# 2007/2008 Final Annual Report for the Big Tujunga Wash Mitigation Area

## Los Angeles County, CA

***Prepared for:***

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Department of Public Works
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**October 2010**

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# Guide to Compliance with the Terms and Conditions in the California Department of Fish and Game Streambed Alteration Agreement (SAA) #5-247-00 for the Big Tujunga Mitigation Bank, dated October 30, 2000

The original Streambed Alteration Agreement (#5-247-00) (SAA) for the Big Tujunga Mitigation Area was issued on October 30, 2000. The SAA contains Terms and Conditions that were required and are addressed in various sections of this annual report. 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.

**Conditions 1 through 5:** These are general conditions that do not require specific language in the annual report. However, the original SAA expired on October 30, 2007 and prior to the submittal of a request for an extension. So, the County of Los Angeles Public Works Department submitted an application for a new SAA in 2008. The new SAA had not been issued prior to the completion of the 2007/2008 season that is covered by this annual report. As a result, no exotic plant species removal activities were conducted after the expiration of the original SAA.

## Work Areas and Vegetation Removal

**Condition 6:** Activities conducted at the site did not result in any permanent adverse impacts to Haines Canyon Creek and/or Big Tujunga Wash.

**Condition 7:** Removal of non-native, invasive plant species did not occur outside of the limits identified at the August 31, 2000 meeting.

**Condition 8:** 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.

**Condition 9:** No native vegetation was removed from the channel, bed, or banks of the stream except as provided for in the SAA.

**Condition 10:** No vegetation was removed during the breeding season in 2007 or 2008. Therefore, no nesting surveys were conducted and no fencing of nests was required.

**Condition 11:** No vegetation was removed or stockpiled in the stream bed or on its banks.

## Equipment and Access

**Condition 12:** No vehicles or equipment were operated or driven in water covered portions of the stream.

**Condition 13:** All staging and storage areas for equipment and materials were confined to the paved areas at the Cottonwood entrance and the Tujunga Ponds entrance.

**Condition 14:** Access to the site only occurred via existing roads and established trails.

## Fill and Spoil

**Condition 15:** No spoils were generated as a result of any activities conducted in the Mitigation Area.

**Condition 16:** No spoils were generated as a result of any activities conducted in the Mitigation Area.

## Structures

**Condition 17:** No structures or associated materials were erected or constructed in the Mitigation Area.

**Condition 18:** No materials were placed in any seasonally dry portions of the stream.

## Pollution, Sedimentation, and Litter

**Condition 19:** Erosion control and maintenance of erosion problems is a routine activity conducted as part of the Master Mitigation Plan (MMP). Erosion control measures conducted in the Mitigation Area are discussed in Section 7.0 of this annual report.

**Condition 20:** No aggregate washing or other activities were conducted that would have resulted in the production of water containing mud, silt, or other pollutants.

**Condition 21:** No raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil, or other petroleum products, or any other substances that could be hazardous to aquatic life were used in the Mitigation Area.

**Condition 22:** All litter and pollution laws were complied with by the contractors, subcontractors, and employees of Los Angeles County Department of Public Works (LACDPW). Trash pickup was conducted regularly by LACDPW maintenance crews, the site users, the landscape contractor, and by volunteers during an organized Trails Maintenance Day (Section 6.3).

**Condition 23:** No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products, or other organic or earthen materials were generated from any activities conducted in the Mitigation Area.

**Condition 24:** No equipment maintenance was conducted in the Mitigation Area.

**Condition 25:** No vehicles were driven or operated within or adjacent to the stream or ponds.

**Condition 26:** No stationary equipment was left within the boundaries of the Mitigation Area.

**Condition 27:** No equipment was operated in wetted areas.

**Condition 28:** No construction activities occurred that would create turbidity/siltation in the stream or ponds.

**Condition 29:** No temporary or permanent dam, structures, flow restrictions, or fill 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.

**Condition 30:** No silty/turbid water from dewatering or other activities occurred as a result of the activities conducted in the Mitigation Area.

**Condition 31:** No silty/turbid water from dewatering or other activities occurred as a result of the activities conducted in the Mitigation Area.

**Condition 32:** 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 33:** As stated under Condition 29, 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. The 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 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.

**Condition 34:** No spills occurred in the Mitigation Area.

**Condition 35:** No temporary fills were constructed in the Mitigation Area.

## Removal of Non-native Vegetation

**Condition 36:** No herbicides were used in the riparian areas during the 2007/2008 period because the SAA had expired. A revised strategy for the habitat restoration and the control of exotic plants was developed (Section 2.0) in 2007 but it was not implemented because the new SAA was not yet in place. Removal of exotic, invasive plant species was limited to documentation of where the infestations were located. Hand-pulling, cutting, and string-trimming methods were used prior to the expiration of the SAA (Section 3).

## Protection for Wildlife and Aquatic Species

**Condition 37:** The MMP includes an extensive program targeted at removing exotic fish, bullfrogs, and other invasive aquatic species to enhance the habitat for native fishes (See Section 4.0).

**Condition 38:** Because no exotic plant removals or clearing of any vegetation occurred during the breeding season in the riparian areas, focused presence/absence surveys for threatened and endangered species and other species of concern were not conducted during the 2007/2008 period.

**Condition 39:** The only federal-listed species that has been observed in the Mitigation Area is the Santa Ana sucker. All of the activities conducted as part of the exotic aquatic wildlife removal program were conducted by biologists who hold Federal Endangered Species Permits for these species and they submit reports to the U.S. Fish and Wildlife Service in accordance with their permit conditions (Section 3.0).

**Administrative-Miscellaneous**

**Conditions 40 and 41:** No amendments to the SAA were submitted to the CDFG during the 2007/2008 period. CDFG did not identify any breaches of the SAA that was in place for a portion of 2007.

**Condition 42:** Copies of the SAA were provided to all of the biologists and subcontractors who conducted activities in the Mitigation Area.

**Condition 43:** CDFG did not request any site visits during the 2007/2008 period.

**Condition 44:** No construction activities occurred in the Mitigation Area during the 2007/2008 period.

**Condition 45:** CDFG did not issue a suspension or cancellation of the SAA.

# 1.0 INTRODUCTION

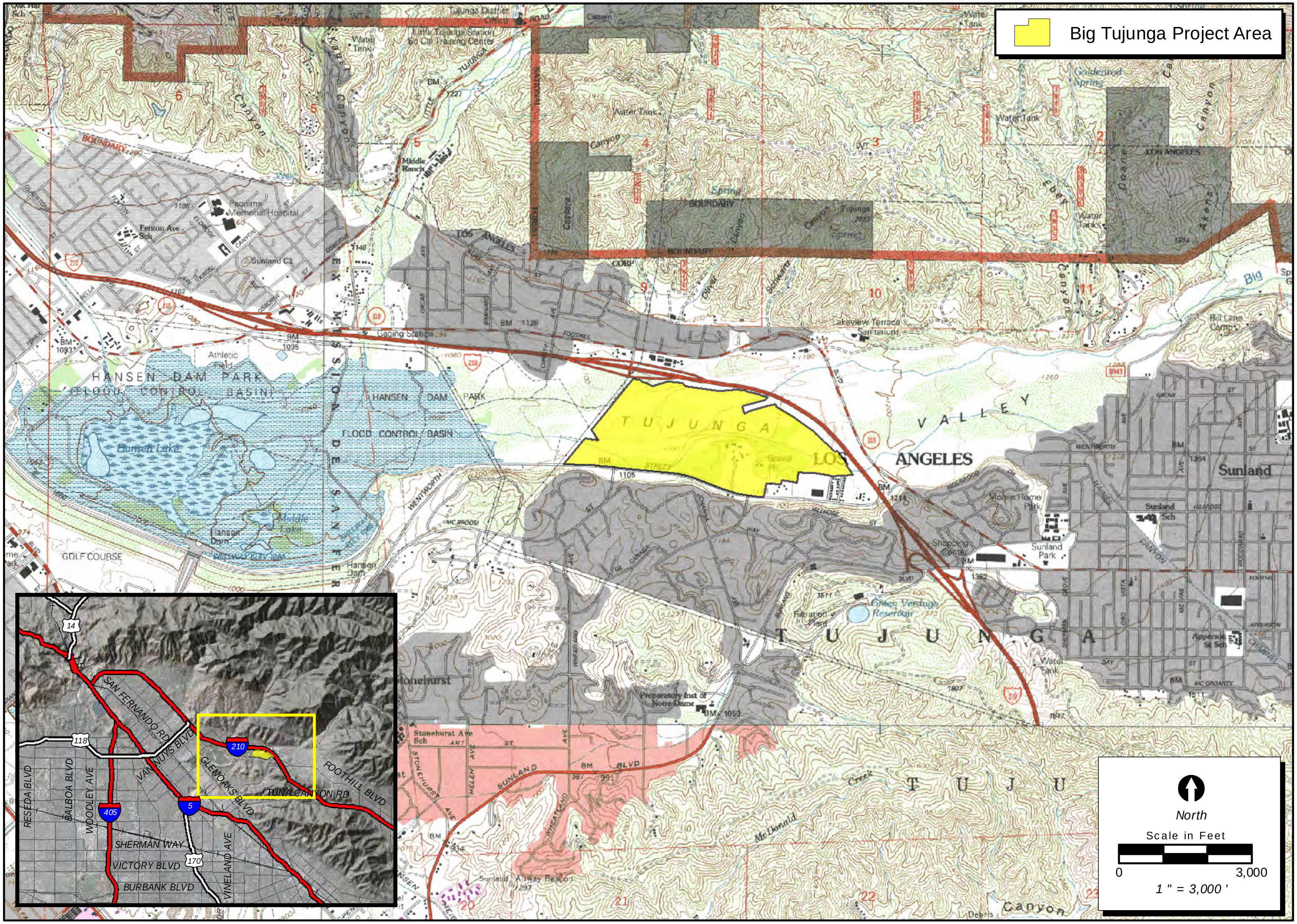
## 1.1 PURPOSE

The purpose of this report is to provide a summary of the management activities conducted at the Big Tujunga Mitigation Area from July 2007 to December 2008. These activities were conducted in accordance with the Master Mitigation Plan (MMP) for the Big Tujunga Mitigation Area. The MMP was originally 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's (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 catesbeiana*), 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 Master Mitigation Plan (LTMMP). This report summarizes all activities conducted between July 2007 and December 2008.

## 1.2 LOCATION AND SETTING

The Big Tujunga Wash 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 I-210 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 Big Tujunga Wash Mitigation Area supports two watercourses: Big Tujunga Wash proper 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 Big Tujunga Ponds and surrounding habitat were originally created as part of the mitigation measures for the construction of the I-210 Freeway 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:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Site_Vicinity\Tujunga_ProjectVicinity_v3.mxd (JSwager 10/12/2010)

10/12/2010

**Figure 1-1. Project Location Map**

*2010-116 Big Tujunga Wash Mitigation Area*

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Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Aerial_Maps\Onsite\Tujunga_Bank_Aerial.mxd (Swager 10/13/2010)

Aerial Date: March 2008
Map Date: 10/13/2010

**Figure 1-2. Big Tujunga Wash Mitigation Bank**

*2010-116 Big Tujunga Wash Mitigation Area*

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## 1.3 SUMMARY OF THE ANNUAL REPORT

Table 1-1 provides a list of the tasks described in the MMP that were implemented during the latter half of 2007 and during 2008. Certain tasks in the MMP were not conducted because the scope of work indicates that they will be done once during the three-year contract. These tasks include the focused surveys for fish, arroyo toad, least Bell's vireo, and southwestern willow flycatcher. In addition, because the original Streambed Alteration Agreement (SAA) for the Mitigation Area had expired, the exotic plant removal task was focused on the upland areas until the new SAA is acquired from the California Department of Fish and Game (CDFG). 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 in 2007/2008**

| Implemented in 2007/2008 | |
|---|---|
| | **<u>TASK A - Continue Habitat Restoration Program</u>** |
| X | Task A1 - Assess site and revise habitat restoration plan in MMP |
| | **<u>TASK C - Continue Exotic Plant Eradication Program</u>** |
| X | Task C3 – Weeding Only – Oak/Sycamore Uplands |
| | **<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 Metering Reminders and Meetings |
| X | Task F3 - CAC Meeting Reports |
| X | Task F4 - Contribution to Annual Report |
| | **<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 G7 - Annual Water Quality Monitoring , Analyses, and Report |
| X | Task G8 - Trails Monitoring |

| | | |
|---|---|---|
| | **TASK I - Finalize Formal Banking Agreement** | |
| X | Task I1 - Finalize Agreement and Negotiation with Resource Agencies | |
| | **TASK J - Update and Renew Permits** | |
| X | Task J2 - CDFG SAA and Meetings | |

### 1.3.1 Continuation of Habitat Restoration Program

The ultimate goal of the Big Tujunga Wash Mitigation Area site 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 Big Tujunga Wash Mitigation Area. Although the Big Tujunga Wash site 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 established to target removal of the 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. 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. A summary of Habitat Restoration Program activities implemented between July 2007 and December 2008 is included in Section 2.0.

### 1.3.2 Continuation of Brown-headed Cowbird Trapping Program

Long term continuation of the brown-headed cowbird trapping and removal program is based on several factors and will be conducted at the discretion of LACDPW. Cowbird trapping and removal activities were not conducted in 2007/2008 because the contract only includes trapping once during the three-year contract. The trapping will be conducted in 2009.

### 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. ECORP combined the previously separate exotic plant eradication programs of “Arundo Removal and Maintenance,” “Tamarisk Removal and Maintenance,” Hyacinth Removal and Maintenance,” “Castor Bean Removal and Maintenance,” and “Eupatory Removal and Maintenance,” into one simplified “Exotic Plant Species Control” task. Initial 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 major focus of this task for the 2007/2008 period was removal of weeds and non-native grasses from the oak/sycamore woodland restoration area. Exotic plant species control tasks implemented in 2007/2008 are summarized in Section 3.0.

### 1.3.4 Continuation of Exotic Wildlife Eradication Program

This task consists of the continued removal efforts of non-native invasive wildlife species. Efforts were focused on removal of exotic aquatic wildlife species, primarily bullfrogs 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 five exotic removal efforts occurred during the third and fourth quarters of 2007 and second and third quarters of 2008. Exotic wildlife removal tasks implemented in 2007/2008 are summarized in Section 4.0.

### 1.3.5 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 2007/2008 are summarized in Section 5.0.

### 1.3.6 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. The status of the Community Awareness Program and activities conducted in 2007/2008 are summarized in Section 6.0.

### 1.3.7 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 Big Tujunga 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 wildlife surveys (least Bell's vireo [*Vireo bellii pusillus*], southwestern willow flycatcher [*Empidonax traillii extimus*], and arroyo toad [*Anaxyrus californicus*]). The results of the continued site maintenance and monitoring program tasks that were conducted during the 2007/2008 contract year are summarized in Section 7.0.

### 1.3.8 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 order to strategize a new work plan for ensuring the success of this area. A detailed summary of the work plan and restoration activities within oak/sycamore woodland area conducted between July 2007 and December 2008 are included in Section 8.0.

#### 1.3.9 Finalization of Formal Banking Agreement

A first draft of the Formal Banking Agreement was prepared in 2001 but it was never finalized. Chambers Group prepared a second draft of the Conservation Easement during the third quarter of 2006 but it also was not finalized. ECORP and its Mitigation Banking Specialist, Lockhart and Associates, assumed the responsibility of finalizing the formal banking agreement for the Big Tujunga Wash Mitigation Area in 2007. ECORP prepared a draft of the Conservation Easement and an outline for the Memorandum of Understanding in January of 2008. This was provided to LACDPW for review and comment. The current status of this task is included in Section 9.0.

#### 1.3.10 Updated and Renewed Permits

ECORP and its Permitting Specialist, Gonzales Environmental Consulting, were available as needed to assist LACDPW with the updating and renewal of permits associated with the Big Tujunga Wash Mitigation Area. The existing Streambed Alteration Agreement (#5-247-00) that authorized restoration activities within riparian areas of the Mitigation Area expired on June 30, 2007 and could not be renewed. ECORP's team assumed the responsibility of preparing the new Streambed Alteration Agreement (SAA) application for the continuance of exotic plant removal activities at the Big Tujunga Wash Mitigation Area and the current status of this task is summarized in Section 10.0.

#### 1.3.11 Finalization of Existing Long-Term Maintenance and Monitoring Plan

This task was not implemented during the 2007/2008 contract period because the MMP programs were undergoing review to determine the best long-term approach to achieve the goals in the MMP. This task is scheduled to be completed during the third contract year.

#### 1.3.12 Assessment of Post Catastrophic Event Damage

No catastrophic events occurred during the 2007/2008 contract period that would require post catastrophic event damage assessment. Therefore, this task was not implemented in 2007/2008.

#### 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.

## 2.0 CONTINUATION OF HABITAT RESTORATION PROGRAM

The habitat restoration program was established to preserve, improve, and create habitat for Santa Ana sucker (*Catostomus santaanae*), 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. This section of the annual report focuses on the 2007 assessment and revision of the Habitat Restoration Plan for the Mitigation Area. Long-term maintenance and monitoring of the habitat restoration area is discussed in Section 7.0 (Continuation of Site Maintenance and Monitoring Program) of this annual report.

### 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 (*Arundo donax*), 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. A total of approximately 40 acres of habitat along Haines Canyon Creek and 20 acres of habitat surrounding the Tujunga Ponds were enhanced. 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, and install cuttings and container plant materials, and to 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 restoration plan that would be more applicable to current conditions on the site. In addition, the revised restoration plan would be designed to address the long-term management of the restoration areas on the site. The purpose of this revised habitat restoration plan is 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 A.

### 2.2 SUMMARY OF THE ORIGINAL HABITAT RESTORATION EFFORTS

The program that was implemented during the first five years of MMP implementation focused on the planting of new riparian woodland overstory and understory plantings in existing canopy openings or in openings that were created after the extensive stands of the invasive exotic species giant reed or Tamarisk (*Tamarix* spp.) were removed. The species that were included in the original planting plan for the cottonwood-willow riparian restoration areas are listed in Table 2-1. The table also lists the numbers of each species that were installed and reported in the as-built report for the Mitigation Area.

**Table 2-1. Numbers/Species of Plants Installed in the Restoration Areas**

| Common Name | Scientific Name | As-Built Numbers Installed (2002) |
|---|---|---|
| black willow | *Salix gooddingii* | 100 |
| red and arroyo willow | *Salix laevigata* and *Salix lasiolepis* | 3,660 |
| mule fat | *Baccharis salicifolia* | 1,716 |
| cottonwood | *Populus fremontii* | 231 |
| California rose | *Rosa californica* | 978 |
| California blackberry | *Rubus ursinus* | 215 |
| **Total** | | **6,900** |

Approximately one-quarter of the 6,900 original riparian plantings were completed during the first quarter of 2001 and the remaining restoration areas were planted in January of 2002. Planting consisted of installing hardwood cuttings, liners, and container plants. Cuttings consisted of willow species (*Salix* spp.) and mule fat (*Baccharis salicifolia*). Container plants included 5-gallon Fremont cottonwood (*Populus fremontii*) and understory liner plantings of California rose (*Rosa californica*) and California blackberry (*Rubus ursinus*). The cuttings, liners, and container plants were installed in open areas near the ponds and the downstream portions of Haines Canyon Creek. Seeding was not conducted in any of the riparian restoration areas and irrigation was limited to hand-watering.

In 2004, Chambers Group noted that plant losses were relatively high and were mainly attributed to insufficient water being available to the new plantings. This was either caused by the depth to groundwater being such that the new plantings were not able to establish adequate root systems to utilize the groundwater or that the planting sites were remote and difficult to reach with hand-watering (Chambers Group 2004). However, at that time, Chambers Group concluded that natural recruitment was working better to fill openings in the riparian canopy than the active planting program so they proposed no new plantings at that time. In 2005, the planting results had not changed substantially when Chambers Group reported that only 24 percent of original plantings were still alive even though 80 percent survival was required (Chambers Group 2006).

Chambers Group added additional plantings to the Haines Creek planting sites downstream of the ponds in the early spring of 2007. Chambers Group reported the counts of surviving plants in March of 2007 in their 2006/2007 annual report (Chambers Group 2007) along with the numbers of additional plants that were installed in April of 2007. These numbers are listed in Table 2-2.

