

2011 Annual Report for the Big Tujunga Wash Mitigation Area Los Angeles County, California



Prepared for:



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Department of Public Works
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Big Tujunga Wash Mitigation Area
Los Angeles County, California**

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COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
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**Guide to Compliance with the Terms and Conditions in the California
Department of Fish and Game Streambed Alteration Agreement #1600-2008-
0253-R5 for the Big Tujunga Wash Mitigation Area,
dated January 29, 2009**

A draft Streambed Alteration Agreement (SAA) (#1600-2008-0253-R5) was submitted to the Los Angeles County Department of Public Works (LACDPW) from California Department of Fish and Game (CDFG) on January 29, 2009 (Appendix A). The following key provides a quick reference as to how the conditions were addressed and where the explanations of the activities associated with the conditions are located in the document.

Resource Protection

Condition 1: Vegetation removal activities did occur between the dates of March 1 and September 1, however, breeding bird pre-construction surveys were conducted prior to all exotic vegetation removal activities occurring in 2011. In addition, a qualified biological monitor was present during all exotic vegetation removal activities to ensure 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: Pre-construction nesting raptor surveys were conducted prior to all vegetation removal activities occurring within the Mitigation Area in 2011. No active raptor nests were identified within the active work areas, therefore no impacts occurred to nesting raptors and no fencing of nests was required (see Section 4.0).

Condition 3: No active bird nest was destroyed or disturbed during the 2011 breeding season, in accordance with the Migratory Bird Treaty Act (MBTA) of 1918. Appropriate measures, such as pre-construction surveys and biological monitoring, were taken to prevent impacts to breeding/nesting birds protected under the MBTA.

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

Condition 5: CDFG has been notified of the presence of all listed and sensitive species occurring within the Mitigation Area. No other listed species were observed in the Mitigation Area.

Condition 6: A qualified biological monitor was on site during all clearing, enhancement, and restoration activities (see Section 4.0). The biological monitor conducted the appropriate pre-construction surveys on site prior to activities occurring in an area.

Condition 7: All native vertebrate species encountered during clearing, enhancement, and restoration activities were safely relocated, if necessary. No native wildlife vertebrate species perished as a result of the activities occurring in the Mitigation Area. No wildlife exclusionary devices were necessary, therefore none were constructed. No work was conducted on site without the presence of a biological monitor (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 acted as an informational brochure that was handed out to recreational user groups as part of the new public outreach program (see Section 7.4). In addition, the biological monitor conducted tailgate worker education sessions each morning prior the 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 2011 annual report will be submitted to CDFG.

Condition 10: CDFG 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 Take Permit.

Condition 11: Wildlife-proof trash receptacles have not yet been installed in the Mitigation Area.

Condition 12: Hunting was not permitted nor authorized within the Mitigation Area in 2011.

Work Areas and Vegetation Removal

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

Condition 14: All personnel who conducted activities within the boundaries of the site were provided maps and no native vegetation was removed within or beyond the boundaries of the site. The work areas were clearly delineated and unnecessary impacts did not occur to ephemeral streams and 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: No vegetation with a diameter at breast height (dbh) larger than 3 inches was removed, except as stated in the MMP and approved by CDFG.

Condition 16: No native vegetation was removed from the channel, bed, or banks of the stream except as provided for in the SAA.

Equipment and Access

Condition 17: No vehicles or equipment were operated or driven in water covered portions of the stream.

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

Fill and Spoil

Condition 19: No fill was placed in any area of the Mitigation Area.

Structures

Condition 20: No materials were placed in any seasonally dry portions of the stream.

Condition 21: No installation of erosion control structures occurred during 2011, nor was there a need for such structures.

Condition 22: No bridges, culverts, or other structures were constructed as part of the activities associated with the MMP.

Condition 23: No temporary or permanent dam, structures, or flow restrictions were constructed 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 7.4)

Pollution, Sedimentation, and Litter

Condition 24: All litter and pollution laws were complied with by the contractors, subcontractors, and employees of LACDPW. Trash pickup was conducted regularly by the site users, the landscape contractor, and by volunteers during an organized Trail Maintenance Day (Section 7.3).

Condition 25: No equipment maintenance was conducted in the Mitigation Area.

Condition 26: No spills occurred in the Mitigation Area.

Condition 27: No silty/turbid water from dewatering or other activities occurred as a result of the activities conducted in the Mitigation Area.

Condition 28: No equipment washing or other activities were conducted that would have resulted in the production of water containing mud, silt, or other pollutants.

Condition 29: No alteration of the stream's low flow channel, bed, or banks were altered as a result of the implementation of the activities in the Mitigation Area.

Condition 30: As stated under Condition 24, the only movement of rocks within the beds or banks of the stream occurred during the removal of rock dams created by the recreational users. The removal of the rock dams was conducted by biologists who are familiar with the sensitive fishes in the stream (see Section 7.4). These activities were done 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 because it eliminates

habitat that is better suited for exotic wildlife (bullfrogs [*Lithobates catesbeianus*], largemouth bass [*Micropterus salmoides*], and etc.) that pose a threat to this species.

Permitting and Safeguards

Condition 31: The CDFG, United States Army Corps of Engineers (USACE), and Regional Water Quality Control Board (RWQCB) were consulted with 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 didn't need to issue a permit because there wasn't going to be any fill within their jurisdiction. The continued implementation of the MMP and the Long-term Maintenance and Monitoring Plan (LTMMP) for the Mitigation is not expected to have any impact on Corps' 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. No additional work on the CE was conducted in 2011.

Administrative-Miscellaneous

Condition 33: No amendments to the SAA were submitted to the CDFG during the 2011 period. CDFG did not identify any breaches of the SAA during the 2011 period.

Condition 34: No terms or conditions of the SAA were violated during the 2011 period.

Condition 35: Copies of the SAA were provided to all of 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 2010 or 2011.

Condition 37: CDFG was notified within five days prior to the start of exotic vegetation removal activities occurring within the Mitigation Area (see Section 4.0).

Conditions 38 and 39: CDFG did not request any site visits during the 2011 reporting period.

Conditions 40 through 42: CDFG did not issue a suspension or cancellation of the SAA in 2011.

1.0 INTRODUCTION

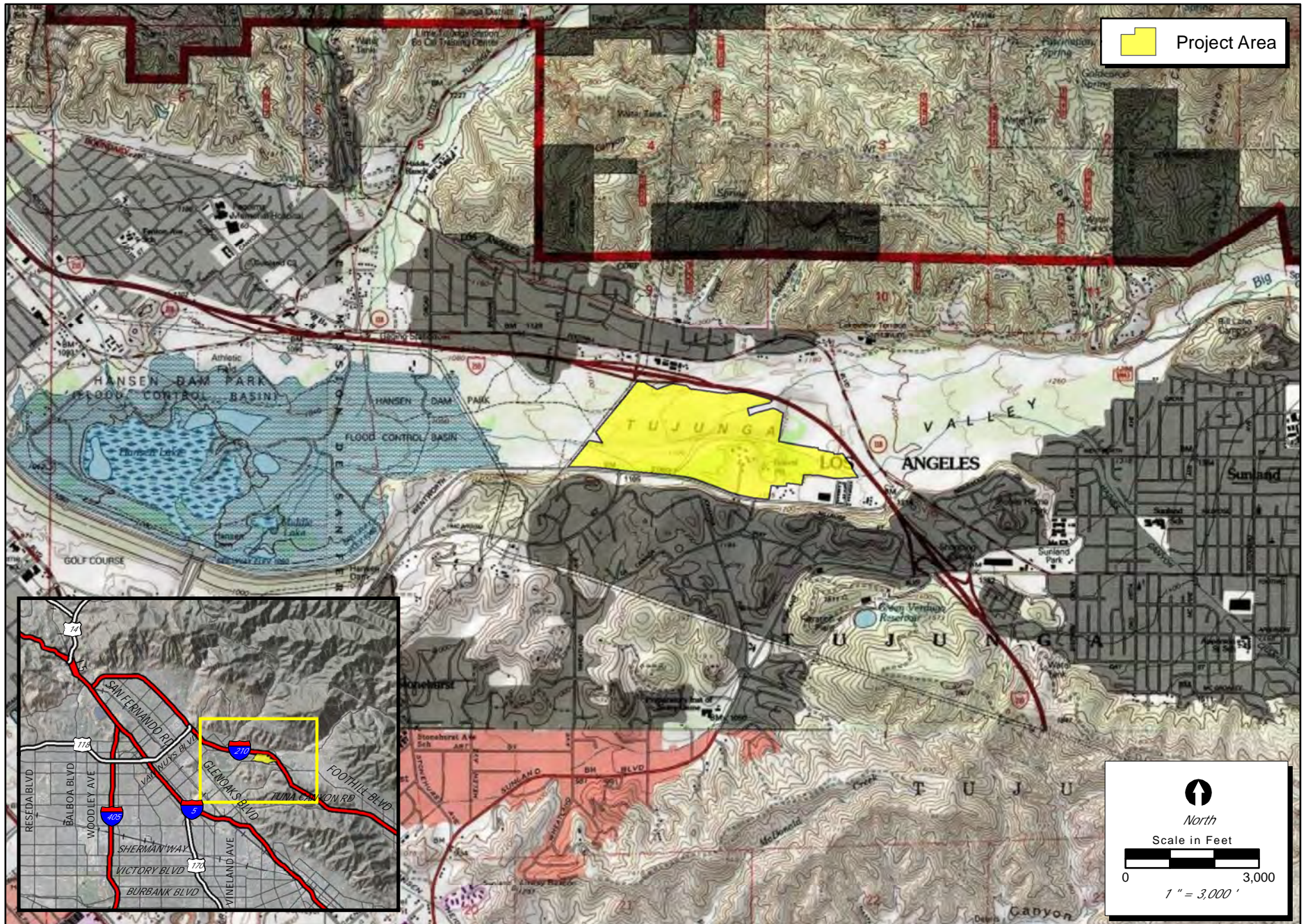
1.1 Purpose

The purpose of this report is to provide a summary of the management activities conducted at the Big Tujunga Wash Mitigation Area (Mitigation Area) from January to December 2011. These activities were conducted in accordance with the Master Mitigation Plan (MMP) for the Mitigation Area. 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 Game (CDFG) requirement for the preparation of a management plan for the site. The MMP encompassed strategies to enhance and protect existing habitat for wildlife and to create additional natural areas that could be utilized by native wildlife and numerous user (recreational) groups. In addition, the MMP included programs for the removal of exotic fishes and amphibians, bullfrogs (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*) from the Tujunga Ponds, trapping to control brown-headed cowbirds (*Molothrus ater*), development of a formal trails system, and development of public awareness and education program at the site. Implementation of the MMP began in August 2000 and was completed five years later. An additional year of limited maintenance and surveys was added between late summer 2006 and late summer 2007. ECORP Consulting, Inc. (ECORP) was contracted by the Los Angeles County Department of Public Works (LACDPW) in July 2007 to continue MMP activities as part of implementation of the Long-term Maintenance and Monitoring Plan (LTMMP). This report summarizes all activities conducted in the Mitigation Area between January and December 2011.

1.2 Location and Setting

The Mitigation Area is located in Big Tujunga Wash, just downstream of Interstate (I-) 210 Freeway overcrossing, near the City of Los Angeles' Sunland community in San Fernando Valley, Los Angeles County. The site is bordered on the north by I-210 and on the east by I-210 and the County of Los Angeles Department of Parks and Recreation 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, on the north side 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 on the south side 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. The nearby Tujunga Ponds and surrounding habitat were originally created as part of the mitigation measures for the construction of I-210 and are located in 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 on Figure 1-2.



Location: N-116 Big Tujunga Wash Mitigation Area/Maps/Site_Vicinity_Tujunga_ProjectVicinity_v3_2010.mxd

2010

Figure 1-1. Project Location

2010-116 Big Tujunga Wash Mitigation Area



Location: N-116/Big Tujunga Mitigation Area/AerialMaps/Tujunga_Bank_Aerial_v3_2010.mxd

Figure 1-2. Big Tujunga Wash Mitigation Area

2010-116 Big Tujunga Wash Mitigation Area

Aerial Date: March 2008
Map Date: 2010

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 2011. Certain tasks in the MMP were not conducted because the scope of work requires that they will be done once during a three-year period and that they be conducted during a good rain 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 2011. Additional tasks that were implemented but are not shown in the table include the preparation of the reports (Task M) and attendance at meetings with the LACDPW staff (Task N).

Table 1-1. Mitigation and Monitoring Tasks Implemented and/or Continued in 2011

Implemented and/or Continued in 2011	
	<u>TASK B – Continue Brown-headed Cowbird Trapping Program</u>
x	Task B1 – Trap Construction
x	Task B3 – Training of Personnel
x	Task B4 – Daily Trap Checking
x	Task B5 – Draft and Final Reports
	<u>TASK C – Continue Exotic Plant Eradication Program</u>
x	Task C2 – Exotic Riparian Plant Removal and Maintenance
x	Task C3 – Weeding Only – Oak/Sycamore Uplands
x	Task C4 – Water Lettuce Removal
	<u>TASK D – Continue Exotic Wildlife Eradication Program</u>
x	Task D1 – Continue Exotic Wildlife Eradication Program
x	Task D3 – Monitoring Reports
	<u>TASK E – Maintain Formal Trails System</u>
x	Task E1 – Trails Closure, Clearing, and Maintenance
x	Task E2 – Quarterly Maintenance Reports
	<u>TASK F – Continue Community Awareness Program</u>
x	Task F1 – Newsletters (Spring, Fall)
x	Task F2 – CAC Meeting Reminders and Meetings
x	Task F3 – CAC Meeting Reports
x	Task F4 – Contribution to Annual Report

Implemented and/or Continued in 2011	
	<u>TASK G – Continue Site Maintenance and Monitoring Program</u>
x	Task G1 – Erosion Control and Barrier Maintenance
x	Task G2 – Cottonwood/Willow Restoration Areas Maintenance
x	Task G5 – Success Monitoring
x	Task G8 – Trails Monitoring
	<u>TASK J – Update and Renew Permits</u>
x	Task J2 – CDFG SAA and Meetings
	<u>TASK K – Long-term Maintenance and Monitoring Plan</u>
x	Task K1 – Review and Finalize Plans
	<u>TASK O – Expanded Public Outreach</u>
x	Task O2 – Outreach Site Visits

1.3.1 Continuation of Habitat Restoration Program

The ultimate goal of the Mitigation Area is to provide for long-term preservation, management, and enhancement of the biological resources for the benefit of the state's fish and wildlife resources. In addition, the Mitigation Area was established to provide compensation for loss of similar resources elsewhere in the Los Angeles Basin. The habitat restoration program was established in August 2000 as part of the MMP for the Mitigation Area. Although the Mitigation Area provided habitat for several sensitive and listed wildlife species, much of the habitat was highly disturbed and infested with invasive non-native plant species at the time of the Mitigation Area's establishment. The habitat restoration program was developed to target the removal of invasive non-native plant species and ultimately improve the habitat value of the existing plant community. The program was also designed to create habitat in areas that were severely degraded and preserve habitat that was seemingly intact. In late 2007, ECORP conducted an initial site visit to assess the current conditions of the Habitat Restoration Program and to strategize long-term management of the Mitigation Area and its habitat. Habitat restoration activities were continued through 2011 (Section 2.0).

1.3.2 Continuation of Brown-headed Cowbird Trapping Program

Brown-headed cowbird trapping was conducted in and around the Mitigation Area in the spring of 2011. This program is outlined in the MMP as a method to enhance the ecological value of the site by reducing and ultimately eliminating the occurrence of brood parasitism of native riparian bird species. Two cowbird traps were placed within the Mitigation Area and two traps were placed just outside the Mitigation Area in

suitable cowbird foraging habitat. A total of 211 cowbirds were removed from the four traps between April 1 and June 30, 2011. Details regarding the brown-headed cowbird trapping program are found in Section 3.0.

1.3.3 Continuation of Exotic Plant Eradication Program

This task consisted of the ongoing monitoring of past exotic plant removal efforts and the continued removal efforts of exotic and invasive vegetation. Site visits were conducted to determine locations that would require exotic plant removal and to strategize the best course of action. Periodic site visits were conducted to determine the locations of exotic plant species removal efforts 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 the removal techniques would coincide with the exotic plant species growth cycles. The major focus of this task for the 2011 period was girdling exotic trees and treating exotic plant species (such as giant reed [*Arundo donax*] and eupatory [*Ageratina adenophora*]) with CDFG-approved herbicides.

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. This task and the other exotic plant species control tasks implemented in 2011 are summarized in Section 4.0.

1.3.4 Continuation of Exotic Wildlife Eradication Program

This task consists of the continued removal of non-native, invasive wildlife species. Efforts were focused on removal of exotic aquatic wildlife species, primarily bullfrogs, largemouth bass (*Micropterus salmoides*), and crayfish, from perennial waters at the Tujunga ponds and Haines Canyon Creek. Exotic wildlife removal efforts targeted both life stages of bullfrogs (tadpoles and adult bullfrogs) in an effort to maximize the efficiency of the removal program. A total of four exotic removal efforts occurred during 2011 reporting period. While in previous years six exotic removal efforts were conducted in a year, the presence of water lettuce prevented two removal efforts from being conducted in 2011. Exotic wildlife removal tasks implemented in 2011 are summarized in Section 5.0.

1.3.5 Native Fish Monitoring

Native fish monitoring surveys were not conducted within the Mitigation Area in 2011.

1.3.6 Maintenance of Formal Trails System

Quarterly site visits were conducted for the purpose of walking all of the main trails established during implementation of the MMP and documenting areas that required maintenance, brush clearing, or placement of barriers to close paths that branched from the trails. Areas that required minor repairs were remedied during the quarterly visit or in combination with other task site visits. More extensive problem areas were mapped for repair at a later time. Trail maintenance tasks implemented in 2011 are summarized in Section 6.0.

1.3.7 Continuation of Community Awareness Program

This program consists of the continued implementation of the biannual Community Advisory Committee (CAC) meetings that are held in spring and fall of each year. ECORP assumed the duty of distributing meeting reminders to the CAC mailing list, assisting LACDPW with development of meeting agendas and any supporting handouts, summarizing CAC meeting minutes and distribution of the minutes to the CAC meeting list, and producing the Spring and Fall newsletters for distribution by LACDPW. 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 into 2011. The new outreach program also informed the user groups of the types of recreational activities allowed at the site, as well as the types of prohibited activities. The status of the Community Awareness Program and activities conducted in 2011 are summarized in Section 7.0.

1.3.8 Continuation of Site Maintenance and Monitoring Program

The purpose of the Site Maintenance and Monitoring Program task is to monitor the success of the cottonwood/willow restoration areas in the riparian area of the Mitigation Area. Cottonwoods and willows were planted throughout the site in 2001 and 2002. In addition to monitoring the success of these plantings, this task includes assessing erosion control and barrier maintenance issues on the site, as well as water quality monitoring and focused sensitive wildlife surveys. Focused surveys for least Bell's vireo, southwestern willow flycatcher, and arroyo toad were not conducted in 2011. The results of the continued site maintenance and the monitoring program tasks that were conducted during 2011 are summarized in Section 8.0.

1.3.9 Restoration of 11-acre Oak/Sycamore Woodland

The oak/sycamore woodland area was revegetated with native plant species in 2000 and was monitored on an annual basis. The restoration in a portion of the area was not very successful because of failure of the irrigation system (due to coyotes [*Canis latrans*]) and excessive herbivory by gophers (*Thomomys bottae*). ECORP and its installation contractor, Natures Image, conducted a detailed assessment of the oak/sycamore restoration areas in 2008 to develop a new work plan for ensuring the success of this area. A summary of the restoration activities that were conducted within oak/sycamore woodland area during 2011 are included in Section 9.0.

1.3.10 Finalization of Formal Banking Agreement

A draft Conservation Easement (CE) was prepared by LACDPW and submitted to CDFG for review on December 22, 2010. No additional work was conducted on the CE in 2011.

1.3.11 Updated and Renewed Permits

Additional permits were not acquired for the Mitigation Area in 2011. The current Streambed Alteration Agreement (SAA) for the Mitigation Area was not revised in 2011; all conditions remained the same for the 2011 period. ECORP notified CDFG prior to all exotic plant removal efforts conducted in 2011.

1.3.12 Finalization of Existing Long-term Maintenance and Monitoring Plan

ECORP submitted a draft version of the LTMMP to LACDPW in March 2011 and is awaiting comments. The LTMMP was submitted under a separate cover (ECORP 2011) and is not included in this annual report.

1.3.13 Preparation and Submittal of Reports

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

1.3.14 Attendance at Meetings with Agencies, Public, and Consultants

ECORP's staff was available to attend meetings as necessary with the LACDPW regarding various aspects of the MMP implementation. This is discussed in Section 10.0.

2.0 CONTINUATION OF HABITAT RESTORATION PROGRAM

The habitat restoration program was established to preserve, improve, and create habitat for Santa Ana sucker (*Catostomus santanae*), Santa Ana speckled dace (*Rhinichthys osculus*), arroyo chub (*Gila orcutti*), 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 was focused on the restoration of the cottonwood-willow riparian habitat. 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. This section of the annual report focuses on the activities conducted in 2011.

2.1 Habitat Restoration Plan Assessment

Restoration is intended to improve the habitat value of an existing plant community. 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. In addition, several extraneous equestrian trails throughout the riparian zone were targeted for closure and restoration with native riparian species. The composition of the replacement plantings in the enhancement areas was designed to develop habitat that would support the breeding and foraging activities of a variety of sensitive riparian species, such as the least Bell's vireo. 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.

When ECORP took over the contract for the implementation of the MMP in 2007, an initial assessment of the restoration areas was conducted. ECORP proposed to re-evaluate the habitat restoration program for the cottonwood-willow riparian restoration areas and to prepare a revised habitat restoration plan that would be more applicable to current conditions on the site. In addition, the revised habitat restoration plan was designed to address the long-term management of the restoration areas on the site. The purpose of this revised habitat restoration plan was to review the results of previous habitat restoration planting/enhancement efforts and to propose a new approach, which builds on the results of the previous efforts. The revised restoration plan is included in Appendix C of the 2009 Annual Report for the Mitigation Area (ECORP 2010).

2.2 Summary of the Original Habitat Restoration Efforts

The original habitat restoration efforts conducted in the Mitigation Area were 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 were focused on the planting of new riparian woodland overstory and understory plantings 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 through 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. However, at that time, it was concluded that natural recruitment was working better to fill 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. The recently-planted container plants did survive and a watering program was implemented immediately to promote survival. No additional loss of these container plants was noted following the watering program.

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. The habitat restoration plan was also updated in 2009 (ECORP 2010).

2.3 Summary of the Invasive Exotic Plant Species Removal Program

As part of the MMP, an invasive exotic plant species removal program was undertaken in tandem with the riparian habitat enhancement program. This was done not only to remove the exotic plant species, but also to open up canopy areas for the reestablishment of native woodland cover. Initially, the non-native species listed in Table 2-1 were the species that were targeted for eradication. The initial exotics removal efforts were primarily focused on the giant reed because of the extensive distribution of this species on the site. This effort was for the most part successful and many of the riparian enhancement areas were located in sites formerly dominated by this species.

Table 2-1. Target Non-Native Weed Species

Common Name	Scientific Name
Eupatory	<i>Ageratina adenophora</i>
Palm trees	<i>Arecastrum</i> sp., <i>Washingtonia</i> sp., etc.
Giant reed	<i>Arundo donax</i>
Mustards	<i>Brassica</i> sp.
Italian thistle	<i>Carduus pycnocephalus</i>
Nonnative weedy thistles	<i>Cirsium</i> sp.
Water hyacinth	<i>Eichhornia crassipes</i>
Eucalyptus	<i>Eucalyptus</i> sp.
Fennel	<i>Foeniculum vulgare</i>

Table 2-1. Target Non-Native Weed Species (continued)

Common Name	Scientific Name
Tree tobacco	<i>Nicotiana glauca</i>
Castor bean	<i>Ricinus communis</i>
Pepper trees	<i>Schinus</i> sp.
Milk thistle	<i>Silybum marianum</i>
Tamarisk	<i>Tamarix ramosissima</i>
<u>Non-native annual grasses</u>	
Wild oat	<i>Avena fatua</i>
Slender wild oats	<i>Avena barbata</i>
Foxtail chess	<i>Bromus madritensis</i> ssp. <i>rubens</i>
Rippgut brome	<i>Bromus diandrus</i>
Soft chess	<i>Bromus hordeaceus</i>
Mediterranean barley	<i>Hordeum murinum</i>
Italian ryegrass	<i>Lolium multiflorum</i>
Annual beard grass	<i>Polypogon monspeliensis</i>
<u>Non-native perennial grasses</u>	
Pampas grass	<i>Cortaderia selloana</i>
Bermuda grass	<i>Cynodon dactylon</i>
Fountain grass	<i>Pennisetum setaceum</i>
Smilo grass	<i>Piptatherum miliaceum</i>

When ECORP conducted their first site evaluation in 2007, it was noted that giant reed was still present in some of the restoration areas and in some other areas around the Mitigation Area. More importantly, ECORP noted at the time it assumed management of the project that the most dominate group of invasive exotic dominating the riparian canopies were exotic tree species. These included the exotic tree species originally designated for removal and several other dominant non-native canopy trees listed in Table 2-2. In addition, it was evident that in many areas eupatory was a significant understory species and this was added to the list of target species.

Table 2-2. Invasive Exotic Tree Species

Common Name	Scientific Name
Acacia species	<i>Acacia dealbata</i> and <i>Acacia</i> spp.
Common catalpa	<i>Catalpa bignonioides</i>
Eucalyptus	<i>Eucalyptus</i> spp.
Ornamental fig	<i>Ficus carica</i>
Evergreen ash	<i>Fraxinus uhdei</i>
Japanese privot	<i>Ligustrum japonicum</i>
Liquidambar	<i>Liquidambar styraciflua</i>

Table 2-2. Invasive Exotic Tree Species (continued)

Common Name	Scientific Name
Mulberry	<i>Morus alba</i>
Wild tobacco	<i>Nicotiana glauca</i>
Castor bean	<i>Ricinus communis</i>
California pepper	<i>Schnius molle</i>
Brazilian pepper	<i>Schnius terebinifolius</i>
Chinese elm	<i>Ulmus parvifolius</i>
Palm trees	<i>Washingtonia</i> spp., <i>Phoenix canariensis</i> , etc.

2.4 Revised Habitat Restoration Program

The Revised Habitat Restoration Plan that was implemented in 2009 was continued in 2011. Back in 2009, the plan was redesigned to focus on addressing the current habitat restoration needs of the Mitigation Area, as those needs evolved. Instead of planting container plants and cuttings throughout the Mitigation Area (as was the focus in the original plan), the habitat restorations efforts in 2009, 2010, and 2011 targeted the elimination of the large, non-native trees that create the dense overstory within the Mitigation Area. In addition, the plan identified 39 non-native species of trees, shrubs, and grasses that would be targeted for removal if they were observed in the Mitigation Area. Removal of these non-native plants will allow more sunlight to reach the ground surface and will result in less competition for the native plant species. Non-native plant species removal efforts conducted in 2011 are discussed in more detail in Section 4.0. The Revised Habitat Restoration Plan document can be found in Appendix C of the 2009 Annual Report for the Big Tujunga Wash Mitigation Area (ECORP 2010).

3.0 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 predation 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 in 2009, 2010, and 2011. Trapping was not conducted in 2007 and 2008, as it was one of the tasks that was originally scheduled to occur once every three years. Based in the new SAA, the CDFG is requesting that this task be completed every year. Griffith Wildlife Biology operated two cowbird traps within the Mitigation Area and two traps adjacent to the Mitigation Area between April 1 and June 30, 2011 (Griffith Wildlife Biology 2011). The methodology, results, and discussion of the 2011 trapping are presented below and a full copy of the report is included as Appendix C.

3.1 Brown-headed Cowbird Natural History

Brown-headed cowbirds are known as a brood parasite. This bird species parasitizes the nests of native bird host species by laying their larger egg(s) in the host species nest and leaving the egg(s) to be reared by the native host. Female cowbirds do not make a nest of their own, nor do they contribute in raising their own young. Brown-headed cowbird young are often larger and more demanding than the offspring of the native birds, resulting in the host bird raising the cowbird chick and neglecting the rest of its young. Female cowbirds can lay between 40 and 100 eggs during the breeding season (ranging from two to four months).

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 predation rates by brown-headed cowbirds. In many areas, the reduction or elimination of brown-headed cowbirds through trapping has been directly related to native bird species population increase.

3.2 Methodology

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



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2010\Cowbird\Tujunga_Cowbird_Traps_2010_updated20120229.mxd (ek:the 2/29/2012)

Figure 3-1. Brown-headed Cowbird Trap Locations

2010-116 Big Tujunga Wash Mitigation Area

Aerial Date: NAIP 2010
Map Date: 2/29/2012

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 of each trap explaining the significance of the trap and urging recreational users not to tamper with the trap. At the start of trapping on April 1, one male and two female decoy cowbirds were present in the traps. After April 7, the preferred ratio of male to female decoys was established in each trap with at least 2 males for every 3 females (up to 3 males and 5 females). The traps were opened on April 1 and operated every day, including holidays, until June 30, 2011. Each trap was serviced daily by either the Principal Investigator or a trapping assistant and 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, 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, 2011. The cowbirds not used as decoys were euthanized with carbon monoxide and moved off-site to be provided as forage for raptor rehabilitation/reintroduction facilities.

3.3 Results

A total of 211 cowbirds were removed during the 2011 trapping season, including 103 males, 99 females, and 9 juveniles. Most cowbirds were captured and removed during the first 7 weeks of the 13-week trapping period (between April 1 and May 20). Trap vandalism did not occur during the 2011 trapping season so there were no losses of decoys or trapping days.

A total of 362 non-target birds were captured in the traps and then quickly released. Four non-target species were captured, including California towhee (*Pipilo crissalis*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), and the CDFG Species of Special Concern (SSC) yellow-headed blackbird (*Xanthocephalus xanthocephalus*). The seven yellow-headed blackbirds captured during the trapping period were released unharmed and in good health. In addition, banded cowbirds and/or banded non-target species were also not captured during the trapping season. There were no mortalities of decoy or non-target birds due to the lack of water, food, shade, or unclean conditions present in the trap. Only two California towhees were predated upon inside the traps during the entire 13 weeks of trapping.

3.4 Discussion

Brown-headed cowbird trapping during the 2011 season resulted in a record high number of cowbirds removed from the Mitigation Area and surrounding areas since trapping began in 2001. A total of 211 brown-headed cowbirds were removed from the Mitigation Area and vicinity, much higher than the average number of 136.75 removed per year between 2001 and 2011 (trapping was conducted 9 of the past 11 trapping seasons). Juveniles locally raised are relatively easy to capture within their natal habitat and can be a good indication of the success of a trapping program. Only nine juvenile brown-headed cowbirds were removed during the 2011 trapping season, possibly indicating that nest predation 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 would be effective at reducing nest predation 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).

4.0 CONTINUATION OF EXOTIC PLANT ERADICATION PROGRAM

The purpose of exotic plant removal and eradication at the Mitigation Area is to increase the suitability and ecological value of the existing native vegetation communities. As described in Section 2.0 of this annual report, the original exotic plant removal program was targeted at the riparian communities in and around Haines Canyon Creek, Big Tujunga Wash, and the Tujunga Ponds. By removing the exotic plant species from the riparian areas, 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 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.

Site visits were conducted at the site on numerous occasions during 2011 to either plan for the exotic plant removal methods or to document exotic plant locations within the riparian areas during 2011. Site visits were conducted between January and October 2011 by ECORP biologists Gregorio Benavides, Adam Schroeder, Benjamin Smith, and Phillip Wasz. During each site visit, the biologists conducted a walkthrough of all of the trails in the riparian and upland areas. The purpose of these surveys was to record locations where infestations of exotic plant species were becoming problematic. Location coordinates of new exotic plant species locations were taken with a global positioning system unit (GPS) and recorded on data sheets. During exotic plant removal efforts, biologists showed the maintenance subcontractor, Natures Image, the locations of exotic plants needing treatment.

4.1 Riparian Exotic Plant Removal

Exotic plant removal activities occurred on February 25, April 5, May 14 and 31, June 7 through 9, 14 through 15, September 7 and 12 through 16, 2011. All removal activities took place within the riparian vegetation communities throughout the Mitigation Area and CDFG was notified prior to the commencement of all removal activities. A biological monitor conducted pre-construction surveys for sensitive wildlife and breeding birds (during the breeding bird season) prior to the commencement of the exotic plant removal and remained on site during the removal activities to ensure the crews conducted work within the appropriate pre-defined work areas. The biological monitor 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 (Appendix B). The biological monitor also showed the removal crews locations of exotic plant species that had been previously recorded during quarterly site visits. Newly identified stands of exotic vegetation were treated as they were discovered. All treated areas were documented by the biological monitor and digital photographs were taken to document removal efforts. Plants and trees treated with herbicide were flagged with survey flagging to aid detection during follow up visits to determine success.

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. 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 (AquaMaster™). All other locations were treated with either Razor Pro® or, when girdling, with Garlon 4® herbicide. All removal efforts were conducted within the riparian habitat throughout the Mitigation Area (Figure 4-1). 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 also placed in areas that would not impede visitor traffic or pose a safety hazard. Locations of the placement of these cuttings were recorded with a GPS unit by the biological monitor.

Approximately 600 locations throughout the Mitigation Area were targeted for exotic plant and tree species removal in 2009 and 2010. These same locations were targeted during all exotic plant removal efforts in 2011 utilizing the same techniques employed during 2009 and 2010. Because exotic plant removal activities have been conducted in the same areas within the Mitigation Area annually since 2009, coordinates of exotic plant species in these known locations were not documented in 2011. Instead, these locations were displayed on an aerial map as polygons within the Mitigation Area.

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

4.2 Water Lettuce Removal

In March 2011, aquatic biologists conducting an exotic wildlife removal effort noticed that the Tujunga Ponds were beginning to become infested with water lettuce, an invasive plant commonly used in aquariums and ponds. Within one month following 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 utilize the ponds as habitat. ECORP contacted LACDPW immediately to create a plan for water lettuce removal from the Mitigation Area waterways.

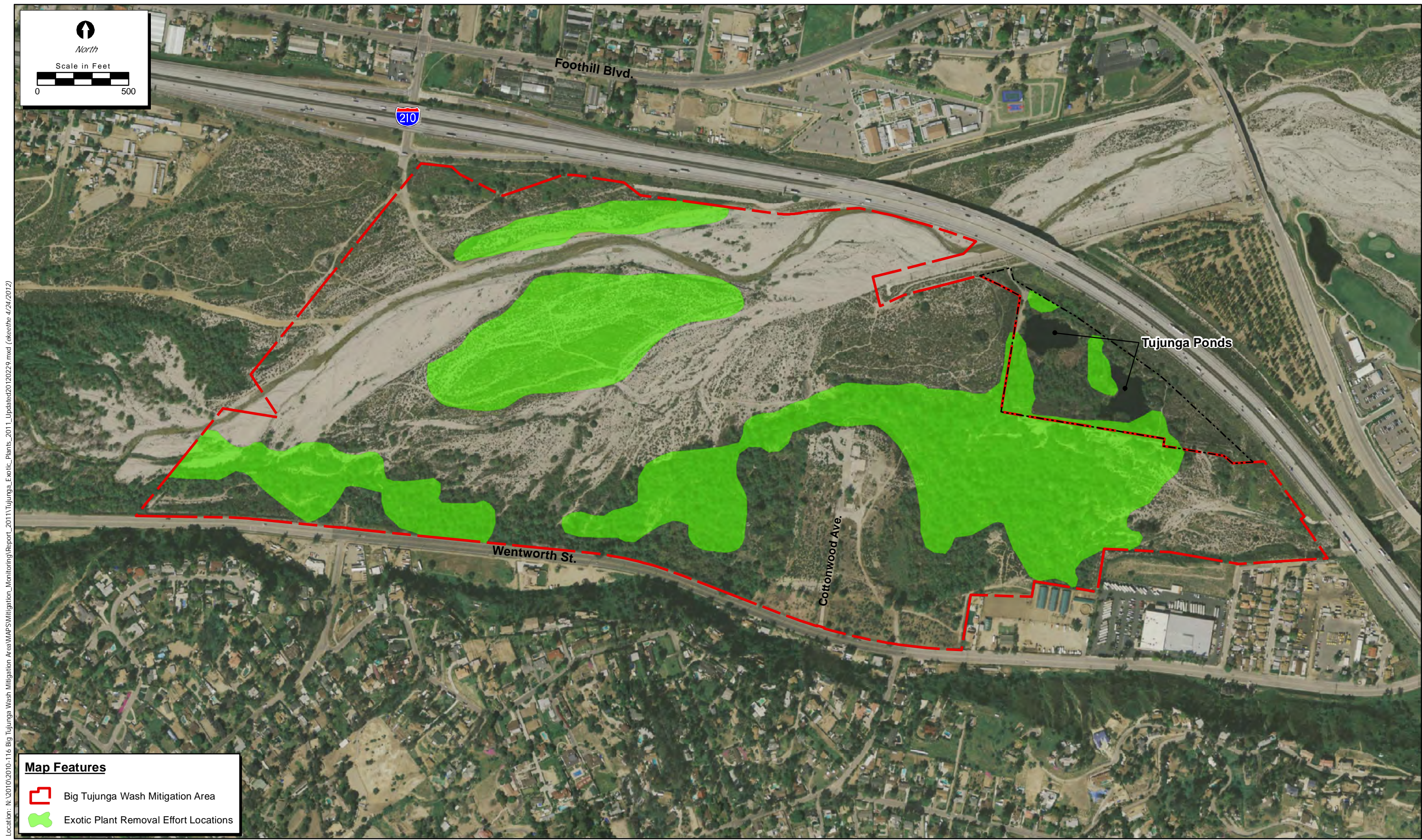


Figure 4-1. Exotic Plant Removal Locations

2010-116 Big Tujunga Wash Mitigation Area

The first water lettuce removal effort occurred between June 28 and July 1, 2011. The removal activities were monitored by ECORP biologist Gregorio Benavides. Natures Image, ECORP's subcontractor, deployed 50-foot seine nets using an aluminum boat around large patches of water lettuce. The crew then pulled the nets to shore and disposed of the nets into a 40-yard dumpster. This concluded the initial water lettuce removal effort.

An additional reconnaissance-level site visit was conducted on September 6, 2011 by ECORP biologist Benjamin Smith to determine the level of effort necessary to remove the water lettuce from the ponds. A pre-construction meeting was also held at the site on September 6, 2011 to discuss the strategy and logistics for eradicating water lettuce the within the ponds.

The second round of water lettuce removal efforts began on September 13, 2011. A group of Los Angeles County Department of Parks and Recreation (LACDPR) volunteers used rakes and pitchforks to remove the water lettuce from the East Pond and place it in piles adjacent to the ponds. Prior to the start of the removal process the water lettuce removal crews were given instruction by the ECORP biologist, and crews were informed of the possible biological resources present on the site. After the start of the removal effort, the biologist made site visits periodically to consult with the crew, monitor progress, and document the effort. Natures Image began large-scale efforts on the West Pond on September 14, 2011. Using a motorized boat and a large seine net, the crew encircled a patch of water lettuce and dragged it to shore. A forklift waiting on the shore lifted the net from the water and placed the discarded water lettuce into a 40-yard dumpster. This process was repeated several times during each removal effort while the volunteers focused their efforts on the East Pond. In addition to these efforts, fishing net was placed across the West Pond just downstream of the beginning of the water lettuce to prevent water lettuce from entering Haines Canyon Creek.

After five weeks of sustained effort in the west pond, the majority of the water lettuce was removed. Small areas of water lettuce remained along the edges of the pond within patches of vegetation. During the fifth week of water lettuce removal (October 17 through 21), Natures Image focused efforts on the East Pond. A tractor was also used to transport the discarded vegetation from the ponds into the dumpster.

Removal efforts were conducted at the ponds on various occasions between September 13 and October 27, 2011. On October 27, all water lettuce removal efforts were temporarily stopped in the Mitigation Area at the request of LACDPW due to the need to correct a contract issue regarding use of the tractor and forklift at the site.

The water lettuce removal effort resumed on December 27, 2011 using the same methodology as before the stoppage and physical removal of the water lettuce was completed on January 5, 2012. Renovate®, an herbicide designed for use within aquatic environments and approved by the CDFG for use within the Mitigation Area, was applied to patches of hard to reach water lettuce within cattails and other vegetation around the perimeter of the ponds between January 6 and January 11, 2012. Additional herbicide

applications were scheduled to follow on a monthly basis for three months. Weekly memoranda detailing the water lettuce removal efforts are found in Appendix E.

4.3 Upland Weeding in Oak/Sycamore Area

Natures Image continued weeding activities throughout 2011 in the upland oak/sycamore area near the Cottonwood entrance. Weeding activities were conducted on April 6 through 7, May 31, June 9, 10, 13, 14, and September 14, 2011. Site visits were conducted by ECORP biologists Gregorio Benavides, Benjamin Smith, and Phillip Wasz during 2011 to assess the success of weeding in the upland areas. It appears that the weeding has contributing to the overall health and growth of the native tree and upland species. More detailed information regarding this task is found in Section 9.0.

5.0 CONTINUATION OF EXOTIC AQUATIC WILDLIFE ERADICATION PROGRAM

The overall purpose of the exotic wildlife removal program is to restore, create, and maintain suitable habitat for native aquatic species, and to remove and eliminate ecological pressures on native species resulting from the presence of the exotic species. The exotic wildlife removal 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 out-compete natives for available space and food resources. Exotics can also pose direct impacts to 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 the 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 summarizes the results of four exotic removal efforts conducted during 2011. A copy of the full report can be found in Appendix F.

5.1 Methodology

A wide range of sampling techniques was utilized during the exotic aquatic wildlife removal efforts. The sampling approaches were adapted to the various site conditions during each sampling session. Seven different methods were utilized to capture and remove exotic aquatic species, including: fyke-net trapping, spearfishing (daytime and nighttime), hand capture/dipnet surveys, minnow trapping, seining, bullfrog gigging, and turtle trapping.

All spearfishing and hand capturing efforts were conducted while snorkeling. Bullfrog removal was primarily done at night by patrolling the parameter of the ponds and upper portions of 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 were allowed to fish overnight. Additionally, during

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

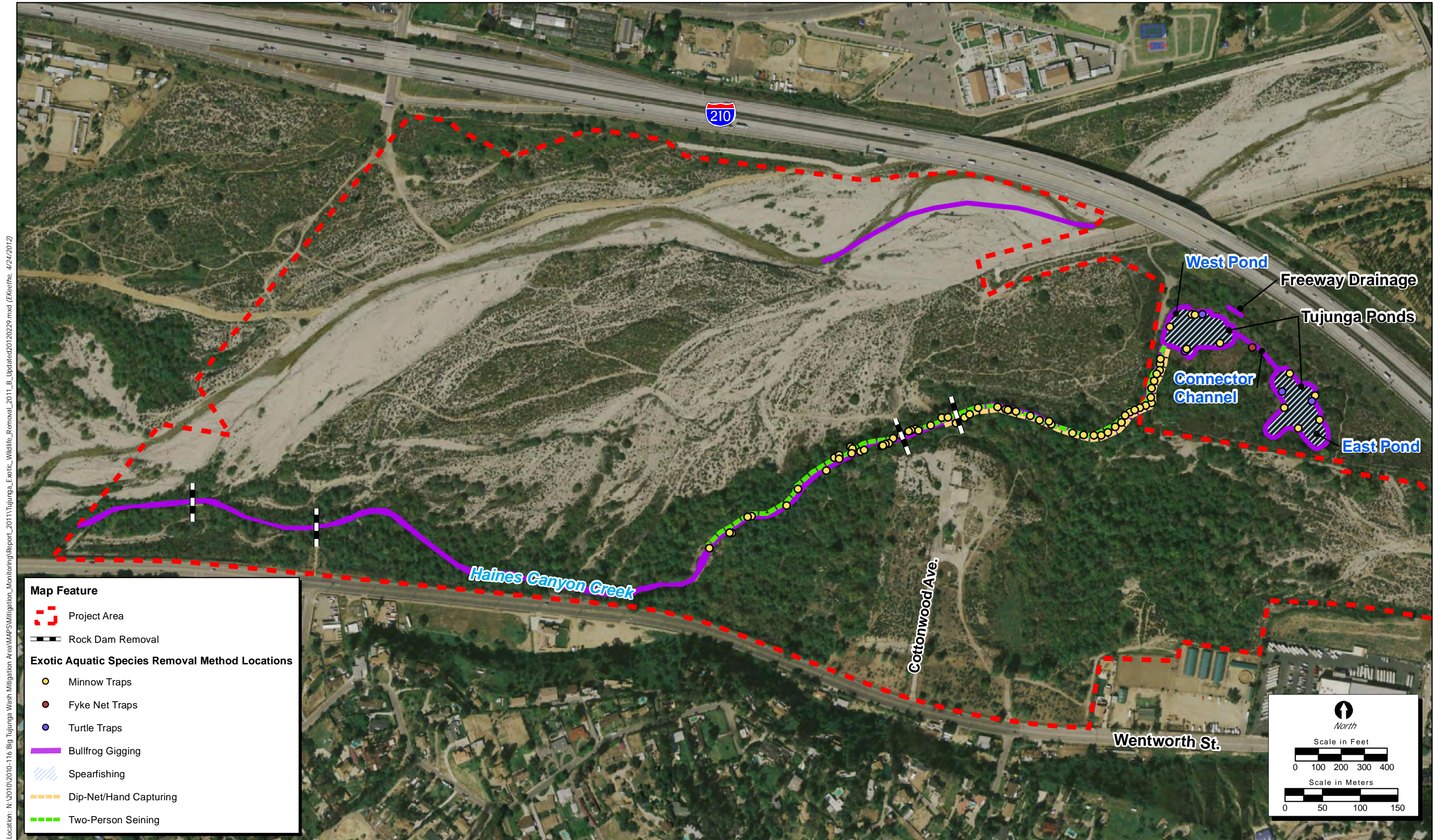
An evaluation of the sampling locations and methods were conducted prior to each removal effort. Sampling locations were generally selected in areas with the highest probability for the detection and capture of exotic aquatic species, based on the following criteria: presence of access points, habitat suitability (e.g., pooled habitats lacking aquatic vegetation), and overall crew safety. With the sampling locations selected, sampling methods utilized were generally determined by the habitat type and effectiveness of a method at removing these species. In addition to the exotic aquatic species removal efforts in the creek, efforts were also made to remove rock dams and foot bridges.

The 2011 removal of exotic aquatic species (fish, amphibian, reptile, and invertebrate) from the Mitigation Area was conducted over a total of four removal efforts: April 5 through 7 (effort #1), June 14 through 16 (effort #2), August 22 through 24 (effort #3), and October 10 through 12 (effort #4). All sampling was conducted under the direction of USFWS 10(a)(1)(A) recovery permit holders for Santa Ana sucker, Todd Chapman and Brian Zitt (TE-110094-2 and TE-27460A-0, respectively). 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 5-1.

5.2 Results

A total of 4,768 exotic individuals were captured, representing 10 exotic aquatic species (7 fish, 1 amphibian, 1 reptile, and 1 invertebrate) during the 2011 removal efforts (Table 5-1). Captures in Haines Canyon Creek accounted for the highest proportion of this total (95.1 percent), followed by the West Pond (3.15 percent), East Pond (1.22 percent), Connector Channel (0.48 percent), freeway drainage (0.08 percent), and Big Tujunga Wash (0.02 percent). The highest proportion of exotics species were captured using two-person seining (43.68 percent), followed by minnow trapping (29.96 percent), hand capture/dipnet (22.12 percent), spearfishing (2.78 percent), bullfrog gigging (1.05 percent), Fyke netting (0.41 percent).

The four removal efforts resulted in the capture and removal of 4,487 red swamp crayfish, 130 largemouth bass, 47 green sunfish (*Lepomis cyanellus*), 46 bullfrog tadpoles, 28 bullfrog adults, 7 bullfrog juveniles, 7 bluegill (*Lepomis macrochirus*), 5 mosquitofish (*Gambusia affinis*), 4 red-eared sliders (*Trachemys scripta*), 4 goldfish (*Carassius auratus*), 2 brown bullhead (*Ameiurus nebulosus*), and 1 black bullhead (*Ameiurus melas*). Two native fish species, Santa Ana sucker and arroyo chub, were collected and released back into the creek during the removal efforts, accounting for 1.7 percent of the total catch. A complete listing of all aquatic species captured during the 2011 sampling efforts is included in the full report presented in Appendix F.



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\Map\SWMitigation_Monitoring\Report_2011\Tujunga_Exotic_Wildlife_Removal_2011_B_Updated20120229.mxd (EKeethe, 4/24/2012)

Aerial Date: DigitalGlobe March 2008
Map Date: 2011

Figure 5-1. Exotic Aquatic Species Removal Locations

2010-116 Big Tujunga Wash Mitigation Area

Table 5-1. Summary of Exotic Aquatic Species Removal by Location and Efforts, 2011

Sampling Location	Sampling Dates	Exotic Species											Native Species			Grand Total	
		Goldfish	Black bullhead	Brown bullhead	Mosquitofish	Green sunfish	Bluegill	Largemouth bass	Bullfrog adult	Bullfrog juvenile	Bullfrog tadpole	Red-eared slider	Red swamp crayfish	Arroyo chub	Santa Ana sucker		Southwestern pond turtle
HAINES CANYON CREEK	April 5 – April 7, 2011							10	1				17				257
	June 14 – June 16, 2011	2			5	18		4	3		15	1,457	21	1			1,526
	August 22 – August 24, 2011	1				12		6	1	3	2	999	18	15			1,057
	October 10 – October 12, 2011					1			7	2		1,758	6	3			1,777
	Subtotal	3				5	31		20	12	5	17	4,443	62	19		4,617
WEST POND	April 5 – April 7, 2011		1	1		9	2	82	6							1 ^a	106
	June 14 – June 16, 2011	1		1		1	2	7	2 ^b				4				19
	August 22 – August 24, 2011								5 ^b	2							7
	October 10 – October 12, 2011					1	3	15									19
	Subtotal	1	1	2		11	7	104	13	2			4	5			1
CONNECTOR CHANNEL	April 5 – April 7, 2011							5			15						20
	June 14 – June 16, 2011								2								2
	August 22 – August 24, 2011							1									1
	Subtotal							6	2		15						23
EAST POND	April 5 – April 7, 2011					5					14						58
	Subtotal					5					14						58
BIG TUJUNGA WASH	August 22 – August 24, 2011								1								1
	Subtotal								1								1
Grand Total		4	1	2	5	47	7	130	28	7	46	4	4,487	62	19	1	4,850

^a Observed while spearfishing

^b Two individuals captured in the freeway drainage adjacent to the West Pond

During removal effort #1, water lettuce was found to be completely covering the surface of the East Pond. Following this initial observation, LACDPW was notified and a water lettuce removal program was created. During removal effort #2, water lettuce had spread into the Connector Channel and the West Pond, leaving no open surface water. Following this second observation, the water lettuce removal program was initiated, which is described in more detail in Section 4.2.

5.3 Discussion

In 2011, a dynamic sampling approach was utilized during the four removal efforts. The number of individuals removed from Haines Canyon Creek accounted for 95.1 percent of the total exotic aquatic species captured in 2011. Red swamp crayfish was the most abundant species captured and accounted for 96.2 percent of that total. As a result of focusing the sampling within Haines Canyon Creek during removal efforts #2 through 4, more red swamp crayfish were removed during these efforts, and thus produced higher totals of individuals captured than compared to removal effort #1.

The aquatic species assemblage within the Tujunga Ponds is almost exclusively comprised of exotic fishes, turtles, bullfrogs, and red swamp crayfish. The habitat present within the Tujunga Ponds provides these species with an ideal area to forage, breed, and take shelter. Haines Canyon Creek is potentially acting as a sink for recruits from source populations of exotic aquatic species moving downstream from the Tujunga Ponds and upstream from the Big Tujunga Wash, and the Hansen Dam Recreational Area through the lower portion of Haines Canyon Creek. One of the most effective methods for removing exotic fishes from Haines Canyon Creek has been backpack electrofishing. Although effective, this method has the greatest potential to cause stress to native fish populations (i.e., Santa Ana sucker, Santa Ana speckled dace, and arroyo chub). In addition, as a condition of Todd Chapman 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 young-of-the-year (YOY). This stipulation limited the sampling methods available for use in the creek during this time period.

Two-person seining was used in place of electrofishing in 2011 and proved to be an effective method for removing red swamp crayfish and juvenile fishes. It was the most effective method for capturing and removing red swamp crayfish in 2011, especially from Haines Canyon Creek. Dip-netting and minnow trapping were also effective in removing red swamp crayfish from the creek. Combined, these three sampling methods removed a total of 4,432 red swamp crayfish, accounting for 91.4 percent of the total catch in 2011. Minnow trapping continues to be an effective removal method for capturing red swamp crayfish from the Tujunga Ponds.

In past surveys, bullfrog gigging has been equally effective in capturing bullfrog tadpoles; however, the spread of water lettuce inhibited snorkeling surveys from being conducted in the East Pond. Bullfrog gigging remains the most effective method for capturing adult and juvenile bullfrogs. Adult and juvenile bullfrogs removed from Haines

Canyon Creek and the West Pond accounted for 91.4 percent of the bullfrogs captured in 2011.

Spearfishing continues to be an effective method for capturing and removing large exotic fishes. The night spearfishing surveys produced more captures than day spearfishing, these fish are typically easier to approach at night.

Turtle trapping conducted in the Tujunga Ponds during removal effort #1 did not yield a catch. Possible factors that may have influenced the trap were the presence of water lettuce, the time allowed for trapping, and other disturbances. During this removal effort the East Pond was completely covered with water lettuce, while the West Pond still contained open water habitat. Generally, turtle traps need to be set for a minimum of four days in order to get optimal results. During removal effort #1, turtle traps were only set for a total three days. Spearfishing surveys were also being conducted simultaneously in the Tujunga Ponds, near the location of the traps. This activity around the traps could have disturbed or inhibited turtles from going into them. Conversely, these spearfishing surveys resulted in the hand capture of four red-eared sliders.

Photo documentation and results of each of the sampling efforts are included in the exotic wildlife removal report (Appendix F). Appendix F also includes the summary memoranda that were prepared after each of the removal efforts.

6.0 MAINTENANCE OF FORMAL TRAILS SYSTEM

The purpose and 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. Established trails used by equestrians and hikers are present in the Mitigation Area. The preservation of main trails and the closure of several unnecessary trails were essential components 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 main 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 (camping, making fires) will be reduced. The maintenance and monitoring of the trail system is a necessary component of the overall restoration and enhancement program.

Quarterly site visits were conducted to look for areas that might qualify for trails closure, for identifying areas where trails were blocked by trash or debris, and for marking locations of extensive stands of poison oak. Assessment of trail signs, information kiosks, and portable toilets were included in each survey. Areas that required minor repairs were remedied during the quarterly visit or in combination with other site visits. More extensive problem areas were mapped for repair at a later time.

In 2011, the trails maintenance effort began with a site visit by ECORP biologist on March 16, 2011 to assess the current condition of the trails present in the Mitigation Area and to mark locations needing maintenance or attention. ECORP biologist Gregorio Benavides met with a local resident, to discuss issues pertaining to trail maintenance within the Mitigation Area. Additional site visits and/or trails maintenance activities were conducted by Mr. Benavides, Benjamin Smith, and/or Phillip Wasz on April 5, May 14 and 31, June 6 through 8, 10, and 25, and September 7 and 12 through 15, 2011. 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 include:

- Fallen trees and branches obstructing trails;
- Dense vegetation crowding trails;
- Poison oak overgrowth; and
- Unauthorized trail establishment by recreational users.

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 into quarterly trails maintenance reports, which are included as Appendix G. The existing trails that were surveyed and problem areas that were recorded by ECORP in 2011 are shown on Figure 6-1.



Location: N-116 Big Tujunga Mitigation Area/Maps/Mitigation Monitoring/Report_2010/Tujunga Trails Analysis Updated2009.mxd

Aerial Date: DigitalGlobe March 2008
Map Date: 2011

Figure 6-1. Trails in the Mitigation Area

2010-116 Big Tujunga Wash Mitigation Area

Vandalism and graffiti continue to be prevalent throughout the Mitigation Area. The most common locations were on the portable toilets, the kiosks, the informational signs, boulders, and etc. In addition, trash was observed in various areas throughout the site. Steel drums, tires, chicken wire, metal debris, toys, and clothing were present throughout the riparian area, alluvial/wash area, and adjacent to the Tujunga Ponds and Haines Canyon Creek. Natures Image visited the site on several occasions during 2011 to remove many of the large pieces of trash; however, trash dumping continues to be a problem in the Mitigation Area.

Local volunteers and equestrian groups continue to be active participants in the maintenance of the trails system. These groups patrol the Mitigation Area on a regular basis to document unauthorized overnight campers and vandals, collect and remove trash, and clear debris from trails.

6.1 Trail Closures

Two trail closures occurred within the Mitigation Area in 2011. The first occurred in June 2011 when ECORP was contacted by a local citizen about a trail safety issue near the Bert Bonnet Trail. A 600-foot section of the trail located 0.3 mile southwest from the North Wheatland Ave entrance had eroded away due to increased rainfall during the winter and spring months. The decision was made to establish a narrow trail further away from the edge of the wash to allow access around the unsafe portion of the trail. On June 25, 2011, the alternate trail was surveyed for nesting birds, and subsequently cleared of brush and large branches. The eroded trail was closed temporarily during this time for recreational user safety. This trail closure is discussed in the trails maintenance and monitoring report dated June 23, 2011 in Appendix G.

The second closure occurred in December 2011 during the water lettuce removal effort that involved heavy equipment use (forklift and a tractor). Trails located near the Tujunga Ponds were closed to protect recreational users from areas where the forklift and tractor were being during the removal efforts. Trails were re-opened once the removal efforts were completed. This trail closure is discussed in the water lettuce removal report dated December 30, 2011 in Appendix E.

7.0 CONTINUATION OF 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 biannual 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, sending out the meeting reminders, assisting with preparation of meeting agendas and handouts, recording meeting minutes, and distributing the meeting minutes to the most current CAC mailing list. Biannual CAC meetings were conducted in April and October 2011 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/facilities>).

Community residents and representatives from local community organizations serve as the major components of the CAC, but the committee also includes agency and elected official 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 H.

7.1 Newsletters (Spring, Fall)

ECORP drafted two newsletters during 2011, the Spring edition in April and the Fall edition in October. Electronic versions of these newsletters were submitted to LACDPW for distribution and incorporation on their web page. The newsletters are included in Appendix I.

7.2 CAC Meetings (Spring, Fall)

The CAC meetings were held in the Spring and the Fall of 2011. The Spring CAC meeting took place on Thursday, April 28, 2011 and the Fall CAC meeting took place on Thursday, October 6, 2011. CAC meetings were held from 6:30 pm to 8:30 pm at LACDPW's Hansen Yard, 10179 Glenoaks Boulevard, Sun Valley, California 91352. ECORP drafted and sent a meeting reminder/invitation to the most recent CAC mailing list (Appendix H) two weeks prior to each scheduled meeting. ECORP assisted LACDPW with the preparation of an agenda for the meetings and this was provided in the mailing as well as being made available as a handout at the meeting. ECORP representatives, Ms. Mari Quillman, Mr. Gregorio Benavides, and Mr. Benjamin Smith, 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 distribution of the meeting minutes to the most current CAC mailing list. The proceedings at the spring and fall 2011 CAC meetings are summarized in the meeting minutes which are included as Appendix J. Below is a list of the major issues discussed during the 2011 CAC meetings.

- Site Safety Issues
 - Signage and contact info in the Mitigation Area
 - Homeless people and encampments
 - Increased coordination with and response from the Sheriff's Department
 - General trail safety issues
 - Los Angeles County Vector Control for mosquito spraying
 - Issues with loose dogs in the Mitigation Area

- General site maintenance activities
 - General site signage and maintenance of signs throughout the Mitigation Area
 - Graffiti removal and management
 - Gate and fence repair, reconstruction, and removal
 - Prevention of new trail construction in the Mitigation Area and in the Creek
 - Poison oak control along the trails
 - Los Angeles County Vector Control activities

- Updates on MMP Programs
 - Exotic plant removal activities
 - Exotic wildlife removal activities
 - Riparian and upland restoration and maintenance activities
 - Water quality monitoring
 - Trail usage and monitoring
 - Water lettuce removal activities

- Public outreach
 - Target outreach efforts to occur during equestrian events held in or around the Mitigation Area
 - Continue public outreach program to educate all types of user groups on the appropriate use of the Mitigation Area
 - Organized trail cleanup on November 5, 2011
 - Reminding Mitigation Area users about the importance of not removing vegetation during the breeding bird season and the importance of staying on existing trails
 - Distributing informational flyers targeted for specific user groups
 - Protecting native plants present in the Mitigation Area, such as yucca

- Enforcing acquisition of appropriate use permits from LACDPW for organized events occurring in the Mitigation Area
- Newsletter distribution
- Arranging a tour of the Mitigation Area for County and City officials
- Potentially offering a certificate to children who help during the trails cleanup day as part of a certification program for community service

7.3 Trail Maintenance Day

The Seventh Annual Trail Maintenance Day was held on Saturday, November 5, 2011. An alternate date for the Trail Maintenance Day was not scheduled due to scheduling conflicts and because the event occurred so late into the fall season. ECORP worked together with LACDPW to modify the flyers that provided the information for the Seventh Annual Trail Maintenance Day. ECORP provided the flyers to LACDPW in electronic format for posting on their website and for further distribution 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 7-1.

The Trail Maintenance Day event was attended by six volunteers and two project managers from LACDPW. Three aquatic and terrestrial biologists from ECORP attended the event to ensure that sensitive resources were not affected by the activities. Various portions of the site were targeted for trash removal during each of the events, including Haines Canyon Creek and all trails throughout the Mitigation Area. Two aquatic biologists from ECORP removed trash in Haines Canyon Creek and around sensitive fish habitats.



Big Tujunga Mitigation Area 7th Annual Trail Maintenance Day



Please join Public Works and ECORP Consulting for the
7th Annual Trail Maintenance Day!

Date: Saturday, November 5, 2011
**EVENT will be CANCELLED IF there is a NATIONAL
WEATHER FORECAST OF RAIN**

Time: 8 a.m. – 12 Noon
(Please arrive by 8 a.m., to beat the heat!)

Place: Cottonwood Entrance to the Mitigation Bank
(Located at intersection of Wentworth Street and
Cottonwood Avenue, Thomas Guide Page 503, C2/3)

Purpose: To clean up litter along the designated trails
within the Mitigation Bank.

Remember to wear comfortable clothes, bring your hat,
gloves, sun block and insect repellent!

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

Your help and efforts to maintain the habitat restoration
of the Mitigation Bank are much appreciated!



Figure 7-1. November 2011 Trail Maintenance Day Flyer

7.4 Public Outreach Education Program

In an ongoing effort to enhance and protect the existing wildlife and habitats at the Mitigation Area, another task under the Community Awareness Program was developed and implemented during the 2009 contract year and continued into 2011. This task was the direct result of the increasing evidence of problem areas associated with recreational use observed 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 the approved and prohibited types of recreational activities within the Bank. This task was continued into the 2011 contract year as well because of its success during 2009 and 2010.

During site visits in the spring and summer of 2009, ECORP biologists observed increasing problems with visitors utilizing the waterways (Haines Canyon Creek and Tujunga Ponds) in the Mitigation Area for recreational activities such as picnicking, fishing, swimming, and wading. In some rare cases, cooking, barbecuing, 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. Removal of these rock dams was conducted by biologists who are knowledgeable of behaviors of and habitats utilized by the sensitive fish present in Haines Canyon Creek. The dam removal was done with as little silt generation as possible and the rocks were placed back in the stream in a natural arrangement. Removal of the rock dams is critical for the federally listed (threatened) and California Species of Special Concern (SCC) Santa Ana sucker that occurs in the Haines Creek. 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 the public outreach for the Mitigation Area. A bilingual educational brochure was developed and handed out to the different user-groups during the weekend site visits (Appendix B).

The newly developed public outreach program was continued throughout the 2011 contract period. On site interviews and education about the Mitigation Area were conducted by ECORP's bilingual biologists, Gregorio Benavides, Israel Marquez, and J. Freddie Olmos, between June and September 2011. All outreach efforts took place on weekends, during the peak visiting hours between 10 AM and 5 PM. During these outreach efforts, the biologists handed out the bilingual brochures describing the ecological purpose of the Mitigation Area, the importance of protecting sensitive biological resources, and the allowed 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 help contribute further to these goals.

Many brochures were distributed to weekend visitors during 2011. The biologists also conducted informal interviews, short question and answer sessions, and explained LACDPW's conservation goals to as many visitors as possible during each outreach. Outreaches took place either in the Mitigation Area or at Gabrieliño Park, which is commonly used as a staging area to enter the Mitigation Area. Memos documenting the results of the outreach efforts in 2011 are included in Appendix K.

The outreach effort will be addressed in the LTMMP that is currently under development for the site. The LTMMP is expected to be completed in 2012.

8.0 CONTINUATION OF SITE MAINTENANCE AND MONITORING PROGRAM

The purpose of the Site Maintenance and Monitoring Program task is to monitor the success of the cottonwood/willow restoration areas that were planted throughout the riparian areas of the Mitigation Area in 2001 and 2002. In addition to monitoring the success of these plantings, this task includes erosion control and barrier maintenance, weed and trash removal in order to maintain restoration areas, replacement of cuttings/containers and reseeding of areas if necessary, water quality monitoring, and focused wildlife surveys for least Bell's vireo, southwestern willow flycatcher, and arroyo toad. Presence/absence surveys for least Bell's vireo, southwestern willow flycatcher, and arroyo toad were recommended every three years in the original draft LTMMMP prepared by Chambers Group (Chambers 2006) and were therefore not conducted in 2011 because focused surveys were conducted during the spring and summer of 2009.

