A second picnic area (noted in the June 2013 memo) located just east of the South Wheatland entrance (NAD 83, UTM 11 S 375257E, 3792554N) also showed evidence of recent use. Rocks within Haines Canyon Creek had been removed and placed along the bank and a large rock dam was constructed to form a pool (Figures 3 and 4). A shade structure was also observed in the vicinity of the second picnic area (Figures 5 and 6).

A tree along the trail to the south of the Tujunga Ponds within the southern willow scrub area has fallen and is blocking the trail (NAD 83, UTM 11 S 0376309E, 3792457N). The tree blocked the path for both hikers and equestrian and will be removed during the September exotic plant removal effort (Figure 7).

Two rock dams (Figures 8 and 9) had been created within Haines Canyon Creek (NAD 83, UTM 11 S 0376160E, 3792672N and 11 S 0375999E, 3792622N). ECORP biologists removed the dams from within Haines Canyon Creek (Figures 10 and 11).

The poison oak within the Mitigation Area appears to be well maintained and was not encroaching on any of the trails. Homeless encampments were not observed and no new unauthorized trails were observed during the time of the survey.

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

SIGNED: Rebecca L Valdez DATE: September 30, 2013

Rebecca Valdez
Associate Biologist

Figure 1. Log dam at popular picnic area located near the South Wheatland entrance.

Figure 2. Stick added to rope swing at the popular picnic area near the South Wheatland entrance.

Figure 3. Rocks along the creek bank at the second picnic site along Haines Canyon Creek.

Figure 4. Rock dam within Haines Canyon Creek at the second picnic area.

Figure 5. Shade structure constructed near second picnic area.

Figure 6. Inside the shade structure near second picnic area.

Figure 7. Fallen tree blocking a trail located south of the Tujunga Ponds.

Figure 8. Haines Canyon Creek before the log dam was removed.

Figure 9. Second log crossing before the dam was removed.

Figure 10. Haines Canyon Creek after the log dam was removed.

Figure 11. Second log crossing after the dam was removed.

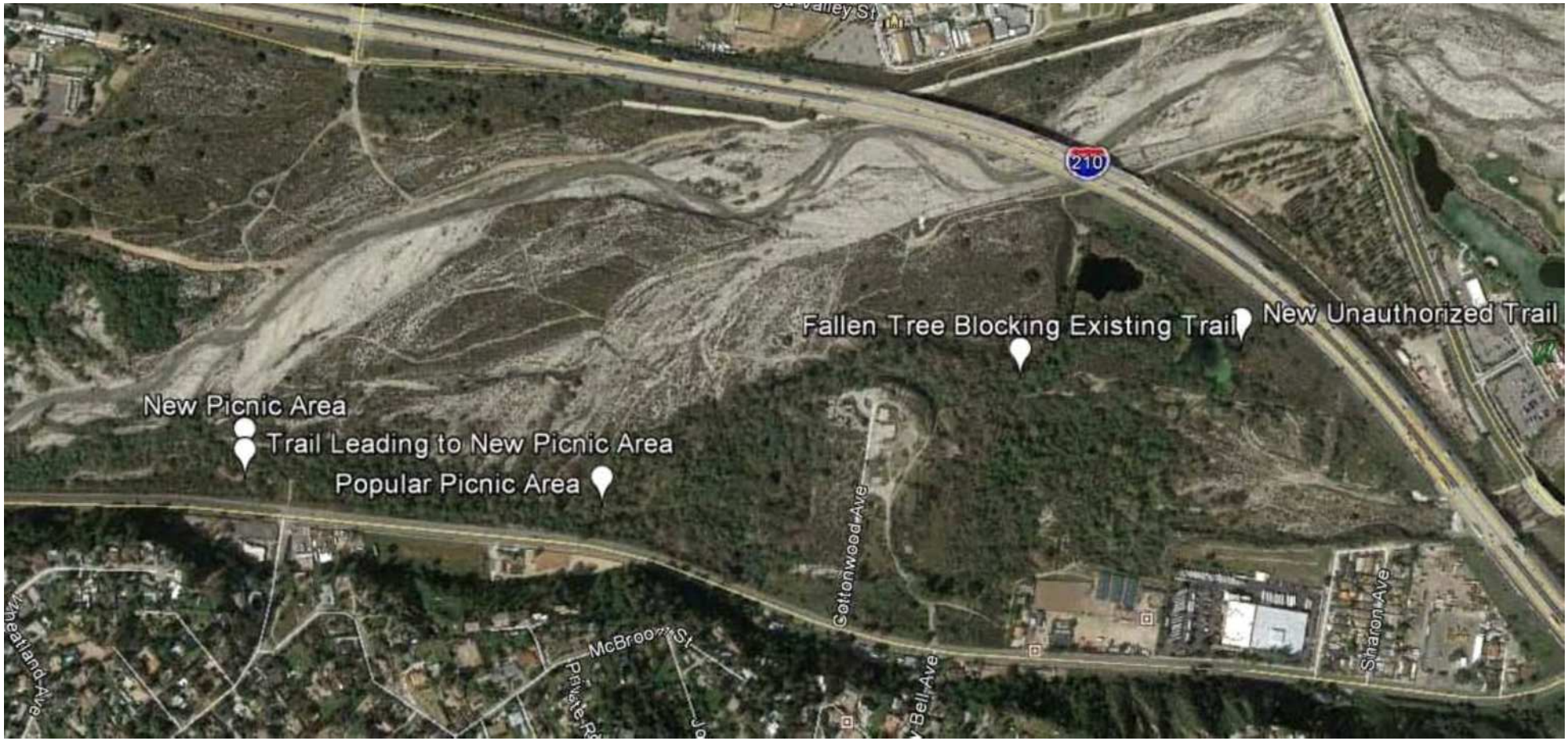

Figure 15. Map of Issue Areas within the Mitigation Area.

October 9, 2013
(2010-116.010/06/6A)

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

SUBJECT: Fourth Phase Memorandum for the Trails Maintenance and Monitoring Site Visit (October 2013) at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

This memorandum serves as documentation for the trails maintenance and monitoring site visit conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) in October 2013.

All trails within the Mitigation Area were surveyed on October 8, 2013 by ECORP Consulting, Inc. (ECORP) biologists Amy Trost and Carley Lancaster to identify any problem areas along the trail system at the Mitigation Area. The biologists surveyed for areas of erosion, fallen trees, poison oak overgrowth, and potential safety hazards present on and adjacent to the trails. The current condition of the trails and trail system was documented and representative site photographs were taken.

A branch along the trail south of the Tujunga Ponds within the southern willow scrub area has fallen and is blocking the trail (North American Datum 1983 [NAD 83], Universal Transverse Mercator [UTM] 11S 0376413E, 3792500N). The tree blocked the path minimally but was too heavy for the biologists to remove during the visit (Figure 1). A tree has fallen and is blocking the trail along Haines Canyon Creek west of the Tujunga Ponds (NAD 83, UTM 11S 0376308E, 3792613N) and a new, unauthorized trail is being formed around it (Figure 2). Further west, a series of branches have fallen at one of the crossings along Haines Canyon Creek and will also need to be removed (NAD 83, UTM 11S 0375343E, 3792650N; Figure 3). All fallen trees and branches will be removed by the landscape subcontractor shortly following this site visit during the October trail maintenance effort.

There is an unauthorized trail along the southern border of the Tujunga Ponds (NAD 83, UTM 11S 0376569E, 3792648N; Figure 4). There was no suitable natural material nearby so the biologists did not close the trail; however, the trails nearby have large numbers of overhanging branches and will need to be trimmed. When they are trimmed

during the trail maintenance effort, the branches can be used to block the unauthorized trail during the October trail maintenance effort.

There is an area of erosion north of the Cottonwood Avenue entrance as the trail drops down into the riparian habitat along Haines Canyon Creek (NAD 83, UTM 11S 0376153E, 3792650N; Figure 5). The trail in this area has been eroding over the last several years and will continue to be monitored until it needs to be filled.

One male pedestrian was observed on the trail along Haines Canyon Creek west of the South Wheatland entrance. He appeared to be homeless and was carrying a milk crate full of items. After he saw the biologists he headed into the bushes and shrubs adjacent to Haines Canyon Creek. He may have been heading to the picnic area with the rock wall or the homeless encampment that was discovered during the April exotic plant removal effort. The biologists left the area after seeing him and the incident was reported to County of Los Angeles Department of Public Works.

The poison oak within the Mitigation Area appears to be well maintained and was not encroaching on any of the trails.

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 9, 2013

Amy Leigh Trost
Assistant Biologist

Figure 1. Branch blocking trail south in the southern willow scrub area.

Figure 2. Tree blocking trail west of the Tujunga Ponds.

Figure 3. Branches blocking creek crossing.

Figure 4. Unauthorized trail south of the Tujunga Ponds.

Figure 5. Erosion near Cottonwood Avenue entrance.

APPENDIX J

Stakeholder Mailing List

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APPENDIX K

Newsletters

Big T Wash Line

April 2013

A Publication of the
County of Los Angeles
Department of Public Works
(LACDPW)

Announcements

- **Report any suspicious activity you see occurring in the Mitigation Area immediately to the LA Sheriff's Department Dispatch.** Please report issues such as loose or aggressive dogs, weapons, vandalism, and anything else that seems suspicious. It is important to report these issues to law enforcement because each time something is reported a record is created, which brings more attention to the issue.

LA Sheriff's Department Dispatch: 1-800-834-0064

- **Watch out for mosquitoes!** If you see any mosquito infestations at Big T, please report them to LACDPW (refer to page 6 for contact information). Mosquitoes can carry deadly diseases such as West Nile Virus.

- **Save your tree trimming needs for the fall!** The breeding bird season is currently in full swing! Do our feathered friends a favor and save your tree trimming activities for the fall. Most bird species are protected by the Migratory Bird Treaty Act, a federal law that was established in 1918 to protect birds, their nests, and their habitat. Violation of this federal law can mean bad news, so be sure to plan your trimming needs for September or later.