**Table 2-2. Numbers of Plants in the Restoration Areas in April 2007**

| Common Name | As-Built Numbers Installed (2002) | Number Required in MMP ($5^{th}$ Year) | March 2006 Observed Numbers | Additional Numbers Planted in April 2007 | Total Count in April 2007 |
|---|---|---|---|---|---|
| black willow | 100 | 72 | 34 | 33 | 67 |
| red and arroyo willow | 3,660 | 2,635 | 525 | 1,613 | 2,138 |
| mule fat | 1,716 | 1,236 | 344 | 760 | 1,104 |
| cottonwood | 231 | 166 | 72 | 83 | 155 |
| California rose | 978 | 704 | 162 | 0 | 162 |
| California blackberry | 215 | 155 | 53 | 580 | 633 |
| **Total** | **6,900** | **4,968** | **1,190** | **3,069** | **4,259** |

The plantings in 2007 included pole cuttings of black, red, and arroyo willows and mule fat, cottonwoods in 5-gallon containers, and liners of California blackberry. At the time of planting, California rose were unavailable so they planted additional California blackberry. Unfortunately, 2007 was a severe drought year and these plantings went in at the end of the rainy season when there was insufficient soil moisture or supplemental watering to support their survival. The plantings went for a period of time without supplemental watering because it was at this same time that there was a delay in the contract transition between Chambers Group and ECORP. By the time ECORP took over the project in the early summer of 2007 (only 3 to 4 months after planting), the only recent plantings that appeared to still be alive were cottonwoods. ECORP counted a total of 51 surviving cottonwoods. ECORP immediately instituted a bi-weekly watering program for the surviving cottonwoods in 2007 and 2008 and no further loss of cottonwoods was noted.

When ECORP conducted their first evaluation of the site in mid-2007, it was not possible to determine which plants in the restoration areas were surviving from the original 2001-2002 planting. The original markers that identified the plantings were no longer in place, either as a result of vandalism or just loss over time due to scouring during storm events or natural decay of the wood stakes that were used to mark the locations. At this point, it likely is not possible to determine the total number of plantings that have survived since 2001/2002 without them being marked. Therefore, ECORP's future success monitoring will be focused on the success criteria of 75 percent cover in the restoration areas rather than survival of plantings.

## 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 2-3 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 2-3. Target Non-Native Weed Species**

| **Common Name** | ***Scientific Name*** |
|---|---|
| Tamarisk | *Tamarix ramosissima* |
| Giant reed | *Arundo donax* |
| Eucalyptus | *Eucalyptus* sp. |
| Castor bean | *Ricinus communis* |
| Eupatory | *Ageratina adenophora* |
| Pepper trees | *Schinus* sp. |
| Mustards | *Brassica* sp. |
| Water hyacinth | *Eichhornia crassipes* |
| Tree tobacco | *Nicotiana glauca* |
| Fennel | *Foeniculum vulgare* |
| Italian thistle | *Carduus pycnocephalus* |
| Milk thistle | *Silybum marianum* |
| Nonnative weedy thistles | *Cirsium* sp. |
| Palm trees | *Arecastrum* sp., *Washingtonia* sp., etc. |
| Nonnative annual grasses<br><br>Wild oats<br>Slender wild oats<br>Foxtail chess<br>Ripgut brome<br>Soft chess<br>Mediterranean barley<br>Italian ryegrass<br>Annual beard grass | <br><br>*Avena fatua*<br>*Avena barbata*<br>*Bromus madritensis* ssp. *rubens*<br>*Bromus diandrus*<br>*Bromus hordeaceus*<br>*Hordeum murinum*<br>*Lolium multiflorum*<br>*Polypogon monspeliensis* |
| Nonnative perennial grasses<br><br>Pampas grass<br>Bermuda grass<br>Fountain grass<br>Smilo grass | <br><br>*Cortaderia selloana*<br>*Cynodon dactylon*<br>*Pennisetum setaceum*<br>*Piptatherum miliaceum* |

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 Big Tujunga 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 2-4. In addition, it was evident that in many areas eupatory (*Ageratina adenophora*) was a significant understory species and this was added to the list of target. The terms and conditions of the existing Streambed Alteration Agreement for the project did not allow removal of vegetation during the breeding season. Therefore, ECORP's subcontractor was not able to conduct any exotic plant removal during the breeding season in 2007. In addition, the renewal of the SAA, which took place during late 2007 and 2008, precluded the removal of exotic invasive plant species until the new SAA was issued by the CDFG.

**Table 2-4. Invasive Exotic Tree Species**

| **Common Name** | ***Scientific Name*** |
|---|---|
| Acacia species | e.g., *Acacia dealbata, and Acacia* sp. |
| Brazilian pepper | *Schnius terebinifolius* |
| Common catalpa | *Catalpa bignonioides* |
| Castor bean | *Ricinus communis* |
| California pepper | *Schnius molle* |
| Chinese elm | *Ulmus parvifolius* |
| Eucalyptus | *Eucalyptus* spp. |
| Evergreen ash | *Fraxinus uhdei* |
| Japanese privot | *Ligustrum japonicum* |
| Liquidambar | *Liquidambar stryraciflua* |
| Mulberry | *Morus alba* |
| Ornamental fig | *Ficus carica* |
| Palm trees | *Washingtonia* spp., *Phoenix canariensis*, etc. |
| Wild tobacco | *Nicotiana glauca* |

## 2.4 REVISED HABITAT RESTORATION PROGRAM

The occurrence of repeated drought years, the apparent fluctuations in the water table levels, the infeasibility of installing an irrigation system in the riparian habitat, and the removal of cuttings by vandals have all contributed to a relatively low survival rate of the cuttings/plantings in the cottonwood willow riparian restoration and enhancement areas at the Big Tujunga Mitigation Area. However, the cuttings and container plants that were planted beginning in 2000/2001 and continuing periodically until 2007 appear to have resulted in the establishment of enough plants that the cover values may exceed the success criteria of 75 percent cover. The actual values for cover will be analyzed during the 2009 success monitoring and functional analysis that will be conducted at the site. In the meantime, ECORP has re-evaluated the value of continued planting of cuttings and container plants and has determined that an alternate restoration strategy would likely be more successful.

Previous functional analyses at the Big Tujunga Mitigation Area have shown that natural recruitment is occurring in the areas where the extensive cover of giant reed was removed. The naturally recruited willows, mule fat, and cottonwoods have been able to become established not only because the dense areas of giant reed were removed but also because the dense canopy created by the giant reed was removed. This has allowed sunlight to penetrate to the ground surface and as a result, the native species have been able to naturally recruit into these areas.

It appears by visual estimate and the recent functional analyses conducted by ECORP, that 5 to 10 percent of the overall canopy cover within the riparian corridor is dominated by non-native exotic tree species that are detrimental to overall habitat quality (ECORP 2008). Removal of this exotic canopy cover will result in two significant habitat improvements. First, with the new openings in the canopy cover, native plant species will naturally become established in these areas. Since most native riparian woodland plant species are shade intolerant, they will only germinate and become established in areas where there is little to no canopy cover. Opening up the canopy cover will result in the development of more understory vegetation in these areas. Second, the removal of the exotic tree species will create more edge habitat areas for birds that favor edges, such as the least Bell's vireo.

Continuing to install cuttings in the cottonwood/willow riparian areas has proven to be relatively unsuccessful. The revised restoration strategy, therefore, includes a more active exotic tree removal program that will be incorporated into the existing invasive and exotic plant removal program. The existing program focuses on giant reed, tamarisk, castor bean, eupatory, and water hyacinth. ECORP proposes to include the eradication of the major invasive exotic tree species found within the corridor along with the elimination of giant reed and the other invasive and exotic. It is our conclusion that a concerted effort in this direction will produce the greatest improvement to overall habitat quality. At the same time, ECORP proposes to continue supplemental hand-watering and maintenance of the 51 recently planted cottonwoods. With this continued support it is likely these plantings can become established and survive for the long term.

Exotic tree species would be killed in place using a combination of glysoposphate (Round-up®, Aquamaster®), triclophyr (Pathfinder II®/Garlon 4®), and imacypyr (Habitat®) herbicides. Giant reed would be first cut and then treated with a glyphosophospate based herbicide as it re-sprouts. This program would be implemented according to the MMP and the conditions of the Streambed Alteration Agreement to assure the aquatic resources and nesting birds are protected. Spraying would be conducted during the early spring when most species enter their active growth cycle for the season. Follow-up spraying would be conducted in the summer and the following spring to kill any resprouts or eradiate new seedlings.

## 3.0 CONTINUATION OF EXOTIC PLANT ERADICATION PROGRAM

The purpose of exotic plant removal and eradication at the Big Tujunga Mitigation Area is to increase the suitability and ecological value of the existing native vegetation communities. As described in Section 2.4 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 Big Tujunga Mitigation Area.

The major exotic plant species targeted at the Big Tujunga Mitigation Area riparian areas during the 2007/2008 period included giant reed, tamarisk, eupatory, castor bean (*Ricinus communis*), evergreen ash (*Fraxinus uhdei*), water hyacinth (*Eichornia crassipes*), and Japanese privot (*Ligustrum japonicum*). Other species that were targeted include mustard (*Brassica* spp.), tree tobacco (*Nicotiana glauca*), and pepper trees (*Schinus* spp.).

Site visits were conducted at the site on numerous occasions to either plan for the exotic plant removal methods or to locate exotic plant locations within the riparian areas. A treatment plan was devised during the initial site visit and assessment in July 2007. All plants over 3 feet in height that were to be treated with herbicide and flagged so that treatment success could be monitored. Smaller patches of giant reed were to be sprayed with Aquamaster®, while larger patches of giant reed were to be cut down to ground level and the stumps painted with 100% Aquamaster® solution. Ornamental trees would be girdled with a machete or chainsaw to cut through to the cambium layer to the inner xylem and then painted with Pathfinder II®. All plants treated with herbicide were to be left to die in place. Seedlings of the exotic and/or ornamental plant species would be sprayed as soon as possible after germinating.

Monthly site visits were conducted between July 2007 and the end of 2008 by ECORP biologists Todd Chapman, Kristen Mobraaten, and Brian Zitt. 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 (Figure 3-1). Location coordinates were taken with a global positioning system unit (GPS) and recorded on data sheets. Coordinates were incorporated into monthly memos (Appendix B) and provided to Nature's Image for the removal of exotic plants from upland areas and the eventual removal of exotic plants from riparian areas once the SAA was received from CDFG.

Actual spraying of invasive exotic plant species was limited during the 2007/2008 timeframe because the SAA had expired. Use of herbicides for exotic plant species removal within the riparian areas requires a SAA from CDFG. ECORP prepared the application for a new SAA and submitted it to LACDPW in 2007 and it went to the CDFG in 2008. The new SAA had not been received as of the end of 2008 so no herbicides were used in the riparian habitats during weed removal activities during the 2007/2008 contract year. However, continued maintenance did continue through the use of string-trimming, cutting, and hand-pulling methods.

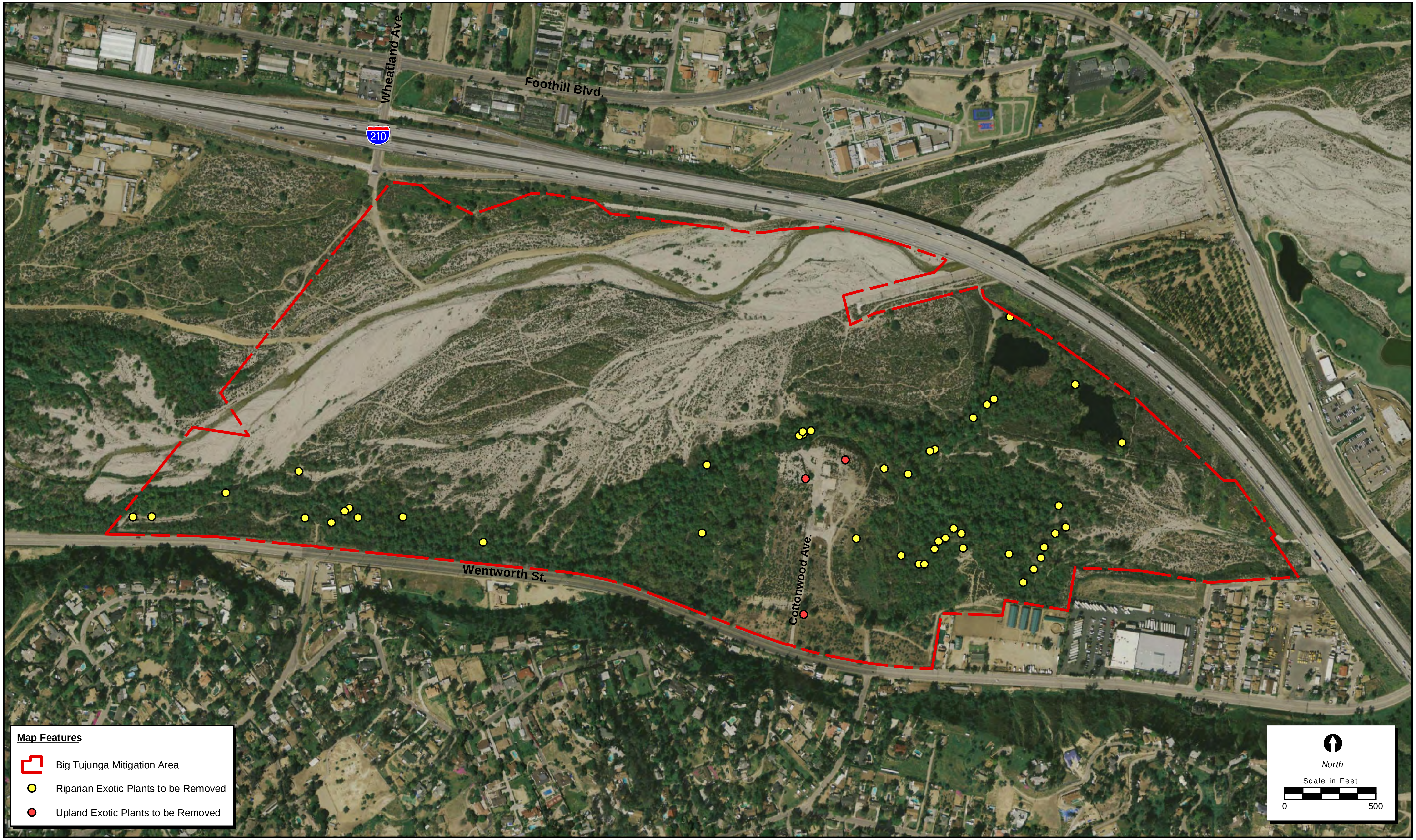


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**Figure 3-1. Exotic Plant Removal Locations**

*2007-110 Big Tujunga Mitigation Bank*

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## 4.0 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 pressures felt by exotic aquatic species on native 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 Big Tujunga 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.

Fisheries biologists Todd Chapman, Manna Warburton, and Brian Zitt 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 five exotic removal efforts conducted during the third and fourth quarters of 2007 and second and third quarters of 2008.

### 4.1 METHODOLOGY

Eight distinct methods were used to capture and collect aquatic species, including spearfishing, seining, crayfish and minnow trapping, backpack electrofishing, rod and reel sampling, fyke netting, bullfrog removal, and turtle trapping. During each sampling session, many of the methods were continued while some new ones were incorporated based on the information collected during the previous sampling effort and current site conditions (access, water visibility, and vegetation presence). All spearfishing efforts were conducted while snorkeling. Seining was accomplished using a 100’ beach seine deployed using a small inflatable boat. Turtle and crayfish/minnow traps were baited with small cans of sardines and “seafood select” cat food with small holes punched into them. All traps were allowed to fish overnight. Backpack electrofishing was used in the shallow portions nearest the perimeter of the ponds and in deep pocket pools of Haines Canyon Creek. Rod and reel sampling was conducted from an inflatable boat in both ponds using a variety of lures, spinnerbaits, and worms. Fyke netting was primarily deployed within the West Pond and the small channel that connects the West and East Ponds. Bullfrog removal was primarily done at night by patrolling the parameters of the ponds in an inflatable boat or on foot in the upper portions of Haines Canyon Creek. Additionally, during snorkeling activities any Centrarchid (Sunfish Family) nests or bullfrog egg masses observed were destroyed or removed.

Exotics wildlife collection and removal in the Tujunga ponds and Haines Canyon Creek was conducted on July 31-August 2, August 27-30, and October 9-10, 2007, and May 14-16, and July 28-29, 2008. Results of the sampling efforts were summarized in Exotic Wildlife Removal Memos following each of the surveys. Locations of aquatic removal efforts are displayed in Figure 4-1.

## 4.2 RESULTS

The five sampling efforts resulted in the removal of 832 largemouth bass (*Micropterus salmoides*), 160 bluegill (*Lepomis macrochirus*), 61 green sunfish (*Lepomis cyanellus*), one black bullhead (*Ameiurus melas*), two goldfish (*Carassius auratus*), 924 mosquitofish (*Gambusia affinis*), six red-eared sliders (*Trachemys scripta elegans*), eight adult bullfrogs, 221 bullfrog tadpoles, and 377 crayfish. The majority of exotic species collected and observed were from the ponds and not in Haines Canyon Creek. Overall, three native species were observed during the five exotic wildlife removal sessions. A total of eight Santa Ana suckers, one two-striped garter snake (*Thamnophis hammondii*), two California Species of Special Concern southwestern pond turtles (*Actinemys marmorata pallida*) were documented and released back on the site. Results of the removal efforts are summarized in Table 4-1.

## 4.3 DISCUSSION

The sampling efforts deployed during 2007-2008 varied depending on the time of year, number of personnel, and overall site conditions. Since native fishes inhabit Haines Canyon Creek, the East and West Ponds are a source population for exotic species to enter the creek, and the West Pond connects directly into the creek; the majority of sampling efforts took place in the West Pond with subsequent sampling in the East Pond and Haines Canyon Creek.

Submerged aquatic vegetation in the ponds has a high rate of seasonal variation, with peaks in the late summer months. When timed correctly, being adaptive to the swing in seasonal vegetation was advantageous. Seining during the early spring and into summer produced large numbers of exotic juvenile fishes that would become entrapped in the filamentous algae, inhibiting their escape from the net. Spearfishing efforts in the late fall and early spring provided the best visibility for maximizing the potential for catch.

The most suitable areas in each pond that would yield the highest numbers when sampling by spear were identified by snorkeling both the ponds in their entirety. Spearfishing surveys proved to have the largest impact at removing finfishes larger than six inches, the majority of those taken being adult largemouth bass. In conjunction with the spearfishing surveys, night removal of adult bullfrogs was conducted by patrolling the upper portions of Haines Canyon Creek on foot and the banks on each pond by boat. These surveys were most effective in the late spring through summer when temperatures are relatively warmer and bullfrogs are generally more active. Little to no bullfrog activity was observed outside of those seasons.