8.1 Erosion Control and Barrier Maintenance

ECORP's Restoration Specialist, biologists, and/or ECORP's maintenance contractor, Nature's Image, conducted quarterly site visits during 2011 to survey the condition of existing barriers surrounding the site and identify potential erosion problems that may require the installation of erosion control measures. Surveyors walked the entire site and coordinates of problem areas or areas in question were recorded.

ECORP biologists Gregorio Benavides, Benjamin Smith, and Phillip Wasz conducted site visits on February 25, March 16, April 5, May 14, June 25, and September 7, 2011. Areas of erosion in the oak/sycamore woodland area and where the fence surrounding the site had been compromised were recorded using a handheld GPS unit. The GPS coordinates for these locations were included in the quarterly Erosion Control and Barrier Maintenance Memos, which are included as Appendix L. The locations of problems were reported to either Natures Image or LACDPW so they could be resolved.

8.2 Cottonwood/Willow Restoration Area Maintenance

ECORP's Restoration Specialist and biologists and/or ECORP's maintenance contractor, Nature's Image, conducted quarterly site visits to survey the condition of the cottonwood/willow restoration areas. Surveyors walked the entire site coordinates of problem areas or areas in question were recorded. This task includes removal of invasive weeds and trash from riparian areas, watering existing plantings, and assessing the need for exotic plant removal activities. Representative site photos were taken. Noxious weeds were identified and mapped during the quarterly site visits and those occurring in areas where impacts to breeding birds would not be an issue, were controlled using hand and mechanical methods (hand-pulling and string-trimming). The 2007 assessment of the habitat restoration plan approach to achieving the success criteria indicated that planting additional cuttings and containers likely would not be practical, therefore no additional plantings or cuttings were installed in the restoration areas in 2011 (see Section 2.0). The revised approach to the exotic plant removal included a more aggressive program of removing exotic trees throughout the

cottonwood willow habitat areas in order to open up the canopy so natural recruitment can occur at a higher rate. The exotic plant species removal program will continue in the future in order to continue the efforts to open up the canopy and to encourage more natural recruitment. All efforts were conducted according to the terms and conditions of the new SAA. The quarterly Cottonwood/Willow Restoration Area Maintenance Memos are found in Appendix M.

8.3 Cottonwood/Willow Restoration Success Monitoring

A modified version of the hydrogeomorphic (HGM) approach was used for the functional assessment of the riparian or floodplain habitat in the Mitigation Area (Brinson 1995). The logic behind the HGM approach is to compare the wetlands functions of the target sites to a reference standard site determined to have the highest level of functioning (Brinson 1995). By definition, reference standard functions receive an index score of 1.0. Target sites are assigned a score of between 0 for no function and 1.0 for as high as the reference standard. The crediting and debiting mechanism for Skunk Hollow Mitigation Area (Stein 1997) was used as a starting point and adapted to be specific for this analysis. Evaluation variables assess riparian habitat functions (e.g., cover, structure, etc.), hydrologic and biogeochemical functions, and wildlife values.

A complete discussion of the functional analysis design and results are included in the 2011 Functional Analysis and Success Monitoring Report (Appendix N).

Annual functional analyses were conducted 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 1998). Field sampling for the 2011 annual functional analysis was conducted on July 28 and 29, 2011, by ECORP botanist Jordan Zylstra and ECORP biologist Cara Snellen.

Additionally, success monitoring and analysis, recently implemented in 2009, was included as a quantitative method to evaluate the performance specifically of the riparian restoration areas. Field data collection for the success monitoring was conducted by Mr. Zylstra and Ms. Snellen on July 27, 2011. A summary of the results is presented below.

8.3.1 Annual Performance Monitoring

ECORP conducted the functional analysis data collection on July 28 and 29, 2011. Vegetation cover within the riparian habitat was determined by measuring the canopy cover of each tree or shrub included in the point-centered quarter method described in the 2011 Functional Analysis and Success Monitoring Report. In order to provide a more thorough assessment of the riparian habitat and specifically monitor and measure the success of the updated revegetation efforts, a second analysis methodology was implemented. This success analysis of vegetation included detailed analysis of growth, cover, height, and viability of 10 of the 23 restoration areas using point transect methods as described in the 2011 Functional Analysis and Success Monitoring Report. ECORP conducted the success monitoring data collection on July 27, 2011. Copies of all data sheets are included in the report found in Appendix N.

8.3.1.1 Functional Analysis of the Riparian Habitat

Vegetation cover of mature plants was moderate for 2011, with approximately 71 trees and 212 shrubs per acre were found in the riparian habitat at the Mitigation Area. Approximately 98 percent of the trees and 80 percent of the shrubs encountered were native species. The tree canopy forms a dense multi-layered canopy throughout the site in most areas (116.5 percent cover overall) and shrubs form an open understory of approximately 6 percent cover. The relative density of trees and shrubs at the community level was approximately 25 percent trees and 75 percent shrubs. However, overall tree cover dominated the community with a relative dominance value of approximately 95 percent. Furthermore, overall tree cover consists primarily of native species. Despite the apparently underdeveloped understory (only 6 percent overall), native shrubs are well-represented with a relative dominance value of approximately 98 percent. The results for overall density, relative density, dominance (percent cover), and relative dominance for the Mitigation Area riparian habitat are summarized in Table 8-1.

Table 8-1. Density, Relative Density, Dominance, and Relative Dominance

	Density (# plants/acre)	Relative Density (% of total community)	Dominance (Percent Cover)	Relative Dominance (% of total community)
Native Species				
Trees	68.7	97.5	116.0	99.1
Shrubs	170.1	80.3	6.3	97.8
Non-Native Species				
Trees	1.8	2.5	1.1	0.9
Shrubs	41.8	19.7	0.1	2.2
Summary All Species				
Trees	70.5	24.9	116.5	95.2
Shrubs	211.9	75.1	5.8	4.8

Overall organic cover was moderate at approximately 54 percent; however, cover of annual grasses was relatively low at approximately 17 percent. The average number of topographic features encountered per 330 feet was approximately 14. The average tree height analysis (2.9 category units) indicated that most trees on the site are greater than 13 feet in height with some falling into the 7- to 13-foot height range. The results of percent organic cover, percent annual grass cover, tree height, and average topography score measurements for the riparian habitat within the Mitigation Area are summarized in Table 8-2.

Table 8-2. Percent Organic Cover, Annual Grass Cover, Average Tree Height, and Average Number of Topographic Features

Percent Organic Cover	Percent Cover of Annual Grass	Average Tree Height (Category units)	Average Topography Features (per 100 meters)
53.6	17.2	2.9	13.7

For the riparian system, the Functional Unit (FU) is calculated to be 0.82 per acre. In previous functional analysis reports for the Mitigation Area, a total of 76.0 acres of willow riparian habitat was used to calculate the Functional Unit Capacity (FCU). However, in 2009, the habitats in the Mitigation Area were remapped in order to create a new vegetation map. The number of acres of willow riparian habitat present in 2009 was then recalculated using Geographic Information Systems (GIS) software. In order to get a more accurate estimate of the acres of willow riparian habitat, GIS was also utilized to subtract the number of acres encompassed by the trails through the willow riparian habitat. The resulting total acreage for willow riparian habitat currently present in the Mitigation Area is 91.2 acres. This is an increase over what was originally mapped in 1997. Therefore, based on the new acreage of 91.2 acres, the total FCU for riparian habitat in the Mitigation Area in 2011 is:

$$\text{FCU}_{\text{Big T}} = (0.82_{\text{FU willows}})(91.2 \text{ acres of willows}) = 74.78$$

The FCU value of the riparian habitat at the Mitigation Area has increased from 59.74 in 1997 to 74.78 in 2011. The target functional value for the enhanced riparian habitat along Haines Canyon Creek (as set forth by the MMP) is 0.87 with a functional capacity unit value of 66.12. Although the FU is slightly below the target value, the overall functional capacity for the riparian habitat within the Big Tujunga Wash has exceeded the fifth-year standards. The results and further discussion of the Functional Analysis is found in Appendix N.

8.3.1.2 Success Monitoring of Restoration Areas

Native tree species comprised a relatively open tree layer with approximately 35 percent cover; no non-native trees were present in the restoration areas. The shrub layer was poorly developed with native species accounting for approximately 5 percent and non-natives for 3 percent. Ground cover was dominated by non-native species (75.2 percent) while cover of natives was approximately 8 percent. Plant cover values, determined for both native and non-native species at each of the three vegetation layers (tree, shrub, and ground), are presented in Table 8-3.

Table 8-3. Percent Cover by Vegetation Layer and Plant Category

Vegetation Layer	Percent Cover	
	Native	Non-native
Tree	35.2	0.0
Shrub	4.5	2.5
Ground	8.3	75.2

Additionally, total percent cover in the restoration areas was determined for native and non-native species (Table 8-4). Non-native plant cover was very high at approximately 91 percent cover; native plant cover was relatively moderate (44.4 percent). Bare ground accounted for approximately 4 percent of the restoration areas sampled. Combined coverage of all three vegetation components was greater than 100 percent as a result of presence of both native and non-native species at a single transect sampling point.

Table 8-4. Percent Cover of Natives, Non-natives, and Bare Ground

Percent Cover Of Native Species	Percent Cover of Non-native Species	Percent Cover of Bare Ground
44.4	90.8	3.8

Survival and percent cover requirements of plantings were established such that the original MMP Plantings shall have a minimum of 80 percent survival the first year, 90 percent survival after the third year, and 100 percent survival thereafter, and/or shall attain 75 percent cover after 5 years. In 2007, there were a total of 51 surviving cottonwoods from the 2002 and 2007 riparian planting efforts (ECORP 2008a). Forty-eight live individuals were counted during the 2009 success analysis field sampling, indicating a survival rate of 94 percent for cottonwoods over a span of two years (ECORP 2010). Due to the high survival rate of cottonwoods, as well as the increasing difficulty in distinguishing planted and recruited individuals, count data for cottonwoods are no longer collected as part of the sampling effort. The other native plant species originally included in the riparian plantings are mulefat (*Baccharis salicifolia*), black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), California wild rose (*Rosa californica*), and California blackberry (*Rubus ursinus*). These species appeared to be well established in the restoration areas; however, detailed information regarding the success of each could not be adequately gauged.

8.3.1.3 Riparian Area Survival

In 2008, ECORP submitted a Revised Habitat Restoration Plan for the Mitigation Area (ECORP 2008b). The new revegetation strategy was to include a more active non-native plant removal program and to increase maintenance efforts for the surviving cottonwoods. It was also determined that future success monitoring would focus on the success criteria of 75 percent native cover in the restoration areas rather than the survival of riparian plantings. In previous years, results of the functional analysis were used to estimate percent cover and overall success of the restoration areas. In the 2008 annual report, it was suggested that the 5th year requirement of 75 percent native cover had been met in riparian restoration areas based on the cover values calculated as part of the functional analysis. However, it was determined in 2009 that the success criteria had not been met in the riparian restoration areas based on the success monitoring and analysis results (54.2 percent). Percent cover values calculated during the 2009 success analysis also indicated a much lower level of vegetative cover by layer in the restoration areas (native trees 48.8 percent and shrubs 13.2 percent) as compared to the riparian habitat (native trees 148.5 percent and shrubs 19.2 percent).

In addition to the relatively low native cover in 2009, non-native cover in the restoration areas was very high at approximately 58 percent overall. It was determined that an intense non-native plant removal program would be the most effective revegetation strategy as it would provide space for growth of important riparian plant species as well as additional opportunities for native plant establishment. Removal efforts began in earnest in late 2009 once the revised SAA was issued by CDFG. The removal program

has proved extremely successful in eradicating non-native trees (0 percent cover). Non-native shrubs have also been limited in the restoration areas; cover decreased from approximately 9 percent in 2010 to only 3 percent this year. However, the creation of open, unshaded space provided ample opportunity for invasive non-native ground species, such as prickly lettuce (*Lactuca serriola*), tocalote (*Centaurea melitensis*), sowthistle (*Sonchus* spp.), shortpod mustard (*Hirschfeldia incana*), and brome (*Bromus* spp.), to become established. Additional open space was created by debris flows from the 2009 Station Fire as well as overland runoff during rain events. As a result, non-native ground cover has increased to approximately 75 percent in 2011 (90.8 percent overall) from approximately 37 percent last year (59.6 percent overall). This substantial increase in non-native cover also appears to have crowded out native species and limited growth. In 2010, native cover in the tree, shrub, and ground layers were approximately 61, 21, and 18 percent, respectively. This year, native tree cover was limited to approximately 35 percent, shrubs 5 percent, and ground species 8 percent. Overall, native cover has decreased nearly 30 percent from 72 percent in 2010 to approximately 44 percent in 2011.

The eradication of the non-native trees in the restoration areas indicates that the non-native plant removal program has been effective on some level. The overall health of the riparian habitat within the Mitigation Area, as determined by the functional analysis and field observations, further indicates the program's effectiveness. However, non-native cover is a major problem within the restoration areas. To address this problem, the non-native removal program will be adjusted and efforts will be focused on the restoration areas. Furthermore, invasive ground species will be targeted for removal.

A major goal of the MMP for the Mitigation Area was to improve habitat and thus better support breeding and foraging activities of sensitive riparian wildlife species, such as the least Bell's vireo, in the restoration areas. High cover of native riparian trees and shrubs is essential for these sensitive species; however, success analysis results in 2009, the first year of implementation, indicated that the restoration areas provided limited native cover. The intense non-native plant removal program that was subsequently implemented appears to be very effective in providing establishment opportunities and increasing cover of natives in the riparian habitat overall, as indicated by this year's functional analysis. Non-native trees have also been eradicated from the restoration areas. However, the 2011 success analysis results indicate that non-native plant species are a major presence in the restoration areas. It is imperative that the non-native plant removal program continue as this type of vegetation will adversely affect sensitive wildlife species utilizing the riparian habitat as well as limit any future improvements in native cover. If the non-native plant removal program is focused within the restoration areas and maintained at the same level of intensity, the success criteria of 75 percent native cover may eventually be achieved, resulting in improved habitat quality for riparian wildlife.

8.4 Trails Enhancement/Reclamation

Trails enhancement largely consisted of activities designed to keep equestrians and hikers on established trails while discouraging them from wandering off of the trails or from establishing new trails. Enhancement activities took place during periodic maintenance sessions. Large rocks and overhanging branches were removed from the trails for safety purposes. These materials were placed alongside the trails to further delineate the paths. The closed trails were monitored and obstructive barriers were replaced as needed. Large boulders and branches were strategically placed to prevent the use of unauthorized side trails as part of the trails reclamation process. Trail users have continued to access some of the reclaimed trails. Detailed information on the Trails Maintenance and Monitoring Program can be found in Section 6.0.

8.5 Annual Water Quality Monitoring

ECORP's subconsultant, MWH Laboratories, conducted the annual water quality sampling for the site in 2012. 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 utilizing a YSI 550A Field 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 analyses were performed at MWH Laboratories in Monrovia, California. Quality assurance/quality control (QA/QC) procedures in the laboratory followed the methods described in the MWH Laboratories Quality Assurance Manual. 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. The technique uses a float (a small plastic ball) to measure stream velocity.

8.5.1 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 8-5 and provided in the 2011 Water Quality Monitoring Report that is included as Appendix O. 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 8-5. 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

8.5.2 Water Quality Sampling Results for 2011

Results of analyses conducted by MWH and Emax Laboratories are summarized in Table 8-6. 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 8-6. Summary of Water Quality (February 23, 2012)

Parameter	Units	Haines Canyon Creek, Inflow to Tujunga Ponds	Haines Canyon Creek, Outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
Temperature	°C	18.9	18.0	13.7	17.2
Dissolved Oxygen	mg/L	7.6	8.3	12.5	10.2
pH	std units	6.75	6.82	8.74	8.04
Total residual chlorine	mg/L	ND	ND	ND	ND
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	ND	ND	ND	ND
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND
Nitrate-Nitrogen	mg/L	8.7	5.8	ND	5.3
Orthophosphate-P	mg/L	0.039	0.031	0.014	0.030
Total phosphorus-P	mg/L	0.042	0.037	0.029	0.035
Glyphosate	µg/L	ND	ND	ND	ND
Chloropyrifos*	ng/L	ND	ND	ND	ND
Pesticides (EPA 8081A)**	µg/L	ND	ND	ND	ND
Turbidity	NTU	0.56	0.46	0.95	0.31
Fecal Coliform Bacteria	(MPN/100 ml)	14	<2	2	8
Total Coliform Bacteria	(MPN/100 ml)	700	900	280	1100

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, fensulfotion, 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.

8.5.2.1 Discharge Measurements

Using the field technique described in the methodology section, flows in the outlet from the Tujunga Ponds, in Haines Canyon Creek (leaving the site), and in Big Tujunga Wash were approximated. Estimated flows for February 2012 are summarized in Table 8-7.

Table 8-7. Estimated Flows for February 2012

Sampling Date	Approximate Flow (cubic feet per second)		
	Outlet of Tujunga Ponds	Haines Canyon Creek leaving the site	Big Tujunga Wash
2/23/2012	1.9	3.8	18.5

8.5.2.2 Comparison of Results with Aquatic Life Criteria

Table 8-8 provides the results of the February 2012 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 8-8. Discussion of February 2012 Big Tujunga Wash Sampling Results

Parameter	Discussion
Temperature	<ul style="list-style-type: none"> Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations.
Dissolved oxygen	<ul style="list-style-type: none"> Dissolved oxygen (DO) levels ranged from 7.6 mg/L in the inflow to the Tujunga Ponds to 12.5 in Big Tujunga Wash. DO levels in the ponds were above the recommended minimum (5.0 mg/L) and mean (7.0 mg/L) for warmwater fish species.
pH	<ul style="list-style-type: none"> Lowest pH was observed in the inflow to Tujunga Ponds (6.75), with highest pH observed in Big Tujunga Wash (8.74). 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. The pH of Big Tujunga Wash was slightly above the high end of the range.
Total residual chlorine	<ul style="list-style-type: none"> No residual chlorine was detected at any station.
Nitrogen	<ul style="list-style-type: none"> Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. Ammonia was below the detection limit at all stations.
Phosphorus	<ul style="list-style-type: none"> Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range at these four stations was 0.029 to 0.042 mg/L; recommended range is <0.05 – 0.1 mg/L).
Glyphosate	<ul style="list-style-type: none"> Glyphosate was not detected at any station.
Chloropyrifos	<ul style="list-style-type: none"> Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.
Pesticides	<ul style="list-style-type: none"> Pesticides analyzed by EPA Method 8081A were not detected at any station.
Turbidity	<ul style="list-style-type: none"> Turbidity levels were low (<1 NTU) at all stations.
Bacteria	<ul style="list-style-type: none"> Fecal coliform levels at all stations were well below the water contact recreation standard of 200 MPN/100 ml. Total coliform levels ranged from 280 MPN/100 ml in Big Tujunga Wash to 1,100 MPN/100 ml in Haines Canyon just before exiting from the site. [Note that recreation standards are for fecal coliiform. Total coliform standards apply to waterbodies where shellfish can be harvested for human consumption.]

9.0 RESTORATION OF 11-ACRE OAK/SYCAMORE WOODLAND

The oak/sycamore woodland area is located adjacent to Wentworth Street and south of Haines Canyon Creek. This area was revegetated with native plant species in 2000 and the success of the restoration was monitored on an annual basis between 2000 and 2005. The oak/sycamore woodland weed removal efforts began on July 5, 2007 with a meeting between ECORP and Natures Image to discuss the plan of action for restoring the upland area. Methods discussed for restoration included weed whipping areas around the native shrubs and trees, such as flat-top buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), and oaks (*Quercus* spp.). It was also decided that no weed removal activities would occur near the oak and elderberry (*Sambucus mexicanus*) trees along the fence bordering Wentworth Street unless exotic plants and/or ornamental trees had become established. Castor bean and tree tobacco were included as target species in the weed removal program.

Weed removal activities were continued in 2011 and conducted by hand using Round-Up® herbicide, hand tools, and gasoline-powered weed whackers. The schedule for weed removal activities included four efforts during each contract year. Due to inclement weather in 2011, two larger removal efforts were conducted instead of the typical four smaller efforts. The weed removal efforts were timed to remove the weeds and non-native grasses during the growing season and prior to them depositing new seeds in the restoration area.

Active restoration of the 11-acre oak/sycamore woodland is not being conducted at this time; however, Natures Image performed weed removal activities on April 6 and 7, June 9, 10, 13, and 14 and September 14, 2011. Prior to each of the weed removal efforts, ECORP biologists visited the site to conduct pre-construction surveys to identify breeding birds or other sensitive biological resources that may be affected by weeding activities. Notes and representative site photographs were taken and the coordinates of additional weed/exotic plant locations were recorded using a handheld GPS unit. Only one nest was observed on April 5, 2011 during the pre-construction survey conducted prior to weed removal activities. The nest was located in the western portion of the upland area and the biologist established a 300-foot no-work buffer around the nest for the duration of weed removal activities. The no-work buffer was removed once weed removal activities were completed.

During site visits in the middle of the spring, new growth was observed on many of the native shrubs and trees where weeding had been conducted under the canopies and around the base of these native plants. The native shrub and tree species planted in this area in 2001 and 2002 appear to be thriving and replanting/reseeding is not necessary at this time. Quarterly reports were produced summarizing the restoration efforts in the 11-acre oak/sycamore woodland (Appendix P).

10.0 ATTENDANCE AT MEETINGS WITH AGENCIES, PUBLIC, AND CONSULTANTS

ECORP was available on an on-call basis to attend meetings with agencies, public, and consultants as a representative of LACDPW; however, no meetings pertaining to the Mitigation Area were held in 2011.

11.0 REFERENCES

Brinson, Mark

1995 *The HGM Approach Explained*. National Wetlands Newsletter.

[Chambers] Chambers Group, Inc.

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

2006 Long Term Monitoring and Maintenance Plan for Big Tujunga Wash, Los Angeles California. Unpublished Report prepared for County of Los Angeles, Department of Public Works.

[ECORP] ECORP Consulting, Inc.

2008a 2008 Functional Analysis for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California. Unpublished report submitted to Los Angeles County Department of Public Works. November 2008.

2008b Revised Habitat Restoration Plan for the Big Tujunga Wash Mitigation Area. Unpublished Report submitted to Los Angeles County Department of Public Works. September 2009.

2010 2009 Annual Report for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works.

2011 Draft Long-term Maintenance and Monitoring Plan for the Big Tujunga Wash Mitigation Area, Los Angeles County. Unpublished report submitted to Los Angeles County Department of Public Works. April 2011.

Griffith Wildlife Biology

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

2011 Big Tujunga Wash Brown-Headed Cowbird Control Program. Unpublished Report prepared for County of Los Angeles, Department of Public Works.

Stein, Eric D.

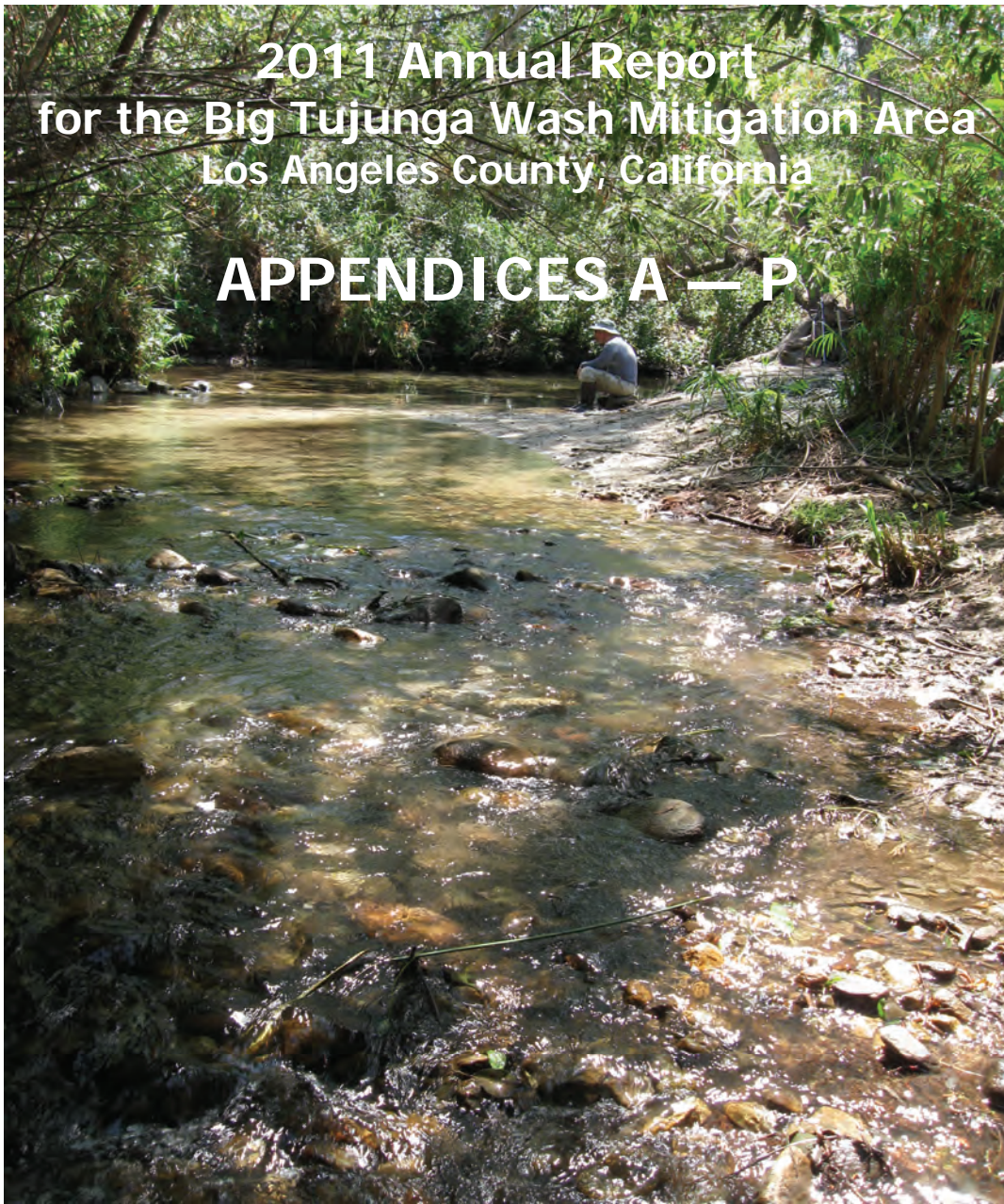
1997 *Crediting and Debiting Mechanism for the Barry Jones Wetland Mitigation Bank (formerly Proposed as the Skunk Hollow Mitigation Bank)*. Prepared for the U. S. Army Corps of Engineers, Los Angeles District, Regulatory Branch.

[USDA NRCS] United States Department of Agriculture, Natural Resources Conservation Service

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

2011 Annual Report
for the Big Tujunga Wash Mitigation Area
Los Angeles County, California

APPENDICES A — P



Prepared for:



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

Prepared by:



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ENVIRONMENTAL CONSULTANTS

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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
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AGREEMENT REGARDING PROPOSED STREAM OR LAKE ALTERATION

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

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

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

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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.*

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Project Location:

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

Project Description:

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

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

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

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

- Conservation Credits Remaining.

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

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

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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.

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- 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:

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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,

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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:

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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:

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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.

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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

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

CONCURRENCE

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

Name (signature)

Date

Name (printed)

Title

California Department of Fish and Game

Helen R. Birss
Environmental Program Manager
South Coast Region

Date

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

APPENDIX B

Public Outreach and Worker Education Brochure



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

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

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

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

¿Preguntas? / Questions?

LADPW: Valerie De La Cruz

(626) 458-6126

Water Resources Division

County of Los Angeles

Department of Public Works

P.O. Box 1460

Alhambra, CA 91802



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'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!

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

Big-T is like a small island

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

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

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

Big-T es como una isla pequeña

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

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

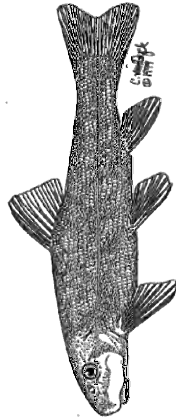
Con el tiempo la isla se ha hecho más pequeña. Big-T es sensible a los cambios de su hábitat. Estos cambios pueden causar que un hábitat tan importante desaparezca. Cuando esto sucede los animales y las plantas también pueden desaparecer.

There is no place like Big-T

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

No hay lugar como Big-T

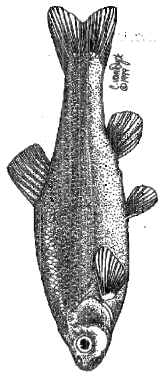
Big-T es único por las plantas y los animales que viven aquí. Varios de estos animales son tan únicos que se han hecho regulaciones para proteger el lugar donde viven. Esto significa que las plantas, el agua, la tierra, y las piedras que componen sus hogares (o hábitat) no debe ser dañado.



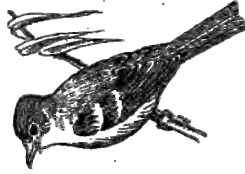
Santa Ana sucker
(*Catostomus santaanae*)



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



Arroyo chub
(*Gila orcutti*)



Southwestern
willow flycatcher
(*Empidonax traillii extimus*)



Bell's vireo
(*Vireo bellii*)



California Sycamore
(*Platanus racemosa*)



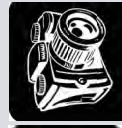
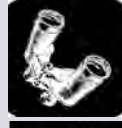
Black willow (*Salix nigra*)

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

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



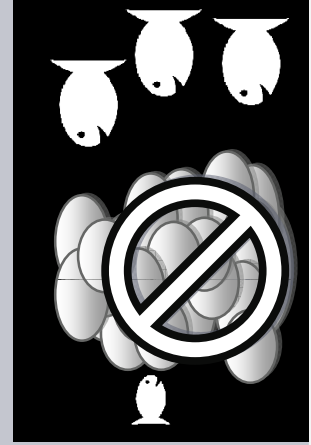
YES/SI



NO!



No dams/No presas



2011 Brown-headed Cowbird Trapping Report

2011 BIG TUJUNGA WASH
BROWN-HEADED COWBIRD CONTROL PROGRAM



GRIFFITH WILDLIFE BIOLOGY

2011 BIG TUJUNGA WASH
BROWN-HEADED COWBIRD CONTROL PROGRAM

prepared for:

Los Angeles County Flood Control District
900 S Fremont
Alhambra, California 91803

under subcontract to:

ECORP Consulting, Inc
1801 Park Court Place, B-103
Santa Ana, California 92701
Attn: Mari (Schroeder) Quillman

prepared by:

Griffith Wildlife Biology
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Final Report 16 July 2011
Revised 20 December 2011

Preferred citation:

Griffith Wildlife Biology 2011. 2011 Big Tujunga Wash Brown-headed Cowbird Control Program. Unpublished report prepared for ECORP Consulting, Santa Ana, CA, by Griffith Wildlife Biology, Calumet, MI.

EXECUTIVE SUMMARY

Four cowbird traps were operated in and near the Big Tujunga Wash Mitigation Area in 2011. The traps were operated from 1 April to 30 June. Each trap contained at least one male and one female decoy cowbird as of 3 April, and the preferred 2-3 male and 3-5 female decoys as of 7 April and subsequently.

Two hundred eleven (211) cowbirds were removed, including 103 males, 99 females, and 9 juveniles, well above the 2001-2011 average of 136.75.

The male: female capture ratio was 1.04:1. Most of the adult cowbirds were captured in weeks 1-7: 85/103 males (83%) and 96/99 females (97%). No banded cowbirds or other banded birds were captured, and the traps were not vandalized.

In addition to cowbirds, 362 non-target birds of 4 species were captured, of which all but 2 (0.6%) were released unharmed. This total includes the multiple capture, release, and recapture of a smaller number of individuals. Seven (7) yellow-headed blackbirds (*Xanthcephalus xanthcephalus*) (CDFG SSC) 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.

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*).

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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 (Willet 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) in Trap 4 at Big Tujunga Wash.



Two cowbird eggs in a least Bell's vireo nest at the San Gabriel River near Santa Fe Dam.

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. 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.

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 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*, vireo) and southwestern willow flycatcher (*Empidonax traillii extimus*, flycatcher), and the federally threatened California gnatcatcher (*Polioptila californica californica*, gnatcatcher) (USFWS 1986, 1993, 1995).

California gnatcatcher photos from San Diego County



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 (ibid).

The cowbird control project at Big Tujunga Wash was initiated in 2001 and performed in 2001-2006 and 2009-2011. Griffith Wildlife Biology (GWB) has been the trapping contractor since 2006. The purpose of the trapping purpose is to enhance reproductive success among the vireo, flycatcher, gnatcatcher, and other host species by decreasing or eliminating cowbird brood parasitism by removing cowbirds from the study area.

Cowbird traps have also been operated immediately downstream at Hansen Dam Basin in 1996, 1997, and 2001-2011 (GWB 2011), and immediately upstream of Interstate 210 at Angeles National Golf Course in 2008-2011 (GWB 2011a).

STUDY AREA

Big Tujunga Wash is located in Los Angeles County near Sunland, 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 slightly upstream from the basin, but have not yet occupied the Big Tujunga Wash Mitigation 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 T3 and T4 (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 30 March, activated 1 April, and operated from 1 April to 30 June 2011 (91 days, 13 weeks).

Each trap is 6' wide, 8' long, and 6' tall, with a 1 3/8" 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 a 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 pound 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 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. Each trap contained at least 1 male and 1 female decoy cowbird as of 3 April, and the preferred 2-3 male and 3-5 female live decoys as of 7 April 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 1 April to 30 June. 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 Project Manager. The traps were deactivated, disassembled, and transported to off-site storage on 30 June.

The number of cowbirds removed is a net number calculated by subtracting from the gross number of cowbirds captured: the number of banded cowbirds released, cowbirds released by vandals, cowbirds accidentally released, and unexplained missing decoy cowbirds. Captured cowbirds not utilized as decoys were euthanized with carbon monoxide and provided as forage to raptor rehabilitation/reintroduction facilities.

This project was performed under the authority of Federal Endangered Species Permit TE 758175-7 and a Memorandum of Understanding (MOU) from the California Department of Fish & Game (CDFG). The Principal Investigator was J.T. Griffith. The Project Manager was J.C. Griffith. The Trap Technicians were S. Dunagan, J.T. Griffith, and R. Marotta. A complete cowbird trapping protocol is available (GWB 1992).

RESULTS

Two hundred eleven (211) cowbirds were removed in 2011, including 103 males, 99 females, and 9 juveniles (Table 1, Table 2). The male: female capture ratio was 1.04:1. No banded cowbirds or other banded birds were captured. The first cowbirds were captured on 5 April: 1 male and 2 females in Trap 3. Most of the adult cowbirds were captured in weeks 1-7 (1 April – 19 May): 85/103 males (83%) and 96/99 females (97%) (Figure 5). The first juveniles (3) were captured on 17 June in Trap 1.

In addition to cowbirds, 362 non-target birds of 4 species were captured, of which all but 2 (0.6%) were released unharmed (Table 3). This total includes the multiple capture, release, and recapture of a smaller number of individuals. Seven (7) yellow-headed blackbirds (*Xanthcephalus xanthcephalus*), listed by California as a Species of Special Concern (CDFG 2008) were captured and released unharmed (Table 3). No other sensitive or endangered, threatened, or candidate non-target species were captured. Non-target birds may perish in the traps from stress, inter- or intra-specific competition, or by being preyed upon by snakes, hawks, or weasels. 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 2011.

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 and from each trap site varies year to year, sometimes independently. The number of cowbirds removed in 2011 (211, including 103 males, 99 females, and 9 juveniles) was higher than the 2001-2011 average (136.75, including 62.5 males, 68 females, and 6.25 juveniles).

Female cowbirds are territorial and extremely fecund (40-60 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, 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 99 females in 2011 precluded up to 3,960 parasitism events (40 per female) allowing the production of up to 15,840 songbird young (4 per otherwise parasitized nest) in the study area. Because not all parasitism events are viable and not all cowbird eggs are laid in the nests of small hosts, the actual numbers of cowbird eggs and songbird young are likely much lower but still significant.

Locally raised cowbirds are easily and quickly captured after fledging, and are therefore good indicators of the efficacy of a trapping program. Nine (9) juveniles were captured in 2011, suggesting that cowbird parasitism was greatly reduced but not eliminated in the study area in 2011.

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 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, 2009-2011 were the highest capture totals ever, even with only 4 traps and a 91 day trapping season vs 7 traps and 122 days). 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 cowbird control project will be required indefinitely to reduce or eliminate cowbird parasitism and enhance reproductive success among host species.

MANAGEMENT RECOMMENDATIONS

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

LITERATURE CITED

- California Department of Fish & Game (CDFG). 2008. California Bird Species of Special Concern. W. David Shuford and Thomas Gardali, Eds. Studies in Western Birds No. 1 published jointly by Western Field Ornithologists and California Department of Fish & Game, Sacramento, California.
- Chambers Group, Inc. 2000. Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank. Unpublished report prepared for the County of Los Angeles Department of Public Works by Chambers Group Inc, Irvine, California.
- _____. 2005. Final 2005 Annual Brown-headed Cowbird Trapping and Removal Program Report for the Big Tujunga Wash Mitigation Bank Los Angeles County, California. Unpublished report prepared for the Los Angeles County Department of Public Works Water Resources Division by Chamber's Group, Inc, Irvine, California
- Darley, J.A. 1968. The Social Organization of breeding Brown-headed Cowbirds. Ph.D. Thesis, University of Western Ontario, London, Ontario.
- _____. 1983. Territorial behavior of the female Brown-headed Cowbird (*Molothrus ater*). Can. J. Zool. 61: 65-69.
- Flahaut, M.R., and Z.M. Schultz. 1955. Northern Pacific Coast Region. Audubon Field Notes 9:395-397.
- Friedmann, H. 1963. Host relations of the parasitic cowbirds. US Natl. Mus. Bull. 233. 273 pp.
- Freidmann, H., and L. F. Kiff. 1985. The parasitic cowbirds and their hosts. Proc. West. Found. Zool. 2:226-304.
- Gaines, D. 1974. A new look at the nesting riparian avifauna of the Sacramento Valley, California. Western Birds 5:61-80.
- Goldwasser, S., Gaines, D., and S.R. Wilbur. 1980. The least Bell's vireo in California: a de facto endangered race. American Birds 34:742-745.
- Griffith, J. T. and Griffith, J. C. 2000. Cowbird control and the endangered least Bell's vireo: a management success story. Pp. 342-356 in The Ecology and Management of Cowbirds and their Hosts. University of Texas Press, Austin, Texas.
- Griffith Wildlife Biology (GWB). 1992 (updates). Brown-headed cowbird trapping protocol. Unpublished document prepared for the USFWS, CDFG, and internal use by Griffith Wildlife Biology, Calumet, MI.
- _____. 2009. The Status of the Least Bell's Vireo and Southwester Willow Flycatcher at Los Angeles County Drainage Areas [including Hansen Dam] in 2009. Unpublished report prepared for the United State Army Corps of Engineers, Los Angeles District, by Griffith Wildlife Biology, Calumet, MI.

- _____. 2011. 2011 Orcas Park [Hansen Dam] brown-headed cowbird control program. Unpublished report prepared for the City of Los Angeles and K. Hovanian Homes, Ontario, CA, by Griffith Wildlife Biology, Calumet, MI.
- _____. 2011a. 2011 Angeles National Golf Course brown-headed cowbird control program. Unpublished document prepared for ANGC, Sunland, CA, by Griffith Wildlife Biology, Calumet, MI
- Grzybowski, J.A. 1995. The black-capped vireo (*Vireo atricapillus*). In *The Birds of North America* 181 (A. Poole and F. Gill, eds). Academy of Natural Sciences, Philadelphia; American Ornithologist's Union, Washington D.C.
- Holford, K.C. and D.D. Roby. 1993. Factors limiting fecundity of Brown-headed Cowbirds. *Condor* 95:536-654.
- Raim, Arlo. 2000. Spatial Patterns of Breeding Female Brown-headed Cowbirds on an Illinois Site. Pp. 87-99 in *The Ecology and Management of Cowbirds and their Hosts*. University of Texas Press, Austin, Texas.
- Robinson, S.K., S.I. Rothstein, M.C. Brittingham, L.J. Petit, and J.A. Grzybowski. 1995. Ecology and behavior of cowbirds and their impact on host populations. Pp. 428-460 in *Ecology and Management of neotropical migratory birds* (T.E. Martin and D.M. Finch, eds). Oxford University Press, New York.
- Scott, D.M., and C.D. Ankney. 1983. The laying cycle of Brown-headed Cowbirds: Passerine Chickens? *Auk* 100:583-592.
- Smith, J.N.M., and P. Arcese. 1994. Brown-headed Cowbirds and an island population of Song Sparrow: A 16-year study. *Condor* 96:916-934.
- United States Fish & Wildlife Service (USFWS). 1986. Determination of Endangered Status for the Least Bell's Vireo. *Federal Register* 60(38):10694. 43 pp.
- _____. 1993. Determination of Threatened Status for the California Gnatcatcher. *Federal Register* 58: 16742.
- _____. 1995. Final Rule Determining Endangered Status for the Southwestern Willow Flycatcher. USFWS, Carlsbad Field Office.
- Unitt, P. 1984. The birds of San Diego County. San Diego Soc. of Natural History, Memoir 13.
- Weatherhead, P.J. 1989. Sex-ratios host-specific reproductive success, and impact of Brown-headed Cowbirds. *Auk*. 106:358-366.
- Willett, G. 1933. Revised list of birds of SW California. *Pacific Coast Avifauna*. 21:1-203.

Figure 1. 2011 Big Tujunga Wash brown-headed cowbird control project location near Sunland, California.

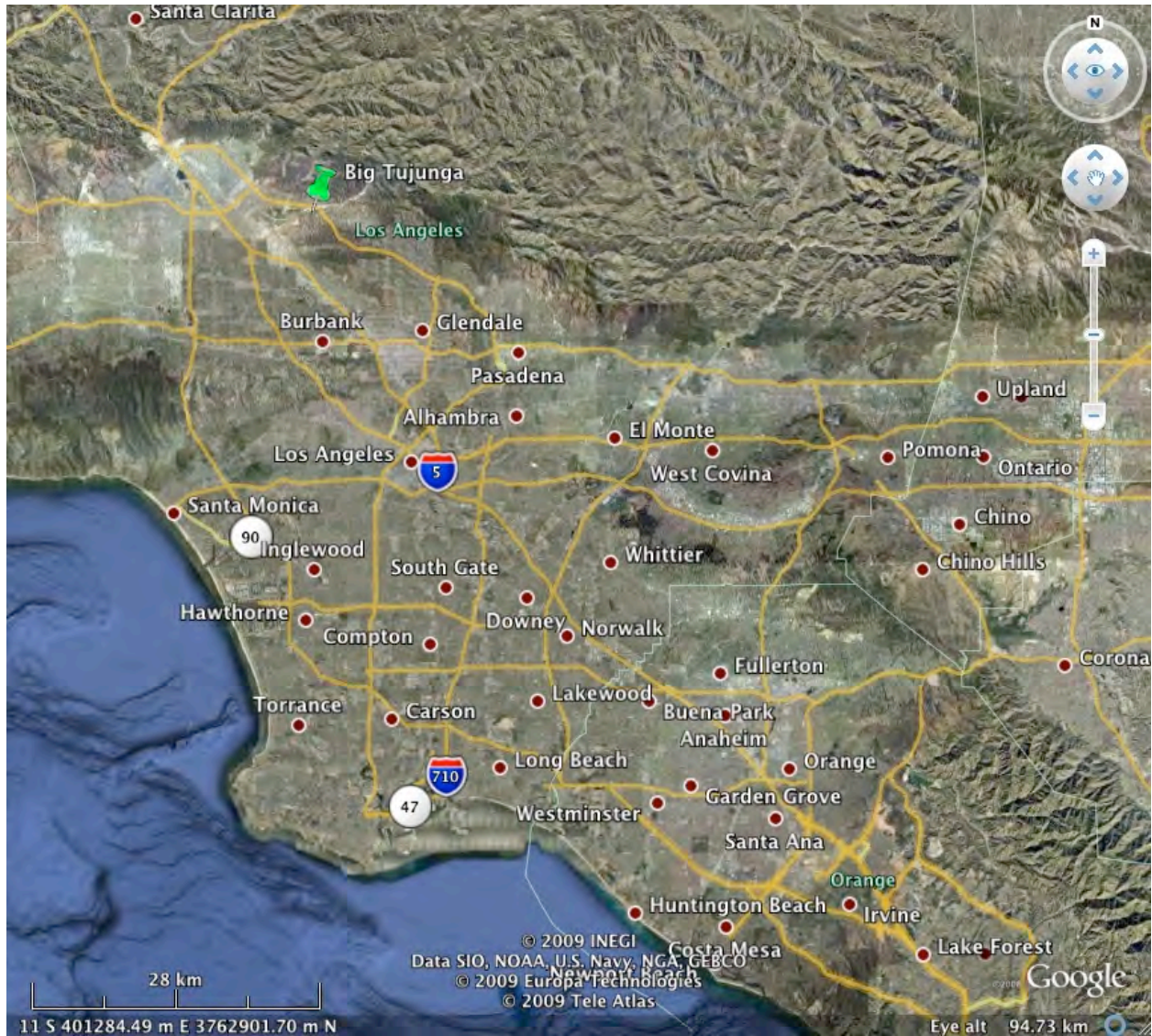


Figure 2. 2011 Big Tujunga Wash brown-headed cowbird trap locations.



Figure 3. 2011 Big Tujunga Wash brown-headed cowbird traps 1 and 2, in situ.



Trap 1



Trap 2

Figure 4. 2011 Big Tujunga Wash brown-headed cowbird traps 3 and 4, in situ.

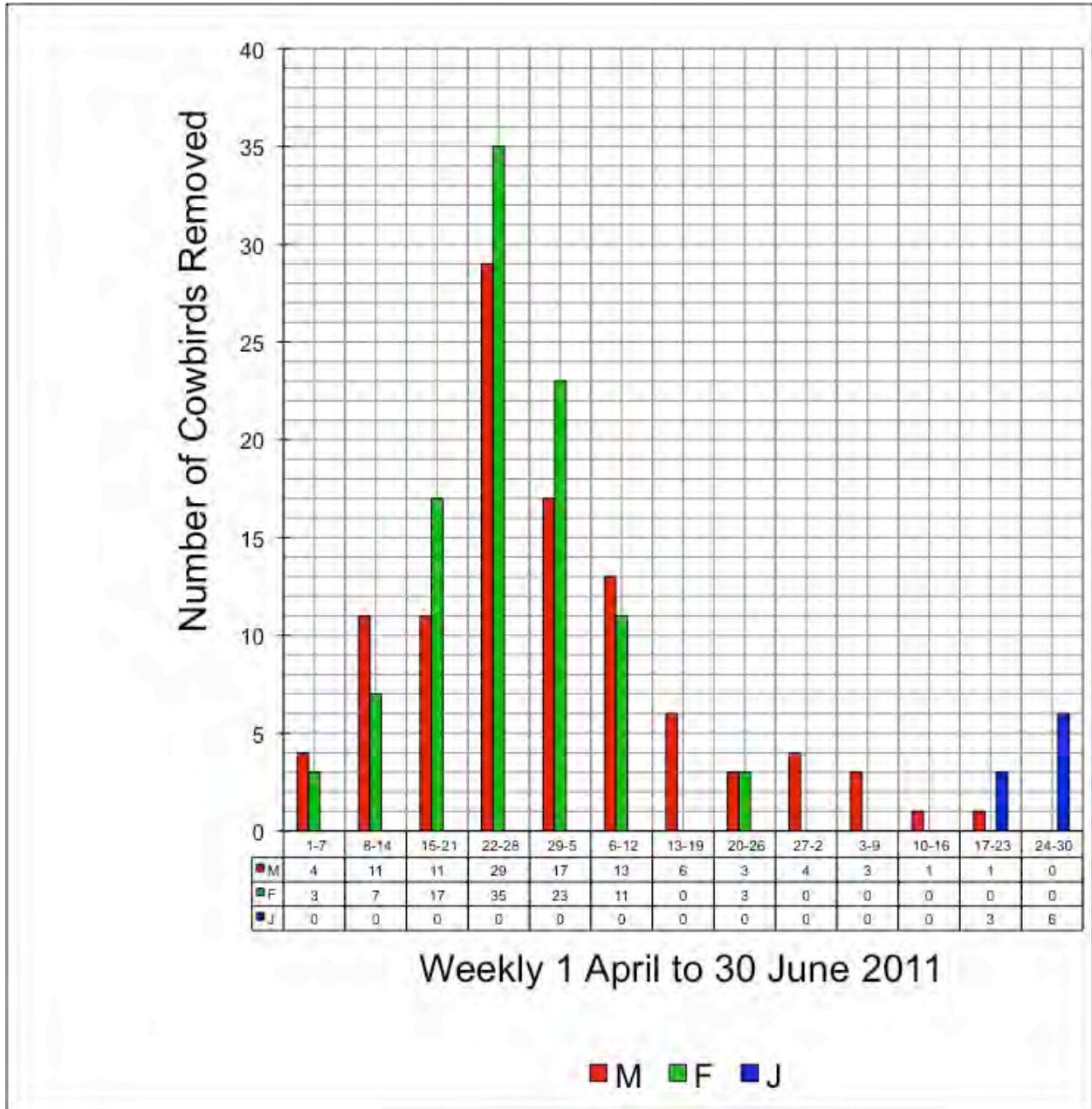


Trap 3



Trap 4

Figure 5. Number of male, female, and juvenile cowbirds removed per week at Big Tujunga Wash in 2011.



M: Male
 F: Female
 J: Juvenile

Table 1. Number of brown-headed cowbirds captured at Big Tujunga Wash, 2001-2011.

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 ^a	7	3/30 - 8/1	53	66	18	137	19.57	0.80
2006 ^{b,c}	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
TOTAL	51		500	544	50	1094	21.45	0.92
AVG	6.375		62.50	68.00	6.25	136.75	21.45	0.92

a: Chambers Group, Inc. 2005

b: GWB 2006

c: Trap 4 operated 2-29 June only

Table 2. Number of male, female, and juvenile cowbirds captured per day, per week, per trap, and total at Big Tujunga Wash in 2011.

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													6	8	8
3													6	8	8
4													6	8	8
5							1	2					1	2	8
6							1	1					1	1	8
7							2						2	0	8
wk 1	0	0	0	0	0	0	4	3	0	0	0	0	4	3	0
8									1				1	0	0
9									1				1	0	0
10							2						2	0	0
11	2								1	2			3	2	0
12									3	3			3	3	0
13		1							1	1			1	2	0
14													0	0	0
wk 2	2	1	0	0	0	0	2	0	0	7	6	0	11	7	0
15									1	1			1	1	0
16	2						1	1		1			4	1	0
17							1	1					1	1	0
18							1	3		2			1	5	0
19										1			0	1	0
20									5	2			2	5	0
21	1						1	1		2			2	3	0
wk 3	3	0	0	0	0	0	4	11	0	4	6	0	11	17	0
22	1						2	3		1			4	3	0
23		1					5	3		1			5	5	0
24		1					7	2		3	4		10	7	0
25		1						4		1			0	6	0
26								3			1		0	4	0
27		1		1			4	4					5	5	0
28	1	3		1			3	2					5	5	0
wk 4	2	7	0	2	0	0	21	21	0	4	7	0	29	35	0
29		2			2		1	3					1	7	0
30		1					2	2		1			2	4	0
May 1		1					7	6		2			9	7	0
2	2			1				2		1			3	3	0
3													0	0	0
4													0	0	0
5								2		2			2	2	0
wk 5	2	4	0	1	2	0	10	15	0	4	2	0	17	23	0
6										1			0	1	0
7	2	1					1	3					3	4	0
8	1	1											1	1	0
9													0	0	0
10					1					1			0	2	0
11	1	1					1	1		7	1		2	3	0
12										7			7	0	0
wk 6	4	3	0	0	1	0	2	4	0	7	3	0	13	11	0
13							1						1	0	0
14	1									1			2	0	0
15	1												1	0	0
16	1												1	0	0
17													0	0	0
18							1						1	0	0
19													0	0	0
wk 7	3	0	0	0	0	0	2	0	0	1	0	0	6	0	0
20													0	0	0
21		1											6	1	0
22													6	8	8
23													6	8	8
24										1			6	8	8
25											1		1	8	8
26													2	2	0
27													6	8	8
28													6	8	8
wk 8	1	3	0	0	0	0	0	2	0	0	0	0	3	3	0
27													0	0	0
28	1												1	0	0
29													0	8	0
30													0	8	0
31	1												1	8	0
Jun 1													3	0	0
2	1								1				2	0	0
wk 9	3	0	0	0	0	0	0	1	0	0	0	0	4	0	0
3													0	0	0
4													0	0	0
5													0	0	0
6										1			1	0	0
7										1			1	0	0
8												1	1	0	0
9													0	0	0
wk 10	0	0	0	0	0	0	0	2	0	0	1	0	3	0	0
10													0	0	0
11													0	0	0
12													0	0	0
13	1												1	0	0
14													0	0	0
15													0	0	0
16													0	0	0
wk 11	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
17			3										0	0	3
18													0	0	0
19													0	0	0
20													0	0	0
21													0	0	0
22	1												1	0	0
23													0	0	0
wk 12	1	0	3	0	0	0	0	0	0	0	0	0	1	0	3
24													0	0	0
25			1										0	0	1
26													0	0	0
27													0	0	0
28			3									2	0	0	3
29													0	0	0
30													0	0	0
wk 13	0	0	4	0	0	0	0	0	0	0	0	2	0	0	6
TOTAL	22	18	7	3	3	0	50	54	0	28	24	2	103	99	9

M: Male
 F: Female
 J: Juvenile

Table 3. Number of non-target species captured & released or preyed upon in cowbird traps at Big Tujunga Wash in 2011.

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
YHBL					5								2	
CATO	5		10		8		13		19		24		33	1
HOFI	21		6								2		2	
HOSP	6		18		4		15		3		7		6	

TOTAL	32	0	34	0	17	0	28	0	22	0	33	0	43	1
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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
YHBL													7	0
CATO	32	1	21		16		17		16		11		225	2
HOFI							1				3		35	0
HOSP	2		2		11		8		7		4		93	0

TOTAL	34	1	23	0	27	0	26	0	23	0	18	0	360	2
--------------	-----------	----------	-----------	----------	-----------	----------	-----------	----------	-----------	----------	-----------	----------	------------	----------

YHBL yellow-headed blackbird
 CATO California towhee
 HOFI house finch
 HOSP house sparrow

C&R: Captured and Released Unharmed

PU: Preyed Upon

Appendix 1. Warning/informational sign placed on cowbird traps at Big Tujunga Wash in 2011.

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 D

Exotic Plant Removal Memos, Photographs, and CDFG Notifications

Exotic Plant Removal Memos



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

February 1, 2011
(2010-116.001/C/C2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C2 –Exotic Plant Removal (January 2011) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continuation exotic plant removal and maintenance at the Big Tujunga Wash Mitigation Area during this period. The next exotic plant removal effort is scheduled for February 2011.

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

SIGNED: 

DATE: February 1, 2011

For Gregorio Benavides
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

April 15, 2011
(2010-116.001/C/C2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C2 – Combined Exotic Plant Removal (February through April 2011) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continuation of invasive exotic plant removal effort and maintenance at the Big Tujunga Wash Mitigation Area (Mitigation Area) during the February through April 2011 timeframe.

Pre-construction surveys were conducted prior to the implementation of the exotic plant removal activities. The actual survey dates were February 25 and April 5, 2011. The purpose of the surveys was to identify locations where active bird nests were located and to identify the locations of exotic plant species that were targeted for removal (i.e., tree of heaven, castor bean, and giant reed). Neither songbird breeding activity nor raptor nests were observed in the treatment area, so no buffers were established. The actual removal of the invasive exotic plant species was conducted by the landscape contractor's crews on April 5, 2011. 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 relating to the Area's sensitive species and habitat by a qualified ECORP Consulting, Inc. (ECORP) biologist.

The removal effort was conducted in the riparian habitat areas and along the southern edge of Big Tujunga Wash. The removal efforts were focused on removing species such as tree of heaven, giant reed, and castor bean from the understory. In the past, tree of heaven was abundant in some areas but this species was not found during this removal effort, which indicates that the previous treatments have been successful.

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

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crossings were made only at established creek crossings to minimize disturbance to sensitive habitat and species.

Exotic plant removal activities are slated to continue on the site during the month of May 2011.

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

SIGNED:  _____

DATE: April 15, 2011

For Gregorio Benavides
Biologist

June 22, 2011
(2010-116.002/C/C2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

**SUBJECT: TASK C2 – Combined Exotic Plant Removal (May through June 2011)
in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles
County, California**

Dear Ms. De La Cruz:

This letter serves as a notice of the continuation of invasive exotic plant removal effort and maintenance at the Big Tujunga Wash Mitigation Area (Mitigation Area) during the period of May through June 2011.

Pre-construction surveys were conducted for the purposes of identifying locations of active bird nesting behavior and to identify target locations containing exotic plant species. ECORP biologist Gregorio Benavides conducted two such site visits on May 14 and 31, 2011 in advance of the implementation of the exotic plant removal activities. The two surveys resulted in the following observations:

- Neither songbird breeding activity nor raptor nests were observed in the areas slated for treatment, therefore no buffers were established.
- Stands and patches of mustard plant (*Brassica* sp.) were observed throughout the riparian area in areas receiving low to high levels of sunlight (Figure 1).
 - a. Mustard plant was ubiquitous in the area east of the oak/sycamore upland area and north of Gibson Ranch;
 - b. The eastern and northern boundaries of the Tujunga Ponds area;
 - c. The riparian habitats in the central and western portions of the Mitigation Area contained dense patches of mustard plant;
 - d. The narrow, sun-drenched area along the Wentworth Street fence also contained dense patches of mustard plant;
 - e. The areas of the riparian vegetation adjacent to the Big Tujunga Wash contained mustard plant patches;
 - f. The sloped areas adjacent to the upland area contained large stands extending into the riparian area (e.g., the 2010 burn area northeast of the upland area).

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- Thistle (*Carduus* sp.) were observed throughout the riparian area, but were relegated to areas receiving intermediate to high levels of sunlight. In most cases thistle was associated with stands of mustard plant in either mixed configurations with mustard or in discrete stands adjacent to patches of mustard (Figure 1). Thistle was generally absent in areas of low light (under dense riparian growth near water) or in areas containing dense stands of native species.
- Isolated plants of castor bean (*Ricinus communis*) were observed in the riparian area in areas receiving low to high sunlight. Most plants were immature and were new growth. There was a high concentration of castor bean plants in the area between the Tujung Ponds and the oak/sycamore upland area in sandy patches of soil (Figure 2).
- Tree of heaven (*Ailanthus altissima*, Figure 3), fig plant (*Ficus* sp.), and giant reed (*Arundo donax*) were present in areas receiving low to high sunlight of the riparian area. Most plants were found near areas where previous removal efforts were conducted and probably represent growth from buried roots or runners that were not previously identified.
- Weedy plants were found near and in areas receiving intermediate to high levels of sunlight. Weedy plant assemblages were relegated to recently disturbed areas, such as the burn area next to the upland area and areas that had been previously treated for exotic plant removal. In most cases weedy plants were spatially associated with stands of mustard plant.
-

The removal effort for those areas identified above were conducted June 7 through 9 and June 14 through 15, 2011 by Natures Image and supervised by ECORP biologist Gregorio Benavides. The following is a summary of the work performed in June:

- Mustard plants were removed using line trimmers (Figure 4), and cut patches were treated with Garlon 4™ herbicide or, in areas near water, with AquaMaster™ herbicide. The area east of the oak/sycamore upland area and north of Gibson Ranch was by far the area with highest concentration of mustard plant patches and stands, so several days were dedicated to this area alone.
- Stands of thistle were removed using either line trimmers (Figure 5) or a modified line trimmer fitted with a circular saw blade. In all cases, thistle cuttings were mulched and treated with the appropriate herbicide.
- Castor bean (Figure 6), tree of heaven, fig plant, and giant reed (Figure 7) were cut down with machete and treated with the appropriate herbicide. Roots and runners were pulled out of the ground when possible.
- Weedy plants stands were cut down using line trimmers and treated with the appropriate herbicide (Figure 8).

During the removal process the following protocols were conducted to minimize disturbance to sensitive habitat and species. Only water-soluble herbicide was used in areas within a 5-meter distance from all water sources. Water sources include Haines Canyon Creek, Tujung 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.

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 relating to the Area's sensitive species and habitat by a qualified ECORP biologist.

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

SIGNED: Gregorio Benavides

DATE: June 22, 2011

For Gregorio Benavides
Biologist



Figure 1. Mixed stands of mustard plant and thistle (in the background) were found throughout the riparian area.



Figure 2. Isolated patches of castor bean were found throughout the riparian area. Small castor bean plants were found all throughout the riparian area in restoration section 2.



Figure 3. Single occurrences of tree of heaven, such as this specimen, were cut down and treated in the riparian area.



Figure 4. Mustard plant removal in process in the riparian area.



Figure 5. Thistle removal using line trimmers. Large stands such as this one were found in areas receiving high levels of sunlight.



Figure 6. Nature's Image crew treating exotic plants in the riparian area.



Figure 7. A large stand of giant reed was located next to the Haines Canyon Creek.



Figure 8. Stands of weedy plants were removed and treated with herbicide.

October 3, 2011
(2010-116.004/C/C2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C2 – Exotic Plant Removal and Maintenance for the Third Quarter of 2011 (July through September) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continued exotic plant removal and maintenance at the Big Tujunga Wash Mitigation Area (Mitigation Area) during the third quarter of 2011 (July through September)

A pre-removal reconnaissance site visit was conducted on September 7, 2011 by ECORP Consulting, Inc. (ECORP) biologists Benjamin Smith and Phillip Wasz in order to identify areas of concern. These areas included large tracks of exotic plants such as giant reed (*Arundo donax*), fig tree (*Ficus* sp.), and castor bean (*Ricinus communis*). The actual removal of the invasive exotic plant species was conducted by the landscape contractor's crews September 12 through 16, 2011. 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 relating to the area's sensitive species and habitat by a qualified ECORP biologist.

The removal effort was conducted in the riparian habitat areas and along the southern edge of Big Tujunga Wash. The removal efforts were focused on removing species such as tree of heaven (*Ailanthus altissima*), giant reed, fig tree, and castor bean from the understory (Figures 1, 2, and 3).

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

- 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.

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Additional exotic plant removal activities have not yet been scheduled at this time.

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

SIGNED: 

DATE: October 3, 2011

Phillip Wasz
Biologist



Figure 1: Castor Bean Removal



Figure 2: Giant reed removal, September 12, 2011.



Figure 3: Giant reed cut and sprayed, September 12, 2011.



December 31, 2011
(2010-116.006/C/C2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C2 – Exotic plant removal and maintenance for the Fourth Quarter of 2011 (October through December) in the Riparian Area of the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continued exotic plant removal and maintenance at the Big Tujunga Wash Mitigation Area during the fourth quarter of 2011 (October through December 2011). Exotic plant removal activities did not occur in the Mitigation Area during this period. The next removal effort has not yet been scheduled at this time

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

SIGNED: 

DATE: December 31, 2011

Phillip Wasz
Biologist

CA Department of Fish and Game Notifications

March 25, 2011
(2010-116/C/C2)

Ms. Jamie Jackson
California Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

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

Dear Ms. Jackson:

The purpose of this letter is to provide notification that exotic plant removal activities will potentially begin on April 5, 2011 at the Los Angeles County Department of Public Works' Big Tujunga Mitigation Area near the City of Sunland in Los Angeles County. The start date is conditioned on suitable weather conditions. The activities will begin with the biologists conducting a pre-construction 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 survey will take place on April 4, 2011. The locations of all active nests 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 nests are identified, then an appropriately-sized buffer will be established as a "no work" zone. A biological monitor will be on site full time during all 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 (Schroeder) Quillman
Principal Biological Resources Program Manager

May 25, 2011
(2010-116/C/C2)

Ms. Jamie Jackson
California Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

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

Dear Ms. Jackson:

The purpose of this letter is to provide notification that exotic plant removal activities will potentially begin on June 1, 2011 at the Los Angeles County Department of Public Works' Big Tujunga Mitigation Area near the City of Sunland in Los Angeles County. The start date is conditioned on suitable weather conditions. The activities will begin with the biologists conducting a pre-construction 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 survey will take place on May 31, 2011. The locations of all active nests 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 nests are identified, then an appropriately-sized buffer will be established as a "no work" zone. A biological monitor will be on site full time during all 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 (Schroeder) Quillman
Principal Biological Resources Program Manager

September 8, 2011
(2010-116.005/C/C2 and C4)

Ms. Jamie Jackson
California Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

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

Dear Ms. Jackson:

The purpose of this letter is to provide notification that exotic plant removal activities will be conducted between September 12 and November 18, 2011 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 specifically focus on the removal of water lettuce, a non-native backyard pond plant, from the Tujunga Ponds that was likely originally introduced into the ponds when someone released a pet turtle or non-native fish. A previous removal effort was conducted but only a small portion of the water lettuce was removed. The efforts to remove it were far more labor intensive than was anticipated so an alternative method was developed. At present, both of the Tujunga Ponds exhibit a very dense cover of water lettuce over the entire water surface and we have estimated that approximately a million plants cover the surface of the ponds. Open water habitat is non-existent in the ponds as seen in the photograph of the west Tujunga Pond.



The water lettuce has now moved downstream into Haines Canyon Creek where the Santa Ana sucker resides. Therefore, a very large removal effort will be necessary to eliminate this plant from the ponds. The alternative method that has been developed utilizes a reach lift that can extend out over the water surface. The crews will utilize a boat and net to corral the water lettuce and then the net will be drawn up and hooked onto the reach lift. The lift will then carry the net to the dumpster where it will release the plants from the net. In addition, hand trash pickers will be used around the cattails and other native vegetation at the edges of the ponds to remove the water lettuce plants that are mixed in with the native vegetation. This alternative method of removal will be the most efficient way to remove the water lettuce and it will minimize damage to the banks of the ponds and to the native vegetation around the edges of the ponds. The reach lift will only travel on established trails around the ponds. A few small branches of native trees and shrubs will be trimmed to allow access for the reach lift but all trimming will be done under the supervision of the biological monitor. In addition, the areas travelled by the reach lift will be seeded with native plants that occur in the immediate vicinity immediately following the completion of the removals. We anticipate very little impact from this method but we are going to reseed just to encourage additional growth of native plants along the edges of the trails that were travelled by the reach lift.