- **Be sure to say *¡Hola!* to our bilingual biologists!** Bilingual biologists will be visiting Big T on weekends during the spring and summer to educate people about the special habitats and wildlife as well as the appropriate recreational activities at the site. The biologists would love to talk with you and answer any questions you may have about the area.

Native Fishes Survey Results

In 2012, aquatic biologists conducted a native fishes survey at Big T to assess the populations of the federally-threatened Santa Ana sucker (*Catostomus santaanae*) and other sensitive fish present in Haines Canyon Creek and Big Tujunga Wash. It looks like populations in the creek have dramatically increased! When this survey was conducted in 2009, only 41 Santa Ana suckers were observed in the creek. In 2012, the biologists found 502 Santa Ana suckers; that's 12 times more fish in just 3 years! This is really exciting news for both Big T and for the entire Santa Ana sucker population. Let's keep up the good work and make sure our waterways are free of rock dams, trash, and other obstacles so our native fishes can thrive!

Santa Ana suckers are one of the native fish found in the streams at Big T. They are federally listed as threatened.

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 6). Big T covers an area of approximately 210 acres of sensitive habitat. The site was purchased by the LACDPW in 1998 for the purpose of compensating for habitat loss for other LACDPW projects.

The LACDPW 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

http://www.ladpw.org/wrd/facilities

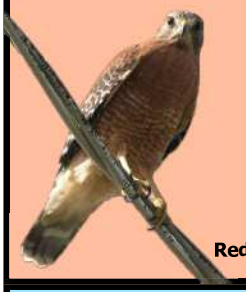
Red-tailed hawk. Ben Smith

Do You Recognize that Raptor?

Whether soaring through the air or perched high up in a tree, raptors, or birds of prey, are abundant at Big T. The three most common raptors at Big T are the red-tailed hawk, red-shouldered hawk, and Cooper's hawk. Here, we'll provide you with some pointers to improve your enjoyment of these majestic birds.

Red-tailed Hawk (*Buteo jamaicensis*). Ben Smith

Red-tailed hawks are large raptors with brown backs and pale underparts. They are best distinguished from other hawks by their distinctly red tail, which is most visible in flight, although some of these hawks can be so darkly colored that their red tail is hard to see. Those hawks are called dark morphs. They give a harsh call described as "kee-eee-ar." Their large nest (up to three feet in diameter and six feet tall), consists of a tall pile of sticks lined with bark and dry vegetation and are placed high in a tree. Look for these hawks either soaring high in the air in circles or perched on anything tall, such as a tree or telephone pole. They eat small mammals like mice and rabbits.



Red-shouldered hawk (*Buteo lineatus*). Richard J Kinch

If you want to see a **red-shouldered hawk**, head to the wooded areas along the creek at Big T. It's likely you'll hear one of these hawks crying "Kee-rah" before you even see it – they tend to be pretty noisy! These hawks are medium-sized with a red breast, black-and-white checkered wings, and black and white bands on the tail. Their nests are also made of sticks and vegetation, are two feet in diameter, and are placed in a tree just below the canopy. Red-shouldered hawks eat small animals such as lizards, rodents, and insects.

The **Cooper's hawk** actually eats other birds. It is a medium-sized raptor with a gray back, reddish breast, and long, striped tail. If you have binoculars, you may see that this bird's eyes are red. You're likely to find Cooper's hawks in wooded areas or anywhere with trees, including your neighborhood! Their stick nests are about the same size as a red-shouldered hawk's nest, but are found higher up in trees. Listen for the repetitive "kek-kek-kek" call of the Cooper's hawk to identify it.

Cooper's Hawk (*Accipiter cooperi*). Tom Grey

Can you recognize the different raptors at Big T? Next time you're out, see if you can find all three species!

2012 Trail Cleanup Day

Volunteers met early on Saturday morning to clean up the trails at Big T. Look at all the trash they collected!

The 8th Annual Big Tujunga Wash Mitigation Area Trail Cleanup Day was held on October 20, 2012 and was a complete success! Over 20 volunteers donated their time on a Saturday morning to help beautify Big T. Enthusiastic community volunteers, high school students, ECORP's biologists, and LACDPW staff all got together on this drizzly Saturday to clean up litter along the designated trails at Big T.

The focus of the event was trash removal in the upland, riparian, and creek areas. ECORP's biologists attended the event to provide guidance and support during cleanup activities and to ensure the safety and protection of sensitive species at Big T. The volunteers were successful in clearing a record amount of trash from along the trails thanks to Terry Kaiser's organized and clear instructions on which areas to target during the cleanup. Many large items were removed from along the trails, including a rusted shopping cart, a footstool, an old tire, and a sleeping bag! Thanks to the dedicated efforts and hard work of the volunteers, the trails at Big T were left in a sparkling clean condition!

Thanks to all that participated in this important effort!

Volunteers worked hard on October 20th to make sure the trails at Big T were looking good. They did a great job at cleaning up the area!

The next annual trail cleanup day will take place in the fall of 2013. We anticipate it will be scheduled in September. Please look for the next Trail Cleanup Day event announcement in the Fall 2013 newsletter or on our website: http://www.ladpw.org/wrd/facilities.

Mind Your Manners (On the Trails)

As people head out to Big Tujunga this spring, so will many birds, who travel long distances from their winter homes to have babies at Big T. During this exciting time, there are ways that you can help the birds successfully raise their young while you are out enjoying the site.

Yellow Warbler. MDF/CCSA

Take a look at the birds you see next time you're out on one of the trails and try to see if you can figure out what they are doing! Birds spend their time in many of the same ways we spend our time; talking with each other, building homes, courting their mates, feeding their babies, looking for food, and defending their home areas. This time of year, the males will spend most of their time singing and flying around their territory – it's their way of defending their home from unwanted intruders. The males may also be singing to try and attract a female for a mate. The female doesn't sing as much as the male; her job after she pairs with a male is to spend her time on the nest incubating the eggs. Males and females that have paired up together will usually communicate with one another by giving simple calls to let their mate know of their whereabouts, what they're doing, and when they're coming "home" to the nest.

California Gnatcatcher. Mari Quillman

As you can see, it's really important for us humans to practice proper trail etiquette during this time of year to help the birds safely rear their young. If we aren't careful when walking or riding along the trails we can unintentionally disrupt the birds' natural behaviors, which can make life tough for the birds that are trying to raise their babies. Birds will actually leave the nest if you get too close because they consider you a predator! Not only does this stress the birds, it also keeps them away from eggs or young, which need constant care.

If you're walking on the trails, stick to marked areas, stay alert, and try to keep noise levels down. This will allow you to better appreciate all of the interesting bird activity around you. Running on the trail or making large, sudden gestures with your arms should also be avoided, as this can disturb birds and other wildlife. Feel free to stop and watch birds, but if you notice that a bird is "scolding" you (making a lot of noise and flying around you), then it is best to move on quietly – that bird probably has a nest nearby. If you're walking a dog, keep your dog on-leash at all times. A dog off-leash likes to explore and could disturb nests in the shrubs along the trail. Birds respond a bit differently to horseback riders, as they don't see horses as predators. Nonetheless, if you're riding a horse, stay on the trail and don't ride through vegetation off-trail because this can be very destructive to nests in the vegetation. If you're riding with a group, ride single-file, go at a slow pace, and avoid loud conversations.

A biologist observes birds from afar.

Now that you're aware of ways to protect nesting birds, go out and enjoy them! See if you can watch the birds to figure out how they are spending their day. There are many useful bird field guides and smartphone apps such as iBird that can help you learn more about birds and their behaviors.

Trail vs. Drainage: What's the Difference?

Drainages, also known as washes or dry creeks, are natural channels that carry water on a seasonal basis to or from rivers and streams. Drainages can often look like a lot like trails but there are a few differences to note. As opposed to established trails, drainages at Big T are usually full of rocks because smaller dirt and sand particles get washed away by the fast flowing water, which leaves larger rocks and gravel exposed. Drainages can be narrower than trails and often contain traces of a high water line (even when the drainage is dry). Two ways you can tell a high water line is present: 1) Plant debris that was washed down from higher ground is present on the edges of the drainage as well as wrapped around the base of trees, shrubs, and large rocks, and 2) there is a visible change in the dirt from inside the drainage to the banks of the same drainage.

Here is a photo of a drainage that was taken at Big T. Note the rocky bottom, the distinctive banks, and the change in soil layers from the bottom of the drainage to the vegetated banks.

What should you do if you accidentally find yourself walking in a drainage instead of a trail? Stay calm and don't worry! Just stop, turn around, and head back the way you came from until you find yourself back on an established trail again. Whatever you do, don't step out of the drainage and begin creating a new trail to find your way back to the main trail. Once one person (or horse) walks overland through vegetation, it suggests to other people that this might be a potential trail. Before we know it, an unauthorized trail has become established at Big T!

Hikers enjoying the use of an established trail in Big T.

As you might already know, it is important for visitors to remain on established trails. Why? The trail system within Big T is designed to allow visitors to enjoy the natural beauty of Big T while also allowing for the sensitive animals and plants to thrive in this designated conservation site.

If you have any questions about the established trails system, please contact LACDPW (contact information is on page 6).

Are the trees dead? Nope, they are just holding their breath until Spring!

Have you noticed that a lot of the trees and shrubs at Big T look like they might be dead during the winter? This is because they are **deciduous**, meaning they lose their leaves each winter. Trees and bushes use their leaves to breathe.

Tiny microscopic holes in the leaf called stomata open and close each day to let the plant "breathe" in and out. And each time they open and close, a little bit of water escapes, too. Have you ever been outside when it's *really* cold and notice that you can see your breath? What you see is water escaping with the air that you are breathing out. The same thing happens when plants breathe. Winter is very dry, so instead of keeping all their leaves and losing water, deciduous plants just get rid of them. Then the plants become dormant and save energy by holding all their water in their trunks and branches until spring arrives.