In addition to spearing for exotic fishes, snorkeling surveys enabled the targeting and removal of Centrarchid nests, bullfrog tadpoles, crayfish, and red-eared sliders. All six of the red-eared sliders collected during sampling efforts were taken as a result of snorkeling surveys. Turtle traps were deployed but no species were captured. Possible reasons for the non-productive

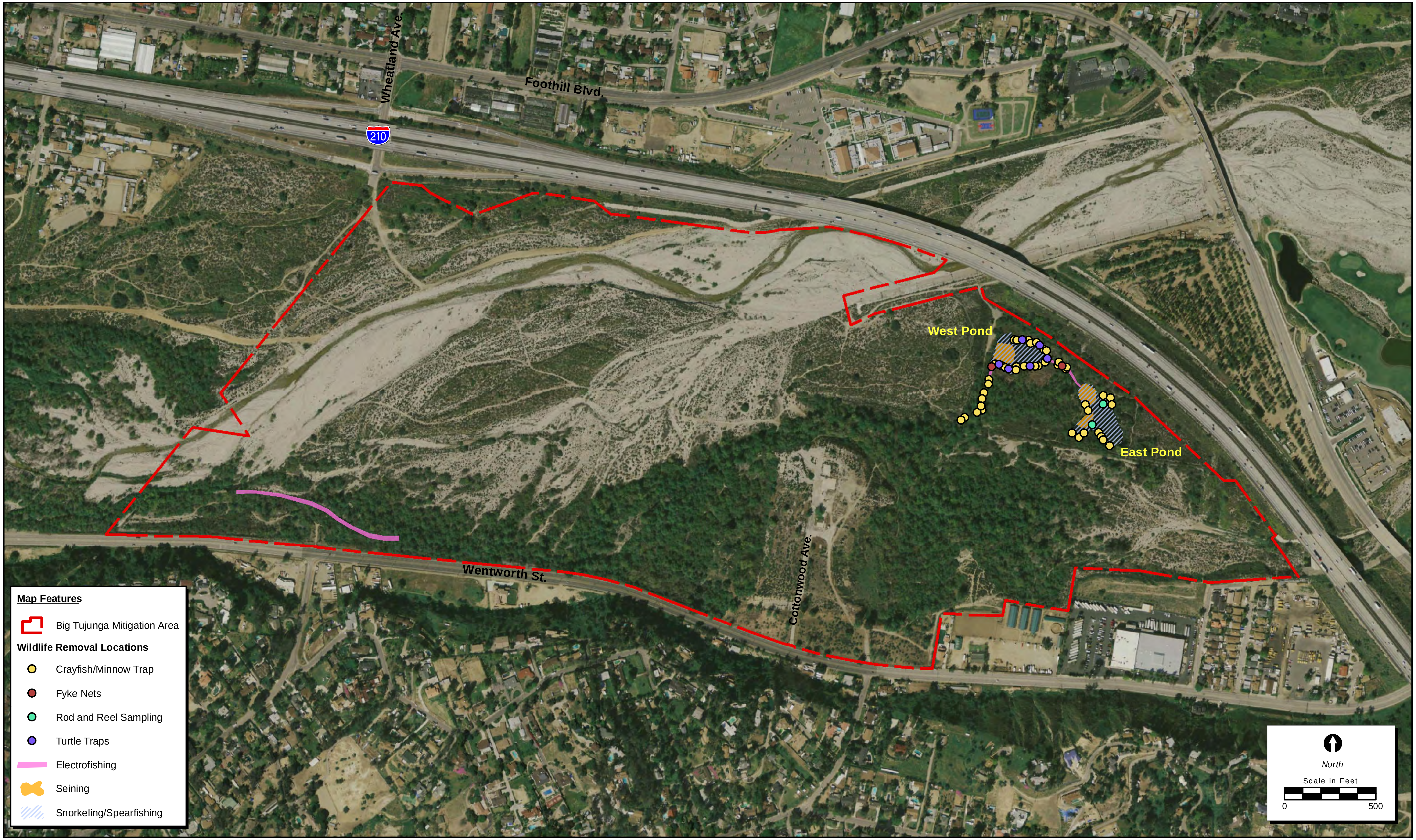


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**Figure 4-1. Exotic Wildlife Removal Locations**

*2007-110 Big Tujunga Mitigation Bank*

Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2007_2008\Exotic_Wildlife_Removal\Tujunga_Exotic_Wildlife_Removal_2007_2008.mxd (JSwager 10/13/2010)

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traps could be attributed to the minimal number of days the traps were allowed to fish and the locations in which they were set. All the red-eared sliders were captured in the East Pond, while the traps were all deployed in the West Pond.

Seining locations were limited to suitable bank accessibility at both ponds. We have considered the idea of deploying gill nets, which will most likely be used in our 2008-2009 sampling efforts. Minnow/crayfish traps appeared to yield relatively low numbers of animals in the ponds, while in the upper portions of Haines Canyon Creek the traps produced higher numbers of animals. Factors affecting the production of the traps could be attributed to: the overall size of the ponds verses the number of traps deployed, the depth of the ponds, and bank vegetation; all of which inhibit the effectiveness of the traps. In contrast, Haines Canyon Creek consists of shallow water habitat with several backwaters and pools which is ideal for minnow/crayfish traps.

During initial surveying, fyke nets were deployed in shallow areas around the exterior of the West Pond and within the small channel that connects the two ponds. In the subsequent sampling sessions only one fyke net was deployed at the site, within the connecting channel, due to the high visibility of these nets with the general public and the overall production of the net in the channel verses the other locations.

Sampling in Haines Canyon Creek was accomplished by crayfish/minnow traps in the upper portions and backpack electrofishing in deeper pocket pools where exotic fishes were targeted and removed. Backpack electrofishing during the October 2007 sampling session resulted in the capture and removal of 16 largemouth bass from Haines Canyon Creek. While processing the fish one of them began to regurgitate a Santa Ana sucker, one of the federally-threatened fish species that the exotic wildlife removal program is designed to protect. This is among the first ever documented cases of predation upon the Santa Ana sucker by largemouth bass. Photo documentation of the predation and results of each of the sampling efforts are included in the exotic wildlife removal report (Appendix C). Appendix C also includes the summary memoranda that were prepared after each of the five removal efforts.

## Table 4-1. 2007-2008 Exotics Species Removal Program - SPECIES TOTALS

| Sampling Location | Sampling Dates | Largemouth Bass | Bluegill | Green Sunfish | Goldfish | Black bullhead | Mosquitofish | Red-eared slider | Adult Bullfrog | Bullfrog Tadpoles | Crayfish | Native species observed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WEST POND* | July 31-Aug 2, 2007 | 324 | 68 | 37 | 1 | | 267 | | 2 | 65 | 50 | |
| | August 27-30, 2007 | 114 | 49 | 5 | | | 557 | | | 36 | 38 | |
| | October 9-10, 2007 | 66 | 10 | 7 | | 1 | 14 | | | 4 | 16 | (1) southwestern pond turtle |
| | May 14-16, 2008 | 85 | 13 | 4 | | | | | 5 | 10 | 68 | (1) two-striped garter snake |
| | July 28-29, 2008 | 90 | 11 | 2 | 1 | | | | | 9 | 2 | |
| | **subtotal** | **679** | **151** | **55** | **2** | **1** | **838** | **0** | **7** | **124** | **174** | |
| **West Pond includes the small channel connecting the two ponds* | | | | | | | | | | | | |
| EAST POND | July 31-Aug 2, 2007 | | | | | | | | | | 8 | |
| | August 27-30, 2007 | 44 | 1 | 2 | | | 75 | | | 42 | 90 | |
| | October 9-10, 2007 | 16 | 1 | 2 | | | | | | 6 | 7 | |
| | May 14-16, 2008 | 53 | 7 | 1 | | | | 4 | 1 | 33 | | |
| | July 28-29, 2008 | 42 | | | | | | 2 | | 16 | | (1) southwestern pond turtle |
| | **subtotal** | **155** | **9** | **5** | | | **75** | **6** | **1** | **97** | **105** | |
| HAINES CANYON CREEK | July 31-Aug 2, 2007 | | | | | | 3 | | | | 8 | (2) Santa Ana sucker |
| | August 27-30, 2007 | | | | | | | | | | | |
| | October 9-10, 2007 | 8 | | 1 | | | 5 | | | | 122 | (6) Santa Ana sucker |
| | May 14-16, 2008 | | | | | | | | | | 27 | |
| | July 28-29, 2008 | | | | | | | | | | | |
| | **subtotal** | **8** | | **1** | | | **8** | | | | **157** | |
| | **GRAND TOTAL** | **842** | **160** | **60** | **2** | **1** | **921** | **6** | **8** | **221** | **436** | |

## 5.0 MAINTENANCE OF FORMAL TRAILS SYSTEM

The purpose and goal of maintaining a formal trails system at the Big Tujunga 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 Big Tujunga Wash 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.

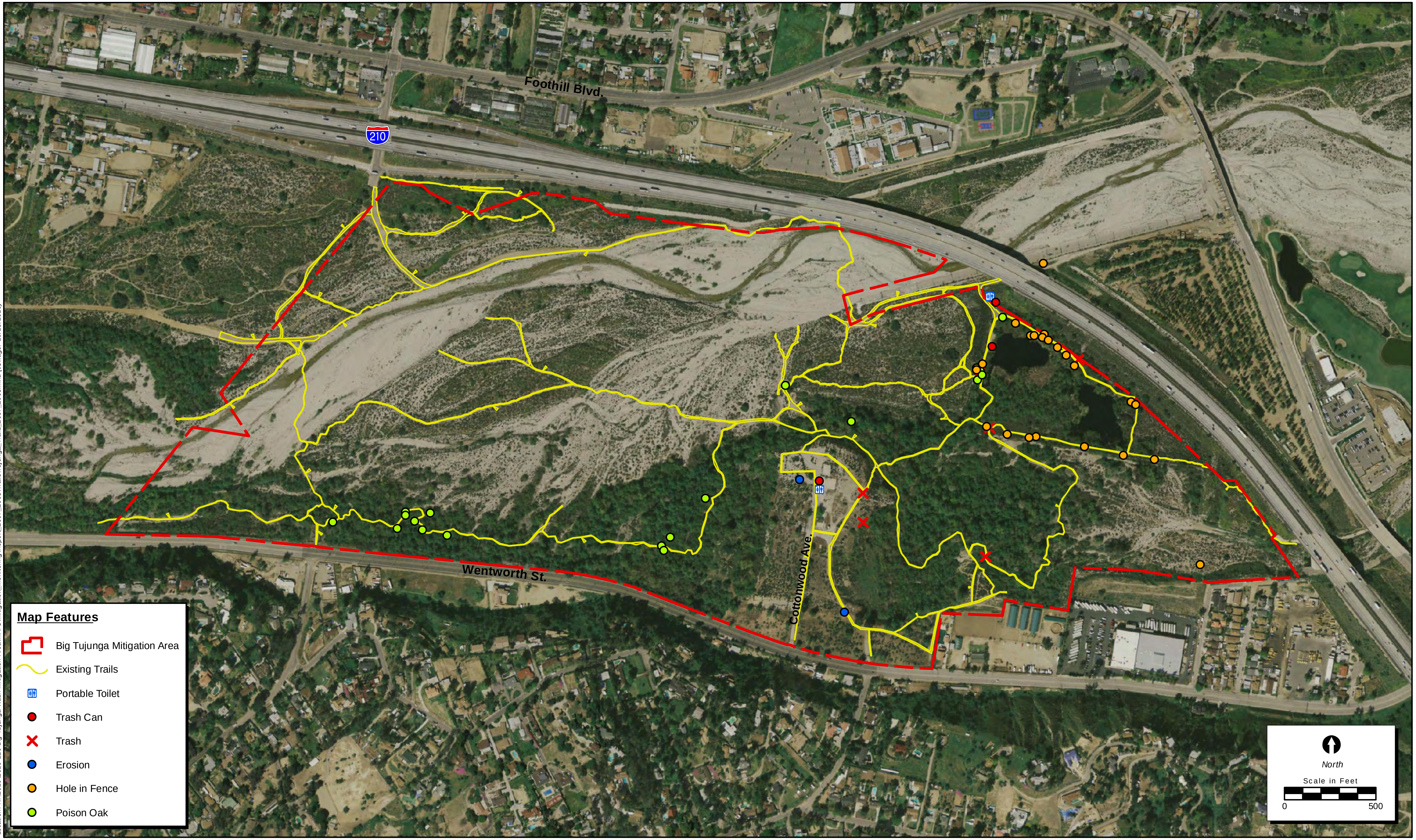
The trails maintenance effort began with a site visit by ECORP biologists on August 27, 2007 to assess the current condition of the trails present in the Big Tujunga Mitigation Area and to mark locations needing maintenance or attention. Quarterly site visits were conducted to look for areas that might 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 port-a-potties 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.

Quarterly site visits were conducted by ECORP biologists Mari Quillman, Todd Chapman, Kristen Mobraaten, Brian Zitt between July 2007 and December 2008. The biologists walked the trail system, taking site photographs and recording locations of trash, debris, graffiti and vandalism, un-maintained trails, rock dams, and potential areas for trail closure. These areas were summarized into quarterly trail maintenance reports which are included as Appendix D.

For the most part, the trails running throughout the site are relatively well defined. The heavy rains during the rainy season moved plant and wood debris into Haines Canyon Creek, creating some minor dams in the creek that flooded the trails in a few locations. These temporarily flooded areas were no longer an issue once flows in Haines Canyon Creek were reduced toward the end of the spring.

Vandalism and graffiti were prevalent throughout the Mitigation Area. The most common locations were on the port-a-potties, 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. The informational kiosk located in the oak/sycamore woodland area by the Cottonwood Gate was removed on April 9, 2008. The kiosk was in poor shape (the plexiglass had been broken and the maps were either destroyed or removed) and LACDPW decided it was no longer worthwhile to maintain the kiosk.

LACDPW contracted a land surveyor in early 2008 to survey in all trails on the site in order to assess the current trails at the Mitigation Area, both authorized and unauthorized. The existing trails that were surveyed in and problem areas that were recorded by ECORP are shown on Figure 5-1.




Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2007_2008\Trails\Tujunga_Trails_2007_2008.mxd (JSwager 10/13/2010)

*Aerial Date: March 2008*
*Map Date: 10/13/2010*

**Figure 5-1. Big Tujunga Wash Mitigation Bank Trails**

*2010-116 Big Tujunga Wash Mitigation Area*

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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. The 4$^{th}$ Annual Trails Maintenance Day was held on May 17, 2008. LACDPW staff, ECORP biologists, and local volunteers removed of more than 20 full bags of trash, several large tires, razor wire, and plastic crates.

## 6.0 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 Big Tujunga Wash 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 September 2007 and March and September 2008 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 (www.ladpw.org).

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

### 6.1 NEWSLETTERS (SPRING, FALL)

ECORP drafted the Fall newsletter and submitted it to LACDPW in December 2007. After a series of comment periods, the newsletter was ready for finalization in May 2008. At that time, the team decided to include the most recent updates for spring 2008. Therefore, a combined Fall 2007/Spring 2008 newsletter was produced instead of two separate newsletters. An electronic version of the final newsletter was provided to LACDPW in May 2008 for distribution and incorporation on their web page. A second newsletter was prepared during the fall of 2008 and it was provided to LACDPW in electronic format in September 2008. The newsletters are included in Appendix F.

### 6.2 CAC MEETINGS (SPRING, FALL)

The CAC meetings were held in the Fall of 2007 and in the Spring and Fall of 2008. The Fall 2007 CAC meeting took place on Thursday, September 27, 2007, the Spring 2008 CAC meeting took place on Thursday, March 27, 2008, and the Fall 2008 meeting took place on September 25, 2008. 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 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, Ms. Anne Surdzial, and Mr. Todd Chapman, 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 Fall 2007 and Spring and Fall 2008 CAC meetings are summarized in the meeting minutes which are included as Appendix G. Below is a list of the major issues discussed during the 2007 and 2008 CAC meetings.

- Site Safety Issues
  - Difficulties contacting Los Angeles Police Department (LAPD) and lack of LAPD enforcement in the Mitigation Area
  - Unauthorized all-terrain vehicles (ATV) and mountain bikes on the trails
  - Presence of people with weapons (guns or air rifles)
  - Unleashed dogs and attacks on people and horses
  - Possibility of Ranger patrols in the Mitigation Area
  - Ranger support for neighborhood watch programs in the Mitigation Area
  - Harassment of equestrians by motorcycle riders
  - Constructing ATV/motorcycle barriers at the Tujunga Ponds gate
  - Wentworth fence damage and encroachment on horse trail

- General site maintenance activities
  - General site signage and the appropriate enforceable codes
  - Graffiti and potential graffiti removal efforts
  - Removal of the kiosk near the Cottonwood Area
  - Utilizing the Cottonwood Area as an emergency evacuation area
  - Change in management at the Hansen Dam Equestrian Center
  - Potential installation of an equestrian gate at the Wheatland/Wentworth entrance
  - Encroachment and land swap with Gibson Ranch and resolution
  - Orange 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

- Public outreach
  - County Website includes CAC meeting minutes and other pertinent information
  - Gibson Ranch Charity Event – "Ride for a Cure"
  - Trail Maintenance Day event

## 6.3 TRAIL MAINTENANCE DAY

ECORP worked together with LACDPW to modify the flyer that provided the information for the 4th Annual Trail Maintenance Day. The event was held on Saturday, May 17, 2008. ECORP provided the flyer 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 is shown in Figure 6-1.

Approximately 15 people, inclusive of two ECORP and two LACDPW volunteers, attended the event and assisted with trail maintenance and trash removal. More than 20 full bags of trash, several large tires, a bundle of razor wire, and some plastic crates were removed.

## 6.4 CHARITY EVENT DISPLAY

On October 4, 2008, LACDPW and ECORP staff set up a display booth at a charity event located at the Gibson Ranch, which is immediately adjacent to the Mitigation Area. The event, which was called Ride for a Cure, consisted of a full day of live music, celebrity guests, a silent auction, equestrian competitions and performances as well as information booths and food and merchandise vendors. The charities that benefitted from the event included the American Parkinson Disease Foundation and The Roy and Patricia Disney Cancer Center at Providence St. Joseph's.

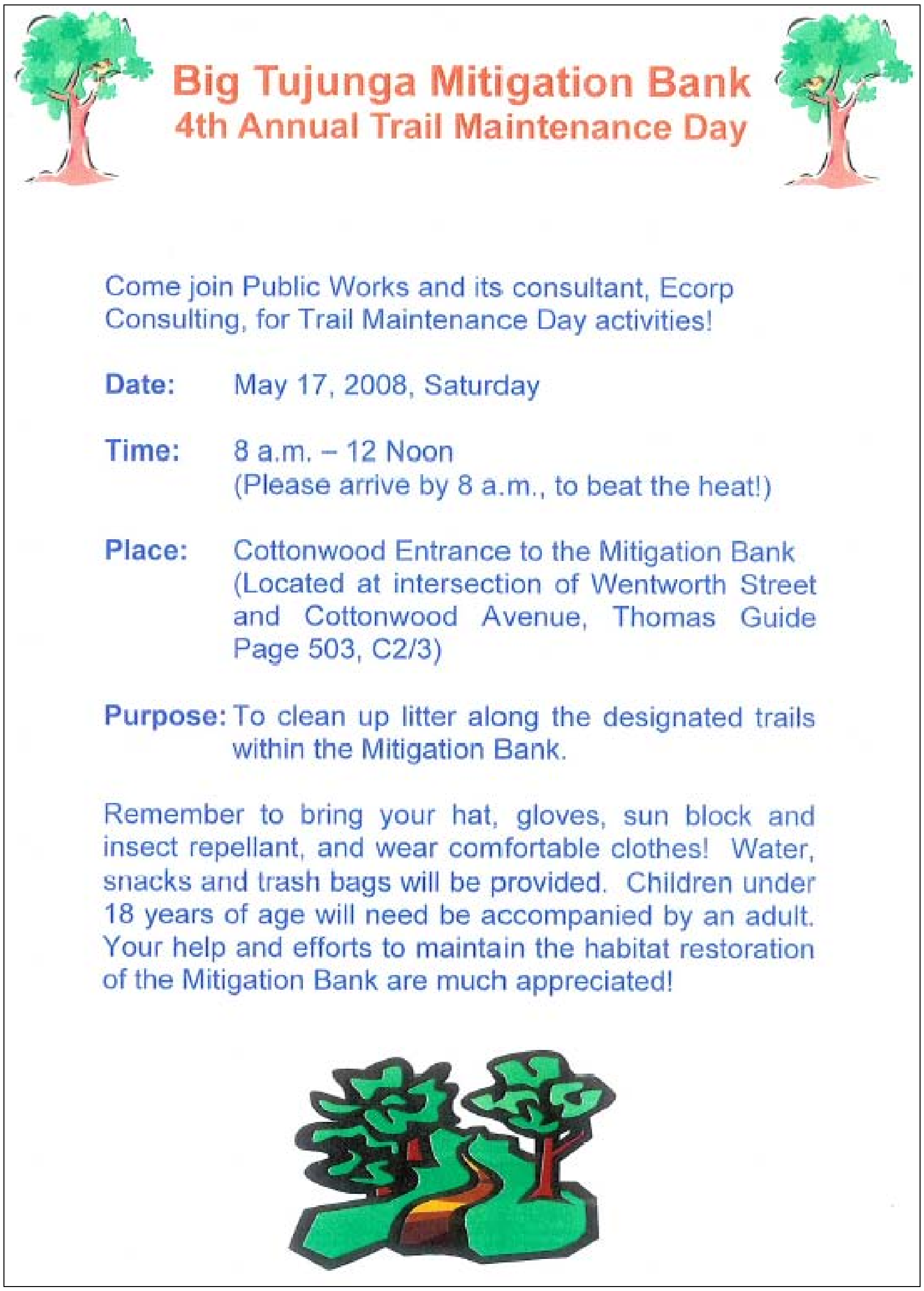



**Figure 6-1. Trail Maintenance Day Flyer**

Ms. Valerie De La Cruz from LACDPW and Ms. Mari Quillman from ECORP staffed the booth and talked to attendees and local equestrians about the habitat values in the Mitigation Area and the importance of preserving the area. In addition, they also informed people about the permitted and unpermitted activities in the Mitigation Area and the importance of staying on established trails. Big T Washline newsletters, trails maps, and other LACDPW brochures were made available to the public during the charity event. A photograph of the display is shown in Figure 6-2.