Prior to the initiation of the water lettuce removal activities, the Biologist will conduct a pre-construction survey for sensitive resources. The locations of sensitive resources found during the survey will be identified using a Global Positioning System (GPS) and if necessary, a buffer will be established as a "no work" zone. A biological monitor will be on site 2 to 4 days during each week during the water lettuce removal to ensure that the crews don't disrupt any sensitive resources or harm any native wildlife species.

The quarterly exotic plant removal activities (arundo, tamarisk, castor bean, and eupatory, as well as non-native trees and shrubs) and maintenance activities (weed removal) will also be conducted concurrently during the same timeframe. A biological monitor will be on site full time during these activities to ensure that sensitive resources and native wildlife species are not harmed as a result of the quarterly 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 (Schroeder) Quillman
Principal Biological Resources Program Manager

APPENDIX E

Water Lettuce Removal Memos

June 27, 2011
(2010-116.005/C/C2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C2 - Removal of Water Lettuce within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area (Mitigation Area) during the period of May through June 2011.

In late 2010, single plants of water lettuce were observed and identified in the East Tujunga Pond during exotic aquatic species removal. During an exotic plant removal effort in April 2011, ECORP biologist Gregorio Benavides observed that water lettuce had completely covered the surface of both the East and West Tujunga Ponds (Figures 1 and 2). Water lettuce has not infiltrated the Connector Channel (situated between both ponds) suggesting that it is not a viable habitat for water lettuce (Figure 3).

The ecological significance of removing water lettuce is crucial for the following reasons. First, both water temperature and oxygen concentration levels may be affected by shielding the pond surface by water lettuce. Water lettuce may be acting as a heat insulator trapping heat underneath water lettuce mats. Gas exchange between the pond surface and the air may be limited by water lettuce. Both an increase in water temperature and a decrease in dissolved oxygen concentration may negatively affect aquatic vegetation and aquatic vertebrates and invertebrates living in the Tujunga Ponds.

Second, aquatic birds no longer have access to the pond due to the intense matting that now covers the Tujunga Ponds. Nesting and feeding sites have been limited because the area of exposed water surface has declined.

Third, anoxic (dangerously low levels of dissolved oxygen in the water) conditions in the Tujunga Ponds may occur after a large water lettuce die-off. As mentioned before, aquatic animal species would be negatively affected by anoxic conditions.

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Fourth, water lettuce invasion into the Haines Canyon Creek is imminent. Water lettuce has been observed at the confluence between the West Tujunga Pond and the Haines Canyon Creek (Figure 4). Small, isolated patches of water lettuce have also been observed at the upper reaches of Haines Canyon Creek (Figure 5). The spread and establishment of water lettuce into the Creek would negatively affect native fishes living in the creek. The species in the South Coast Minnow-Sucker fish community, including Santa Ana sucker (*Catostomus santaanae*), arroyo chub (*Gila orcutti*), and Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), are residents of the Haines Canyon Creek in the Mitigation Area. Santa Ana sucker is a federally listed as threatened species and both Santa Ana speckled dace, and arroyo chub, are California species of concern.

The removal of water lettuce was conducted on June 28 through July 1, 2011 by Natures Image and directed and monitored by ECORP biologist Gregorio Benavides. Prior to the removal, the community was notified that the Tujunga Ponds Trail would be closed to equestrian and foot traffic. Signs and barricades were installed at access points to redirect trail traffic. The following protocol was followed to remove water lettuce from the Tujunga Ponds:

- Fifty-foot nets (fitted with float and weighted lines) were deployed into the ponds by a aluminum boat;
- Natures Image crews pulled nets to shore by hand and by the aid of all-terrain-vehicles (Gator pulling a trailer);
- Water lettuce was transported to garbage dumpsters using the Gator and trailer;
- Incidental catches of aquatic species were identified, catalogued, and recorded with photography; and
- Filled garbage dumpsters were removed from the premises and replaced with an empty receptacle.

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 relating to the Area's sensitive species and habitat by a qualified ECORP biologist.

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

SIGNED: 
For Gregorio Benavides
Biologist

DATE: 06/27/2011



Figure 1. Water lettuce in the East Tujunga Pond.



Figure 2. Water lettuce in the West Tujunga Pond.



Figure 3. No water lettuce was observed in the Connecting Channel between the ponds.



Figure 4. Water lettuce at the Ponds-Haines Canyon Creek confluence.



Figure 5. Water lettuce observed in the upper reaches of Haines Canyon Creek.

September 19, 2011
(2010-116.005/C/C4)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - Removal of Water Lettuce Report for September 13 through 16, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area during the period of September 13 through 16, 2011. ECORP Consulting, Inc. biologist Ben Smith visited the site and documented the progress of the water lettuce removal effort. The week's effort is described below.

A pre-construction meeting was held at the site on Tuesday, September 6, 2011 to discuss the strategy and logistics for eradicating water lettuce within the ponds. The plan consisted of Natures Image, the contractor, using a boat and a seine net to encircle patches of water lettuce and then pulling it to shore where a forklift would lift the net from the water and empty the water lettuce into a dumpster. Additionally, volunteers from the Los Angeles County Department of Parks and Recreation would remove water lettuce from near the shore. However, the volunteers would not work in the same area as the forklift due to safety concerns.

The removal effort began on Tuesday, September 13, with a group of ten volunteers from the Los Angeles County Department of Parks and Recreation removing water lettuce from near the shore of the west pond and placing it in the dumpster. Natures Image began using the boat, net, and forklift to remove water lettuce from the west pond on Wednesday, September 14. On this same day, a group of ten volunteers from the Department of Parks and Recreation began removing water lettuce from near the shore of the east pond and stockpiling it on the bank. Groups of 20 volunteers were used on Thursday and Friday, September 15 and 16, to remove water lettuce from the east pond. Methods used to draw the water lettuce to within reach from the shore included tying a rope to a rake, throwing it out into the water lettuce and pulling it back to shore and using a similar strategy by tying ropes to the ends of a log. Rakes and pitchforks were used to lift the water lettuce out of the water. Natures Image continued removal within the west

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pond on Thursday and Friday, but with a new, stronger net and improved efficiency. Two 40-yard dumpsters were filled with water lettuce by the end of the week. Approximately one third of the water lettuce within the west pond was visually estimated to have been removed. Additionally, although the surface of the east pond remained covered with water lettuce, the volunteers stockpiled enough water lettuce to fill approximately half of one dumpster.

The trail along the east bank of the ponds was saturated with areas of standing water during the week of September 12 through 16, posing a potential problem for transporting water lettuce from the east pond to where the dumpsters were located near the west pond. This was likely due, at least in part, to elevated water levels within the ponds that resulted from a blocked outflow channel into Haines Canyon Creek. A plastic mesh had previously been placed across the opening to the outflow channel to prevent water lettuce from washing downstream into the Haines Canyon Creek. Leaves and debris had blocked the mesh, causing it to act as a dam. Additionally, members of the public had constructed a bridge out of rocks and logs in front of the mesh, which was also acting as a dam. Both the mesh and the bridge were removed on Friday, September 16, resulting in a six-inch drop in the water level within the pond. Fishing net was placed across the pond just downstream of the beginning of the water lettuce to prevent water lettuce from entering Haines Canyon Creek. A plastic mesh had been previously placed in the creek below the first mesh as a secondary barrier to the water lettuce. This mesh did not appear to be affecting water levels in the ponds and was left in place.

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

SIGNED: Ben Smith

DATE: 9/19/2011

Ben Smith
Biologist



Photo 1. Water lettuce within the west pond on 9/13/11.



Photo 2. Water lettuce within the west pond on 9/16/11.



Photo 3. Volunteers with the Los Angeles County Department of Parks and Recreation removing water lettuce from the east pond.



Photo 4. Stockpiled water lettuce on the bank of the east pond.



Photo 5. Natures Image using a boat and seine net to gather water lettuce.



Photo 6. Load of water lettuce removed by a forklift.



Photo 7. Blocked outflow channel into Haines Canyon Creek.



Photo 4. Outflow channel into Haines Canyon Creek cleared of obstructions.

September 26, 2011
(2010-116.005/C/C4)

Valeria De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - Removal of Water Lettuce Report for September 19 through 23, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area during the period of September 19 through 23, 2011.

Nature's Image continued to use a seine net and boat with an outboard motor to remove water lettuce from the west pond. Efficiency has improved and three 40-yard dumpsters were filled as a result of the week's effort in the west pond, bringing the project total to five dumpsters filled. Approximately one-third of the water lettuce appears to have been removed, however this is likely a low estimate because as water lettuce is removed from the pond, the remaining water lettuce tends to spread out and occupy a larger area. One waterfowl, an American coot, was observed using the area within the west pond that has been cleared of water lettuce.

Volunteers from the Los Angeles County Department of Parks and Recreation continued removing water lettuce from the east pond using rakes and pitchforks. Small patches of open water have appeared at the access points and the piles of water lettuce on the banks continue to grow, however, in spite of the large mounds of water lettuce on the banks, progress appears slow. One additional access point was cleared by Nature's Image on Thursday, September 22, giving the volunteers a total of six access points to the east pond. Nature's Image also created two access points to the west pond on the north side, however, these have not been used because they provide only limited access to the water lettuce and the bank drops sharply into deeper water at these locations.

Two measures have been put in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the west pond before the outflow channel into Haines Canyon Creek and a plastic mesh across Haines Canyon Creek a short distance downstream from the ponds. Water lettuce was

ECORP Consulting, Inc.

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removed from near the outflow channel on the west end of the west pond on Monday, September 19 and on Thursday, September 22. A small amount of water lettuce tucked away inside the cattails near the outflow channel, downstream from the fishing net and upstream from the plastic mesh, was found and removed. One or two water lettuce plant pieces were found within the outflow channel upstream of the plastic mesh located within Haines Canyon Creek a short distance downstream from the pond. No water lettuce or water lettuce pieces were observed downstream of the mesh.

Members of the public had again constructed an unauthorized crossing consisting of rocks and logs at the outflow channel, which was causing a slight rise in water level within the pond. This was removed on Thursday, September 22. The formerly saturated trail along the northeast side of the ponds is still muddy, but appeared to be improving due to the lower water levels in the ponds.

No pond turtles or two-striped garter snakes were observed during removal efforts. Periodic checks of the dumpsters revealed that non-native crayfish and mosquito fish were being captured with the removal of the water lettuce. Nature's Image reported capturing one adult large-mouthed bass and one juvenile large-mouthed bass was observed on the shore where the net was being pulled from the water. One California tree frog was observed in the water lettuce near the shore of the east pond, however, no native species were observed to have been captured through the water lettuce 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: Ben Smith

DATE: 9/26/2011

Ben Smith
Biologist



Photo 1. Water lettuce within the West Pond on 9/16/11.



Photo 2. Water lettuce within the West Pond on 9/22/11. View from the same location as Photo 1.



Photo 3. The two largest piles of water lettuce removed by Los Angeles County Department of Parks and Recreation volunteers from the East Pond on 9/15/11.



Photo 4. The two largest piles of water lettuce removed by Los Angeles County Department of Parks and Recreation volunteers from the East Pond on 9/22/11.



Photo 5. Nature's Image clearing non-native umbrella sedge to access water lettuce within the East Pond. Photo taken on 9/22/11.



Photo 6. The location pictured in Photo 5 after vegetation removal. Photo taken on 9/22/11.



Photo 7. A small area of open water is now visible within the East Pond. Photo taken on 9/22/11.



Photo 4. Three 40-yard dumpsters were filled as a result of the week's effort within the West Pond. Photo taken on 9/22/11.

October 3, 2011
(2010-116.005/C/C4)

Valeria De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - SUBJECT: Task C4 - Removal of Water Lettuce Report for September 26 through 30, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area during the period of September 26 through 30, 2011.

Natures Image continued to use a seine net and boat with an outboard motor to remove water lettuce from the west pond. A second net was added to the effort later in the week to improve efficiency, so that while the reach lift was emptying one net, the other was being deployed to bring in more water lettuce. Four 40-yard dumpsters were filled as a result of the week's effort in the west pond, bringing the project total to nine dumpsters filled. According to the estimate from Nature's Image, sixty five percent of the water lettuce had been removed from the west pond as of Friday, September 30.

Volunteers from the Los Angeles County Department of Parks and Recreation continued removing water lettuce from the east pond using rakes and pitchforks. Small patches of open water remain at the access points; however, the amount of open water does not appear to have increased noticeably due to the remaining water lettuce spreading out to occupy the areas that were cleared.

Two measures have been put in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the west pond before the outflow channel into Haines Canyon Creek and a plastic mesh across Haines Canyon Creek a short distance downstream from the ponds. No water lettuce was observed downstream from the fishing net holding the water lettuce in the west pond, either in the end of the pond or in Haines Canyon Creek.

The formerly saturated trail along the northeast side of the ponds has mostly dried up with the exception of one small area that contains soggy mud. Members of the public had again

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constructed a crossing consisting of rocks and logs at the outflow channel, which was causing a slight rise in water level within the pond. This was removed on Friday, September 30.

No native species such as pond turtles or two-striped garter snakes were observed to have been captured through the water lettuce 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: Ben Smith

DATE: 10/3/2011

Ben Smith
Biologist



Photo 1. Water lettuce within the west pond on 9/26/11.



Photo 2. Water lettuce within the west pond on 9/29/11. View from the same location as Photo 1.



Photo 3. View of the east pond from the north end. Photo taken on 9/26/11.



Photo 4. View of the east pond from the south end. Photo taken on 9/26/11.



Photo 5. Los Angeles County Department of Parks and Recreation volunteers removing water lettuce from the east pond using a modified floating rake. Photo taken on 9/26/11.



Photo 6. Stockpiled water lettuce on the bank of the east pond. Photo taken on 9/29/11.

October 10, 2011
(2010-116.005/C/C4)

Valeria De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - Removal of Water Lettuce Report for October 3 through 7, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area (Mitigation Area) during the period of October 3 through 7, 2011.

Natures Image continued to use a reachlift, seine net, and boat with an outboard motor to remove water lettuce from the west pond. The bulk of the water lettuce was removed from the pond by the end of the week, although a ring of water lettuce remained around the edges of the pond near the shore and cattails (Photos 1 and 2). The removal plan for the remaining water lettuce in the west pond is to have a second boat collect the water lettuce using dip nets or pitchforks while the reachlift and seine net are used to greater efficiency in the east pond. Rainy weather on Wednesday, October 5 prevented the crew from working that day. Five 40-yard dumpsters were filled as a result of the week's effort in the west pond, bringing the project total to fourteen dumpsters filled.

Volunteers from the Los Angeles County Department of Parks and Recreation continued removing water lettuce from the east pond using rakes and pitchforks. The water lettuce near the access points appears less tightly compacted than at the start of the removal effort (Photo 3). The volunteers did not work on Wednesday, October 5 due to rainy weather.

A tractor with a front loader was delivered on Monday, October 3 to assist with the removal effort in the east pond (photo 4). Overhanging branches were pruned from the edges of the trail between the east and west ponds on the east side of the ponds to create room for the tractor to drive on the trail (Photos 5 and 6). The pruning was monitored and documented by ECORP biologist Ben Smith. Approximately 20 arroyo willow (*Salix lasiolepis*) limbs and three black willow (*Salix gooddingii*) limbs three inches in diameter or greater as well as approximately 15 mulefat (*Baccharis salicifolia*) stalks were pruned.

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Two measures have been put in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the west pond before the outflow channel into Haines Canyon Creek and a plastic mesh across Haines Canyon Creek a short distance downstream from the ponds. ECORP aquatic biologist Adam Schroeder surveyed the portion of Haines Canyon Creek within the mitigation area on Friday, October 7 for any water lettuce that might have eluded these measures. No water lettuce was observed downstream from the fishing net holding the water lettuce in the west pond, either in the end of the pond or in Haines Canyon Creek, however, three rock dams that had been built by the public and 49 non-native red swamp crayfish were removed from the creek during the survey.

Native birds including an American coot and a belted kingfisher were observed using the west pond by the end of the week. No native species such as pond turtles or two-striped garter snakes were observed to have been captured through the water lettuce 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: Ben Smith

DATE: 10/7/2011

Ben Smith
Biologist



Photo 1. Water lettuce within the West Pond. Photo taken on 10/3/11.



Photo 2. Water lettuce within the West Pond near the end of the week. Photo taken on 10/6/11.



Photo 3. Water lettuce within the East Pond. Photo taken on 10/6/11.



Photo 4. Tractor delivered on 10/3/11 for transporting water lettuce from the East Pond to the dumpsters.



Photo 5. Trail on the east side of the Tujunga Ponds prior to pruning on 10/4/11.



Photo 6. Trail on the east side of the Tujunga Ponds after pruning on 10/4/11. Photo taken from the same location as Photo 5.

October 17, 2011
(2010-116.005/C/C4)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - Removal of Water Lettuce Report for October 10 through 14, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area (Mitigation Area) during the period of October 10 through 14, 2011. ECORP Consulting, Inc. biologist Ben Smith visited the site and documented the progress of the water lettuce removal effort. The week's effort is described below.

Removal of most of the water lettuce from the West Pond was completed on Friday, October 7, with only a small amount left around the margins of the pond (Photo 1). Natures Image moved the reachlift, seine net, and boat to the East Pond on Monday, October 10 and began removing water lettuce from that location (Photo 2). An area of open water is now visible where Natures Image has been working (Photos 3 and 4). The dumpsters are staged near the West Pond approximately 800 feet from the access point on the East Pond where Natures Image is removing the water lettuce. The most efficient method of water lettuce removal from the East Pond so far has been to use the reachlift to remove the filled net from the water, empty the net into the bucket of a tractor, and use the tractor to transport the water lettuce to the dumpsters. The crew in the boat deploys a second net while the tractor bucket is being filled, and by the time the second net is filled, the tractor has returned to make another trip. Use of the tractor on the trail has resulted in sections becoming rutted and very muddy (Photo 5). A total of six 40-yard dumpsters were filled during the week, bringing the project total to 20 dumpsters filled.

Volunteers from the Los Angeles County Department of Parks and Recreation continued assisting the water lettuce removal effort on Tuesday, October 11 and on Wednesday, October 12. Volunteer crews were not available to work the rest of the week. The East Pond access are within an area needed for the Natures Image tractor to maneuver, therefore the volunteers were asked to focus on the West Pond, where they would be out of harm's way of the tractor, and remove the water lettuce from the margins of the West

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Pond. The volunteers used four access points along the northwest side of the West Pond to remove water lettuce that was within reach from the shore. No boats were used during this effort. They did not use their boat due to safety concerns.

Two measures have been put in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the West Pond before the outflow channel into Haines Canyon Creek and a plastic mesh across Haines Canyon Creek a short distance downstream from the ponds. Evidence suggested that a fishing party at the West Pond occurred over the weekend and individual water lettuce plants were dislodged from behind the fishnet and into Haines Canyon Creek upstream from the mesh. These were removed on Monday, October 10. No water lettuce was found downstream from the mesh. One fishing lure was found caught in the fishnet at the end of the pond. Yanking on the line in an attempt to free the fishing lure may be the reason the water lettuce was dislodged. Another fishing lure was found in the water near the first and sections of abandoned and tangled monofilament fishing line were found along the edge of the pond. These were also removed.

A total of eight American coots and two pied-billed grebes (Photo 6), a diving bird that feeds on crayfish, were observed in the West Pond at the beginning of the week. No native species such as pond turtles or two-striped garter snakes were observed to have been captured through the water lettuce removal effort.

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

SIGNED: Ben Smith

DATE: 10/17/2011

Ben Smith
Biologist



Photo 1. Water lettuce along the margins of the West Pond. Photo taken on 10/10/11.



Photo 2. Water lettuce removal within the East Pond. Photo taken on 10/11/11.



Photo 3. Water lettuce within the East Pond. Photo taken on 10/10/11.



Photo 4. Water lettuce within the East Pond. Photo taken on 10/14/11.



Photo 5. Muddy, rutted condition of the trail along the east side of the ponds. Photo taken on 10/14/11.



Photo 6. Pied-billed grebes, water birds that feed on crayfish, were observed in the West Pond. Photo taken on 10/11/11.

October 24, 2011
(2010-116.005/C/C4)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - Removal of Water Lettuce Report for October 17 through 21, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area during the period of October 17 through 21, 2011. ECORP Consulting, Inc. biologist Ben Smith visited the site and documented the progress of the water lettuce removal effort. The week's effort is described below.

Natures Image continued using the tractor, reachlift, and boat to remove water lettuce from the East Pond as evidenced by the increasing patch of open water where the crew has been working (Photos 1 through 4). The trail along the east side of the ponds remains rutted and muddy in several locations from the back and forth travels of the tractor. The crew placed dead branches in the tire ruts where the mud was deepest to offset some of the impacts from the tractor. The condition of the trail did not appear to be getting worse. A small amount of water lettuce remains around margins of the West Pond (Photos 5 and 6). A second crew from Natures Image began removing water lettuce from the edges of the West Pond on Thursday, October 20 using waders and hand tools. They continued the effort on Friday October 21 using a second boat they brought to the site. A total of five 40-yard dumpsters were filled during the week, bringing the project total to 25 dumpsters filled.

Volunteers from the Los Angeles County Department of Parks and Recreation continued assisting the water lettuce removal effort on Monday, October 17 and Wednesday, October 19. The volunteers worked on removing the remaining water lettuce from the edges of the West Pond that was within reach of access points on the western shore.

Two measures have been put in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the West Pond before the outflow channel into Haines Canyon Creek and a plastic mesh across

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Haines Canyon Creek a short distance downstream from the ponds. A small amount of water lettuce pieces and leaves was removed from the short section of Haines Canyon Creek upstream from the plastic mesh and downstream from the end of the pond on Monday, October 17 and Thursday, October 20. No water lettuce was found downstream from the mesh.

An increasing number of wildlife species have been observed using the West Pond, including two mallards, a dozen or so American coots, and a great blue heron. No native species such as pond turtles or two-striped garter snakes were observed to have been captured through the water lettuce removal effort.

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

SIGNED: Ben Smith

DATE: 10/24/2011

Ben Smith
Biologist



Photo 1. Water lettuce within the East Pond. Photo taken on 10/17/11.



Photo 2. Water lettuce within the East Pond. Photo taken on 10/20/11 from the same location as Photo 1.



Photo 3. Water lettuce within the East Pond. Photo taken on 10/17/11.



Photo 4. Water lettuce within the East Pond. Photo taken on 10/20/11 from the same location as Photo 3.



Photo 5. Water lettuce along the margins of the West Pond. Photo taken on 10/17/11.



Photo 6. Water lettuce along the margins of the West Pond. Photo taken on 10/17/11.

October 31, 2011
(2010-116.005/C/C4)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task C4 - Removal of Water Lettuce Report for October 24 through 28, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area during the period of October 24 through 28, 2011. ECORP Consulting, Inc. biologist Ben Smith visited the site and documented the progress of the water lettuce removal effort. The week's effort is described below.

Natures Image continued using the tractor, reachlift, and boat to remove water lettuce from the East Pond and approximately three fourths of the water lettuce has been removed from this location (Photos 1 through 6). The trail along the east side of the ponds appears to have dried out somewhat, although one small section remains muddy (Photo 7). A second crew from Natures Image used a second boat to remove a significant amount of the water lettuce around the edges of the West Pond, although a small amount still remains (Photos 8 and 9). Water lettuce removal from the Tujunga ponds was stopped on Thursday, October 27 at the request of the Los Angeles County Department of Public Works (LACDPW). The removals are scheduled to resume in two to three weeks. A total of three 40-yard dumpsters were filled during the week, bringing the project total to 28 dumpsters filled.

Volunteers from the Los Angeles County Department of Parks and Recreation did not assist with the removal effort during the week of October 24 through 27.

Two measures have been put in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the West Pond before the outflow channel into Haines Canyon Creek and a plastic mesh across Haines Canyon Creek a short distance downstream from the ponds. On Monday, October 24, small amount of water lettuce pieces and leaves, including one seedling water lettuce plant, was removed from the short section of Haines Canyon Creek upstream from the

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plastic mesh and downstream from the end of the pond. ECORP biologists removed the water lettuce in the West Pond that was just upstream from the fishnet near Haines Canyon Creek on Friday, October 28. The water lettuce was removed from the pond using a seine net and piled by hand in a clearing near the trail (Photo 10). This was done in order to reduce any potential effects large amounts of decaying vegetation in the water might have on Haines Canyon Creek following next week's herbicide treatment.

The benefits of removing the water lettuce are evidenced by the wildlife that has returned to the ponds. Waterfowl, consisting mainly of American coots, are currently using both ponds and at least one kingfisher was observed in the vicinity of the East Pond. No native species such as pond turtles or two-striped garter snakes were observed to have been captured through the water lettuce removal effort.

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

SIGNED: Ben Smith

DATE: 10/28/2011

Ben Smith
Biologist



Photo 1. Water lettuce within the East Pond. Photo taken on 10/24/11 looking south.



Photo 2. Water lettuce within the East Pond. Photo taken on 10/28/11 looking south from the same location as Photo 1.



Photo 3. Water lettuce within the East Pond. Photo taken on 10/24/11 looking southwest.



Photo 4. Water lettuce within the East Pond looking southwest. Photo taken on 10/28/11 looking southwest from the same location as Photo 3.



Photo 5. Water lettuce within the East Pond. Photo taken on 10/24/11 looking north.



Photo 6. Water lettuce along the margins of the West Pond. Photo taken on 10/28/11 looking north from the same location as Photo 5.



Photo 7. Muddy portion of the trail along the east side of the ponds. Photo taken on 10/28/11.



Photo 8. Natures Image Crew removing water lettuce from the margins of the West Pond. Photo taken on 10/24/11.



Photo 9. Water lettuce along the margins of the West Pond. Photo taken on 10/28/11 looking south.



Photo 10. Water lettuce along the margins of the West Pond. Photo taken on 10/28/11.

December 30, 2011
(2010-116.006/D)

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

SUBJECT: Task C4 - Removal of Water Lettuce Report for December 27 through 30, 2011 at the Big Tujunga Wash Mitigation Area, within the Tujunga Ponds, Los Angeles County, California

Dear Ms. Yu:

This letter serves as a notice of continuation of the water lettuce (*Pistia stratiotes*) removal effort within the Tujunga Ponds site adjacent to the Big Tujunga Wash Mitigation Area (Mitigation Area) during the period of December 27 through 30, 2011.

Removal of water lettuce from within the Tujunga ponds resumed on Tuesday, December 27 after a two-month break from the schedule. Natures Image was re-subcontracted under New Creation Builders, a contractor hired by the Los Angeles County Department of Public Works, to complete the water lettuce removal. Equipment, including a reach forklift, tractor with a bucket, dumpsters, and a boat were staged at the site on Tuesday, December 27. Water lettuce in the West Pond within reach of the shore was removed with hand tools while the equipment was being staged. On Wednesday, December 28, an e-mail notice was sent notifying the public that the trails around the ponds would be closed to the public for the duration of the project. Barricades with trail closure signs were placed on the trails leading to the work areas around the ponds. Notices of the trail closures were also posted at the Mary Bell, Wheatland North, and Wheatland South entrances of the Mitigation Area (Figure 1).

The status of the water lettuce within the ponds was documented on Tuesday December 27, as the removal effort restarted. Although a few seedling water lettuce plants were noted, the water lettuce did not appear to have spread since the end of October. It is likely that colder weather is slowing or stopping the growth of mature plants. The overall mass of the water lettuce appeared to have slightly decreased due to herbivory from invertebrates. Most of the water lettuce was gone from the West Pond, with a small amount around the perimeter and in the constricted area leading to Haines Canyon Creek on the southwest end of the pond (Photo 1). Approximately one fourth of the East Pond was covered with water lettuce (Photos 3 and 5), and visible portions of the channel connecting the two ponds still contained water lettuce.

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Natures Image used the boat and outboard motor, reach forklift, and tractor to remove water lettuce from the East Pond Wednesday through Friday, December 28 through 30. Nearly all the water lettuce from the perimeter of the West Pond and most of the water lettuce from the East Pond was removed by Friday, December 30, filling approximately two dumpsters (Photos 1 through 6). The trail used by the tractor along the north side of the ponds was in poor condition with deep ruts and muddy areas due to previous use by the tractor and continues to remain in poor condition with continued use of the tractor on the trail.

Two measures were previously left in place to prevent water lettuce from escaping the ponds and spreading down Haines Canyon Creek: a fishnet stretched across the end of the West Pond before the outflow channel into Haines Canyon Creek and a plastic mesh across Haines Canyon Creek a short distance downstream from the ponds. The fishnet within the pond was moved to the mouth of the outflow channel on Tuesday, December 27 to facilitate removal of the water lettuce behind the net. A small amount of water lettuce was found within the channel upstream from the plastic mesh and was removed. No water lettuce was found downstream from the plastic mesh, indicating that the measures are successfully preventing water lettuce from traveling downstream from the ponds.

A variety of aquatic birds were observed using the ponds, including ruddy ducks, ring-necked ducks, redhead, mallard, American coots, and pied-billed grebes. Kingfishers were also observed in the vicinity of the ponds.

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: Ben Smith

DATE: 12/30/2011

Ben Smith
Biologist



Figure 1. Map of trail closure and sign locations.



Photo 1. Water lettuce in the West Pond upstream from Haines Canyon Creek. Photo taken on 12/27/11.

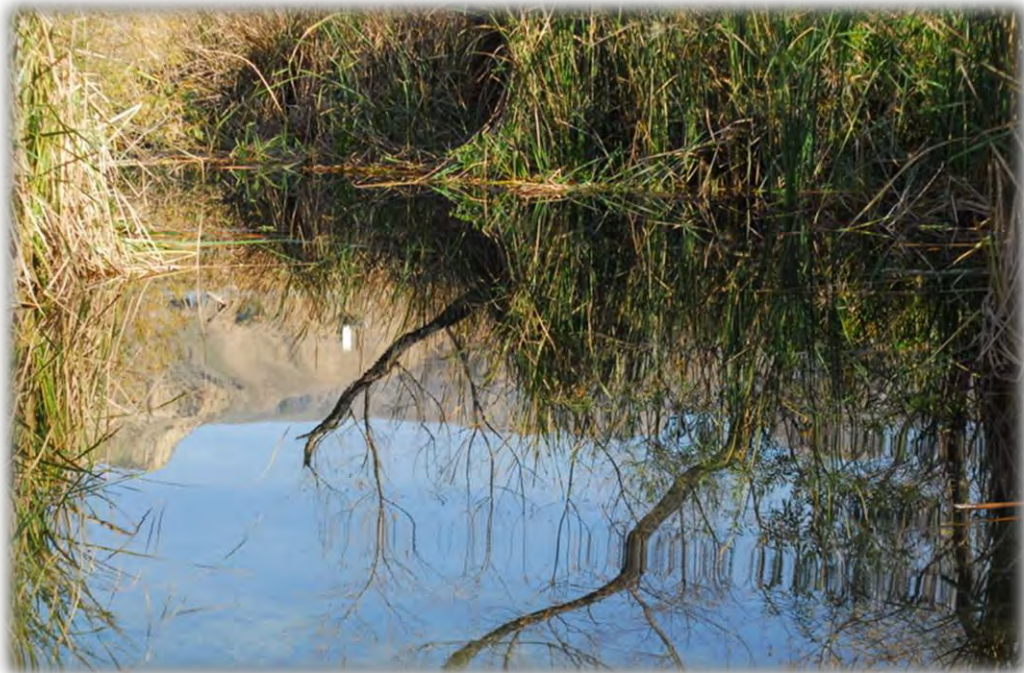


Photo 2. West pond near Haines Canyon Creek cleared of water lettuce. Photo taken on 12/30/11 from the same location as Photo1.



Photo 3. Water lettuce within the East Pond. Photo taken on 12/27/11.



Photo 4. Water lettuce within the East Pond. Photo taken on 12/30/11 from the same location as Photo 3.



Photo 5. Water lettuce within the East Pond. Photo taken on 12/27/11.



Photo 6. Water lettuce within the East Pond. Photo taken on 12/30/11 from the same location as Photo 5.

APPENDIX F

Exotic Wildlife Removal Memos and 2011 Report

Exotic Wildlife Removal Memos



April 8, 2011
(2010-116.001/D/D1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task D1 – Exotic Aquatic Species Removal Efforts for January through April 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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) from January through April 2011. The purpose of this program is to remove exotic aquatic wildlife from the Big 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 first exotic aquatic species removal effort took place April 5 to 7, 2011. The primary species targeted during the removal efforts were largemouth bass (*Micropterus salmoides*), American bullfrog (*Lithobates catesbeianus*), and red swamp crayfish (*Procambarus clarkii*). ECORP fisheries biologists Brian Zitt, Terrance Wroblewski, and Adam Schroeder conducted removal efforts in the Big Tujunga Ponds and Haines Canyon Creek using a suite of sampling methods.

During this removal effort, ECORP biologists set a total of 30 baited minnow/crayfish traps, four turtle traps, and one fyke net in habitats suitable for catching and removing exotic aquatic species. Twenty of the minnow/crayfish traps were set in the upper portions of Haines Canyon Creek, nearest the West Pond. The remaining minnow/crayfish traps were set in the East Pond. Two turtle traps were set in the East Pond and two were set in the West Pond. The fyke net was set in the channel connecting the West and East Ponds (Connector Channel). Each of the traps were baited and allowed to set for approximately 24 hours prior to being checked. Floats were placed within the fyke net's cod end to prevent the possibility of turtle or bird mortality.

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Seine nets of various sizes (10 and 15 feet in length) were used to capture exotic fishes and crayfish in the upper reaches of Haines Canyon Creek. Seine hauls targeted deep pools, areas of overhanging instream vegetation, and undercut banks. Daytime snorkeling/spearfishing surveys were conducted in the Tujunga Ponds and visibility ranged from 10 to 20 feet. These surveys allow for fish nesting sites to be destroyed and the removal of large exotic fishes, although it has proven to be an effective method of removing other exotic aquatic species (e.g. turtles, American bullfrogs, and red swamp crayfish). Currently, the East Pond is completely covered with water lettuce (*Pistia stratiotes*) leaving no open surface water. Water lettuce is an aquatic plant used extensively in the aquarium trade. It 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. At night, bullfrog gigging surveys were conducted around the perimeter of the Tujunga Ponds and the upper portion of Haines Canyon Creek. While conducting the bullfrog gigging surveys at night, spearfishing efforts were also conducted in the Tujunga Ponds.

The exotic aquatic species captured and removed during this effort included: red swamp crayfish, largemouth bass, green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), black bullhead (*Ameiurus melas*), brown bullhead (*Ameiurus nebulosus*), red-eared slider (*Trachemys scripta elegans*), and American bullfrog (adult and tadpoles). In addition to collecting exotic aquatic species during the removal effort, 14 arroyo chub (*Gila orcutti*) were collected in Haines Canyon Creek. This fish is a California Species of Special Concern and based on field observations each individual appeared to be of good health. The 14 arroyo chub were immediately recorded and released into the creek unharmed. During the snorkel surveys in the West Pond a single southwestern pond turtle (*Actinemys marmorata pallid*) was observed. The southwestern pond turtle is also a California Species of Special Concern. There were no other native species observed in the Tujunga Ponds.

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: _____



Brian Zitt
Fisheries Biologist

DATE: April 8, 2011



June 22, 2011
(2010-116.002/D/D1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task D1 -Exotic Aquatic Species Removal Efforts for May through June 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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) for May through June 2011. 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 second exotic aquatic species removal effort took place June 14 to 16, 2011. 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, and Adam Schroeder conducted removal efforts in the Tujunga Ponds and Haines Canyon Creek using a suite of sampling methods.

During this removal effort, red swamp crayfish were observed in very high numbers in Haines Canyon Creek. In an attempt to decrease the population of red swamp crayfish in the creek, ECORP biologists utilized two-person seines to target deep pools, areas of overhanging instream vegetation, and undercut banks with the highest concentrations of exotic aquatic species. ECORP biologists worked systematically in an upstream direction, sampling each habitat repeatedly until all exotic aquatic species were removed. During the exotic aquatic species removal in the creek, any water lettuce (*Pistia stratiotes*) encountered during the surveys was removed. In addition to seining in Haines Canyon Creek, baited minnow/crayfish traps were set in habitats suitable for catching and removing exotic aquatic species.

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Nighttime snorkeling/spearfishing surveys were conducted in the Tujunga Ponds where visibility ranged from 10 to 15 feet. These surveys target the removal of large exotic fishes and allowed for fish nesting sites to be destroyed. It has also proven to be an effective method of removing exotic turtles, American bullfrogs, and red swamp crayfish. Currently, both ponds are completely covered with water lettuce leaving no open surface water. Bullfrog giggering surveys were conducted at night throughout Haines Canyon Creek and around the perimeter of the Tujunga Ponds.

The exotic aquatic species captured and removed during this effort included: 1,462 red swamp crayfish, 19 green sunfish (*Lepomis cyanellus*), 11 largemouth bass, 2 goldfish (*Carassius auratus auratus*), 2 bluegill (*Lepomis macrochirus*), 1 brown bullhead (*Ameiurus nebulosus*), and 22 American bullfrogs (7 adults and 15 tadpoles). In addition to collecting exotic aquatic species during the removal effort, 21 arroyo chub (*Gila orcutti*), a California Species of Special Concern, and 1 Santa Ana sucker (*Catostomus santaanae*), a federally listed as threatened species, were collected in Haines Canyon Creek. These fish were immediately recorded and released into the creek unharmed. Based on field observations each individual appeared to be of good health. There were no native species observed in the Tujunga Ponds.

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: 
Brian Zitt
Fisheries Biologist

DATE: June 22, 2011



August 25, 2011
(2010-116.003/D/D1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task D1 -Exotic Aquatic Species Removal Efforts for July through August 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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) for July through August 2011. 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 third exotic aquatic species removal effort took place August 22 to 24, 2011. 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, Danny Heilprin, and Adam Schroeder conducted removal efforts in the Tujunga Ponds and Haines Canyon Creek using a suite of sampling methods.

During this removal effort, red swamp crayfish were observed in very high numbers in Haines Canyon Creek. In an attempt to decrease the population of red swamp crayfish in the creek, ECORP biologists utilized two-person seines to target deep pools, areas of overhanging instream vegetation, and undercut banks with the highest concentrations of exotic aquatic species. ECORP biologists worked systematically in an upstream direction, sampling each habitat repeatedly until all exotic aquatic species were removed. During the exotic aquatic species removal in the creek, any water lettuce (*Pistia stratiotes*) encountered during the surveys was removed. In addition to seining in Haines Canyon Creek, baited minnow/crayfish traps were set in habitats suitable for catching and removing exotic aquatic species.

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Currently, both ponds are completely covered with water lettuce leaving no open surface water. Bullfrog gigning surveys were conducted at night throughout Haines Canyon Creek, in the freeway drainage, and around the perimeter of the Tujunga Ponds.

The exotic aquatic species captured and removed during this effort included: 999 red swamp crayfish, 12 green sunfish (*Lepomis cyanellus*), 7 largemouth bass, 1 goldfish (*Carassius auratus auratus*), and 14 American bullfrogs. In addition to collecting exotic aquatic species during the removal effort, 18 arroyo chub (*Gila orcutti*), a California Species of Special Concern, and 15 Santa Ana sucker (*Catostomus santaanae*), a federally listed as threatened species, were collected in Haines Canyon Creek. These fish were immediately recorded and released into the creek unharmed. Based on field observations each individual appeared to be of good health. There were no native species observed in the Tujunga Ponds.

In addition to the exotic aquatic species removal efforts, multiple man-made dams and barriers were broken down in Haines Canyon Creek in an attempt to restore the natural flow of water. Two of the baited minnow/crayfish traps were removed from the upper portion of the creek in the early morning of August 23, 2011 by an unknown individual. The lines were cut, and the trap labels and flagging were left in the creek. The traps were not recovered.

During the surveys two aggressive pit bulls were encountered. They ran away and animal control was contacted.

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

SIGNED: 
Brian Zitt
Fisheries Biologist

DATE: August 25, 2011



October 13, 2011
(2010-116.004/D/D1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task D1 -Exotic Aquatic Species Removal Efforts for September through December 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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) for September through December 2011. 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 fourth exotic aquatic species removal effort took place October 10 through 12, 2011. The primary species targeted during the removal effort were red swamp crayfish (*Procambarus clarkii*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), Bluegill (*Lepomis macrochirus*) and the American bullfrog (*Lithobates catesbeianus*). ECORP fisheries biologists Todd Chapman, Terrance Wroblewski, and Adam Schroeder conducted removal efforts in the Big Tujunga Ponds and Haines Canyon Creek using a suite of sampling methods.

During this removal effort, red swamp crayfish were observed in very high numbers in Haines Canyon Creek. In an attempt to decrease the population of red swamp crayfish in the creek, ECORP biologists utilized two-person seine nets, minnow traps, dip-nets, and hand capture methods targeting deep pools, areas of overhanging instream vegetation, and undercut banks. ECORP biologists worked systematically in an upstream direction, sampling each habitat repeatedly until all exotic aquatic species were removed. During efforts in the creek, any water lettuce (*Pistia stratiotes*) encountered was also removed.

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Nighttime snorkeling/spearfishing surveys were conducted in the West Pond where visibility ranged from 10 to 15 feet. These surveys targeted the removal of large exotic fishes. It has also proven to be an effective method of removing exotic turtles, American bullfrogs, and red swamp crayfish. With the exception of the margins, the West Pond is clear of water lettuce, and this made nighttime spearfishing efforts possible. Currently, the east pond is completely covered with water lettuce leaving no open surface water. Nighttime bullfrog giggering surveys were conducted Haines Canyon Creek and around the perimeter of the Tujunga Ponds.

The exotic aquatic species captured and removed from the Tujunga Ponds during this effort included: 1,758 red swamp crayfish, 2 green sunfish, 15 largemouth bass, 3 bluegill, and 9 American bullfrogs (7 adults and 2 metamorphs). In addition to collecting exotic aquatic species during the removal effort, 6 arroyo chub (*Gila orcutti*), a California Species of Special Concern, and 3 Santa Ana sucker (*Catostomus santaanae*), a federally-listed (threatened) species, were captured in Haines Canyon Creek. These fish were immediately released into the creek unharmed. There were no native species observed in the Tujunga Ponds.

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

SIGNED: Mar Quillman for

DATE: October 13, 2011

Terrance Wroblewski
Fisheries Biologist

2011 Exotic Wildlife Removal Report

2011 EXOTIC AQUATIC WILDLIFE SPECIES REMOVAL REPORT FOR THE BIG TUJUNGA WASH MITIGATION AREA



Prepared for:

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



December 2011

Prepared by:



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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 Game's (CDFG's) 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 utilized 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) will be developed to specifically address the continuation of this program into the future.

Historically, all southern California coastal freshwater fish species 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 species 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 fish species: Santa Ana sucker (*Catostomus santaanae*), federally-listed as threatened; Santa Ana speckled dace (*Rhinichthys osculus* spp. 3), a California Species of Special Concern (SSC); and arroyo chub (*Gila orcuttii*), a California SSC. Compared to historical records, the current distribution for each of these species has been severely reduced. The native fish populations that occur within the Mitigation Area are provided an important refuge from habitat alteration and dewatering. The Mitigation Area is considered to be one of the last remaining locations in the Los Angeles River Drainage where these three species of fish can still be found (Swift et al. 1993).

The Big Tujunga Wash Mitigation Area currently provides suitable habitat for two native reptile species, the southwestern pond turtle (*Actinemys marmorata pallida*) and the two-striped garter snake (*Thamnophis hammondi*). These species are both listed as California 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 species in the Mitigation Area, although there are known populations of arroyo toad upstream in Big Tujunga Wash (Wash) and several of its tributaries.

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 non-native 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 in 2011.

1.1 Location and Setting

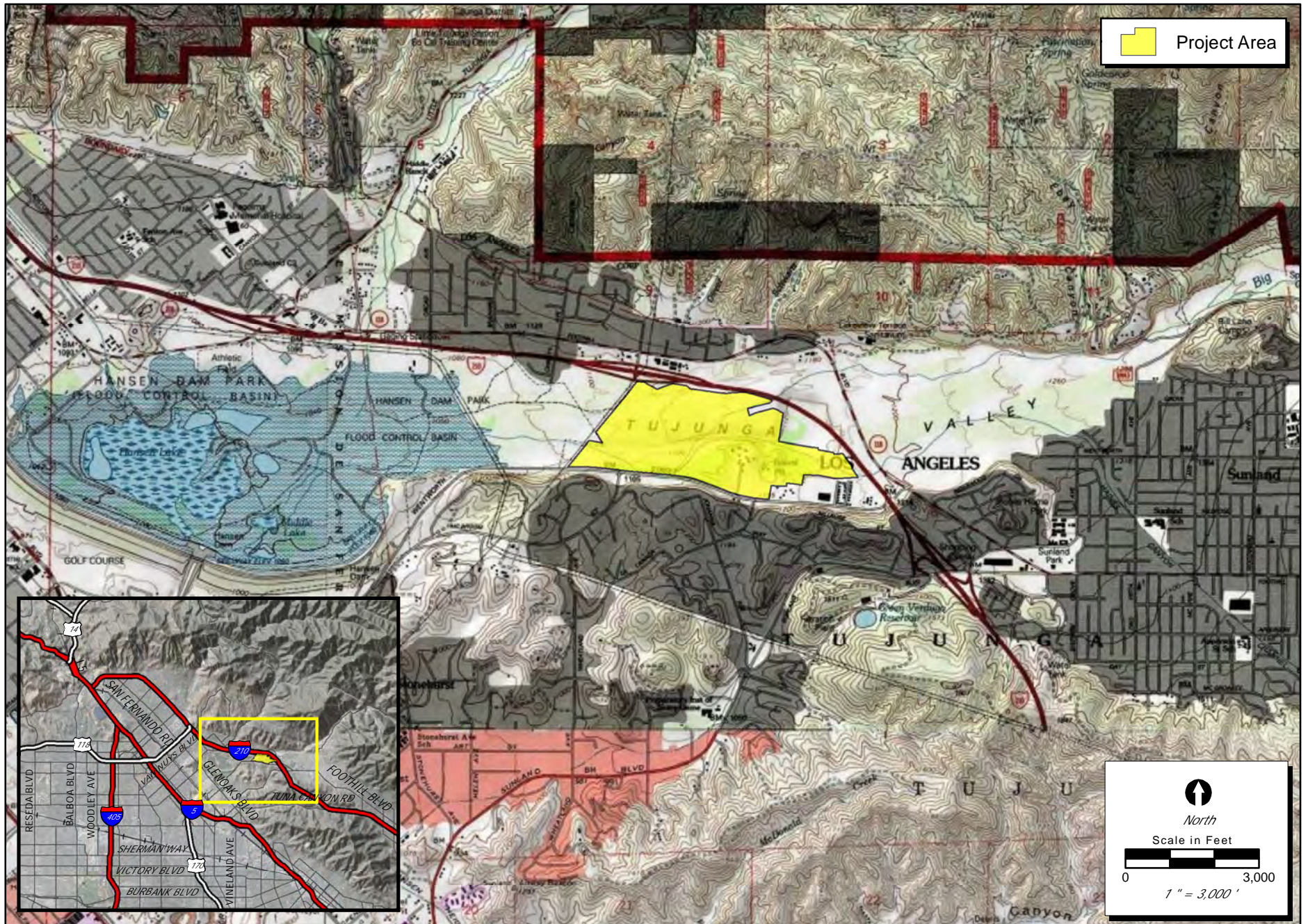
The Mitigation Area is located in Big Tujunga Wash, just downstream of Interstate 210 (I-210) Freeway overcrossing, near the City of Los Angeles' Sunland community in San Fernando Valley, Los Angeles County (Figure 1-1). The Mitigation Area is bordered on the north by I-210, on the east by I-210 and the Tujunga Ponds, and on the south by Wentworth Street. The western boundary is contiguous with high power lines crossing Big Tujunga 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.

The Mitigation Area contains two watercourses (Figure 1-2): The Wash and Haines Canyon Creek (Haines Canyon Creek). The Wash is located in the northern portion of the Mitigation Area, and is intermittent during portions of the year leaving a majority of the channel dry. The amount of surface water within Big Tujunga Wash is dependent upon controlled releases from the Big Tujunga Dam (approximately 17.5 kilometers [km] [10.9 miles {mi}] upstream) and from local rainfall.

Haines Canyon Creek, a relatively narrow (less than 10 meters [m] [33 feet {ft}] width) and densely vegetated perennial stream with flow originating from the East and West Tujunga Ponds (Ponds), is located on the south side of the Mitigation Area and is situated between the Ponds and Hansen Dam. The creek contains a wide array of aquatic habitats that can range from slow moving glides (less than 0.3 meters/second [m/s][1.0 foot/second {ft/s}]), deep pools (less than 1.5 m [4.9 ft]), and fast-flowing riffles and runs (greater than 0.3 m/s [1.0 ft/s]) flowing over mud, sand, gravel, cobble, and boulder substrates. The banks along the creek provide an equally diverse set of habitats, ranging from deep (greater than 1.5 m [4.9 ft]) vegetated overhangs 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 Canyon 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, in-stream vegetation, and bank stability.

Water flowing into Haines Canyon Creek originates from underground springs that first supply water directly into the Ponds. The Ponds are located in 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 and surrounding riparian habitats were originally created as part of the mitigation measures initiated during the construction of the I-210 Freeway. The Ponds are divided into three distinct water features: the West Pond, the Connector Channel, and the East Pond.

The West Pond lies adjacent to the I-210 freeway, approximately 60 m (200 ft) to the south, and connects directly to Haines Canyon Creek. The West Pond has a surface area of approximately 3,200 square meters (m²) (10,500 square feet [ft²]) 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 native and non-native trees and 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.

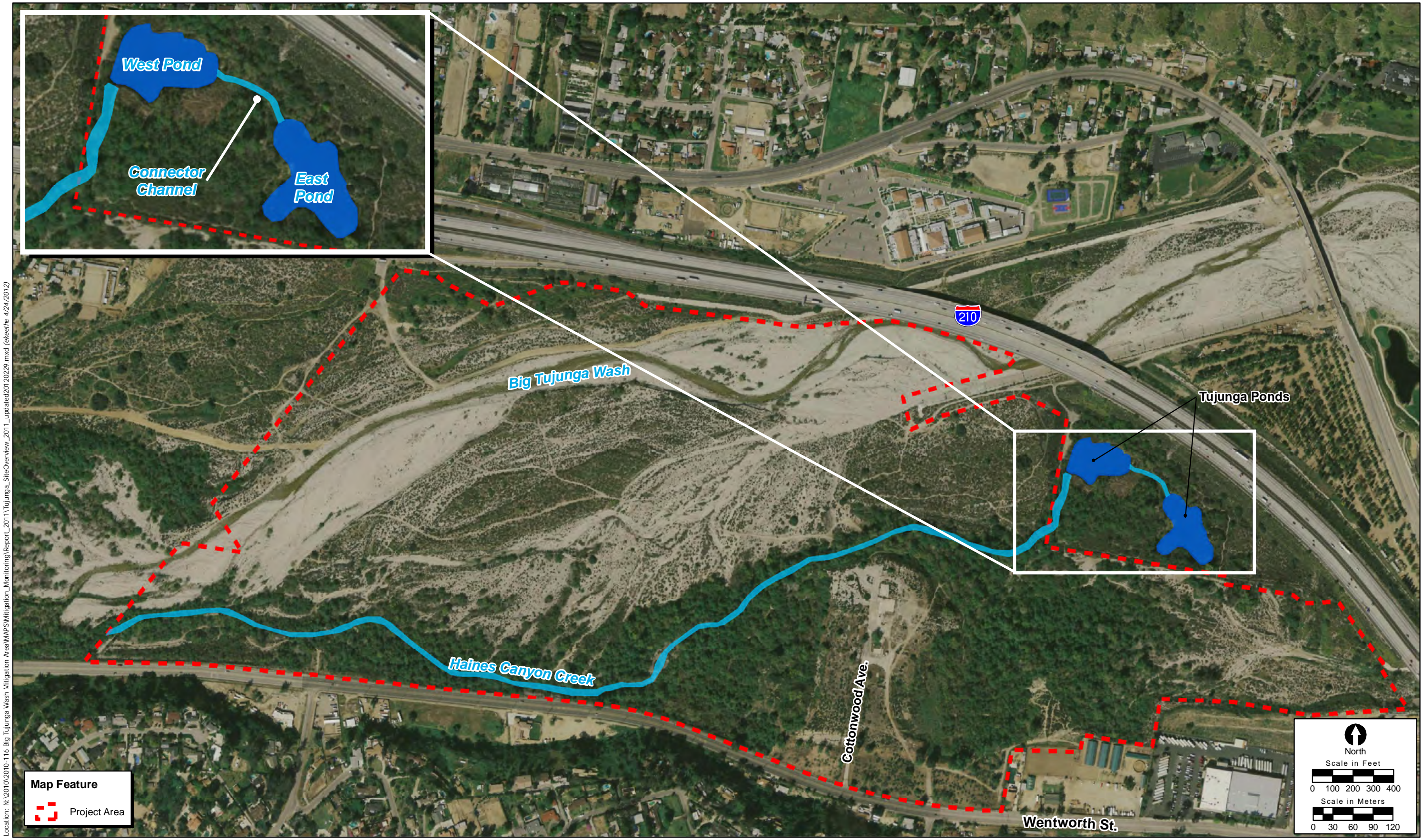


Location: N-116 Big Tujunga Wash Mitigation Area/Maps/Site_Vicinity_Tujunga_ProjectVicinity_v3_2010.mxd

2010

Figure 1-1. Project Location

2010-116 Big Tujunga Wash Mitigation Area



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAP-S\Mitigation_Monitoring\Report_2011\Tujunga_SiteOverview_2011_updated\20120229.mxd (ekeeefe 4/24/2012)

Figure 1-2. Project Area Watercourses

2010-116 Big Tujunga Wash Mitigation Area

Aerial Date: DigitalGlobe March 2008

Map Date: 2011

The Connector Channel is a 70 m (230 ft) long, narrow channel that connects the West and East Ponds. This channel has a maximum width of 5 m (16 ft), with dense riparian 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 m² (10,800 ft²) 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 of the pond with cobble and gravel areas along portions of the perimeter. The banks are heavily lined with native and non-native trees and vegetation that provide both submerged and overhanging habitat. Unlike the West Pond however, the East Pond possesses a more complex bank with many shallow water coves. The East Pond also experiences greater seasonal fluctuations in both algal and emergent aquatic plant growth.

In addition to the aquatic habitats within the Mitigation Area a cement 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. Following periods of heavy rain the water spills over from the drainage flooding the adjacent equestrian trail, along the northeastern portion of the Ponds, turning the area into a swamp. Flooding of the equestrian trail provides a continuous habitat and gives exotic aquatic species (i.e., red swamp crayfish [*Procambarus clarkii*] and bullfrogs [*Lithobates catesbeianus*]) an opportunity to move from the drainage and into the ponds. Although a chain link fence is in place along the freeway drainage several openings allow biologists access to survey for exotic aquatic species.

Haines Canyon 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 fish species. 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 fish species, 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 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 species can produce offspring that could eventually move down into Haines Canyon Creek.

1.2 Exotic Aquatic Species Ecology in Big Tujunga Wash Mitigation Area

The extremely favorable habitat conditions in the Ponds (clear, slow moving water; abundant vegetation; availability of prey items – both native and introduced) have allowed several exotic aquatic species to become established either following deliberate introductions or natural range expansions from other locations. Several of these species adapted well to these conditions, and

have both persisted and proliferated in the absence of natural predators and competitors. Their presence 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 this 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.

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 fish species 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 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 fish species.

2.0 METHODOLOGY

The 2011 removal of exotic aquatic species (fish, amphibian, reptile, and invertebrate) from the Mitigation Area was conducted over a total of four removal efforts: April 5 through 7 (effort #1), June 14 through 16 (effort #2), August 22 through 24 (effort #3), and October 10 through 12 (effort #4). All removal efforts were conducted under the direction of U.S. Fish and Wildlife Service (USFWS) 10(a)(1)(A) recovery permit holders for Santa Ana sucker, Todd Chapman and Brian Zitt (TE-110094-2 and TE-27460A-0, respectively). 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.

An evaluation of the removal locations and methods were conducted prior to each removal effort. Removal locations were generally selected in areas with the highest probability for the detection and capture of exotic aquatic species, based on the following criteria: presence of access points, habitat suitability (e.g., pooled habitats lacking aquatic vegetation), and overall crew safety. With the sampling locations selected, removal methods utilized were generally determined by the habitat type and effectiveness of a method at removing these species. In addition to the exotic aquatic species removal efforts in the creek, efforts were also made to remove rock dams and foot bridges.

2.1 Water Quality

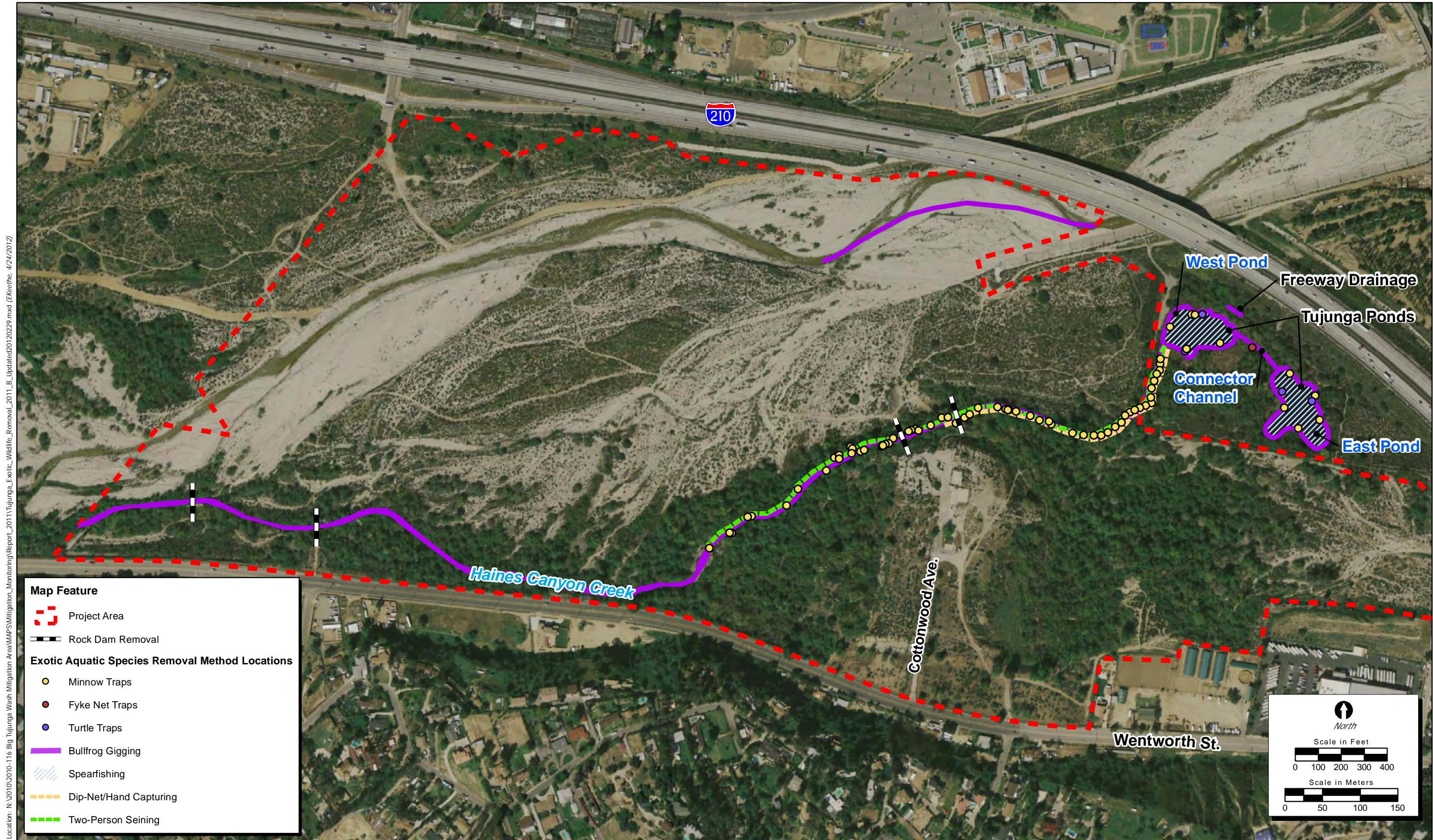
Prior to the start of each removal effort, water quality readings were collected to minimize any anomalous readings caused by the disturbance of sediments in the sampling location. Water quality readings were obtained from the water's surface in areas where removal efforts were going to take place. A multi-probe HORIBA (Model U-5000) meter was utilized to record water temperature, conductivity, salinity, dissolved oxygen (DO), total dissolved solids (TDS), pH, turbidity, and oxidation-reduction potential (ORP). The meter was calibrated according to the manufacturer's instructions prior to each removal effort, and all of the data were tabulated according to site location and date following collection.

2.2 Removal Methods

A wide range of removal methods were utilized during the 2011 exotic aquatic species removal efforts (Table 2-1). These methods included: fyke net trapping, spearfishing (day and night), dip-netting/hand capturing, bullfrog gigging, two-person seining, minnow trapping, and turtle trapping. Prior to each removal effort, all potential sampling methods were evaluated for efficacy based upon information derived from previous removal efforts. Sampling locations and the various sampling methods utilized during 2011 are shown in Figure 2-1. Below is a description of each method used during the exotic aquatic species removal efforts.

Table 2-1. Removal Methods Used by Date, Big Tujunga Wash Mitigation Area, 2011

Removal Location	Removal Effort Number	Removal Dates	Fyke Net Trapping	Spearfishing (Day/Night)	Dip-Netting/ Hand Capturing	Bullfrog Gigging	Two-Person Seining	Minnow Trapping	Turtle Trapping
HAINES CANYON CREEK	1	April 5, 2011				X		X	
	1	April 6, 2011				X	X	X	
	1	April 7, 2011						X	
	2	June 14, 2011				X	X	X	
	2	June 15, 2011			X	X	X	X	
	2	June 16, 2011					X	X	
	3	August 22, 2011				X	X	X	
	3	August 23, 2011					X	X	
	3	August 24, 2011						X	
	4	October 10, 2011			X	X	X	X	X
	4	October 11, 2011			X	X	X	X	X
	4	October 12, 2011							X
WEST POND	1	April 5, 2011		X		X		X	X
	1	April 6, 2011		X	X	X		X	X
	1	April 7, 2011						X	X
	2	June 14, 2011				X			
	2	June 15, 2011				X			
	3	August 22, 2011				X			
	4	October 10, 2011			X		X		
	4	October 11, 2011			X		X		
CONNECTOR CHANNEL	1	April 5, 2011	X			X		X	
	1	April 6, 2011	X			X		X	
	1	April 7, 2011	X					X	
	2	June 14, 2011				X			
	2	June 15, 2011				X			
EAST POND	1	April 5, 2011						X	X
	1	April 6, 2011		X				X	X
	1	April 7, 2011						X	X
BIG TUJUNGA WASH	3	August 22, 2011				X			



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\Map\SWMitigation_Monitoring\Report_2011\Tujunga_Exotic_Wildlife_Removal_2011_B_Updated20120229.mxd (EKeethe, 4/24/2012)

Map Feature

- - - Project Area
- Rock Dam Removal

Exotic Aquatic Species Removal Method Locations

- Minnow Traps
- Fyke Net Traps
- Turtle Traps
- Bullfrog Gigging
- ▨ Spearfishing
- - - Dip-Net/Hand Capturing
- - - Two-Person Seining

North

Scale in Feet

0 100 200 300 400

Scale in Meters

0 50 100 150

Aerial Date: DigitalGlobe March 2008
Map Date: 2011

Figure 2-1. Exotic Aquatic Species Removal Locations

2010-116 Big Tujunga Wash Mitigation Area

2.2.1 Fyke Net Trapping

Fyke net traps are large hoop style nets with detachable wings attached to the throat. Each trap consisted of three steel frames (1.0 m² [3.3 ft²]) 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 them. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the traps were most often strategically deployed into areas that were mostly inaccessible to the public. 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 three days during removal effort #1.

2.2.2 Spearfishing Surveys

Spearfishing surveys were conducted using either banded spear guns or pole spear slings equipped with barbed, five-prong trident tips targeting adult exotic fishes. These surveys were conducted by snorkeling the Ponds during the day and at night. While snorkeling the Ponds, all Centrarchid (sunfish family) nests and bullfrog egg masses observed were either destroyed or removed. Since most fish are inactive at night, they are less elusive and easier to capture. Spearfishing at night has proven to be an extremely effective tool for capturing and removing large adult fish. In addition to removing exotic aquatic species, these surveys also provide biologists insight into the current underwater habitat features, species specific habitat preferences, and approximate locations of exotic aquatic species aggregations. Spearfishing (day and night) was utilized as a sampling method for a total of five days during all removal efforts, with the exception of effort #3.

2.2.3 Dip-netting/Hand Capturing Surveys

Long handled dip-nets (3.00-mm [0.12-in] knotless nylon mesh) were utilized in the most appropriate habitats (e.g., undercut banks and areas containing overhanging vegetation) for capturing exotic aquatic species (e.g., red swamp crayfish, turtles, and bullfrog tadpoles). This method was utilized during the day in areas of Haines Canyon Creek where seining was limited due to accessibility, and at night in combination with bullfrog gigging surveys. Red swamp crayfish and bullfrogs are most active at night and thereby 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, since light directed into a their eyes will reflect an eye-shine, thereby exposing their location. Fish are generally inactive at night, thereby making 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 utilized as a sampling method for a total of three days during removal efforts #1 and #4.