If it doesn't quite make sense, here's an example: Take a deep breath. Now, hold it as long as you can… You held it for a while didn't you? Now hold it again, but this time jump up and down while you hold it. It was a lot harder this time, wasn't it? Just like you, it is easier for the tree to hold its breath, and therefore its water, when it is not using as much energy. But don't worry, spring is here and soon all the deciduous plants will take a nice big breath and start growing those beautiful green leaves again.

Some plants are still green in winter, you say? Take a closer look at those plants. Most of them have needles instead of leaves. The needle shape holds water better than a large, flat leaf shape. So, trees and shrubs with needles can keep their leaves all year and not have to worry about losing water in the winter.

Deciduous trees in summer with foliage.

Deciduous trees in fall changing colors.

Deciduous trees in winter without leaves.

Animal Corner: Long-tailed Weasel

The long-tailed weasel (*Mustela frenata*) has a long, slender body and short legs with a tail that is roughly half its body length. It is found in most areas of the United States and into Canada. In Southern California, the animal is reddish-brown to tan along its back and white to yellow along its belly. In the northern part of its range the long-tailed weasel turns white in winter to blend in with its snowy habitat.

Because its legs are so short and its body is so long, long-tailed weasels often use a bounding gate to get around. Bounding is fun to watch because weasels scrunch up their bodies like a caterpillar and hop from their back feet to their front feet and back again. They prey mostly on small mammals and help maintain rodent and rabbit populations. They live in woodlands and thickets as well as open areas, as long as they have access to a water source such as a stream. Long-tailed weasels are known to be noisy and will often call at other animals (even humans) that enter into their territory. However, they are also very secretive and are not often seen, so it is very special if you do happen to see one! Stay on the lookout in Big T; you never know what you might see (or hear)!

A long-tailed weasel looks around curiously. David Dahms.

Big Tujunga Wordsearch

Use the articles in the newsletter to fill in the blanks in the sentences below. *(answers on Page 6)*

1) Five hundred and two _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ were observed when biologists surveyed Haines Canyon Creek at Big T in 2012.

2) Deciduous plants become _ _ _ _ _ _ _ to save energy by holding all their water in their trunks and branches until spring arrives.

3) _ _ _ - _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ can be identified by their red colored breasts and black-and-white checkered wings.

4) Long-tailed weasels have long _ _ _ _ _ _, short _ _ _ _, and a _ _ _ _ that is roughly half its body length.

5) _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ is an important day held once a year at Big T where volunteers help clean up trash and make sure the site looks good.

6) _ _ _ _ birds spend most their time singing and moving around their territories in the spring, whereas _ _ _ _ _ _ birds usually sit on the nest and incubate eggs.

7) _ _ _ _ _ _ _ _ _, which carry water after rain events, can be narrower than trails and often contain traces of a high water line.

8) _ _ _ - _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ are most commonly identified by their distinctive red tail that is visible when they fly.

9) _ _ _ _ _ _ _ _ _ trees lose their leaves each fall and winter, which can make the trees look dead (even though they aren't!).

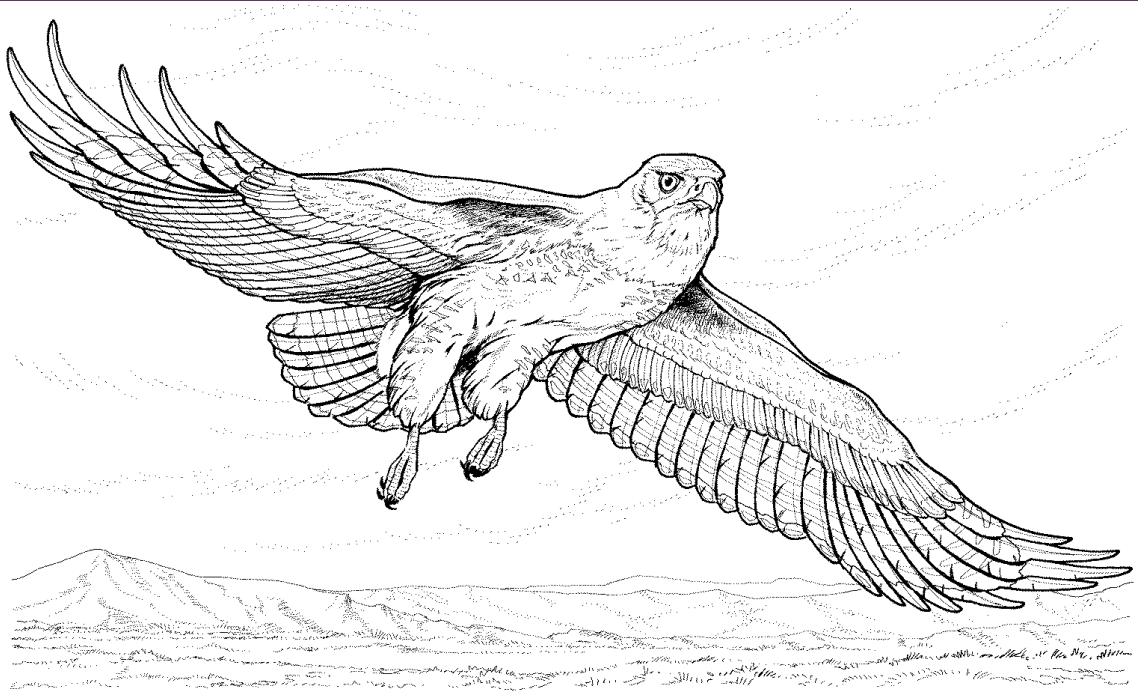
10) If a bird starts _ _ _ _ _ _ _ _ you and trying to make you feel unwanted in that area, it is best to move on quietly because that bird probably has a nest nearby.

11) _ _ _ _ - _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ are known to be noisy and will often call at other animals or humans that enter their territory.

12) The bird of prey known as the _ _ _ _ _ _ _ _ _ _ _ _ may prey on other birds.

We've hidden 10 red-tailed hawks like this one throughout the newsletter, can you find them all?
GOOD LUCK ON YOUR SEARCH!

Kid's Corner



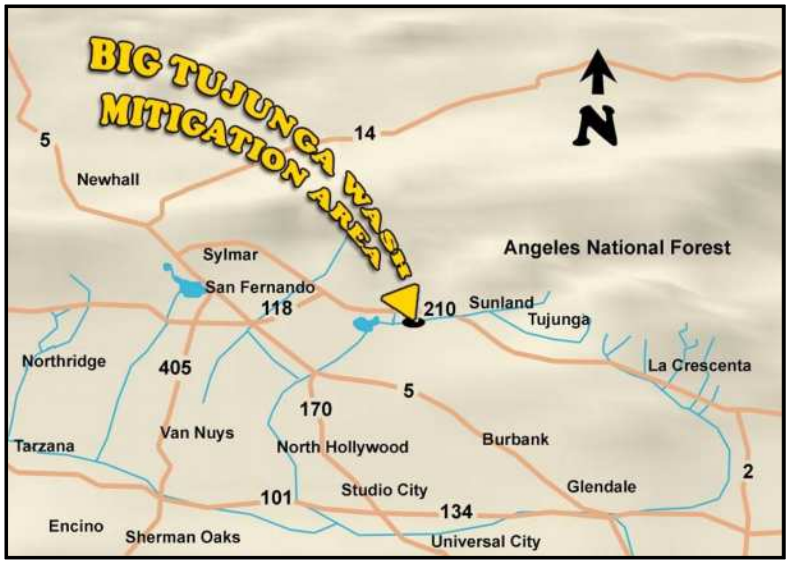
Color this picture of a red-tailed hawk. Read the article about raptors on page 2 to learn more about this beautiful bird!

Courtesy of www.supercoloring.com/pages/flying-hawk/

Water Resources Division
County of Los Angeles
Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803

Where is Big T?

Downstream of Big Tujunga Canyon, right in the heart of Sun Valley, south of the 210 freeway, you'll find a native riparian (water loving plant) natural area filled with cottonwoods, willows, and pools of water that support many native aquatic species. Check out the Big T website for more information at: http://www.ladpw.org/wrd/facilities/



Emergencies? Incidents? Questions?

- **CALL 911 TO REPORT ANY EMERGENCY SUCH AS FIRE OR ACCIDENT**
- To report minor incidents or regulation infractions contact the Sheriff's Department at 1-800-834-0064. (Please **DO NOT** use 911.)
- Do not attempt to enforce regulations yourself; please allow law enforcement to handle the situation/incident.

* For emergency follow up or to report minor incidents, obtain information, or get questions answered during weekday work hours (8:00 a.m. to 5:00 p.m., Monday through Thursday), please contact:

Grace Yu
Water Resources Division
County of Los Angeles Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803
Email: gyu@dpw.lacounty.gov

Answers to word search:
1) Santa Ana Suckers; 2) Dormant;
3) Red-shouldered hawks;
4) Bodies, Legs, Tail;
5) Trail Cleanup Day;
6) Male, Female; 7) Drainages;
8) Red-tailed hawks; 9) Deciduous;
10) Scolding; 11) Long-tailed weasels;
12) Cooper's hawk

Big T Wash Line

September 2013

A Publication of the
County of Los Angeles Department of Public Works
(LACDPW)

Announcements

- **Report any suspicious activity you see occurring in the Mitigation Area immediately to the LA Sheriff's Department Dispatch.** Please report issues such as loose or aggressive dogs, weapons, vandalism, and anything else that seems suspicious. It is important to report these issues to law enforcement because each time something is reported a record is created, which brings more attention to the issue.

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- **The Big T Website Has Changed!** Check out the new and improved Big T website at: **www.dpw.lacounty.gov/wrd/projects/BTWMA**

  Please note that the old web address will still work.

- **ATTENTION! TIME TO TRIM THOSE TREES!** You've waited patiently through the spring and summer and now it's finally time to trim your trees and shrubs! The breeding bird season is officially over and you can safely start pruning without fear of disturbing that hummingbird nest in your hedgerow. Just remember that birds begin breeding again in February, so trim 'em while you can.