**Figure 6-2. Display at the Ride for a Cure Charity Event**

## 7.0 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 Big Tujunga Wash 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 draft Long-term Maintenance and Monitoring Plan (Chambers Group 2007) but this document was not finalized. ECORP will be completing the LTMMP as part of this contract so the frequency of surveys will be reevaluated as part of negotiations with the CDFG. Because focused surveys for these species were conducted on an annual basis during the implementation phase of the MMP, these elements are not scheduled to be conducted until the second or third contract year ECORP's contract, and therefore are not included as part of this report.

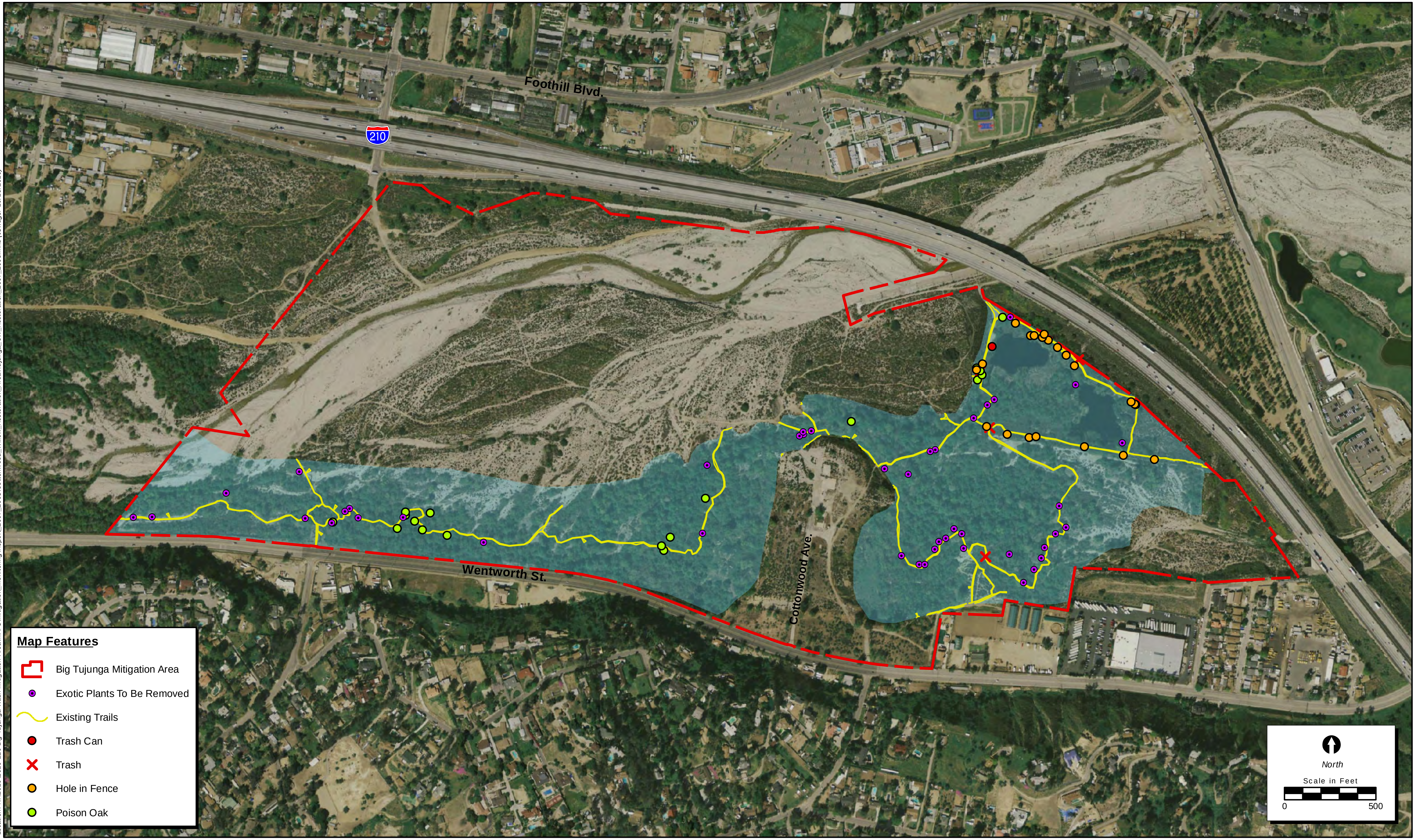
### 7.1 EROSION CONTROL AND BARRIER MAINTENANCE

ECORP's Restoration Specialist and biologists and/or ECORP's maintenance contractor, Nature's Image, conducted quarterly site visits during the latter half of 2007 and during 2008 to survey the condition of existing barriers surrounding the site and identify potential erosion problems that may require the installation of erosion control measures. The entire site was walked and coordinates of problem areas or areas in question were recorded.

ECORP biologists Todd Chapman, Kristen Mobraaten, and/or Brian Zitt conducted site visits in August and December of 2007 and in January, February, March, April, June, August, and December of 2008. 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 and are shown on Figure 7-1. The GPS coordinates for these locations are included in the quarterly Erosion Control and Barrier Maintenance Reports, which are included as Appendix H.

### 7.2 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. The entire site was walked and 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 replacement cuttings and container plantings. Representative site photos were taken. The application package for a new SAA had been submitted and was pending approval by CDFG at the time of this report. Because a new SAA had not been issued during the 2007/2008 year, the maintenance activities conducted in the cottonwood/willow restoration areas were limited to manual methods conducted outside of the breeding season. 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). Watering of the cuttings that were installed by Chambers Group in late spring of




Location: N:\2010\2010-116 Big Tujunga Wash Mitigation Area\MAPS\Mitigation_Monitoring\Report_2007_2008\Cottonwood_Willow_Restoration_Area\Tujunga_CW_Restoration_2007_2008.mxd (JSwager 10/13/2010)

*Aerial Date: March 2008*
*Map Date: 10/12/2010*

**Figure 7-1. Cottonwood/Willow Restoration and Maintenance Area**

*2010-116 Big Tujunga Wash Mitigation Area*

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2007 was continued throughout 2007 and 2008 in order to maximize their survival. Based on the fact that 2007 and 2008 were drought years, no additional plantings or cuttings were installed in the restoration areas. In addition, 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 (see Section 2.0). The alternative approach will include 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. When the new SAA is issued for the project, the exotic plant species removal program will become more active through the use of herbicides and a larger removal effort. All efforts will be conducted according to the terms and conditions of the new SAA.

Natures Image conducted maintenance visits in the cottonwood/willow restoration area on numerous occasions during summer and early fall of 2007 and 2008 to water cottonwood plantings and willow cuttings from Chambers Group's 2007 planting efforts. The cottonwood and willow plantings in the restoration areas that did survive appear to be thriving. No additional container plants and/or cuttings were installed during 2008. Natures Image continued to maintain the restoration areas by picking up trash and removing non-native grasses and weeds through hand removal methods. Because the SAA had not been issued in 2008, no herbicides were used during maintenance activities in the cottonwood-willow restoration area. Locations of invasive plant species that will need to be removed from the riparian areas once the SAA is issued are shown on Figure 7-1. The GPS coordinates for these locations are included in the quarterly Cottonwood/Willow Restoration Area Maintenance Memos (Appendix I).

## 7.3 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 Big Tujunga Wash 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 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 2008 Functional Analysis Report (Appendix J).

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 Group, Inc. 1998). Field sampling to collect data for the 2008 final annual functional analysis was conducted on May 19-20, 2008.

Field data collection for the functional analysis and success monitoring was collected by ECORP's botanists, Kerry Myers Kenwood and Danica Shaffer-Smith, on May 19, 2008. Ms. Pam DeVries, the biologist who conducted the functional analyses for the Big Tujunga Mitigation Area from the late 1990's until the early 2000's, also assisted ECORP's botanists with the data collection. A summary of the results is presented below.

### 7.3.1 Annual Performance Monitoring

Chambers Group collected data at the site on May 19 and 20, 2007 and the results of their 2007 analysis are included in the 2006/2007 Annual Report (Chambers Group 2007). ECORP conducted the functional analysis data collection on May 19 and 20, 2008. Vegetation cover was determined by measuring the canopy cover of each tree or shrub included in the point-centered quarter method described in the 2008 Functional Analysis Report. Copies of all data sheets are included in the Functional Analysis report (Appendix J).

Targets for Survival and Percent Cover

Survival and percent cover requirements were established in the MMP and are summarized below. 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. According to the MMP, if the survival and cover requirements are not met, then replacement plantings were to be installed to achieve the required standards, as necessary. The MMP also states that replacements would have to be monitored with the original plantings for a 5-year monitoring period with the same survival and growth requirements as the plantings.

The survival and cover standards for the riparian habitat plantings are summarized in Table 7-1.

**Table 7-1. Riparian Planting Areas - Density, Dominance, and Relative Frequency**

| 1st Year | 3rd Year | 5th Year |
|---|---|---|
| 80% survival | 90% survival | 100% survival and/or 75% cover |
| Performance standards during Year 5 must be attained without human interference (irrigation, rodent control). | | |

Riparian Area Survival

The 2008 data show that the riparian habitat plantings exceeded the 5th year requirement of 75 percent cover. The success criteria in the MMP state survival standards for individual plant species but the criteria also state that 75 percent cover in the 5th year would achieve success. According to the data collected in 2008, this cover standard for the cottonwood-willow restoration areas was met in 2008. The analysis of the data collected in 2008 included an estimation of the density of a number of the species that were planted in the restoration areas. Black and arroyo willow are the most abundant tree species on the site with approximately 2,961 and 2,780 individuals present, respectively. Approximately 152 Fremont cottonwoods are also present in the riparian habitat. Among shrub species, golden current (*Ribes aureum*) was the most abundant species at a calculated density of approximately 8,808 individuals. The density of mule fat was calculated at approximately 6,954 individuals and the density of California rose was calculated at approximately 464 individuals.

Riparian Area Percent Cover

Vegetation cover of mature plants in the riparian planting areas was high for 2007/2008, with an overall value of 123.3 percent tree canopy cover and 17.5 percent cover of native shrubs in the understory (Table 7-2). Fifth-year standards, as specified in the MMP, indicate that 75 percent cover is needed for all riparian plantings; therefore, the cover values for the riparian plantings exceeded the set standards.

Approximately 77 trees and 488 shrubs per acre were found in the riparian habitat at Big Tujunga Wash Mitigation Area. Approximately 75 percent of the shrubs and 90 percent of the trees encountered during the survey were native species. The tree canopy forms a dense multi-layered canopy cover throughout the site in most areas (approximately 123.3 percent cover overall) and shrubs form an open understory cover of approximately 18.3 percent. The relative frequency of trees to shrubs was 14 percent trees to 86 percent shrubs. Performance standards set forth by the MMP require 75 percent cover for container plants and cuttings in the riparian enhancement areas during the fifth year after planting. Based on the data collection conducted in 2008, this level of cover has been achieved. The results for overall density, percent cover, and relative frequency for the Big Tujunga Wash riparian habitat are summarized in Table 7-2.

**Table 7-2. Riparian Planting Areas - Density, Dominance, and Relative Frequency**

| | Absolute Density (# plants/acre) | Dominance (Percent Cover) | Relative Density (% of total community) |
|---|---|---|---|
| **Native Species** | | | |
| Trees | 69 | 121.4 | - |
| Shrubs | 366 | 17.5 | - |
| **Non-Native Species** | | | |
| Trees | 8 | 4.3 | - |
| Shrubs | 122 | 2.6 | - |
| **Summary All Species** | | | |
| Trees | 77 | 123.3 | 14 |
| Shrubs | 488 | 18.3 | 86 |

Overall, vegetative cover was relatively high at approximately 85.2 percent and the presence of annual grasses was 10.6 percent cover. The average number of topographic features encountered per 100 meters was approximately 16.8. The average tree height analysis indicated that most trees on the site are greater than 4 meters in height, with most falling into the 2 to 4 meter height range. The results of percent organic cover, percent annual grass cover, tree height, and average topography score measurements for the riparian habitat at the Big Tujunga Wash study area are summarized in Table 7-3.

**Table 7-3. Riparian Planting Areas - Percent Organic Cover, Annual Grass Cover,**

| Percent Organic Cover | Percent Cover of Annual Grass (%) | Average Tree Height (Category units) | Average Topographic Features (per 100 meters) |
|---|---|---|---|
| 85.2 | 10.6 | 2.8 | 16.8 |

For the riparian system, the Functional Unit (FU) is calculated to be 0.88 per acre (please refer to Appendix J. 2008 Functional Analysis Report for an explanation of Functional Units and how they are derived). A total of 76 acres of willow habitat, calculated using the GIS technology, was delineated at the site during the initial study in 1997. This number of acres of cottonwood-willow riparian habitat has likely increased since it was mapped in 1997. However, the mapping has not been updated since that time. ECORP will be updating the mapping of the vegetation communities in 2009 and if the number of acres of this habitat has changed, then the new acreage value will be used for the 2009 functional analysis. Based on the old mapping of 76 acres of willow riparian habitat, the total FCU for riparian habitat at Big Tujunga Wash is:

**FCU Big T = (0.88 FU willows)(76 acres of willows) = 66.88**

The Functional Unit Capacity value of the riparian habitat at the Big Tujunga Wash Mitigation Area has increased from 59.74 in 1997 to 66.88 in 2007/2008. 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. Therefore, the 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 J.

## 7.4 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.

Several trails were repaired and trash was removed during a trail enhancement day on May 17, 2008. Trail users have continued to access some of the reclaimed trails. Detailed information on the Trails Program can be found in Section 5.0.

## 7.5 ANNUAL WATER QUALITY MONITORING

ECORP's subconsultant, MWH, conducted the annual water quality sampling for the site in 2007 and 2008. 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 HACH SensION 6 DO meter and an Orion 230A with HACH 51935 electrode. Sampling occurred in Haines Canyon Creek, Haines Canyon Creek inflow to the Tujunga Ponds, Haines Canyon Creek outflow to the Tujunga Ponds, and Big Tujunga Wash. 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 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 (a small plastic ball) to measure stream velocity. Water quality sampling was conducted by MWH on December 17, 2007, and December 29, 2008. The draft of the December 2007 Water Quality Monitoring Report was submitted to LACDPW for review in February 2008 and it was finalized in April 2008. The 2008 Water Quality Report was submitted to LACDPW in early 2009. The 2008 results have been incorporated into this 2007/2008 Annual Report. A summary of the 2007 and 2008 results of the water quality monitoring are provided below.

### 7.5.1 Baseline Water Quality

Sampling and analysis conducted by LADPW prior to implementation of the MMP is considered the baseline for water quality conditions at the site. The results of baseline analyses conducted in April 2000 are listed in Table 7-4 and provided in the December 2007 and 2008 Water Quality Monitoring Reports that are included as Appendices K and L, respectively. Higher bacteria and turbidity observed in the 4/18/00 samples were attributed to a rain event. Phosphorus levels were also high in the 4/18/00 samples, perhaps due to release from sediments.

**Table 7-4. 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 |

### 7.5.2 Water Quality Sampling Results for 2007 and 2008

Results of analyses conducted by MWH Laboratories are summarized in Table 7-5. Note that the yields (percent recoveries) of QC samples were within acceptable limits (percentages) for all samples. Note that some of the water quality constituents that are tested on an annual basis after the implementation of the MMP were not included in the baseline water quality sampling. Tests for herbicides and pesticides were added to determine whether or not these chemicals were being transported downstream to the Mitigation Area.

**Table 7-5. Water Quality Sampling Results (December 17, 2007 and December 29, 2008)**

| 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 | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 |
| Temperature | °C | 16.8 | 18.2 | 15.6 | 16.4 | 12.4 | 14.4 | 14.8 | 15.9 |
| Dissolved Oxygen | mg/L | 5.42 | 5.53 | 7.24 | 7.05 | 10.42 | 10.90 | 8.15 | 9.25 |
| pH | std units | 6.34 | 6.98 | 6.72 | 7.01 | 8.22 | 8.56 | 7.40 | 6.88 |
| Total residual chlorine | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| Ammonia-Nitrogen | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| Kjeldahl Nitrogen | mg/L | 0.23 | 0.21 | ND | ND | ND | 0.20 | ND | ND |
| Nitrite-Nitrogen | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| Nitrate-Nitrogen | mg/L | 8.6 | 8.4 | 5.7 | 6.3 | ND | ND | 5.1 | 5.2 |
| Orthophosphate-P | mg/L | 0.31 | 0.028 | 0.15 | 0.019 | 0.05 | ND | 0.29 | 0.019 |
| Total phosphorus-P | mg/L | 0.05 | 0.04 | 0.031 | 0.03 | ND | ND | 0.04 | 0.03 |
| Glyphosate | µg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloropyrifos* | ng/L | ND | ND | ND | ND | ND | ND | ND | ND |
| Pesticides/PCBs (EPA 608)** | µg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| Turbidity | NTU | 0.40 | 1.00 | 0.45 | 0.40 | 0.45 | 0.90 | 0.40 | 0.30 |
| Fecal Coliform Bacteria | (MPN/ 100 ml) | 21 | 7 | 140 | 36 | 50 | 4 | 30 | 90 |
| Total Coliform Bacteria | (MPN/ 100 ml) | 500 | 500 | 900 | 50 | 220 | 50 | 500 | 280 |

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

* The analytical method used for chloropyrifos (diazinon/chlorpyrifos by GCMS, EPA 625) also tests for the following chemicals: diazinon, sulprofos, demeton, dichlorvos, disulfoton, dimethoate, ethoprop, fenchlorophos, fensulfothion, fenthion, merphos, mevinphos, malathion, parathion-methyl, phorate, tokuthion, tetrachlorovinphos, and trichloronate.

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

Discharge Measurements

Using the field technique described in the methodology section, 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 December 2007 and 2008 are summarized in Table 7-6.

**Table 7-6. Estimated Flows for December 2007 and 2008**

| Sampling Date | Approximate Flow (cubic feet per second) | | |
|---|---|---|---|
| | Outlet of Big Tujunga Ponds | Haines Canyon Creek leaving the site | Big Tujunga Wash |
| 12/17/2007 | 7.5 | 5.3 | 1.0 |
| 12/29/2008 | 5.5 | 6.1 | 2.7 |

Comparison of Results with Baseline Data

Water quality in December 2007 and 2008 was generally similar to baseline conditions for parameters such as pH, nitrate, ammonia, and Kjeldahl nitrogen. Substantially higher bacteria and turbidity levels were observed in the 4/18/00 baseline samples due to a rain event. Phosphorus levels were also higher in the April 2000 samples than in December 2007 and 2008, perhaps due to release from sediments.

Comparison of Results with Aquatic Life Criteria

Table 7-7 provides the results of the December 2007 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 EPA's criteria for freshwater aquatic life. Table 7-8 provides the results of the December 2008 water quality sampling comparison.