2.2.4 Bullfrog Gigging Surveys

Bullfrog gigging surveys were conducted throughout Haines Canyon Creek, around the perimeter of the Ponds and in portions of Big Tujunga Wash. 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 adults and newly metamorphosed bullfrogs are most active and thereby more susceptible to

being located and captured. Biologists searched systematically for bullfrog eye-shine by shining their light along the shoreline, the surface of the water, riparian vegetation, 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 egg masses were removed using a seine or dip-net and placed into a bucket along with any attached aquatic vegetation. Areas containing large numbers of bullfrog tadpoles were sampled to depletion using both dip-nets and seine nets. Bullfrog gigging efforts were utilized as a sampling method for a total of seven nights during removal efforts 1 through 4.

2.2.5 Two-person Seining Surveys

Two-person seining was accomplished through the use of both (3.0-m [10-ft] and 5.0-m [16-ft]) un-bagged (3.00-mm [0.12 in] delta weave mesh) seines mounted on poles, within Haines Canyon Creek. Seines were generally hauled upstream or across pooled habitats and either pulled up or onto the banks. Seining was the preferred method used to sample slower moving waters, lacking woody debris or heavy vegetation, 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 utilized as a sampling method for a total of eight days during removal efforts 1 through 4.

2.2.6 Minnow Trapping

Minnow traps are two-piece cylinders (approximately 41 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 (Whiskas[®] brand tuna in sauce cat food or chunks of frozen fish), and secured to either the surrounding vegetation or metal T-posts at various locations around the perimeter of both Ponds and in Haines Canyon Creek. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the traps were most often strategically deployed into areas that were mostly inaccessible to the public. Each trap was allowed to fish for a minimum of 12 hours prior to being checked. Minnow traps were utilized as a sampling method for a total of twelve days during removal efforts 1 through 4.

2.2.7 Turtle Trapping

Turtle traps are hoop-net traps approximately 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 foam filled polyvinyl chloride (PVC) pipes to ensure full deployment, and accessory floats to provide sufficient buoyancy for the maintenance of an adequate head space. In an attempt to reduce the potential for theft, removal, or vandalism of the sampling equipment, the traps were most often strategically deployed into areas that were mostly inaccessible to the public. 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 utilized as a sampling method for a total of three days during removal effort #1.

2.3 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 each species captured by each sampling method at each of the locations 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. A complete listing of all aquatic species captured during the 2011 sampling efforts is included in Appendix A.

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 of 1983 (NAD83). Photographs were taken of representative individuals from each species captured, site locations, and removal methods and these photographs are included in Appendix B. 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 Water Quality

Water quality data were primarily collected in the West Pond, with two readings collected in Haines Canyon Creek and a single reading collected in the East Pond (Table 3-1). Water quality between the three sampling areas remained relatively constant with the exception of DO and conductivity. DO values in the West Pond ranged from 7.720 to 14.58 milligrams per liter (mg/L), the lowest reading was taken in the East Pond at 5.940 mg/L, and the highest was taken in Haines Canyon Creek at 19.16 mg/L. Conductivity values ranged from 0.555 to 1.40 milliSiemens per centimeter (mS/cm), and water temperatures ranged from 18.08 to 21.88 degrees Celsius (°C). Salinity, total dissolved solids (TDS), and pH readings remained relatively constant with values from 0.3 to 0.7 parts per thousand (ppt), 0.355 to 0.897 grams per liter (g/L), and 6.71 to 7.33 pH units, respectively.

3.2 Exotic Aquatic Species Removal

A total of 4,850 individuals were captured, representing 10 exotic aquatic species (7 fish, 1 amphibian, 1 reptile, and 1 invertebrate) during the 2011 removal efforts (Table 3-2). Of that total, 95.1 percent (4,617 individuals) were collected in Haines Canyon Creek, while the remaining 4.9 percent were collected in the remaining water features: West Pond (151 individuals), East Pond (58 individuals), Connector Channel (23 individuals), freeway drainage (4 individuals), and Big Tujunga Wash (1 individual). The four removal efforts resulted in the capture and removal of 4,487 red swamp crayfish, 130 largemouth bass, 47 green sunfish, 46 bullfrog tadpoles, 28 bullfrog adults, 7 bullfrog juveniles, 7 bluegill, 5 mosquitofish, 4 red-eared sliders (*Trachemys scripta*), 4 goldfish (*Carassius auratus*), 2 brown bullhead (*Ameiurus nebulosus*), and 1 black bullhead (*Ameiurus melas*). Two native fish species, Santa Ana sucker and arroyo chub, were collected and released back into the creek during the removal efforts, accounting for 1.7 percent of the total catch.

3.2.1 *Exotic Aquatic Species Captured in Haines Canyon Creek*

A total of 4,617 individuals, consisting of six exotic and two native species were captured in Haines Canyon Creek during the 2011 removal efforts (Tables 3-2 and 3-3). The exotic aquatic species captured in the creek consisted of four fish species (goldfish, mosquitofish, green sunfish, and largemouth bass), bullfrogs (adults, juveniles, and tadpoles) and red swamp crayfish. Red swamp crayfish was the most abundant species captured (number of individuals [n] =4,443), accounting for 96.2 percent of the total catch at this location. Two-person seining was the most effective method for capturing exotic aquatic species (n=2,118) accounting for 45.8 percent of the exotic aquatic species captured at this location. Minnow trapping efforts accounted for 30.0 percent of the exotic aquatic species (n=1,395), while dip-netting/hand capturing efforts accounted for 23.6 percent of the exotic aquatic species captured in Haines Canyon Creek (n=1,068). Two species of native fish, Santa Ana sucker and arroyo chub, were collected during the removal efforts in Haines Canyon Creek. These species accounted for 1.8 percent of the total catch at this location.

Table 3-1. Water Quality Record, Big Tujunga Wash Mitigation Area, 2011

Removal Location	Removal Effort Number	Removal Dates	Time	Water Column Location	Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	Total Dissolved Solids (g/L)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)
HAINES CANYON CREEK	2	June 15, 2011	19:00	Surface	19.08	7.18	0.3	19.16	0.571	0.365	12.9	93
	4	October 12, 2011	11:00	Surface	19.01	7.15	0.3	9.85	0.569	0.567	0.0	98
WEST POND	1	April 5, 2011	11:32	Surface	18.08	7.14	0.7	8.97	1.400	0.897	0.8	168
	1	April 5, 2011	18:00	Surface	21.10	7.23	0.7	12.52	1.400	0.896	3.5	153
	1	April 6, 2011	12:05	Surface	18.57	7.23	0.7	14.58	1.350	0.866	3.0	185
	2	June 15, 2011	20:16	Surface	20.01	6.71	0.3	9.08	0.555	0.355	12.7	128
	4	October 10, 2011	18:40	Surface	20.40	7.33	0.3	7.72	0.573	0.367	0.0	123
	4	October 11, 2011	18:20	Surface	21.88	7.11	0.3	8.19	0.572	0.366	0.0	108
EAST POND	1	April 5, 2011	11:40	Surface	18.38	7.06	0.7	5.94	1.350	0.863	2.0	248

Table 3-2. Summary of Aquatic Species Removal by Location and Efforts, 2011

Removal Location	Removal Effort Number	Removal Dates	Exotic Species											Native Species			Grand Total	
			Goldfish	Black bullhead	Brown bullhead	Mosquitofish	Green sunfish	Bluegill	Largemouth bass	Bullfrog adult	Bullfrog juvenile	Bullfrog tadpole	Red-eared slider	Red swamp crayfish	Arroyo chub	Santa Ana sucker		Southwestern pond turtle
HAINES CANYON CREEK	1	April 5 – April 7, 2011							10	1				229	17			257
	2	June 14 – June 16, 2011	2			5	18		4	3				1,457	21	1		1,526
	3	August 22 – August 24, 2011	1				12		6	1	3	2		999	18	15		1,057
	4	October 10 – October 12, 2011					1			7	2			1,758	6	3		1,777
		Subtotal		3			5	31		20	12	5	17	4,443	62	19		4,617
WEST POND	1	April 5 – April 7, 2011		1	1		9	2	82	6			4				1 ^a	106
	2	June 14 – June 16, 2011	1		1		1	2	7	2 ^b				5				19
	3	August 22 – August 24, 2011								5 ^b	2							7
	4	October 10 – October 12, 2011					1	3	15									19
		Subtotal		1	1	2		11	7	104	13	2		4	5			1
CONNECTOR CHANNEL	1	April 5 – April 7, 2011							5				15					20
	2	June 14 – June 16, 2011								2								2
	3	August 22 – August 24, 2011							1									1
		Subtotal							6	2			15					23
EAST POND	1	April 5 – April 7, 2011					5						14				58	
	Subtotal					5							14				58	
BIG TUJUNGA WASH	3	August 22 – August 24, 2011								1								1
	Subtotal									1								1
Grand Total			4	1	2	5	47	7	130	28	7	46	4	4,487	62	19	1	4,850

^a Observed while spearfishing

^b Two individuals captured in the freeway drainage adjacent to the West Pond

Table 3-3. Species Abundance Summary by Removal Method, Haines Canyon Creek, 2011

Removal Method	Removal Effort Number	Removal Dates	Exotic Species							Native Species		Grand Total	
			Goldfish	Mosquitofish	Green sunfish	Largemouth bass	Bullfrog adult	Bullfrog juvenile	Bullfrog tadpole	Red swamp crayfish	Arroyo chub		Santa Ana sucker
TWO-PERSON SEINING	1	April 6, 2011				10				20	1		31
	2	June 14, 2011			3				3	108	1		115
	2	June 15, 2011			5				5	781	2		793
	2	June 16, 2011	2	5	8	3			4	372	5	1	400
	3	August 23, 2011	1		11	4	1			642	14	15	688
	4	October 11, 2011								91			91
		Subtotal	3	5	27	17	1		12	2,014	23	16	2,118
DIP-NETTING/HAND CAPTURING	1	April 6, 2011								58			58
	4	October 10, 2011								372	1		373
	4	October 11, 2011								632	5		637
		Subtotal								1,062	6		1,068
BULLFROG GIGGING	1	April 6, 2011					1						1
	2	June 15, 2011						3	3				6
	3	August 22, 2011					1	2	2	11			16
	4	October 10, 2011					6						6
	4	October 11, 2011					3						3
	Subtotal					11	5	5	11				32
SPEARFISHING - NIGHT	2	June 15, 2011				1							1
	3	August 22, 2011			1	2							3
		Subtotal			1	3							4
MINNOW TRAPPING	1	April 5, 2011											-
	1	April 6, 2011								70	9		79
	1	April 7, 2011								81	7		88
	2	June 15, 2011			2					96	2		100
	2	June 16, 2011								100	11		111
	3	August 23, 2011								213	4		217
	3	August 24, 2011								133			133
	4	October 11, 2011								439		1	440
	4	October 12, 2011			1					224		2	227
	Subtotal			3					1,356	33	3	1,395	
Grand Total			3	5	31	20	12	5	17	4,443	62	19	4,617

3.2.2 Exotic Aquatic Species Captured in and around the West Pond

A total of 151 individuals, consisting of nine exotic aquatic species were captured in the West Pond during the 2011 removal efforts (Tables 3-2 and 3-4). The exotic aquatic species captured in the West Pond consisted of six fish species (goldfish, black bullhead, brown bullhead, green sunfish, bluegill, and largemouth bass), bullfrogs (adults and juveniles), red swamp crayfish, and red-eared sliders. Largemouth bass was the most abundant species captured (n=104), accounting for 69.3 percent of the total catch at this location. Spearfishing (both day and night) was the most effective method for capturing exotic aquatic species, mainly fishes (n=126) accounting for 84.0 percent of the exotic aquatic species captured at this location. Bullfrog gigging efforts captured 11 bullfrogs (nine adults and two juveniles) around the perimeter of the Pond and another four adults adjacent to the West Pond in wetted portions of the I-210 freeway drainage channel. Bullfrog gigging accounted for 10.0 percent of the exotic aquatic species captured at this location. Four red-eared sliders were captured by hand during these efforts, accounting for 2.7 percent of the exotic aquatic species captured in the West Pond. One native species, southwestern pond turtle, was observed during the removal efforts in the West Pond.

3.2.3 Exotic Aquatic Species Captured in the Connector Channel

A total of 23 individuals, consisting of two exotic aquatic species were captured in the Connector Channel during the 2011 removal efforts (Tables 3-2 and 3-5). The exotic aquatic species captured in the Connector Channel consisted of largemouth bass and bullfrogs (adults and tadpoles). Bullfrog tadpoles were the most abundant species captured (n=15), accounting for 65.2 percent of the total catch at this location. Of the two sampling methods, fyke net trapping accounted for the majority of the individuals captured (87.0 percent). Bullfrog gigging efforts captured two adult bullfrogs and one largemouth bass. No native species were detected during the removal efforts in the Connector Channel.

3.2.4 Exotic Aquatic Species Captured in the East Pond

A total of 58 individuals, consisting of three exotic aquatic species were captured in the East Pond during the 2011 removal efforts (Tables 3-2 and 3-6). All of these species were captured in the minnow traps utilized during removal effort #1. Red swamp crayfish was the most abundant species captured accounting for 67.2 percent of the total catch (n=39), bullfrog tadpole accounted for 24.1 percent of the total catch (n=14), and green sunfish accounted for 8.6 percent of the total catch (n=5). No native species were detected during the removal efforts in the East Pond.

3.2.5 Exotic Aquatic Species Captured in the Big Tujunga Wash

On August 22, 2011 a single adult bullfrog was captured in Big Tujunga Wash during a bullfrog gigging survey. With the exception of several western toad metamorphs (*Anaxyrus boreas halophilus*), no other species were detected during this survey.

Table 3-4. Species Abundance Summary by Removal Method, West Pond, 2011

Removal Method	Removal Effort Number	Removal Dates	Exotic Species										Native Species	Grand Total	
			Goldfish	Black bullhead	Brown bullhead	Green sunfish	Bluegill	Largemouth bass	Bullfrog adult	Bullfrog juvenile	Red-eared slider	Red swamp crayfish	Southwestern pond turtle		
BULLFROG GIGGING	1	April 5, 2011												1 ^a	2
	1	April 6, 2011													5
	2	June 14, 2011													2
	4	August 22, 2011													7
			Subtotal												13
DIP-NETTING/HAND CAPTURING	1	April 6, 2011													4
		Subtotal													4
SPEARFISHING - DAY	1	April 5, 2011						16							16
	1	April 6, 2011						2							2
		Subtotal							18						18
SPEARFISHING - NIGHT	1	April 5, 2011		1			5	1	32						39
	1	April 6, 2011			1		4	1	32						38
	2	June 15, 2011	1		1		1	2	7				5		17
	4	October 10, 2011					1	3	10						14
	4	October 11, 2011							5						5
		Subtotal	1	1	2	11	7	86					5		108
Grand Total			1	1	2	11	7	104	13	2	4	5	1	151	

^a Observed while spearfishing

^b Two individuals captured in the freeway drainage adjacent to the West Pond

Table 3-5. Species Abundance Summary by Removal Method, Connector Channel, 2011

Removal Method	Removal Effort Number	Removal Dates	Exotic Species			Grand Total
			Largemouth bass	Bullfrog adult	Bullfrog tadpole	
BULLFROG GIGGING	2	June 15, 2011		2		2
	3	August 22, 2011	1			1
		Subtotal		1	2	3
FYKE NET TRAPPING	1	April 5, 2011				-
	1	April 6, 2011	5		11	16
	1	April 7, 2011			4	4
		Subtotal	5		15	20
Grand Total			6	2	15	23

Table 3-6. Species Abundance Summary by Removal Method, East Pond, 2011

Removal Method	Removal Effort Number	Removal Dates	Exotic Species			Grand Total
			Green sunfish	Red swamp crayfish	Bullfrog tadpole	
MINNOW TRAPPING	1	April 5, 2011				-
	1	April 6, 2011	2	10	2	14
	1	April 7, 2011	3	29	12	44
Grand Total			5	39	14	58

4.0 DISCUSSION

In 2011, a dynamic sampling approach was utilized during a total of four removal efforts resulting in the removal of 4,768 individuals, consisting of 10 exotic aquatic species. The results were comparable between three of the four efforts, with removal effort #1 in April 2011 yielding the lowest number of individuals captured. During removal effort #1 several sampling methods were deployed throughout the Mitigation Area, while during subsequent removal efforts, sampling methods were primarily concentrated in Haines Canyon Creek. This shift in the sampling regiment was due to the observations of exotic aquatic species within Haines Canyon Creek and the difficulties associated with sampling the Ponds due to the presence of water lettuce. The number of individuals removed from Haines Canyon Creek accounted for 95.1 percent of the total exotic aquatic species captured in 2011. Red swamp crayfish was the most abundant species captured and accounted for 96.2 percent of that total. As a result of focusing the sampling within Haines Canyon Creek during removal efforts #2 through 4 during June, August, and October, respectively, more red swamp crayfish were removed during these efforts, and thus produced higher totals of individuals captured than compared to removal effort #1.

The aquatic species assemblage within the Ponds is almost exclusively comprised of exotic fishes, turtles, bullfrogs, and red swamp crayfish. The habitat present within the Ponds provides these species with an ideal area to forage, breed, and take shelter. Haines Canyon Creek is potentially acting as a sink for recruits from source populations of exotic aquatic species moving downstream from the Ponds and upstream from Big Tujunga Wash, and the Hansen Dam Recreational Area through the lower portion of Haines Canyon Creek. One of the most effective methods for removing exotic fishes from Haines Canyon Creek has been backpack electrofishing. Although effective, this method has the greatest potential to cause stress to native fish populations (i.e., Santa Ana sucker, Santa Ana speckled dace, and arroyo chub). In addition, as a condition of Todd Chapman 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." This stipulation limited the sampling methods available for use in the creek during this time period.

Two-person seining was used in place of electrofishing in 2011 and proved to be an effective method for removing red swamp crayfish and juvenile fishes. It was the most effective method for capturing and removing red swamp crayfish in 2011, especially from Haines Canyon Creek. Dip-netting and minnow trapping were also effective in removing red swamp crayfish from the creek. Combined, these three sampling methods removed a total of 4,432 red swamp crayfish, accounting for 91.4 percent of the total catch in 2011. Minnow trapping continues to be an effective removal method for capturing red swamp crayfish from the Ponds. In addition to trapping red swamp crayfish, this method has also been effective at capturing bullfrog tadpoles. Due to the spread of water lettuce, minnow traps were only deployed in the Ponds during removal effort #1. During this effort, biologists observed large aggregations of bullfrog tadpoles in the East Pond. In past surveys, bullfrog gigging has been equally effective in capturing bullfrog tadpoles; however, the water lettuce also inhibited snorkeling surveys from being conducted in the East Pond. Tadpoles were also observed in the West Pond, but at a much lower densities. It should be noted these large groups of bullfrog tadpoles persisted even in the presence of adult largemouth bass, which may corroborate the results of palatability

studies showing tadpoles to be the least preferred food item of largemouth bass (Kruse and Francis 1977).

Bullfrog gigging remains the most effective method for capturing adult and juvenile bullfrogs. Adult and juvenile bullfrogs removed from Haines Canyon Creek and the West Pond accounted for 91.4 percent of the bullfrogs captured in 2011. Four of the adult bullfrogs, added to the West Pond total, were captured in the I-210 freeway drainage channel. This drainage retains water throughout the year and provides breeding and foraging habitat for bullfrogs. Spearfishing continues to be an effective method for capturing and removing large exotic fishes. The night spearfishing surveys produced more captures than day spearfishing; these fish are typically easier to approach at night.

Turtle trapping conducted in the Ponds during removal effort #1 did not yield a catch. Possible factors that may have influenced the trap were the presence of water lettuce, the time allowed for trapping, and other disturbances. During this removal effort the East Pond was completely covered with water lettuce, while the West Pond still contained open water habitat. Generally, turtle traps need to be set for a minimum of four days in order to get optimal results. During removal effort #1, turtle traps were only set for a total three days. Spearfishing surveys were also being conducted simultaneously in the Ponds, near the location of the traps. This activity around the traps could have disturbed or inhibited turtles from going into them. Conversely, these spearfishing surveys resulted in the hand capture of 4 red-eared sliders.

4.1 Problems Encountered During Removal

Exotic aquatic species removal efforts in the Ponds and Connector Channel were somewhat restricted during a majority of year because of the introduction and proliferation of the water lettuce. Due to its proliferation, the East Pond and Connector Channel were only able to be sampled during removal effort #1. The West Pond was also sampled during removal effort #1, but was completely covered during removal efforts #2 and #3. Prior to conducting removal effort #4 water lettuce removal efforts within the Ponds were able to clear a majority of the West Pond's surface. This allowed biologists to conduct additional sampling during removal effort #4.

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. Trap locations were generally chosen based upon the ability to keep the traps concealed and inaccessible to the public. During removal effort #3, two minnow traps went missing from their sampling locations in Haines Canyon Creek. The trap identification labels and flagging were left behind and the lines securing the traps had been cut. This was the only incident involving the tampering or removal of sampling equipment during the 2011 removal efforts.

On August 23, 2011, while conducting two-person seining efforts in Haines Canyon Creek biologists were confronted by two aggressive, unleashed pit bulls. After a short stand-off, the biologists were able to fend off the dogs and contact Los Angeles County Animal Control.

In addition to the exotic aquatic species removal efforts conducted in the creek, several rock dams and foot bridges were also removed. These barriers can change both the stream habitat type (from riffle, rapid, or glide to deep pools or runs) and instream habitat complexity (i.e., filamentous algae, aquatic macrophytes, and overhanging vegetation). These altered habitats often create suitable foraging and breeding habitat for exotic aquatic species. The removal of these structures restored the natural flow of the creek, and removes the potential for adverse impacts to native fish species.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The current exotic aquatic species control program utilizes an approach which efficiently and effectively removes exotic aquatic species posing the greatest potential impact to the native species within the Mitigation Area. Due to the various complexities associated with the habitat in the Ponds, the complete eradication of exotic aquatic species will likely not be possible without extended removal efforts. In order to maintain the current reduced levels of these exotic species, removal activities will need to be continued. The keys to enhancing and maintaining a successful exotic aquatic species removal program are: 1) provide continuous monitoring efforts to keep exotic aquatic species in check, and 2) maintain a dynamic sampling approach with regard to changing site conditions and seasonal variations encountered. In the early spring and summer months, surveys should be conducted to disrupt all fish nests and remove bullfrog egg masses. These techniques could provide an effective way to limit recruitment of these species. Night bullfrog gigging surveys around the perimeter of the Ponds and Haines Canyon Creek should be conducted in the early spring and summer months when this species is most active.

Due to the presence of known populations of special status fishes within Haines Canyon Creek, efforts should also continue to target and remove red swamp crayfish and exotic fishes from the creek during the late winter and spring months to minimize their impacts to breeding adults and young native fishes. Largemouth bass typically become inactive in the winter months, with decreasing daylight and decreasing water temperatures. These seasonal climatic changes can also cause a die off in submerged aquatic vegetation, which can greatly increase the water visibility within the Ponds. Therefore, additional spearfishing efforts should also be conducted to target larger fishes during these months with optimal water visibility conditions.

Water lettuce removal efforts in the Ponds have been underway to restore open water habitat to migratory birds and other wildlife species. The water lettuce removal efforts should be continued within the Ponds to ensure that this plant species does not continue to spread downstream into Haines Canyon Creek. Vegetation control efforts should also be conducted along the I-210 freeway drainage channel located between the slope of the I-210 freeway and the northeastern portion of the Ponds. This drainage holds water throughout the year, and the dense vegetation is providing shelter 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.

6.0 REFERENCES

- Ellison, J. P. 1984. A revised classification of native aquatic communities of California. No. 84-1. California State Resources Agency, Sacramento.
- Goldberg, T. L., D. A. Coleman, E. C. Grant, K. R. Inendino, and D. P. Philipp. 2003. Strain variation in an emerging iridovirus of warm-water fishes. *Journal of Virology* 77(16):8812-8818.
- Grant, E. C., D. P. Philipp, K. R. Inendino, and T. L. Goldberg. 2003. Effects of temperature on the susceptibility of largemouth bass to largemouth bass virus. *Journal of Aquatic Animal Health* 15(3):215-220.
- Kruse, K. C., and M. G. Francis. 1977. A predation deterrent in larvae of the bullfrog, *Rana catesbeiana*. *Transactions of the American Fisheries Society* 106(3):248-252.
- Minckley, W. L., P. C. Marsh, J. E. Brooks, J. E. Johnson, and B. L. Jensen. 1991. Management towards recovery of the Razorback sucker. Pages 303-358 in W. L. Minckley and J. E. Deacon, eds. *Battle against extinction: native fish management in the American west*. University of Arizona Press, Tucson.
- Moyle, P. B. 2002. *Inland Fishes of California*. University of California Press, Berkeley.
- Moyle, P. B., and R. D. Nichols. 1973. Ecology of some native and introduced fishes of the Sierra Nevada foothills in central California. *Copeia*. Pp. 478-490.
- Swift, C. C., T. R. Haglund, M. Ruiz, and R. N. Fisher. 1993. The status and distribution of the freshwater fishes of southern California. *Bulletin of the Southern California Academy of Sciences* 92(3):101-167.
- Traxler, S. L. and B. Murphy. 1995. Experimental trophic ecology of juvenile largemouth bass, *Micropterus salmoides*, and blue tilapia, *Oreochromis aureus*.

APPENDIX A

Species Captured During the Exotic Aquatic Species Removal Efforts, 2011

COMMON NAME	SCIENTIFIC NAME
MALOCOSTRACANS	MALOCOSTRACA
Freshwater Crayfishes	Cambaridae
* red swamp crayfish	<i>Procambarus clarkii</i>
RAY-FINNED FISHES	ACTINOPTERYGII
Carps and Minnows	Cyprinidae
* goldfish	<i>Carassius auratus</i>
arroyo chub	<i>Gila orcuttii</i>
Suckers	Catostomidae
Santa Ana sucker	<i>Catostomus santaanae</i>
North American Catfishes	Ictaluridae
* black bullhead	<i>Ameiurus melas</i>
* brown bullhead	<i>Ameiurus nebulosus</i>
Livebearers	Poeciliidae
* mosquitofish	<i>Gambusia affinis</i>
Sunfishes	Centrarchidae
* green sunfish	<i>Lepomis cyanellus</i>
* bluegill	<i>Lepomis macrochirus</i>
* largemouth bass	<i>Micropterus salmoides</i>
AMPHIBIANS	AMPHIBIA
True Frogs	Ranidae
* American bullfrog	<i>Lithobates catesbeianus</i>
REPTILIANS	REPTILIA
Box and Water Turtles	Emydidae
southwestern pond turtle	<i>Actinemys marmorata pallida</i>
* red-eared slider	<i>Trachemys scripta</i>
* indicates exotic species	

APPENDIX B

Exotic Aquatic Species Removal Photographs



Photo A: Two-person seining in Haines Creek.

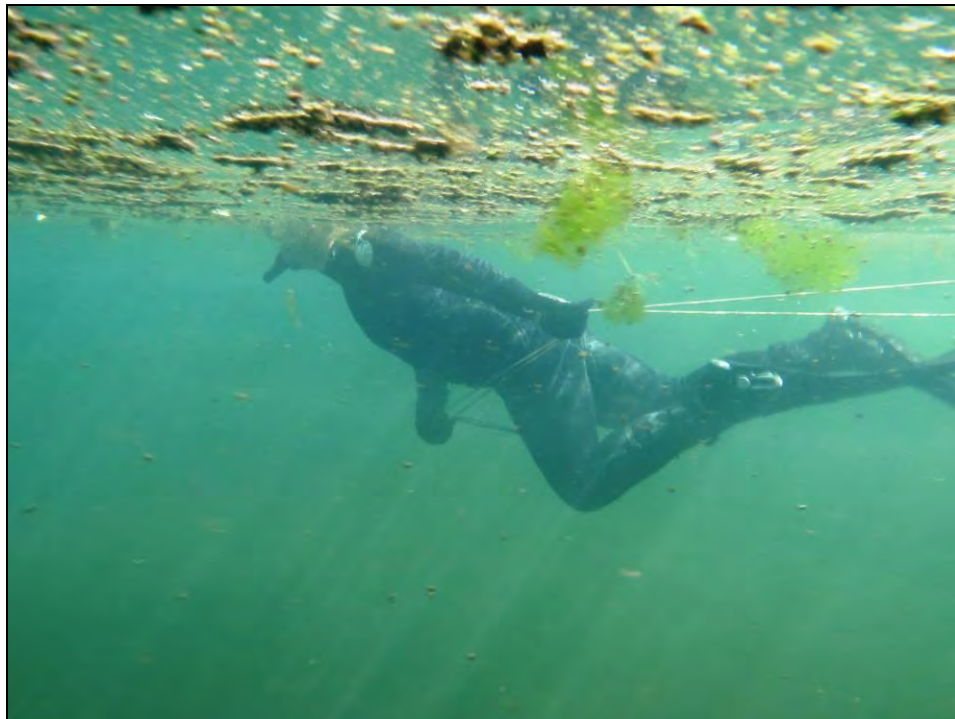


Photo B: Snorkeler setting turtle traps in the West Pond during removal effort #1.

Exotic Aquatic Species Removal Photographs



Photo C: Four red-eared sliders captured by hand in the West Pond.



Photo D: Largemouth bass captured in Haines Creek during seining efforts.

Exotic Aquatic Species Removal Photographs



Photo E: Female red swamp crayfish carrying hatchlings captured in Haines Creek.



Photo F: Juvenile bullfrog captured in Haines Creek.

Exotic Aquatic Species Removal Photographs



Photo F: Green sunfish captured in Haines Creek during seining efforts.



Photo G: Goldfish captured in the West Pond during night spearfishing efforts.

Exotic Aquatic Species Removal Photographs



Photo I: Water Lettuce covering the West Pond during removal effort #2.



Photo J: Water lettuce covering the East Pond during removal effort #2.

Exotic Aquatic Species Removal Photographs



Photo K: Arroyo chub captured in Haines Creek during seining efforts.



Photo L: Santa Ana sucker captured in Haines Creek during seining efforts.

Exotic Aquatic Species Removal Photographs

APPENDIX G

Trails Maintenance and Monitoring Quarterly Reports



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

February 1, 2011
(2010-116/E/E1-E2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task E1 –Trails Closure, Clearing, Maintenance, and Monitoring Report for January 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving trail clearing and maintenance was conducted at the Big Tujunga Wash Mitigation Area during January 2011. The next removal effort is scheduled for April 2011.

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

SIGNED: 

DATE: February 1, 2011

For Gregorio Benavides
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

April 28, 2011
(2010-116.001/E/E1-E2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task E1 –Trails Closure, Clearing, Maintenance, and Monitoring Report for February through April 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 the trails maintenance and monitoring efforts for the period covering February through April 2011.

The activities conducted during this timeframe included correspondence with a local concerned citizen (in-person interview, emails, and phone calls) and on-site surveys with Los Angeles County Department of Public Works (LACDPW) employees. In addition, the regularly scheduled trails maintenance monitoring was also conducted during this period.

At the request of LACDPW, ECORP was asked to correspond with a local citizen who was concerned about a trail in the Mitigation Area that had been delineated with rocks. ECORP's biologist, Greg Benavides, corresponded with the local citizen via email and telephone for the purpose of gathering information about the location of the lined path, photos of the path, and to answer questions about the Mitigation Area. As a result of this correspondence, it was determined that the path in question was located in Haines Canyon Wash, near the eastern end of the Mitigation Area and northeast of Gibson Ranch.

As a result of the local citizen's concerns, ECORP's biologist and LACDPW employees made a site visit on March 16, 2011 to examine the delineated path. A plan to remediate the impacts to the trail was discussed and the plan was implemented later in the month by LACDPW Flood Maintenance Division. A second site visit was conducted on April 5, 2011 by ECORP's biologist and Natures Image to remediate the area in question. Remediation on both occasions entailed moving rocks and boulders to their former locations.

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Normal trails maintenance was also conducted on April 5, 2011 by Natures Image and supervised by an ECORP's biologist. During this effort, the following activities were conducted throughout the entire trail system:

- Tree branches lying on the trails were cleared off of the trails;
- Overhanging tree branches, located at hiker and equestrian-height, were trimmed by machete;
- Poison oak was trimmed away from established trails;
- Large logs were moved out of the trail using portable chain saws; and
- Unauthorized trails were blocked with branches to discourage use.

Garbage and non-organic debris was not observed during this trails maintenance session.

As a safety precaution to equestrian and hiker groups, ECORP's biologist notified LACDPW that gas-powered tools, such as string trimmers and portable chainsaws, were going to be used along the entire trail system. LACDPW then notified the site users via an email notification.

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

SIGNED:  _____

For Gregorio Benavides
Biologist

DATE: April 4, 2011

June 23, 2011
(2010-116.002/E/E1-E2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task E1 –Trails Closure, Clearing, Maintenance, and Monitoring Report for May through June 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 the trails maintenance and monitoring efforts for the period covering May through June 2011.

The activities conducted during this timeframe included an on-site visit with a local citizen regarding a trail safety issue. In addition, the regularly scheduled trails maintenance monitoring was also conducted during this period.

ECORP was contacted by a local citizen about a trail safety issue near the Bert Bonnet Trail. Gregorio Benavides met with Mr. Kaiser on May 14, 2011 to view a section of the Big Tujunga Mitigation Area that had eroded and may be dangerous for normal trail traffic. The section of trail in question was located approximately 0.3 mile southwest from the north Wheatland Ave entrance. The global positioning system (GPS) coordinates for this location are as follows: LAT 34°16'5.02"N LON 118°21'21.25"W.

Recent rains during the winter and spring increased water flow in the Big Tujunga Wash (Figure 1). As a result, undercutting by water flow in the wash has caused large sections of the trail to break off creating a 5- to 10-foot precipice in the established trail (Figure 2). The remaining sections of the trail adjacent to the eroded section are intact, yet the observed erosion pattern dictates that more sections of the trail will also break off into the wash. The problem section is located at the western edge of the Mitigation Area property, beyond which no Mitigation Area established trails exist. The affected trail is popular among equestrians as it connects the Mitigation Area with other recreational areas of the Big Tujunga Wash.

Trail closure and re-routing the trail away from the point of erosion are two feasible approaches to this issue (Figure 3). The trail under consideration is approximately 600 feet long. The decision was made to establish a narrow trail further away from the edge

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of the wash prior to closing the dangerous trail. By establishing a new trail prior to closure of the dangerous trail, the biologist determined that we could control the trail location and minimize the impacts to native alluvial scrub habitat. If the trail was closed prior to establishing a new trail, then the thought was that people and horses might establish multiple trails through the adjacent habitat.

On June 25, 2011, ECORP biologist Gregorio Benavides met with the same local citizen at the eroded trail site to discuss options for moving the trail away from the leading edge of the erosion. It was decided that an alternate route be established to protect the safety of recreational users while the existing eroded trail be closed until further notice. Prior to clearing a path for an alternate trail route, Mr. Benavides conducted a survey of the brush around the new trail route to ensure no active bird nests were located within or adjacent to the modified trail alignment. No active bird nests were observed or detected. Mr. Benavides then conducted brush clearing along a new trail alignment (Figure 4) using hand tools. The clearing was done in a manner to minimize the impacts on the native habitat and to establish a trail that would be safe for equestrians and hikers. Mr. Benavides placed a temporary trail closure sign at either end of the closed trail to prevent recreational users from accessing the eroded portion of the trail while a new trail was being established. The location of the closed trail is illustrated in the Map Attachment at the end of this report. At the end of the day, the temporary closure sign was removed, and small rocks were placed at the entrance to the trail, to encourage the use of the newly cleared trail.

ECORP biologist Gregorio Benavides conducted two site surveys (May 14 and 31, 2011) in the riparian area. The purpose of these visits was to assess trail conditions and to identify locations that required normal trail maintenance. The two surveys resulted in the following observations:

- Fallen trees obstructing normal trail traffic in three locations;
- Vegetation growth into the trail throughout the established trail system (Figure 5);
- Poison oak growth encroaching on the trail near the upper Haines Canyon Creek and east of the Wheatland Avenue entrance;
- Heavy growth of thistle, mustard plant, and weedy species along the established trails;
- Low tree branches at equestrian head-height or lower (Figure 6); and
- Continued use of unauthorized trails at the northern section of the upland area where Cottonwood Avenue ends.

Maintenance to remedy the trail issues outlined above were conducted June 6 through 8 and 10, 2011 by Natures Image and supervised by an ECORP biologist Gregorio Benavides. The following is a summary of that work performed in June.

- The established trails located in the eastern portion of the Mitigation Area property north of Gibson Ranch were cleared of large patches of mustard and thistle growing into the trails. Grasses and weedy species were also cleared from the trails as they were obstructing view of the trails (Figure 7).
- The trail near the Tujunga Ponds was cleared of overgrowth of native and non-native (mostly mustard plant) along the southern section of the trail; the north section of the trail was cleared of patches of mustard and low-hanging branches;

the eastern section of the trail was cleared of encroaching poison oak growth (where the West Pond meets the upper Haines Canyon Creek).

- The trail running throughout the central and western portions of the Mitigation Area adjacent to Haines Canyon Creek was cleared of mustard, thistle, weedy species, low-hanging branches, and poison oak. Fallen trees and large logs blocking or obstructing normal trail traffic were removed with a chainsaw (Figure 8).
- The trails in the upland area (Cottonwood Avenue, Mary Bell Avenue, and behind Gibson Ranch) were cleared of mustard, weedy species, and native vegetation overgrowth (Figure 9).
- ECORP biologist Gregorio Benavides surveyed the trail within the upland portions adjacent to Big Tujunga Wash to locate and identify trail issues; there were no physical obstructions, overgrowth, or trouble spots that required restorative work.
- Post-trail clearing surveys by ECORP biologist Gregorio Benavides were conducted to ensure trails remained free of debris, vegetation, and obstructions (Figure 10).

Garbage and non-organic debris were not observed during this trails maintenance session.

As a safety precaution to equestrian and hiker groups, ECORP's Biologist notified the Los Angeles County Department of Public Works (LACDPW) that gas powered tools, such as line-trimmers and portable chain saws, were going to be used along the entire trail system. LACDPW then notified the site users via an email notification.

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

SIGNED:  _____

For Gregorio Benavides
Biologist

DATE: June 6, 2011



Map Attachment: Temporary trail closure location in June 2011.



Figure 1. Water flow in the Big Tujunga Wash has been consistent in 2011.



Figure 2. Site of trail erosion is the result of undercutting during high water flow periods. The horse trail is approximately 10 feet above the Wash.



Figure 3. Proposed trail detour (yellow arrow) would place the existing horse trail (red arrow) away from the leading edge of the erosion zone.



Figure 4. Cleared trail. Arrow points to brush cleared to make way for new trail just north of the Big Tujunga Wash. The yellow arrow shows brush that was removed to demarcate the new, safer trail.



Figure 5. Thistle growth was removed along the established trails.

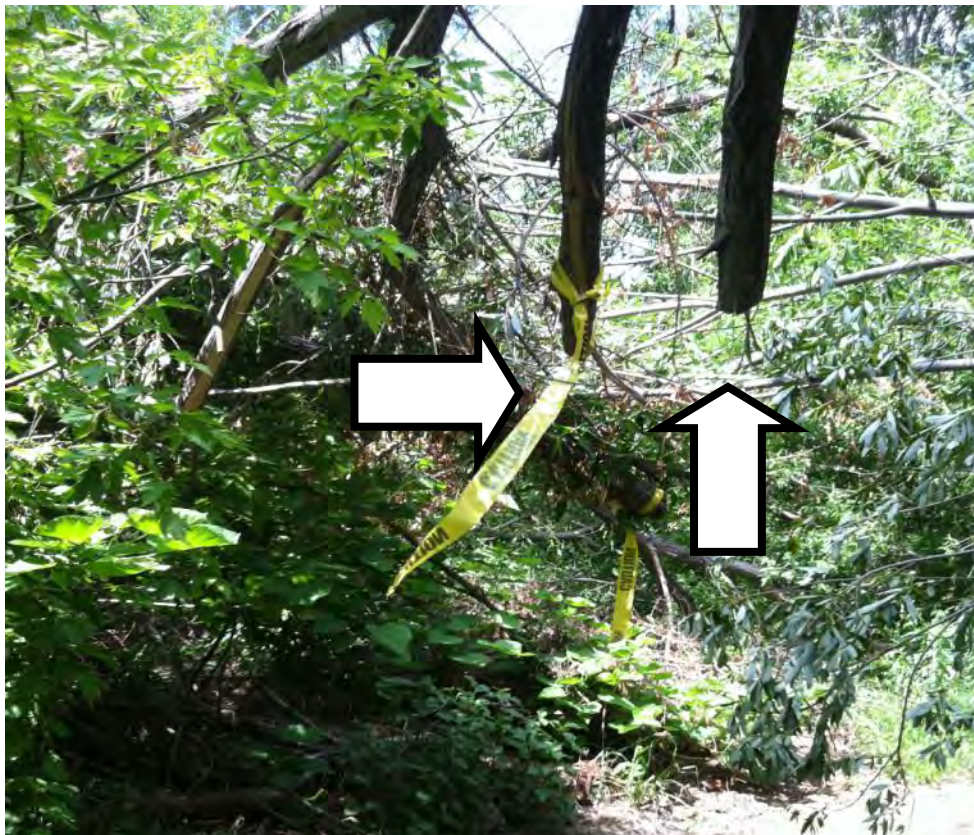


Figure 6. Fallen trees were removed from the trail. This tree was located along the southern portion of the Water Trail, just east of the Wheatland Ave Entrance. Arrows point to overhanging branches from a fallen tree before the tree was removed. Note the caution flagging tape used to warn equestrians

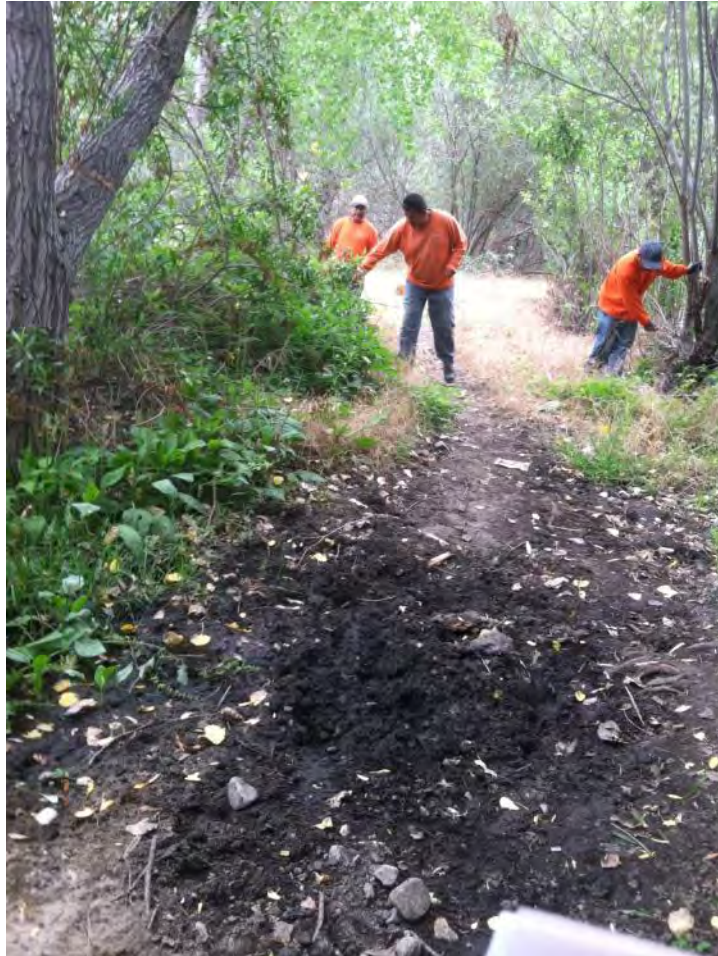


Figure 7. Trail edges were cleared of overgrowth and exotic plant species. Here, restoration crews are clearing trails with machetes.



Figure 8. Objects, such as this large tree, were removed from the established trails.



Figure 9. High traffic sections of the trail, such as this one behind Gibson Ranch, were cleared of brush overgrowth with line trimmers and machete. The photograph on the right shows the cleared path leading to the Ranch.



Figure 10. Trails were inspected after restoration work was conducted by Nature's Image crews.

October 1, 2011
(2010-116.004/E/E1-E2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task E1 –Trails Closure, Clearing, Maintenance, and Monitoring Report for July through September 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

In an ongoing effort to enhance the quality of the trails at the Big Tujunga Wash Mitigation Area (Mitigation Area), ECORP Consulting, Inc. (ECORP) has continued the trails maintenance and monitoring efforts for the period covering July through September 2011.

The activities conducted during this timeframe involved regularly scheduled trail maintenance and monitoring. These activities were conducted to assess the overall condition of the trail and to identify and problem areas.

ECORP biologists Ben Smith and Phillip Wasz conducted a site assessment on September 7, 2011 in the riparian and wash areas of the mitigation site. The purpose of these visits was to assess trail conditions and to identify locations that required normal trail maintenance. During the assessment the biologists identified and marked areas of concern. Items of concern were fallen trees obstructing the trail, vegetation overgrowth, poison oak overgrowth, low hanging trees and braches at equestrian height, and unauthorized water crossings.

Los Angeles County Department of Public Works (LACDPW) was contacted by community members on September 9, 2011 about a low hanging tree that needed to be addressed within the trail system. ECORP was then notified on September 12, 2011 and the tree was scheduled for removal (Figures 1 and 2).

Maintenance to remedy the trail issues outlined above was conducted September 12, 13, 14, and 15, 2011 by Natures Image and supervised by ECORP biologists Ben Smith and Phillip Wasz. During this effort all the trails were walked and overgrowth was cut back, fallen or low hanging branches and trees were removed (including the one identified above), and unauthorized water crossings were dismantled.

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2010-116.002/E/E1-E2

As a safety precaution for equestrian and hiker groups, ECORP's biologist notified LACDPW that gas powered tools, such as line-trimmers and portable chain saws, would be used along the entire trail system. LACDPW then notified the site users via an email notification.

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

SIGNED: 

DATE: October 1, 2011

Phillip Wasz
Biologist



Figure 1: Low hanging tree removal



Figure 2: Low hanging tree after removal



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 31, 2011
(2010-116.006/E/E1-E2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task E1–Trails Closure, Clearing, Maintenance, and Monitoring Report for October through December 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving trail clearing and maintenance was conducted at the Big Tujunga Wash Mitigation Area during the fourth quarter of 2011 (October through December 2011). Although no trails maintenance work was conducted, water lettuce removal was continued during this period and the access points to the Tujunga Ponds were closed during the removal process. The next clearing and maintenance effort has not yet been scheduled at this time.

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

SIGNED: 

DATE: December 31, 2011

Phillip Wasz
Biologist

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APPENDIX H

Stakeholder Mailing List

Ms. Chris Arlington
Shadow Hills Property
Owners Association
9635 La Canada Way
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Mr. Chris Stone
Los Angeles County
Department of Public Works
900 S. Freemont
Alhambra, CA 91803

Mr. Aaron Allen
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District Director
Councilmember Richard Alarcon
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Mr. Damian Carroll
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North Hollywood, CA 91301

Mr. Ray A. Bourque
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Tujunga, CA 91042

The Honorable Michael D. Antonovich
Supervisor Fifth District
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County of Los Angeles
21943 Plummer Street
Chatsworth, CA 91311

Ms. Laurelle Geils
7526 Thousand Oaks Drive
Tujunga, CA 91042

APPENDIX I

Newsletters

Big T Wash Line

APRIL 2011



A Publication of the
County of Los Angeles
Department of Public Works

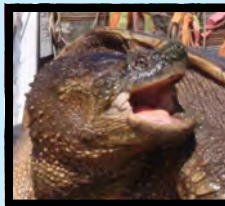


Announcements

- ◆ Please be aware that **parts of Big T's trails are flooded** due to the spring rains. Be extra careful when traveling on the trails east of the Cottonwood Area (north of Gibson Ranch). Also, the trails along the northern border of the Tujunga Ponds (adjacent to Hwy 210) **are flooded and very muddy, making traveling by foot a challenge**. Trail flooding is minimal just west of the south Wheatland entrance, but caution should be practiced just the same.
- ◆ The **new ordinance signs** have been installed at seven entrances into the Mitigation Area (See map on page 4).
- ◆ **Bird nesting season is NOW!** Please take extra care to stay on the existing trails and do not hike or ride your horses off into the adjacent plant communities. Enjoy the sounds and the antics of the baby birds because they will be leaving the nests soon.

Aquatic Exotics

Why are there exotic aquatic species in the Big T Ponds? How did they get here?



Last year, ECORP biologists removed a common snapping turtle from the East Pond. This species is **not native** to California. Many of Big T's exotic

species are a result of unwanted pets, abandoned animals, or sport fish being released into the ponds or the stream. Unfortunately, exotic species have negative effects on native species (See the article on page 2). ECORP biologists have been very successful at removing exotic species from Big T, but it's everyone's responsibility to protect Big T's native species. Responsible pet owners should donate unwanted pets to a rescue organization and not release them at Big T. The California Turtle and Tortoise Club has a rescue and adoption program. More information can be found at this link:
<http://tortoise.org/cttc/adoption.html>



ABOUT THE BIG TUJUNGA WASH MITIGATION AREA

The County of Los Angeles Department of Public Works' implementation of the Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Area (Big T) has been under way since April 2000.

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 Los Angeles County Department of Public Works in 1998 for the purpose of compensating for habitat loss for other County of Los Angeles Public Works projects.

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 birds (least Bell's vireo, southwestern willow flycatcher).

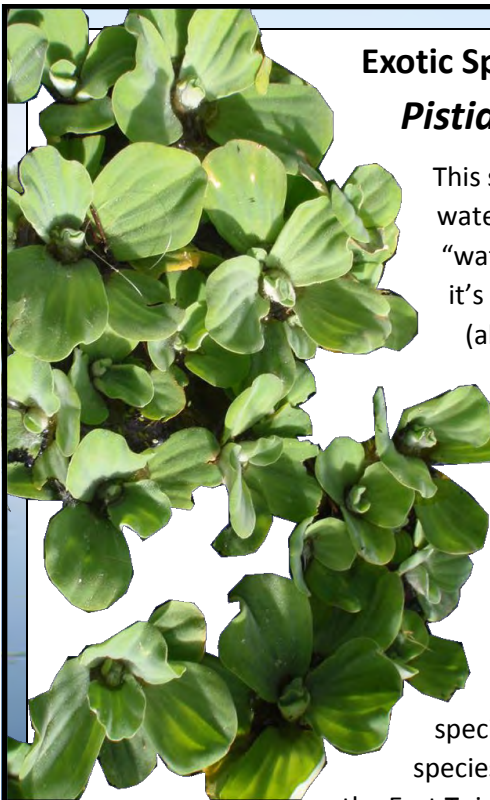
The purpose of this newsletter is to provide an update of ongoing programs and to explain the upcoming enhancement measures that will be implemented on the site in the next few months. Newsletters will be published on a bi-annual basis (Spring and Fall).

More information can be found at
<http://www.ladpw.org/wrd/facilities>

Native Plant Species Restoration Continues

Competition for resources, such as space and sunlight, among Big T's plants can be fierce. To give native plants a boost, a restoration crew (headed by an ECORP biologist) continued exotic plant removal during the month of April. We are happy to report that **exotic plants in the riparian area have not made a significant comeback.**





Exotic Species Feature *Pistia stratiotes*

This species of invasive water plant is called “water lettuce”, and its scientific name (above) means

“water soldier”.

Water lettuce was first reported in Florida in the late 18th century and it is considered an unwanted

species. At Big T, this species has taken hold of the East Tujunga Pond and has

slowly made its way to the West Pond. Water lettuce grows best in warm weather (72-86°F), easily covering the surface of still or slow-moving waters.

The large mats covering the East Tujunga Pond have affected water temperature, sunlight penetration, and oxygen levels. A recent survey of the ponds by ECORP aquatic biologists found that water temperature was cooler because water lettuce deflects sunlight. Submerged vegetation is shaded and normal growth is prevented. Oxygen levels were also lower, which may be harmful to fish and invertebrates in the ponds.

Water lettuce is commonly sold in the aquarium trade and can adapt well in different conditions. The water lettuce population is the result of non-native species being introduced into the Tujunga Ponds. ☹️



Brown-Headed Cowbird Trapping Begins

The brown-headed cowbird is a **nest parasite** that evolved this behavior due to its nomadic life style. Flocks long ago followed bison populations, since insects (cowbird food!) abound with the bison. Cowbirds evolved a strategy to lay eggs in a host nest, freeing them to follow bison. Removing cowbirds from Big T directly benefits our native birds from becoming a host parent.



Brown-headed cowbird trapping has commenced at Big T, so during your hike or ride you may encounter one of these traps. **If you encounter a trap, please**

keep in mind that it is very important that the trap not be disturbed for the following reasons:

First, cowbirds must be enticed to enter the traps. Decoy cowbirds (males and females) and food and water are used to attract more cowbirds.

If a cowbird senses danger, it will forego entering the trap in spite of a free meal or a potential mate, so please do not disturb the traps.

Secondly, **trapped birds perceive humans as a threat**, so approaching a trap is very stressful to the birds. It's important to keep clear of the trap, especially since native birds may also be present.

Each day all cowbird traps are checked and stocked with clean water and food and if native birds are also present they are released without harm. ☹️



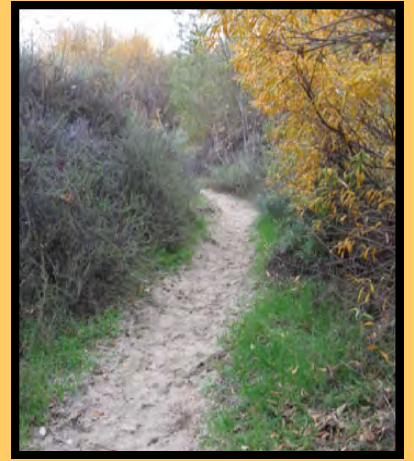
Thanks for your cooperation!



LET'S TALK TRAILS!!!

Did you know, back in 2000 when the Mitigation Area was established, the community members named a trail after Bert Bonnet? Who, you ask, is Bert Bonnet? Well, Bert is a very long time resident of Shadow Hills who was originally responsible for cutting and maintaining most of the trails that wind through Shadow Hills and surrounding areas. He also initiated and led many of the long-distance (100 to 200 miles) trail rides held annually in California. Bert has not made a profession of training horses but everyone knows that training horses is his "gift." Bert's calm demeanor and his "whisperer" approach to training horses is well known by his friends. His philosophy for training horses includes being kind, handling them quietly, and avoiding rushing them through the training. Amazingly, Bert broke his first horse at age 6. At age 101, Bert still continues to ride with his friends in Shadow Hills and with the two groups he helped to form (Corral 20 and the Trailblazers). In December, Bert had a tragic accident on his horse and the fire department, veterinarians, and local resi-

dents conducted a valiant rescue effort. Bert was OK but unfortunately, his horse did not make it. Our hearts go out to Bert in the loss of his beloved horse. Bert is an honored member of the Shadow Hills Community and that is why the community members named a trail after him (See map on Page 4). Next time you ride the Bert Bonnet Trail, take your hat off to Bert and **honor Bert** by being responsible trail users. Riding single file eliminates impacts to the natural habitat along the trails and minimizes erosion along the trails, particularly at the stream crossings. Let's all be good stewards of the trails in the Mitigation Area and if you see vegetation that needs to be trimmed to keep the trails clear, then please contact **Valerie De La Cruz at LADPW (626) 458-6126.**



Songbird Profile: Common Yellowthroat

While on a hike or ride through Big T, you may hear a gentle whistle

that says, "wichety, wichety, wichety." Chances are it's a common yellowthroat, a native bird species.

The common yellowthroat (*Geothlypis trichas*) is found year-round at Big T in low grassy and weedy habitats. Recently, common yellowthroats have been spotted on the scrubby

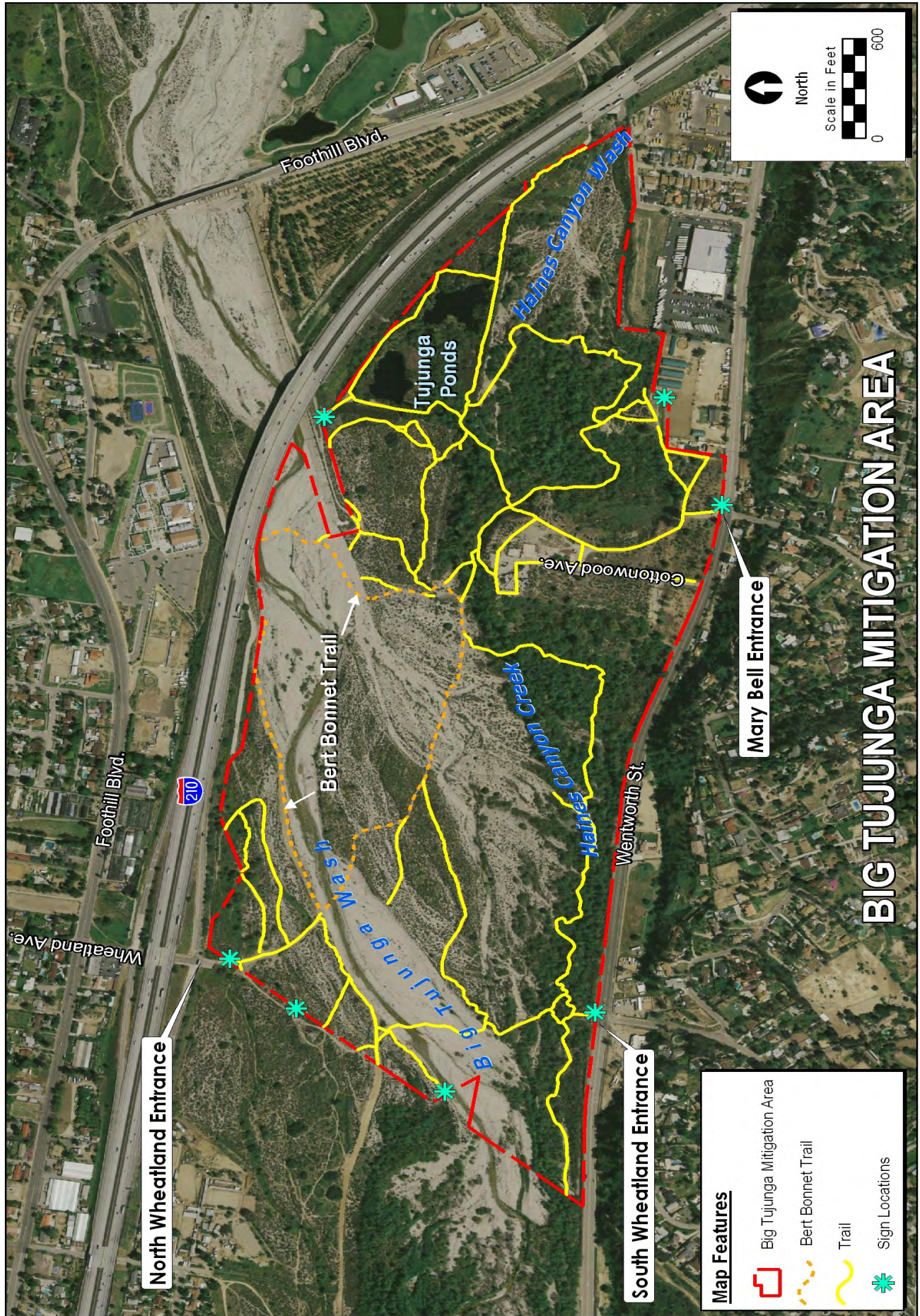
vegetation near the Mary Bell entrance and in the Cottonwood area.

Males and females have different plumage colors.

Males have a dark mask and a brightly colored throat, and are often called the "bandit bird." Females are olive colored and blend in with their environment (a camouflage tactic).

Females tend to choose males with the brightest yellow feathers, because this signals the ability to gather food successfully. It's also a signal for health, since the yellow coloration comes from eating the right food items. Females have evolved this behavior to recognize a good mate that will pass on his food-gathering skills to their offspring.





BIG TUJUNGA MITIGATION AREA

Q-1: This bird is a common yellowthroat. Is this a male or a female?



Q-2: This plant is growing in the Tujunga Ponds, but it does not belong in Big T. Its name is _____?

- A. Water carrots
- B. Water onions
- C. Water lettuce

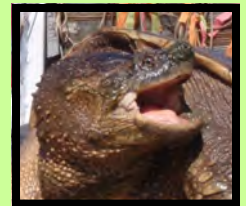


Q-3: True or False: Is it OK to visit the cowbird traps in Big T?



Q-4: Which of these is correct?

- A. Snapping turtles are not from California.
- B. Last year, a snapping turtle was found in the Tujunga Ponds.
- C. It's NOT OK to abandon any kind of turtle in the Big T ponds.
- D. All are correct.

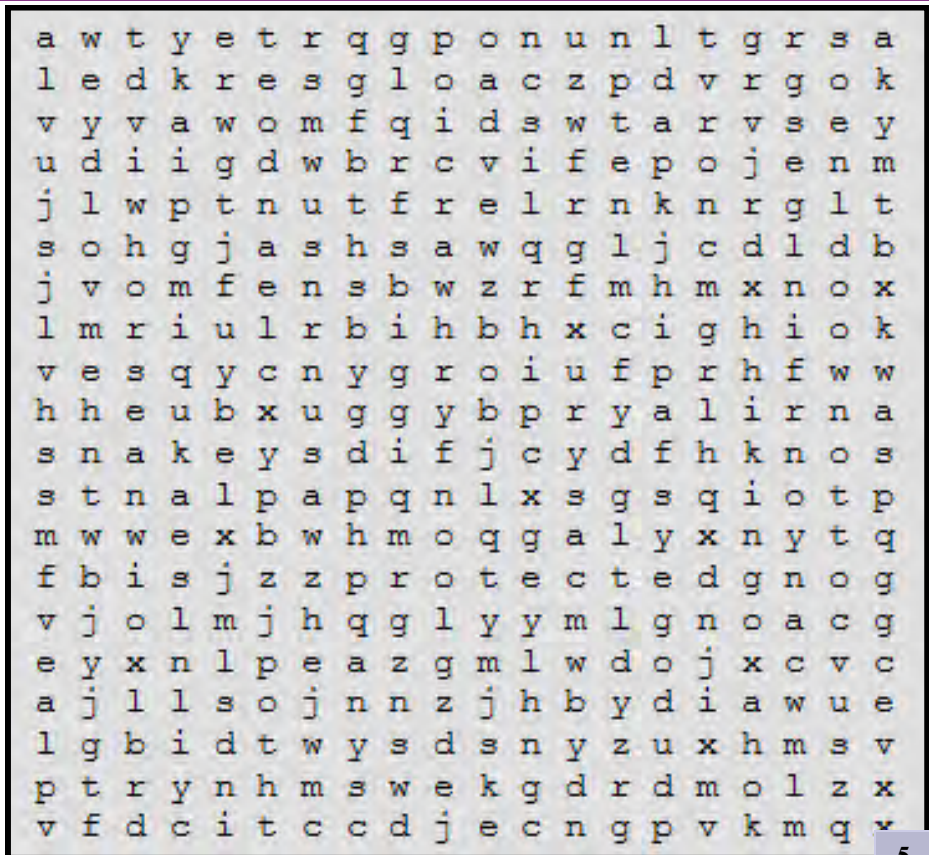


ANSWERS: Q-1: male Q-2: C Q-3: False Q-4: D

Big T Word Search

We've hidden 15 Big T vocabulary words. Most are things you may see on a visit to Big T. GOOD LUCK on your search!

- birds
- canyon
- cottonwood
- creek
- equestrian
- fish
- horse
- native
- protected
- snake
- wash
- willows
- hiking
- plants
- trails





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:



Emergencies? Incidents? Questions?

- **CALL 911 TO REPORT ANY EMERGENCY SUCH AS FIRE OR ACCIDENT**
- Please **DO NOT** use 911 to report minor incidents or regulation infractions. Contact the Sheriff's Department at 1-800-834-0064.
- In the case of an emergency situation (those where 911 is involved) please make a follow up call to the Department of Public Works as soon as possible at the numbers listed below.*
- Do not attempt to enforce regulations. Contact Sheriff's Department 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:

Valerie De La Cruz or Cindy Rowlan

Water Resources Division
 County of Los Angeles Department of Public Works
 900 S. Fremont Avenue
 Alhambra, CA 91803
 Phone: (626) 458-6126 / (626) 458-6132
 Fax: (626) 979-5436
 Email: vdelacruz@dpw.lacounty.gov or crowlan@dpw.lacounty.gov

Big T Wash Line

November 2011



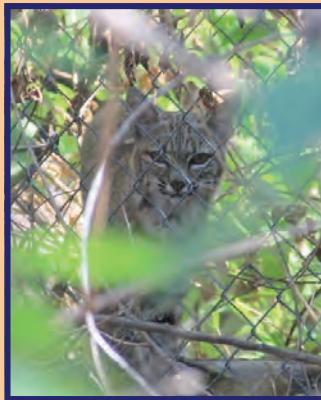
A Publication of the
County of Los Angeles
Department of Public Works
(LACDPW)



Announcement

- **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.
- **The rainy season is upon us** and we want to keep you and your family safe. Please stay out of the Mitigation Area when it rains. Debris flows resulting from the Station Fire are still a major threat to the region for the next 2 to 4 years.

Featured Animal: Bobcat



While hiking around Big T, keep your eyes open for this elusive cat! Bobcats (*Lynx rufus*) are highly solitary animals typically found in riparian areas, shrub lands, forests, and chaparral. A bobcat was recently sighted in the mitigation area near the Tujunga Ponds!

Bobcats are generally tan to gray-brown in color with dark spots or streaks on

their body. The ears are long and black-tipped, and their tails are shortened, which makes them look "bobbed." The bobcat is larger and bulkier than your average housecat, weighing anywhere from 15 to 40 pounds!

Mostly active during the evening and early morning hours, the bobcat can travel up to 7 miles in one night while looking for food. They typically eat rabbits and hares, but have been known to also eat insects, rodents, birds, reptiles, and even young deer. The cat has highly acute hearing and vision and an excellent sense of smell.