- **Water Lettuce Herbicide in the Ponds** – We have recently been having issues with water lettuce, an exotic, fast spreading aquatic plant species, in the Tujunga Ponds. The ponds have been sprayed with a water-soluble herbicide that should have little to no impact on the people and wildlife at Big T. But just in case, keep your pets (and yourselves) out of the ponds.

- **Trails Cleanup Day** — Please join LACDPW and ECORP Consulting, Inc. for the 9th Annual Trail Cleanup Day on October 5th, 2013. 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: comfortable clothes, gloves, hat, sun block, and bug repellant. *Note: Trails Cleanup Day will be rescheduled for October 12 or 19 if there is rain or poor weather.

- **Brown-headed Cowbird Trapping** — The results are in and this year's brown-headed cowbird trapping was a success! Four traps were placed throughout Big T and surrounding areas and a total of 54 males, 42 females, and 1 juvenile were removed from the area. We trap these parasitic birds to protect our native bird species at Big T. Cowbirds lay their eggs in the nests of native songbirds. As the young cowbirds hatch and grow, they outcompete the native babies in the nest and the native babies usually die because they do not get enough food. Low numbers of brown-headed cowbird juveniles at Big T means our trapping efforts are working and the native baby birds have better chances of survival at Big T!

You Are Our Eyes and Ears!

Please help us keep Big T beautiful, functional, and safe for all recreational users! If you see any issues such as rock dams, unauthorized cutting or removal of vegetation, homeless encampments, or problems with the entrance gates, please contact BTWMA@dpw.lacounty.gov to report what you saw. We value your input regarding these incidences!

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More information can be found at

www.dpw.lacounty.gov/wrd/projects/BTWMA

Councilmember Felipe Fuentes Visits Big T!

Big T received a big-time visitor in August – Los Angeles City Councilmember Felipe Fuentes of Council District 7! The Councilmember is making a great effort at getting to know his new Council District and we are happy to help! The Councilmember and his team toured the site with LACDPW, County of Los Angeles Department of Parks and Recreation, and ECORP Consulting on August 22, 2013. LACDPW educated the Councilmember about the history and purpose of the site, and explained the multitude of programs that are conducted each year to maintain Big T as a natural area. While touring through the site, ECORP biologists were able to highlight the unique habitat features and describe all the sensitive species that call Big T home. LACDPW also discussed some of the site security issues including homeless encampments, wildfires, fishing, and rock dams. Councilmember Fuentes was interested to know how he could help increase protection at Big T.

Overall, as the Chair of the City's Energy and Environment Committee, the Councilmember was impressed with Big T and was happy to see it kept in such a natural state amidst the urban development in Los Angeles County. He was pleased with the County's public outreach efforts and wanted to know how we can engage more young people to these natural areas. Councilmember Fuentes even mentioned that he wanted to bring his daughter out to tour the site one day! All in all, it was a very successful day of show and tell!

Warming up to Forest Fires

Fires can happen year-round, but summer and fall are the most likely times for fires because the temperatures are high, the humidity is low, and the Santa Ana winds start to pick up. While the idea of a fire may be scary, occasional fires can actually be good for the environment.

Many areas benefit from forest fires because these fires get rid of dead and dying trees and make room for young, healthy vegetation. Forest fires are naturally occurring fires that burn an area at a lower temperature. Historically, these fires are usually started by lightening strikes and are considered a natural part of the ecology in many areas of southern California. A wildfire, on the other hand, burns at a much hotter temperature and usually destroys everything in its path. Wildfires are not a natural process to southern California and are usually very devastating to the areas in which they occur.

We know what to do in a fire, but what about all the plants and animals? Animals, like people, know how to get in and out of their "neighborhood" and most will move away from fire. Birds fly, mammals walk or run, and reptiles burrow under logs and rocks or hide in the soil while fires pass. Some animals even use fires to catch a meal! Predators sometimes follow the edge of a fire to catch small animals running away. Birds will circle above and catch insects in the smoke or mice exposed on the ground.

While animals can crawl, run or fly, plants have different strategies to survive a fire. Native plants that are found in fire-prone areas generally have thick, waxy leaves that are difficult to burn, which makes them resistant to forest fires. Many plants have the ability to re-grow from the roots even if the entire plant above ground is burned. Some plants even need forest fires in order to survive! Many trees have seeds that can't grow until a forest fire cooks and cracks the outside of the hard shell. The ash left by a fire contains nutrients that the new seeds need to grow.

Forest fires (not wildfires) can be important for a healthy environment, but we don't want them near our houses, so it is important to have what firefighters call "defensible space" around your home. Keep a 100-foot area around your house clear of dead plants, dry leaves, or thick vegetation. Check out the following link for more information on keeping your house safe during the fire season: **www.readyforwildfire.org/defensible_space**.

Here at Big T, there are several recreational activities that are prohibited so we can reduce the chances of a devastating wildfire breaking out. Campfires, smoking, hunting, and shooting guns are all prohibited at Big T because these activities have the potential to create destructive wildfires that threaten the homes and structures adjacent to the site in addition to the plants and wildlife that are found here.

A firefighter puts out a fire at Big T in 2012.

Check out the Beautiful Fall Colors!

Cottonwood tree changing color at Big T

In our last newsletter, we talked about how trees are able to survive during the cold winter months. Specifically, we talked about deciduous trees; trees that lose their leaves in winter. Well, in the warm summer season the trees are looking very green and happy. The green color that you see during the spring and summer is created by a pigment called chlorophyll. The green chlorophyll helps plants turn sunlight, water, and air into the sugars and starches that plants need for food. It does this through a complex reaction called photosynthesis. During the warm months of the year, there is plenty of air, water, and especially sunlight for the chlorophyll to work hard all summer making food for the tree. But, as the days get shorter and shorter in autumn, there is less sunlight during the day. The shorter days and reduction in sunlight let the trees know that it's time to start getting ready for the winter season. They stop producing as much food and start conserving their water, so the chlorophyll isn't needed and slowly disappears from the leaves. As the chlorophyll disappears, so does the green color in the leaves.

When the green disappears we start to see the yellow, orange, and red colors that are left behind in the leaves. Yellow leaves are often seen in birch and cottonwood trees. Red and orange colors are often seen in maple trees or sumac bushes. Dogwood trees have a dark red or even purple color to their leaves in fall. Oaks typically have brown leaves in the autumn and winter. See how many different colors you can find while enjoying the beautiful outdoors this autumn!

Cottonwood tree in the Summer. Photo courtesy of Eve & George DeLange

Cottonwood tree in the fall. Photo courtesy of pfeiferstudio.com

I Found This Baby Animal — What Should I Do?

Baby northern mocking bird. Photo courtesy of Steve Gifford –USFWS

You can find young animals year round. Some animals, like snakes and lizards, are born ready to take care of themselves and venture out into the world. Other animals, like birds and mammals, need their parents to care for them for several weeks and even months after they are born. During the spring and summer in particular you can find lots of baby animals in parks, zoos, or even in your own backyard.

When they are old enough, baby animals like to go out and explore the world. But don't worry, their parents are usually close by to keep an eye on them. If an animal can move by itself that means they can find their way back to their nest and away from danger. If you can't see their parents nearby, that's okay; they are probably out looking for food for their baby. Stay back from the animal and make sure to take lots of pictures!

But what if the animal clearly needs help? If you find a baby bird that doesn't have any feathers yet, look for their nest. If you find the nest you can put the baby bird back inside. If you can't find the nest you should put the baby bird close by, out of harm's way, and let its parents come back for it. Make sure to stay away from the bird for several hours. Keep your pets away from it, too! If you don't see the mother return after 4 to 6 hours, then you should contact a specialist in wildlife rehabilitation.

If you find an animal that is bleeding, shivering severely, or has been attacked by a cat or dog, there are several steps that can be taken to help them. Contact a wildlife rehabilitator immediately! They will instruct you about what to do with the animal. If you cannot contact a wildlife professional right away, then place the animal in a warm, dark place such as a cardboard box with a towel inside. Make sure to close up the box so the animal can't jump out and hurt itself and make sure your container has holes for air! Be sure to wear thick gloves (preferably leather) when you place the animal in the container to protect yourself from any bites or scratches. Animals can be stressed when they are hurt and might attack if they feel threatened. Wash your hands after handling the animal to prevent contracting any diseases. After you've made the animal comfortable, try contacting a wildlife rehabilitator again and take it to a wildlife rehabilitation center.

A Mallard mother and chicks. Photo courtesy of Becky Valdez

If you find an animal in need, you can try searching for the nearest wildlife rehabilitator or check the Wildlife Rehab Info Directory website: **wildliferehabinfo.org**.

What Do You Mean I Can't Fish Here?

You might have asked yourself from time to time, "Why is fishing not allowed in the beautiful ponds and rippling creeks at Big T?" Good question. One answer to that question is because the waterways at Big T are home to a special group of fishes: the arroyo chub, Santa Ana speckled dace, and Santa Ana Sucker. As you probably already know, all of these fish species are sensitive because of their declining populations and natural habitats. Fishing, though a seemingly harmless activity, has the potential to harm any one of these native fish species through accidental hooking or injury from fisherman walking through the stream and accidentally stepping on the bottom-dwelling fish (such as the Santa Ana sucker).

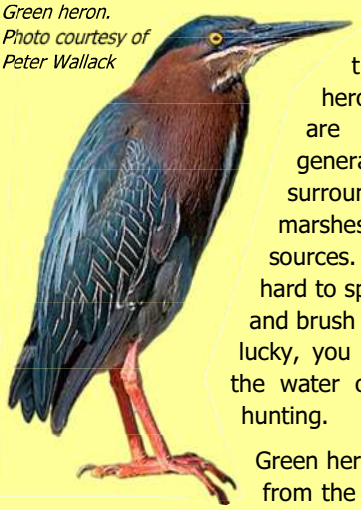
Santa Ana suckers are federally listed as threatened.