**Table 7-7. Comparison of December 2007 Water Quality Values to Objectives for Protection of Beneficial Uses and Freshwater Aquatic Life**

| Parameter | Discussion |
|---|---|
| Temperature | • Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations. |
| Dissolved oxygen | • Dissolved oxygen levels ranged from 5.42 mg/L in the inflow to the ponds to 10.42 in Big Tujunga Wash. DO levels at all stations were above the recommended minimum for warmwater fish species (5.0 mg/L). |
| pH | • Lowest pH was observed in the inflow to the ponds (6.34), with highest pH observed in Big Tujunga Wash (8.22). On this date, pH measurements at all stations except the inflow to the ponds were within the 6.5 to 8.5 range identified in the Basin Plan. |
| Total residual chlorine | • No residual chlorine was detected at any station. |
| Nitrogen | • Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L and nitrate levels were below the method reporting limit (0.44 mg/L) at the Big Tujunga Wash station.<br>• Ammonia and nitrite were not detected at any station. |
| Phosphorus | • Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range was ND to 0.05 mg/L; recommended range is <0.05 – 0.1 mg/L).<br>• Higher orthophosphate measurements are suspected to be caused by interference, possibly by arsenate (concentrations as low as 0.1 mg As/L interfere (positively) with the phosphate determination). |
| Glyphosate | • No glyphosate was detected at any station. |
| Chloropyrifos | • Chloropyrifos and the other pesticides tested using EPA's analytical method 625 were not detected at any station. |
| Pesticides/ PCBs (EPA 608 compounds) | • Pesticides and PCBs analyzed by EPA Method 608 were non-detect at all stations. |
| Turbidity | • Turbidity levels were low (<0.50 NTU) at all stations. |
| Bacteria | • Fecal coliform levels at all stations were below the water contact recreation standard of 200 MPN. Total coliform levels were generally low at all stations. |

**Table 7-8. Comparison of December 2008 Water Quality Values to Objectives for Protection of Beneficial Uses and Freshwater Aquatic Life**

| Parameter | Discussion |
|---|---|
| Temperature | Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations. |
| Dissolved oxygen | Dissolved oxygen levels ranged from 5.53 mg/L in the inflow to the ponds to 10.90 in Big Tujunga Wash. DO levels at all stations were above the recommended minimum for warmwater fish species (5.0 mg/L). |
| pH | Lowest pH was observed in Haines Canyon Creek exiting the site (6.88), with highest pH observed in Big Tujunga Wash (8.56). On this date, pH measurements at all stations except Big Tujunga Wash were within the 6.5 to 8.5 range identified in the Basin Plan. |
| Total residual chlorine | No residual chlorine was detected at any station. |
| Nitrogen | Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L and nitrate levels were below the method reporting limit (0.20 mg/L) at the Big Tujunga Wash station.<br>Ammonia and nitrite were not detected at any station. |
| Phosphorus | Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range was ND to 0.04 mg/L; recommended range is <0.05 – 0.1 mg/L). |
| Glyphosate | No glyphosate was detected at any station. |
| Chloropyrifos | Chloropyrifos and the other pesticides tested using EPA's analytical method 625 were not detected at any station. |
| Pesticides/ PCBs (EPA 608 compounds) | Pesticides and PCBs analyzed by EPA Method 608 were not detected at any station. |
| Turbidity | Turbidity levels were low (≤1 NTU) at all stations. |
| Bacteria | Fecal coliform levels at all stations were below the water contact recreation standard of 200 MPN. Total coliform levels were generally low at all stations. |

## 8.0 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 has been monitored on an annual basis since that time. The revegetation of this area was designed to increase the number of oak and sycamore trees and to create a coastal sage scrub understory that would support a wide diversity of plants and wildlife. This effort suffered repeated setbacks early on in the implementation. Coyotes were diligently and repeatedly destroying the tubing associated with the irrigation system. As a result, many of the plantings either died or their growth was inhibited due to lack of sufficient water. In addition, gophers were removing the planted shrubs at an alarming rate. When ECORP was issued the contract for the implementation of the MMP in July of 2007, the task for the oak/sycamore woodland restoration only included weeding. During the negotiations, LACDPW and ECORP discussed options for the oak/sycamore woodland recovery. The decision was made to focus the efforts on weed and non-native grass removal to reduce competition for resources between the native and non-native species. Without the competition, this focused effort is expected to enhance the oak/sycamore woodland restoration area by allowing the existing native plant species to naturally recruit new individuals. As a result, the value of the habitat for native wildlife species is also expected to increase. This vegetation community, once mature, would act as a natural buffer zone between the urban activities and the riparian areas to the north.

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 fasiculatum*), 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 conducted by hand using Round-Up® herbicide, hand tools, and gasoline-powered weed whackers. The schedule for weed removal activities includes four efforts during each contract year. 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.

Natures Image conducted a very large initial weed removal effort (over 5 days) in the 11-acre oak/sycamore woodland during February of 2008. Follow-up removal efforts were also conducted in April and November of 2008. The limited rainfall in 2008 resulted in a lower amount of weed growth than in a normal rain year. Following each of the weed removal efforts, ECORP visited the site to survey and document the locations and success of weed removal in the oak/sycamore woodland area. During site visits in the middle of the spring, new growth was observed on many of the shrubs and trees on which the weeding had been conducted. Seed pods present on castor bean plants were removed from the plants present in the oak/sycamore woodland area to prevent reproduction. 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. Coordinates of areas needing additional weeding were noted by ECORP's Restoration Specialist and later removed by Nature's Image.

ECORP biologists conducted site visits following weed removal efforts to document weed removal success in the oak/woodland area. Notes and representative site photographs were taken and the coordinates of additional weed/exotic plant locations were recorded using a handheld GPS unit. Quarterly reports were produced summarizing the restoration efforts in the 11-acre oak/sycamore woodland (Appendix M).

## 9.0 FINALIZATION OF FORMAL BANKING AGREEMENT

The Formal Banking Agreement is a method for keeping track of credits used in the Big Tujunga Wash Mitigation Area and determining the number of credits still available. Two drafts of the Conservation Easement/Banking Agreement, one in 2001 and one in 2006, were prepared by Chambers Group. In January of 2008, ECORP's subconsultant, Ms. Sharon Lockhart, who is a specialist in mitigation banking prepared a new work plan for completing the Conservation Easement (CE) and the Memorandum of Understanding (MOU) for the Mitigation Area. This was submitted to the LACDPW in January of 2008. Shortly thereafter, Ms. Lockhart prepared a draft of the Conservation Easement and an outline for the MOU and these were submitted to the LACDPW for review and comment in January of 2008. LACDPW staff internally reviewed the draft CE and provided ECORP with concerns regarding some of the language in the CE. These concerns were primarily related to the funding for the long-term management of the Mitigation Area. LACDPW continued their review with their legal department throughout the remainder of 2008 and ECORP made no further changes to the CE or MOU in 2008.

### 9.1 CHANGES IN THE MITIGATION BANKING TEMPLATES

Subsequent to ECORP's preparation of the draft CE, a new set of mitigation banking templates was issued. In a statewide multi-agency team effort, and as a result of a 2006 multi-agency Memorandum of Understanding, mitigation banking templates were released via a U.S. Army Corps of Engineers (USACE) Public Notice on May 9, 2008. A second Public Notice was published on September 11, 2008 announcing the templates and a stakeholder meeting to be held on September 30, 2008. The agencies represented in this template-development effort include: the California Resources Agency, CDFG, USACE, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Department of Agriculture - Natural Resources Conservation Service, and National Oceanic and Atmospheric Association - National Marine Fisheries Service. The finalized banking template documents include the following:

1. mitigation bank enabling instrument (BEI)
2. conservation easement (for banks)
3. long-term management plan
4. checklist
5. property assessment and warranty

In 2008, the CDFG indicated to LACDPW that they consider the Big Tujunga Mitigation Area a conservation area rather than a mitigation bank and therefore, the mitigation bank enabling instrument is not necessary. The efforts towards finalizing the CE, the long-term management plan, and the funding for the long-term management of the site will be completed in 2009/2010.

## 10.0 UPDATED AND RENEWED PERMITS

At the time of the Big Tujunga Wash Mitigation Area's establishment, it was thought that restoration activities may require permits from USACE, Regional Water Quality Control Board (RWQCB), and CDFG. Permits are required from USACE and the RWQCB whenever activities result in discharge of dredged or fill material into Waters of the United States. Activities that affect the channel and/or associated riparian vegetation require a 1601 Streambed Alteration Agreement from the CDFG. After an informal consultation with the agencies, it was determined that only a 1601 SAA from CDFG would be required for exotic weed removal activities that would be conducted adjacent to waterways. Because no discharge of dredged or fill material will result from the restoration activities in the Mitigation Area, USACE, and RWQCB determined that permits from these agencies were not necessary.

A Streambed Alteration Agreement (#5-247-00) was issued for the initial restoration activities in the Big Tujunga Mitigation Area on October 30, 2000. The allotted number of five (5) extensions was utilized for the five-year implementation of the MMP. An interim extension from December 31, 2006 through June 30, 2007 was granted by CDFG in order to allow LACDPW sufficient time to prepare and submit a new SAA application. ECORP assumed the responsibility of preparing the new SAA application for the continuance of weed removal activities at the Big Tujunga Wash Mitigation Area.

ECORP conducted an initial site visit in July 2007 to determine the extent of restoration activities still necessary and best course of action for the removal of non-native invasive weed species. After determining the plan of action, ECORP's subconsultant, Gonzales Environmental Consulting, LLC (GEC), began accumulating the necessary documents from LACDPW for preparation of the SAA application. The new application updated the methodology that will be used to remove non-native invasive weed species and included the most recent list of herbicides that would be utilized in and around open water. A copy of the SAA application and cover letter is included as Appendix N. The completed SAA application and application fee, which were submitted to CDFG on July 22, 2008, are also included in Appendix N.

# 11.0 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. ECORP's Project Manager attended one meeting with LACDPW staff to discuss the preparation for the 2008 Trails Maintenance Day.

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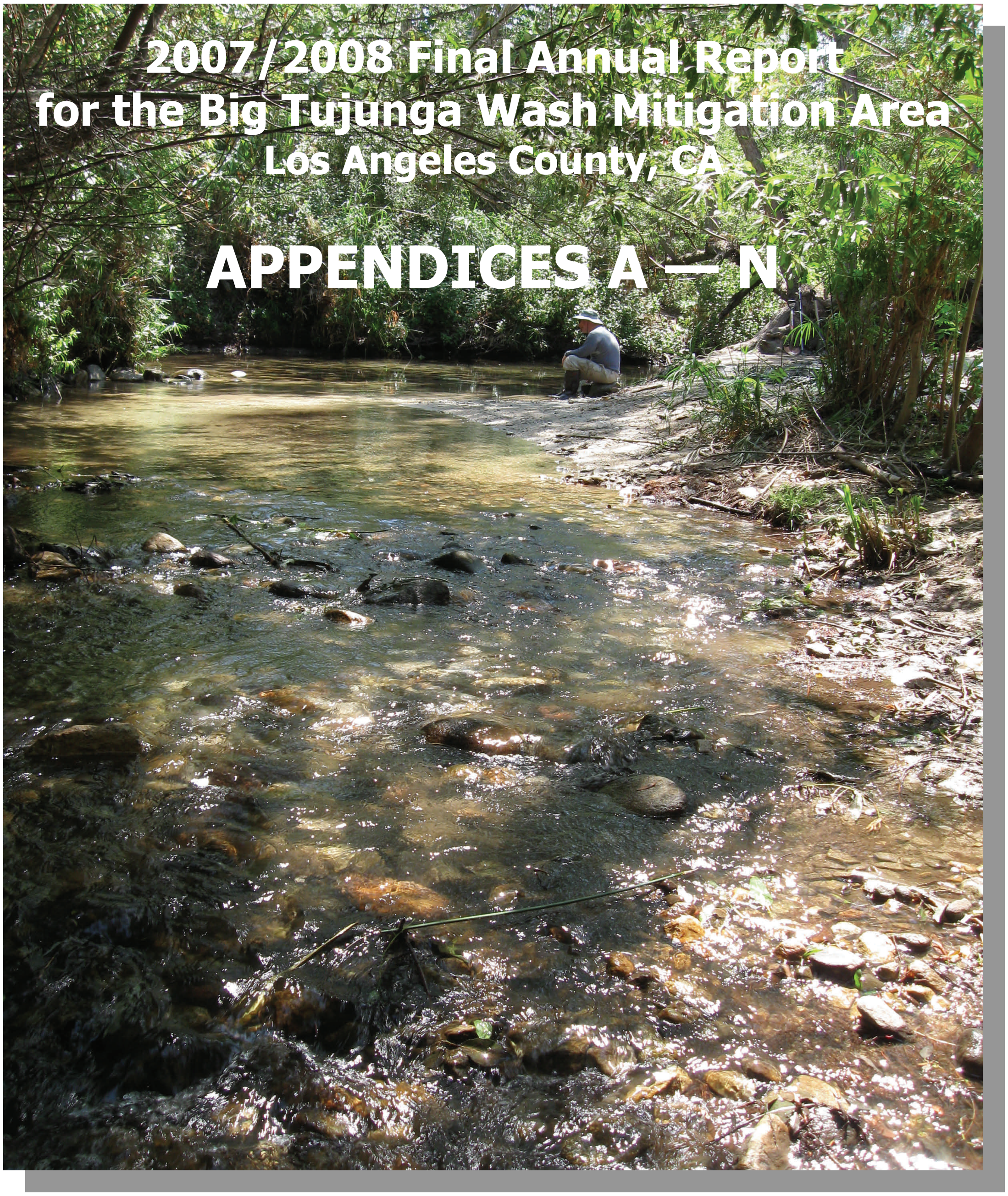
# 2007/2008 Final Annual Report for the Big Tujunga Wash Mitigation Area

## Los Angeles County, CA

# APPENDICES A — N



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**October 2010**

## APPENDIX A

# Revised Habitat Restoration Plan (Revised)

# REVISED HABITAT RESTORATION PLAN
# FOR
# BIG TUJUNGA WASH MITIGATION AREA

## 1.0 INTRODUCTION

### 1.1 Purpose of the Revised Restoration Plan

In late 1998, the Los Angeles County Department of Public Works (LACDPW) purchased a 207-acre site in the Big Tujunga Wash to serve as mitigation for some of LACDPW's projects. Prior to the purchase of the site, LACDPW obtained concurrence from the U.S. Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), and Regional Water Quality Control Board (RWQCB) that the site could serve as a mitigation bank for other LACDPW'S projects that would impact similar habitats. Both the Corps and the RWQCB allotted credits in the bank based on the number of acres of the site within the waters of the United States and the value of the upland habitats on site. Their allotment of credits in the bank, which was 157.6 credits from the Corps and 154 from the RWQCB, was contingent upon the implementation of a number of enhancement measures designed to improve the quality of the habitats on the site. The conceptual enhancement measures, described in Chambers Group, Inc.'s (Chambers) August 2000 document entitled "Enhancement Opportunities at Big Tujunga Wash, Los Angeles County, California," were submitted to the agencies when LACDPW requested concurrence with the mitigation bank concept (Chambers 2000a). Proposed enhancement programs included exotic plant species removal, native habitat restoration and enhancement, exotic wildlife species removal (fishes, bullfrogs (*Rana catesbeiana*), brown-headed cowbird (*Molothrus ater*), crayfish (*Procambarus* sp.)), and restriction of equestrian use to established trails.

In mid-1999, LACDPW issued a contract to prepare a Master Mitigation Plan (MMP) for the Big Tujunga Wash Mitigation Bank based on the previous parameters discussed in their opportunities study (Chambers 2000b). The purpose of the MMP was to serve as a guide for implementation of the various enhancement programs and to fulfill a CDFG requirement for the preparation of a management plan for the site. The MMP included a 5-year program of implementation, maintenance, and monitoring of these enhancement strategies. Implementation of the MMP was initiated in late 2000 and the end of the 5-year program was originally anticipated to be in late 2005. However, the enhancement programs were extended by the LACPDW and Chambers monitored additional enhancement work at the site through early 2007. In mid-2007, LACDPW issued a new contract to ECORP Consulting, Inc. (ECORP) to continue the implementation of the MMP and to prepare a Long-term Maintenance and Monitoring Plan for the Mitigation Area.

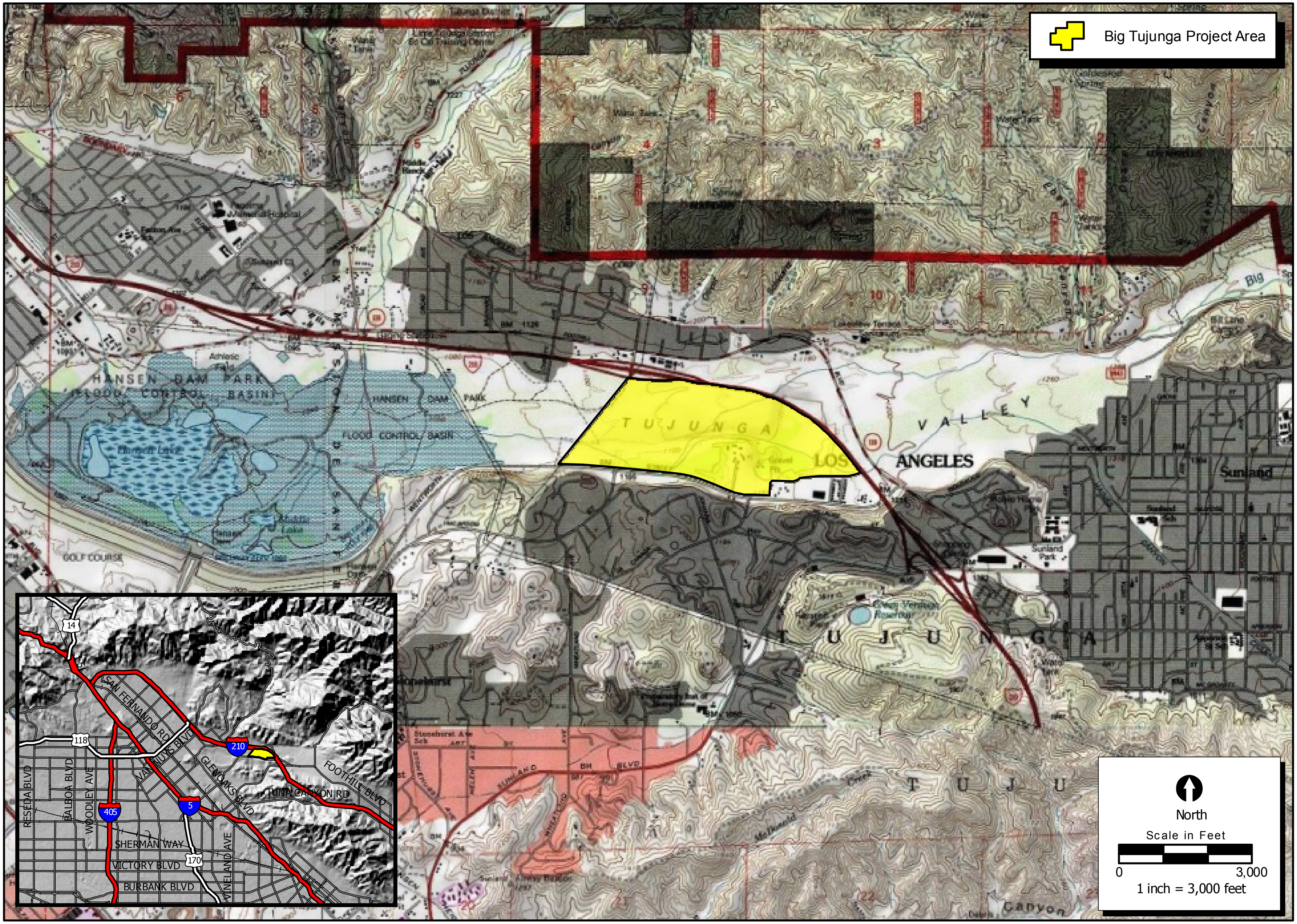
ECORP proposed to re-evaluate the habitat restoration program for the cottonwood-willow riparian restoration areas and to prepare a revised restoration plan that would be more applicable to current conditions on the site. In addition, the revised restoration plan would be designed to address the long-term management of the restoration areas on the site. The purpose of this revised habitat restoration plan is 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.

## 1.2 Location and Setting

The Big Tujunga Wash Mitigation Bank is located in Big Tujunga Wash, just downstream of the 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 210 Freeway 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 Mitigation Bank boundaries.

The Big Tujunga Wash Mitigation Bank supports two watercourses, one containing flow from Big Tujunga Wash proper, and the other conveying the flow from Haines Canyon to Big Tujunga Wash. The flow in the Big Tujunga Wash, on the north side of the site, is partially controlled by Big Tujunga Dam and is intermittent based on rainfall amounts and water releases from the Dam. The flow in Haines Canyon Creek, located on the south side of the site, 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 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 Big Tujunga Ponds and surrounding habitat, consisting of approximately 27 acres located in the northeast corner of the site, were originally created as part of the mitigation measures for the construction of the 210 Freeway and are currently under the jurisdiction of the Los Angeles County Department of Recreation and Parks. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, and the Tujunga Ponds can be found on Figure 2.

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Map Date: 10/15/2008

**Figure 1. Project Location Map**

*2007-110 Big Tujunga Mitigation Bank*

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Aerial Date: March 2008
Map Date: 10/29/08

**Figure 2. Big Tujunga Wash Mitigation Bank**

*2007-110 Tujunga Mitigation Bank*

ECORP Consulting, Inc.
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## 2.0 Background on the Habitat Restoration Program

### 2.1 Targets for Survival and Percent Cover

Survival and percent cover requirements were established in the original MMP and are summarized below.

> The requirements stated that 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. If the survival and cover requirements are not met, replacement plantings shall be implemented to achieve the required standards, as necessary. Replacements will be monitored with the original plantings for a 5-year monitoring period with the same survival and growth requirements as the plantings.

The program that was implemented during the first five years according to the MMP focused on the planting of new riparian woodland overstory and understory plantings in existing canopy openings or in openings that were created after the extensive stands of the invasive exotic species giant reed (*Arundo donax*) or Tamarisk (*Tamarix* spp.) were removed. The species that were included in the original planting plan for the cottonwood-willow riparian restoration areas are listed in Table 1. The table also lists the numbers of each species that were installed and reported in the as-built report for the Mitigation Area.