If you are lucky enough to see one of these secretive cats, no need to worry! It will likely take cover pretty quickly. Bobcats are extremely shy and not known to be aggressive towards humans. Consider yourself one of the lucky few to actually see one of these beautiful cats.

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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 birds (least Bell's vireo, southwestern willow flycatcher).

The purpose of this newsletter is to provide an update of ongoing programs and to explain the upcoming enhancement measures that will be implemented on the site in the next few months. Newsletters will be published on a bi-annual basis (Spring and Fall).

More information can be found at <http://www.ladpw.org/wrd/facilities>

Trail Maintenance Day

Please join Public Works and Ecorp Consulting for the 6th Annual Trail Maintenance Day. Help us clean up litter along the trails in the Big Tujunga Mitigation area.

- **When:** Saturday Nov. 5th from 8AM– 12PM
 - **Where:** Cottonwood Entrance (Wentworth St. and Cottonwood Ave.)
 - **Water, Snacks, and Trash bags will be provided.**
- If rain is predicted, Trail Maintenance Day will be canceled.*
- Please Bring:**
- Hat
 - Gloves
 - Comfortable Clothes
 - Sunblock
 - Bug Repellent
 - Close toed shoes

“Bee” on the Lookout!



Honey Bee: Photo copyright: <http://bbe-tech.com/bees/bee-identification/>

Several ECORP employees and a maintenance crew member had recent and uncomfortable encounters with yellow jackets and honey bees at Big T. In both cases, non-native plants were being pulled or cut in the vicinity of nest and a hive and the bees went on the attack! Yellow jackets typically nest on the ground in rodent burrows or in hollow tree cavities and honey bees typically build their hives in tree cavities. Both species, but especially yellow jackets, can be highly defensive and troublesome when their nests, hives, or food sources are disturbed. While a bee can typically sting you only once, a yellow jacket can sting multiple times making them much more painful to contend with. Yellow

jackets and bees are commonly confused, but the best way to tell the two apart is by the hair (or lack of hair) on their bodies. Bees have a fuzzy or furry appearance whereas yellow jackets have smooth shiny bodies. Keep an eye out for areas where many bees appear to be congregating because this may indicate a nest or hive is present. If you accidentally come across a nest of either, it is best to stay clear and quickly get out of the area. Seek medical attention immediately for severe reactions to bites and stings.



UC State-wide IPM Project
© 2000 Regents, University of California

Yellow Jacket: Photo by: Jack Kelly Clark.

Cowbird Trapping Results for 2011

In our last newsletter, we announced the beginning of the brown-headed cowbird trapping season. The brown-headed cowbird is a nest parasite on our native birds. Cowbirds lay their eggs in the nest of other species leaving the hatching and rearing of the young to others. This causes our native birds to abandon their own eggs and young and end up raising the larger, faster growing cowbird chicks. We are happy to report that we had a very successful trapping season at Big T in 2011!



Two traps were placed in the Big T mitigation area, one was placed at the equestrian center, and another was placed at the Gibson Ranch. Traps are baited with food, water, and decoy cowbirds in order to encourage more cowbirds to enter the traps. Cowbirds generally flock in areas where livestock are kept so placing them at the equestrian center and the Gibson Ranch really helped to keep the mitigation area free of cowbirds. A big thanks to the equestrian center and the Gibson Ranch! A total of 211 cowbirds were trapped and removed in 2011! Only 9 juvenile cowbirds were captured, which likely indicates that very few of the cowbird pairs were successful in laying eggs in the nests of our native birds. Juvenile cowbirds are easy to catch when they first fledge from the nest, so the low number of captured juveniles suggests that cowbird parasitism was greatly reduced by our efforts in 2011.



Water Lettuce Removal



Water lettuce quickly filled both ponds at Big T after it was introduced earlier this year, eliminating habitat for waterfowl and other birds and dramatically changing the aquatic environment. The thick mat of water lettuce has limited the removal of exotic wildlife that can also wreak havoc on native fish and amphibians. Eradication of the water lettuce began on September 13 with the help of a crew of volunteers from the County of Los Angeles Department of Parks and Recreation. The volunteers have been removing water lettuce from the east pond using rakes and pitchforks and have amassed large stockpiles of the plant on the banks of the pond. Openings in the water lettuce can be seen near the shore where the volunteers have concentrated their efforts. Nature's Image, the landscape contractor, began their removal efforts in the west pond. The equipment they are using includes a boat, nets, and a reach lift, which is a type of forklift with an extendable boom. The nets are deployed from the boat to surround a patch of water lettuce and then the net is pulled tight. The boom on the reach lift can be extended over the water where it lifts the loaded net and then empties the net into a nearby dumpster. This eliminates damage to the banks of the pond that may result if the nets

were dragged up onto the shore. By October 6th, the bulk of the water lettuce had been removed from the west pond. A total of 14 40-yard dumpsters had been filled. The effort has already started to pay off because wildlife have started returning to the ponds. An American coot, a type of waterfowl, has taken up residence in the west pond, and now that it can see the fish again, a belted kingfisher has also returned. Thanks to cooperation from the community, Nature's Image has been able to work safely, nearly free of interruptions from equestrians and hikers passing through the work area. Thank you all for respecting the safety issue of heavy equipment working in a confined area by avoiding the ponds during work hours. The removal is expected to last until mid-November.



Rare Plants at Big T!

Davidson's bushmallow (*Malacothamnus davidsonii*) and southern black walnut (*Juglans californica*) are both rare plants that can be found growing in the Big T Mitigation area. Davidson's bushmallow is a shrub in the hibiscus family with



Davidson's bushmallow (*Malacothamnus davidsonii*)

fuzzy green leaves and small pink flowers that resemble miniature hibiscus flowers. This plant is endemic to California, meaning it only grows in California, and is listed as rare, threatened or

endangered by the California Native Plant Society. A good example of Davidson's bushmallow can be seen growing next to the trail on the east side of the east pond. Southern black walnut is also endemic to California and, although not as rare as Davidson's bushmallow, it is listed by the California Native Plant Society as a plant with limited distribution. Like other

types of walnut trees, it produces nuts, although they are smaller than typical walnuts found in grocery stores. Several southern black walnuts can be found on the trail between Cottonwood Avenue and the ponds. Be careful if you decide to pick up nuts from this tree, dyes in the husk around the shell will stain your hands black!



Above and Right:
Southern Black Walnut (*Juglans californica*)



Exotic Plants Not Welcome



Non-Native African Fountain Grass

ECORP biologists and a work crew from Nature's Image spent seven days during September removing invasive, non-native plants from the Big T mitigation area. Invasive plants, when left unchecked, can potentially overtake an area while providing little or no benefit to native wildlife species that rely on native plants for food, shelter, and habitat. Arundo (*Arundo*

donax), tree of heaven (*Ailanthus altissima*), and tamarisk (*Tamarix ramosissima*) were among the culprits targeted by the removal effort and are on the State of California's list of noxious weeds. Weeds were removed by hand-pulling, herbicide spraying, or a combination of cutting and spraying the stumps with herbicide. Large patches of arundo were removed along Haines Canyon Creek and in Big Tujunga Wash. Tree of heaven was also removed from areas along Haines Canyon Creek. Most of these were young trees ranging from a few inches to around eight feet in height. Tamarisk was removed from along Big Tujunga Wash. A large population of African fountain grass

(*Pennisetum setaceum*), another invasive weed, was found in the upland area in Big Tujunga Wash. Although African fountain grass is popular for landscaping, alternatives should be considered before planting this grass because it easily escapes into natural areas like Big T where it displaces native habitat. Information on what to plant and what to avoid can be found on the California Native Plant Society's website at www.cnps.org. Eliminating the use of invasive plants in urban landscaping in surrounding areas and removing non-native plants helps keep the Big T Mitigation Area healthy, providing high-quality habitat for the plants and animals to thrive there.



Nature's Image removing non-native Arundo.



Davidson's bushmallow (*Malacothamnus davidsonii*).

Announcements Continued

- **If planning an event** or a group activity in the Big T Mitigation Area, apply for a permit. Application can be found at: http://www.ladpw.org/wrd/facilities/Flood_Permit_Application.pdf
- **If you encounter loose, aggressive dogs** in the Mitigation Area or if any other incidents occur in the Mitigation Area, contact Sheriff's Department at 1-800-834-0064.
- **If you encounter graffiti** in the Mitigation Area, please contact the Los Angeles County Graffiti Hotline at 1-800-675-4357.
- **Help our Fish Thrive!** Please do not build rock dams in the wash. Our fish need running water and stream habitat to survive. If you see a rock dam, please report to LACDPW.



Animal Tracks

Do you know who left this print? He's been spotted near Tujunga Ponds at Big T! No, it's not a bear or a coyote. And no, it's not your pet dog. This print is from a bobcat! You can tell it's not a bear or dog print because it doesn't have any claws and it has an "M" shaped rear pad. Next time you are out for a hike, see if you can find any bobcat tracks at Big T!

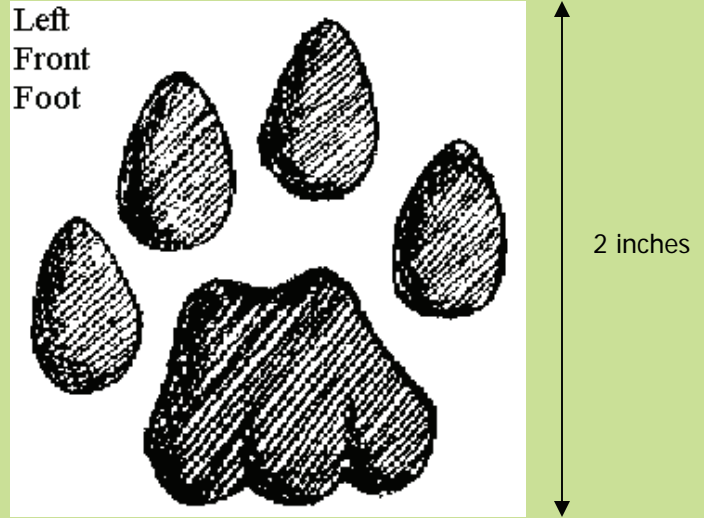


Photo copyright: <http://www.bear-tracker.com/bobcat.html>

Big T Word Scramble



Kid's Corner

Can you unscramble these words? All of the clues can be found throughout this month's newsletter. Good luck!

1. **WOLYLE KCTEJA** -----
Stay away from their nest! They might sting you.
2. **TCAOBB** -----
This animal is really shy and will likely hide from you.
3. **RPTEASIA** -----
The cowbird is a nest _____.
4. **DOYEC** -----
This is used to attract cowbirds to a trap.
5. **BAWHSMOULL** -----
This plant is a member of the hibiscus family.
6. **ARETW TTCEULE** -----
While it sounds good enough to eat, this plant is an unwelcome guest at Big T.

7. **RKCO MASD** -----
Building one of these in the wash is harmful to our native fish.
8. **TIXOEC NATPLS** -----
Crews spent time removing these in order for native plants and animals to thrive.
9. **ERET FO VANEHE** -----
A non-native plant species that was removed from the Big T Mitigation area.
10. **ADHN LUPILGN** -----
One method used to remove non-native plant species.

Answers: 1. Yellow Jacket 2. Bobcat 3. Parasite 4. Decoy
5. Bushmallow 6. Water Lettuce 7. Rock Dams 8. Exotic
Plants 9. Tree of Heaven 10. Hand-Pulling

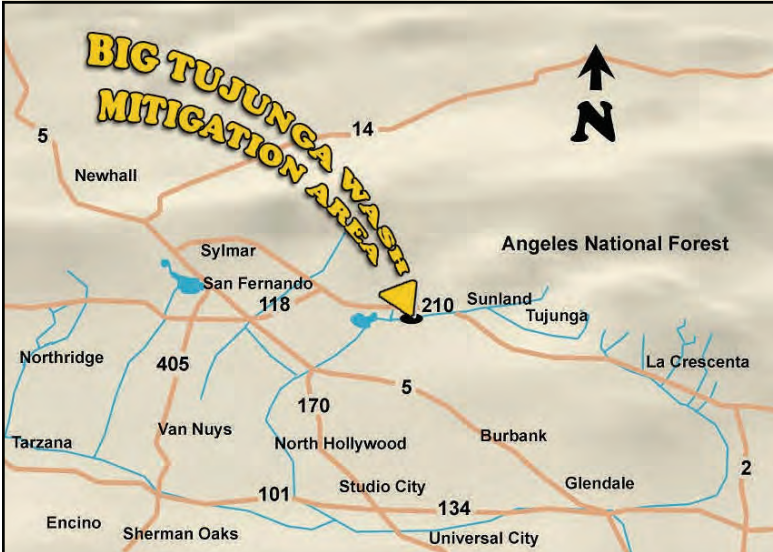


County of Los Angeles
 Department of Public Works
 Water Resources Division
 900 S. Fremont Avenue
 Alhambra, CA 91803



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**
- Please **DO NOT** use 911 to report minor incidents or regulation infractions. Contact the Sheriff's Department at 1-800-834-0064.
- In the case of an emergency situation (those where 911 is involved) please make a follow up call to the Department of Public Works as soon as possible at the numbers listed below.*
- Do not attempt to enforce regulations. Contact Sheriff's Department 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:

Valerie De La Cruz or Cindy Rowlan
 Water Resources Division
 County of Los Angeles Department of Public Works
 900 S. Fremont Avenue
 Alhambra, CA 91803
 Phone: (626) 458-6126 / (626) 458-6132
 Fax: (626) 979-5436
 Email: vdelacruz@dpw.lacounty.gov or crowlan@dpw.lacounty.gov

APPENDIX J

Community Advisory Committee Meeting Agendas and Minutes

Big Tujunga Wash Mitigation Bank Project
Community Advisory Committee Agenda

Date: Thursday, April 28, 2011

Time: 6:30 to 8:30 p.m.

Location: 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. Riparian Habitat Restoration
 3. Exotic Wildlife Removal/Monitoring
 4. Water Quality Analysis
 5. Trail Restoration/Maintenance
 6. New Public Outreach Activities
- V. Discuss and Schedule Next Trail Maintenance Day
- VI. Schedule Next CAC Meeting
- VII. Comments, Questions, and Answers

**Big Tujunga Wash Mitigation Area Project
Community Advisory Committee Minutes
Thursday, April 28, 2011 Meeting
At Hansen Yard**

I. Welcome/Introduction

Meeting attendance sign-in sheet attached.

II. Review of Meeting Agenda

Valerie De La Cruz reviewed the meeting agenda.

III. Discussion of Action Items from the September 23, 2010 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 VIII.

- 1. Sergeant Nikolof from Los Angeles County Sheriff's Department, Parks Bureau (LACo.Sheriffs) will provide the information on the fines (Bail Schedule) to Valerie De La Cruz of County of Los Angeles Department of Public Works (LACo.DPW). Valerie De La Cruz will distribute the information to ECORP and the members of the CAC.**

Sergeant Nikolof stated that he will send the information to Valerie by email.

- 2. Sergeant Nikolof will provide a copy of the Big Tujunga grid map to Dispatch.**
The grid maps that show all of the Hansen Dam area and the Big Tujunga Mitigation Area were previously provided to Sergeant Nikolof and he provided them to Dispatch. However, he stated that most of the officers who patrol are familiar enough with the area that they don't rely heavily on the maps.

Related Security Items

Chris Arlington stated that she tried to call to report some men walking towards ponds that were carrying beer. This occurred on November 14, 2011 at 11:00 am. Chris was told that no officers were available. Sergeant Nikolof stated that he would check out why this was the case, but he explained that officers could have been on another call at the time.

Mary Benson from City of LA District #2 announced that a homeless encampment that is located outside of the Mitigation Area is scheduled for removal in mid June–July, 2011. There is a concern that the removal, which will be supervised by the LA City Police Department, may result in a movement of homeless people out of the Big Tujunga Wash and into the Mitigation Area, specifically the Tujunga Ponds area.

A report was made that a Haines Canyon Creek trail that leads towards the I-210 Freeway underpass had been intentionally booby trapped in an effort to discourage trail traffic. Wire and other debris were reported on the trail at that location. The City of Los Angeles Police Department looked into this matter, and April 15th was the last time that debris was reported on the trail.

Concern still exists about an individual who lets his two dogs run loose in the Mitigation Area. One appears to be a Pit Bull mix and the other looks like a shepherd mix. The Los Angeles County Animal Care and Control officer would like to talk to owner and asked if anyone had his phone number or knew where he lived. No one knew enough about the owner to provide any information.

Greg Benavides (ECORP) mentioned that there are some areas around the ponds that could potentially hide homeless encampments. One of the areas is between the east and west Tujunga ponds. Valerie De La Cruz asked Sergeant Nikolof if LACo.Sheriffs will be able to increase their patrols. He stated that the number of officers on patrol in the area will be increased during the summer months. Sergeant Nikolof stated that concerned citizens should still call LACo.Sheriffs Dispatch if they see anything amiss in the Mitigation Area.

3. Greg Benavides (ECORP) will do some follow-up research to determine if there is an ordinance that protects the Yuccas from being harvested during the blooming season.

Yuccas are not protected, so while harvesting the flowers during the blooming season disturbs the reproductive cycle, it is not illegal. However, the ordinances on the signs posted in the Mitigation Area address the cutting of vegetation and don't allow damage to LACo.DPW's property. Therefore, if someone is seen removing Yucca flower stalks or other plants or animals from the Mitigation Area, then LACo.Sheriffs Dispatch should be called. This issue was covered in a previous edition of the Big T Wash Line newsletter, but it may warrant another article in the future.

4. Valerie De La Cruz will provide Terry Kaiser with 30 to 40 copies of the newsletter to distribute to feed and tack stores in the area.

Valerie De La Cruz provided Terry Kaiser with copies of the September 2010 newsletter. She will also provide him with 40 hardcopies of the April 2011 newsletter. Chris Arlington also requested 30 hardcopies of the April 2011 newsletter and Mary Benson requested an electronic version of the April 2011 newsletter. Cindy Rowlan and Valerie De La Cruz stated that the April 2011 newsletter mailing will go out on Monday, May 1, 2011. In addition, the newsletter will also be posted on the LACo.DPW website.

- 5. Mary Benson will provide a list of schools where the newsletter can be distributed to in order to get the information about the Mitigation Area to the local communities.**

Mary Benson stated that she had provided the list of schools to Valerie De La Cruz.

- 6. Chris Arlington will print out the newsletters from the LACo.DPW website and distribute them at the SHPOA meetings.**

Chris Arlington stated that she will distribute the April 2011 newsletters to other Shadow Hills Property Owners Association (SHPOA) affiliates.

- 7. Terry Kaiser will add the LACo.DPW link to the Equestrian Trails Incorporated (ETI) website, which has approximately 150 members, so that the ETI members can view the newsletter and other information about the Mitigation Area.**

Terry Kaiser stated that he has already added the LACo.DPW web link to the ETI website, though he may have posted an incorrect URL (web link). He will correct the link. In addition, Valerie De La Cruz will add the ETI link to the LACo.DPW community website (www.eticorral20.com).

- 8. LACo.DPW will check into adding a specific reference on the new ordinance signs that says paintball guns and air rifles are not allowed in the Mitigation Area.**

Sergeant Nikolof confirmed that the ordinance on the signs that refers to no weapons also covers paint ball guns and air rifles. It was decided to not add the words "paint ball guns" and "air rifles" to the ordinance sign.

For information purposes, the new ordinance signs have all been installed. A new sign location is on the haul road at the west end of the Mitigation Area. In addition, Los Angeles County Department of Parks and Recreation gave LACo.DPW authorization to post the new signs at the entrance to the Tujunga Ponds. The orientation of the new signs is such that people will be able to read the text as they enter the Mitigation Area. The trails map that was displayed at the meeting showed the locations of all of the new signs.

- 9. A suggestion was made to include an announcement in the next newsletter that informs people they can call Dispatch if they see anyone with paintball guns or air rifles in the Mitigation Area.**

- 10. Valerie De La Cruz will plan for a spring time tour for Los Angeles County Supervisor's and City Council personnel.**

The tour is still the planning stage. The best time to do a tour is in the spring because the plants are leafed out, the flowers are blooming, and the birds are very active.

James Gutman stated that there is debris at the outlet of the west pond and it is likely keeping the water levels in the ponds higher than normal. ECORP will have Natures Image check the pond outlet area and if there is a pile of debris there, then they will remove it.

11. ECORP will make sure that Natures Image's maintenance crews keep plant materials piled at the unauthorized trail at the end of Cottonwood in order to continue to deter the unauthorized use of the trail.

Greg Benavides monitored while the Natures Image crews piled debris and rocks at the entrance to the trail at the north end of the Cottonwood area. The unauthorized trail goes from the upland area down the steep hill to the trail below. Even though the debris was piled there, equestrians continue to use the trail by walking around the piled materials. The CAC members stated that people use that trail to train their horses how to walk down steep grades. A more permanent barrier may need to be installed. It may require a crossbar that is constructed all along the area at the end of Cottonwood. Greg Benavides will provide Valerie De La Cruz with a photo of the trail entrance and Valerie will work with Flood Maintenance Division to determine a method to close that trail. Terry Kaiser stated that he would be willing to help with a design for the closure.

12. Valerie De La Cruz will check with Dale Gibson regarding the September 25th "Ride for the Cure" trails event that was planned to occur in the Mitigation Area. Use of the Mitigation Area for an event of this type requires a permit from LACo.DPW.

Valerie De La Cruz was not able to issue a permit for the activities with such a short notice. She did attend the Ride for the Cure event and talked to Dale Gibson about getting permits in the future. All organized events that take place within the Mitigation Area boundaries require a permit. Valerie posted all of the permit applications on the County's website and she explained that the applications are very easy to fill out. When filling out an application for a trail riding event, for example, a map needs to be attached that shows the trails that will be used. Also, the permit fee can be waived if requested and the County agrees. All permit applications should be submitted to Edna Garcia (egarcia@dpw.lacounty.gov) at Construction Division for processing and approval.

13. Elektra Kruger will contact Valerie De La Cruz regarding having someone from LACo.DPW attend the SHPOA meeting.

Valerie De La Cruz and Cindy Rowlan attended the SHPOA meeting and did a great job!

14. Valerie De La Cruz will coordinate with LA Co. Animal Care and Control regarding enforcement in the Mitigation Area. The contact person at County Animal Control is Stacey Dancy.

Stacey Dancy is with the City of L.A. Department of Animal Services and is not the LA County contact person. Officer Larrios is the contact person for the LA Co. Animal Care and Control. He stated that they will use all-terrain vehicles (ATVs) to patrol the Mitigation Area as well as the areas downstream towards Hansen Dam. The fine for

loose dogs ranges from \$700 to \$800. Officer Larrios said LA Co. Animal Care and Control will notify LCo.DPW two weeks prior to when they plan to patrol the Mitigation Area so LCo.DPW can post the notice on the County's website. Valerie De La Cruz will provide an email notification to the community. Chris Arlington requested that Officer Larrios notify other Animal Care and Control officers to shut off their ATVs when approaching equestrians on the trail and to make sure the officers talk to the riders. By doing this, there is less of a chance that the horses will be spooked by the vehicles or the officers.

15. ECORP will conduct a reconnaissance of the trails just prior to the next maintenance visit by the landscape contractor (Natures Image) to notify them of the problem areas, including where the poison oak is growing into the trail.

The main problem areas where poison oak is growing out onto the trails are east of the south Wheatland entrance and along the west side of the west pond near the fence and where the creek begins. Natures Image cut the poison oak during the previous trail maintenance but it has grown back again. These areas will be targeted again during the next trails maintenance in May.

Italian thistle is now a problem north of the creek crossing and behind Gibson Ranch. The CAC members also mentioned several large castor bean plants along the fence line adjacent to Wentworth Avenue. Greg Benavides will instruct Natures Image to target the thistle and castor bean during the May maintenance visits. Valerie De La Cruz requested that ECORP notify her when the next maintenance visit is scheduled.

The CAC members discussed trimming of vegetation while they are riding or hiking through the Mitigation Area. Terry Kaiser and other equestrians carry machetes when they are riding in order to cut vegetation that could represent a danger to the horse or rider. Sergeant Nikolof informed the group that a machete could be considered a weapon but if it is carried in a sheath that is visible to the officers, the patrolling officers likely would not cite the riders.

Valerie De La Cruz reminded the members that cutting the vegetation during the breeding season requires a Biological Monitor to ensure that nesting birds aren't affected by the trimming. This is a condition of the California Department of Fish and Game Streambed Alteration Agreement for the Mitigation Area. The CAC Members requested that they be notified a couple of days prior to the next maintenance visit so they can notify the SHPOA members. A suggestion was made to provide them with some text for an email blast they can send out to their members. ECORP will prepare text of an email that can be sent out to the members of both the SHPOA and ETI groups. The email will be reviewed by LCo.DPW and then sent to Chris Arlington (SHPOA@shpoa.us) and Terry Kaiser. Greg Benavides will provide specific training to

the maintenance crew members regarding proper behavior around horses when they are encountered on the trail during maintenance activities.

16. ECORP's biologist will map the extent of the burn and photograph the conditions where the fire occurred during the next trails monitoring site visit. This information will be provided to LACo.DPW and will be included in the 2010 annual report.

Greg Benavides photographed the location where the trees were burned in the riparian area behind Gibson Ranch. He also found another small burn area approximately 300 feet away from the main burn. Embers may have blown over and started this additional fire. The maintenance crews will focus on weeding in these areas so the weeds do not out-compete the native vegetation as it recovers.

17. Mary Benson will provide Valerie De La Cruz with information about potential partnering between LACo.DPW and the new Deputy Mayor's office (Rommel Pasqual, Deputy Mayor in charge of the environment) for River Keeper outreach.

Mary Benson called the Deputy Mayor's office and they directed her to the East Valley Coordinator, Angelica Ayala. She coordinates the LA River cleanups. Her phone number is (818) 778-4990. Mary Benson suggested that LACo.DPW coordinate with Angelica.

18. ECORP's biologist will meet with Terry Kaiser and possibly Chris Mowry, the LA County Parks and Recreation Department's Ranger, to look at the area where equestrians are riding through the creek to determine a method to eliminate this trail use.

The area is still open and people are still walking through the creek. Greg Benavides noted a lot of erosion at creek crossings and he has suggested that equestrians cross in single file to minimize the bank erosion. It has been noted that there are equestrian groups that have been seen riding inside the creek at this location. It is likely that they do not know they shouldn't be doing that so there needs to be better education targeted at these recreational site users. The CAC Members discussed possible methods to get the word out to them. The Bronco Entertainment Group puts on equestrian and rodeo events at Gabrielino Park and that may be a good time to do some education for those equestrians. Greg Benavides will find out when the next equestrian/rodeo event will be held and will notify LACo.DPW to determine if public outreach can be scheduled.

Other large groups of equestrians get together between 9:30 and 10:00 am on Saturdays and Sundays at the feed store located at 11084 Sheldon Street. This may be another opportunity to do some public outreach to equestrians who ride through the Mitigation Area. LACo.DPW will consider this as another outreach task.

IV. New Discussion Items

Vector Control Issues

ECORP's Biologists as well as many of the CAC Members have noted that the mosquitoes are particularly bad along the water trail and behind Gibson Ranch. Valerie De La Cruz stated that Vector Control did a treatment in the Mitigation Area on April 27, 2011. She also stated that Vector Control wants to do an aerial treatment over the Mitigation Area in mid-May. The treatment would be done using a helicopter. Concerns were raised over when the treatment would be conducted (day or night) and how low the helicopter would fly when it did the treatment. Valerie De La Cruz stated that she would find out additional information from Vector Control. If the treatment is done at night, then there won't be any impacts to equestrians or to nesting birds.

Trail Restoration Work

LACo.DPW's Flood Maintenance Division sent a crew out to Haines Canyon Wash to remove the alignment of rocks marking the trails and restoring the adjacent areas back to their natural state. Valerie De La Cruz reminded the CAC Members of the email she had sent out regarding the fact that vegetation removal can only be conducted by the authorized biologists (ECORP) and their maintenance contractor (Natures Image). In addition, her email also addressed the fact that rocks should not be moved to create trails and if they are moved off of trails because they are a safety hazard, then they need to be placed carefully at the edge of the trail and habitat areas. Rocks should never be thrown into the adjacent habitat because there is a potential to damage the habitat or disrupt nesting birds.

Vegetation Removal during the Breeding Season

The bird breeding season is between February 15 and August 1 so no vegetation clearing or cutting can occur unless a biologist has conducted a pre-construction survey and a biological monitor is present during the clearing. This topic has been addressed in previous newsletters but the CAC Members discussed other ways to notify people about the hazards of vegetation trimming during the breeding season. ECORP suggested writing an article for the SHPOA newsletter. In addition, ECORP suggested providing text for an email that can be sent out to the SHPOA and ETI members. The group thought that was a great idea because they can reach hundreds of members very quickly using the email blast technique. ECORP will prepare a short article and text for an email and will send it to LACo.DPW for review prior to sending it to Chris Arlington and Terry Kaiser.

Organized Trail Cleanup on April 23, 2011

Terry Kaiser and a group of volunteers had planned a trail cleanup along the water trail near the west end of the Mitigation Area. Terry Kaiser contacted ECORP and LACo.DPW prior to the cleanup to discuss the issues with the trail. He stated there were some large rocks in the trail that were exposed during some of the large rains. These rocks represented safety hazards for equestrians so he arranged to have a group help with clearing these

rocks from the trail. Mari Quillman (ECORP) and Valerie De La Cruz instructed him to have his group carefully set the rocks off the edge of the trail and to avoid any disturbance to the adjacent habitat. The low level of activity was not anticipated to have any impacts on nesting birds. Terry Kaiser reported to the CAC Members that the work was mostly focused on the trail downstream of the Mitigation Area boundary. The crews only worked about 25 feet inside of the boundary of the Mitigation Area. The crews were very careful to move the rocks without creating any disturbances. Terry Kaiser had followed up with both ECORP and LACo.DPW on the Monday following the cleanup. The follow up was appreciated.

Graffiti Concerns

The CAC Members stated that graffiti is an ongoing problem on the Lake View Terrace side of the Mitigation Area. The worst problems appear to be coming from the north Wheatland entrance and along the haul road. Many of the rocks are painted with graffiti. In addition, the area where the road to the ponds crosses under the 210 freeway also has a lot of graffiti on the rocks. Valerie De La Cruz will contact the graffiti abatement group and get them out there to do the removals. Graffiti can be reported to the Graffiti Hotline by calling (800) 675-4357 (option 2) or by visiting www.dpw.lacounty.gov and follow the "Stop Graffiti" link.

Terry Kaiser mentioned that there is a strange metal placard that looks like a cult sign on an old post near the south Wheatland entrance. He stated that it is either a fine stencil or it is hand-painted. ECORP will coordinate with Terry Kaiser to look at it and recommend a removal method.

Trails Safety Issues

The CAC Members discussed the possibility of LACo.DPW putting on a vegetation trimming workshop for equestrians and other site users who hike the trails. LACo.DPW realizes that overhanging vegetation along the trails can be a safety hazard, particularly to equestrians. The workshop could cover topics such as when it is and is not OK to trim, methods of trimming, and where to place cuttings. LACo.DPW does not want to encourage people to trim vegetation because they don't want to violate the permit conditions for the Mitigation Area. However, they do realize that there could be safety issues. LACo.DPW will discuss the potential of having a workshop.

Trails Signage and Identification

LACo.DPW and ECORP had discussed how to identify authorized and established trails in the Mitigation Area. Many of the trails are established but are not shown on the latest version of the trails map. The trails mapping was conducted by a survey crew hired by LACo.DPW but they may not have surveyed in all of the existing trails used by visitors to the site. Terry Kaiser suggested that he could use his Global Positioning System Unit (GPS) while he rides the trails and then he can provide the data to ECORP. This would help to show where all of the trails are in the Mitigation Area.

ECORP suggested putting up trails signs that would show open and closed trails. The signs could be fashioned after the trails signs used by the Bureau of Land Management (photographs were shown at the meeting). The CAC Members were in favor of using those sorts of signs. If LACo.DPW wants to go forward with signing the trails, then ECORP can provide the information on where the BLM has their signs fabricated.

The CAC Members stated that some of the old habitat restoration area signs are still located in certain areas. The most notable area is along the trail in the oak/sycamore woodland restoration area. These signs are not necessary anymore so they will be collected and disposed of during the next maintenance effort in May.

The CAC Members suggested that an email blast be sent out to the SHPOA and ETI members (in English and Spanish) regarding why it is important to stay on the trails in the Mitigation Area. ECORP will provide LACo.DPW with the text for an email in regards to this issue. After it is reviewed by LACo.DPW, then it will be forwarded to Chris Arlington and Terry Kaiser.

Internal Gate at the South Wheatland Entrance

Terry Kaiser provided a potential design for an internal gate at the south Wheatland entrance. Another horse got loose in the Mitigation Area and ran out the south Wheatland entrance and across Wentworth. Fortunately, the horse's owner had stopped traffic so the horse was not injured. The fact that this entrance is completely open creates a hazard not only for horses that run across Wentworth, but it also represents a potential hazard to drivers if a horse darts out in front of their cars. The internal gate will prevent loose horses from being able to exit the Mitigation Area at the south Wheatland entrance. Terry Kaiser will fill out a construction permit application on the County's website and he will provide his proposed design. Installation of the gate will not result in the removal of any vegetation or in any impacts in the Mitigation Area. The location where the gate is proposed is devoid of vegetation. Valerie De La Cruz will let Terry Kaiser know who to contact in the County's Construction Division.

Outreach Focused at Kids

Mary Benson suggested that LACo.DPW talk to the Los Angeles Unified School District Parent Centers because all kids have to do 40 hours of community service work before they graduate from high school. If LACo.DPW could create a certificate program for kids that help out with the trails cleanup day in the Mitigation Area, then the schools will likely encourage the kid's participation. The kids have to have a signed certificate as proof that they have done the community service hours. Officer Larrios spoke about the Regional Occupational Program (ROP), which provides kids with community service hours and includes proof that they have done the work. Officer Larrios will send the info on the ROP

program to Valerie De La Cruz. Ms. De La Cruz will investigate on whether or not the County can take part in an event like this.

Trails Maintenance Day

The CAC Members discussed using an email blast to notify all SHPOA and ETI members about the upcoming trails maintenance day on October 15, 2011 (the alternative date is October 22, 2011). This should be done a couple of weeks prior to the actual cleanup day. LACo.DPW will provide an email notification to the community two weeks prior to the trails cleanup day to help forward the information.

V. Current Status of Programs

The current status of programs was not discussed in any detail during this meeting. The only programs that were mentioned were the continuing maintenance and exotic plant removal activities that will be conducted in May/June. In addition, exotic wildlife removal will also occur in the May/June timeframe.

VI. Discuss and Schedule for the Next Trail Maintenance Day

The next Trail Maintenance Day is scheduled on October 15, 2011 from 8:00 am to 12:00 pm. The event will be cancelled if rain is forecasted. LACo.DPW will provide trash bags, gloves, and snacks.

VII. Schedule Next CAC Meeting

The next CAC meeting is scheduled for Thursday, October 6, 2011, from 6:30 pm to 8:30 pm at Hansen Yard, 10179 Glen Oaks Boulevard, Sun Valley, CA 91352.

VIII. Action Items

- Sergeant Nikolof stated that he will send the information about the Bail Schedule to Valerie De La Cruz by email. Valerie's email address is: VDELACRUZ@dpw.lacounty.gov
- Sergeant Nikolof will check on why there were no officers available when Chris Arlington reported people with beer walking towards the Tujunga Ponds on November 14, 2011 around 11:00 am.
- ECORP may include an article about removal of Yucca flower stalks and other vegetation from the Mitigation Area in the September Big T Wash Line Newsletter.
- Valerie De La Cruz will provide 40 copies of the April 2011 newsletter to Terry Kaiser and 30 copies to Chris Arlington. She will also send an electronic version to Mary Benson.
- Chris Arlington will distribute the April 2011 newsletters to other Shadow Hills Property Owners Association (SHPOA) affiliates.
- Terry Kaiser will correct the LACo.DPW web link he added to the ETI website. Valerie De La Cruz will add the ETI link to the LACo.DPW community website (www.eticorral20.com).
- ECORP will include an announcement in the September Big T Wash Line newsletter that informs people that they can call LACo.Sheriffs Dispatch if they see anyone in the Mitigation Area with paintball guns and/or air rifles.
- Valerie De La Cruz will coordinate a tour of the Mitigation Area for County and City Officials.
- Greg Benavides will provide Valerie De La Cruz with a photo of the problem trail at the north end of the Cottonwood area where equestrians are taking their horses down the steep hillside. Valerie De La Cruz will work with Flood Maintenance Division to determine a method to close that trail. Terry Kaiser stated that he would be willing to help with a design for the closure.
- Officer Larrios will notify Valerie De La Cruz two weeks prior to when LA County Animal Care and Control will be doing an enforcement sweep through the Mitigation Area.

Valerie De La Cruz will then send out a notification to the community about the scheduled date.

- Officer Larríos will tell all of his respective officers to shut off their ATVs when approaching equestrians on the trail and to make sure the Officers talk to the riders.
- ECORP's Biological Monitors will direct the Natures Image crews to target the poison oak and Italian thistle that is encroaching on the trails.
- ECORP will notify Valerie De La Cruz about the date of the next maintenance event in the Mitigation Area. Valerie will send a notification to the community about when the crews will be on site.
- ECORP will prepare an article about why trees and vegetation should not be cut during the bird breeding season and they will prepare text for an email addressing the same subject. These will be provided to Valerie De La Cruz for review and then they will be provided to Chris Arlington for the SHPOA newsletter and email blast to the SHPOA members. These will also be provided to Terry Kaiser so he can send them out to the ETI members.
- ECORP will prepare text for an email blast (in English and Spanish) to the SHPOA and ETI members about the importance of staying on the trails in the Mitigation Area. ECORP will provide the text to LACo.DPW for review prior to sending it to Chris Arlington and Terry Kaiser.
- Greg Benavides will provide specific training to Natures Image's crews regarding the proper behavior when they encounter a horse and rider during their maintenance activities.
- Greg Benavides will determine when the next equestrian event will occur at Gabrielino Park, and he will provide that information to Valerie De La Cruz. LACo.DPW and ECORP will then discuss the possibility of conducting outreach at that event. LACo.DPW and ECORP will also discuss possible outreach to the large groups of equestrians who gather on the weekends at the feed store on Sheldon Street.
- Valerie De La Cruz will contact Vector Control to find out additional information about the aerial treatment that is planned in May.
- Valerie De La Cruz will contact the graffiti abatement group and get them out there to do graffiti removals. The primary targeted areas are the following: near the north Wheatland entrance, along Haul road, and along the road that leads to the ponds (under the 210 freeway). Graffiti can be reported to the Graffiti Hotline by calling (800)

675-4357 (option 2) or by visiting www.dpw.lacounty.gov and follow the "Stop Graffiti" link.

- ECORP will coordinate with Terry Kaiser to look at the potential cult sign located near the north Wheatland entrance. Following the site visit, ECORP will provide Valerie De La Cruz with photos and a suggestion for methods to remove the sign.
- LACo.DPW will discuss the possibility of putting on a vegetation trimming workshop for equestrians and other site users who hike the trails.
- Terry Kaiser volunteered to use his GPS unit to map the locations of all of the minor trails used by equestrians. If he has time to do the mapping, then he will provide the GPS data to ECORP so it can be incorporated into the trails map.
- LACo.DPW will decide if they want to go forward with installing trails signs that indicate open and closed trails and directions. If necessary, ECORP will provide LACo.DPW with information on where the Bureau of Land Management has their trails signs fabricated.
- ECORP's Biological Monitor will direct the Natures Image crews to pick up the old habitat restoration area signs when they conduct the next maintenance event at the site.
- Terry Kaiser will fill out a construction permit application on the County's website for the internal gate at the south Wheatland entrance and he will provide his proposed design. Valerie De La Cruz will notify Terry Kaiser whom to contact in the County's Construction Division about the proposed gate.
- Valerie will check into the possibility of LACo.DPW offering a signed certificate to kids who help out with the trails cleanup day in the Mitigation Area. Officer Larrios will send Valerie De La Cruz information on the ROP's community service hours certification program.
- LACo.DPW will provide an email notification about the October Trails Maintenance Day to the community approximately two weeks before the scheduled date of October 15, 2011 with an alternative date being October 22, 2011.

Big Tujunga Wash Mitigation Bank Project
Community Advisory Committee Agenda

Date: Thursday, October 6, 2011

Time: 6:30 to 8:30 p.m.

Location: 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. Riparian Habitat Restoration
 3. Exotic Wildlife Removal/Monitoring
 4. Water Quality Analysis
 5. Trail Restoration/Maintenance
 6. New Public Outreach Activities
- V. Discuss and Schedule Next Trail Maintenance Day
- VI. Schedule Next CAC Meeting
- VII. Comments, Questions, and Answers

**Big Tujunga Wash Mitigation Area Project
Community Advisory Committee Meeting Minutes
From the Thursday, October 6, 2011 Meeting
At Hansen Yard**

I. Welcome/Introduction

Meeting attendance sign-in sheet attached.

II. Review of Meeting Agenda

Valerie De La Cruz reviewed the meeting agenda.

III. Discussion of Action Items from the April 28, 2011 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 VIII.

1. Sergeant Nikolof stated that he will send the information about the Bail Schedule to Valerie De La Cruz by email.

Valerie De La Cruz has followed up with an e-mail but has not heard back from Sergeant Nikolof.

2. Sergeant Nikolof will check on why there were no officers available when Chris Arlington reported people with beer walking towards the Tujunga Ponds on November 14, 2010 around 11:00 am.

Valerie De La Cruz has followed up with an e-mail but has not heard back from Sergeant Nikolof.

3. ECORP may include an article about removal of Yucca flower stalks and other vegetation from the Mitigation Area in the September Big T Wash Line Newsletter.

This article will be included in the spring 2012 newsletter when the plants are blooming.

4. Valerie De La Cruz will provide 40 copies of the April 2011 newsletter to Terry Kaiser and 30 copies to Chris Arlington. She will also send an electronic version to Mary Benson.

Valerie De La Cruz provided the copies and Elektra Kruger of Shadow Hills Property Owners Association was able to obtain copies from Chris Arlington. Valerie will continue to provide copies upon request.

5. Chris Arlington will distribute the April 2011 newsletters to other Shadow Hills Property Owners Association (SHPOA) affiliates.

Chris Arlington distributed the copies.

- 6. Terry Kaiser will correct the LACDPW web link he added to the ETI website. Valerie De La Cruz will add the ETI link to the LACDPW community website (www.eticorral20.com).**

ETI link currently leads to the broader LACDPW website. Valerie De La Cruz will send the Big Tujunga link to Terry Kaiser and Elektra Kruger.

- 7. ECORP will include an announcement in the September Big T Wash Line newsletter that informs people that they can call Los Angeles County Sheriff's Dispatch if they see anyone in the Mitigation Area with paintball guns and/or air rifles.**

This announcement will be included in the spring 2012 newsletter.

- 8. Valerie De La Cruz will coordinate a tour of the Mitigation Area for County and City Officials.**

Grace Yu will schedule a site tour for County and City officials through Mary Benson of the City of Los Angeles, District 2. The tour will be scheduled after the water lettuce removal is completed. Ten staff members from Councilmember Krekorian's office will likely attend.

- 9. Greg Benavides will provide Valerie De La Cruz with a photo of the problem trail at the north end of the Cottonwood area where equestrians are taking their horses down the steep hillside. Valerie De La Cruz will work with Flood Maintenance Division to determine a method to close that trail. Terry Kaiser stated that he would be willing to help with a design for the closure.**

Ben Smith of ECORP will follow up with this item and will send photos to Valerie De La Cruz and Grace Yu.

- 10. Officer Larios (County Animal Care and Control) will notify Valerie De La Cruz two weeks prior to when LA County Animal Care and Control will be doing an enforcement sweep through the Mitigation Area. Valerie De La Cruz will then send out a notification to the community about the scheduled date.**

Valerie De La Cruz has not received notice or a response to a follow up e-mail to Officer Larios. The best assumption is that these sweeps have not occurred within the Big T Mitigation Area.

- 11. Officer Larios will tell his officers to shut off their ATVs when approaching equestrians on the trail and to make sure the officers talk to the riders.**

Valerie De La Cruz will follow up with Officer Larios via e-mail and will notify Elektra Kruger.

- 12. ECORP's Biological Monitors will direct the Natures Image crews to target the poison oak and Italian thistle that is encroaching on the trails.**

This was done during the exotic removal effort in September 2011.

13. ECORP will notify Valerie De La Cruz about the date of the next maintenance event in the Mitigation Area. Valerie will send a notification to the community about when the crews will be on site.

ECORP notified LACDPW and will continue to notify when these events will occur. LACDPW passes the notices on to the various email recipients.

14. ECORP will prepare an article about why trees and vegetation should not be cut during the bird breeding season and they will prepare text for an email addressing the same subject. These will be provided to Valerie De La Cruz for review and then they will be provided to Chris Arlington for the SHPOA newsletter and email blast to the SHPOA members. These will also be provided to Terry Kaiser so he can send them out to the ETI members.

ECORP prepared an article and sent it to Valerie De La Cruz and Cindy Rowlan at LACDPW. Article will be reviewed and distributed appropriately.

15. ECORP will prepare text for an email blast (in English and Spanish) to the SHPOA and ETI members about the importance of staying on the trails in the Mitigation Area. ECORP will provide the text to LACDPW for review prior to sending it to Chris Arlington and Terry Kaiser.

ECORP is in the process of preparing the text for the email blast. It will be provided to LACDPW for review and distribution.

16. Greg Benavides will provide specific training to Natures Image's crews regarding the proper behavior when they encounter a horse and rider during their maintenance activities.

Greg Benavides did provide the training to Natures Image's crews and the crews have since been exhibiting appropriate behavior when encountering equestrians.

17. Greg Benavides will determine when the next equestrian event will occur at Gabrielino Park and he will provide that information to Valerie De La Cruz. LACDPW and ECORP will then discuss the possibility of conducting outreach at that event. LACDPW and ECORP will also discuss possible outreach to the large groups of equestrians who gather on the weekends at the feed store on Sheldon Street.

Greg Benavides was not able to find a schedule of events occurring at Gabrielino Park. According to Mary Benson, Hansen Dam Equestrian Center is a more likely location for events and she will e-mail a schedule to Mari Quillman at ECORP. Greg Benavides did provide the English/Spanish information flier to the Sheldon Street tack store so it would be available to the equestrians. Mary Benson suggested putting the flier up at the liquor store across the street so the dog walkers would see it. ECORP will provide the fliers to the liquor store during the next public outreach visit.

18. Valerie De La Cruz will contact Vector Control to find out additional information about the aerial treatment that is planned in May.

Valerie De La Cruz called and left a message with Vector Control but she did not hear back from them. She assumes the aerial treatment was completed. ECORP will provide

the text for an email blast that will include asking site users to report mosquito infestations and problems with the trail. The email blast will also include the graffiti hotline number.

- 19. Valerie De La Cruz will contact the graffiti abatement group and get them out there to do graffiti removals. The primary targeted areas are the following: near the north Wheatland entrance, along the Haul road, and along the road that leads to the ponds (under the 210 freeway). Graffiti can be reported to the Graffiti Hotline by calling (800) 675-4357 (option 2) or by visiting www.dpw.lacounty.gov and follow the "Stop Graffiti" link.**

Valerie De La Cruz will coordinate a meeting on site with Andrea Gutman or Terry Kaiser to complete this item.

- 20. ECORP will coordinate with Terry Kaiser to look at the potential cult sign located near the north Wheatland entrance. Following the site visit, ECORP will provide Valerie De La Cruz with photos and a suggestion for methods to remove the sign.**

Greg Benavides met with Terry Kaiser to look at the sign and they removed it while they were there.

- 21. LACDPW will discuss the possibility of putting on a vegetation trimming workshop for equestrians and other site users who hike the trails.**

A workshop will be tentatively scheduled for spring 2012.

- 22. Terry Kaiser volunteered to use his GPS unit to map the locations of all of the minor trails used by equestrians. If he has time to do the mapping, then he will provide the GPS data to ECORP so it can be incorporated into the trails map.**

ECORP has not heard from Terry Kaiser regarding this task. ECORP will follow up with Terry Kaiser to see if he is still willing to provide GPS data of the minor trails in the Mitigation Area.

- 23. LACDPW will decide if they want to go forward with installing trails signs that indicate open and closed trails and directions. If necessary, ECORP will provide LACDPW with information on where the Bureau of Land Management has their trails signs fabricated.**

ECORP provided photographs of the signs used by the Bureau of Land Management (BLM) to mark trails in open areas on BLM lands. Mari provided sample sign photo. LACDPW will discuss whether or not to put trails signs in the Mitigation Area.

- 24. ECORP's Biological Monitor will direct the Natures Image crews to pick up the old habitat restoration area signs when they conduct the next maintenance event at the site.**

ECORP will follow up to make sure that the signs are removed.

25. Terry Kaiser will fill out a construction permit application on the County's website for the internal gate at the south Wheatland entrance and he will provide his proposed design. Valerie De La Cruz will notify Terry Kaiser whom to contact in the County's Construction Division about the proposed gate.

LACDPW has not yet received a permit application from Terry Kaiser for the proposed gate installation.

26. Valerie will check into the possibility of LACDPW offering a signed certificate to kids who help out with the trails cleanup day in the Mitigation Area. Officer Larrios will send Valerie De La Cruz information on the ROP's community service hours certification program.

Valerie De La Cruz has not yet received information from Officer Larrios. Elektra Kruger and Mary Benson will forward an email to Sunland Tujunga Village Christian School and Sun Valley High School. The email will need to include an indemnification form for parents of children under 18 to sign.

27. LACDPW will provide an email notification about the October Trails Maintenance Day to the community approximately two weeks before the scheduled date of October 15, 2011 with an alternative date being October 22, 2011.

The trails maintenance day schedule has changed and now the maintenance day is planned for November 5, 2011.

IV. New Discussion Items

Animal Safety Issues

A horseback rider on the haul road was recently attacked, but not injured, by a pitbull and Doberman that, although leashed, escaped from their owner. It was reported that two pitbulls formerly running loose in the Mitigation Area were captured by Animal Control.

Homeless Issues

Los Angeles skid row homeless people obtained an injunction on June 23 against LAPD confiscating and destroying their property. Homeless people in the Big Tujunga Mitigation Area and ponds formerly received a two week notice to vacate. Right now LAPD is not conducting homeless interventions. According to Mary Benson, approximately 70-80 homeless people live in Big Tujunga Wash. Councilmember Krekorian is working with authorities and charitable groups to offer services to the homeless. A homeless connect day offering health assessments, flu shots, and a place to sleep is planned for sometime before the end of the year. Usually only about 10% of the homeless people come out for these events. The Tamayo property, located on the north side of the Mitigation Area, and an area between I-210 and Kristy Street have encountered homeless encampments. Property violations, such as unsightly trash or allowing homeless encampments on a private parcel, are set to change from a misdemeanor to an infraction that carries a fine. Valerie will try to

coordinate with CALTRANS to fix the hole in their fence on the north side of the west Tujunga pond because it is being used as a travel path between Caltrans' property and the Mitigation Area.

Staff Change at LACDPW

Valerie De La Cruz will be moving to another assignment within LACDPW and Grace Yu will transition into the project manager position during the next couple months for the Big Tujunga Mitigation Area.

V. Current Status of Programs

Exotic Plant Removal

Exotic plant species removal activities were conducted between September 12 and 20, 2011. The work crew consisted of ten men the first day followed by five men for the remainder of the removal period. In addition, ECORP's monitoring biologists, Ben Smith and Phil Wasz, conducted the full time monitoring during the exotic plant removals. The bulk of the plants removed from the Mitigation Area consisted of arundo, castor bean, and tree of heaven. Most of the Tree of Heaven plants were seedlings or saplings, although one large tree was killed by girdling it. Tamarisk, a potentially invasive non-native plant, was removed from along Big Tujunga Wash. Non-native plants that will require additional treatment include: African fountain grass that is currently dormant and needs to be treated with herbicide during its active growth period in the spring and early summer; annual weeds, such as summer mustard, that will germinate in the spring; and any arundo that re-sprouts from removal areas or that washes in during winter floods. Non-native Umbrella sedge, which occurs throughout the riparian area, is not as invasive or harmful to native habitat as many of the other non-native species that were removed. So, the umbrella sedge was left in place. Additional activities included maintenance along the trails and removal of eight rock dams in the creek. Low branches that were obstructing the trails or that might represent a safety hazard for equestrians were targeted during the maintenance. In addition, poison oak that was encroaching on the trails was also targeted during the maintenance.

Water Lettuce Removal

Water lettuce removal began on September 13, 2011 with a group of volunteers from the Los Angeles County Department of Parks and Recreation using rakes and pitchforks. The volunteers have been concentrating their removal efforts in east pond. Nature's Image has been working in the west pond using a boat with a motor, a seine net, and reachlift. The bulk of the water lettuce has been cleared from the west pond and Nature's Image anticipates starting on the east pond on Monday, October 10, 2011. Nature's Image will have filled five 40-yard dumpsters by the end of the week, bringing the project total to 14. Branches were trimmed from the trail along the north side of the ponds to provide access for a tractor to transport water lettuce from the east pond to the dumpster location in the parking area west of the west pond. The water lettuce removal effort will be ongoing until the bulk of the water lettuce is physically removed from the Tujunga ponds.

VI. Discuss and Schedule for the Next Trail Maintenance Day

The next Trail Maintenance Day is scheduled on November 5, 2011 from 8:00 am to 12:00 pm. The event will be cancelled if rain is forecasted. LACDPW will provide trash bags, gloves, water, and snacks.

VII. Schedule Next CAC Meeting

The next CAC meeting is scheduled for Thursday, April 26, 2012, from 6:30 pm to 8:30 pm at Hansen Yard, 10179 Glen Oaks Boulevard, Sun Valley, CA 91352.

VIII. Action Items

1. ECORP may include an article about removal of Yucca flower stalks and other vegetation from the Mitigation Area in the spring 2012 Big T Wash Line Newsletter.
2. Valerie De La Cruz will continue providing 40 copies of the newsletters to Terry Kaiser and 30 copies to Chris Arlington. She will also continue sending an electronic version to Mary Benson.
3. Valerie will send the Big Tujung website link to Elektra Kruger and Terry Kaiser.
4. ECORP will include the Big Tujung website address in the announcements section of the upcoming Big Tujung Wash Line newsletter.
5. ECORP will include an announcement in the spring 2012 Big Tujung Wash Line newsletter that informs people that they can call Los Angeles County Sheriff's Dispatch if they see anyone in the Mitigation Area with paintball guns and/or air rifles.
6. Valerie De La Cruz will coordinate a tour of the Mitigation Area for County and City Officials. Councilmember Krekorian would like 10 people from his office to attend. Valerie will schedule through Mary Benson once the water lettuce removal is finished.
7. Ben Smith will provide Valerie De La Cruz with follow up photos of the problem trail at the north end of the Cottonwood area where equestrians are taking their horses down the steep hillside. Valerie De La Cruz will work with Flood Maintenance Division to determine a method to close that trail.
8. Valerie De La Cruz will check on the correct phone number people should call for dog problems in the Mitigation Area.
9. Valerie De La Cruz will follow-up with Officer Larios by email to ask the officers who patrol on ATVs to shut off their vehicles when approaching equestrians on the trails. In addition, she will ask him to remind his officers to talk to the riders as they approach so the horses recognize them as people.

10. ECORP will notify Valerie De La Cruz about the date of the next maintenance event in the Mitigation Area. Valerie will send a notification to the community about when the crews will be on site.
11. Mari Quillman will email the article about why trees and vegetation should not be cut during the bird breeding season to Valerie De La Cruz. Valerie De La Cruz will review the article and then forward it to Chris Arlington for the SHPOA newsletter and an email blast to the SHPOA members. The article will also be provided to Terry Kaiser so he can send them it to the ETI members.
12. ECORP will prepare text for an email blast (in English and Spanish) to the SHPOA and ETI members about the importance of staying on the trails in the Mitigation Area. ECORP will provide the text to LACDPW for review and the Valerie De La Cruz will provide it to Chris Arlington and Terry Kaiser.
13. Mary Benson will email the schedule for events at the Hansen Dam Equestrian Center so that ECORP can coordinate a public outreach at this venue. As part of the expanded public outreach program that occurs during the summer months, ECORP will conduct outreach to the large groups of equestrians who gather on the weekends at the feed store on Sheldon Street. In addition, ECORP will put up flyers for the dog walkers that stop at the liquor store across the street from the feed store.
14. Valerie De La Cruz will continue following up with Vector Control to find out additional information about the schedule for mosquito treatment within the Mitigation Area.
15. Valerie De La Cruz will coordinate a meeting on site with Andrea Gutman or Terry Kaiser regarding graffiti abatement.
16. ECORP will send the text of an email blast to Valerie De La Cruz that reminds the equestrians and other site users to report mosquito infestations and trail problems. In addition, the email blast will include the graffiti hotline number.
17. LACDPW will discuss the possibility of putting on a vegetation trimming workshop for equestrians and other site users who hike the trails. This may be scheduled during the spring of 2012.
18. ECORP will follow-up with Terry Kaiser to see if he is still willing to provide GPS data for the minor trails through the Mitigation Area.
19. LACDPW will decide if they want to go forward with installing trails signs that indicate open and closed trails and directions. If requested, ECORP will provide LACDPW with information on where the Bureau of Land Management has their trails signs fabricated.
20. Ben Smith will follow up to ensure the old habitat restoration area signs have been removed.
21. Valerie De La Cruz and Cindy Rowlan will check into creating a certificate of community service for kids who help out with the trails cleanup day in the Mitigation Area. Valerie

De La Cruz will send an email to Mary Benson and Elektra Kruger announcing the program and will include an indemnification form for parents to sign if kids are under the age of 18. Mary Benson and Elektra Kruger will forward the announcement to Sunland Tujunga Village Christian School, Sun Valley High School, and other applicable organizations.

22. Mari Quillman will send Valerie De La Cruz information for the email announcement of the November 5, 2011 trails maintenance day.

APPENDIX K

Community Outreach Memos

June 27, 2011
(2010-116.002/O/O2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task O - Public Outreach for May through June 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 expanded its public outreach efforts to include non-equestrian user groups who regularly visit the Mitigation Area for recreational purposes.

Outreach Efforts

On site interviews and education about the Mitigation Area was conducted by ECORP biologist Gregorio Benavides on June 25, 2011. All outreach efforts took place during the peak hours of 10 AM and 2 PM.

On June 25, 2011, approximately 20 fliers were distributed to weekend visitors. Informal interviews, short question and answer sessions, and an explanation of the Los Angeles County Department of Public Works (LACDPW) conservation goals were conducted to approximately 20 people consisting of family groups of 3 to 5 persons ranging from toddlers to adults. Outreach took place in the Mitigation Area at the Tujunga Ponds and along popular swimming/wading locations at Haines Canyon Creek. Mitigation Area visitors fell into one of two groups: non-equestrian family groups or equestrian user groups.

Non-Equestrian Family Groups

As expected, visitors were receptive to outreach efforts. About half of the groups were new to the outreach effort at the Mitigation Area; the others had received outreach materials and on-site education in the past from ECORP biologist Gregorio Benavides. All groups were of Latino heritage with some being monolingual (Spanish only) or bilingual.

All family groups were situated at or headed for Haines Canyon Creek or the Tujunga Ponds. Swimming and wading was observed. No unleashed dogs were observed. Cooking was not observed as each of the family groups stated that they were aware of the no open-fire policy

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at the Mitigation Area. No alcohol consumption was observed during the interview/outreach effort.

Effects on Sensitive Habitat by Non-Equestrian Family Groups

No new dams were observed at the unauthorized swimming pond near the South Wheatland entrance to the Mitigation Area. This site is the most popular wading site in the Mitigation Area, and during the June 25, 2011 visit, children were observed wading in the creek. Large dead branches were used to bridge across the creek to facilitate crossing over from Big Tujunga Wash to the riparian area of the Mitigation Area. Garbage was observed outside over-filled cans near the upper Haines Canyon Creek. Garbage cans at the south Wheatland entrance and at the ponds indicate that visitors are making full use of disposal sites (Figure 2). Tree trimming adjacent to picnicking areas was not observed; no new trails were observed.

Equestrian User Groups

During the outreach effort, eight equestrians were provided outreach education. ECORP biologist Gregorio Benavides reminded riders to cross the creek single file to minimize erosion (Figure 3) along the banks and to stay on the established trails.

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: June 27, 2011

For Gregorio Benavides
Biologist



Figure 1. Trees used to cross the Haines Canyon Creek at the Wheatland entrance to the Tujunga Ponds.



Figure 2. Trash cans at the Wheatland Ave entrance.



Figure 3. Erosion caused by equestrians crossing side-by-side at the Haines Canyon Creek. This crossing is located just northwest of the upland area.

July 30, 2011
(2010-116.003/O/O2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task O - Public Outreach for July 2011 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 expanded its public outreach efforts to include non-equestrian user-groups who regularly visit the Mitigation Area for recreational purposes.

Outreach Efforts

On site interviews and education about the Mitigation Area was conducted by Gregorio Benavides on July 22 and July 30, 2011. All outreach efforts took place during the peak hours of 10 AM to 3 PM.

During both outreach visits in July, equestrian and non-equestrian visitors received an educational brochure outlining the County of Los Angeles Department of Public Works (LACDPW) conservation goals for the Mitigation Area. The educational brochure also contains the Mitigation Area's rules and regulations. During each outreach event, ECORP biologist Gregorio Benavides spoke about why specific activities are prohibited in the Mitigation Area. Most outreach events included informal interviews, and short question and answer sessions. Visitor's questions to the biologist ranged from natural history topics to questions about the Mitigation Area's rules and regulations.

Outreach took place throughout the Mitigation Area. ECORP biologist Gregorio Benavides searched for visitors on the established trails and at popular swimming/wading locations in the Haines Canyon Creek or Tujunga Ponds. Mitigation Area visitors fell into one of two groups: non-equestrian family groups or equestrians user groups.

Non-Equestrian Family Groups

The family groups encountered during July 2011 were situated along the Haines Canyon Creek and the Tujunga Ponds. The family groups were there to have a picnic and swim. Neither

cooking nor alcohol consumption was observed during any of the outreach events. No unleashed dogs were observed. Litter was minimal in high use areas. Waste receptacles throughout the Mitigation Area were inspected to get a sense of visitor activities (Figure 1). Most receptacles contained litter associated with a picnic (e.g. paper plates, discarded food packaging), though some contained beer packaging. Most waste receptacles were full, indicating that the Mitigation Area receives many visitors during the week.

All of the family groups outreached were of Latino heritage with some being monolingual (Spanish only) or bilingual Spanish-English speakers. The family groups were receptive and many stated they had read the posted Mitigation Area rules and regulations, which are posted in both English and Spanish.

Effects on Sensitive Habitat by Non-Equestrian Family Groups

A popular location for picnickers and swimmers is the unauthorized swimming pond situated 1,000 feet west of the South Wheatland Ave entrance. It is the most popular wading site in the Mitigation Area. During both visits, children were observed wading in the Wheatland Swimming Pond. Visitors have continued to dam the Haines Canyon Creek (Figure 2) just downstream of the swimming pond in an effort to make the pond deeper. The dams consisted of large dead branches and boulders. During the July 22, 2011 visit, this dam was removed from the Haines Canyon Creek.

No new trails were observed along the established trails. There was evidence of tree trimming or vandalism at the Wheatland Swimming Pond: willow tree branches were partially broken off at the trunk.

Equestrian User Groups

Equestrians were outreached to along the established trails or on the Upland Area. Equestrians were provided with the education brochure. Outreach events with equestrians are usually brief. Most questions to ECORP biologist Gregorio Benavides were about the conservation efforts taking place at Big Tujunga. Several riders stated that they were planning to post the education brochure at their stable 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. There was some evidence of unauthorized tree trimming along the established trails (Figure 3).

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: July 30, 2011

For Gregorio Benavides
Biologist



Figure 1. Most waste receptacles in the Mitigation Area contained picnic-related garbage. Trash was minimal around popular areas used by visitors.



Figure 1. Branches and boulders were removed from the Haines Canyon Creek at the Wheatland Entrance to the Tujunga Ponds.



Figure 2. Unauthorized tree trimming was observed along the trail near the Tujung Ponds.

August 22, 2011
(2010-116.004/O/O2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803-1331

SUBJECT: Task O - Public Outreach for August 2011 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 expanded its public outreach efforts to include non-equestrian user groups who regularly visit the Mitigation Area for recreational purposes.

Outreach Efforts

Onsite interviews and education about the Mitigation Area was conducted by Brian Zitt and Freddie Olmos on August 20, 2011. All outreach efforts took place during the peak hours of 10 a.m. to 2 p.m.

During this outreach visit, equestrian and non-equestrian visitors received an educational brochure outlining the County of Los Angeles County Department of Public Works (LACDPW) conservation goals for the Mitigation Area. The educational brochure also contains the Mitigation Area's rules and regulations. During this outreach event, ECORP biologists spoke about why specific activities are prohibited in the Mitigation Area. Most outreach events included informal interviews, and short question and answer sessions. Visitor's questions to the biologist ranged from natural history topics to questions about the Mitigation Area's rules and regulations.

Outreach took place throughout the Mitigation Area. ECORP biologists searched for visitors within the established trails and at popular swimming/wading locations in the Haines Canyon Creek or Tujunga Ponds. Mitigation Area visitors fell into one of two groups: non-equestrian family groups or equestrians.

Non-Equestrian Family Groups

One family group was encountered during the August 2011 outreach effort along the Haines Canyon Creek. The family group of about 12 was there to have a picnic and swim. The family

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group outreached was of Latino heritage and predominantly Spanish-speaking; the children were bilingual. The family group was receptive and stated they were aware of the posted Mitigation Area rules and regulations, which are posted in both English and Spanish at the south Wheatland entrance.