The other answer to that question is because Big T is a preserved natural area and the ponds were originally created as mitigation to offset the impacts created from construction of the 210 freeway. LACDPW owns and manages Big T as a natural area to offset any impacts resulting from LACDPW's other projects in the region. LACDPW has an agreement in place with the California Department of Fish and Wildlife (CDFW). CDFW has the responsibility to make sure that Big T is maintained in a natural state that is suitable for native wildlife and plant species to thrive. Because the primary purpose of Big T is to be a sanctuary for wildlife and plants, many types of recreational activities are restricted at the site. Fewer impacts occur to the plants and wildlife by only allowing passive recreational activities such as hiking, horseback riding, and nature viewing. Additionally, the types of recreational activities that are not allowed at the site are regulated by CDFW and if not adhered to, CDFW may not allow any recreational activities at the site! It is unique to see recreational activities allowed in mitigation banks; therefore, it is our privilege to be able to use Big T in this way. LACDPW takes pride in allowing the public to access Big T and doesn't want that privilege to be taken away, so LACDPW must enforce the terms in their agreements. This ultimately means that fishing cannot be allowed at the site. Feel free to search the internet to find other great fishing locations in the region!

Some native fish can be hard to spot near the rocks like this Santa Ana sucker.

Animal Corner: Green Herons and Black-crowned Night-Herons

Green heron. Photo courtesy of Peter Wallack



Both the green heron (*Butorides virescens*) and the black-crowned night-heron (*Nycticorax nycticorax*) are small stocky birds that generally live in wooded areas surrounding rivers, streams, ponds, marshes, estuaries, and other water sources. These small herons can be hard to spot through tangles of leaves and brush where they perch. If you get lucky, you may see one foraging near the water or crouching on land while hunting.

Green herons breed over a wide range from the Canadian border to the Gulf of Mexico and west to the Great Plains, western Texas, and southwestern New Mexico. They are dark in color with a green back, a chestnut body, and a grayish green cap that is often raised into a short crest. Their necks are long and thick and can be drawn up against their bodies giving a front-heavy appearance. Green heron's bills are relatively long, straight, and dagger-like, making it easier to hunt fish and amphibians. Occasionally, they will use twigs or insects as bait to lure in their prey.

Adult black-crowned night-heron

Black-crowned night-herons breed across most of the United States, except for from the Appalachian Mountains into Maine and the arid northern plains. These herons have light grayish under-parts with a white neck, and a black back and crown (top of head). The genus name *Nycticorax* means "night-raven," which is fitting because black-crowned night-herons are nocturnal foragers. You can catch a peek at these birds very early in the morning or just before sunset. They can sometimes be heard at dusk flying and giving a "quark" call. They have shorter necks and bills and in shallow water they may vibrate their bill in order to attract their prey.

If you keep your ears alert and your eyes open, you may come across one of these magnificent water birds at Big T!

Juvenile black-crowned night-heron. Photo courtesy of USFWS

Q-1: Circle the activities you are allowed to do at Big T and cross off the ones that you are not allowed to do.

A. Riding Horses

B. Fishing

C. Hiking

D. Camping

E. Smoke Cigarettes

Q-2: True or False: Trees should be trimmed in the fall and winter.

Q-3: What should you do if you find a baby animal?

A. Put the animal in a warm dark place if it looks hurt.

B. Leave it alone if it can move on its own.

C. Put it back near or in its nest/home if it does not have fur or feathers.

D. Call a wildlife rehabilitator if it looks hurt.

E. All of the above.

Q-4: Circle one. This bird is a Black-crowned Night-Heron. Is this an **Adult or Juvenile?**

Photo courtesy of USFWS

Big Tujunga Word Scramble

Kid's Corner

1. **REGEN EHONR** _____ _____

This animal will use twigs or insects to bait their prey.

2. **ETRSOF REFSI** _____ _____

These are naturally occurring, happen mostly in the summer and the fall, and can also be good for the environment.

3. **CSUDOEDUI** _____

_____ trees loose their leaves in the winter.

4. **IGB NUGUAJT** ___ _____

The name of the preserved natural area owned by LACDPW.

5. **EPLIEF ETENUFS** _____ _____

Councilmember _____ _____ visited Big T on August 22nd this year.

6. **PLCHLHOYORL** _____

This gives plants their green color and disappears from some trees in the wintertime.

7. **BNIELFEDSE ACSPE** _____ _____

An area around your house that has been cleared of dead plants, dry leaves, or thick vegetation to protect it from fire.

8. **CAKLB-WORCNED HIGNT-RONEH**

_____-_____ _____-_____

The genus name of this bird means "night raven"

9. **GINISHF** _____

This activity is prohibited at Big T in order to protect the aquatic wildlife.

10. **ANSAT AAN KRESCU** _____ ___ _____

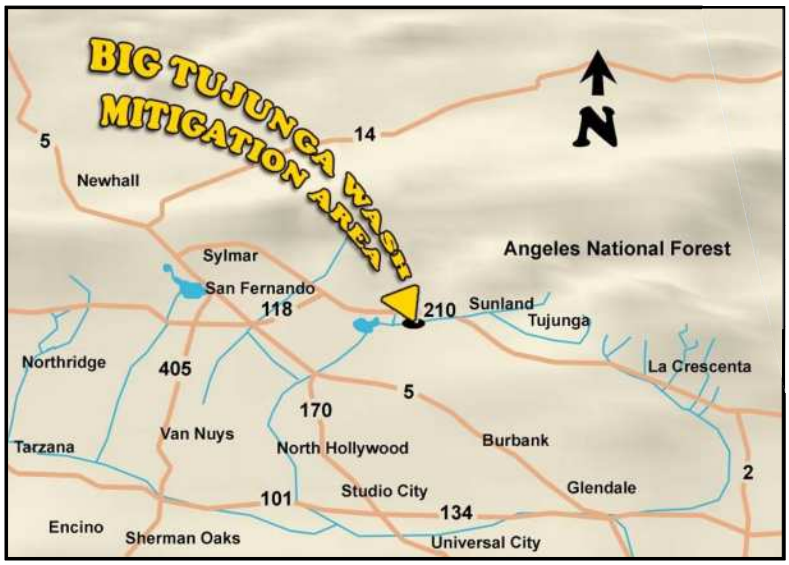
A federally listed threatened fish found at Big T.

ANWSERS-Q&A Q-1:A and C, Q-2:True, Q-3:E, Q-4:Adult **Word Scramble-1**.Green Heron 2.Forest fires 3.Deciduous 4.Big Tujunga 5.Felipe Fuentes 6.Chlorophyll 7.Defensible Space 8.Black-Crowned Night-Heron 9.Fishing 10.Santa Ana Sucker

Water Resources Division
County of Los Angeles
Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803

Where is Big T?

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



Emergencies? Incidents? Questions?

- **CALL 911 TO REPORT ANY EMERGENCY SUCH AS FIRE OR ACCIDENT**
- To report minor incidents or regulation infractions contact the Sheriff's Department at 1-800-834-0064. (Please **DO NOT** use 911.)
- Do not attempt to enforce regulations yourself; please allow law enforcement to handle the situation/incident.

* For emergency follow up or to report minor incidents, obtain information, or to get questions answered, please contact:

Grace Yu
Water Resources Division
County of Los Angeles Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803
Email: BTWMA@dpw.lacounty.gov

APPENDIX L

Community Advisory Committee Meeting Agendas and Minutes

PUBLIC NOTICE

BIG TUJUNGA WASH MITIGATION AREA
COMMUNITY ADVISORY COMMITTEE MEETING

Notice is hereby given that the semi-annual meeting of the Big Tujunga Wash Mitigation Area Community Advisory Committee (CAC) will be held on:

Thursday, April 25, 2013
6:30 p.m. to 8:30 p.m.
Hansen Yard
10179 Glenoaks Boulevard
Sun Valley, CA 91352

The purpose of the Big Tujunga Wash Mitigation Area 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.

In an effort to reduce our paper use, this and future notices are being distributed electronically. For more information about the mitigation area, please visit http://dpw.lacounty.gov/wrd/facilities. If you have changes to your e-mail address or would like to be removed from the CAC distribution list, please contact Ms. Grace Yu at gyu@dpw.lacounty.gov.

(TWO-SIDED DOCUMENT)

BIG TUJUNGA WASH MITIGATION AREA
COMMUNITY ADVISORY COMMITTEE MEETING

AGENDA

Thursday, April 25, 2013
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

(TWO-SIDED DOCUMENT)

Big Tujunga Wash Mitigation Area Project
Community Advisory Committee
2013 Spring Meeting Minutes
April 25, 2013

I. Welcome/Introduction

Meeting attendance sign-in sheet attached.

II. Review of Meeting Agenda

Grace Yu reviewed the meeting agenda.