**Table 1 – Numbers/Species of Plants Installed in the Restoration Areas**

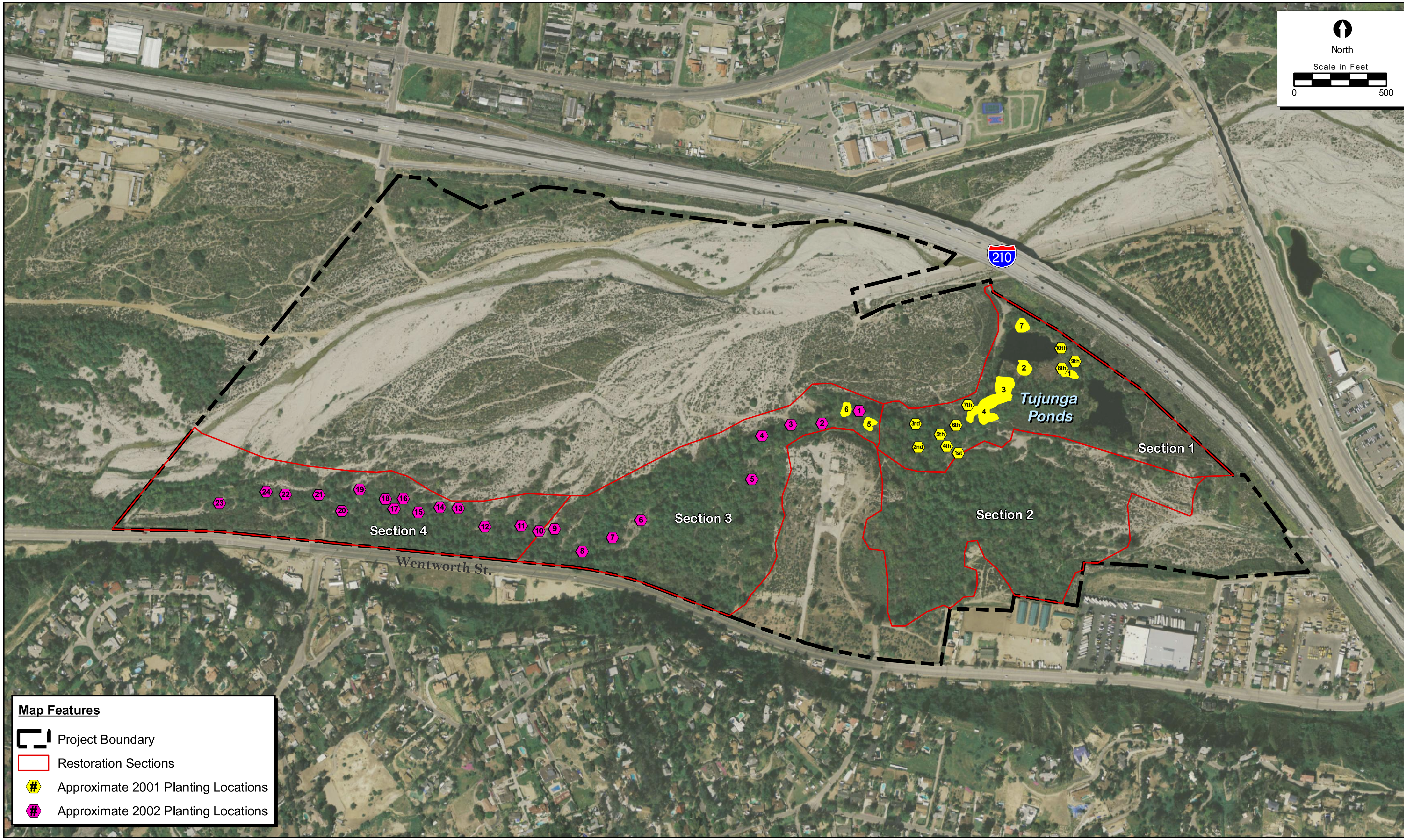
| Common Name | Scientific Name | As-Built Numbers Installed (2002) |
|---|---|---|
| black willow | *Salix gooddingii* | 100 |
| red and arroyo willow | *Salix laevigata* and *Salix lasiolepis* | 3,660 |
| mule fat | *Baccharis salicifolia* | 1,716 |
| cottonwood | *Populus fremontii* | 231 |
| California rose | *Rosa californica* | 978 |
| California blackberry | *Rubus ursinus* | 215 |
| **Total** | | **6,900** |

Approximately one-quarter of the 6900 original riparian plantings were completed during the first quarter of 2001 and the remaining restoration areas were planted in January of 2002. Planting consisted of installing hardwood cuttings, liners, and container plants. Cuttings consisted of willow species (*Salix* spp.) and mule fat (*Baccharis glutinosa*). Container plants included 5-gallon Fremont cottonwood (*Populus fremontii*) and understory liner plantings of California rose (*Rosa californica*) and California blackberry (*Rubus ursinus*). The cuttings, liners, and container plants were installed in open areas near the ponds and the downstream portions of Haines Canyon Creek. The 2001 and 2002 planting locations are shown in Figure 3. Seeding was not conducted in any of the riparian restoration areas and irrigation was limited to hand-watering.

## 2.2 Issues with Replacement Plantings

In 2004, Chambers noted that plant losses were relatively high and were mainly attributed to insufficient water being available to the new plantings. This was either caused by the depth to groundwater being such that the new plantings were not able to establish adequate root systems to utilize the groundwater or that the planting sites were remote and difficult to reach with hand-watering (Chambers 2004). However, at that time, Chambers concluded that natural recruitment was working better to fill openings in the riparian canopy than the active planting program so they proposed no new plantings at that time. ECORP conducted a functional analysis at the Big Tujunga Mitigation Site in 2008 and the results of that analysis support the conclusion that natural recruitment was actively filling in the restoration areas (ECORP 2008).

In 2005, the planting results had not changed substantially when Chambers reported that only 24% of original plantings were still alive even though 80% survival was required (Chambers 2006). Table 2 lists the numbers of plants originally installed plus the numbers observed in 2005.

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Map Date: 03/20/09
Photo Source: DigitalGlobe March 2008

**Figure 3. Riparian Planting Locations**

*2007-110 Big Tujunga Mitigation Site Master Plan*

ECORP Consulting, Inc.
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**Table 2 - Riparian Habitat Container Plantings Survival**

| Common Name | Scientific Name | As-Built Numbers Installed (2002) | Number Required in MMP (5th Year) | 2005 Observed Numbers | 2005 Percent Survival |
|---|---|---|---|---|---|
| black willow | *Salix gooddingii* | 100 | 72 | 33 | **46** |
| red and arroyo willow | *Salix laevigata* and *Salix lasiolepis* | 3,660 | 2,635 | 650 | **25** |
| mule fat | *Baccharis salicifolia* | 1,716 | 1,236 | 296 | **24** |
| cottonwood | *Populus fremontii* | 231 | 166 | 64 | **39** |
| California rose | *Rosa californica* | 978 | 704 | 117 | **17** |
| California blackberry | *Rubus ursinus* | 215 | 155 | 16 | **10** |
| **Total** | | **6,900** | **4,968** | **1,176** | **23.7** |

Because of this shortfall, Chambers added additional plantings to the Haines Creek planting sites downstream of the ponds in the early spring of 2007. Chambers reported the counts of surviving plants in March of 2007 in their 2006/2007 annual report (Chambers 2007) along with the numbers of additional plants that were installed in April of 2007. These numbers are listed in Table 3.

**Table 3 – Numbers of Plants in the Restoration Areas in April 2007**

| Common Name | As-Built Numbers Installed (2002) | Number Required in MMP (5th Year) | March 2006 Observed Numbers | Additional Numbers Planted in April 2007 | Total Count in April 2007 |
|---|---|---|---|---|---|
| black willow | 100 | 72 | 34 | 33 | 67 |
| red and arroyo willow | 3,660 | 2,635 | 525 | 1,613 | 2,138 |
| mule fat | 1,716 | 1,236 | 344 | 760 | 1,104 |
| cottonwood | 231 | 166 | 72 | 83 | 155 |
| California rose | 978 | 704 | 162 | 0 | 162 |
| California blackberry | 215 | 155 | 53 | 580 | 633 |
| **Total** | **6,900** | **4,968** | **1,190** | **3,069** | **4,259** |

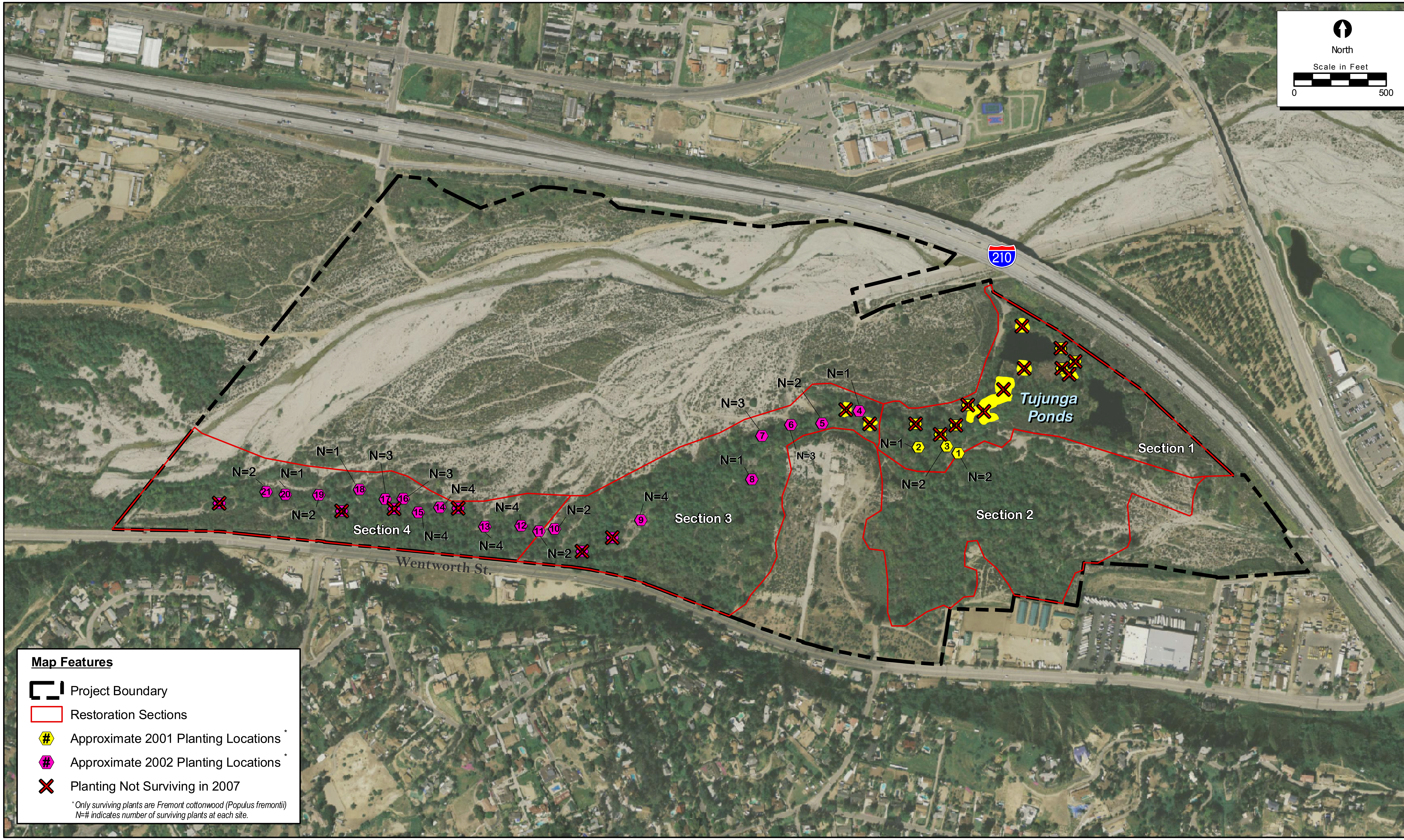
The plantings in 2007 included pole cuttings of black, red, and arroyo willows and mule fat, cottonwoods in 5-gallon containers, and liners of California blackberry. At the time of planting, California rose were unavailable so they planted additional California blackberry. Unfortunately, 2007 was a severe drought year and these plantings went in at the end of the rainy season when there was insufficient soil moisture or supplemental watering to support their survival. The plantings went for a period of time without supplemental watering because it was at this same time that there was a delay in the contract transition between Chambers and ECORP. By the time ECORP took over the project in the early summer of 2007 (only 3-4 months after planting), the only recent plantings that appeared to still be alive were cottonwoods. ECORP counted a total of 51 surviving cottonwoods. ECORP immediately instituted a bi-weekly watering program for the surviving cottonwoods in 2007 and 2008 and no further loss of cottonwoods was noted.

When ECORP conducted their first evaluation of the site in mid-2007, it was not possible to determine which plants in the restoration areas were surviving from the original 2001-2002 planting. The original markers that identified the plantings were no longer in place, either as a result of vandalism or just loss over time due to scouring during storm events or natural decay of the wood stakes that were used to mark the locations. At this point, it likely is not possible to determine the total number of plantings that have survived since 2001/2002 without them being marked. Therefore, ECORP's future success monitoring will be focused on the success criteria of 75% cover in the restoration areas rather than survival of plantings. Approximate locations of surviving plantings in 2007 are presented in Figures 4 and 5.

## 2.3 Invasive Exotic Plant Species Removal Program

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 4 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.

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 Big Tujunga 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 5. In addition, it was evident that in many areas eupatory (*Ageratina adenophora*) was a significant understory species and this was added to the list of target. The terms and conditions of the existing Streambed Alteration Agreement for the project did not allow removal of vegetation during the breeding season. Therefore,

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Map Date: 03/20/09
Photo Source: DigitalGlobe March 2008

**Figure 4. Mitigation Planting Survival 2007**

*2007-110 Big Tujunga Mitigation Site Master Plan*

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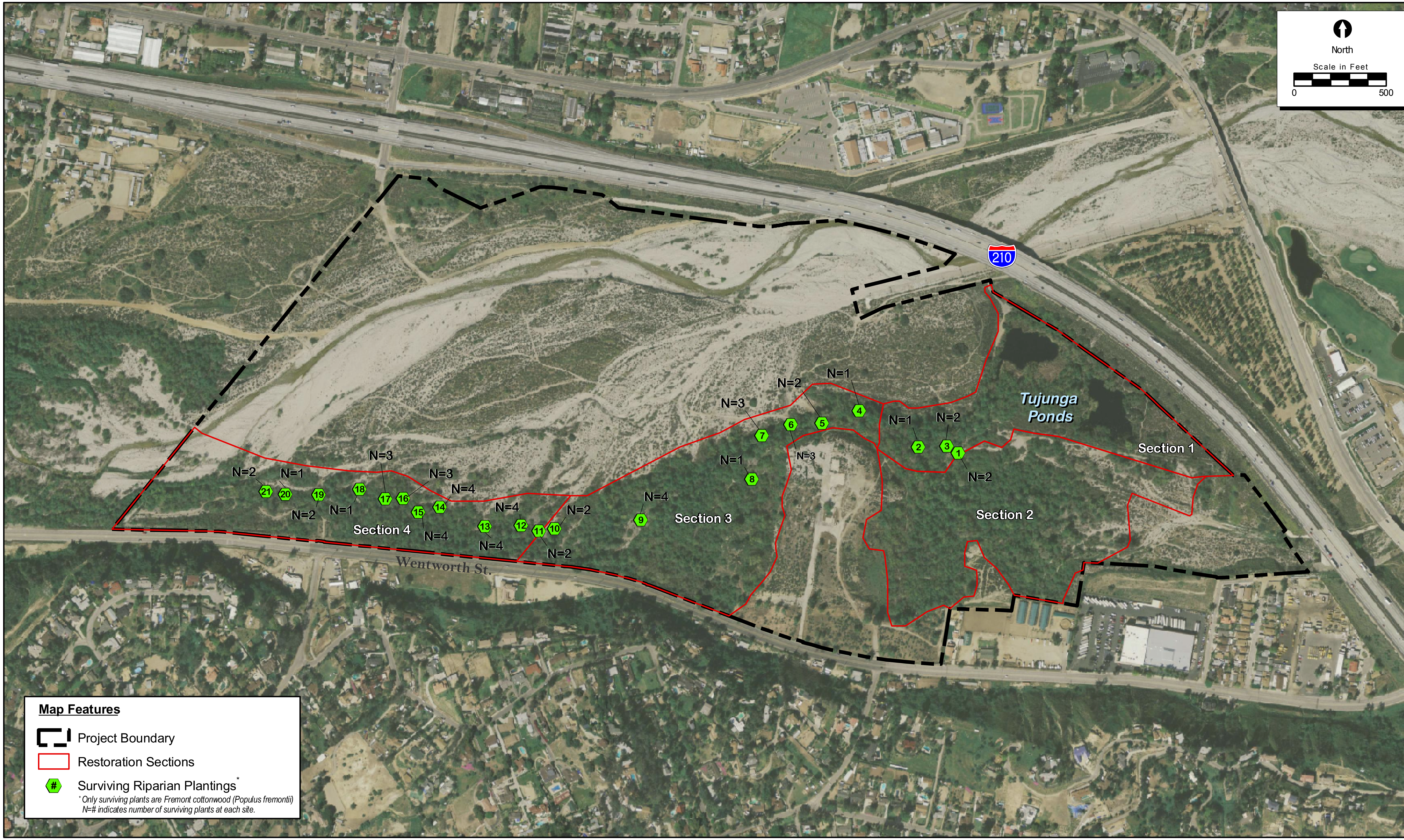


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Map Date: 03/20/09
Photo Source: DigitalGlobe March 2008

**Figure 5. Surviving Riparian Plantings**

*2007-110 Big Tujunga Mitigation Site Master Plan*

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ECORP's subcontractor was not able to conduct any exotic plant removal during the breeding season in 2007. In addition, the renewal of the Streambed Alteration Agreement (SAA), which took place during late 2007 and 2008, precluded the removal of exotic invasive plant species until the new SAA was issued by the California Department of Fish and Game. The new SAA wasn't issued prior to the end of 2008 so focused exotics removal was not conducted during the spring/summer of 2008.

ECORP's Landscape Contractor continued to conduct maintenance activities in the oak-sycamore woodland restoration area and the riparian restoration areas in the non-breeding season. Their activities included trash removal, weed removal, and general cleanup activities.

## Table 4 - Target Non-Native Weed Species

| Common Name | Scientific Name |
|---|---|
| Tamarisk | *Tamarix ramosissima* |
| Giant reed | *Arundo donax* |
| Eucalyptus | *Eucalyptus* sp. |
| Castor bean | *Ricinus communis* |
| Eupatory | *Ageratina adenophora* |
| Pepper trees | *Schinus* sp. |
| Mustards | *Brassica* sp. |
| Water hyacinth | *Eichhornia crassipes* |
| Tree tobacco | *Nicotiana glauca* |
| Fennel | *Foeniculum vulgare* |
| Italian thistle | *Carduus pycnocephalus* |
| Milk thistle | *Silybum marianum* |
| Nonnative weedy thistles | *Cirsium* sp. |
| Palm trees | *Arecastrum* sp., *Washingtonia* sp., etc. |
| Nonnative annual grasses<br><br>Wild oats<br>Slender wild oats Foxtail chess<br>Ripgut brome<br>Soft chess<br>Mediterranean barley<br>Italian ryegrass<br>Annual beard grass | <br>*Avena fatua/Avena barbata*<br>*Bromus madritensis* ssp. *rubens*<br>*Bromus diandrus*<br>*Bromus hordeaceus*<br>*Hordeum murinum*<br>*Lolium multiflorum*<br>*Polypogon monspeliensis* |
| Nonnative perennial grasses<br><br>Pampas grass<br>Bermuda grass<br>Fountain grass<br>Smilo grass | <br><br>*Cortaderia selloana*<br>*Cynodon dactylon*<br>*Pennisetum setaceum*<br>*Piptatherum miliaceum* |

**Table 5 - Invasive Exotic Tree Species**

| Common Name | Scientific Name |
|---|---|
| Acacia species | e.g. *Acacia dealbata, and Acacia sp***.** |
| Brazilian pepper | *Schnius terebinifolius* |
| Common catalpa | *Catalpa bignonioides* |
| Castor bean | *Ricinus communis* |
| California pepper | *Schnius molle* |
| Chinese elm | *Ulmus parvifolius* |
| Eucalyptus | *Eucalyptus* spp. |
| Evergreen ash | *Fraxinus uhdei* |
| Japanese privot | *Ligustrum japonicum* |
| Liquidambar | *Liquidambar stryraciflua* |
| Mulberry | *Morus alba* |
| Ornamental fig | *Ficus carica* |
| Palm trees | *Washingtonia* spp., *Phoenix canariensis*, etc. |
| Wild tobacco | *Nicotiana glauca* |

## 3.0 Revised Riparian Habitat Restoration Program

The occurrence of repeated drought years, the apparent fluctuations in the water table levels, the infeasibility of installing an irrigation system in the riparian habitat, and the removal of cuttings by vandals have all contributed to a relatively low survival rate of the cuttings/plantings in the cottonwood willow riparian restoration and enhancement areas at the Big Tujunga Mitigation Area. However, the cuttings and container plants that were planted beginning in 2000/2001 and continuing periodically until 2007 appear to have resulted in the establishment of enough plants that the cover values exceed the success criteria of 75% cover. The actual values for cover will be analyzed during the 2009 functional analysis that will be conducted at the site. In the meantime, ECORP has re-evaluated the value of continued planting of cuttings and container plants and has determined that an alternate restoration strategy would likely be more successful.