Two individuals, a man and a woman, were observed wading in an open reach of Haines Canyon Creek approximately 100 feet downstream of the confluence with the Tujunga ponds. A plastic fence had been staked in across the creek and the two individuals were observed using aquarium-style nets to pursue fish in an attempt to capture them. The individuals were immediately questioned (i.e., who they were, what their intentions were, if they had permission to be collecting, what they were collecting, what they planned on doing with what they collected). The man has been observed onsite a few years ago wearing a "Pond Works" hat that resembles the style and color of the Public Works insignia. During the previous encounter he was attempting to collect mosquitofish for his aquarium/pond business. At this time, the man responded that he wanted to catch some small bass to put in his aquarium. They were informed that what they were doing was not allowed and there could be serious ramifications for their actions. They were told to remove their fence and vacate the water. The individuals were given information on what activities are allowed and not allowed at the Mitigation Area. No animals were observed in their possession at the time of this incident.

Neither cooking nor alcohol consumption was observed during the outreach event. One trail user had three dogs on leashes and was supportive of our outreach effort. She said that in the last year she has noticed that there is less trash in the Mitigation Area. Three young bicycle riders were encountered at the creek crossing near the south Wheatland entrance. They were informed that bicycles are not allowed in the Mitigation Area and were encouraged to use the trails for hiking and nature viewing. Litter was minimal in high use areas. Two beer packages were found near the ponds.

Effects on Sensitive Habitat by Non-Equestrian Family Groups

A popular location for picnickers and swimmers is the unauthorized swimming pond situated approximately 1,000 feet west of the South Wheatland Ave. It is the most popular wading site in the Mitigation Area. During this visit, children were observed with bathing suits ready to enter the pond. They were informed of the protected fish species in the creek and that swimming is not allowed.

Visitors have continued to build dams in several areas of Haines Canyon Creek. The majority of the dams are located downstream of the trail crossing and act as a foot bridge to cross the creek. Other areas included locations near open exposed banks in an effort to make swimming/wading ponds. These dams consist of large dead branches and rocks. All of the dam locations were removed during the exotic aquatic species removal effort (August 22 through 24, 2011). No new trails were observed along the established trails. There was evidence of unauthorized tree trimming with chainsaws along the southern-most trail between Wheatland Avenue and Cottonwood Avenue.

Equestrian User Groups

Biologists spoke with equestrians during the outreach conducted throughout the Mitigation Area. The education brochure was provided to equestrians. Outreach events with equestrians were usually brief. Most questions to ECORP biologists were about the conservation efforts taking place at the Mitigation Area, in particular removal of the water lettuce. One rider stated that she would post the education brochure at her barn to get the word out to fellow riders. Riders were reminded to stay on the established trails. One rider was observed in the distance across the creek with two unleashed dogs.

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.



Brian Zitt
Aquatic Biologist

DATE: August 22, 2011



Jesus "Freddie" Olmos
Senior Environmental Analyst/Project Manager

DATE: August 22, 2011

September 6, 2011
(2010-116.004/O/O2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803-1331

SUBJECT: Task O - Public Outreach during Labor Day Weekend 2011 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 expanded its public outreach efforts to include non-equestrian user groups who regularly visit the Mitigation Area for recreational purposes.

Outreach Efforts

Onsite interviews and educational talks about the Mitigation Area were conducted over Labor Day Weekend by ECORP Biologist Israel Marquez from September 3 to September 5, 2011. All outreach efforts took place during the peak visitor hours of 10 a.m. to 2 p.m.

During these outreach visits, equestrian and non-equestrian visitors received an educational brochure outlining the County of Los Angeles Department of Public Works (LACDPW) conservation goals for the Mitigation Area, as well as the Mitigation Area's rules and regulations. During this outreach event, ECORP biologist spoke about why specific activities are prohibited in the Mitigation Area. Most outreach events included informal interviews, and short question and answer sessions. Visitors' questions to the biologist ranged from natural history topics to questions about the Mitigation Area's rules and regulations.

Outreach took place throughout the Mitigation Area. ECORP's biologist spoke with visitors along the established trails and at popular swimming/wading locations at Haines Canyon Creek and Tujunga Ponds. Mitigation Area visitors fell into one of two groups: non-equestrian groups or equestrians.

Non-Equestrian Groups

Mr. Marquez spoke with a total of 13 non-equestrian recreational users throughout the Mitigation Area. These visitors were provided with the educational brochure and encouraged to

ask questions and provide comments and suggestions on how to make the Mitigation Area more user-friendly while still maintaining purpose of acting as a mitigation area.

The biologist observed two different couples with their unleashed dogs in the mitigation site; one couple was walking with their dog on one of the trails west of Cottonwood Avenue, and the other couple was playing with their dog on the southwest side of West Pond. After the biologist informed them of the ongoing mitigation effort, they agreed they knew about the law that requires dogs to be leashed and both couples said that they would take that into account for their next visit.

A group of four young male visitors was observed west of the Wheatland entrance on the southern boundary of the Mitigation Area. They were drinking beer and swimming near a previously constructed dam. The biologist informed them about the importance of keeping the Mitigation Area pristine, about the laws that protect the site, and asked them for any comments and suggestions on making the Mitigation Area more user-friendly. The individuals showed interest and they agreed to keep clean the area. The next day, the biologist went back to the area and found no signs of trash or destructive behavior.

Another group of five (women and children) were swimming and having a picnic by the creek approximately 30 feet west of the power lines, west of the Mitigation Area boundaries. Given the proximity to the Mitigation Area, the biologist also spoke to these Spanish-speaking individuals. They said that most of the people like to go west of the power lines; sometimes up to 200 people on weekends will visit that area. One of the ladies said that she has seen people starting bonfires and bringing propane barbecues near the creek area. She said that fewer people visit the creek in areas closer to the freeway.

Neither cooking nor fishing activities were observed during the outreach event. Bicycle tracks that ended by the remains of a small fire were observed near the ponds on September 5, 2011. Litter was minimal on the trails and near the ponds. However, more trash was observed west and east of the Wheatland gate entrance, where people tend to create small trails between the bushes and the creek.

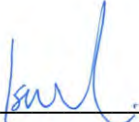
Equestrian User Groups

Mr. Marquez made contact with a total of 44 equestrian users throughout the Mitigation Area. Equestrian users were encouraged to ask questions and provide comments or suggestions on how to make the Mitigation Area more user-friendly while still upholding its purpose as a mitigation area. Outreach events with equestrian users are usually brief. Most questions asked were about the conservation efforts taking place at the Mitigation Area, with particular focus on the removal of the water lettuce and trash. One of the equestrian users was especially worried about potentially unclean water because her horses were not drinking the water in Haines Canyon Creek.

A family group of three male riders were drinking beer at the pond. They said they have been enjoying the Mitigation Area's trails for long time and they have never left any sort of trash. They were informed of the site maintenance activities and mitigation efforts at the Mitigation Area and they supported them.

One rider stated that she would like to see additional information on the trails, such as small plates showing plant and animal names, and another one at the entrance explaining why conservation and preservation are important for the benefit of everyone. She also said that bilingual interpretative hikes guided by volunteers or student interns would be a good way of getting kids and young adults more involved in the conservation effort.

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.



Israel Marquez
Assistant Biologist

DATE: September 6, 2011

APPENDIX L

Erosion Control and Barrier Maintenance Quarterly Memos



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

February 1, 2011
(2010-116/G/G1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G1 – Erosion Control and Barrier Maintenance Monitoring for January 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving erosion control and barrier maintenance was conducted at the Big Tujunga Wash Mitigation Area during January 2011. The next erosion control and barrier maintenance effort is scheduled for April 2011.

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

SIGNED: _____

For Gregorio Benavides
Biologist

DATE: February 2, 2011

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



April 15, 2011
(2010-116.001/G/G1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G1 – Erosion Control and Barrier Maintenance Monitoring Report for February through April 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 the erosion control and barrier maintenance monitoring efforts throughout the restoration site.

During the February to April 2011 time period, ECORP biologists conducted erosion control and barrier maintenance surveys in the Mitigation Area. The surveys were conducted during on-site reconnaissance (February 25, 2011) and trails maintenance efforts (April 5, 2011). No new erosion on the trails or in adjacent areas was observed on the established trails in the riparian area. However, during an onsite visit with Los Angeles County Department of Public Works (LACDPW) employees (March 16, 2011), a heavily eroded portion of the upland trail (between Cottonwood Street and Mary Bell Avenue) was identified for repair. The trail is used daily and therefore warrants repair. The trail is wide enough for a small bulldozer to grade the path. A date for repair has not been identified, and because it is near vegetation, a biological monitor will likely be necessary. Barriers on the project site were intact and showed no signs of vandalism.

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

SIGNED: 

DATE: April 15, 2011

For Gregorio Benavides
Biologist



July 5, 2011
(2010-116.002/G/G1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G1 – Erosion Control and Barrier Maintenance Monitoring Report for May through June 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 the erosion control and barrier maintenance monitoring efforts throughout the restoration site.

ECORP was contacted by a local citizen about a trail safety issue near the Bert Bonnet Trail. Gregorio Benavides met with the resident on May 14, 2011 to view a section of the Mitigation Area that has eroded and may be dangerous for normal trail traffic. The section of trail in question is located approximately 0.3 mile southwest from the north Wheatland Ave entrance. The global positioning system (GPS) coordinates for this location are as follows: LAT 34°16'5.02"N LON 118°21'21.25"W. Increased water flows caused large sections of the trail to break off and made other sections of the trail dangerous.

Recent rains during the winter and spring increased water flow in Big Tujunga Wash. As a result, undercutting by water flow in the wash has caused large sections of the trail to break off creating a 5- to 10-foot precipice in the established trail. The remaining sections of the trail adjacent to the eroded section are intact, yet the observed erosion pattern dictates that more sections of the trail will also break off into the wash.

The decision was made to establish a new trail further away from the edge of the wash and to close the existing dangerous trail. On June 25, 2011, ECORP biologist Gregorio Benavides met with the local resident at the eroded trail site to discuss options for moving the trail away from the leading edge of the erosion. Mr. Benavides then conducted brush clearing along a new trail alignment using hand tools. The clearing was done in a manner as to minimize the impacts on the native habitat and to establish a trail that would be safe for equestrians and hikers.

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

No other erosion on the trails or in adjacent areas was observed on the established trails in the riparian area and the barriers on the project site were intact and showed no signs of vandalism.

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

SIGNED:  _____

For Gregorio Benavides
Biologist

DATE: July 5, 2011



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 3, 2011
(2010-116.004/G/G1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G1 – Erosion Control and Barrier Maintenance Monitoring Report for July through September 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 the erosion control and barrier maintenance monitoring efforts throughout the restoration site.

ECORP biologists Benjamin Smith and Phillip Wasz conducted a site visit on September 7, 2011 to identify areas of concern within the Mitigation Area. No new erosion within the trails or in adjacent areas was observed. The barriers on the project site were in the same condition and showed no new signs of vandalism.

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

SIGNED: 

Phillip Wasz
Biologist

DATE: October 3, 2011



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 31, 2011
(2010-116.006/G/G1)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G1 – Erosion Control and Barrier Maintenance Monitoring Report for October through December 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving erosion control and barrier maintenance was conducted at the Big Tujunga Wash Mitigation Area during from October through December 2011. The next erosion control and barrier maintenance effort is not yet scheduled at this time.

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

SIGNED: _____

Phillip Wasz
Biologist

DATE: December 31, 2011

ECORP Consulting, Inc.

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APPENDIX M

Cottonwood/Willow Restoration Area Maintenance Quarterly Memos



February 1, 2011
(2010-116/G/G2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G2 – Cottonwood/Willow Restoration Area Maintenance and Monitoring During January 2011 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving maintenance or monitoring of the cottonwood/willow restoration areas occurred during January 2011 at the Big Tujunga Wash Mitigation Area. The next maintenance and monitoring effort is scheduled for April 2011.

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

SIGNED: _____

For Gregorio Benavides
Biologist

DATE: February 1, 2011



April 15, 2011
(2010-116.001/G/G2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G2 – Cottonwood/Willow Restoration Areas Maintenance during the February through April 2011 Timeframe for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Area for native wildlife species, ECORP Consulting, Inc. (ECORP) has continued its cottonwood/willow restoration areas maintenance and monitoring efforts for 2011. Maintenance includes the removal of weeds and loose trash within the native habitat areas, control of poison oak along the trails, and watering of restoration plantings, if necessary. Monitoring is conducted by ECORP's biologist and the maintenance is conducted by Natures Image, the landscape contractor.

Prior to any weed removal activities, ECORP's biologist conducted a pre-construction survey on April 5, 2011 to determine if any active bird nests were located within the areas where maintenance was scheduled to occur. Neither songbird breeding activity nor raptor nests were observed in the treatment area, therefore no buffers were established. ECORP's biologist also conducted an onsite orientation briefing for the purpose of informing the landscape contractor's crew members about the Mitigation Area's regulations and the sensitive species and habitats that are present in the Mitigation Area.

During this maintenance effort, Nature's Image removed weeds and other growth around cottonwood plantings. The plantings appeared healthy and in most cases, required very little attention with respect to weeding, as previous efforts have been effective in eliminating unwanted vegetation around the plantings. The 2001 and 2002 plantings located throughout the riparian habitat in the Mitigation Area have shown considerable growth and required minimal maintenance. One planting near the Wheatland entrance had been vandalized or inadvertently damaged by passerbys as it had some broken branches. All other plantings were intact.

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

SIGNED:  _____

DATE: April 15, 2011

For Gregorio Benavides
Biologist

June 27, 2011
(2010-116.002/G/G2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G2 – Cottonwood/Willow Restoration Areas Maintenance during the May through June 2011 Timeframe for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

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 cottonwood/willow restoration areas maintenance and monitoring efforts for 2011. Maintenance includes the removal of weeds and loose trash within the native habitat areas, control of poison oak along the trails, and watering of restoration plantings, if necessary. Monitoring is conducted by ECORP's biologist and the maintenance is conducted by Natures Image, the landscape contractor.

Prior to any weed removal activities, ECORP's biologist conducted a pre-construction survey on May 14 and 31, 2011 to determine if any active bird nests were located within the areas where maintenance was scheduled to occur. ECORP's biologist also conducted an onsite orientation briefing for the purpose of informing the landscape contractor's crew members about the Mitigation Area's regulations and the sensitive species and habitats that are present in the Mitigation Area.

The two surveys resulted in the following observations:

- Neither songbird breeding activity nor raptor nests were observed in the areas slated for treatment, therefore no buffers were established.
- Stands and patches of mustard plant (*Brassica* sp.) were observed around cottonwood plantings (Figure 1).
- Thistle (*Carduus* sp.) was observed near cottonwood plantings (Figure 2).
- Weedy plants were found underneath cottonwood plantings (Figure 3).

During this maintenance effort (June 6 through 8, 2011), Natures Image removed mustard plant, thistle, and weeds and other growth around cottonwood plantings. The plantings appeared healthy and in most cases, required very little attention with respect

to weeding, as previous efforts have been effective in eliminating unwanted vegetation around the plantings. The 2001 and 2002 plantings have shown considerable growth and required minimal maintenance.

I hereby certify that the statements furnished above present the data and information required for this biological 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, 2011

For Gregorio Benavides
Biologist



Figure 1. Mustard plant was ubiquitous throughout the riparian area, including areas near cottonwood plantings.



Figure 2. Thistle (to the left) was present near cottonwood plantings. All thistle plants were removed with line trimmers.



Figure 3. Weedy plants were removed with line trimmers.



October 3, 2011
(2010-116.004/G/G2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G2 – Cottonwood/Willow Restoration Area Maintenance and Monitoring for the 3rd quarter of 2011 (July through September) for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continued maintenance and monitoring of the cottonwood/willow restoration areas during the 3rd quarter of 2011 (July through September) at the Big Tujunga Wash Mitigation Area (Mitigation Area).

A monitoring visit was conducted by ECORP Consulting, Inc. (ECORP) Biologists Ben Smith and Phillip Wasz on September 7, 2011. During this time the restoration areas were inspected and areas needing maintenance were identified. The maintenance occurred on September 12, 13, 14, and 15, 2011, and was conducted by Natures Image, the landscape contractor. Maintenance involved weed removal around cottonwood plantings. The plantings appeared healthy and, in most cases, required very little maintenance other than weeding.

Prior to any work, all Natures Image field technicians received an onsite orientation and instruction on the Mitigation Area's regulations and concerns relating to the Mitigation Area's sensitive species and habitat by a qualified ECORP biologist.

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

SIGNED: 

Phillip Wasz
Biologist

DATE: October 3, 2011



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 30, 2011
(2010-116.006/G/G2)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Task G2 – Cottonwood/Willow Restoration Area Maintenance and Monitoring for October through December 2011 for the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving maintenance or monitoring of the cottonwood/willow restoration areas occurred during October through December at the Big Tujunga Wash Mitigation Area. The next maintenance and monitoring effort has not yet been scheduled at this time.

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

SIGNED: _____

Phillip Wasz
Biologist

DATE: December 30, 2011

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 N

2011 Functional Analysis Report

2011 Functional Analysis and Success Monitoring for the Big Tujunga Wash Mitigation Area

Los Angeles County, California



Submitted to:



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

Submitted by:



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1801 Park Court Place
Building B, Suite 103
Santa Ana, California 92701

December 2011

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for the
Big Tujunga Wash Mitigation Area
Los Angeles County, California**

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1.0 INTRODUCTION

1.1 Purpose of the Study

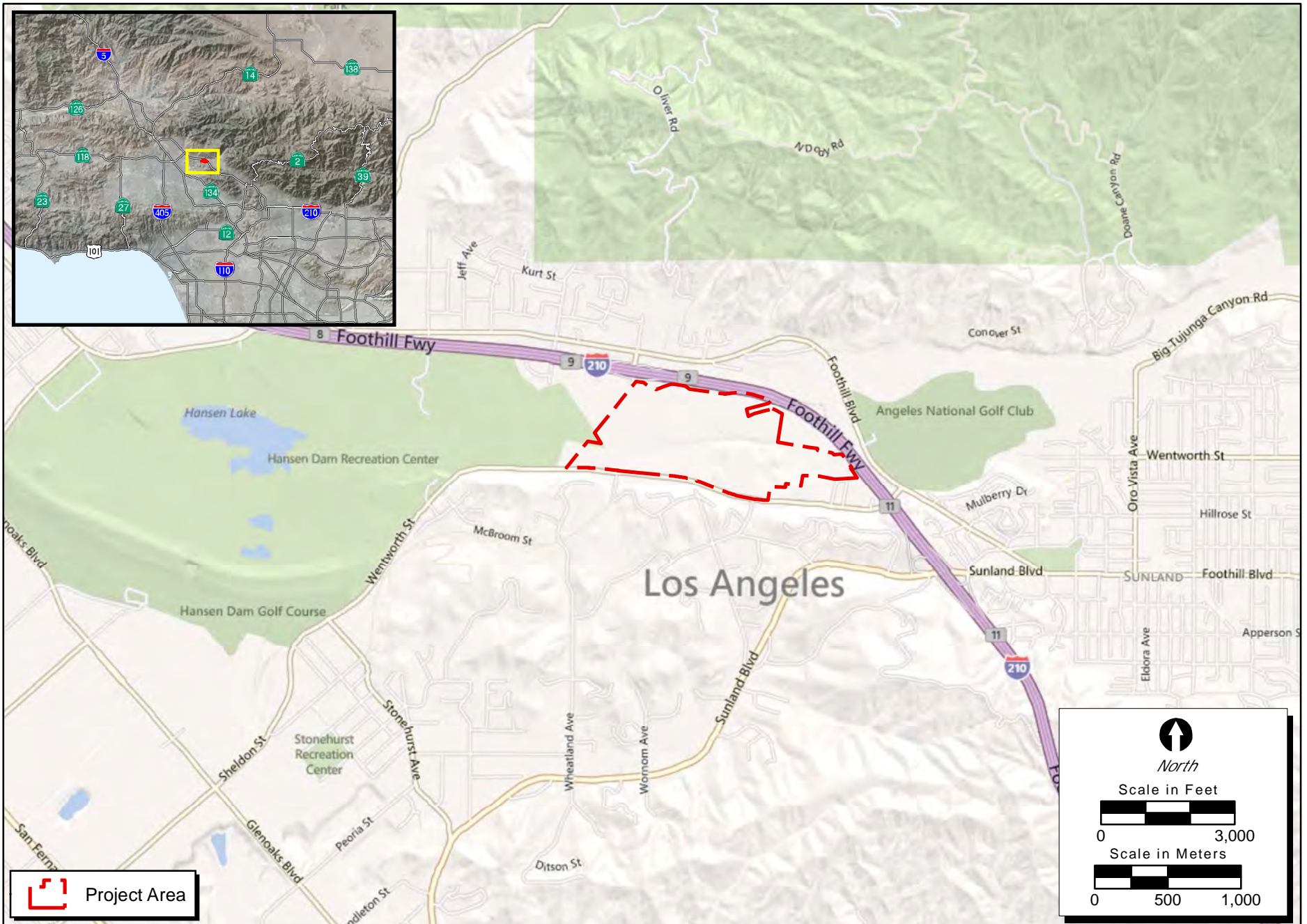
The purpose of this analysis is to use an objective, quantitative method of habitat assessment to compare the functional values of willow riparian habitat in the Big Tujunga Wash Mitigation Area (Mitigation Area) with the baseline functional analysis previously completed on the site (Chambers 1998). The functional analysis is used as a tool to assess the overall success of the habitat restoration program that was initiated in late 2000. Additionally, success monitoring and analysis was implemented in 2009 as a quantitative method to specifically evaluate the performance of the riparian restoration areas. This document includes the results of the functional analysis and the success monitoring for 2011.

1.2 Location and Setting

The Mitigation Area is located in Big Tujunga Wash, just downstream of the Interstate 210 (I-210) freeway overcrossing, near the City of Los Angeles' Sunland area in Los Angeles County's San Fernando Valley. The site is bordered on the north and east by the I-210 and the Tujunga Ponds and on the south by Wentworth Street. The west side of the site is contiguous with the downstream portion of Big Tujunga Wash. Figure 1 depicts the general vicinity of the project and the boundaries of the Mitigation Area.

The Mitigation Area supports two watercourses: the main branch of Big Tujunga Wash (on the north) and the south fork of Big Tujunga Wash, also referred to as Haines Canyon Creek. The main branch of Big Tujunga Wash, which flows downstream from the north, through the middle of the site and then exits the western edge 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, which joins the south fork of Big Tujunga Wash upstream of the Mitigation Area, flows through the site from the eastern boundary. Haines Canyon Creek is a tributary of Big Tujunga Wash that conveys water flow from the south fork of Big Tujunga Wash and Haines Canyon to the main branch of Big Tujunga Wash. Flow in the south fork of Big Tujunga Wash is intermittent and may be fed by groundwater and/or runoff from adjacent residential areas. Perennial flow joins Haines Canyon Creek and the south fork of Big Tujunga Wash at the outlet of the Tujunga Ponds. The two branches of Big Tujunga Wash merge near the western boundary of the Mitigation Area and continue into the Hansen Dam Flood Control Basin, located approximately 0.8 kilometers (km) (0.5 miles [mi]) downstream of the site. The site is wholly 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.

The two Tujunga Ponds are located outside of the Mitigation Area, between the northern boundary of the Mitigation Area and the I-210. The lands where the ponds are located (12.87 acres) are owned by the County of Los Angeles Department of Parks and Recreation. The ponds and surrounding habitat were originally created as mitigation for the construction of the I-210. An underground water source supplies the ponds with a perennial water source. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, the Tujunga Ponds, and other geographic features is shown on Figure 2.



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_ProjectVicinity_v3b_Updated20120229.mxd (ekteethe 3/1/2012)

2/29/2012

Figure 1. Project Location
2010-116 Big Tujunga Wash Mitigation Area



Figure 2. Big Tujunga Wash Mitigation Area

2010-116 Big Tujunga Wash Mitigation Area

2.0 METHODS

2.1 Functional Analysis Design

A modified version of the hydrogeomorphic (HGM) approach was used for the functional assessment of the riparian or floodplain habitat in the Mitigation Area. The logic behind the HGM approach is to compare the wetlands functions of the target sites to a reference standard site determined to have the highest level of functioning (Brinson 1995). By definition, reference standard functions receive an index score of 1.0. Target sites are assigned a score of between 0, for no function, and 1.0 for as high as the reference standard. The crediting and debiting mechanism for Skunk Hollow Mitigation Bank (Stein 1997) was used as a starting point and adapted to be specific for this analysis. Nine evaluation variables were used for the functional assessment of willow riparian habitat:

Riparian Habitat

- Cover (COV)
- Structural Diversity (STD)
- Contiguity (CON)
- Urban Encroachment (URB)
- Percent Exotic Vegetation (EXO)

Hydrologic

- Hydrologic Regime (REG)
- Characteristics of Flood-prone area (FPA)
- Micro and Macro Topographic Complexity (TOP)

Biogeochemical

- Available Organic Carbon (CAR)

In addition to these variables, which evaluate wetlands function, three variables were included to address wildlife values. It is implicit in HGM that wildlife values will be present if the wetlands functions are high. However, for the purpose of this analysis, it was considered desirable to directly compare wildlife values prior to and after enhancement activities. The wildlife evaluation variables are:

Wildlife Values

- Rareness (RAR)
- Wildlife Species Richness (RIC)
- Presence of Habitat Specialists (SPE)

The definitions and scores for each of these evaluation variables are presented in Table 2-1. In order to determine the Functional Units (FU) per acre of the willow riparian habitat system, the 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). Potential mathematical relationships to describe the relationship between evaluation variables (EV) are briefly discussed below.

It is appropriate to sum the scores of the evaluation variables (i.e., $FU = EV1+EV2+.....+EVn$) when habitat value is determined by variables that act independently and when these variables cumulatively increase the value of the habitat. In contrast, a compensatory relationship exists when a variable with a low functional value can be offset by a variable with a high value. In that case the mathematical formula that best expresses the relationship between evaluation variables would be an arithmetic mean (i.e., $FU = (EV1+EV2+.....+EVn)/n$) because the overall habitat value will be equal to the average of the separate evaluation variables. If a compensatory relationship exists between variables but overall functional value is strongly influenced by low values to the extent that if any of the evaluation variables are equal to zero, functional value is equal to zero, then a geometric mean (i.e., $FU = (EV1*EV2 \dots *EVn)^{1/n}$) may be the most appropriate mathematical expression. Finally, if one evaluation variable strongly influences other variables and the value of these other variables is zero when the influential evaluation variable is zero, then it would be appropriate to multiply the dependent criteria by the influential variable.

For most of the evaluation variables used in the riparian model, it was believed that most of the variables acted independently and contributed cumulatively to overall habitat function. Therefore, an additive function was used to describe the relationship between most of the variables with the exception that two of the variables, Percent Exotic Vegetation (EXO) and Hydrologic Regime (REG), strongly influence other variables. For example, the willow riparian habitat variables Structural Diversity (STD) and Cover (COV) both contribute cumulatively to the habitat value and a high value for one does not compensate for a low value for the other. Therefore, it is appropriate to sum the values for these variables. However, exotic vegetation has little habitat value and a site will have little value as habitat if most of the vegetation is exotic, even if STD and COV are high. Therefore, a low score for exotic vegetation (high percentage of exotics) depresses the value of both these variables and it is appropriate to multiply the sum of STD and COV by EXO. We do not propose to multiply the scores for Contiguity (CON) and Urban Encroachment (URB) by EXO, because the habitat values expressed by these variables are somewhat independent of the composition of the vegetation. For example, an undeveloped area dominated by exotic vegetation would still serve as a wildlife movement corridor; therefore, if the site had a high value for CON, this variable would not be depressed by exotic vegetation. Similarly, the negative effects of urban encroachment on habitat (e.g., cats and dogs, human disturbance, noise, invasive lighting) would act independently of exotic vegetation.

The Hydrologic (FPA and TOP) and Biogeochemical (CAR) variables contribute to functional value in an independent and cumulative function and are added. However, all of the functional variables (Riparian Habitat, Hydrologic, and Biogeochemical) are strongly dependent on water. Therefore, all of these variables are multiplied by REG because water is the driving force behind riparian systems. If water is not present (REG=0), the riparian system has no functional value. The exception to this is URB, which is not dependent upon the presence of water. This variable was not multiplied by REG because it is an independent variable.

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:

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

Table 2-1. Riparian Habitat and Hydrogeomorphic Functional Analysis Variables

Value	Variables
Riparian Habitat-Structural Diversity (STD)	
0.0	Site permanently converted to land use that will not be able to support native riparian vegetation, such as housing, agriculture, or concrete channel.
0.2	No existing riparian vegetation (e.g., covered with annual grasses and scrub, bare ground).
0.4	Vegetated areas of the site contain sparse, scattered, patchy, or remnant riparian vegetation that is immature and/or lacks structural (vertical) diversity, and may have exotic plants interspersed in riparian areas.
0.6	The patches of riparian vegetation on the site contain riparian trees and/or saplings (i.e., perennial dicots), but contain no, or poorly developed, shrub understory.
0.8	The patches of riparian vegetation on the site contain riparian trees and saplings, plus a well developed native shrub understory.
1.0	The patches of riparian vegetation on the site are structurally diverse. They contain riparian trees, saplings, and seedlings, as well as developed native shrub understory.
Riparian Habitat – Cover (COV)	
0.0	Site permanently converted to land use not able to support native riparian vegetation, such as housing, agriculture, or concrete channel.
0.2	No existing riparian vegetation (e.g., covered with annual grasses and scrub, bare ground).
0.4	Patches of monotypic riparian vegetation covering up to 50% of the site, interspersed among grasses, exotic plants, or bare ground.
0.6	Patches of diverse riparian vegetation covering up to 30% of the site, interspersed among grasses, exotic plants, or bare ground; AND/OR greater than 50% of the site covered with monotypic patch(es) of riparian vegetation, interspersed among grasses, exotic plants, or bare ground.
0.8	Diverse riparian vegetation covering between 30% and 75% of the site, e.g., strips or islands of riparian habitat interspersed in open space.
1.0	Diverse riparian vegetation (e.g., at least 3 different genera of riparian vegetation present) covering between 75% and 100% of the site.
Contiguity of Habitat (CON)	
0.0	Habitat on site is completely isolated from similar habitat and surrounded by permanent barriers to wildlife movement (e.g., houses).
0.4	Habitat on site is completely isolated from similar habitat by dirt roads or other open space, but there are no permanent barriers to wildlife movement.
0.6	Habitat is partially continuous with similar habitat upstream or downstream of the site, but large open spaces or areas frequented by humans may inhibit wildlife movement.
0.8	Habitat is continuous with similar habitat either upstream or downstream of the site.
1.0	Habitat is continuous with similar habitat upstream and downstream of the site.

Table 2.1 (cont'd). Riparian Habitat and Hydrogeomorphic Functional Analysis Variables

Value	Variables
Urban Encroachment (URB)	
0.0	Habitat is completely isolated from similar habitat due to urban development.
0.2	Habitat has one side contiguous with similar habitat, with remaining sides surrounded by urban development.
0.4	Habitat has two adjacent sides with similar habitat, other remaining sides surrounded by urban development.
0.6	Habitat has two opposite sides with similar habitat, other remaining sides surrounded by urban development.
0.8	Habitat has one side open to urban development.
1.0	Habitat completely surrounded by similar habitat with no evidence of urban development.
Percent of Exotic Invasive Species/Vegetation (EXO)	
0.0	Site is covered by pure stands of exotic invasive vegetation.
0.2	Site is covered by more than 75% exotic invasive vegetation.
0.4	Site is covered by 51 - 75% exotic invasive vegetation.
0.6	Site is covered by 26 - 50% exotic invasive vegetation.
0.8	Site is covered by 10 - 25% exotic invasive vegetation.
1.0	Site is covered by less than 10% of exotic invasive vegetation.
Hydrologic Regime of Riparian Zone (REG)	
0.0	No regular supply of water to the site. Site not associated with any water source, surface drainage, impoundment, or groundwater discharge.
0.2	Water supply to the site is solely from artificial irrigation (e.g., sprinklers, drip irrigation). No natural surface drainage, natural impoundment, groundwater discharge or other natural hydrologic regime.
0.5	Site sustained by natural source of water, but is not associated with a stream, river, or other concentrated flow conduit. For example, the site is sustained by groundwater, or urban runoff. There is no evidence of riparian processes (e.g., overbank flow, scour, or deposition).
0.7	Site is within or adjacent to an impoundment on a natural watercourse which is subject to fluctuations in flow or hydroperiod.
1.0	Site is within or adjacent to a stream, river, or other concentrated flow conduit, which provides the primary source of water to the site. The site contains some evidence of riparian processes such as overbank flow or scour or deposition.
Characteristics of Flood-prone Area (FPA)	
0.0	Channel is contained in a concrete-lined channel, culvert, etc.
0.2	Channel has an earthen bottom; however, it is structurally confined (e.g., riprap or concrete sideslopes).
0.4	Channel has an earthen bottom and earthen side slopes; however, it is incised or confined such that the flood prone area would be subject to overbank flow only during extreme flow events (e.g., greater than a 50-year flood event).
0.6	Channel has an earthen bottom and earthen side slopes and is mildly incised or confined such that the flood prone area would be subject to periodic overbank flow (e.g., during a ten-year flood event).

Table 2.1 (cont'd). Riparian Habitat and Hydrogeomorphic Functional Analysis Variables

Value	Variables
Characteristics of Flood-prone Area (FPA) [cont'd]	
0.8	Site is part of a flood plain which provides an opportunity for overbank flow during moderate flow events (e.g., during a two- to ten-year flood event).
1.0	Site is a natural channel with little to no evidence of incision or confinement.
Micro and Macro Topographic Complexity (TOP)	
0.0	Channel is contained in a concrete-lined channel, culvert etc., which has no natural micro or macro topographic features.
0.2	Flood prone area is characterized by a homogenous, flat earthen surface with little to no micro and macro topographic features.
0.6	Flood prone area contains micro and/or macro topographic features such as ponds, hummocks, bars, rills, and large boulders, but is predominantly homogeneous or flat surface.
1.0	Flood prone area is characterized by micro and macro topographic complexity such as pits, ponds, hummocks, rills, large boulders, etc.
Available Organic Carbon (CAR)	
0.0	Site is contained in a concrete-lined channel that contains no detritus.
0.2	Site is contained in a concrete-lined channel that contains some detritus.
0.4	Site contains less than 5% relative cover of debris, leaf litter, or detritus in channel.
0.6	Site contains between 5% and 25% relative cover with debris, leaf litter, or detritus.
0.8	Site contains between 26% and 60% relative cover with debris, leaf litter, or detritus.
1.0	Site contains over 60% relative cover with debris, leaf litter, or detritus.
Rareness - Listed and sensitive species (RAR)	
0.0	No listed or sensitive species observed or known to occur on site; no suitable habitat.
0.2	No listed or sensitive species observed or known to occur on site; limited suitable habitat exists.
0.4	No listed or sensitive species observed or known to occur on site. Suitable habitat present on the site.
0.6	Listed threatened or endangered species and/or sensitive species reported on the site in the past but not observed during the 2010 monitoring and maintenance activities (no 2010 focused surveys). Suitable habitat still present on the site.
1.0	One or more sensitive or listed endangered or threatened species observed on the site during the 2010 monitoring and maintenance activities (no 2010 focused surveys). Suitable habitat present on the site.
Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	
0.0	Less than 10 species of wildlife detected during monitoring and maintenance activities (no 2010 focused surveys).
0.2	Between 11 and 30 species of wildlife detected during monitoring and maintenance activities (no 2010 focused surveys).
0.5	Between 31 and 50 species of wildlife detected during monitoring and maintenance activities (no 2010 focused surveys).
0.7	Between 51 and 60 species of wildlife detected during monitoring and maintenance activities (no 2010 focused surveys).

Table 2.1 (cont'd). Riparian Habitat and Hydrogeomorphic Functional Analysis Variables

Value	Variables
Terrestrial Wildlife (Vertebrate) Species Richness (RIC) [cont'd]	
1.0	Over 60 species of wildlife detected during monitoring and maintenance activities.
Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	
0.0	No habitat specialists observed on the site.
0.2	1 to 5 habitat specialists observed on the site.
0.6	5 to 10 habitat specialists observed on the site.
1.0	Greater than 10 habitat specialists observed on the site.

2.2 Functional Analysis Methods

2.2.1 Data Collection

Four of the habitat and hydrologic evaluation variables apply to the site as a whole and did not require the collection of additional field data. These criteria are CON, URB, REG, and Characteristics of the Flood-prone Area (FPA). These criteria were scored based on the overall characteristics of the Mitigation Area.

The evaluation criteria derived from additional field sampling were STD, EXO, Micro and Macro Topographic Complexity (TOP), COV, Available Organic Carbon (CAR), Rareness (RAR), Terrestrial Wildlife Species Richness (RIC), and Presence of Habitat Specialists (SPE).

STD and EXO were scored primarily from measurements made using the point-centered quarter method (Mueller-Dombois and Ellenberg 1974; Cox 1996). In this method of vegetation sampling, the distance to the mid-point of the nearest tree and the nearest shrub from the sampling point is measured in four directions (one in each of the four quarters established at the sampling point through a cross formed by two perpendicular lines through the point). This method yields quantitative data for number of species, density of each species, and density of shrubs and trees (vegetation layers). These data can then be used to derive scores for STD and EXO. Additionally, at each sampling point, a transect was used to determine the density of topographic features. For the purpose of this analysis, a topographic feature was defined as a feature (boulder, pit, hummock, etc.) that is greater than one foot in height or size. The length of the transect was either the distance to the farthest tree or shrub as measured by the point-centered quarter method or 10 meters (m) (32.8 feet [ft]) from the sampling point, whichever was greater. Because a tape measure had to be laid out to measure the distance to the nearest tree or shrub in each quarter, this measurement was used as the transect line when it was long enough to measure density of features. However, in dense riparian brush, this distance may be very short. In that instance, a separate 10-m transect to count topographic features was conducted. Finally, at each sampling point a 1-square meter (m²) (3.3-ft²) quadrat was analyzed to count seedlings and saplings (part of score for STD and EXO) and to measure cover of debris, leaf litter, and detritus, all of which comprise CAR.

A stratified random sampling scheme was used to avoid biased data collection. The points were selected by dividing the Mitigation Area willow riparian habitat into grid segments, each 91.4 m (300 ft) in length and width. The grid was drawn over a scanned aerial photograph of the site. A stratified random method was used to select 10 grid segments throughout the willow riparian

habitat. Two sampling points were selected within each of the 91.4-m (300-ft) grid segments for point-centered quarter samples, quadrats, and transects. The first point was selected by walking into the approximate center of the predetermined grid segment. The second point was determined by randomly selecting a compass direction and a number of paces selected from a random number generator. The surveyors then walked the selected number of paces in the selected compass direction. Each point became the center of the point-centered quarter measurements, the topographic features transect, and the one-meter square quadrat. Using this sampling scheme, 20 1-m² (3.3-ft²) quadrats and 20 transects were conducted, with 80 trees and 80 shrubs measured, in the willow riparian areas of the Mitigation Area. All tree and shrub species were identified on site using the Jepson Manual (Hickman 1993) and recorded in order to develop a compendium of plant species that occur in the Mitigation Area willow riparian habitat. The sampling point locations for the Mitigation Area are shown in Figure 3; these sampling points were selected during initiation of the habitat restoration program in late 2000 (Chambers 2000). Field sampling for functional analysis was conducted on the site on July 28 and 29, 2011.

Two classifications of vegetation (trees and shrubs) were included in the point-centered quarter measurements in the willow riparian habitat. The distance to the mid-point of the closest tree, defined as a woody plant of average to tall height (i.e., greater than 2 m [6.6 ft]) originating from a single base, was measured for each quarter of the sampling point. The distance to the mid-point of the nearest shrub, defined as a plant of small to medium height (i.e., between 0.5 and 2 m [1.6 and 6.6 ft]) with a woody base, was also measured for each quarter. Young individuals of the genus *Salix* were considered a shrub if its growth pattern was multi-branched at the base and the individual had not attained a height over 2 m (6.6 ft). The estimated diameter of the canopy of each tree and shrub included in the distance measurement was also recorded to determine aerial cover.

The understory in many of the selected willow riparian sampling locations in the Mitigation Area was impassable due to dense vegetation or steep topography. For those locations, the distance randomly selected to be walked to determine the second sampling point was estimated and the sampling point was then accessed by an alternate route. Alternately, the distance was modified by reducing the number of paces in the selected compass direction to a passable extent.

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Area\MAPS\Mitigation_Analysis\Tujunga_Function_Sampling_2010_updated\20120229.mxd (6/6/12 2/29/2012)



Figure 3. Functional Analysis Sampling Points

2010-116 Big Tujunga Wash Mitigation Area

Aerial Date: March 2008
Map Date: 2/29/2012

2.2.2 Data Analysis

Functional analysis values for STD, COV, TOP, and CAR were determined by analyzing data collected for the willow riparian habitat at the Mitigation Area. Presentation of both calculations and analyzed data has been slightly modified from previous reports to provide a more relevant analysis of the willow riparian habitat.

Density

Density, a component of STD, was calculated based on the point-centered quarter method of vegetation sampling where the distance from the center of the quadrat to the mid-point of the nearest shrub or tree was recorded for each of the four quarters (Mueller-Dombois and Ellenberg 1974; Cox 1996). Absolute density for all shrubs and for all trees per unit area was determined by the formula:

$$\text{Absolute (total) density of all species (plants/area)} = \frac{\text{Area}}{D^2}$$

where area is 4,046.9 m² (1 acre) and D is the mean distance. Density for a group of species (e.g., native shrubs, native trees, etc.) could then be determined using the following formula:

$$\text{Absolute (total) density of a group of species (plants/area)} = \frac{\text{Number of individuals of a group of species}}{\text{Total number of individuals of all species}} * \text{Absolute (total) density of all species}$$

Relative density for a group of species, expressed as a proportion of all species present per unit area, was calculated by the formula:

$$\text{Relative density (\%)} = \frac{\text{Absolute (total) density of a group of species}}{\text{Absolute (total) density of all species}} * 100$$

which can be further simplified as follows:

$$\text{Relative density (\%)} = \frac{\text{Number of individuals of a group of species}}{\text{Total number of individuals of all species}} * 100$$

At the community level, relative density of the two vegetation classes (trees and shrubs) can be determined using previously calculated densities:

$$\text{Relative density} = \frac{\text{Absolute (total) density of vegetation class}}{\text{Total (sum) of absolute densities for all classes}} * 100$$

which illustrates spatial distribution of trees and shrubs in the community per unit area.

Vertical Structure

Another component of STD involves the vertical variety of the vegetation. As an aid in estimating vertical structural diversity, heights of tree and shrubs encountered at each sampling point were estimated and classified into categories as follows:

Height of Tree or Shrub	Classification
< 2 m (< 6.6 ft)	1
2 – 4 m (6.6 – 13.1 ft)	2
> 4 m (> 13.1 ft)	3

Dominance (Percent Cover)

Dominance was used to determine COV. Absolute dominance refers to the area covered by the crown of a group of species per unit area, which is a measure of cover. Absolute dominance of a group of species was calculated by the following formula:

$$\text{Absolute (total) dominance of a group of species (m}^2\text{/area)} = \text{Absolute (total) density of a group of species} * \text{average dominance value for that group of species}$$

where the average dominance value for a species is the average area covered by the crown for one individual of that group of species.

Dominance for an individual species or for a group of species (e.g., native trees) can be expressed as a percent cover by the dividing the total absolute dominance value for that species or group by the unit area (4,046.9 m² [1 acre]) and multiplying the result by 100:

$$\text{Absolute dominance (percent cover)} = \frac{\text{Absolute (total) dominance of a group of species}}{\text{Area}} * 100$$

Relative dominance, or the percent dominance of a group of species relative to the dominance of all groups, is expressed as:

$$\text{Relative dominance (\%)} = \frac{\text{Absolute (total) dominance of a group of species}}{\text{Total (sum) of absolute dominance values for all groups}} * 100$$

Percent Organic Cover

CAR was estimated by visually estimating the percentage of organic debris, leaf litter, and detritus within the boundaries of each quadrat. These values were averaged to examine the total potential available organic carbon in the habitat.

Topography

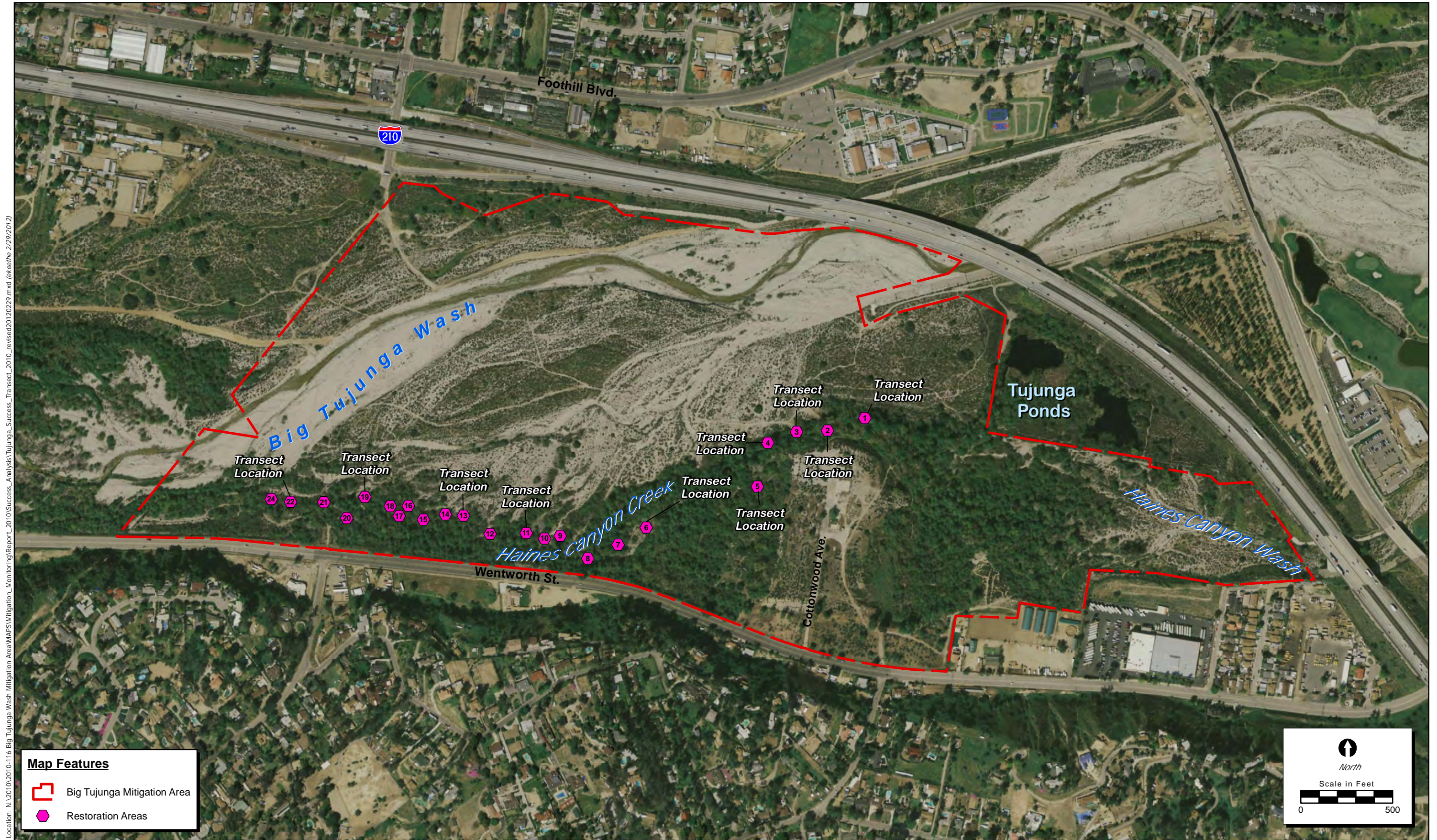
TOP was determined by scoring the number of rocks, ridges, slopes, or other geographic units measuring 0.3 m (1 ft) or higher about the ground surface along a 10-m (32.8-ft) transect line (or farthest distance as measured by the point-centered quarter method). Possible scores range from a value of 0 for a flat topography with no rocks or boulders to a value of 2 or greater for a transect with numerous boulders and/or slopes. Scores were averaged to determine a mean value per 100 linear meters (328.1 linear feet).

2.3 Success Monitoring and Analysis Methods

In order to provide a more thorough assessment of the willow riparian habitat and specifically monitor and measure the success of the updated revegetation efforts (ECORP 2008b), a second analysis methodology was implemented. This success analysis of vegetation within the

Mitigation Area included (1) estimation of total percent cover by desired and weedy (undesired) species for all restoration areas through visual reconnaissance, and (2) detailed analysis of growth, cover, height, and viability through a minimum of 40 percent sampling of the 23 restoration areas using point transect methods (10 restoration areas). Twenty-four restoration areas were originally created within the Mitigation Area. However, when the habitat restoration plan was initiated in 2000, only 23 of the areas were included for monitoring (areas 1 through 22 and 24). Point transect lines, either 7.6 or 15.2 m (25 or 50 ft) in length, dependent on the area dimensions, were established in the 10 selected restoration areas (areas 1 through 6, 11, 13, 19, and 22). At each 0.3-m (1-ft) interval along the transect, a point was projected vertically into the vegetation using a thin demarcated rod. Each species intercepted on the rod was recorded and classified according to vegetation layer. Three layers were identified: a ground layer for vegetation less than 0.5 m (1.6 ft) in height, a shrub layer for vegetation 0.5 to 2 m (1.6 ft to 6.6 ft) in height, and a tree layer for vegetation over 2 m (6.6 ft). Coverage of native and non-natives within a vegetation layer was determined by dividing the number of hits for the species group by the total number of hits for the layer. Presence of natives, non-natives, and bare ground were also noted at each transect point for determination of native, non-native, and overall vegetation cover (i.e., both natives and non-natives). Transect lines were established to best represent the restoration area as determined by the monitor.

Plant vigor, recruitment, and patterns of growth within the restoration areas were noted and documented along with the quantitative measurements described above. Aggregations of individual plants or species into stands or zones provide important information relating to (1) gradients in physical parameters within the area, or (2) interactions with neighboring species (including wildlife). Photographic records were kept of all restoration areas for purposes of comparing earlier and later stages of plant establishment and growth. Set photographic documentation points were utilized for each survey for consistency in photographic comparisons. All plant species were identified on site using the Jepson Manual (Hickman 1993) and recorded to develop a compendium of plant species that occur in the Mitigation Area willow riparian habitat. The transect locations within the sampled restoration areas for the Mitigation Area are shown in Figure 4. Field sampling for the success analysis was conducted in the Mitigation Area on July 27, 2011.



Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Area\MAPS\Mitigation_Report_2010\Success_Analysis\Tujunga_Success_Transect_2010_revised20120229.mxd (sketch 2/29/2012)

Figure 4. Success Analysis Transect Locations

2010-116 Big Tujunga Wash Mitigation Area

*Aerial Date: March 2008
Map Date: 2/29/2012*

3.0 RESULTS

3.1 Functional Analysis Results

Approximately 71 trees and 212 shrubs per acre were found in the willow riparian habitat at the Mitigation Area. Approximately 98 percent of the trees and 80 percent of the shrubs encountered were native species. The tree canopy forms a dense multi-layered canopy throughout the site in most areas (116.5% cover overall) and shrubs form an open understory of approximately 6 percent cover. The relative density of trees and shrubs at the community level was approximately 25 percent trees and 75 percent shrubs. However, overall tree cover dominated the community with a relative dominance value of approximately 95 percent. The results for overall density, relative density, dominance (percent cover), and relative dominance for the Mitigation Area willow riparian habitat are summarized in Table 3-1.

Table 3-1. Density, Relative Density, Dominance, and Relative Dominance

	Density (# plants/acre)	Relative Density (% of total community)	Dominance (Percent Cover)	Relative Dominance (% of total community)
Native Species				
Trees	68.7	97.5	116.0	99.1
Shrubs	170.1	80.3	6.3	97.8
Non-Native Species				
Trees	1.8	2.5	1.1	0.9
Shrubs	41.8	19.7	0.1	2.2
Summary All Species				
Trees	70.5	24.9	116.5	95.2
Shrubs	211.9	75.1	5.8	4.8

Overall organic cover was moderate at approximately 54 percent; however, cover of annual grasses was relatively low at approximately 17 percent. The average number of topographic features encountered per 100 m (328.1 ft) was approximately 14. The average tree height analysis (2.9 category units) indicated that most trees on the site are greater than 4 m (13.1 ft) in height with some falling into the 2 to 4 m (6.6 to 13.1 ft) height range. The results of percent organic cover, percent annual grass cover, tree height, and average topography score measurements for the willow riparian habitat within the Mitigation Area are summarized in Table 3-2.

Table 3-2. Percent Organic Cover, Annual Grass Cover, Average Tree Height, and Average Number of Topographic Features

Percent Organic Cover	Percent Cover of Annual Grass	Average Tree Height (Category units)	Average Topography Features (per 100 m)
53.6	17.2	2.9	13.7

Standardized data sheets used during functional analysis field sampling are found in Appendix A and a compendium of all plant species encountered, including trees and shrubs, in the willow riparian habitat is found in Appendix B.

3.2 Qualitative Descriptions and Determination of Functional Values

Structural Diversity (STD)	
Score	Criteria
0.7	0.6 - The patches of riparian vegetation on the site contain riparian trees and/or saplings (i.e., perennial dicots), but contain no, or poorly developed, shrub understory. 0.8 - The patches of riparian vegetation on the site contain riparian trees and saplings, plus a well-developed native shrub understory.

The site contains a well-developed native tree component with most native trees greater than 4 m (13.1 ft) in height, with some falling into the 2 to 4 m (6.6 to 13.1 ft) height range (2.95 category units for native trees). The density of native shrubs is moderate at 170 plants per acre, and native tree density is at 69 individuals per acre. Native tree canopy cover is approximately 116 percent overall; this result of cover greater than 100 percent reflects layering within the tree canopy. However, native shrubs comprise only about 6 percent cover in the understory. Despite the apparently underdeveloped understory, native shrubs are well-represented with a relative dominance value of approximately 98 percent. A score of 0.7 was selected to best represent the structural diversity in this habitat.

Riparian Habitat - Cover (COV)	
Score	Criteria
1.0	Diverse riparian vegetation (e.g., at least 3 different genera of riparian vegetation present) covering between 75% and 100% of the site.

Riparian vegetation on the site is diverse with a total of 20 native species represented (17 different genera). Trees in the willow riparian habitat had an average aerial cover (dominance value) of approximately 68.3 m², which is consistent with the multi-layered cover value of approximately 116 percent in the native tree canopy. Relative dominance of native trees in the Mitigation Area willow riparian habitat is approximately 99 percent. Native shrubs provided 1.5 m² of aerial cover, on average, creating an open understory of approximately 6 percent cover. Therefore, a score of 1.0 was assigned to this variable.

Contiguity of Habitat (CON)	
Score	Criteria
1.0	Habitat is continuous with similar habitat upstream and downstream of the site.

The willow riparian habitat is continuous with similar habitat both upstream in the Tujunga ponds and downstream beyond the property boundaries. Therefore, a score of 1.0 was selected for this variable.

Urban Encroachment (URB)	
Score	Criteria
0.6	Habitat has two opposite sides with similar habitat, other remaining sides surrounded by urban development.

The I-210 freeway forms the boundary of the willow riparian habitat at the extreme east end of the site near the Tujunga Ponds. The majority of the habitat downstream of the ponds is bordered by residential and commercial urban developments along Wentworth Street. Relatively undisturbed alluvial habitat forms the habitat's north boundary and a portion of the south boundary in the east portion of the site. Finally, the habitat is contiguous with similar habitat at the site's extreme western end. Although the urban encroachment is not strictly limited to two opposite sides, the score of 0.6 best describes the amount and position of urban development around the site.

Percent of Exotic Invasive Species/Vegetation (EXO)	
Score	Criteria
1.0	Site is covered by less than 10% of exotic invasive vegetation.

A variety of non-native species occur within the willow riparian habitat including castor bean (*Ricinus communis*), sticky eupatory (*Ageratina adenophora*), evergreen ash (*Fraxinus uhdei*), giant reed (*Arundo donax*), and tree of heaven (*Ailanthus altissima*); however, overall cover of exotic invasive species was low at approximately 1 percent for exotic tree species and less than 1 percent for exotic shrub species. A score of 1.0 was therefore assigned to this variable.

Hydrologic Regime of Riparian Zone (REG)	
Score	Criteria
1.0	Site is within or adjacent to a stream, river, or other concentrated flow conduit, which provides the primary source of water to the site. The site contains some evidence of riparian processes such as overbank flow or scour or deposition.

The willow riparian habitat is adjacent to Haines Canyon Creek, a perennial stream that is the primary source of water to the site. Evidence of deposition was also observed. Consequently, a score of 1.0 was assigned to this variable.

Characteristics of Flood-prone Area (FPA)	
Score	Criteria
0.8	Site is part of a flood plain which provides an opportunity for overbank flow during moderate flow events (e.g., during a two- to ten-year flood event).

The hydrological assessment for the Big Tujunga Wash has not changed since the initial analysis completed in 1997 (Chambers 1998). The site is part of a flood plain that experiences overbank flow; therefore, a score of 0.8 was assigned to this variable.

Micro and Macro Topographic Complexity (TOP)	
Score	Criteria
0.8	0.6 - Flood-prone area is characterized by micro and macro topographic features such as ponds, hummocks, bars, rills, and large boulders, but is predominantly homogeneous or flat surface. 1.0 - Flood prone area is characterized by micro and macro topographic complexity such as pits, ponds, hummocks, rills, large boulders, etc.

The data analysis determined that approximately 14 topographic features are present per 100 m (328.1 ft). A score of 0.8 assigned to this variable best represents the topographic complexity, which includes some areas of relatively flat surface present in the willow riparian habitat.

Available Organic Carbon (CAR)	
Score	Criteria
0.9	0.8 - Site contains between 26% and 60% relative cover with debris, leaf litter, or detritus. 1.0 - Site contains over 60% relative cover with debris, leaf litter, or detritus.

A moderate amount of available organic carbon in the form of organic debris, leaf litter, and detritus was present on the site. Twelve of the 20 quadrats had 50 percent or greater cover of organic carbon, and average cover overall was approximately 54 percent. Because the average amount of organic carbon for the site was close to 60 percent, a score of 0.9 was assigned to this variable.

Rareness - Listed and Sensitive Species (RAR)	
Score	Criteria
1.0	One or more sensitive or listed endangered species and/or sensitive species observed on the site during monitoring and maintenance activities (no 2011 focused surveys). Suitable habitat present on the site.

A total of 1 listed and 5 sensitive wildlife species were observed on site during 2011. Santa Ana sucker (*Catostomus santaanae*), a federally listed threatened fish species and a California Species of Special Concern (SSC) (CDFG 2011a; CDFG 2011b), were found along the upper and lower portions of Haines Canyon Creek. Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3) and arroyo chub (*Gila orcuttii*), both SSCs, were also observed in Haines Canyon Creek. One southwestern pond turtle (*Actinemys marmorata pallida*), a SSC, was observed in the Tujung ponds. Other sensitive species observed in the Mitigation Area during monitoring and maintenance activities include yellow warbler (*Dendroica petechia brewsteri*), a SSC, and Cooper's hawk (*Accipiter cooperii*), a California Department of Fish and Game (CDFG) Watch List (WL) species (no focused surveys in 2011). Due to the detection of 6 listed and/or sensitive wildlife species and presence of suitable habitat, a score of 1.0 was assigned to this variable.

Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	
Score	Criteria
0.6	0.5 - Between 31 and 50 species of wildlife detected during monitoring and maintenance activities (no 2011 focused surveys). 0.7 - Between 51 and 60 species of wildlife detected during monitoring and maintenance activities (no 2011 focused surveys).

A total of 66 wildlife species were detected in 2011, including 1 mollusk, 1 crustacean, 4 insects, 9 fishes, 2 amphibians, 5 reptiles, 40 birds, and 4 mammals. After removing mollusks', crustaceans, insects, fish, and domestic mammals, 50 of the 66 species represent terrestrial vertebrate wildlife species that are included in the score for this variable. Therefore,

the willow riparian habitat was assigned a score of 0.6 for this variable. A compendium of all wildlife species observed or detected in the Mitigation Area in 2011 is found in Appendix C.

Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	
Score	Criteria
0.8	0.6 - 5 to 10 habitat specialists observed on the site.
	1.0 - Greater than 10 habitat specialists observed on the site.

A total of 7 habitat specialists, wildlife species that have specific habitat requirements, were observed on site during 2011. These include pied-billed grebe (*Podilymbus podiceps*), green heron (*Butorides virescens*), Nuttall’s woodpecker (*Picoides nuttallii*), downy woodpecker (*Picoides pubescens*), yellow warbler, common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*).

The pied-billed grebe is a small diving bird that requires seasonal or permanent ponds with dense stands of emergent vegetation, bays and sloughs for breeding. The green heron is found in small wetlands in low-lying areas and only breeds in thick swampy vegetation. The common yellowthroat is a small song bird that is associated with low, dense vegetation near water. Red-winged blackbirds breed in emergent vegetation near open water. The pied-billed grebe, green heron, common yellowthroat, and red-winged blackbirds were found in and around the Tujung ponds.

The Nuttall’s woodpecker is associated with oak and riparian woodlands and the downy woodpecker is found in open deciduous woodlands, especially in riparian areas. The yellow warbler is typically found in wet, deciduous thickets, especially willows. All of these species were observed in the willow riparian habitat throughout the site. Nuttall’s woodpecker was also observed within the oak woodland habitat on site.

The wildlife species detected in 2011 were a result of incidental observations made during exotic species removal efforts and trail maintenance visits. Due to the observation of 7 habitat specialists, this variable was assigned a score of 0.8.

3.3 Calculation of Functional Units and Functional Unit Capacity

The algorithm used to obtain a functional unit value for the willow riparian habitats is:

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

The calculation for the FU value for the willow riparian habitat is therefore:

$$FU_{\text{willows}} = \frac{(((0.7 + 1.0) 1.0 + 1.0 + 0.9 + 0.8 + 0.8) 1.0 + 0.6 + 1.0 + 0.6 + 0.8)}{10}$$

For the willow riparian habitat, the FU is calculated to be 0.82 per acre.

To calculate the total FCU for the willow riparian habitat in the Mitigation Area, the following formula was used:

$$FCU_{\text{Big T}} = FU_{\text{willows}} (\text{acres of willow riparian habitat})$$

In previous functional analysis reports for the Mitigation Area, a total of 76.0 acres of willow riparian habitat was used to calculate the FCU. However, in 2009, the habitats in the Mitigation Area were remapped in order to create a new vegetation map. The number of acres of willow riparian habitat present in 2009 was then recalculated using GIS. In order to get a more accurate estimate of the acres of willow riparian habitat, GIS was also utilized to subtract the number of acres encompassed by the trails through the willow riparian habitat. The resulting total acreage for willow riparian habitat currently present in the Mitigation Area is 91.2 acres. This is an increase over what was originally mapped in 1997. This increase likely occurred because areas in which large stands of exotic plant species were removed in 2000 and 2001 have filled in with willow riparian habitat. Therefore, based on the new acreage of 91.2 acres, the total FCU for willow riparian habitat in the Mitigation Area in 2011 is:

$$FCU_{\text{Big T}} = (0.82_{FU_{\text{willows}}})(91.2 \text{ acres of willow riparian habitat}) = 74.78$$

3.4 Discussion and Comparison of Functional Values

The FCU value of the willow riparian habitat in the Mitigation Area decreased by 1.83 units from 76.61 units in 2010 to 74.78 units in 2011. The FU value between 2010 and 2011 also decreased slightly from 0.84 to 0.82, respectively. This decrease in the FU value was likely due to the fact that the scores for RIC and SPE had decreased this year. However, this decrease is a result of focused wildlife surveys not being conducted in 2011 and not a result in a reduction in the number of species that utilize the site. The repeated visits conducted by biologists during the focused survey season allows for the development of a much larger species list. The decrease in the FU value was largely offset by the increased scores for CAR and TOP. Despite the increases in both the amount of available carbon and the topographic complexity of the Mitigation Area, the FU value for 2011 was only slightly higher than the baseline value in 1997. A subsequent major decrease in the FCU value for 2011 was offset by the increase in the number of acres of willow riparian habitat. Prior to 2009, the number of acres of willow riparian habitat that was mapped in 1997 was used for the FCU calculation (76.0 acres). The increased acreage of willow riparian habitat (91.2 acres) explains why the functional unit capacity in 2011 remains relatively high.

The FCU calculated in 2011 is approximately 25 percent greater than that of baseline conditions recorded in 1997. Table 3-3 presents a comparison of FCU values for each variable in 1997 (baseline), 2001, 2008, 2009, 2010, and 2011.

Table 3-3. Comparison of Functional Capacity Values

Variable	2011	2010	2009	2008	2001	1997
Structural Diversity (STD)	0.7	0.7	0.8	0.8	0.7	0.7
Riparian Habitat Cover (COV)	1.0	1.0	1.0	1.0	0.8	1.0
Percent of Exotic Invasive Species/Vegetation (EXO)	1.0	1.0	0.8	1.0	1.0	0.8
Contiguity of Habitat (CON)	1.0	1.0	1.0	1.0	1.0	1.0
Available Organic Carbon (CAR)	0.9	0.8	1.0	1.0	1.0	1.0
Characteristics of Flood-prone Area (FPA)	0.8	0.8	0.8	0.8	0.8	0.8
Micro and Macro Topographic Complexity (TOP)	0.8	0.7	0.7	0.7	0.9	0.8
Hydrologic Regime of Riparian Zone (REG)	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
Rareness – Listed and Sensitive Species (RAR)	1.0	1.0	1.0	1.0	1.0	1.0
Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	0.6	0.8	1.0	1.0	1.0	0.7
Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	0.8	1.0	1.0	0.6	0.6	0.9
FU	0.82	0.84	0.85	0.88	0.84	0.79
Acres	91.2	91.2	91.2	76.0	76.0	76.0
FCU	74.78	76.61	77.52	66.88	63.84	59.74

Although the score for COV remained at the highest possible value of 1.0, cover in the willow riparian habitat increased substantially since 2010. Currently, native tree cover is approximately 116 percent, whereas in 2010 cover was only 78 percent with half as much average aerial cover (only 47.7 m² in 2010 versus 68.3 m² in 2011). This increase is likely due to the open areas created by the non-native (exotic) plant removal effort, which enabled native species to become further established in the willow riparian habitat. The removal of non-native plant species began again in late 2009 once the revised Streambed Alteration Agreement was issued by the CDFG. As a result, cover of non-native trees and shrubs has decreased steadily since the effort was reinitiated; non-native trees and shrubs provided 8.0 and 0.7 percent cover, respectively, in 2010 but only 1.0 and 0.1 percent in 2011. However, the 2011 score for EXO did not change as it had already reached the highest possible value in 2010. This decrease in non-native cover and subsequent maximum EXO score has significantly reduced competition for space, allowing natives to extend their reach into areas previously monopolized by non-natives. Although the score for STD remained unchanged and the native shrub understory appears poorly developed (6.3% cover), it should be noted that cover has increased 50 percent from 2010 (only 3.8% cover). A total of 12 native shrub species were present this year whereas only 9 species were detected in 2010.