III. Discussion of Action Items from the September 27, 2012 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. **Grace Yu (LACDPW) and Mary Benson (City of Los Angeles District 7; CD7) will contact the following people for a City/County tour of the Mitigation Area: CD7 staff members, Sunland Tujunga staff members, and Gerald Rubicon. Mary will let Chris Stone (LACDPW) know who will be attending the tour of the Mitigation Area. Grace will give Mary some times that would work best for a site visit, preferably during a morning. Mary will contact Chris Arlington (SHPOA) to let her know if Foothill Mounted Patrol should be there during the site visit.** Grace Yu contacted Mary Benson and Councilmember Alarcon's office about conducting a visit but she received no responses. Felipe Fuentes will take over as the new Councilmember beginning July 1, 2013. Mary would like a site tour to be conducted regardless of who is elected because it is important to show the ecological and biological significance of the Mitigation Area to elected officials. Mary will contact Grace when CD7 is ready to schedule a tour. *This action item has been tabled and will be revisited upon CD7's initiation.*

2. **Mary Benson will provide the name and contact information of the new LAPD officer assigned to patrol the Mitigation Area to the CAC.** Mary Benson reported that the new Los Angeles Police Department (LAPD) officer assigned to patrol the Mitigation Area is Officer Don Boone, the Senior Lead Officer from the LAPD Foothill station. Officer Boone has expressed interested in working with LACDPW to keep the Mitigation Area safe and he is willing to hike through it in order to patrol the site better. *This action item is now complete.*

3. **Grace Yu will follow up with Flood Maintenance Division about blading or smoothing the access road from the North Wheatland entrance in order to provide easier access into the Mitigation Area for the Los Angeles Sheriff's Department (LASD) and LAPD.** Grace Yu has put in a work

order that has not been completed yet. Work is expected to be performed on the road within the next two weeks. *This action item is now complete.*

4. **ECORP will draft a Mitigation Area permit protocol.** Permit protocol has been drafted and ECORP will submit the draft to LACDPW for review on Friday, April 26, 2013. This document will serve as a starting point for LACDPW to decide what circumstances and events will require permits. Once the permit protocol has been finalized LACDPW will make the document available to the public. *This action item is now complete.*

5. **Mary Benson and Chris Stone will advocate scheduling more LAPD and/or LASD patrols of the Mitigation Area. Grace Yu will work with LAPD and LASD.** Grace Yu will contact Officer Boone to coordinate LAPD patrols of the Mitigation Area. Steve Carbahol of the LAPD Valley Traffic Off-Road Unit has also agreed to patrol the Mitigation Area. Additionally, Grace will coordinate with rangers at the Santa Monica Mountains Conservatory (SMMC) and the Mountains Recreation and Conservation Authority (MRCA) about patrolling the Mitigation Area. Grace reported that the Los Angeles County Flood Maintenance Division will begin patrolling the site every Monday on a weekly basis. ECORP will be sending bilingual biologists beginning on Memorial Day weekend to educate the public to help prevent further problems associated with recreationalists at the site. ECORP's bilingual biologists will be conducting weekend visits throughout the late spring and summer with focus on holiday weekends, as those are the expected peak-use recreationist times during the summer.

6. **Grace Yu will formalize the CAC Meeting Membership list.** Grace Yu will continue to update and formalize the CAC Meeting Membership list.

7. **Terry Kaiser (ETI) will check the locks on all the LACDPW-owned Mitigation Area gates and record the locks he can identify to help LACDPW.** Terry Kaiser checked the locks on April 25, 2013. There are new Cat30 locks on the Mary Bell and Cottonwood Avenue entrances to the Mitigation Area. There have been problems with illegal dumping in the Mitigation Area and changing the locks should prevent any further problems. The turntable at the Foothill gate has a combination lock on it. The Wheatland entrance had locks on it from LA Parks and Recreation, the U.S. Forest Service, Department of Water and Power, and LACDPW. There is also a new Cat30 lock on an entrance to Big Tujunga Wash off of Christy Avenue west of the Mitigation Area; this area is not owned by LACDPW. *This action item is now complete.*

8. **Mari Quillman (ECORP) will contact Mike Linton at Vulcan Materials Company for information and possibly to obtain a boundary map of the Vulcan Materials Company properties along Foothill Boulevard.** A 4-acre lot located at the intersection of Wentworth Avenue and Foothill Avenue, across from the Angeles National Golf Club, belongs to Vulcan Materials Company. Vulcan is interested in giving the area to an entity so the lot could be made into a parking lot and access area to the Big Tujunga Wash for recreation. There would be room to park horse trailers. It would require developing some trail routes from this area. Vulcan would like to partner with a willing agency or organization in a

grant/restoration project which would serve as mitigation for a quarry down the street. However, Vulcan Materials Company has run into some issues with the project and they do not anticipate the project starting for another few years. Mari Quillman will check periodically with Vulcan and will report back when Vulcan is ready to begin. *This action item has been tabled until further notice.*

IV. Ongoing and New Discussion Items

1. Upcoming Events

- Terry Kaiser has an equestrian event scheduled for June 23, 2013. The event will include equestrian trails trials where one to two horses (with their riders) at a time will go through an obstacle at the Haines Canyon Creek crossing near the Wheatland entrance. This event was held last year as well. Terry will contact LACDPW for permitting.
- Friends of the LA River (FOLAR) will be doing a cleanup at Haines Canyon Creek at the flood control channel area on May 18, 2013. If anyone is interested they may contact Karin Flores. Hansen Dam will also be hosting their first volunteer cleanup effort in the near future. The Recreation and Parks Supervisor, Peggy Kelly, has more information.

2. Homeless in the Mitigation Area

There have been several homeless encampments found in the Mitigation Area lately, including one recently identified by ECORP biologists with a person and dog living in it. On March 30, 2013, under the Interstate-210 bridge north of the Mitigation Area, the City of Los Angeles conducted a homeless relocation and cleanup. Increased patrols should help prevent more homeless encampments from being established within and immediately adjacent to the Mitigation Area. Councilmember Alarcon along with the Department of Mental Health has a program to help homeless people with mental illnesses; the Councilmember's office should be contacted if there are any homeless people found with suspected mental illnesses.

3. Trail Cleanup Day

The 2013 Trail Cleanup Day is tentatively scheduled for September 21, 2013. LACDPW would like to work with Heal the Bay and be incorporated into their California Coastal Clean-up Day in order to have a larger turn out for the Trail Cleanup Day. LACDPW will have a meeting with Heal the Bay in May 2013. There will need to be a team captain who will have to attend regular Heal the Bay meetings in Santa Monica leading up to the event.

4. Big Tujunga Dam Sediment Removal

The LACDPW will be releasing a California Environmental Quality Act (CEQA) document soon and are expecting to release a Mitigated Negative Declaration (MND) in mid-May 2013. The MND will be available for public review from mid-May to late June and there will be an informational meeting in late May. A map of the sediment placement associated with the project is on the LACDPW website. The project is slated to begin next summer but this is dependent on the storm events in 2013 and early 2014. It is anticipated that this project will only affect the water

course in the Tujunga Reservoir; flow in the Mitigation Area will not be affected by this project.

5. Charro Event Contact Info

ECORP has received the contact information for the Charreada (Charro) equestrian events and will keep up to date on events that happen in and around the Mitigation Area.

6. Trails Maintenance

Terry Kaiser would like to do a walk-through with ECORP biologists the next time there is a trial maintenance visit scheduled. During the last trails maintenance/monitoring visit the trails were cleared for pedestrians but not high enough for horses and riders. There is also a dense patch of poison oak approximately 300 to 500 feet north of the Wheatland entrance along the creek that needs to be removed. ECORP will contact their landscape contractor to schedule a visit to trim the poison oak.

7. Mitigation Area Signage

It was reported that the signs by the Tujunga Ponds have been tagged with graffiti and need to be replaced or cleaned. Grace Yu is looking into revising and replacing all Mitigation Area entrance signs and possibly installing trail signs.

Terry Kaiser offered to make trail signs for the Mitigation Area. Terry is chairman of California Trail Users Coalition, the group that makes rugged and durable U.S. Forest Service signs. It was suggested that signs be placed at each of the trailheads, major intersections, and unmarked entrances to the Mitigation Area to help keep people on existing trails. Terry suggested visiting Eaton Canyon to see examples of clear signage on the entrances to trails.

It was suggested that a sign be placed at the bottom of the levy and on the Water Trail at the western boundary of the Mitigation Area to signify the boundaries of the Mitigation Area.

8. California Department of Transportation

Mary Benson announced that the California Department of Transportation (Caltrans) District 7 has acknowledged that the rectangular-shaped property on the northern part of the Mitigation Area located south and west of Foothill Boulevard is under their jurisdiction. This property/right-of-way includes the access road into the Mitigation Area from the Foothill Gate. Mary stated that Ed Toledo is the Caltrans District 7 Maintenance Supervisor for this parcel and would be the person to contact for Mitigation Area coordination. Grace Yu will coordinate with Caltrans for cooperation with recreational activity restrictions in the Mitigation Area as well as possibly placing additional Mitigation Area signage in this area.

9. Website

The Mitigation Area website has been recently updated and most of the Mitigation Area documents are available online. A larger update and redesign of the site will be done once all documents have been made available.

V. Current Status of Programs

1. Exotic Plant Eradication Program

The last removal effort of 2012 took place in mid-December. The first removal effort of 2013 occurred between April 10 and April 19, focusing on annual weedy species to remove plants before they went to seed. Water lettuce has not been observed in the ponds since the last exotic plant removal effort.

2. Exotic Wildlife Removal/Monitoring

A total of 2,439 individuals, consisting of 12 exotic aquatic species, were removed from Hanes Canyon Creek, Big Tujunga Wash, and the Tujunga Ponds, in 2012. The majority of the exotic aquatic species were removed from Haines Canyon Creek. One new exotic aquatic species was observed in the ponds, the Mozambique Tilapia, a highly adaptable fish species native to Africa. The first removal effort of 2013 will take place in May.

3. Focused Surveys for Listed Wildlife Species

Native fishes surveys were conducted in December 2012. All three native fish species (Santa Ana sucker, Santa Ana speckled dace, and arroyo chub) were observed in the Mitigation Area. A total of 502 Santa Ana suckers were observed in Haines Canyon Creek, which is a substantial increase from the 41 observed in 2009, the last time this focused survey was conducted. Populations of native fishes appear to be healthy in the Mitigation Area. Focused surveys are conducted every three years and thus will not be conducted in 2013.

4. Water Quality Analysis

No changes in water quality were observed in the 2012 water quality analysis; the water remains in good quality within the Mitigation Area. The 2013 water quality analysis will be conducted in fall or early winter.

5. Trails Restoration/Maintenance

A trails restoration/maintenance effort was conducted by ECORP biologists during the exotic plant removal effort earlier in April 2013. Due to recent high-wind events, a lot of branches had fallen across the paths. The landscape contractor's crews removed obstructions to clear existing trails. Trash and debris near the trails was removed and unauthorized trails surrounding the ponds were closed.