Previous functional analyses at the Big Tujunga Mitigation Area have shown that natural recruitment is occurring in the areas where the extensive cover of giant reed was removed. The naturally recruited willows, mule fat, and cottonwoods have been able to become established not only because the dense areas of giant reed were removed but also because the dense canopy created by the giant reed was removed. This has allowed sunlight to penetrate to the ground surface and as a result, the native species have been able to naturally recruit into these areas.

It appears by visual estimate and the recent functional analyses conducted by ECORP, that 5 to 10% of the overall canopy cover within the riparian corridor is dominated by non-native exotic tree species that are detrimental to overall habitat quality (ECORP 2008). Removal of this exotic canopy cover will result in two significant habitat improvements. First, with the new openings in the canopy cover, native plant species will naturally become established in these areas. Since most native riparian woodland plant species are shade intolerant, they will only germinate and become established in areas where there is little to no canopy cover. Opening up the canopy cover will result in the development of more understory vegetation in these areas. Second, the removal of the exotic tree species will create more edge habitat areas for birds that favor edges, such as the least Bell's vireo.

Continuing to install cuttings in the cottonwood/willow riparian areas have proven to be relatively unsuccessful. The revised restoration strategy, therefore, includes a more active exotic tree removal program that will be incorporated into the existing invasive and exotic plant removal program. The existing program focuses on giant reed, tamarisk, castor bean, eupatory, and water hyacinth. ECORP proposes to include the eradication of the major invasive exotic tree species found within the corridor along with the elimination of giant reed and the other invasive and exotic. It is our conclusion that a concerted effort in this direction will produce the greatest improvement to overall habitat quality. At the same time, ECORP proposes to continue supplemental hand-watering and maintenance of the 51 recently planted cottonwoods. With this continued support it is likely these plantings can become established and survive for the long term.

Exotic tree species would be killed in place using a combination of glysoposphate (Round-up®, Aquamaster®), triclophyr (Pathfinder II®/Garlon 4®), and imacypyr (Habitat®) herbicides. Giant reed would be first cut and then treated with a glyphosophospate based herbicide as it re-sprouts. This program would be implemented according to the MMP and the conditions of the Streambed Alteration Agreement to assure the aquatic resources and nesting birds are protected. Spraying would be conducted during the early spring when most species enter their active growth cycle for the season. Follow-up spraying would be conducted in the summer and the following spring to kill any resprouts or eradiate new seedlings.

## References

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2000a *Enhancement Opportunities at Big Tujunga Wash, Los Angeles County, California*. Prepared for the Los Angeles County Department of Public Works, Alhambra, California.

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2004. *Preliminary Draft Big Tujunga Wash Semi-annual Mitigation Bank Report. January-June 2004.* Prepared for the Los Angeles County Department of Public Works, Alhambra, California.

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2008. *Functional Analysis of the Big Tujunga Wash Mitigation Bank for 2008*. Prepared for the Los Angeles County Department of Public Works, Alhambra, California.

# APPENDIX B

## Exotic Plant Removal Monthly Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

July 25, 2007
(2007-110)

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

**SUBJECT: July 2007 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the exotic plant removal activities within the riparian area as of July 2007. The exotic plant removal activities began on July 5, 2007 with a site visit by ECORP biologists Mari (Schroeder) Quillman, and Brad Burkhart; and two representatives from Natures Image (Dan Parker and Mitchell Farr).

The riparian area was surveyed, and exotic plant removal efforts for the upcoming year were discussed. Some of the upcoming efforts included focusing on the complete eradication of arundo (*Arundo donax*) and tamarisk (*Tamarix* sp.), eupatory (*Ageratina adenophora*) removal from visible areas along the trails, around the ponds, and bordering Haines Creek was also a top priority for this area of the restoration area. A more exhaustive list of other exotic plant species occurring within the riparian areas of the site was submitted to Natures Image, and included castor bean (*Ricinus communus*), eupatory, (*Ageratina adenophora*), evergreen ash (*Fraxius uhdei*), and Japanese privot (*Ligustrum japonicum*). No exotic plant removal efforts will occur in the dry wash area, except for locations where arundo has become established.

Methods for the weed control were discussed with Natures Image. It was decided that all plants over 3 feet tall are to be flagged so both ECORP and Natures Image can identify what plants have been treated and which plants need further treatment until they are determined to be dead. It has been suggested that arundo patches be sprayed with Aquamaster® (once the herbicide use has been approved in the riparian area by California Department of Fish and Game). For larger patches of arundo, the stalks will be cut down to ground level and the stumps will be painted with a 100% solution of

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Aquamaster®. Ornamental trees are recommended to be girdled with a machete or chain saw, in order to cut through the cambium layer into the inner xylem. The area girdled is then to be painted with Pathfinder II®. All plants which are sprayed will be left in place to die. Any seedlings of ornamental tree species will be sprayed as soon as they are encountered.

To date, no exotic plant removal efforts by Natures Image have begun.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

August 30, 2007
(2007-110)

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

**SUBJECT: August 2007 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank. Exotic plant removal activities were commenced by ECORP Consulting, Inc. in July 2007. To date there have been no weed removal efforts in the riparian areas undertaken by Natures Image. The only other site visits conducted by ECORP Consulting were those for exotic aquatic species removal efforts in late August 2007.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

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September 28, 2007
(2007-110)

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

**SUBJECT: September 2007 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during September 2007. To date, no weed removal efforts in the riparian areas have been undertaken by Natures Image. ECORP biologist Mari (Schroeder) Quillman visited the site on September 27, 2007, to survey the riparian areas for additional problem areas to focus exotic plant removal efforts in the future. Areas needing attention were noted and will be discussed at a later date with Natures Image.

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

SIGNED:_________________________ DATE:__________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 31, 2007
(2007-110)

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

**SUBJECT: October 2007 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during October 2007. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas. There have also been no subsequent site visits by ECORP biologists during October 2007.

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

SIGNED:_________________________ DATE:__________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

November 30, 2007
(2007-110)

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

**SUBJECT: November 2007 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during November 2007. To date, Natures Image has not undertaken any exotic plant removal efforts due to the need to renew their spraying permits. There were no subsequent site visits by ECORP biologists during November 2007.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

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December 30, 2007
(2007-110)

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

**SUBJECT: December 2007 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during December 2007. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas, however, ECORP biologist Todd Chapman visited the Big Tujunga site on December 20, 2007 to meet with Andrea Gutman, a local resident involved in the Big T Community Action Committee and site safety patrol. Ms. Gutman showed Mr. Chapman several areas on the slopes separating the Cottonwood uplands from the riparian habitat which contained stands of arundo along with several locations within the riparian area that contained arundo. The location of several exotic palm trees was also pointed out during this site visit. Mr. Chapman recorded GPS coordinates to report to Natures Image for future removal.

| GPS location # | Easting | Northing | Issue |
|---|---|---|---|
| 1 | 11S 0376554 | 3792460 | Arundo, castor bean, gypsum weed present |
| 2 | 11S 0376579 | 3792520 | Arundo present |
| 3 | 11S 0376106 | 3792707 | Arundo present |
| 4 | 11S 0375985 | 3792528 | Arundo present |
| 5 | 11S 0375846 | 3792485 | Arundo present |
| 6 | 11S 0374914 | 3792539 | Extensive amounts of Arundo present, end of project site |
| 7 | 11S 0376414 | 3792480 | Arundo and Tree of Heaven present |
| 8 | 11S 0376485 | 3792429 | Castor bean present |
| 9 | 11S 0376249 | 3792489 | Arundo present |

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

SIGNED:_________________________ DATE:__________________

Kristen Mobraaten
Biologist

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January 31, 2008
(2007-110)

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

**SUBJECT: January 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during January 2008. ECORP biologists Brad Burkhart and Kristen Mobraaten met with two representatives from Natures Image on January 29, 2008 to discuss exotic plant removal in the riparian area of the Big Tujunga site. Several areas of arundo (*Arundo donax*), castor bean (*Ricinus communis*), eupatory (*Ageratina adenophora*), and Algerian ivy (*Hedera canariensis*) were observed in various locations throughout the riparian area. Natures Image made note of these locations and plans on eradication efforts to begin in the near future. The same basic topics were discussed during this site visit with Natures Image as were discussed during the July 2007 site visit. These topics included focusing on the eradication of arundo, tamarisk (*Tamarix* spp.), and eupatorium within the riparian area utilizing the same methods of weed control as discussed during the July 2007 site visit. Other exotic plant species were pointed out to Natures Image for complete removal or to be killed in place. Natures Image was reminded to conduct follow up visits to their exotic plant removal efforts once they begin to ensure that plants treated initially are in fact dead.

No exotic plant removal efforts have been conducted in the riparian area during January 2008, however Natures Image plans to commence work in this area during Spring 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

February 28, 2008
(2007-110)

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

**SUBJECT: February 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during February 2008. ECORP biologists Kristen Mobraaten and Todd Chapman visited the site on February 22, 2008 following three days of weed removal activities conducted by Natures Image. Because the use of herbicide has not been approved for use in the riparian area by California Department of Fish and Game, no exotic plant removal efforts have been conducted in the riparian area during February 2008. Natures Image still plans to commence work in this area during spring 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

March 31, 2008
(2007-110)

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

**SUBJECT: March 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during March 2008. ECORP biologists Kristen Mobraaten and Brian Zitt visited the site on March 12, 2008 following the first complete effort of weed removal activities conducted by Natures Image. Because the use of herbicide has not been approved for use in the riparian area by California Department of Fish and Game, no exotic plant removal efforts have been conducted in the riparian area during March 2008. Natures Image still plans to commence work in this area during spring 2008. Areas of mustard (*Brassica* sp.), arundo (*Arundo donax*), and other exotic species are still located on the slopes leading down to the riparian areas, but these areas will not be addressed until herbicide use is approved.

ECORP biologists walked throughout the entire riparian area and recorded locations of exotic plants such as arundo and castor bean (*Ricinus communis*) for future removal and eradication. GPS coordinates of these exotic plant locations were recorded and placed in a list for future reference (see table below). Eupatory (*Ageratina adenophora*) is present throughout the entire riparian area and seems to be concentrated on the banks of Haines Creek and surrounding the two ponds. The locations of eupatory were recorded, where it was easy to observe, however, it is assumed eupatory is present throughout much of Haines Creek.

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GPS coordinates of exotic plants(11S UTM Coordinates, Nad 83)

| Comments | Easting | Northing |
|---|---|---|
| mustard & arundo on slopes; peppertree in riparian area | 376236 | 3792489 |
| arundo, castor bean | 376283 | 3792605 |
| silver wattle | 376340 | 3792445 |
| exotic plants | 376373 | 3792483 |
| arundo | 376414 | 3792471 |
| castor bean, arundo | 376368 | 3792636 |
| eupatory near ponds | 376680 | 3792644 |
| arundo | 376603 | 3792742 |
| ornamental plant | 376495 | 3792856 |
| Algerian ivy | 376467 | 3792719 |
| arundo | 376456 | 3792710 |
| castor bean | 376433 | 3792688 |
| castor bean and arundo | 376519 | 3792620 |
| huge castor bean | 376585 | 3792504 |
| castor bean and arundo | 376567 | 3792494 |
| castor bean and arundo | 376549 | 3792471 |
| Algerian ivy and castor bean | 376531 | 3792435 |
| castor bean | 376490 | 3792460 |
| eupatory | 376149 | 3792663 |
| arundo | 375308 | 3792610 |
| arundo | 375062 | 3792537 |
| eupatory and arundo | 375186 | 3792575 |
| eupatory | 375317 | 3792532 |
| eupatory | 375361 | 3792524 |
| castor bean | 375391 | 3792547 |
| eupatory and castor bean | 375406 | 3792532 |
| arundo in middle of willow plantings (from prev. year) | 375480 | 3792532 |
| eupatory and castor bean | 375614 | 3792489 |
| eupatory and arundo | 375485 | 3792540 |
| eupatory | 375513 | 3792510 |
| castor bean nearby | 376411 | 3792495 |
| castor bean | 376398 | 3792504 |
| large castor bean | 376574 | 3792540 |
| eupatory and arundo | 376543 | 3792454 |
| castor bean | 376513 | 3792413 |
| castor bean, eupatory | 376142 | 3792661 |
| eupatory and arundo | 375031 | 3792536 |

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

SIGNED:_________________________ DATE:__________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

May 30, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 1 Task C2 - May 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during May 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area. There have also been no subsequent site visits by ECORP biologists during May 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

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June 30, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C - June 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during June 2008. ECORP biologists Kristen Mobraaten and Brian Zitt visited the site on June 11, 2008. Because the use of herbicide has not been approved for use in the riparian area by California Department of Fish and Game, no exotic plant removal efforts have been conducted in the riparian area during June 2008. Natures Image still plans to commence work in this area when approval is received. Areas of mustard (*Brassica* sp.), arundo (*Arundo donax*), and other exotic species are still located on the slopes leading down to the riparian areas, but these areas will not be addressed until herbicide use is approved.

ECORP biologists walked throughout the entire riparian area and recorded locations of exotic plants such as arundo and castor bean (*Ricinus communis*) for future removal and eradication. GPS coordinates of these exotic plant locations were recorded and placed in a list for future reference (see table below). Eupatory (*Ageratina adenophora*) is present throughout the entire riparian area and seems to be concentrated on the banks of Haines Creek and surrounding the two ponds. The locations of eupatory were recorded, where it was easy to observe, however, it is assumed eupatory is present throughout much of Haines Creek.

GPS coordinates of exotic plants (11S UTM Coordinates, NAD 83)

| Issue | Easting | Northing | Comments |
|---|---|---|---|
| eupatory | 376310 | 3792460 | Eupatory everywhere |
| castor bean/tree of heaven | 376349 | 3792445 | |
| eupatory | 376366 | 3792470 | |
| exotic plants | 376384 | 3792488 | castor bean, lots of eupatory, tree tobacco, tree of heaven |

| | | | |
|---|---|---|---|
| castor bean | 376323 | 3792595 | several small plants in this area |
| castor bean/arundo | 376360 | 3792633 | |
| poison oak | 376445 | 3792766 | near ponds |
| poison oak | 376229 | 3792684 | |
| exotic plant | 376162 | 3792669 | |
| castor bean | 375988 | 3792614 | |
| poison oak | 375911 | 3792480 | |
| poison oak | 375554 | 3792501 | abundant on both sides of trail down to 375520/3792511 |
| poison oak | 375526 | 3792538 | |
| poison oak/arundo | 375485 | 3792535 | |
| poison oak | 375471 | 3792513 | |
| castor bean | 375384 | 3792543 | |
| poison oak | 375364 | 3792525 | |
| pepper tree | 376148 | 3792668 | |

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

July 31, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C - July 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during July 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area. There have also been no subsequent site visits by ECORP biologists during July 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

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1801 Park Court Place, Building B Suite 103, Santa Ana, California 92701
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August 29, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C = August 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during August 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area.

ECORP biologists Mari (Schroeder) Quillman and Kristen Mobraaten visited the site on August 7, 2008 and met with local resident Andrea Gutman to discuss areas that need maintenance attention. Ms. Quillman and Ms. Mobraaten surveyed the area behind the Gibson Ranch property for planning a revegetation plan. A second site visit was conducted by ECORP biologists Kristen Mobraaten and Brian Zitt on August 15, 2008 to survey additional riparian areas. During both site visits, ECORP biologists walked throughout the entire riparian area and recorded locations of exotic plants such as arundo and castor bean (*Ricinus communis*) for future removal and eradication. GPS coordinates of these exotic plant locations were recorded and placed in a list for future reference (see table below).

Because the use of herbicide has not been approved for use in the riparian area by California Department of Fish and Game, exotic plant removal efforts were not conducted in the riparian area during August 2008. Natures Image still plans to commence work in this area when approval is received. Areas of mustard (*Brassica* sp.), arundo (*Arundo donax*), and other exotic species are still located on the slopes leading down to the riparian areas, but these areas will not be addressed until herbicide use is approved.

GPS coordinates of exotic plants (11S UTM Coordinates, NAD 83)

| Date | Item | Easting | Northing | Comments |
|---|---|---|---|---|
| 8/7/2008 | exotic plants | 376414 | 3792470 | castor bean, arundo |
| 8/7/2008 | exotic plants | 376405 | 3792492 | eupatory |
| 8/7/2008 | exotic plants | 376350 | 3792456 | tree of heaven |
| 8/7/2008 | exotic plants | 376380 | 3792657 | castor bean, arundo |
| 8/7/2008 | hole in fence | 376702 | 3792708 | fence down |
| 8/7/2008 | hole in fence | 376588 | 3762798 | |
| 8/7/2008 | hole in fence | 376552 | 3792826 | |
| 8/7/2008 | poison oak | 376439 | 3792771 | |
| 8/7/2008 | trash, exotic plants | 376121 | 3792674 | metal grate and pipe, castor bean nearby |
| 8/7/2008 | exotic plants | 376104 | 3792684 | |
| 8/7/2008 | trash | 376065 | 3792691 | metal debris |
| 8/7/2008 | exotic plants, poison oak | 375985 | 3792558 | euapatory |
| 8/7/2008 | trash | 375978 | 3792520 | metal debris |
| 8/7/2008 | poison oak | 375926 | 3792494 | |
| 8/7/2008 | exotic plants | 375853 | 3792480 | arundo amidst plantings |
| 8/7/2008 | exotic plants | 375032 | 3792544 | |
| 8/15/2008 | hole in fence, trash | 376552 | 3792944 | |
| 8/15/2008 | poison oak | 376483 | 3792855 | |
| 8/15/2008 | hole in fence | 376504 | 3792845 | |
| 8/15/2008 | hole in fence | 376529 | 3792824 | |
| 8/15/2008 | hole in fence | 376535 | 3792824 | |
| 8/15/2008 | hole in fence | 376549 | 3792821 | |
| 8/15/2008 | hole in fence | 376574 | 3792804 | |
| 8/15/2008 | hole in fence | 376588 | 3792791 | two within close vicinity of one another |
| 8/15/2008 | hole in fence | 376602 | 3792773 | |
| 8/15/2008 | hole in fence | 376696 | 3792712 | |
| 8/15/2008 | hole in fence, exotic plants | 376734 | 3792616 | castor bean and tree tobacco nearby |
| 8/15/2008 | exotic plants | 376742 | 3792589 | pepper tree |
| 8/15/2008 | hole in fence | 376808 | 3792440 | |
| 8/15/2008 | exotic plants | 376710 | 3792545 | castor bean |
| 8/15/2008 | exotic plants | 376691 | 3792592 | eucalyptus |
| 8/15/2008 | exotic plants | 376681 | 3792613 | tree of heaven, arundo |
| 8/15/2008 | hole in fence | 376682 | 3792623 | |
| 8/15/2008 | exotic plants | 376643 | 3792638 | eupatory |
| 8/15/2008 | hole in fence | 376617 | 3792638 | |
| 8/15/2008 | hole in fence | 376525 | 3792654 | |
| 8/15/2008 | hole in fence | 376489 | 3792660 | |
| 8/15/2008 | hole in fence | 376455 | 3792673 | |
| 8/15/2008 | exotic plants | 376591 | 3792639 | castor bean |
| 8/15/2008 | exotic plants | 376621 | 3792538 | arundo |
| 8/15/2008 | exotic plants | 376616 | 3792529 | arundo |
| 8/15/2008 | exotic plants | 376618 | 3792508 | arundo |

| Date | Item | Easting | Northing | Comments |
| --- | --- | --- | --- | --- |
| 8/15/2008 | exotic plants | 376622 | 3792474 | arundo, eucalyptus |
| 8/15/2008 | exotic plants | 376648 | 3792450 | eucalyptus, castor bean, arundo |
| 8/15/2008 | exotic plants | 376625 | 3792464 | eucaluyptus |
| 8/15/2008 | exotic plants | 376610 | 3792465 | arundo |
| 8/15/2008 | exotic plants | 376541 | 3792487 | castor bean, arundo |
| 8/15/2008 | exotic plants | 376543 | 3792473 | castor bean, arundo |
| 8/15/2008 | exotic plants | 376532 | 3792453 | eupatory, castor bean, arundo |
| 8/15/2008 | exotic plants | 376517 | 3792422 | arundo, castor bean |
| 8/15/2008 | exotic plants | 376515 | 3792406 | castor bean |
| 8/15/2008 | exotic plants | 376496 | 3792411 | castor bean, fig, eupatory |
| 8/15/2008 | exotic plants | 376462 | 3792436 | eupatory |
| 8/15/2008 | exotic plants | 376481 | 3792430 | arundo, fig |
| 8/15/2008 | exotic plants | 376437 | 3792449 | castor bean, fig, eupatory |
| 8/15/2008 | exotic plants | 376406 | 3792477 | arundo, castor bean |
| 8/15/2008 | exotic plants | 376431 | 3792708 | arundo, castor bean |
| 8/15/2008 | exotic plants | 376437 | 3792735 | fig, arundo |
| 8/15/2008 | poison oak | 376440 | 3792751 | |
| 8/15/2008 | poison oak | 376448 | 3792759 | |
| 8/15/2008 | hole in fence, exotic plants | 376439 | 3792768 | eupatory |

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

September 30, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C - September 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during September 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area. There have also been no subsequent site visits by ECORP biologists during September 2008.