The amount of debris, leaf litter, and detritus, although still lower than that in 2009 (84.3%), increased substantially from approximately 34 percent in 2010 to 54 percent this year. As a result, the score for CAR also increased from 2010 and is again approaching the highest

possible value. This change can be attributed to a larger source of carbon present in the Mitigation Area. As riparian cover increased so did the amount of vegetative debris, leaf litter, and detritus that accumulated on the ground. The accumulation of carbon-rich materials also partially explains the increased score for TOP. The willow riparian habitat currently includes approximately 14 topographic features per 100 meters, whereas only 10 features were measured in 2010. During field sampling, it was noted that debris, leaf litter, and detritus had accumulated, often at the base of vegetation, creating hummocks. Other topographic features appeared to be the result of recent sedimentation events.

The score for RAR has not changed since the implementation of the functional analysis; however, the number of listed and/or sensitive wildlife species observed has decreased over the last two years. A total of 12 sensitive wildlife species were observed in the Mitigation Area in 2009 whereas 10 sensitive species were observed in 2010 and only 6 sensitive species were observed this year. This is likely a reflection of the absence of focused wildlife survey tasks in 2010 and 2011; focused surveys were last conducted in 2009. Focused sensitive wildlife surveys for native fish, least Bell's vireo, southwestern willow flycatcher, and arroyo toad are only required every 3 years during the long-term monitoring phase of the Mitigation and Monitoring Plan (MMP). These focused surveys provide additional opportunities for species observation. All listed and/or sensitive wildlife species detections this year were incidental observations made during non-native plant removal efforts and quarterly maintenance visits. This decrease in observation opportunities also resulted in an overall decrease in species richness. Ninety-eight terrestrial wildlife species were detected in the Mitigation Area in 2009. Fifty-five terrestrial wildlife species were detected in 2010 and only 50 species were detected this year. The score for RIC decreased to 0.6 as a result. It should be noted, however, the number of sensitive wildlife species this year is greater than that observed in 2008, which also lacked focused surveys.

The score for SPE decreased from 1.0 over the last two years to 0.8 in 2011. This is a result of a decrease in the number of habitat specialists; only 7 species were detected this year. Again, this is undoubtedly due to the lack of focused wildlife surveys, as they were not required in 2011 and thus a subsequent decrease in observation opportunities. Habitat specialists that have been consistently recorded at the site since 2003, including common moorhen (*Gallinula chloropus*), belted kingfisher (*Ceryle alcyon*), Wilson's warbler (*Wilsonia pusilla*), and double-crested cormorant (*Phalacrocorax auritus*), likely continue to utilize the site, but are unlikely to be detected except during focused wildlife surveys.

In conclusion, the FCU value decreased slightly, as a result of the declines in both species richness and number of habitat specialists (RIC and SPE). The lower scores for both RIC and SPE can be attributed to the lack of focused surveys conducted in the Mitigation Area, limiting the number of wildlife observations. However, there was an increase in the scores for CAR and TOP, indicating that available organic carbon and topographical complexity are improving in the Mitigation Area. These improvements can be attributed to the increase in native cover since 2010; tree cover increased approximately 49 percent and shrub cover increased 50 percent. Species richness, as well as the number of sensitive species and habitat specialists present, is expected to increase next year when focused surveys are again conducted. As a result, the improved functional value of the Mitigation Area riparian habitat for wildlife will become apparent in 2012.

3.5 Success Analysis Results

Plant cover was determined for both native and non-native species at each of the three vegetation layers (tree, shrub, and ground) and results are presented in Table 3-4. Native tree species comprised a relatively open tree layer with approximately 35 percent cover; no non-native trees were present in the restoration areas. The shrub layer was poorly developed with native species accounting for approximately 5 percent and non-natives for 3 percent. Ground cover was dominated by non-native species (75.2%) while cover of natives was approximately 8 percent.

Table 3-4. Percent Cover by Vegetation Layer and Plant Category

Vegetation Layer	Percent Cover	
	Native	Non-native
Tree	35.2	0.0
Shrub	4.5	2.5
Ground	8.3	75.2

Additionally, total percent cover in the restoration areas was determined for native and non-native species. Non-native plant cover was very high at approximately 91 percent cover; native plant cover was relatively moderate (44.4%). Bare ground accounted for approximately 4 percent of the restoration areas sampled. Combined coverage of all three vegetation components was greater than 100 percent as a result of presence of both native and non-native species at a single transect sampling point.

Table 3-5. Percent Cover of Natives, Non-natives, and Bare Ground

Percent Cover Of Native Species	Percent Cover of Non-native Species	Percent Cover of Bare Ground
44.4	90.8	3.8

Standardized data sheets used during success analysis field sampling are found in Appendix D and representative photographs of restoration sites are found in Appendix E. A compendium of all plant species encountered in the willow riparian habitat is found in Appendix B.

3.6 Discussion of Success Values

In 2008, ECORP submitted a Revised Habitat Restoration Plan for the Mitigation Area (ECORP 2008b). The new revegetation strategy was to include a more active non-native plant removal program. It was also determined that future success monitoring would focus on the success criteria of 75 percent native cover in the restoration areas rather than the survival of riparian plantings. Prior to 2009, results of the functional analysis were used to estimate percent cover and overall success of the restoration areas. The functional analysis field sampling locations were originally selected to provide baseline information about the willow riparian habitat that existed within the Mitigation Area. In contrast, the restoration areas are located within highly disturbed habitat and required extensive maintenance and native replanting efforts. In order to

obtain more accurate information regarding the performance of the restoration areas and determine the effectiveness of the new revegetation strategy, the separate success monitoring analysis was implemented. The results presented herein represent the third year of quantitative monitoring specifically for the restoration areas.

In the 2008 annual report, it was suggested that the 5th year requirement of 75 percent native cover had been met in riparian restoration areas based on the cover values calculated as part of the functional analysis (ECORP 2008a). However, it was determined in 2009 that the success criteria had not been met in the riparian restoration areas based on the success monitoring and analysis results (54.2%). Percent cover values calculated during the 2009 success analysis also indicated a much lower level of vegetative cover by layer in the restoration areas (native trees 48.8% and shrubs 13.2%) as compared to the willow riparian habitat (native trees 148.5% and shrubs 19.2%). These discrepancies highlighted the importance of the separate success analysis for measuring success specifically in the restoration areas. The success analysis results for 2009 were then used to design a more appropriate long-term monitoring plan and make necessary adjustments to the current revegetation strategy, both of which would help improve overall habitat quality.

In addition to the relatively low native cover in 2009, non-native cover in the restoration areas was very high at approximately 58 percent overall. It was determined that an intense non-native plant removal program would be the most effective revegetation strategy as it would provide space for growth of important riparian plant species as well as additional opportunities for native plant establishment. Removal efforts began in earnest in late 2009 once the revised Streambed Alteration Agreement was issued by CDFG. The removal program has proved extremely successful in eradicating non-native trees (0% cover). Non-native shrubs have also been limited in the restoration areas; cover decreased from approximately 9 percent in 2010 to only 3 percent this year. However, the creation of open, unshaded space provided ample opportunity for invasive non-native ground species, such as prickly lettuce (*Lactuca serriola*), tocalote (*Centaurea melitensis*), sowthistle (*Sonchus* spp.), shortpod mustard (*Hirschfeldia incana*), and brome (*Bromus* spp.) to become established. Additional open space was created by debris flows from the 2009 Station Fire as well as overland runoff during rain events. As a result, non-native ground cover has increased to approximately 75 percent in 2011 (90.8% overall) from approximately 37 percent last year (59.6% overall). This substantial increase in non-native cover also appears to have crowded out native species and limited growth. In 2010, native cover in the tree, shrub, and ground layers were approximately 61, 21, and 18 percent, respectively. This year, native tree cover was limited to approximately 35 percent, shrubs 5 percent, and ground species 8 percent. Overall, native cover has decreased nearly 40 percent from 72 percent in 2010 to approximately 44 percent in 2011.

The eradication of the non-native trees in the restoration areas indicates that the non-native plant removal program has been effective on some level. The overall health of the willow riparian habitat within the Mitigation Area, as determined by the functional analysis and field observations, further indicates the program's effectiveness. However, non-native cover is a problem within the restoration areas. To address this problem, the non-native removal program will be adjusted and efforts will be focused on the restoration areas. Furthermore, invasive ground species will continue to be targeted for removal.

A major goal of the Mitigation Plan for the Mitigation Area was to improve habitat and thus better support breeding and foraging activities of sensitive riparian wildlife species, such as the least Bell's vireo, in the restoration areas (Chambers 2000). High cover of native riparian trees and shrubs is essential for these sensitive species; however, success analysis results in 2009, the first year of implementation, indicated that the restoration areas provided limited native cover. The intense non-native plant removal program that was subsequently implemented appears to be very effective in providing establishment opportunities and increasing cover of natives in the willow riparian habitat overall, as indicated by this year's functional analysis. Non-native trees have also been eradicated from the restoration areas. The 2011 success analysis results indicate that non-native plant species have increased in the restoration areas. This is likely due to the opening up of the tree canopy that resulted from the non-native tree removal program. More sunlight now reaches the ground surface and the non-natives grasses and weeds have germinated in high numbers. These fast-growing species can quickly out-compete the native plant species. In order to get control of the non-natives grasses and weeds, the non-native plant removal program will need to continue. The focus of the program will continue to include the non-native trees and shrubs but will now also include a concerted effort to target the grasses and weeds. If the non-native plant removal program is focused within the restoration areas and maintained at the same level of intensity, the success criteria of 75 percent native cover may be achieved.

4.0 REFERENCES

Brinson, M.

1995 *The HGM Approach Explained*. National Wetlands Newsletter.

[CDFG] California Department of Fish and Game

2011a Special Animals List. Sacramento (CA): State of California, the Resources Agency, Department of Fish and Game.

2011b State and Federally Listed Endangered and Threatened Animals of California. Sacramento (CA): State of California, the Resources Agency, Department of Fish and Game.

[Chambers] Chambers Group, Inc.

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

2000 Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank. Unpublished Report prepared for County of Los Angeles, Department of Public Works. April 2000.

Cox, G. W.

1996 *Laboratory Manual of General Ecology, Seventh Edition*. Wm. C. Brown Publishers, Dubuque, IA.

[ECORP] ECORP Consulting, Inc.

2008a 2008 Functional Analysis of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California. Unpublished Report submitted to County of Los Angeles, Department of Public Works. November 2008.

2008b Revised Habitat Restoration Plan for Big Tujunga Wash Mitigation Area. Unpublished report submitted to Los Angeles County Department of Public Works. September 2009.

Hickman, J. C., Ed.

1993 *The Jepson Manual: Higher Plants of California*. University of California Press, Ltd. Berkeley, CA.

Mueller-Dombois, D. and H. Ellenberg

1974 *Aims and Methods of Vegetation Ecology*. John Wiley & Sons, New York.

Stein, E. D.

1997 *Crediting and Debiting Mechanism for the Barry Jones Wetland Mitigation Bank (formerly Proposed as the Skunk Hollow Mitigation Bank)*. Prepared for the U. S. Army Corps of Engineers, Los Angeles District, Regulatory Branch.

[USFWS] U.S. Fish and Wildlife Service

1980 Habitat Evaluation Procedures Handbook. USFWS, Division of Ecological Services, Washington, D.C.

APPENDIX A

Functional Analysis Data Sheets and Tables of the Raw Data

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + JZ

Sample Plot No: 4A

Location: 375351 / 3792604
on sandy trail / horse turnout
(north of riparian)

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las	3	2.8	12	Bacsal	2.8	3
2	Sal las	3	6.37	12	Hetvil	3.6	0.5
3	Sal las	3	6.37	12	Lopsqu	2.27	1.2
4	Sal las	3	2.87	12	Bacsal	2.2	2

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: <1

% Cover annual grasses: <1

No. of seedlings/saplings: 0

Non-native Cover: <1

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 10 (m)

Comments:

ATFL

BIG TUJUNGA WASH

Date: 6/28/11Field Crew: CS + Jry

MODO

Sample Plot No: 4BLocation: 375337 | 3792598
main trail in sandPoint-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las	3	16.4	10	Lepogu	4.5	2
2	Sal las	3	12.75	15	Hetvil	4.85	0.5
3	Sal las	3	13.6	3	Hetvil	3.34	0.7
4	Sal las	3	6.7	7	Hetvil	2.75	0.6

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m²DiameterSquare- Meter Quadrat Data:% Cover debris/leaf litter, etc: <1 % Cover annual grasses: 2No. of seedlings/saplings: 0 Non-native Cover: 2

GPS Coordinates: S11 _____ UTM _____

Topographic Complexity Transect Data:No. of topographic features > 1 foot tall: 2 Transect Length: 16.4 (m)Comments:

* topographic features = slopes of horse turnout

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + Jny

Sample Plot No: 9A

Location: 375266 / 3792576

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Salgoo	3	3	5	Art doug	0.35	0.2
2	Salgoo	3	4.35	12	Art dou	0	0.2
3	Salgoo	3	3.35	7	Art dou	0.6	0.2
4	Salgoo	3	5.3	5 12	Art dou	0.4	0.2

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100

% Cover annual grasses: 0

No. of seedlings/saplings: ∅

Non-native Cover: 0

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 10 (m)

Comments:

Side of creek - W of crossing
 near steel drum in terrace area
 * enter wash area to access

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + JZ

Sample Plot No: 9B

Location: 375252 / 3792564

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal goo	3	0	15	Art dou	0.4	0.25
2	Sal goo	3	0	15	Art dou	0.1	0.25
3	Sal goo	3	0	15	Art dou	1.0	0.25
4	Sal goo	3	0	15	Art dou	0.35	0.25

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 90

% Cover annual grasses: 10

No. of seedlings/saplings: ∅

Non-native Cover: ~~10~~ 15

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 10 (m)

Comments:

south of creek (N of palm tree grove on hill)
 near restoration site #21
 → open space above bank

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + JZ

Sample Plot No: 12A

Location: 375510/3792523

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las	3	0	15	Roscal	1.1	1.3
2	Sal las	3	0	15	Ribaur	1.8	0.4
3	Sal las	3	0	12	Roscal	4.4	1.0
4	Sal las	3	0	12	Roscal	0.7	0.7

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 90

% Cover annual grasses: 90

No. of seedlings/saplings: 0

Non-native Cover: 90

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2

Transect Length: 10 (m) (trail) cuts

Comments:

same area along trail as restoration site #13

BIG TUJUNGA WASH

Date: 10/28/11

Field Crew: CS + JN

Sample Plot No: 12B

Location: 375508 / 3792499

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las	3	4	2	Bacsal	0	6
2	Queagr	3	2.3	4	Ribaur	1.06	1.0
3	Sal las	3	1.0	8	Toxdiv	3.2	6
4	Sal las	3	0	7	Toxdiv	2	1.5

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 90

% Cover annual grasses: 5

No. of seedlings/saplings: 0

Non-native Cover: 50

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 10 (m)

Comments:

South of 12A; north bank of creek where trail turns E-W

Salanum
not doing
geranium
retundifolia

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + JZ

Sample Plot No: 15A

Location: 375869/3792576

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
* 1	Sallas	3	0	6	Ribaur	0.7	0.2
* 2	Sallas	3	1.45	5	Adeaga	1.2	0.2
* 3	Alrho	3	0.4	10	Baccal	1.5	3
* 4	Sallas	3	12	0.5	Baccal	1.1	3

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 95

% Cover annual grasses: 7

No. of seedlings/saplings: ∅

Non-native Cover: 60

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2

Transect Length: 10 (m)

Comments:

nd of creek in riparian south of smaller upland trail

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + JZ

Sample Plot No: 15B

Location: 375877 | 3792587

Point-Quarter Data:

1/4	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	sal las	3	1.0	10	Solanum Adeaga ^{dog}	7.4	0.7
2	sal las	3	2.85	4	Lepogu	4.6	1.5
3	sal las	3	0.5	10	Hetvil	5.4	1.0
4	sal las	3	0.2	10	Ribaur	6.3	2.5

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 50

% Cover annual grasses: 90

No. of seedlings/saplings: ∅

Non-native Cover: 90

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 10 (m)

Comments:

NE of 15A (~50ft); just south of trail in opening in riparian

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CS + JY

Sample Plot No: 19A

Location: 376010/3792615

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
from base	Ballas	3	0.5	5	Adeaga	4.4	0.5
	Ballas	3	1.5	1.0	Adeaga	4	0.3
	Ballas	3	0.1	7	Adeaga	13.6	0.3
	Ballas	3	8	7	Adeaga	7.8	0.3

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 30 % Cover annual grasses: 0

No. of seedlings/saplings: 16 Frax sp. Non-native Cover: 25

GPS Coordinates: S11 _____ UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2 Transect Length: 13.6 (m)

Comments:

South of creek on bank; E of crossing (2nd)

Lolium

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CB + Jzy

Sample Plot No: 19B

Location: 376001 | 3792604

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las	3	0	9	Adeaga	7.6	0.8
2	Aceneg	3	2.8	8	Adeaga	2.2	0.3
3	Sal las	3	1.7	16	Adeaga	1.8	0.2
4	Aceneg	1	1.6	0.4	Soldou	1.6	0.5 1.0

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 30

% Cover annual grasses: 1

No. of seedlings/saplings: 16

Non-native Cover: 30

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: ~~2~~ 3

Transect Length: 10 (m)

Comments:

south of creek @ 2nd crossing; just W of trail

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: B + JZ

Sample Plot No: 23A

Location: 376072 | 3792639

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sammex	3	1.7	7	Ribaur	3.2	0.4
2	Bal las	3	0	13	Ribaur	4.4	2
3	Bal las	3	3.1	12	Ribaur	4.75	0.2
4	Bal las	3	3.5	7	—		

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 75

% Cover annual grasses: 15

No. of seedlings/saplings: 0

Non-native Cover: 18

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 3

Transect Length: 10 (m)

Comments:

quad location SW of point; clearing at bottom of slope trail west of parking lot

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CB + JZ

Sample Plot No: 23B

Location: 376052/3792638

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	sal las	3	4.8	8	Adeaga	5.2	0.4
2	sal las	3	0	12	Riccom	0.5	0.5
3	Aceneg	3	0	5	Cyperus	2.4	0.5
4	sal las	3	0	10	Adeaga	1.5	0.2

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 30 % Cover annual grasses: 0

No. of seedlings/saplings: 2 Aceneg
3 Frax sp. Non-native Cover: 50

GPS Coordinates: S11 _____ UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 3 Transect Length: 10 (m)

Comments:

South creek bank in hidden clearing; only accessible from west side of parking lot?

woodrat

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CB + JZ

Sample Plot No: 24A

Location: 376167/3792688

Point-Quarter Data:

base

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las	3	2.5	7	Adeaga	1.7	0.3
2	Salgoo	3	6.1	10	Adeaga	2.3	0.5
3	Sal las laev	3	0	20	Art dou	1.5	0.3
4	Popfre	3	0.8	15	Art dou	1.5	0.3

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 25

% Cover annual grasses: 95

No. of seedlings/saplings: 0

Non-native Cover: 97

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2

Transect Length: 10 (m)

Comments:

just north of 1st house crossing on east bank (next to trail)

BIG TUJUNGA WASH

Date: 6/28/11

Field Crew: CB + JZ

Sample Plot No: 24B

Location: 376188 / 3792699

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Ballas	3	7.9	18	Ribaur	2.1	0.25
2	Sal las	3	0	10	—		
3	Ballas	3	2.4	8	Adeaga	2	1.0
base 4	Sal goo	3	1.1	13	Ribaur	3	0.5

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 60

% Cover annual grasses: 0

No. of seedlings/saplings: 0

Non-native Cover: <1

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2

Transect Length: 10 (m)

Comments:

W of creek @ 1st house crossing; E of trail in riparian

wrenit?
Agrostis
whiptail
partridge
vire

BIG TUJUNGA WASH

Date: 6/29/11

Field Crew: CG+JH

Sample Plot No: 31A

Location: 376490/3792421
rocky wash above E-W trail

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
base + 1	Sal las	3	6.9	10	Ribauer	7.1	0.5
	Sal las	3	6.0	12	Bac cal	2.1	2
base	Sal las	3	6.5	11	Cyperus	5.5	0.7
	Frax udh	1	3.8	1.0	Bac Cyperus	4.7	0.5

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m
²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 98 % Cover annual grasses: 25

No. of seedlings/saplings: 0 Non-native Cover: 25

GPS Coordinates: S11 _____ UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2 Transect Length: 10 (m)

Comments:
E-W trail turns @ into N-S wash trail; site is ~116ft north on road west bank

Big
gnatcatcher?

BIG TUJUNGA WASH

Date: 6/29/11

Field Crew: CB + Jny

Sample Plot No: 31B

Location: 376540/3792411
rocky wash south/parallel to
E-W trail

Point-Quarter Data:

base

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sallas	3	1.0	12	—		
2	—				—		
3	Sallas	3	3.5 15		Soldon	6.1	1.0
4	Sammex	3	0	4.5	Arudon	8.4	0.5

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square-Meter Quadrat Data:

% Cover debris/leaf litter, etc: 7

% Cover annual grasses: 0

No. of seedlings/saplings: 0

Non-native Cover: 0

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2

Transect Length: 10 (m)

Comments:

wash is enclosed on 3 sides by thick willows

BIG TUJUNGA WASH

Date: 6/29/11

Field Crew: CO+Jzy

Sample Plot No: 30A

Location: 376544/3792514

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	gallas	3	0	8	Baccaal	13.6	3
base 2	gallas	3	2.1	4	Baccaal	10.1	3.6
3	gallas	3	2.5	11	Ribaur	9.1	0.2
base 4	gallas	3	2	10	Baccaal	4.3	4

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 80

% Cover annual grasses: 0

No. of seedlings/saplings: 0

Non-native Cover: 3

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 13.6 (m)

Comments: w of trail (below ponds; begins at wash w of site 38)
"willow woodland" opening

BIG TUJUNGA WASH

Date: 6/29/11

Field Crew: CO+JZ

Sample Plot No: 3DB

Location: 376542 | 3792520

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Ballas	3	1.7	13	Ribaur	6.9	1.5
base 2	Ballas	3	5.0	15	Ribaur	10.8	1.0
base 3	Ballas	2	0.8	1.0	Baccaal	2.5	3
base 4	Ballaev	3	1.7	2	Baccaal	2.9	3

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 75

% Cover annual grasses: 0

No. of seedlings/saplings: 0

Non-native Cover: <1

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 0

Transect Length: 10 (m)

Comments:

slightly NW of 3DA within dense willows

- nuttall's woodpecker
- bush tit

BIG TUJUNGA WASH

Date: 6/29/11

Field Crew: CS + Jny

Sample Plot No: 38A

Location: 376701 | 379259 |

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	Sal las laev	3	4.6	9	Sammex	6.3	1
2	Sal laev	3	19	7	erfas	18.7	2
3	Sal las	3	9.6	8	erfas	6.8	0.6
4	Euc sp.	3	6.2	10	Yucvhi	1.5	1.0

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m
²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 98 % Cover annual grasses: 2

No. of seedlings/saplings: ∅ Non-native Cover: 2

GPS Coordinates: S11 _____ UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: _____ Transect Length: _____ (m)

Comments:

terrace above wash to the south; "eucalyptus grove"
lots of fallen trees + treated euc sp.

BIG TUJUNGA WASH

Date: 10/29/11

Field Crew: CG + JY

Sample Plot No: 38B

Location: 376695/3792618
 rocky wash south of fence
 (east of trail)

Point-Quarter Data:

¼	Tree Species	Ht. Cat. ¹	Distance (m)	Cover ² (m)	Shrub Species	Distance (m)	Cover ² (m)
1	sal las	3	9.1	12	Baceal	2.6	3
2	sal las	3	13	8	Artcal	8	2
3	Sammex	2	4.3	3	Artcal	3.3	2
4	Sammex	3	5.4	5	enfas	3.8	1

¹Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m

²Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: <1

% Cover annual grasses: 0

No. of seedlings/saplings: ∅

Non-native Cover: 0

GPS Coordinates: S11 _____

UTM _____

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 0

Transect Length: 13 (m)

Comments:

APPENDIX B

Big Tujunga Wash Flora Compendium

Scientific Name	Common Name
VASCULAR PLANTS	
ANGIOSPERMS (DICOTYLEDONS)	
ACERACEAE	MAPLE FAMILY
<i>Acer negundo</i> var. <i>californicum</i>	box elder
ANACARDIACEAE	SUMAC OR CASHEW FAMILY
<i>Malosma laurina</i>	laurel sumac
<i>Toxicodendron diversilobum</i>	Pacific poison oak
APIACEAE	CARROT FAMILY
<i>Conium maculatum</i> *	poison hemlock
<i>Foeniculum vulgare</i> *	sweet fennel
ASTERACEAE	SUNFLOWER FAMILY
<i>Ageratina adenophora</i> *	sticky eupatory
<i>Ambrosia acanthicarpa</i>	annual bursage
<i>Ambrosia artemisiifolia</i>	annual ragweed
<i>Artemisia californica</i>	coastal sagebrush
<i>Artemisia douglasiana</i>	mugwort
<i>Artemisia dracunculus</i>	tarragon
<i>Baccharis salicifolia</i>	mule fat
<i>Brickellia californica</i>	California brickellbush
<i>Carduus pychocephalus</i> *	Italian thistle
<i>Centaurea melitensis</i> *	totalote
<i>Cirsium occidentale</i> var. <i>occidentale</i>	California thistle
<i>Conyza canadensis</i>	horseweed
<i>Heterotheca grandiflora</i>	telegraph weed
<i>Heterotheca sessiliflora</i>	golden aster
<i>Hypochaeris glabra</i> *	smooth cat's ear
<i>Lactuca serriola</i> *	prickly lettuce
<i>Lepidospartum squamatum</i>	scalebroom
<i>Logfia depressa</i> (= <i>Filago d.</i>)	dwarf cottonrose
<i>Malacothrix saxatilis</i>	cliff desert dandelion
<i>Pseudognaphalium bioloettii</i> (<i>bicolor</i>)	bicolor cudweed
<i>Pseudognaphalium canescens</i> ssp. <i>canescens</i>	fragrant everlasting
<i>Rafinesquia californica</i>	California plumeseed
<i>Senecio flaccidus</i> var. <i>douglasii</i>	sand-wash butterweed
<i>Sonchus asper</i> *	spiny sowthistle
<i>Sonchus oleraceus</i> *	common sowthistle
<i>Stephanomeria pauciflora</i> var. <i>pauciflora</i>	wire-lettuce
<i>Tanacetum parthenium</i> *	feverfew

Scientific Name	Common Name
<i>Taraxacum officinale</i> *	common dandelion
BETULACEAE	BIRCH FAMILY
<i>Alnus rhombifolia</i>	white alder
BIGNONIACEAE	BIGNONIA FAMILY
<i>Catalpa bignonioides</i> *	southern catalpa
BRASSICACEAE	MUSTARD FAMILY
<i>Hirschfeldia incana</i> *	shortpod mustard
<i>Lobularia maritime</i> *	sweet alyssum
<i>Nasturtium officinale</i>	watercress
<i>Sisymbrium altissimum</i> *	tumble mustard
<i>Sisymbrium orientale</i> *	Oriental hedge mustard
CACTACEAE	CACTUS FAMILY
<i>Opuntia littoralis</i>	coastal prickly pear
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY
<i>Sambucus nigra</i> ssp. <i>cerulea</i> (<i>mexicana</i>)	blue elderberry
CARYOPHYLLACEAE	PINK FAMILY
<i>Stellaria media</i> *	common chickweed
CHENOPODIACEAE	GOOSEFOOT FAMILY
<i>Chenopodium</i> sp.	goosefoot
CRASSULACEAE	STONECROP FAMILY
<i>Dudleya lanceolata</i>	coastal dudleya
CURCUBITACEAE	GOURD FAMILY
<i>Marah macrocarpus</i>	Cucamonga manroot
EUPHORBIACEAE	SPURGE FAMILY
<i>Croton californicus</i>	croton
<i>Euphorbia peplus</i> *	petty spurge
<i>Ricinus communis</i> *	castor bean
FABACEAE	LEGUME FAMILY
<i>Lotus scoparius</i>	common deerweed
<i>Medicago polymorpha</i> *	burclover
<i>Medicago sativa</i> *	alfalfa
<i>Spartium junceum</i> *	Spanish broom
FAGACEAE	OAK FAMILY
<i>Quercus agrifolia</i>	California live oak
GERANIACEAE	GERANIUM FAMILY
<i>Erodium cicutarium</i> *	red-stem stork's bill
<i>Geranium rotundifolium</i> *	roundleaf geranium
GROSSULARIACEAE	GOOSEBERRY FAMILY
<i>Ribes aureum</i>	golden currant

Scientific Name	Common Name
HYDROPHYLLACEAE	WATERLEAF FAMILY
<i>Eriodictyon crassifolium</i>	thickleaf yerba santa
<i>Phacelia ramosissima</i>	branching phacelia
JUGLANDACEAE	WALNUT FAMILY
<i>Juglans californica</i> (List 4.2)	Southern California walnut
LAMIACEAE	MINT FAMILY
<i>Lamium amplexicaule</i> *	henbit
<i>Marrubium vulgare</i> *	horehound
<i>Salvia mellifera</i>	black sage
<i>Stachys sp.</i>	hedge nettle
LOASACEAE	LOASA FAMILY
<i>Mentzelia laevicaulis</i>	smoothstem blazingstar
MALVACEAE	MALLOW FAMILY
<i>Malva parviflora</i> *	cheeseweed
<i>Malva sylvestris</i> *	high mallow
MORACEAE	MULBERRY FAMILY
<i>Ficus carica</i> *	edible fig
OLEACEAE	OLIVE FAMILY
<i>Fraxinus udhei</i> *	evergreen ash
<i>Fraxinus velutina</i>	velvet ash
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Camissonia bistorta</i>	California sun cup
<i>Camissonia californica</i>	California evening primrose
<i>Clarkia unguiculata</i>	elegant clarkia
<i>Epilobium brachycarpum</i>	tall annual willowherb
<i>Oenothera elata</i>	evening primrose
PAPAVERACEAE	POPPY FAMILY
<i>Eschscholzia californica</i>	California poppy
PLANTAGINACEAE	PLANTAIN FAMILY
<i>Plantago major</i> *	common plantain
<i>Plantago psyllium</i> *	sand plantain
PLATANACEAE	PLANE TREE FAMILY
<i>Platanus racemosa</i>	western sycamore
POLEMONIACEAE	PHLOX FAMILY
<i>Eriastrum densifolium</i>	giant woolly star
POLYGONACEAE	BUCKWHEAT FAMILY
<i>Eriogonum fasciculatum</i>	California buckwheat
<i>Eriogonum gracile</i>	slender woolly buckwheat
<i>Polygonum hydropiperoides</i>	swamp smartweed
<i>Pterostegia drymarioides</i>	California thread-stem

Scientific Name	Common Name
<i>Rumex</i> sp.	dock
<i>Rumex crispus</i> *	curly dock
<i>Rumex pulcher</i> *	fiddle dock
PRIMULACEAE	PRIMROSE FAMILY
<i>Anagallis arvensis</i> *	scarlet pimpernel
RANUNCULACEAE	BUTTERCUP FAMILY
<i>Delphinium cardinale</i>	scarlet larkspur
ROSACEAE	ROSE FAMILY
<i>Prunus ilicifolia</i>	holly-leaved cherry
<i>Rosa californica</i>	California rose
<i>Rubus ursinus</i>	California blackberry
RUBIACEAE	MADDER FAMILY
<i>Galium aparine</i>	stickywilly
SALICACEAE	WILLOW FAMILY
<i>Populus fremontii</i>	Fremont cottonwood
<i>Salix exigua</i>	narrowleaf willow
<i>Salix gooddingii</i>	Goodding's willow
<i>Salix laevigata</i>	red willow
<i>Salix lasiolepis</i>	arroyo willow
SCROPHULARIACEAE	FIGWORT FAMILY
<i>Mimulus guttatus</i>	common monkeyflower
<i>Verbascum virgatum</i> *	wand mullein
<i>Veronica anagallis-aquatica</i> *	water speedwell
SIMAROUBACEAE	QUASSIA FAMILY
<i>Ailanthus altissima</i> *	tree of heaven
SOLANACEAE	NIGHTSHADE FAMILY
<i>Datura wrightii</i>	jimson weed
<i>Nicotiana glauca</i> *	tree tobacco
<i>Solanum americanum</i>	American black nightshade
<i>Solanum douglasii</i>	Douglas's nightshade
ULMACEAE	ELM FAMILY
<i>Ulmus parvifolia</i> *	Chinese elm
URTICACEAE	NETTLE FAMILY
<i>Urtica dioica</i>	stinging nettle
VITACEAE	GRAPE FAMILY
<i>Vitis girdiana</i>	desert wild grape
ZYGOPHYLLACEAE	CALTROP FAMILY
<i>Tribulus terrestris</i> *	puncture vine
ANGIOSPERMS (MONOCOTYLEDONS)	
AGAVACEAE	AGAVE FAMILY

Scientific Name	Common Name
<i>Hesperoyucca whipplei</i> (= <i>Yucca w.</i>)	chaparral yucca
CYPERACEAE	SEDGE FAMILY
<i>Cyperus</i> sp.	flatsedge
<i>Cyperus involucratus</i> *	umbrella plant
POACEAE	GRASS FAMILY
<i>Agrostis viridis</i> *	bentgrass
<i>Arundo donax</i> *	giant reed
<i>Avena barbata</i> *	slender oat
<i>Avena fatua</i> *	wild oat
<i>Bromus diandrus</i> *	ripgut brome
<i>Bromus rubens</i> *	red brome
<i>Bromus tectorum</i> *	cheatgrass
<i>Cynodon dactylon</i> *	bermuda grass
<i>Ehrharta calycina</i> *	perennial veldtgrass
<i>Lolium perenne</i> *	perennial ryegrass
<i>Piptatherum miliaceum</i> *	smilo grass
<i>Polypogon monspeliensis</i> *	rabbitsfoot grass
<i>Schismus barbatus</i> *	mediterranean schismus
<i>Triticum aestivum</i> *	common wheat
<i>Vulpia myuros</i> *	rat-tail fescue
* non-native species	

APPENDIX C

Big Tujunga Wash Wildlife Compendium

SCIENTIFIC NAME**MOLLUSCA****Gastropoda****CRUSTACEA****Decapoda*** *Procambarus clarkii***INSECTA****Lepidoptera**

Papilionidae

Papilio rutulus

Pieridae

Pieris rapae

Nymphalidae

*Limenitis lorquini**Nymphalis antiopa***OSTEICTHYES****Catostomidae***** *Catostomus santaanae***Centrarchidae*** *Lepomis cyanellus** *Micropterus salmoides***Cyprinidae*** *Carassius auratus*** *Gila orcuttii*** *Rhinichthys osculus* ssp. 3**Ictaluridae*** *Ameiurus melas** *Ameiurus nebulosus***Poeciliidae***Gambusia affinis***AMPHIBIA****Hylidae***Pseudacris* sp.**Ranidae*** *Rana catesbeiana***REPTILIA****Emydidae**** *Actinemys marmorata pallida** *Trachemys scripta***COMMON NAME****MOLLUSCS****Snails and Slugs**

freshwater snail

CRUSTACEANS**Crayfish and Shrimp**

red swamp crayfish

INSECTS**Butterflies and Moths**

Swallowtails

Western Tiger Swallowtail

Whites and Sulfurs

Cabbage White Butterfly

Brush-footed Butterflies

Lorquin's Admiral

Mourning Cloak

BONY FISH**Suckers**

Santa Ana sucker

Sunfishes

Green sunfish

Largemouth bass

Carp and Minnows

Goldfish

Arroyo chub

Santa Ana speckled dace

Catfish

Black bullhead

Brown bullhead

Freshwater Fish

Mosquitofish

AMPHIBIANS**Treefrogs and allies**

treefrog

True frogs

American bullfrog

REPTILES**Box and water turtles**

Southwestern pond turtle

Red-eared slider

SCIENTIFIC NAME**Phrynosomatidae***Sceloporus occidentalis**Uta stansburiana***Teiidae***Cnemidophorus tigris***AVES****Podicipedidae***Podilymbus podiceps***Ardeidae***Butorides virescens***Accipitridae**** *Accipiter cooperii**Buteo jamaicensis**Buteo lineatus***Odontophoridae***Callipepla californica***Rallidae***Fulica americana***Columbidae*** *Columba livia**Zenaida macroura***Apodidae***Aeronautes saxatalis***Trochilidae***Archilochus alexandri**Calypte costae***Picidae***Picoides nuttallii**Picoides pubescens***Tyrannidae***Empidonax difficilis**Myiarchus cinerascens**Sayornis nigricans***Vireonidae***Vireo huttoni***Corvidae***Aphelocoma californica**Corvus brachyrhynchos**Corvus corax***Hirundinidae***Stelgidopteryx serripennis***Aegithalidae***Psaltriparus minimus***Troglodytidae***Thryomanes bewickii**Troglodytes aedon***COMMON NAME****Phrynosomatids**

Western fence lizard

Side-blotched lizard

Whiptail lizards

Western whiptail

BIRDS**Grebes**

Pied-billed grebe

Hérons and Egrets

Green heron

Raptors

Cooper's hawk

Red-tailed hawk

Red-shouldered hawk

Quail

California quail

Rails and coots

American coot

Pigeons and doves

Rock dove

Mourning dove

Swifts

White-throated swift

Hummingbirds

Black-chinned hummingbird

Costa's hummingbird

Woodpeckers

Nuttall's woodpecker

Downy woodpecker

Tyrant flycatchers

Pacific-slope flycatcher

Ash-throated flycatcher

Black phoebe

Vireos

Hutton's vireo

Jays and crows

Western scrub-jay

American crow

Common raven

Swallows

Northern rough-winged swallow

Bushtits

Bushtit

Wrens

Bewick's wren

House wren

SCIENTIFIC NAME**Silviidae***Polioptila caerulea***Timaliidae***Chamaea fasciata***Mimidae***Mimus polyglottis**Toxostoma redivivum***Ptiligonatidae***Phainopepla nitens***Parulidae**** *Dendroica petechia**Geothlypis trichas***Emberizidae***Melospiza melodia**Pipilo crissalis**Pipilo maculatus***Cardinalidae***Pheucticus melanocephalus***Icteridae***Agelaius phoeniceus** *Molothrus ater***Fringillidae***Carduelis psaltria**Carduelis tristis**Carpodacus mexicanus***MAMMALIA****Leporidae***Sylvilagus audubonii***Sciuridae***Spermophilus beecheyi***Muridae***Neotoma* sp.**Equidea*** *Equus caballus*

* Non-native species

** CDFG California Species of Special Concern/Watch List Species/FP Species

*** State and/or Federally Listed Species

COMMON NAME**Gnatcatchers**

Blue-gray gnatcatcher

Wrentits

Wrentit

Mockingbirds and thrashers

Northern mockingbird

California thrasher

Silky flycatchers

Phainopepla

Wood warblers

Yellow warbler

Common yellowthroat

Towhees and sparrows

Song sparrow

California towhee

Spotted towhee

Grosbeaks and buntings

Black-headed grosbeak

Blackbirds and orioles

Red-winged blackbird

Brown-headed cowbird

Finches

Lesser goldfinch

American goldfinch

House finch

MAMMALS**Hares and rabbits**

Desert cottontail

Squirrels

California ground squirrel

Old world rats and mice

Woodrat

Horses and allies

Domestic horse

APPENDIX D

Success Analysis Data Sheets and Tables of the Raw Data

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS JHJ		Coordinates: area # 1	
Section:		376171 / 379266Z	
Photo#: 2258		Direction: E-W	Length: 25 ft
Native	Non-Native	Both	No Plants
1	 	 	1
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Ehrharc	 		
2. Galias			
3. Brodia	 		
4. Aceneg			
5. Bonole			
6. Artlou			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJ		Coordinates: area # 2	
Section:		376103 / 3792679	
Photo#: 2257		Direction: N-S	Length: 50ft
Native	Non-Native	Both	No Plants
1			
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Bromad rub			
2. Vulmyo			
3. Ericic			
4. Hirinc			
5. Carpyc			
6. Hypala			
7. Enfas			
8. Brodia			
9. Pharam			
10. Salias			

Ehrcre |||||
 Galapr |
 Artdou |||

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CO JY		Coordinates: area # 3	
Section:		376039 / 3792656	
Photo#: 2266		Direction: N-S	Length: 50ft
Native	Non-Native	Both	No Plants
	 	 	
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Bromad rub	 		
2. Hetril			
3. thirinc	 		
4. Hypgia			
5. Vulmyo	 		
6. Erocic			
7. Lepsqu			
8. erifas	 	 	
9. Tharam	 		
10. Brotec			

Brodia ~~||||~~ |||

Geranium ||

Alnrho ~~||~~ |||

Ribaur ||

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJY		Coordinates: area #4	
Section:		375953/3792627	
Photo#: 2255		Direction: N-S	Length: 25 ft
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Bromad rub			
2. Vulmyo			
3. erocic			
4. Fildep			
5. Hypgla			
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS & JG		Coordinates: area #5	
Section:		376007 / 3792567	
Photo#: 2254		Direction: E-W	Length: 25 ft
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Yulmud			
2. Bromad			
3. Hedpol			
4. Ruburo			
5. Brodia			
6. Artdou			
7. Arebar			
8. eroair			
9. Hirinc			
10. Schbar			

lobmar. |||
Carpyc |

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CB JN		Coordinates: area #6	
Section:		375829/379285	
Photo#: 2253		Direction: E-W	Length: 50ft
Native	Non-Native	Both	No Plants
1	 		
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Enfas			
2. Vulmyo			
3. Bromad rub	 		
4. Yuenhi			
5. Brodia			
6. Artdou			
7. Hetvil			
8. thirinc			
9. Lacser			
10. Sal las			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJX		Coordinates: area #7	
Section:		375812/3792482	
Photo#: 2251 2252		Direction:	Length: _____
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Pharom Ehrere	Artou Adeaga	Alrho Sallas Salgo
2.	Ficcar Polypogon Concan	Hrinc carpyc Artcal	Popfr catapa
3.	Pipmel	Ecyperus Baccal Riccorn	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 10/27/11	
Surveyors: CSJG		Coordinates: area # 8	
Section:		376778 3792442	
Photo#: 2250		Direction:	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Pharom Polypogon dandelion	Adeaga Sammex	elm Acenag bal lae
2.	Helalb	Pipmel Riccom AltAil	Queagy Popfre
3.		Ribaur Cyperus	Arudon
4.		Blombr Vtgir Fraxudh	
5.			
6.			
7.			
8.			
9.			
10.			

- Humming
 clark
- Lorquins
 admiral

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJG		Coordinates: area # 9	
Section:		375731/3792478	
Photo#: 2249		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Concan hrinc enfas	Baceal Roscal Arefat	Papfre Sal las
2.	Anadon Pharam	Artcal Poccal	Alrho salgoo
3.	Lacser Borub Hetvi	Ruburb Toxdiv	
4.	Lobmar Pipmel	Nicaja Altai Dkarder	
5.	Datwri	Riccom	
6.			
7.			
8.			
9.			
10.			

Stellaria
(Caryophyll)

HDFI

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJ		Coordinates: area # 10	
Section:		875720 / 3792518	
Photo#: 2248		Direction: <u> </u>	Length: <u> </u>
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Hetgra Hirunc	Lepsqu enfes	sallas Alnrho
2.	Brodia Bronub	Yucnri Crocc	
3.	Opulet Hetvil Pharam	Oleander	
4.	Lotseo Hypgia		
5.	Eriden crocal Toxdiv		
6.	Concan Carnca		
7.	Vulmyo Laccer Peean		
8.	erocar		
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS JY		Coordinates: area #11	
Section:		375610/3792494	
Photo#: 2247		Direction: E-W	Length: 25 ft
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Rooval			
2. ehreere			
3. Brodia	 		
4. Popfre			
5. sal las			
6. Tpmel			
7. Baceal			
8. Pharam			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJG		Coordinates: area #12	
Section:		375536 / 3792505	
Photo#: 2245 2246		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Pipmel Toxdiv	Toxdiv Artdou	Queagr Sallas
2.	Opulit Brodia		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJY		Coordinates: area # 13	
Section:		375512/3792514	
Photo#: 2244		Direction: E-W	Length: 25ft
Native	Non-Native	Both	No Plants
	I		
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Sallae			
2. unknown	I		
3. Brodia			
4. Vulmyo			
5. Bromad rub			
6. Pipmel			
7. Ribaur	I		
8. Roscal		I	
9.			
10.			

Water

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJTS		Coordinates: area #14	
Section:		375478/3792527	
Photo#: 342 343		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Znrcr Epruge Cypnus	Rbocal Ribaur	Bal las Bal gos
2.	Bronub Toxdiv	Toxdiv Ficcar Baceal	Hallau Alrho
3.	Polypogon sonole lobmar	Ag Adeaga carpyc	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJG		Coordinates: area #15	
Section:		375447 3792549	
Photo#: 240, 241		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Pipmet sorole petty epurge	Adeage Riccom hemlock	Alnro Sal lae
2.	radish Polypogon Helato	Alt Ail (haveren) Aperus	elm sal lae Ace neg mauderry?
3.	urotica ep.		
4.			
5.			
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: C. J. J.		Coordinates: area #16	
Section:		375413/3792542	
Photo#: 238 239		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Toxdiv Geranium Brodia Tupmel	Toxdiv Ribaur Lutdio Adeaga	Flarac Sal las Alrho Acernac Acerneg
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJG		Coordinates: area #17	
Section:		375376 / 3792546	
Photo#: 2237		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Pipmel barnuda grs.	Artlou Adeaga	Popfre sal las
2.	Pharum Hirinc Ambaca	Ruburs Ficcar Cyperus	Alnrho Aceneg (box elder)
3.	Rumex arrere	Wachmex Bacsa	
4.		Fraxudh Riccom	
5.		Ciroec Urtdio. Datwri	
6.			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS JZ		Coordinates: area # 18	
Section:		375344 3792556	
Photo#: 2236		Direction: _____	Length: _____
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Toxdiv Tpmel	Toxdiv Artcal	Salago Popfre
2.	Arefat Lobmar Sisor	Adcaga Polygon sp. Oenela	Ficcar Alnrho Sal las
3.	zhrcere Brodia erocur	Rumex Chenopod Baceal	
4.	Tucvni Pharam	Riccom Artdou	
5.	Plamaj Himcar Hirinc		
6.	Helalb Naeturium Himgut		
7.	Polmon Taroff		
8.			
9.			
10.			

cabbage wht
smalltail

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS JY		Coordinates: area # 19	
Section:		375297 3792590	
Photo#: 2236		Direction: NE-SW	Length: 25ft
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Vulmyo	1		
2. Erocir			
3. Bromad rub	 		
4. Pharam			
5. hrinc			
6. Sal mel			
7.			
8.			
9.			
10.			

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CSJY		Coordinates: area # 20	
Section:		375314/3792537	
Photo#: 229		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Pharom Ambaca	Toxdiv Ribaur Salmel	Popfre Queagr Sal lds
2.	Hetara Brodia Borulo	Beccal (graph)	Sal goo
3.	Lamamp Cirocc		
4.	Lobmar Hirinc		
5.			
6.			
7.			
8.			
9.			
10.			

Lamium.
amplexical

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: OS JY		Coordinates: area #21	
Section:		375261 / 3792532	
Photo#: 2228		Direction: _____	Length: _____
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Brodia Borrub Hirinc	Enfas Baccal Artcal	R Mallau Popfre
2.	Vulmjo Hypgja	Lepsqu Ribaur	Salgoo Sal Tas Arudon
3.	Lacser Sisoni	salmel Brical Art doug	Sammex
4.	Toxdiv Pharam Hetvil	Cirocc Hetgra	
5.	cenmel		
6.			
7.			
8.			
9.			
10.			

COHA
RTHA
humming
CAQU
WEST

cottontail
uta
fencing

Hypochoeris
glaberrima

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS JZ		Coordinates: area # 22	
Section: 2226, 2227		375202 / 3792547	
Photo#:		Direction: E-W	Length: 25ft
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1. Sal las			
2. Brodia			
3. Sal Sisoro			
4. Galgoo			
5.			
6.			
7.			
8.			
9.			
10.			

letter
|||

letter |||

BIG T RIPARIAN SUCCESS TRANSECT SHEET		Date: 6/27/11	
Surveyors: CS 538		Coordinates: area #24	
Section:		375060/3792539	
Photo#: 2225		Direction: —	Length: —
Native	Non-Native	Both	No Plants
Species	Ground Layer	Shrub Layer	Tree Canopy
1.	Ambaca Het vil Opulit	Erifos Baceal Avefat	Popfre sal las Sal lae
2.	Hirinc Brodia Bro	Roscal Rukars Harmac	
3.	Lobmar Vulmyo	Lepsqu	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

APPENDIX E

Riparian Restoration Area Site Photographs



Photo 1: Restoration Area 1



Photo 2: Restoration Area 2



Photo 3: Restoration Area 3



Photo 4: Restoration Area 4



Photo 5: Restoration Area 5



Photo 6: Restoration Area 6



Photo 7: Restoration Area 7



Photo 8: Restoration Area 8



Photo 9: Restoration Area 9



Photo 10: Restoration Area 10



Photo 11: Restoration Area 11



Photo 12: Restoration Area 12



Photo 13: Restoration Area 13



Photo 14: Restoration Area 14



Photo 15: Restoration Area 15



Photo 16: Restoration Area 16



Photo 17: Restoration Area 17



Photo 18: Restoration Area 18



Photo 19: Restoration Area 19



Photo 20: Restoration Area 20



Photo 21: Restoration Area 21



Photo 22: Restoration Area 22



Photo 23: Restoration Area 24

APPENDIX O

2011 Water Quality Monitoring Report

**County of Los Angeles
Department of Public Works**

February 2012 Water Quality Monitoring Report

for the

**Master Mitigation Plan
for the Big Tujunga Wash Mitigation Area**

April 2012



February 2012 Water Quality Monitoring Report

for

Master Mitigation Plan for the Big Tujunga Wash Mitigation Area for Year 2011

April 2012

Prepared For:

**ECORP Consulting, Inc.
1801 Park Court Place, Building B, Suite 103
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Distribution

Water quality monitoring reports are distributed to the following agencies:

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Water Quality Monitoring

February 2012

BACKGROUND

The County of Los Angeles Department of Public Works (LACDPW) purchased a 207-acre parcel in Big Tujunga Wash as a mitigation area for County flood control projects throughout Los Angeles County. In coordination with local agencies, the County 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. 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. This report presents the results of the water quality sampling for February 2012.

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

Project Site Activities

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

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

Date	Activity
4/2000	Baseline water quality sampling
11/2000 to 11/2001	Arundo, tamarisk, and pepper tree removal Chemical (Rodeo®) application
12/2000 to 11/2002	Water hyacinth removal
12/2000	Fish Sampling at Haines Canyon Creek
12/2000	Water quality sampling
1/2001 to present	Exotic aquatic wildlife (non-native fish, crayfish, bullfrog, and turtle) removal – conducted quarterly
2/2001	Partial riparian planting
3/2001	Selective clearing at Canyon Trails Golf Club
3/2001	Water quality sampling
6/2001	Water quality sampling
7/2001	Fish Sampling at Haines Canyon Creek
9/2001	Water quality sampling
10/2001 to 11/2001	Fish Sampling at Haines Canyon Creek

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

Date	Activity
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
2/2012	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**). Pesticide use reports were supplied by the Golf Club in December 2004, February 2005 and April 2007.

Water quality reports for sampling conducted from 2001 to 2004, and in 2006, were also received from the Golf Club. Concentrations of pesticides (including fungicides, herbicides and insecticides) were not detected in any groundwater monitoring wells or surface water samples during any of the sampling events from 2001 to 2004. Except for nitrate, general chemical parameters did not exceed state drinking water standards. Nitrate concentrations above drinking water limits were detected in two of the groundwater monitoring wells (MW-1 [downgradient] and MW-3 [upgradient]) located on the south side of the golf course site during most sampling events from October 2001 (prior to start of golf course construction) to 2004. In addition, low levels of two VOCs (chloroform and tetrachloroethylene [PCE]) were detected at MW-1 and MW-3 from 2001 to 2004. In both the groundwater and surface water samples collected for the Golf Club during the first and second quarters of 2006, concentrations of pesticides (including fungicides, herbicides and insecticides) were not detected, and general chemical parameters did not exceed state drinking water standards (Angeles National Golf Club, May 2006 and July 2006). No other reports have been received.

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 Agrosiences Surflan A.S.	oryzalin	herbicide
Dow Agrosiences 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

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 February 23, 2012.



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



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Date: April 19, 2012

**Big Tujunga Wash Mitigation Area
Water Quality Sampling Stations**



Figure 1

**Table 3
Water Quality Sampling Locations and Conditions for February 2012**

Date	February 23, 2012		
Air Temperature	Approximately 65-77 degrees Fahrenheit during sample collection period		
Skies	Clear, sunny		
Observations	Water very clear at all locations, low turbidity. Surface vegetation and algae levels relatively low at all stations.		
Sampling Locations	Latitude	Longitude	Time of sample
Haines Canyon Creek	34 16' 0.092" N	118 21' 25.716' W	1120
Haines Canyon Creek, inflow to Tujunga Ponds	34 16' 6.040" N	118 20' 22.616" W	1210
Haines Canyon Creek, outflow from Tujunga Ponds	34 16' 8.263" N	118 20' 30.824" W	1230
Big Tujunga Wash	34 16' 11.615" N	118 21' 4.519" W	1020

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 MWH 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 Big Tujunga Ponds, in Haines Canyon Creek leaving the site, and in Big Tujunga Wash were estimated using a simple field procedure. The technique uses a float to measure stream velocity.

Calculating flow then involves solving the following equation:

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

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 4/18/00 samples are attributable to a rain event. Phosphorus levels were also high in the 4/18/00 samples, due to release from sediments.

February 2012 Results

Water Quality

Results of analyses conducted by MWH and Emax Laboratories are appended to this report (**Appendix A**) and summarized in **Table 6**. Note that the yields (percent recoveries) of QC samples were within acceptable limits (percentages) for all samples.

**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 – February 23, 2012

Parameter	Units	Haines Canyon Creek, Inflow to Tujunga Ponds	Haines Canyon Creek, Outflow from Tujunga Ponds	Big Tujunga Wash	Haines Canyon Creek, just before exit from site
Temperature	°C	18.9	18.0	13.7	17.2
Dissolved Oxygen	mg/L	7.6	8.3	12.5	10.2
pH	std units	6.75	6.82	8.74	8.04
Total residual chlorine	mg/L	ND	ND	ND	ND
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	ND	ND	ND	ND
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND
Nitrate-Nitrogen	mg/L	8.7	5.8	ND	5.3
Orthophosphate-P	mg/L	0.039	0.031	0.014	0.030
Total phosphorus-P	mg/L	0.042	0.037	0.029	0.035
Glyphosate	µg/L	ND	ND	ND	ND
Chloropyrifos*	ng/L	ND	ND	ND	ND
Pesticides (EPA 8081A)**	µg/L	ND	ND	ND	ND
Turbidity	NTU	0.56	0.46	0.95	0.31
Fecal Coliform Bacteria	(MPN/100 ml)	14	<2	2	8
Total Coliform Bacteria	(MPN/100 ml)	700	900	280	1100

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 Big Tujunga Ponds, in Haines Canyon Creek (leaving the site), and in Big Tujunga Wash were approximated. Estimated flows for February 2012 are summarized in **Table 7**.

Table 7
Estimated Flows for February 2012

Sampling Date	Approximate Flow (cubic feet per second)		
	Outlet of Big Tujunga Ponds	Haines Canyon Creek leaving the site	Big Tujunga Wash
2/23/2012	1.9	3.8	18.5

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)	200 ^f (water contact recreation)	--	--	Swimming stds: 33 ^g (geometric mean for enterococci) 126 ^g (geometric mean for <i>E. coli</i>)
Ammonia-nitrogen (mg/L)	See Tables 11 and 12	See Table 9	See Table 10	--
Nitrite-nitrogen (mg/L)	1	--	--	1 (primary drinking water std.)
Nitrate-nitrogen (mg/L)	10	--	--	10 (primary drinking water std.)
Total phosphorus (mg/L)	--	<0.05 – 0.1 ^e (recommendation for streams, no criterion)		--
Turbidity (NTU)	h	i	i	5 (secondary drinking water standard) 0.5 – 1.0 (std. for systems that filter)

Notes:

-- No criterion

CMC Criteria Maximum Concentration or acute criterion

CCC Criteria Continuous Concentration or chronic criterion

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

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 Standard based on a minimum of not less than four samples for any 30-day period, 10% of total samples during any 30-day period shall not exceed 400/100ml.

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 February 2012 sampling are described by parameter in **Table 14**.

**Table 14
Discussion of February 2012 Water Quality Sampling Results**

Parameter	Discussion
Temperature	<ul style="list-style-type: none"> Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations.
Dissolved oxygen	<ul style="list-style-type: none"> Dissolved oxygen levels ranged from 7.6 mg/L in the inflow to the Tujunga Ponds to 12.5 in Big Tujunga Wash. DO levels at all stations were above the recommended minimum (5.0 mg/L) and mean (7.0 mg/L) for warmwater fish species.
pH	<ul style="list-style-type: none"> Lowest pH was observed in the inflow to Tujunga Ponds (6.75), with highest pH observed in Big Tujunga Wash (8.74). 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. The pH of Big Tujunga Wash was slightly above the high end of the range.
Total residual chlorine	<ul style="list-style-type: none"> No residual chlorine was detected at any station.
Nitrogen	<ul style="list-style-type: none"> Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L. Ammonia was below the detection limit at all stations.
Phosphorus	<ul style="list-style-type: none"> Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range at these four stations was 0.029 to 0.042 mg/L; recommended range is <0.05 – 0.1 mg/L).
Glyphosate	<ul style="list-style-type: none"> Glyphosate was not detected at any station.
Chloropyrifos	<ul style="list-style-type: none"> Chloropyrifos and the other pesticides tested using EPA's analytical method 8141A were not detected at any station.
Pesticides	<ul style="list-style-type: none"> Pesticides analyzed by EPA Method 8081A were not detected at any station.
Turbidity	<ul style="list-style-type: none"> Turbidity levels were very low (<1 NTU) at all stations.
Bacteria	<ul style="list-style-type: none"> Fecal coliform levels at all stations were well below the water contact recreation standard of 200 MPN/100 ml. Total coliform levels ranged from 280 MPN/100 ml in Big Tujunga Wash to 1,100 MPN/100 ml in Haines Canyon Creek just before exiting from site. [Note that recreation standards are for fecal coliform. Total coliform standards apply to waterbodies where shellfish can be harvested for human consumption.]

GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX A

**BIG TUJUNGA WASH MITIGATION AREA
WATER QUALITY MONITORING PROGRAM**

LABORATORY RESULTS
February 2012



MWH

LABORATORIES

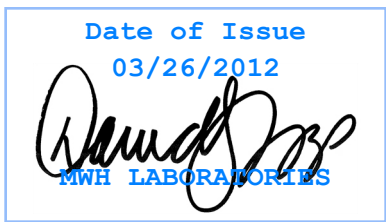
A Division of MWH Americas, Inc.

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

Laboratory Report

for

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



DST: David S Tripp
Project Manager



Report#: 389198
Project: BIG-TUJUNGA
Group: Water Quality
Monitoring
PO#: 1012733.5620.011601

Laboratory certifies that the test results meet all **NELAC** requirements unless noted in the Comments section or the Case Narrative. Following the cover page are Hits Reports, Comments, QC Summary, QC Report and Regulatory Forms. 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	AZ0455	Nevada	CA00006-2010-1
Arkansas	Certified	New Hampshire	2959-11
California – NELAP	01114CA	New Jersey	CA 008
California – ELAP	1422	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 200003-009
Georgia	947	Pennsylvania	68-565
Guam	11-004r	Rhode Island	01114CA
Hawaii	Certified	South Carolina	87016001
Idaho	Certified	South Dakota	Certified
Illinois	200033	Tennessee	TN02839
Indiana	C-CA-01	Texas	T104704230-11-2
Kansas	E-10268	Utah	Mont-1
Kentucky	90107	Vermont	VT0114
Louisiana	LA110022	Virginia	00210
Maine	CA0006	Washington	C383
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

Acknowledgement of Samples Received

MWH Americas - Arcadia

 618 Michillinda Ave.
 Suite 200
 Arcadia, CA 91007
 Attn: Sarah Garber
 Phone: 626-568-6910

 Customer Code: MWH-ECORP
 Folder #: 389198
 Project: BIG-TUJUNGA
 Sample Group: Water Quality Monitoring
 Project Manager: David S Tripp
 Phone: (626) 386-1158
 PO #: 1009944.011601

The following samples were received from you on **February 23, 2012**. 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 MWH Laboratories.

Sample #	Sample ID	Sample Date
<u>201202230334</u>	BTW022312	Feb 23, 2012 10:20
	@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	
<u>201202230343</u>	HCC022312	Feb 23, 2012 11:20
	@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	
<u>201202230344</u>	TJPIN022312	Feb 23, 2012 12:10
	@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	
<u>201202230345</u>	TJPOUT022312	Feb 23, 2012 12:30
	@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_PEST -- Organochlorine Pesticides 3/50



Acknowledgement of Samples Received

MWH Americas - Arcadia

618 Michillinda Ave.
Suite 200
Arcadia, CA 91007
Attn: Sarah Garber
Phone: 626-568-6910

Customer Code: MWH-ECORP
Folder #: 389198
Project: BIG-TUJUNGA
Sample Group: Water Quality Monitoring
Project Manager: David S Tripp
Phone: (626) 386-1158
PO #: 1009944.011601

The following samples were received from you on **February 23, 2012**. 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 MWH Laboratories.

Sample #	Sample ID	Sample Date
	@8141EDD -- Organophosphorous Pesticides (Subcontracted)	



MWH Laboratories

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CHAIN OF CUSTODY RECORD

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)

MWH LABS USE ONLY:

LOGIN COMMENTS: _____

SAMPLES CHECKED AGAINST COC BY: W 38 91978

SAMPLES LOGGED IN BY: JS

SAMPLE TEMP RECEIVED AT:

Colton / Sacramento / Scottsdale _____ °C (Compliance: 4 ± 2 °C)

Monrovia 12.8 °C (Compliance: 4 ± 2 °C)

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

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: <u>MWH</u>		PROJECT CODE: <u>B16 TUJUNGA</u>		COMPLIANCE SAMPLES - Requires state forms <input type="checkbox"/>		NON-COMPLIANCE SAMPLES <input checked="" type="checkbox"/>	
MWH LABS CLIENT CODE: <u>MWH-CORP</u>		COC ID:		Type of samples (circle one): ROUTINE SPECIAL CONFIRMATION		REGULATION INVOLVED: <small>(eg. SDWA, Phase V, NPDES, FDA...)</small>	
TAT requested: rush by adv notice only		STD ___ 1 wk ___ 3 day ___ 2 day ___ 1 day ___		SEE ATTACHED BOTTLE ORDER FOR ANALYSES <input checked="" type="checkbox"/> (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	SAMPLER COMMENTS
<u>2/23</u>	<u>0920</u>	<u>BTW022312</u>		<u>RSW</u>			<u>APR 02/23/12</u> <u>14:06</u>
<u>2/23</u>	<u>1120</u>	<u>HCC022312</u>		<u>RSW</u>			
<u>2/23</u>	<u>1210</u>	<u>TJPI022312</u>		<u>RSW</u>			
<u>2/23</u>	<u>1230</u>	<u>TJPOU022312</u>		<u>RSW</u>			

* 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
<u>[Signature]</u>	<u>SARAH GARDER</u>	<u>MWH</u>	<u>2/23/12</u>	<u>1340</u>
<u>[Signature]</u>	<u>SARAH GARDER</u>	<u>MWH</u>	<u>2/23/12</u>	<u>1343</u>
<u>[Signature]</u>	<u>Chris Cabrera</u>	<u>MWH</u>	<u>2/23/12</u>	<u>1343</u>
RECEIVED BY:				



David S Tripp is Your MWH Labs Project Manager

**Sampler: please return
this paper with your samples**

Kit #: 46151
Created By: DST
Order Date: 02/23/2012
STG: Bottle Orders

Client Code: MWH-ECORP
Project Code: BIG-TUJUNGA Bottle Orders
Group Name: Water Quality Monitoring
PO#/JOB#: ~~100944~~.011601

1012733.011601

Ship By:
02/13/2012

Ship Sample Kits to
MWH Americas - Arcadia
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Attn: Sarah Garber
Phone: 626-568-6910
Fax:

Send Report to
MWH Americas - Arcadia
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Attn: Sarah Garber
Phone: 626-568-6910
Fax:

Billing Address
MWH Americas - Arcadia
618 Michillinda Ave.
Suite 200
Arcadia, CA 91007

Attn: Sarah Garber
Phone: 626-568-6910
Fax:

# of Samples Tests		Bottles - Qty for each sample, type & preservative if any	UN DOT #
4	@8081A, @DIAZEDD Subbed	2 1L amber glass 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 as early as Monday 2/20 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.