6. Public Outreach Program

The public outreach program in 2013 will begin in May, on Memorial Day weekend. ECORPs bilingual biologists will walk trails on the weekends as the weather gets warmer to speak with recreational users of the Mitigation Area.

7. Brown-headed cowbird Trapping

The trapping for 2013 began on April 1 and will continue to June 30. Four traps have been placed in the same locations as previous years throughout the Mitigation Area. All four traps have captured cowbirds to date.

8. Trail Cleanup Day

The 2012 Trail Cleanup Day occurred on October 20; there was a large turnout of

over 20 volunteers. Volunteers were able to split into several groups and cover most of the Mitigation Area. A special thank you goes out to Terry Kaiser for help organizing and delegating teams. The next Trail Cleanup Day has been tentatively scheduled for September 21, 2013.

9. 2012 Annual Report

ECORP submitted the 2012 Big Tujunga Wash Mitigation Area Annual Report on April 9, 2013. LACDPW disseminated the report to California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, the Army Corps of Engineers, and posted it on the Mitigation Area website.

VI. Schedule Next CAC Meeting

The next CAC meeting is scheduled for Thursday, September 26, 2013, 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. Grace Yu will contact Officer Don Boone to coordinate LAPD patrols of the Mitigation Area.
2. Grace Yu will coordinate with the rangers at SMMC and MRCA about patrolling the Mitigation Area.
3. ECORP's bilingual biologists will keep in contact with the Charreada event coordinator to find out when the next event is occurring.
4. Grace Yu will coordinate with Caltrans on recreational activity restrictions and additional signage on or near the Caltrans property/right-of-way south and west of the Foothill Entrance.
5. ECORP will contact their landscape contractor to schedule a visit to trim the poison oak on the trails around the South Wheatland entrance.
6. ECORP will contact Terry Kaiser the next time they conduct a trails maintenance event so Terry can explain how high to trim branches for equestrian access on the trails.
7. Grace Yu will coordinate with Heal the Bay about incorporating the Mitigation Area's Trail Cleanup Day into their California Coastal Clean-up Day activities.

BIG TUJUNGA WASH MITIGATION AREA
COMMUNITY ADVISORY COMMITTEE MEETING

AGENDA

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2. Water Lettuce Control/Monitoring
3. Exotic Wildlife Removal/Monitoring
4. Brown-headed Cowbird Trapping
5. Trails Restoration/Maintenance
6. Public Outreach Program

V. Schedule Next CAC Meeting

VI. Comments, Questions, and Answers

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(TWO-SIDED DOCUMENT)

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Sun Valley, CA 91352

The purpose of the Big Tujunga Wash Mitigation Area 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.

In an effort to reduce our paper use, this and future notices are being distributed electronically. For more information about the mitigation area, please visit http://dpw.lacounty.gov/wrd/facilities. If you have changes to your e-mail address or would like to be removed from the CAC distribution list, please contact Ms. Grace Yu at gyu@dpw.lacounty.gov.

(TWO-SIDED DOCUMENT)

Big Tujunga Wash Mitigation Area Project
Community Advisory Committee
2013 Fall Meeting Minutes
September 26, 2013

I. Welcome/Introduction

Meeting attendance sign-in sheet attached.

II. Review of Meeting Agenda

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

III. Discussion of Action Items from the April 25, 2013 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. **Grace Yu (LACDPW) will contact Officer Don Boon (Los Angeles Police Department [LAPD]) to coordinate LAPD patrols of the Mitigation Area.** Grace Yu spoke with Officer Wall (LAPD), who then gave her Officer Don Boon's contact information. Currently, recreation activities at the site are waning due to the change in weather and upcoming fall season, but there is concern about the next spring and summer. LACDPW would like to begin raising awareness for increased patrols now in anticipation of next spring and summer. A new patrol group, the Mounted Cavalry, is being formed as a volunteer unit out of LAPD. The Mounted Cavalry will patrol the Mitigation Area and act as eyes and ears to help the officers and is expected to start patrolling in Spring 2014. The Mounted Cavalry will have the ability to issue citations. Foothill Mounted Patrol is still conducting patrols. Grace Yu will continue to coordinate with Officer Boon about patrolling the Mitigation Area.

2. **Grace Yu will coordinate with the rangers at Santa Monica Mountains Conservancy (SMMC) and Mountains Recreation and Conservation Authority (MRCA) about patrolling the Mitigation Area.** Grace Yu will coordinate with Debbie Pepe (Los Angeles County Department of Parks and Recreation [LACDPR]) to get the contact information of rangers at SMMC and MRCA. Debbie Pepe reported that the on-call SMMC ranger patrols the upstream portion of Big Tujunga Wash. The on-call SMMC ranger is the best point of contact for patrolling. Grace Yu will continue to coordinate with the rangers about patrolling the Mitigation Area.

3. **ECORP's bilingual biologists will keep in contact with the Charreada event coordinator to find out when the next event is occurring.** ECORP's bilingual biologists tried to maintain correspondence with the Charreada (Charro)

events coordinator but he stopped returning calls and emails in June 2013. Evidence of Charro activities in the Mitigation Area has decreased in recent months, which is likely attributed to increased patrols. For now, outreach efforts will be suspended; however, if there are more signs of site use related to Charro events then outreach will be resumed. *This action item has been tabled.*

4. **Grace Yu will coordinate with California Department of Transportation (Caltrans) on recreational activity restrictions and additional signage on or near the Caltrans property/right-of-way south and west of the Foothill entrance.** Caltrans has not been contacted at this time because LACDPW would like to address enforcement issues in the Mitigation Area first. *This action item has been tabled.*

5. ECORP will contact their landscape contractor to schedule a visit to trim the poison oak on the trails around the South Wheatland entrance. The poison oak was trimmed on May 15, 2013 by their landscape contractor and the trails remain clear. *This action item is now complete***.**

6. ECORP will contact Terry Kaiser (Equestrian Trails, Inc. [ETI]) the next time they conduct a trails maintenance event so Terry can explain how high to trim branches for equestrian access on the trails. Vegetation above the trails continues to be too low for equestrians. ECORP will contact Terry Kaiser before the November/December 2013 trails maintenance and monitoring visit.

7. Grace Yu will coordinate with Heal the Bay about incorporating the Mitigation Area's Trail Cleanup Day into their California Coastal Clean-up Day activities. The objectives of Heal the Bay do not align with those of the Mitigation Area, so this was not pursued. LACDPW will continue to manage the Trail Cleanup Day independently. *This action item is now complete.*

IV. Ongoing and New Discussion Items

1. Trail Cleanup Day

The 2013 Trail Cleanup Day is scheduled for October 5, 2013. Bilingual trash signs were placed anonymously throughout the Mitigation Area and appear to be working well; there is less litter throughout the Mitigation Area. Terry Kaiser will locate large amounts of trash and will report to Grace Yu on areas that need to be concentrated on during Trail Cleanup Day. Terry Kaiser and Randy Hammock will distribute Trail Cleanup Day flyers and copies of the Fall Newsletter to other interested parties.

2. Website and Email

The Mitigation Area website has been recently redesigned and has a new domain, www.dpw.lacounty.gov/wrd/Projects/BTWMA/. The previous domain is still active and will redirect users to the new website. It is now more user-friendly but still contains the comprehensive library of reports, CAC meeting minutes, CAC agendas, and newsletters. Also, the Mitigation Area now has a new email address BTWMA@dpw.lacounty.gov for site users to report issues at the site. Both Grace Yu and Melanie Morita (LACDPW) have access to this email so that issues and questions can be more quickly addressed.

3. Councilmember Fuentes Visit to the Mitigation Area

On August 22 LACDPW, LACDPR, and ECORP Consulting, Inc. (ECORP) gave a tour of the Mitigation Area to Councilmember Felipe Fuentes of Los Angeles Council District 7. The Councilmember toured the cottonwood upland area, the Tujunga Ponds, and the upland area near the ponds. He was given an overview of the programs at the Mitigation Area and discussed concerns regarding homeless people and other site security and patrolling issues. He hopes to increase patrols in the Mitigation Area and create outreach programs for youth to get them involved at the site.

4. Security Issues

- A map of the incidents that have occurred in the Mitigation Area since the last CAC meeting was distributed. This map will be updated prior to each CAC meeting and distributed at the meeting to inform the community about homeless encampments and other site issues within the Mitigation Area.

- Terry Kaiser reported that the number of summer recreationists did not appear to change from previous years; however, he observed the same issues at the Mitigation Area as in previous years. Rock dams, swimming, and campfires were all prevalent during the summer months.

5. Equestrian Safety

- Two new equestrian crossings have been installed on Wentworth Avenue at the Mary Bell and South Wheatland entrances to the Mitigation Area. A third crossing outside of the Mitigation Area is located at Christy Drive off of Foothill Avenue. All crossings have flashing lights; however, users are cautioned to not have a false sense of security when crossing the busy roads. Many times motorists do not stop for the flashing lights or simply cannot see the lights because of overgrown vegetation or the way the setting sun hits. Currently, the crossing at the South Wheatland entrance is the only one that is consistently operational. Terry Kaiser asked LACDPW to trim the vegetation near the crossing signs and lights on the Mitigation Area side of Wentworth Avenue to help motorists see the crossings better. Grace Yu will coordinate with Flood Maintenance to get the foliage trimmed.

- Terry Kaiser installed concrete mounting steps on either side of the Mary Bell entrance to make it easier for riders going to and from the Mitigation Area.

6. Streambed Alteration Agreement Renewal

The streambed alteration agreement with CDFW is set to expire on March 31, 2014. LACDPW and ECORP will work together over the next few months to see that it is renewed.

7. Distribution List Survey

A survey was distributed to the current mailing list to update shareholder contact information, determine if the shareholders are still interested in receiving site news and alerts, and determine how they would like to receive the information (email or regular mail). Individuals interested in being added to the mailing list can fill out a

from on the website at www.dpw.lacounty.gov/wrd/Projects/BTWMA.

8. Mountain Biking in the Mitigation Area

Mountain bikers have recently and consistently been observed entering the site at the North Wheatland entrance. The CAC was advised to contact Grace Yu or ECORP if they see mountain bikers in the Mitigation Area.

9. Mozambique Tilapia in the Ponds

In December 2012, one adult Mozambique tilapia was captured in a gill net in the East Pond during an exotic aquatic species removal effort. This was the first time this species had been found at the site. In May 2013, four adult Mozambique tilapia were again captured in a gill net in the East Pond during a removal effort. In early September 2013 one juvenile Mozambique tilapia was captured in the West Pond. There are likely more juvenile tilapia in the ponds; however, visibility during the September 2013 removal effort was poor so there were no additional sightings. The presence of the juvenile fish is a possible indication that Mozambique tilapia are breeding and successfully moving through the waterways at the Mitigation Area. It is likely this species will spread to the creek. Tilapia are direct predators of native fish, are very successful reproductively, and can adapt to many different habitat types (fresh and salt water). They outcompete native fish populations for food and nesting or shelter spaces. ECORP will continue to monitor the tilapia situation in the ponds and notify LACDPW if additional action is necessary.

Based on recent observations of Mozambique tilapia in the East and West Ponds there was discussion about installing fish screens at the outlet of the West Pond where it connects with Haines Canyon Creek to prevent the tilapia from migrating into the creek and having direct contact with the native fish species. LACDPW asked ECORP to research the amount of maintenance these screens would require.

V. Current Status of Programs

1. Exotic Plant Eradication Program

Three efforts have been conducted in 2013; April 10 through 19, 2013; June 24 through 26, 2013; and September 4 through 9, 2013. The final effort is scheduled for November or December. ECORP will also be conducting site maintenance during the final effort (trail cleanup, etc.).

2. Water Lettuce Control/Monitoring

Water lettuce was observed in the ponds in late June 2013. Two herbicide application efforts were conducted in early July 2013 and early August 2013. Follow up visits in late August 2013 did not detect any water lettuce in the ponds or the Connector Channel. ECORP is continuing to monitor the ponds for presence of water lettuce.

3. Exotic Wildlife Removal/Monitoring

Two of the four removal efforts have been conducted to date, with the most recent effort occurring September 16 through 19, 2013. The last two efforts will occur

between October and December 2013.

4. **Brown-headed cowbird Trapping**
   The trapping for 2013 began on April 1 and ended on June 30. Four traps were placed in the same locations as previous years throughout the Mitigation Area. A total of 54 adult male, 42 adult female, and 1 juvenile brown-headed cowbirds were captured in 2013 for a total of 97 birds. This is a decrease from the 137 that were captured in 2012. The main goal of brown-headed cowbird trapping is to remove the adults from the site before they have a chance to reproduce. A single female cowbird can lay up to 100 eggs in a single season, which can be detrimental to the native songbirds at the Mitigation Area. A substantial decrease from the 2012 captures means trapping has been very successful.

5. **Trails Restoration/Maintenance**
   Four restoration/maintenance efforts have been conducted in 2013 with one more scheduled for the November/December timeframe. Blocked trails have been cleared, poison oak was cleared from trails, and trash and debris has been removed.

6. **Public Outreach Program**
   The public outreach program was completed on Labor Day weekend. ECORP's bilingual biologists conducted ten visits since Memorial Day weekend and spoke with over 100 equestrian and non-equestrian site users. The same issues of rock dam construction, swimming, picnicking, fishing, and campfire building were frequently observed.

VI. Schedule Next CAC Meeting

The next CAC meeting is scheduled for Thursday, April 24, 2014, 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. Grace Yu will contact Wesly Hernandez (Assistant to Councilmember Fuentes) to advertise Trail Cleanup Day.
2. Terry Kaiser will contact Grace Yu about areas that should be focused on during the upcoming Trail Cleanup Day.
3. ECORP will update the incident map prior to the next CAC meeting.
4. Grace Yu will contact the Flood Maintenance Division about clearing vegetation between the Mary Bell entrance and Gibson Ranch on Mitigation Area side of Wentworth Avenue.
5. ECORP will research the maintenance required for fish screens in case LACDPW decides to pursue the installation of screens at the outlet of the West Pond to prevent tilapia from entering Haines Canyon Creek.

APPENDIX M

Public Outreach Memo

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 30, 2013
(2010-116.007/012/12)

Grace Yu
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 2013 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. Yu:

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 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 Israel Marquez on ten different occasions. Outreach efforts took place on May 26, June 9 and 29, July 6, 7, and 21, August 11 and 25, and September 1 and 2, 2013. All outreach efforts took place during the peak hours of 10:00 AM to 3:00 PM.

ECORP biologists walked the established trails system and popular swimming/wading locations in the Haines Canyon Creek and Tujunga Ponds areas and spoke with visitors they encountered. Visitors that were interviewed fell into one of two groups: non-equestrian family groups or equestrian user groups.

During these ten outreach visits all non-equestrian and equestrian visitors encountered received 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 impact on the sensitive species. Most outreach events consisted of informal interviews and short question and answer sessions. Questions from the visitors for the biologists ranged from natural history topics to questions about the purpose of the Mitigation Area's rules and regulations. In addition to these questions, social media awareness of the outreach efforts was a topic discussed

frequently amongst the equestrian users. Equestrian users were interested in including outreach effort information on their social media web pages to inform other visitors of the site.

Non-Equestrian Family Groups

Over 100 non-equestrian site users were encountered during the ten outreach visits. Most of these individuals were situated along the Haines Canyon Creek and the Tujunga Ponds. The larger family groups were observed arriving on the site with the intent to picnic, swim, and fish. All site users were given 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. Additional guidance was given to new visitors on hiking the trail along Haines Canyon Creek (i.e., the Water Trail). Some of the issues observed included alcohol consumption, cigarette smoking, campfires, rock dams in the creek, littering, fishing, dogs off leash, and bathing in the creek.

All of the groups that were encountered were mostly receptive after being educated on the resources and rules within the Mitigation Area. One instance of aggressive behavior on behalf of a non-equestrian site user was encountered by the ECORP biologists. The aggressive individual appeared to be under the influence of alcohol and soon left the site. Many of the people on the site agreed to not use grills, start fires, smoke cigarettes, or litter, but many continued to swim and wade in the creek even after being told that swimming was not permitted. Most users continued their activities once the biologist left their immediate area, including resuming dam building activities.

Most of the family groups that were interviewed during the site visits were Hispanic with some users being monolingual (Spanish only) and others being bilingual (Spanish-English) speakers.

Effects on Sensitive Habitat by Non-Equestrian Family Groups

The largest impacts on sensitive habitat by non-equestrian family groups were caused by swimming and rock dam construction within Haines Canyon Creek. There are a few unauthorized swimming holes 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 Avenue entrance. During the outreach visits, adolescents and adults were observed swimming and wading in this area. 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. The dams in this area consist of large dead branches, boulders, debris, trash, and plastic placed across a narrow portion of the creek that reduced the natural flow and created a buildup of water (Figures 2 and 3). In one instance, the ECORP biologist removed a dam with help of the recreational users before the recreationists left the Mitigation Area (Figure 4). 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 for prompt removal.

Additional adverse effects of non-equestrian family groups included increased littering within the popular picnic areas, vegetation removal, and unauthorized fire pits and campfires (Figures 5 and 6). Bilingual signage was posted by an anonymous community member asking the site users to pick up after themselves before leaving the site (Figure 7).

Equestrian User Groups

Equestrians were approached and interviewed along the established trails, in the upland areas of the Mitigation Area, and near the Tujunga Ponds. Equestrians were given the bilingual brochure and informed about many of the unique aspects of the Mitigation Area. Outreach events with equestrians were usually brief with most of the equestrian site visitors being receptive to the outreach efforts. Most questions to the ECORP biologists were about the conservation efforts taking place at the Mitigation Area and on retrieving contact information for maintenance on the site. Several riders stated that they were planning to post the educational brochure at their stable as well as on their Facebook social media web page to get the word out to fellow riders.

Riders were reminded to cross the creek single file to minimize erosion along the banks, and to stay on the established trails. Additional awareness education was provided to the riders regarding their horses leaving excrement in the waterways and the effects this has on the sensitive habitat. Riders were asked to call LACDPW if they notice any suspicious activity in the Mitigation Area.

Effects on Sensitive Habitat by Equestrian Site Visitors

Equestrian site visitors can affect sensitive habitat by traveling off of the established trail system; evidence of this was observed on one occasion along the Water Trail during the outreach visits conducted in 2013. One equestrian rider was observed riding her horse within Haines Canyon Creek instead of the adjacent trail pathway in order to connect with an adjacent trail. This type of activity typically occurs when a portion of the trail is impassible due to fallen trees and branches or if the trail is extremely muddy or flooded from recent rains (Figure 8). The creation of new trails and traveling off of the established trails can be avoided with continued trail maintenance and equestrian site visitor education. Through these efforts, the frequency of users traveling off of the established trails system can be reduced.

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 30, 2013

Jerry Aguirre
Biologist

Figure 1. Non-equestrian family group picnicking at the popular swimming area near the South Wheatland entrance on September 2, 2013 (Labor Day Weekend).

Figure 2. Rock dam blocking the natural flow of Haines Canyon Creek on August 25, 2013.

Figure 3. Large Rock Dam present at the popular swimming area near the South Wheatland entrance on September 1, 2013 (Labor Day Weekend).

Figure 4. A rock and branch dam observed in the popular swimming area near the South Wheatland entrance on June 29, 2013.

Figure 5. Diaper near the South Wheatland entrance on July 21, 2013.

Figure 6. Campfire remnants in the popular swimming area near the South Wheatland entrance on June 09, 2013.

Figure 7. Bilingual signage posted by an anonymous community member near the South Wheatland entrance August 11, 2013.

Figure 8. Trail obstruction northwest of the Cottonwood Avenue entrance heading towards the Tujunga Ponds August 11, 2013.