MWH

LABORATORIES

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1 800 566 LABS (1 800 566 5227)

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

Laboratory Comments
Report: #389198

Group Comments

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



MWH

LABORATORIES

A Division of MWH Americas, Inc.

750 Royal Oak Dr., Suite 100
Monrovia, California, 91016-3629
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Fax: 626 386 1101
1 800 566 LABS (1 800 566 5227)

Laboratory
Hits Report: 389198

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

Samples Received on:
02/23/2012

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
		201202230334	<u>BTW022312</u>			
02/23/2012	15:14	Fecal Coliform Bacteria	2		MPN/100 ml	2
02/23/2012	18:30	Orthophosphate as P	0.014		mg/L	0.01
02/24/2012	14:26	Orthophosphate as PO4	0.043		mg/L	0.031
02/23/2012	15:14	Total Coliform Bacteria	280		MPN/100 ml	2
02/24/2012	14:53	Total phosphorus as P	0.029		mg/L	0.02
02/24/2012	16:38	Total phosphorus as PO4- Calc.	0.088		mg/L	0.031
02/24/2012	11:04	Turbidity	0.95	5	NTU	0.05
		201202230343	<u>HCC022312</u>			
02/23/2012	15:14	Fecal Coliform Bacteria	8		MPN/100 ml	2
02/23/2012	16:33	Nitrate as Nitrogen by IC	5.3	10	mg/L	0.2
02/23/2012	16:33	Nitrate as NO3 (calc)	23	45	mg/L	0.88
02/23/2012	18:31	Orthophosphate as P	0.030		mg/L	0.01
02/24/2012	14:26	Orthophosphate as PO4	0.092		mg/L	0.031
02/23/2012	15:14	Total Coliform Bacteria	1100		MPN/100 ml	2
02/24/2012	14:54	Total phosphorus as P	0.035		mg/L	0.02
02/24/2012	16:38	Total phosphorus as PO4- Calc.	0.11		mg/L	0.031
02/24/2012	11:05	Turbidity	0.31	5	NTU	0.05
		201202230344	<u>TJPIN022312</u>			
02/23/2012	15:14	Fecal Coliform Bacteria	14		MPN/100 ml	2
02/23/2012	16:56	Nitrate as Nitrogen by IC	8.7	10	mg/L	0.2
02/23/2012	16:56	Nitrate as NO3 (calc)	38	45	mg/L	0.88
02/23/2012	18:36	Orthophosphate as P	0.039		mg/L	0.01
02/24/2012	14:26	Orthophosphate as PO4	0.12		mg/L	0.031
02/23/2012	15:14	Total Coliform Bacteria	700		MPN/100 ml	2
02/24/2012	14:56	Total phosphorus as P	0.042		mg/L	0.02
02/24/2012	16:39	Total phosphorus as PO4- Calc.	0.13		mg/L	0.031
02/24/2012	11:06	Turbidity	0.56	5	NTU	0.05
		201202230345	<u>TJPOUT022312</u>			
02/23/2012	17:08	Nitrate as Nitrogen by IC	5.8	10	mg/L	0.2
02/23/2012	17:08	Nitrate as NO3 (calc)	25	45	mg/L	0.88
02/23/2012	18:37	Orthophosphate as P	0.031		mg/L	0.01
02/24/2012	14:26	Orthophosphate as PO4	0.095		mg/L	0.031
02/23/2012	15:14	Total Coliform Bacteria	900		MPN/100 ml	2



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1 800 566 LABS (1 800 566 5227)

**Laboratory
Hits Report: 389198**

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
02/24/2012 14:57	Total phosphorus as P		0.037		mg/L	0.02
02/24/2012 16:39	Total phosphorus as PO4- Calc.		0.11		mg/L	0.031
02/24/2012 11:08	Turbidity		0.46	5	NTU	0.05



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Laboratory Data
Report: 389198

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
BTW022312 (201202230334)					Sampled on 02/23/2012 1020			
EPA 8141A - Organophosphorous Pesticides (Sub)								
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Azinphos methyl	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Bolstar	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Coumaphos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Demeton	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Diazinon	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Dichlorvos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Disulfoton	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Ethoprop	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Fensulfothion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Fenthion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Methyl Parathion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Mevinphos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Naled	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Phorate	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Ronnel	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Stirophos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Tokuthion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Trichloronate	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Tributylphosphate	67	%		1
2/27/2012	02/28/2012	20:13	(EPA 8141A)	Triphenyl Phosphate	90	%		1
EPA 608 - Organochlorine Pesticides								
2/27/2012	02/29/2012	17:03	(EPA 608)	4,4-DDD	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	4,4-DDE	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	4,4-DDT	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Aldrin	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	alpha-BHC	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	alpha-Chlordane	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	beta-BHC	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	delta-BHC	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Dieldrin	ND	ug/L	0.19	1



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**Laboratory Data
Report: 389198**

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
2/27/2012	02/29/2012	17:03	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Endrin	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Endrin Ketone	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Gamma-BHC	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	gamma-Chlordane	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Heptachlor	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.096	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Methoxychlor	ND	ug/L	0.96	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Toxaphene	ND	ug/L	1.9	1
2/27/2012	02/29/2012	17:03	(EPA 608)	Decachlorobiphenyl	98	%		1
2/27/2012	02/29/2012	17:03	(EPA 608)	Tetrachlorometaxylene	91	%		1
SM 9221C - Fecal Coliform Bacteria								
02/23/2012	15:14	641210	(SM 9221C)	Fecal Coliform Bacteria	2	MPN/100 mL	2	1
SM 9221B - Total Coliform Bacteria								
02/23/2012	15:14	639862	(SM 9221B)	Total Coliform Bacteria	280	MPN/100 mL	2	1
S4500PE/ 365.1 - Total phosphorus as PO4- Calc.								
02/24/2012	16:38		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.088	mg/L	0.031	1
4500P-E/365.1 - Orthophosphate as PO4 (CAL)								
02/24/2012	14:26		(4500P-E/365.1)	Orthophosphate as PO4	0.043	mg/L	0.031	1
SM 4500-CL G - Total Chlorine Residual								
02/24/2012	00:00	641032	(SM 4500-CL G)	Total Chlorine Residual	ND	mg/L	0.1	1
EPA 547 - Glyphosate								
03/01/2012	13:28	641364	(EPA 547)	Glyphosate	ND	ug/L	6	1
EPA 300.0 - Nitrate, Nitrite by EPA 300.0								
02/23/2012	16:45	640666	(EPA 300.0)	Nitrate as Nitrogen by IC	ND	mg/L	0.1	1
02/23/2012	16:45	640666	(EPA 300.0)	Nitrate as NO3 (calc)	ND	mg/L	0.44	1
02/23/2012	16:45	640666	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.05	1
SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)								
02/24/2012	14:53	640870	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.029	mg/L	0.02	1
EPA 351.2 - Total Kjeldahl Nitrogen								
02/29/2012	14:25	641727	(EPA 351.2)	Kjeldahl Nitrogen	ND	mg/L	0.2	1

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



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Laboratory Data
Report: 389198

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
EPA 350.1 - Ammonia Nitrogen								
02/27/2012	14:51	641126	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
EPA 180.1 - Turbidity								
02/24/2012	11:04	640803	(EPA 180.1)	Turbidity	0.95	NTU	0.05	1
4500P-E/365.1 - Orthophosphate as P (OPO4)								
02/23/2012	18:30	640801	(4500P-E/365.1)	Orthophosphate as P	0.014	mg/L	0.01	1

HCC022312 (201202230343)

Sampled on 02/23/2012 1120

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
EPA 8141A - Organophosphorous Pesticides (Sub)								
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Azinphos methyl	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Bolstar	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Coumaphos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Demeton	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Diazinon	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Dichlorvos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Disulfoton	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Ethoprop	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Fensulfothion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Fenthion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Methyl Parathion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Mevinphos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Naled	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Phorate	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Ronnel	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Stirophos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Tokuthion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Trichloronate	ND	ug/L	1.1	1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Tributylphosphate	67	%		1
2/27/2012	02/28/2012	20:47	(EPA 8141A)	Triphenyl Phosphate	81	%		1
EPA 608 - Organochlorine Pesticides								
2/27/2012	02/29/2012	17:25	(EPA 608)	4,4-DDD	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	4,4-DDE	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	4,4-DDT	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Aldrin	ND	ug/L	0.093	1

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



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**Laboratory Data
Report: 389198**

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
2/27/2012	02/29/2012	17:25	(EPA 608)	alpha-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	alpha-Chlordane	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	beta-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	delta-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Dieldrin	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Endrin	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Endrin Ketone	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Gamma-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	gamma-Chlordane	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Heptachlor	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Methoxychlor	ND	ug/L	0.93	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Toxaphene	ND	ug/L	1.9	1
2/27/2012	02/29/2012	17:25	(EPA 608)	Decachlorobiphenyl	100	%		1
2/27/2012	02/29/2012	17:25	(EPA 608)	Tetrachlorometaxylene	85	%		1
SM 9221C - Fecal Coliform Bacteria								
02/23/2012	15:14	641210	(SM 9221C)	Fecal Coliform Bacteria	8	MPN/100 mL	2	1
SM 9221B - Total Coliform Bacteria								
02/23/2012	15:14	639862	(SM 9221B)	Total Coliform Bacteria	1100	MPN/100 mL	2	1
S4500PE/ 365.1 - Total phosphorus as PO4- Calc.								
02/24/2012	16:38		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.11	mg/L	0.031	1
4500P-E/365.1 - Orthophosphate as PO4 (CAL)								
02/24/2012	14:26		(4500P-E/365.1)	Orthophosphate as PO4	0.092	mg/L	0.031	1
SM 4500-CL G - Total Chlorine Residual								
02/24/2012	00:00	641032	(SM 4500-CL G)	Total Chlorine Residual	ND	mg/L	0.1	1
EPA 547 - Glyphosate								
03/01/2012	13:40	641364	(EPA 547)	Glyphosate	ND	ug/L	6	1
EPA 300.0 - Nitrate, Nitrite by EPA 300.0								
02/23/2012	16:33	640666	(EPA 300.0)	Nitrate as Nitrogen by IC	5.3	mg/L	0.2	2
02/23/2012	16:33	640666	(EPA 300.0)	Nitrate as NO3 (calc)	23	mg/L	0.88	2
02/23/2012	16:33	640666	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	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: 389198

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)								
02/24/2012	14:54	640870	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.035	mg/L	0.02	1
EPA 351.2 - Total Kjeldahl Nitrogen								
02/29/2012	14:27	641727	(EPA 351.2)	Kjeldahl Nitrogen	ND	mg/L	0.2	1
EPA 350.1 - Ammonia Nitrogen								
02/27/2012	14:52	641126	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
EPA 180.1 - Turbidity								
02/24/2012	11:05	640803	(EPA 180.1)	Turbidity	0.31	NTU	0.05	1
4500P-E/365.1 - Orthophosphate as P (OPO4)								
02/23/2012	18:31	640801	(4500P-E/365.1)	Orthophosphate as P	0.030	mg/L	0.01	1

TJPIN022312 (201202230344)

Sampled on 02/23/2012 1210

EPA 8141A - Organophosphorous Pesticides (Sub)								
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Azinphos methyl	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Bolstar	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Chlorpyrifos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Coumaphos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Demeton	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Diazinon	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Dichlorvos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Disulfoton	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Ethoprop	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Fensulfothion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Fenthion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Methyl Parathion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Mevinphos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Naled	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Phorate	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Ronnel	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Stirophos	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Tokuthion	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Trichloronate	ND	ug/L	1.1	1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Tributylphosphate	70	%		1
2/27/2012	02/28/2012	21:20	(EPA 8141A)	Triphenyl Phosphate	89	%		1



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**Laboratory Data
Report: 389198**

MWH Americas - Arcadia

Sarah Garber
618 Michillinda Ave.
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Arcadia, CA 91007

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
EPA 608 - Organochlorine Pesticides								
2/27/2012	02/29/2012	17:46	(EPA 608)	4,4-DDD	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	4,4-DDE	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	4,4-DDT	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Aldrin	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	alpha-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	alpha-Chlordane	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	beta-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	delta-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Dieldrin	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Endrin	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Endrin Ketone	ND	ug/L	0.19	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Gamma-BHC	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	gamma-Chlordane	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Heptachlor	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.093	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Methoxychlor	ND	ug/L	0.93	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Toxaphene	ND	ug/L	1.9	1
2/27/2012	02/29/2012	17:46	(EPA 608)	Decachlorobiphenyl	98	%		1
2/27/2012	02/29/2012	17:46	(EPA 608)	Tetrachlorometaxylene	76	%		1
SM 9221C - Fecal Coliform Bacteria								
02/23/2012	15:14	641210	(SM 9221C)	Fecal Coliform Bacteria	14	MPN/100 mL	2	1
SM 9221B - Total Coliform Bacteria								
02/23/2012	15:14	639862	(SM 9221B)	Total Coliform Bacteria	700	MPN/100 mL	2	1
S4500PE/ 365.1 - Total phosphorus as PO4- Calc.								
02/24/2012	16:39		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.13	mg/L	0.031	1
4500P-E/365.1 - Orthophosphate as PO4 (CAL)								
02/24/2012	14:26		(4500P-E/365.1)	Orthophosphate as PO4	0.12	mg/L	0.031	1
SM 4500-CL G - Total Chlorine Residual								
02/24/2012	00:00	641032	(SM 4500-CL G)	Total Chlorine Residual	ND	mg/L	0.1	1
EPA 547 - Glyphosate								

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



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**Laboratory Data
Report: 389198**

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	03/01/2012	13:51	641364 (EPA 547)	Glyphosate	ND	ug/L	6	1
EPA 300.0 - Nitrate, Nitrite by EPA 300.0								
	02/23/2012	16:56	640666 (EPA 300.0)	Nitrate as Nitrogen by IC	8.7	mg/L	0.2	2
	02/23/2012	16:56	640666 (EPA 300.0)	Nitrate as NO3 (calc)	38	mg/L	0.88	2
	02/23/2012	16:56	640666 (EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)								
	02/24/2012	14:56	640870 (SM4500-PE/EPA 365.1)	Total phosphorus as P	0.042	mg/L	0.02	1
EPA 351.2 - Total Kjeldahl Nitrogen								
	02/29/2012	14:36	641727 (EPA 351.2)	Kjeldahl Nitrogen	ND	mg/L	0.2	1
EPA 350.1 - Ammonia Nitrogen								
	02/27/2012	14:53	641126 (EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
EPA 180.1 - Turbidity								
	02/24/2012	11:06	640803 (EPA 180.1)	Turbidity	0.56	NTU	0.05	1
4500P-E/365.1 - Orthophosphate as P (OPO4)								
	02/23/2012	18:36	640801 (4500P-E/365.1)	Orthophosphate as P	0.039	mg/L	0.01	1

TJPOUT022312 (201202230345)

Sampled on 02/23/2012 1230

EPA 8141A - Organophosphorous Pesticides (Sub)								
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Azinphos methyl	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Bolstar	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Chlorpyrifos	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Coumaphos	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Demeton	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Diazinon	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Dichlorvos	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Disulfoton	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Ethoprop	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Fensulfothion	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Fenthion	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Methyl Parathion	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Mevinphos	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Naled	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Phorate	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Ronnel	ND	ug/L	1	1



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**Laboratory Data
Report: 389198**

MWH Americas - Arcadia

Sarah Garber
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Suite 200
Arcadia, CA 91007

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Stirophos	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Tokuthion	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Trichloronate	ND	ug/L	1	1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Tributylphosphate	69	%		1
2/27/2012	02/28/2012	21:53	(EPA 8141A)	Triphenyl Phosphate	80	%		1
EPA 608 - Organochlorine Pesticides								
2/27/2012	02/29/2012	18:08	(EPA 608)	4,4-DDD	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	4,4-DDE	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	4,4-DDT	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Aldrin	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	alpha-BHC	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	alpha-Chlordane	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	beta-BHC	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	delta-BHC	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Dieldrin	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Endosulfan I (Alpha)	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Endosulfan II (Beta)	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Endosulfan Sulfate	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Endrin	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Endrin Aldehyde	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Endrin Ketone	ND	ug/L	0.2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Gamma-BHC	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	gamma-Chlordane	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Heptachlor	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Heptachlor Epoxide	ND	ug/L	0.099	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Methoxychlor	ND	ug/L	0.99	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Toxaphene	ND	ug/L	2	1
2/27/2012	02/29/2012	18:08	(EPA 608)	Decachlorobiphenyl	100	%		1
2/27/2012	02/29/2012	18:08	(EPA 608)	Tetrachlorometaxylene	81	%		1
SM 9221C - Fecal Coliform Bacteria								
02/23/2012	15:14	641210	(SM 9221C)	Fecal Coliform Bacteria	<2	MPN/100 mL	2	1
SM 9221B - Total Coliform Bacteria								
02/23/2012	15:14	639862	(SM 9221B)	Total Coliform Bacteria	900	MPN/100 mL	2	1
S4500PE/ 365.1 - Total phosphorus as PO4- Calc.								



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Laboratory Data
Report: 389198

MWH Americas - Arcadia

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

Samples Received on:
02/23/2012

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	02/24/2012 16:39		(S4500PE/ 365.1)	Total phosphorus as PO4- Calc.	0.11	mg/L	0.031	1
				4500P-E/365.1 - Orthophosphate as PO4 (CAL)				
	02/24/2012 14:26		(4500P-E/365.1)	Orthophosphate as PO4	0.095	mg/L	0.031	1
				SM 4500-CL G - Total Chlorine Residual				
	02/24/2012 00:00	641032	(SM 4500-CL G)	Total Chlorine Residual	ND	mg/L	0.1	1
				EPA 547 - Glyphosate				
	03/01/2012 14:03	641364	(EPA 547)	Glyphosate	ND	ug/L	6	1
				EPA 300.0 - Nitrate, Nitrite by EPA 300.0				
	02/23/2012 17:08	640666	(EPA 300.0)	Nitrate as Nitrogen by IC	5.8	mg/L	0.2	2
	02/23/2012 17:08	640666	(EPA 300.0)	Nitrate as NO3 (calc)	25	mg/L	0.88	2
	02/23/2012 17:08	640666	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.1	2
				SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)				
	02/24/2012 14:57	640870	(SM4500-PE/EPA 365.1)	Total phosphorus as P	0.037	mg/L	0.02	1
				EPA 351.2 - Total Kjeldahl Nitrogen				
	02/29/2012 14:37	641727	(EPA 351.2)	Kjeldahl Nitrogen	ND	mg/L	0.2	1
				EPA 350.1 - Ammonia Nitrogen				
	02/27/2012 14:55	641126	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.05	1
				EPA 180.1 - Turbidity				
	02/24/2012 11:08	640803	(EPA 180.1)	Turbidity	0.46	NTU	0.05	1
				4500P-E/365.1 - Orthophosphate as P (OPO4)				
	02/23/2012 18:37	640801	(4500P-E/365.1)	Orthophosphate as P	0.031	mg/L	0.01	1



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**Laboratory
QC Summary: 389198**

MWH Americas - Arcadia

QC Ref # 639862 - Total Coliform Bacteria

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/23/2012

Analyzed by: MIL
Analyzed by: MIL
Analyzed by: MIL
Analyzed by: MIL

QC Ref # 640666 - Nitrate, Nitrite by EPA 300.0

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/23/2012

Analyzed by: SXX
Analyzed by: SXX
Analyzed by: SXX
Analyzed by: SXX

QC Ref # 640801 - Orthophosphate as P (OPO4)

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/23/2012

Analyzed by: QMK
Analyzed by: QMK
Analyzed by: QMK
Analyzed by: QMK

QC Ref # 640803 - Turbidity

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/24/2012

Analyzed by: NEM
Analyzed by: NEM
Analyzed by: NEM
Analyzed by: NEM

QC Ref # 640870 - Total phosphorus as P (T-P)

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/24/2012

Analyzed by: NJR
Analyzed by: NJR
Analyzed by: NJR
Analyzed by: NJR

QC Ref # 641032 - Total Chlorine Residual

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/24/2012

Analyzed by: MCP
Analyzed by: MCP
Analyzed by: MCP
Analyzed by: MCP

QC Ref # 641126 - Ammonia Nitrogen

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/27/2012

Analyzed by: NJR
Analyzed by: NJR
Analyzed by: NJR
Analyzed by: NJR

QC Ref # 641210 - Fecal Coliform Bacteria

201202230334 BTW022312
201202230343 HCC022312
201202230344 TJPIN022312
201202230345 TJPOUT022312

Analysis Date: 02/23/2012

Analyzed by: MIL
Analyzed by: MIL
Analyzed by: MIL
Analyzed by: MIL

QC Ref # 641364 - Glyphosate

Analysis Date: 03/01/2012



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**Laboratory
QC Summary: 389198**

MWH Americas - Arcadia

(continued)

201202230334	BTW022312	Analyzed by: SZZ
201202230343	HCC022312	Analyzed by: SZZ
201202230344	TJPIN022312	Analyzed by: SZZ
201202230345	TJPOUT022312	Analyzed by: SZZ

QC Ref # 641727 - Total Kjeldahl Nitrogen

Analysis Date: 02/29/2012

201202230334	BTW022312	Analyzed by: NJR
201202230343	HCC022312	Analyzed by: NJR
201202230344	TJPIN022312	Analyzed by: NJR
201202230345	TJPOUT022312	Analyzed by: NJR



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QC Report: 389198

MWH Americas - Arcadia

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
QC Ref# 640666 - Nitrate, Nitrite by EPA 300.0 by EPA 300.0					Analysis Date: 02/23/2012				
LCS1	Nitrate as Nitrogen by IC		2.5	2.49	mg/L	100	(90-110)		
LCS2	Nitrate as Nitrogen by IC		2.5	2.52	mg/L	101	(90-110)	20	1.2
MBLK	Nitrate as Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrate as Nitrogen by IC		0.05	0.0493	mg/L	99	(50-150)		
MS_201202240091	Nitrate as Nitrogen by IC	ND	1.3	6.78	mg/L	106	(80-120)		
MSD_201202240091	Nitrate as Nitrogen by IC	ND	1.3	6.73	mg/L	105	(80-120)	20	0.74
LCS1	Nitrite Nitrogen by IC		1.0	0.959	mg/L	96	(90-110)		
LCS2	Nitrite Nitrogen by IC		1.0	0.958	mg/L	96	(90-110)	20	0.10
MBLK	Nitrite Nitrogen by IC			<0.10	mg/L				
MRL_CHK	Nitrite Nitrogen by IC		0.05	0.0497	mg/L	99	(50-150)		
MS_201202240091	Nitrite Nitrogen by IC	ND	0.5	2.47	mg/L	99	(80-120)		
MSD_201202240091	Nitrite Nitrogen by IC	ND	0.5	2.48	mg/L	99	(80-120)	20	0.40
QC Ref# 640801 - Orthophosphate as P (OPO4) by 4500P-E/365.1					Analysis Date: 02/23/2012				
LCS1	Orthophosphate as P		0.25	0.258	mg/L	103	(90-110)		
LCS2	Orthophosphate as P		0.25	0.255	mg/L	102	(90-110)	20	1.2
MBLK	Orthophosphate as P			<0.01	mg/L				
MRL_CHK	Orthophosphate as P		0.01	0.0110	mg/L	110	(50-150)		
MS_201202230378	Orthophosphate as P	ND	0.5	0.521	mg/L	104	(90-110)		
MS_201202230383	Orthophosphate as P	0.037	0.5	0.547	mg/L	102	(90-110)		
MSD_201202230378	Orthophosphate as P	ND	0.5	0.516	mg/L	103	(90-110)	20	0.96
QC Ref# 640803 - Turbidity by EPA 180.1					Analysis Date: 02/24/2012				
DUP1_201202230064	Turbidity	0.069		0.0730	NTU		(0-10)	10	5.6
DUP2_201202230022	Turbidity	0.14		0.141	NTU		(0-10)	10	0.71
LCS1	Turbidity		20	20.9	NTU	105	(90-110)		
LCS2	Turbidity		20	20.9	NTU	105	(90-110)	20	0.0
MBLK	Turbidity			<0.05	NTU				
MRL_CHK	Turbidity		0.05	0.0530	NTU	106	(50-150)		
QC Ref# 640870 - Total phosphorus as P (T-P) by SM4500-PE/EPA 365.1					Analysis Date: 02/24/2012				
LCS1	Total phosphorus as P		0.4	0.390	mg/L	98	(90-110)		
LCS2	Total phosphorus as P		0.4	0.392	mg/L	98	(90-110)	20	0.51
MBLK	Total phosphorus as P			<0.02	mg/L				
MRL_CHK	Total phosphorus as P		0.02	0.0278	mg/L	139	(50-150)		
MS_201202140423	Total phosphorus as P	0.027	0.4	0.400	mg/L	93	(90-110)		

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

(S) Indicates surrogate compound.

(I) Indicates internal standard compound.

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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)



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Laboratory
QC Report: 389198

MWH Americas - Arcadia
(continued)

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MS2_201202180210	Total phosphorus as P	0.82	0.4	1.26	mg/L	109	(90-110)		
MSD_201202140423	Total phosphorus as P	0.027	0.4	0.406	mg/L	95	(90-110)	20	1.5
QC Ref# 641126 - Ammonia Nitrogen by EPA 350.1					Analysis Date: 02/27/2012				
LCS1	Ammonia Nitrogen		1.0	1.04	mg/L	104	(90-110)		
LCS2	Ammonia Nitrogen		1.0	1.03	mg/L	103	(90-110)	20	0.97
MBLK	Ammonia Nitrogen			<0.05	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0450	mg/L	90	(50-150)		
MS_201202230116	Ammonia Nitrogen	0.13	1.0	1.15	mg/L	102	(90-110)		
MS2_201202230119	Ammonia Nitrogen	0.10	1.0	1.13	mg/L	103	(90-110)		
MSD_201202230116	Ammonia Nitrogen	0.13	1.0	1.13	mg/L	100	(90-110)	20	1.8
QC Ref# 641364 - Glyphosate by EPA 547					Analysis Date: 03/01/2012				
CCCH	Glyphosate		25	21.4	ug/L	86	(80-120)		
CCCM	Glyphosate		10	9.04	ug/L	90	(80-120)		
LCS1	Glyphosate		10	8.68	ug/L	87	(80-120)		
MBLK	Glyphosate			<6	ug/L				
MRL_CHK	Glyphosate		6.0	5.26	ug/L	88	(50-150)		
MS_201202220147	Glyphosate	ND	10	8.42	ug/L	84	(83-119)		
MS2_201202220177	Glyphosate	ND	10	9.44	ug/L	94	(83-119)		
MSD_201202220147	Glyphosate	ND	10	8.65	ug/L	87	(83-119)	20	2.7
QC Ref# 641727 - Total Kjeldahl Nitrogen by EPA 351.2					Analysis Date: 02/29/2012				
LCS1	Kjeldahl Nitrogen		4.0	4.35	mg/L	109	(90-110)		
LCS2	Kjeldahl Nitrogen		4.0	4.27	mg/L	107	(90-110)	20	1.9
MBLK	Kjeldahl Nitrogen			<0.1	mg/L				
MRL_CHK	Kjeldahl Nitrogen		0.2	0.167	mg/L	84	(50-150)		
MS_201202230116	Kjeldahl Nitrogen	ND	4.0	4.37	mg/L	104	(90-110)		
MS2_201202230119	Kjeldahl Nitrogen	ND	4.0	4.6	mg/L	<u>111</u>	(90-110)		
MSD_201202230116	Kjeldahl Nitrogen	ND	4.0	4.36	mg/L	104	(90-110)	20	0.23

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.

(S) Indicates surrogate compound.

(I) Indicates internal standard compound.

22/50

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)

TABLE OF CONTENTS

CLIENT: MWH LABORATORIES
PROJECT: 389198
SDG: 12B225

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1004
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	METHOD 608 (PESTICIDES) METHOD 3520C/8141A	5000 – 5010 5011 – 5021
HPLC	**	6000 –
METALS	**	7000 –
WET	**	8000 –
OTHERS	**	9000 –

** - Not Requested



LABORATORIES, INC.

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

Date: 03-08-2012
EMAX Batch No.: 128225

Attn: Jackie Contreras

MWH Laboratories
750 Royal Oaks Dr., Suite 100
Monrovia CA 91016-3629

Subject: Laboratory Report
Project: 389198

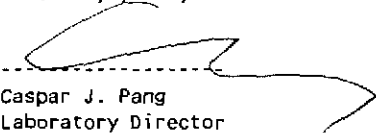
Enclosed is the Laboratory report for samples received on 02/24/12.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
201202230334	B225-01	02/23/12	WATER	PESTICIDES ORGANOCHLORINE PESTICIDES ORGANOPHOSPHORUS
201202230343	B225-02	02/23/12	WATER	PESTICIDES ORGANOCHLORINE PESTICIDES ORGANOPHOSPHORUS
201202230344	B225-03	02/23/12	WATER	PESTICIDES ORGANOCHLORINE PESTICIDES ORGANOPHOSPHORUS
201202230345	B225-04	02/23/12	WATER	PESTICIDES ORGANOCHLORINE PESTICIDES ORGANOPHOSPHORUS

The results are summarized on the following pages.

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

Sincerely yours,



Caspar J. Pang
Laboratory Director

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

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

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



MWH

LABORATORIES

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

Torrance, CA 90501

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

Submission Form & Purchase Order 99-15145

Date: 2/24/2012

***REPORTING REQUIREMENTS: Do Not Combine Reports with any other samples submitted under different MWH Folder Numbers!**
Report & Invoice must have the MWH Folder# 389198 Sub PO# 99-15145 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: mwhlabs-subcontractreports@mwhglobal.com
MWH Laboratories 750 Royal Oaks Dr. Ste. 100, Monrovia, CA 91016
Phone (626) 386-1166 Fax (626) 386-1122
Invoices to: MWH LABORATORIES
Accounts Payable PO BOX 6610, Broomfield, CO 80021

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

12B225

MWH Folder #: 389198 Report Due: 03/09/2012 Sub PO #: 99-15145

Use MWH Lab
Order # for ID

JLS	Client Sample ID for reference only	Analysis Requested	Sample Date & Time	Matrix	PWS Systemcode	PWSID
EPA 8081A 25/50 1	201202230334 BTW022312 @8081A	Organochlorine Pesticides	02/23/12 1020	DW		
EPA 8081A 2	201202230343 HCC022312 @8081A	Organochlorine Pesticides	02/23/12 1120	DW		
EPA 8081A 3	201202230344 TJPIN022312 @8081A	Organochlorine Pesticides	02/23/12 1210	DW		
EPA 8081A 4	201202230345 TJPOUT022312 @8081A	Organochlorine Pesticides	02/23/12 1230	DW		

T = 13.20 C

Relinquished by: Sample Control
Received by:

Date 2/24/12 Time 1159
Date 2/24/12 Time 1159

NOTIFICATION REQUIRED IF RECEIVED OUTSIDE OF 0-8 CELSIUS
An Acknowledgement of Receipt is requested to attn: Jackie Contreras

Richard Beauvil

From: Jaclyn Contreras [Jaclyn.L.Contreras@us.mwhglobal.com]

Sent: Monday, February 27, 2012 2:54 PM

To: Richard Beauvil

Cc: David Tripp

Subject: 389198 - need 8141 as well as 8081A 12B225

Hi Richard

Last week you received 8081 analysis for 4 samples for this report. We will need 8141 performed on this report as well. Is there enough volume to run the requested test? Thanks

jackie

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

MWH LABORATORIES

389198

METHOD 608
PESTICIDES

SDG#: 12B225

CASE NARRATIVE

Client : MWH LABORATORIES

Project : 389198

SDG : 12B225

METHOD 608
PESTICIDES

A total of four (4) water samples were received on 02/24/12 for Pesticides Organochlorine 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 for 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. Result was compliant to project requirement.

Lab Control Sample

A set of LCS/LCD was analyzed with the samples in this SDG. Percent recoveries for CPB046WL/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.

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 were 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 : MWH LABORATORIES
Project : 389198

SDG NO. : 12B225
Instrument ID : GCT105

WATER									
Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	CPB046WB	1	NA	02/29/1215:58	02/27/1210:45	LB29010A	LB29008A	CPB046W	Method Blank
LCS1W	CPB046WL	1	NA	02/29/1216:20	02/27/1210:45	LB29011A	LB29008A	CPB046W	Lab Control Sample (LCS)
LCD1W	CPB046WC	1	NA	02/29/1216:42	02/27/1210:45	LB29012A	LB29008A	CPB046W	LCS Duplicate
201202230334	B225-01	0.96	NA	02/29/1217:03	02/27/1210:45	LB29013A	LB29008A	CPB046W	Field Sample
201202230343	B225-02	0.93	NA	02/29/1217:25	02/27/1210:45	LB29014A	LB29008A	CPB046W	Field Sample
201202230344	B225-03	0.93	NA	02/29/1217:46	02/27/1210:45	LB29015A	LB29008A	CPB046W	Field Sample
201202230345	B225-04	0.99	NA	02/29/1218:08	02/27/1210:45	LB29016A	LB29008A	CPB046W	Field Sample

FN - Filename
% Moist - Percent Moisture

31/50

5002

SAMPLE RESULTS

METHOD 608
PESTICIDES

```

=====
Client      : MWH LABORATORIES           Date Collected: 02/23/12
Project     : 389198                     Date Received: 02/24/12
Batch No.   : 12B225                     Date Extracted: 02/27/12 10:45
Sample ID   : 201202230334              Date Analyzed: 02/29/12 17:03
Lab Samp ID : B225-01                   Dilution Factor: 0.96
Lab File ID : LB29013A                  Matrix          : WATER
Ext Btch ID : CPB046W                   % Moisture      : NA
Calib. Ref.: LB29008A                   Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) ND	0.096	0.019 0.019
GAMMA-BHC (LINDANE)	(ND) ND	0.096	0.019 0.019
BETA-BHC	(ND) ND	0.096	0.019 0.019
HEPTACHLOR	(ND) ND	0.096	0.019 0.019
DELTA-BHC	(ND) ND	0.096	0.019 0.019
ALDRIN	(ND) ND	0.096	0.019 0.019
HEPTACHLOR EPOXIDE	(ND) ND	0.096	0.019 0.019
GAMMA-CHLORDANE	(ND) ND	0.096	0.019 0.019
ALPHA-CHLORDANE	(ND) ND	0.096	0.019 0.019
ENDOSULFAN I	(ND) ND	0.096	0.019 0.019
4,4'-DDE	(ND) ND	0.19	0.019 0.019
DIELDRIN	(ND) ND	0.19	0.019 0.019
ENDRIN	(ND) ND	0.19	0.019 0.019
4,4'-DDD	(ND) ND	0.19	0.019 0.019
ENDOSULFAN II	(ND) ND	0.19	0.019 0.019
4,4'-DDT	(ND) ND	0.19	0.019 0.019
ENDRIN ALDEHYDE	(ND) ND	0.19	0.019 0.019
ENDOSULFAN SULFATE	(ND) ND	0.19	0.019 0.019
ENDRIN KETONE	(ND) ND	0.19	0.019 0.019
METHOXYCHLOR	(ND) ND	0.96	0.19 0.19
TOXAPHENE	(ND) ND	1.9	0.96 0.96

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.3168 (0.3483)	0.3840	82.5 (90.7)	30-140
DECACHLOROBIPHENYL	0.3187 (0.3775)	0.3840	83.0 (98.3)	40-150

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

METHOD 608
PESTICIDES

```

=====
Client       : MWH LABORATORIES           Date Collected: 02/23/12
Project      : 389198                     Date Received: 02/24/12
Batch No.    : 12B225                     Date Extracted: 02/27/12 10:45
Sample ID:   201202230343                 Date Analyzed: 02/29/12 17:25
Lab Samp ID: B225-02                      Dilution Factor: 0.93
Lab File ID: LB29014A                     Matrix          : WATER
Ext Btch ID: CP8046W                      % Moisture     : NA
Calib. Ref.: LB29008A                     Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)	
ALPHA-BHC	(ND) ND	0.093	0.019 0.019	
GAMMA-BHC (LINDANE)	(ND) ND	0.093	0.019 0.019	
BETA-BHC	(ND) ND	0.093	0.019 0.019	
HEPTACHLOR	(ND) ND	0.093	0.019 0.019	
DELTA-BHC	(ND) ND	0.093	0.019 0.019	
ALDRIN	(ND) ND	0.093	0.019 0.019	
HEPTACHLOR EPOXIDE	(ND) ND	0.093	0.019 0.019	
GAMMA-CHLORDANE	(ND) ND	0.093	0.019 0.019	
ALPHA-CHLORDANE	(ND) ND	0.093	0.019 0.019	
ENDOSULFAN I	(ND) ND	0.093	0.019 0.019	
4,4'-DDE	(ND) ND	0.19	0.019 0.019	
DIELDRIN	(ND) ND	0.19	0.019 0.019	
ENDRIN	(ND) ND	0.19	0.019 0.019	
4,4'-DDD	(ND) ND	0.19	0.019 0.019	
ENDOSULFAN II	(ND) ND	0.19	0.019 0.019	
4,4'-DDT	(ND) ND	0.19	0.019 0.019	
ENDRIN ALDEHYDE	(ND) ND	0.19	0.019 0.019	
ENDOSULFAN SULFATE	(ND) ND	0.19	0.019 0.019	
ENDRIN KETONE	(ND) ND	0.19	0.019 0.019	
METHOXYCHLOR	(ND) ND	0.93	0.19 0.19	
TOXAPHENE	(ND) ND	1.9	0.93 0.93	
SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.2976 (0.3178)	0.3720	80.0 (85.4)	30-140
DECACHLOROBIPHENYL	0.3127 (0.3713)	0.3720	84.1 (99.8)	40-150

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

METHOD 608
PESTICIDES

```

=====
Client       : MWH LABORATORIES           Date Collected: 02/23/12
Project      : 389198                     Date Received: 02/24/12
Batch No.    : 12B225                     Date Extracted: 02/27/12 10:45
Sample ID    : 201202230344              Date Analyzed: 02/29/12 17:46
Lab Samp ID  : B225-03                    Dilution Factor: 0.93
Lab File ID  : LB29015A                   Matrix          : WATER
Ext Btch ID  : CPB046W                    % Moisture      : NA
Calib. Ref.  : LB29008A                   Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)	
ALPHA-BHC	(ND) ND	0.093	0.019 0.019	
GAMMA-BHC (LINDANE)	(ND) ND	0.093	0.019 0.019	
BETA-BHC	(ND) ND	0.093	0.019 0.019	
HEPTACHLOR	(ND) ND	0.093	0.019 0.019	
DELTA-BHC	(ND) ND	0.093	0.019 0.019	
ALDRIN	(ND) ND	0.093	0.019 0.019	
HEPTACHLOR EPOXIDE	(ND) ND	0.093	0.019 0.019	
GAMMA-CHLORDANE	(ND) ND	0.093	0.019 0.019	
ALPHA-CHLORDANE	(ND) ND	0.093	0.019 0.019	
ENDOSULFAN I	(ND) ND	0.093	0.019 0.019	
4,4'-DDE	(ND) ND	0.19	0.019 0.019	
DIELDRIN	(ND) ND	0.19	0.019 0.019	
ENDRIN	(ND) ND	0.19	0.019 0.019	
4,4'-DDD	(ND) ND	0.19	0.019 0.019	
ENDOSULFAN II	(ND) ND	0.19	0.019 0.019	
4,4'-DDT	(ND) ND	0.19	0.019 0.019	
ENDRIN ALDEHYDE	(ND) ND	0.19	0.019 0.019	
ENDOSULFAN SULFATE	(ND) ND	0.19	0.019 0.019	
ENDRIN KETONE	(ND) ND	0.19	0.019 0.019	
METHOXYCHLOR	(ND) ND	0.93	0.19 0.19	
TOXAPHENE	(ND) ND	1.9	0.93 0.93	
SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.2796 (0.2839)	0.3720	75.2 (76.3)	30-140
DECACHLOROBIPHENYL	0.3075 (0.3645)	0.3720	82.7 (98.0)	40-150

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

METHOD 608
PESTICIDES

```

=====
Client       : MWH LABORATORIES           Date Collected: 02/23/12
Project      : 389198                     Date Received: 02/24/12
Batch No.    : 12B225                     Date Extracted: 02/27/12 10:45
Sample ID    : 201202230345              Date Analyzed: 02/29/12 18:08
Lab Samp ID  : B225-04                    Dilution Factor: 0.99
Lab File ID  : LB29016A                   Matrix          : WATER
Ext Btch ID  : CPB046W                    % Moisture      : NA
Calib. Ref.  : LB29008A                   Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) ND	0.099	0.020 0.020
GAMMA-BHC (LINDANE)	(ND) ND	0.099	0.020 0.020
BETA-BHC	(ND) ND	0.099	0.020 0.020
HEPTACHLOR	(ND) ND	0.099	0.020 0.020
DELTA-BHC	(ND) ND	0.099	0.020 0.020
ALDRIN	(ND) ND	0.099	0.020 0.020
HEPTACHLOR EPOXIDE	(ND) ND	0.099	0.020 0.020
GAMMA-CHLORDANE	(ND) ND	0.099	0.020 0.020
ALPHA-CHLORDANE	(ND) ND	0.099	0.020 0.020
ENDOSULFAN I	(ND) ND	0.099	0.020 0.020
4,4'-DDE	(ND) ND	0.20	0.020 0.020
DIELDRIN	(ND) ND	0.20	0.020 0.020
ENDRIN	(ND) ND	0.20	0.020 0.020
4,4'-DDD	(ND) ND	0.20	0.020 0.020
ENDOSULFAN II	(ND) ND	0.20	0.020 0.020
4,4'-DDT	(ND) ND	0.20	0.020 0.020
ENDRIN ALDEHYDE	(ND) ND	0.20	0.020 0.020
ENDOSULFAN SULFATE	(ND) ND	0.20	0.020 0.020
ENDRIN KETONE	(ND) ND	0.20	0.020 0.020
METHOXYCHLOR	(ND) ND	0.99	0.20 0.20
TOXAPHENE	(ND) ND	2.0	0.99 0.99

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.3154 (0.3211)	0.3960	79.7 (81.1)	30-140
DECACHLOROBIPHENYL	0.3352 (0.3961)	0.3960	84.6 (100)	40-150

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       : MWH LABORATORIES
Project      : 389198
Batch No.   : 12B225
Sample ID   : MBLK1W
Lab Samp ID : CPB046WB
Lab File ID : LB29010A
Ext Btch ID : CPB046W
Calib. Ref.: LB29008A

Date Collected: NA
Date Received: 02/27/12
Date Extracted: 02/27/12 10:45
Date Analyzed: 02/29/12 15:58
Dilution Factor: 1
Matrix       : WATER
% Moisture   : NA
Instrument ID : GCT105
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ALPHA-BHC	(ND) ND	0.10	0.020 0.020
GAMMA-BHC (LINDANE)	(ND) ND	0.10	0.020 0.020
BETA-BHC	(ND) ND	0.10	0.020 0.020
HEPTACHLOR	(ND) ND	0.10	0.020 0.020
DELTA-BHC	(ND) ND	0.10	0.020 0.020
ALDRIN	(ND) ND	0.10	0.020 0.020
HEPTACHLOR EPOXIDE	(ND) ND	0.10	0.020 0.020
GAMMA-CHLORDANE	(ND) ND	0.10	0.020 0.020
ALPHA-CHLORDANE	(ND) ND	0.10	0.020 0.020
ENDOSULFAN I	(ND) ND	0.10	0.020 0.020
4,4'-DDE	(ND) ND	0.20	0.020 0.020
DIELDRIN	(ND) ND	0.20	0.020 0.020
ENDRIN	(ND) ND	0.20	0.020 0.020
4,4'-DDD	(ND) ND	0.20	0.020 0.020
ENDOSULFAN II	(ND) ND	0.20	0.020 0.020
4,4'-DDT	(ND) ND	0.20	0.020 0.020
ENDRIN ALDEHYDE	(ND) ND	0.20	0.020 0.020
ENDOSULFAN SULFATE	(ND) ND	0.20	0.020 0.020
ENDRIN KETONE	(ND) ND	0.20	0.020 0.020
METHOXYCHLOR	(ND) ND	1.0	0.20 0.20
TOXAPHENE	(ND) ND	2.0	1.0 1.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.2804 (0.2823)	0.4000	70.1 (70.6)	30-130
DECACHLOROBIPHENYL	0.3366 (0.4029)	0.4000	84.1 (101)	40-150

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: MWH LABORATORIES
PROJECT: 389198
BATCH NO.: 12B225
METHOD: METHOD 608

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: CPB046WB CPB046WL CPB046WC
LAB FILE ID: LB29010A LB29011A LB29012A
DATE EXTRACTED: 02/27/1210:45 02/27/1210:45 02/27/1210:45 DATE COLLECTED: NA
DATE ANALYZED: 02/29/1215:58 02/29/1216:20 02/29/1216:42 DATE RECEIVED: 02/27/12
PREP. BATCH: CPB046W CPB046W CPB046W
CALIB. REF: LB29008A LB29008A LB29008A

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 (3000 Dieldrin)	(ND) ND	0.200	0.175 (0.184)	88 (92)	0.200	0.171 (0.184)	86 (92)	2 (0)	40-130	30
Heptachlor	(ND) ND	0.200	(0.175) 0.173	(88) 86	0.200	(0.175) 0.173	(88) 86	(0) 0	30-140	30
Aldrin	(ND) ND	0.200	0.177 (0.184)	88 (92)	0.200	0.172 (0.183)	86 (92)	3 (1)	40-130	30
Dieldrin	(ND) ND	0.200	0.176J (0.181J)	88 (90)	0.200	0.174J (0.179J)	87 (90)	1 (1)	60-140	30
Endrin	(ND) ND	0.200	0.178J (0.180J)	89 (90)	0.200	0.179J (0.180J)	90 (90)	1 (0)	50-140	30
4,4'-DDT	(ND) ND	0.200	(0.194J) 0.179J	(97) 90	0.200	(0.194J) 0.178J	(97) 89	(0) 1	60-140	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	0.3281 (0.3396)	82.0 (84.9)	0.4000	0.2944 (0.3065)	73.6 (76.6)	30-130
Decachlorobiphenyl	0.4000	0.3232 (0.3852)	80.8 (96.3)	0.4000	0.3229 (0.3837)	80.7 (95.9)	40-150

LABORATORY REPORT FOR

MWH LABORATORIES

389198

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

SDG#: 12B225

CASE NARRATIVE

Client : MWH LABORATORIES
Project : 389198
SDG : 12B225

METHOD 3520C/8141A
ORGANOPHOSPHOROUS COMPOUNDS BY GC

A total of four (4) water samples were received on 02/24/12 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.

Method Blank

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

Lab Control Sample

A set of LCS/LCD was analyzed with the samples in this SDG. Percent recoveries for NPB003WL/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.

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 : MWH LABORATORIES
Project : 389198
=====

SDG NO. : 128225
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	NPB003WB	1	NA	02/28/1218:33	02/27/1216:00	ZB28009A	ZB28002A	NPB003W	Method Blank
LCS1W	NPB003WL	1	NA	02/28/1219:06	02/27/1216:00	ZB28010A	ZB28002A	NPB003W	Lab Control Sample (LCS)
LCD1W	NPB003WC	1	NA	02/28/1219:40	02/27/1216:00	ZB28011A	ZB28002A	NPB003W	LCS Duplicate
201202230334	B225-01	1.06	NA	02/28/1220:13	02/27/1216:00	ZB28012A	ZB28002A	NPB003W	Field Sample
201202230343	B225-02	1.14	NA	02/28/1220:47	02/27/1216:00	ZB28013A	ZB28002A	NPB003W	Field Sample
201202230344	B225-03	1.06	NA	02/28/1221:20	02/27/1216:00	ZB28014A	ZB28002A	NPB003W	Field Sample
201202230345	B225-04	1.01	NA	02/28/1221:53	02/27/1216:00	ZB28015A	ZB28002A	NPB003W	Field Sample

FN - Filename
% Moist - Percent Moisture

42/50

5013

SAMPLE RESULTS

METHOD 3520C/8141A
 ORGANOPHOSPHOROUS COMPOUNDS BY GC

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=====
Client       : MWH LABDRATORIES           Date Collected: 02/23/12
Project      : 389198                     Date Received: 02/24/12
Batch No.    : 128225                     Date Extracted: 02/27/12 16:00
Sample ID:   201202230334                 Date Analyzed: 02/28/12 20:13
Lab Samp ID: B225-01                      Dilution Factor: 1.06
Lab File ID: ZB28012A                     Matrix          : WATER
Ext Btch ID: NP8D03W                       % Moisture      : NA
Calib. Ref.: ZB28002A                     Instrument ID   : GCT012
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	ND	1.1	0.53
MEVINPHOS	ND	1.1	0.53
DEMETON	ND	1.1	0.53
ETHOPROP	ND	1.1	0.53
PHORATE	ND	1.1	0.53
NALED	ND	1.1	0.53
DIAZINON	ND	1.1	0.53
DISULFOTON	ND	1.1	0.53
RONNEL	ND	1.1	0.53
CHLORPYRIFOS	ND	1.1	0.53
FENTHION	ND	1.1	0.53
TRICHLORONATE	ND	1.1	0.53
METHYL PARATHION	ND	1.1	0.53
TOKUTHION	ND	1.1	0.53
STIROPHOS	ND	1.1	0.53
BOLSTAR	ND	1.1	0.53
FENSULFOTHION	ND	1.1	0.53
AZINPHOS-METHYL	ND	1.1	0.53
COUMAPHOS	ND	1.1	0.53

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.06	1.590	66.5	30-130
TRIPHENYL PHOSPHATE	1.44	1.590	90.3	50-130

METHOD 3520C/8141A
 ORGANOPHOSPHOROUS COMPOUNDS BY GC

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=====
Client       : MWH LABORATORIES           Date Collected: 02/23/12
Project      : 389198                     Date Received: 02/24/12
Batch No.    : 12B225                     Date Extracted: 02/27/12 16:00
Sample ID    : 201202230343              Date Analyzed: 02/28/12 20:47
Lab Samp ID  : B225-02                   Dilution Factor: 1.14
Lab File ID  : ZB28013A                  Matrix          : WATER
Ext Btch ID  : NPB003W                   % Moisture     : NA
Calib. Ref.  : ZB28002A                  Instrument ID   : GCT012
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	ND	1.1	0.57
MEVINPHOS	ND	1.1	0.57
DEMETON	ND	1.1	0.57
ETHOPROP	ND	1.1	0.57
PHORATE	ND	1.1	0.57
NALED	ND	1.1	0.57
DIAZINON	ND	1.1	0.57
DISULFOTON	ND	1.1	0.57
RONNEL	ND	1.1	0.57
CHLORPYRIFOS	ND	1.1	0.57
FENTHION	ND	1.1	0.57
TRICHLORONATE	ND	1.1	0.57
METHYL PARATHION	ND	1.1	0.57
TOKUTHION	ND	1.1	0.57
STIROPHOS	ND	1.1	0.57
BOLSTAR	ND	1.1	0.57
FENSULFOTHION	ND	1.1	0.57
AZINPHOS-METHYL	ND	1.1	0.57
COUMAPHOS	ND	1.1	0.57

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.14	1.710	66.8	30-130
TRIPHENYL PHOSPHATE	1.38	1.710	80.8	50-130

METHOD 3520C/8141A
 ORGANOPHOSPHOROUS COMPOUNDS BY GC

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=====
Client      : MWH LABORATORIES           Date Collected: 02/23/12
Project    : 389198                     Date Received: 02/24/12
Batch No.  : 12B225                      Date Extracted: 02/27/12 16:00
Sample ID  : 201202230344               Date Analyzed: 02/28/12 21:20
Lab Samp ID: B225-03                     Dilution Factor: 1.06
Lab File ID: ZB28014A                    Matrix          : WATER
Ext Btch ID: NP8003W                      % Moisture      : NA
Calib. Ref.: ZB28002A                    Instrument ID   : GCT012
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	ND	1.1	0.53
MEVINPHOS	ND	1.1	0.53
DEMETON	ND	1.1	0.53
ETHOPROP	ND	1.1	0.53
PHORATE	ND	1.1	0.53
NALED	ND	1.1	0.53
DIAZINON	ND	1.1	0.53
DISULFOTON	ND	1.1	0.53
RONNEL	ND	1.1	0.53
CHLORPYRIFOS	ND	1.1	0.53
FENTHION	ND	1.1	0.53
TRICHLORONATE	ND	1.1	0.53
METHYL PARATHION	ND	1.1	0.53
TOKUTHION	ND	1.1	0.53
STIROPHOS	ND	1.1	0.53
BOLSTAR	ND	1.1	0.53
FENSULFOTHION	ND	1.1	0.53
AZINPHOS-METHYL	ND	1.1	0.53
COUMAPHOS	ND	1.1	0.53

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.10	1.590	69.5	30-130
TRIPHENYL PHOSPHATE	1.41	1.590	88.8	50-130

METHOD 3520C/8141A
 ORGANOPHOSPHOROUS COMPOUNDS BY GC

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=====
Client       : MWH LABDRATORIES           Date Collected: 02/23/12
Project      : 389198                     Date Received: 02/24/12
Batch No.    : 12B225                     Date Extracted: 02/27/12 16:00
Sample ID:   2D1202230345                 Date Analyzed: 02/28/12 21:53
Lab Samp ID: B225-04                      Dilution Factor: 1.01
Lab File ID: ZB28015A                     Matrix          : WATER
Ext Btch ID: NPBDO3W                       % Moisture     : NA
Calib. Ref.: ZB28002A                     Instrument ID  : GCT012
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	ND	1.0	0.51
MEVINPHOS	ND	1.0	0.51
DEMETON	ND	1.0	0.51
ETHOPROP	ND	1.0	0.51
PHORATE	ND	1.0	0.51
NALED	ND	1.0	0.51
DIAZINON	ND	1.0	0.51
DISULFOTON	ND	1.0	0.51
RONNEL	ND	1.0	0.51
CHLORPYRIFOS	ND	1.0	0.51
FENTHION	ND	1.0	0.51
TRICHLORONATE	ND	1.0	0.51
METHYL PARATHION	ND	1.0	0.51
TOKUTHION	ND	1.0	0.51
STIROPHDS	ND	1.0	0.51
BOLSTAR	ND	1.0	0.51
FENSULFOTHION	ND	1.0	0.51
AZINPHOS-METHYL	ND	1.0	0.51
COUMAPHOS	ND	1.0	0.51

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.04	1.515	68.9	30-130
TRIPHENYL PHOSPHATE	1.21	1.515	79.9	50-130

QC SUMMARIES

METHOD 3520C/8141A
 ORGANOPHOSPHOROUS COMPOUNDS BY GC

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=====
Client      : MWH LABORATORIES           Date Collected: NA
Project    : 389198                     Date Received: 02/27/12
Batch No.  : 128225                     Date Extracted: 02/27/12 16:00
Sample ID  : MBLK1W                     Date Analyzed: 02/28/12 18:33
Lab Samp ID: NP8003WB                   Dilution Factor: 1
Lab File ID: ZB28009A                   Matrix          : WATER
Ext Btch ID: NP8003W                     % Moisture      : NA
Calib. Ref.: ZB28002A                   Instrument ID   : GCT012
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
DICHLORVOS	ND	1.0	0.50
MEVINPHOS	ND	1.0	0.50
DEMETON	ND	1.0	0.50
ETHOPROP	ND	1.0	0.50
PHORATE	ND	1.0	0.50
NALED	ND	1.0	0.50
DIAZINDN	ND	1.0	0.50
DISULFOTON	ND	1.0	0.50
RONNEL	ND	1.0	0.50
CHLORPYRIFOS	ND	1.0	0.50
FENTHION	ND	1.0	0.50
TRICHLORONATE	ND	1.0	0.50
METHYL PARATHION	ND	1.0	0.50
TOKUTHION	ND	1.0	0.50
STIROPHOS	ND	1.0	0.50
BOLSTAR	ND	1.0	0.50
FENSULFOTHION	ND	1.0	0.50
AZINPHOS-METHYL	ND	1.0	0.50
COUMAPHOS	ND	1.0	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TRIBUTYL PHOSPHATE	1.01	1.500	67.4	30-130
TRIPHENYL PHOSPHATE	1.28	1.500	85.6	50-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: MWH LABORATORIES
PROJECT: 389198
BATCH NO.: 12B225
METHOD: METHOD 3520C/8141A

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: NPB003WB NPB003WL NPB003WC
LAB FILE ID: ZB28009A ZB28010A ZB28011A
DATE EXTRACTED: 02/27/1216:00 02/27/1216:00 02/27/1216:00 DATE COLLECTED: NA
DATE ANALYZED: 02/28/1218:33 02/28/1219:06 02/28/1219:40 DATE RECEIVED: 02/27/12
PREP. BATCH: NPB003W NPB003W NPB003W
CALIB. REF: ZB28002A ZB28002A ZB28002A

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	1.50	1.03	68	1.50	0.887J	59	15	10-130	30
Ronnel	ND	1.50	1.21	81	1.50	1.04	70	15	30-140	30
Chlorpyrifos	ND	1.50	1.21	81	1.50	1.20	80	1	40-140	30
Tokuthion	ND	1.50	1.32	88	1.50	1.31	88	0	40-130	30
Bolstar	ND	1.50	1.26	84	1.50	1.23	82	3	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	1.50	1.30	87	1.50	1.12	75	30-130
Triphenyl Phosphate	1.50	1.57	104	1.50	1.49	99	50-130

APPENDIX P

Restoration of 11-acre Oak/Sycamore Woodland Quarterly Reports



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

February 1, 2011
(2010-116/C/C3)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C3 – Weeding in the Oak/Sycamore Upland Area for January 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving weeding in the oak/sycamore upland area was conducted at the Big Tujunga Wash Mitigation Area during January 2011. The next weeding effort is scheduled for April 2011.

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

SIGNED: 

DATE: February 1, 2011

For Gregorio Benavides
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

April 15, 2011
(2010-116.001/C/C3)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C3 – Weeding in the Oak/Sycamore Upland Area for February through April 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continuation of the weed removal effort in the Oak/Sycamore Upland areas at the Big Tujunga Wash Mitigation Area (Mitigation Area) during the February through April 2011 timeframe. The area targeted during this effort includes the upland areas on the east and west sides of the Cottonwood and the Mary Bell entrances to the Mitigation Area.

Prior to any weed removal activities, ECORP Consulting, Inc. (ECORP) biologist Gregorio Benavides conducted a pre-construction survey to determine if any active bird nests were located within the areas where weed removal was scheduled to occur. A bird nest was observed in the western portion of the upland area and a 300-foot no-work buffer was established around the nest. In addition, all of the landscape contractor's (Natures Image) crew members were given an onsite orientation briefing by ECORP's biologist. The briefing informed them of the Mitigation Area's regulations and the sensitive species and habitats that are present in the Mitigation Area.

Natures Images crew conducted the weed removal on April 6 and 7, 2011. Hand removal methods were used, which included utilizing tools such as machetes and string trimmers. The removal efforts were focused on non-native weeds growing around the base of native shrubs and trees.

During the pre-construction survey of the upland areas, active bird nesting activity was observed in the western portion of the upland area. A 300-foot buffer was established in this area to prevent disturbing bird breeding activity. While weeding was restricted to the areas outside the buffer, ECORP's biologist instructed Natures Image crew to maintain a distance from the perimeter of the buffer. No raptor breeding or nesting was observed.

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

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

SIGNED:  _____

DATE: April 15, 2011

For Gregorio Benavides
Biologist

June 24, 2011
(2010-116.002/C/C3)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C3 – Weeding in the Oak/Sycamore upland area for May through June 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continuation of the weed removal effort in the Oak/Sycamore upland areas at the Big Tujunga Wash Mitigation Area during the May through June 2011 timeframe. The area targeted during this effort includes the upland areas on the east and west sides of the Cottonwood area and the Mary Bell entrance to the Mitigation Area.

Prior to any weed removal activities, an ECORP Consulting, Inc. (ECORP) biologist Gregorio Benavides conducted a pre-construction survey on May 31, 2011 to determine if any active bird nests were located within the areas where weed removal was scheduled to occur. The survey resulted in the following observations:

- Active bird nesting activity and raptor nests were not observed in the upland area;
- Large stands and patches of mustard plant (*Brassica* sp.) were observed throughout the upland area, including the area behind Gibson Ranch and the movie studio (Figure 1);
- Thistle (*Carduus* sp.) was observed throughout the upland area. In most cases thistle was associated with stands of mustard plant in either mixed configurations with mustard or in discrete stands adjacent to patches of mustard (Figure 2). Thistle density was high along the eastern edge of the upland area, throughout the area behind Gibson Ranch, and in small, dense patches behind the movie studio;
- Weedy plants were found in sparse patches throughout the upland area, behind Gibson Ranch, and behind the movie studio. In most cases weedy plants were spatially associated with stands of mustard plant and thistle (Figure 3).

Natures Image's crew conducted the weed removal on June 9, 10, 13, and 14, 2011 and was supervised by ECORP biologist Gregorio Benavides. Natures Image crews used machetes, line trimmers (Figure 4), and a modified line trimmer (fitted with a circular saw blade) for the removal and treatment effort in the upland area and in the area behind Gibson Ranch and the movie studio. Garlon 4™ herbicide was used to treat cut areas to

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minimize re-growth of unwanted plant species. Also, Los Angeles County Fire officials had made a recommendation to Los Angeles County Department of Public Works (LACDPW) to reduce brush material behind Gibson Ranch and the movie studio, so the exotic vegetation removal efforts in these areas was in compliance with Los Angeles County Fire official's request (Figures 5 and 6).

The following is a summary of the work performed in June:

- Mustard was removed throughout the upland area and the area behind Gibson Ranch. Herbicide was used to prevent re-growth of mustard.
 - The highest concentration of mustard was removed from the western portion of the upland area extending from Cottonwood Ave to the residential area to the east of the upland area (Figures 7 and 8).
 - Line trimmers and machetes were used to remove and mulch mustard growing on the upland area behind Gibson Ranch. The crew removed mustard all along the fence-line from the rodeo/training area to the end of the stable area (Figure 9).
 - Mustard was removed along the downward slopes of the areas described above.
 - In the eastern portion of the Mitigation Area, mustard was removed along the edge of the slope to an area approximately five feet from the slope. ECORP biologist Gregorio Benavides directed crews to remove mustard from this zone to minimize seed dispersal back into the Mitigation Area below Haines Canyon Wash.
- Stands of thistle were removed using either line trimmers (Figure 10) or a modified line trimmer fitted with a circular saw blade. In all cases, thistle cuttings were mulched and treated with the appropriate herbicide.
 - Thick stands of thistle were removed from the eastern portion of the upland area, especially along the sloping areas of the upland (Figure 11);
 - The area behind Gibson Ranch contained sparse but thick stands of thistle, all of which were removed and treated on site;
 - Small patches of thistle were removed behind the movie studio area.
- Weedy plants stands were removed throughout the entire upland area.
 - Small, sparse patches were treated with herbicide along Cottonwood Avenue;
 - Most weedy plants were intermixed with mustard and thistle, so removal was performed at the same time (Figure 12).

Natures Image crews were given an onsite orientation briefing by ECORP's biologist. The briefing informed them of the Mitigation Area's regulations and the sensitive species and habitats that are present in the Mitigation Area.

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

SIGNED: 

DATE: June 24, 2011

For Gregorio Benavides, Biologist



Figure 1. Dense stands of mustard were observed in the upland area during pre-construction surveys in May 2011.



Figure 2. Stands of thistle in the upland area were often associated with mustard plant.



Figure 3. Weedy plant species were often found intermixed with mustard in the upland area.



Figure 4. Natures Image crews removing mustard and other target species with line trimmers.



Figures 5 and 6. Before and after photographs of the removal of exotic vegetation behind Gibson Ranch. The remaining vegetation in the second photo are native bushes.



Figure 7. Photograph of the western portion of the upland area, where mustard density was particularly high.



Figure 8. Mustard removal between Cottonwood Avenue and Mary Bell Avenue entrances.



Figure 9. Mustard, thistle and weedy plant removal behind the horse stables at Gibson Ranch.



Figure 10. Thick stands of thistle were removed throughout the upland area and behind two private property areas, near Gibson Ranch Road.



Figure 6. The thistle removal effort was high along the slopes leading to the upland area. Here, a Natures Image crew is removing thick stands of thistle just north of Gibson Ranch.



Figure 12. Mixed stands of mustard, thistle and weedy plant species were cut down and treated throughout the upland area.

October 3, 2011
(2010-116.004/C/C3)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C3 – Weeding in the Oak/Sycamore Upland Area for July through September 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice of the continued weed removal effort in the oak/sycamore upland areas at the Big Tujunga Wash Mitigation Area (Mitigation Area) during the July through September 2011 time period.

The weed removal was performed by Natures Image personnel on September 14, 2011. The removal effort was conducted on either side of the Cottonwood Avenue and Mary Bell entrances to the Mitigation Area using hand tools such as machetes and weed whackers. Efforts were focused on non-native weeds growing around the base of native shrubs and trees. Pre-construction surveys conducted by ECORP Consulting, Inc. (ECORP) biologists Benjamin Smith and Phillip Wasz were performed in these areas prior to weed removal.

Prior to any work, all Natures Image crew members received an onsite orientation and instruction on the Mitigation Area's regulations and concerns relating to the Mitigation Area's sensitive species and habitat by a qualified ECORP biologist.

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

SIGNED: 

Phillip Wasz
Biologist

DATE: October 3, 2011



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 31, 2011
(2010-116.006/C/C3)

Valerie De La Cruz
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: TASK C3 – Weeding in the Oak/Sycamore Upland Area for October through December 2011 at the Big Tujunga Wash Mitigation Area, Los Angeles County, California

Dear Ms. De La Cruz:

This letter serves as a notice that no work involving weeding in the oak/sycamore upland area was conducted at the Big Tujunga Wash Mitigation Area during the October through December 2011 time period. The next weeding effort has not yet been scheduled at this time.

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

SIGNED: 

DATE: December 31, 2011

Phillip Wasz
Biologist

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