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

SIGNED:_________________________ DATE:__________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 31, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C - October 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during October 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area. There have also been no subsequent site visits by ECORP biologists during October 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

November 28, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C - November 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during November 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area. There have also been no subsequent site visits by ECORP biologists during November 2008.

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

SIGNED:________________________ DATE:__________________

Kristen Mobraaten
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

December 31, 2008
(2007-110/C/C2)

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

**SUBJECT: YEAR 2 Task C - December 2008 Memorandum for the Exotic Plant Removal Efforts in the Riparian Area of the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the exotic plant removal activities at the Big Tujunga Wash Mitigation Bank during December 2008. To date, Natures Image has not undertaken any exotic plant removal efforts in the riparian areas because no word has been received from CDFG regarding the use of herbicide in the riparian area.

ECORP biologists Kristen Mobraaten and Brian Zitt visited the site on December 12, 2008 and met with local residents Andrea and James Gutman to discuss areas that need maintenance attention. The ECORP biologists walked throughout the entire riparian area and recorded locations of exotic plants such as arundo (*Arundo donax*) and castor bean (*Ricinus communis*) for future removal and eradication. GPS coordinates of these exotic plant locations were recorded and placed in a list for future reference (see table below).

Because the use of herbicide has not been approved for use in the riparian area by California Department of Fish and Game, exotic plant removal efforts were not conducted in the riparian area during December 2008. Natures Image still plans to commence work in this area when approval is received. Areas of mustard (*Brassica* sp.), arundo, and other exotic species are still located on the slopes leading down to the riparian areas, but these areas will not be addressed until herbicide use is approved.

GPS coordinates of exotic plants (11S UTM Coordinates, NAD 83)

| Date | Item | Easting | Northing | Comments |
|---|---|---|---|---|
| 12/12/2008 | exotic plants | 376219 | 3792661 | eupatory, ash |
| 12/12/2008 | exotic plants | 376321 | 3792624 | castor bean, ash saplings all over the place |
| 12/12/2008 | exotic | 376424 | 3792680 | tree of heaven |

| Date | Item | Easting | Northing | Comments |
|---|---|---|---|---|
| | plants | | | |
| 12/12/2008 | exotic plants | 376449 | 3792702 | ash |
| 12/12/2008 | exotic plants | 376438 | 3792721 | ash, arundo |
| 12/12/2008 | exotic plants | 375796 | 3792484 | ash, eupatory |
| 12/12/2008 | exotic plants | 375619 | 3792495 | unknown bunchgrass (definitely not native) |
| 12/12/2008 | exotic plants | 375525 | 3792508 | palm, possibly in middle of poison oak |
| 12/12/2008 | exotic plants | 375104 | 3792527 | castor bean |
| 12/12/2008 | exotic plants | 375335 | 3792561 | ash, arundo, castor bean, eupatory, palm tree, sedge |
| 12/12/2008 | exotic plants | 375300 | 3792624 | oleander |
| 12/12/2008 | exotic plants | 375319 | 3792548 | tree of heaven |
| 12/12/2008 | exotic plants | 375037 | 3792548 | lantana growing in middle of sage |
| 12/12/2008 | exotic plants | 375178 | 3792578 | 2 palms and tree tobacco |
| 12/12/2008 | exotic plants | 375232 | 3792530 | pampas grass |
| 12/12/2008 | exotic plants | 375643 | 3792481 | ash |
| 12/12/2008 | exotic plants | 375791 | 3792490 | Japanese privot |
| 12/12/2008 | exotic plants | 375873 | 3792509 | arundo |
| 12/12/2008 | exotic plants | 375926 | 3792496 | unknown bunchgrass (definitely not native) |
| 12/12/2008 | poison oak | 376435 | 3792762 | poison oak all over the place |

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

SIGNED:___________________________ DATE:____________________

Kristen Mobraaten
Biologist

# APPENDIX C

## Exotic Wildlife Removal Memos and 2008 Report

# Exotic Wildlife Removal Memos

August 7, 2007
(2007-110)

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

**SUBJECT**: **Exotic Wildlife Removal Effort (Session #1) for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan,

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the exotic wildlife eradication effort for 2007. The Master Mitigation Plan (MMP) described a program to remove exotic wildlife from both of the Tujunga ponds, and Haines 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.

Session #1 began on July 31, 2007 and continued until August 2, 2007. Fisheries biologists Todd Chapman, Manna Warburton, and Brian Zitt utilized several sampling methods during this sampling session. The main species targeted during these efforts were the American bullfrog (*Rana catesbeiana*), the red swamp crayfish (*Procambarus clarkii*), and various fish species including: large mouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*), bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*). Fyke nets were deployed across the outlets of the east and west Tujunga ponds and, additionally, in some deep water habitat along the south side of the west pond. Baited minnow and turtle traps were deployed into both of the ponds and allowed to fish for approximately 24 hours. A backpack electrofishing unit was utilized along the banks and in conjunction with the fyke nets. A seine net was also hauled in several locations along the perimeter of the west pond.

Visibility in both of the ponds is currently extremely poor, approximately 12 inches. The west pond also has developed an overgrowth of green hair algae and an aquatic species of grass. This grass and hair algae have formed large mats on the surface, sometimes extending throughout the entire water column. Although the visibility made spear fishing and reconnaissance snorkeling ineffective, the fyke nets, minnow and turtle traps, backpack electrofishing, and seine net were able to capture and remove adult bullfrog and tadpoles, red-swamp crawfish, large-mouth bass, green sunfish, bluegill, goldfish (*Carassius auratus*), and mosquitofish (*Gambusia affinis*) from the site.

During our efforts it should also be noted that two adult Santa Ana sucker (*Catastomus santaanae*) were observed and released unharmed. These two individuals were located just downstream from the outlet of the west pond at the top of Haines creek.

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

SIGNED:__________________________ DATE:___________________

Todd Chapman
Senior Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 17, 2007
(2007-110)

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

**SUBJECT: Exotic Wildlife Removal Effort (Session #2) for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. is continuing the exotic wildlife eradication effort for 2007. The Master Mitigation Plan (MMP) described a program to remove exotic wildlife from both of the Tujunga ponds and Haines Creek to relieve potential impacts to native aquatic species. These exotic aquatic species pose direct impacts to the natives through predation of juvenile and larval life stages, and indirect impacts through competition for available food resources, habitat, and the transmission of parasites or pathogens.

Session #2 began on August 27, 2007 and continued through August 30, 2007. Fisheries biologists Todd Chapman, Manna Warburton, Brian Zitt, Kristen Mobraaten, and Jenny Smith utilized multiple sampling methods during this effort. The main species targeted during this sampling were the American bullfrog (*Rana catesbeiana*), the red swamp crayfish (*Procambarus clarkii*), and various fish species including: large mouth bass (*Micropterus salmoides*), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*). Fyke nets were deployed across the outlets of the east and west Tujunga ponds. Baited minnow and turtle traps were deployed into both of the ponds and were allowed to fish for approximately 24 hours prior to being checked and re-deployed. A backpack electrofishing unit was utilized along the banks of both ponds, and concurrently with the fyke nets. Seine net hauls were also conducted at several locations along the perimeter of the east and west ponds.

Visibility in the east pond has improved dramatically since our last effort and is currently ~3-4 feet. Visibility in the west pond has also improved, although it still remains between ~1-2 feet . The west pond still maintains an abundance of green hair algae, and an aquatic grass species that extends from the bottom of the pond to the surface forming large floating mats. With increasing water clarity, reconnaissance snorkeling surveys, coordinated dip-netting, and spear fishing will become an important component of future surveys. The most effective sampling techniques utilized during this removal effort were the fyke nets used in conjunction with the backpack electrofisher, the baited minnow and turtle traps, and the seine net hauls. With each of these methods we were able to capture and remove adult bullfrogs and their tadpoles, red-swamp crayfish, large-mouth bass, green sunfish, bluegill, goldfish, and mosquitofish (*Gambusia affinis*).

No Santa Ana sucker (*Catastomus santaanae)* were observed or captured during our Session #2 sampling efforts. There was one incident which occurred during our last day of sampling with a homeless man and his dog. One of our biologists was bitten on the leg by this dog, and our entire team was told, "you don't belong here you should just leave." This incident was reported to the Public Works, LAPD, and the Los Angeles County Animal Control Agency.

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

SIGNED:__________________________ DATE:____________________

Todd Chapman
Senior Biologist

October 22, 2007
(2007-110)

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

**SUBJECT: Exotic Wildlife Removal Effort (Session #3) for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. is continuing the exotic wildlife eradication effort for 2007. The Master Mitigation Plan (MMP) described a program to remove exotic wildlife from both of the Tujunga ponds and Haines Creek to relieve potential impacts to native aquatic species. These exotic aquatic species pose direct impacts to the natives through predation of juvenile and larval life stages, and indirect impacts through competition for available food resources, habitat, and the transmission of parasites or pathogens.

Session #3 began on October 9, 2007 and continued through October 10, 2007. Fisheries biologists Todd Chapman, Manna Warburton, Brian Zitt, and Chris Lawford utilized multiple sampling methods during this effort. The main species targeted during this sampling were the American bullfrog (*Rana catesbeiana*), the red swamp crayfish (*Procambarus clarkii*), and various fish species including: large mouth bass (*Micropterus salmoides*), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*). A fyke net was deployed across the outlet leading from the east pond into the west Tujunga pond. Baited minnow and turtle traps were deployed into the west ponds. Baited minnow traps were also deployed throughout the upper portions of Haines Creek. All traps were allowed to fish for approximately 24 hours prior to being checked. A backpack electrofishing unit was utilized along the banks of both ponds, concurrently with the fyke nets, and in various large pools of Haines Creek.

Visibility in the east pond has improved since our last effort and is currently ~4-5 feet. Visibility in the west pond has also improved slightly and is between two to five feet. The west pond still supports an abundance of green hair algae and an aquatic grass species that extends from the bottom of the pond to the surface, forming large floating mats. Due to the increase in water clarity, reconnaissance snorkeling surveys were conducted in combination with spear fishing in both ponds. The most effective sampling techniques utilized during this removal effort were: fyke nets in conjunction with backpack electrofishing; backpack electrofishing in the deep pools of Haines Creek; spear fishing in the ponds; and baited minnow traps in the creek and pond.With each of these methods, red-swamp crayfish, large-mouth bass, green sunfish, black bullhead (*Ameriurus melas*), and mosquitofish (*Gambusia affinis*) were captured and removed from the site.

It should be noted that six adult Santa Ana sucker (*Catastomus santaanae)* were observed or captured within Haines Creek during the session. Each of the suckers captured was measured and then released, unharmed, back into the creek. All observation and capture locations were recorded using a handheld GPS unit.

Additionally, it should be noted that evidence of exotic species predation on the Santa Ana sucker was documented during this sampling effort. During the processing effort of the captured exotic species, one of the largemouth bass to regurgitated an adult Santa Ana sucker which was approximately half its size. Measurements and photographs of both species were recorded.

Another result of this latest exotic species removal effort was the capture of a single adult male southwestern pond turtle in the fyke net placed across the channel connecting the east and west ponds. This turtle was measured and its overall health was assessed prior to its release back into the connection channel. There was no sign of predation or impacts due to anthropogenic fishing pressures within 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:_________________________ DATE:_________________

Todd Chapman
Senior Biologist

July 7, 2008
(2007-110 / D / D1)

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

**SUBJECT**: **Exotic Aquatic Species Removal Effort (Session #4) for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan,

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. is continuing the exotic aquatic species eradication effort for 2007. The Master Mitigation Plan (MMP) described a program to remove exotic wildlife from both of the Tujunga ponds, and Haines 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.

Session #4 began on May 14, 2008 and continued until May 16, 2008. Fisheries biologists Todd Chapman, Manna Warburton, Brian Zitt, Danica Schaffer-Smith, and Jenny Smith utilized several sampling methods during this sampling session. The main species targeted during these efforts were the American bullfrog (*Rana catesbeiana*), the red swamp crayfish (*Procambarus clarkii*), and various fish species including: large mouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*), bluegill (*Lepomis macrochirus*), and green sunfish (*Lepomis cyanellus*). A fyke net was deployed across the outlet canal between the east and west Tujunga ponds. Baited minnow and turtle traps were deployed into both of the ponds and into suitable portions of Haines Canyon Creek. The nets and traps were allowed to fish for approximately 24 hours before being rechecked. A backpack electrofishing unit was utilized along the banks of the west pond and in conjunction with the fyke net in the connecting channel. A large bagged seine net was also hauled in several locations along the perimeter of the west pond with the use of an inflatable boat.

Visibility in both of the ponds is currently fair to good with visibility ranging from 4 to 6 feet. The visibility in the west pond has continued to decrease through the spring and into the summer. Snorkeling with a pole spear is proving to be quite effective at catching and removing large numbers of exotic fish species including largemouth bass, bluegill, green sunfish, bullfrog, and red-eared slider. This sampling method is also slightly more effective after dusk. The west pond is maintaining a healthy and overabundant amount of the aquatic plant rupia sp., in addition to the green hair algae which often creates mats on the bottom of the pond and grows up the individual clumps of rupia. When the ambient air temperatures reach their peaks for the summer, these algae mats float to the surface and often can create a monolayer of algae and aquatic plant across the surface of the ponds. The fyke nets, seine net, minnow traps, and turtle traps were quite productive during this sampling effort capturing and removing adult bullfrog and tadpoles, red-swamp crawfish, large-mouth bass, green sunfish, bluegill, and mosquitofish (*Gambusia affinis*) from the site. A single red-eared slider was captured and removed from the site, and it was given to the Orange County Chelonian Society for adoption purposes. A two striped garter snake was also captured during our efforts although this individual was found dead within one of the minnow traps.

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

SIGNED:___________________________ DATE:___________________

Todd Chapman
Senior Biologist

August 26, 2008
(2007-110 / D / D1)

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

**SUBJECT**: **Exotic Aquatic Species Removal Effort (Session #5) for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan,

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. is continuing the exotic aquatic species eradication effort. The Master Mitigation Plan (MMP) described a program to remove exotic wildlife from both of the Tujunga ponds, and Haines 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.

Session #5 began on July 28th, 2008 and continued through July 29th, 2008. Fisheries biologists Manna Warburton, Brian Zitt, and Gregorio Benavidez utilized multiple sampling methods during this effort. The primary species targeted during this sampling session were the American bullfrog (*Rana catesbeiana*), the red swamp crayfish (*Procambarus clarkii*), and various fish species including: largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), and goldfish (*Carasius auratus*). One fyke net was deployed across the outlets of the east and west ponds and it was allowed to fish for approximately 24 hours prior to being checked. Both daytime and nighttime spear fishing efforts were made during each of the survey dates. In addition, surveys were conducted around the perimeter of the east and west ponds using an inflatable boat, and on foot through the upper 100 meters of Haines Creek.

Visibility in the west pond ranged from 6 to 8 feet, and algal mats were restricted to the pond's perimeter. Visibility in the east pond ranged from 2 to 4 feet with thick algal mats covering most of the pond's surface as well as forming dense columns down to the bottom. Spear fishing continues to be effective in targeting larger bass, bluegill, green sunfish, and goldfish in both ponds. Low visibility in the eastern pond did not reduce effectiveness, and large numbers of both adult and juvenile target species were taken regardless of the algal mats. Previously observed differences in submerged aquatic vegetation between the two ponds remained, and the west pond continues to host dense stands of the aquatic plant rupia (*Rupia sp.*).

Snorkel surveys have continued to be effective in targeting exotic turtles as well, and during this effort a large adult red-eared slider (*Trachemys scripta elegans*) was taken. The animal was transported off site for adoption. Surveys for adult bullfrog, conducted at night along the perimeter of the two ponds and down Haines creek, produced a single observation that escaped collection. Bullfrogs have been observed to be more numerous earlier in the spring, and collection efforts during those months were more fruitful. A single adult male was heard calling from the east pond but not directly observed. No bullfrog egg masses were observed, and the large numbers of mature tadpole larvae seen during previous visits were not evident in this session. Two dead juvenile bullfrogs were observed lying on the bottom of the east pond, with no evidence for why they might have died. As per previous observations, bullfrogs seem to experience a great deal of seasonal abundance within the bank.

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

SIGNED:__________________________ DATE:___________________

Todd Chapman
Senior Biologist

# 2008 Exotic Wildlife Removal Report

# 2007-2008 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


***Prepared by:***


ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1801 Park Court Place
Building B, Suite 103
Santa Ana, CA 92701
(714) 648-0630


**September 2009**

CONTENTS

# 2007-2008 Exotic Aquatic Wildlife Species Removal Report for the Big Tujunga Wash Mitigation Area



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## EXOTIC WILDLIFE ERADICATION PROGRAM

## 1.0 INTRODUCTION

As part of the implementation of the exotic wildlife eradication program for the Master Mitigation Plan (MMP), ECORP Consulting Inc., (ECORP) was contracted by the Los Angeles County Department of Public Works (LACDPW) in July 2007 to continue the exotic aquatic species removal effort. 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 site. A Long-term Maintenance and Management Plan (LTMMP) will be prepared to address the continuation of this program in the future. The MMP encompasses 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. It also provides direction for the eradication of exotic aquatic wildlife from both the Tujunga Ponds and Haines Canyon Creek in order to relieve some of the negative impacts that these non-natives have on native species. Implementation of the MMP initially began in August 2000. In the summer of 2007, ECORP assumed responsibility for the ongoing effort to protect and enhance the existing aquatic habitats at the Big Tujunga Wash Mitigation Bank for native wildlife species through the removal of exotic aquatic wildlife species.

The purpose of the exotic aquatic wildlife removal program is to restore, create, and maintain suitable habitat for native aquatic species and to remove and eliminate pressures created by exotic aquatic species on the natives. The exotic aquatic wildlife removal program focuses on the removal of non-native fishes, reptiles, amphibians, and invertebrates from both Haines Canyon Creek and the Tujunga Ponds. Due to the prolific nature of most exotic aquatic species, they are able to quickly increase their numbers and often quickly repopulate recently disturbed habitat areas. These species have the ability to inhabit various habitat types while often tolerating extreme environmental conditions. One of the major problems with the exotic species is that they are able to out-compete natives for available habitat space and/or food resources (Moyle and Nichols 1973; Moyle 2002). Exotic species can also directly impact native aquatic species through hybridization between two closely related species (Hubbs and Miller 1943) and through predation of adults and their young (Minckley et al. 1991), or they can indirectly impact them through the transmission of pathogens or parasites (Moyle 2002). Of the exotics present at the Big Tujunga site, the most targeted species include largemouth bass *(Micropterus salmoides)*, American bullfrog (*Rana catesbeiana*), and red swamp crayfish (*Procambarus clarkii*), which have the ability to pose the greatest threat to sensitive native fishes.

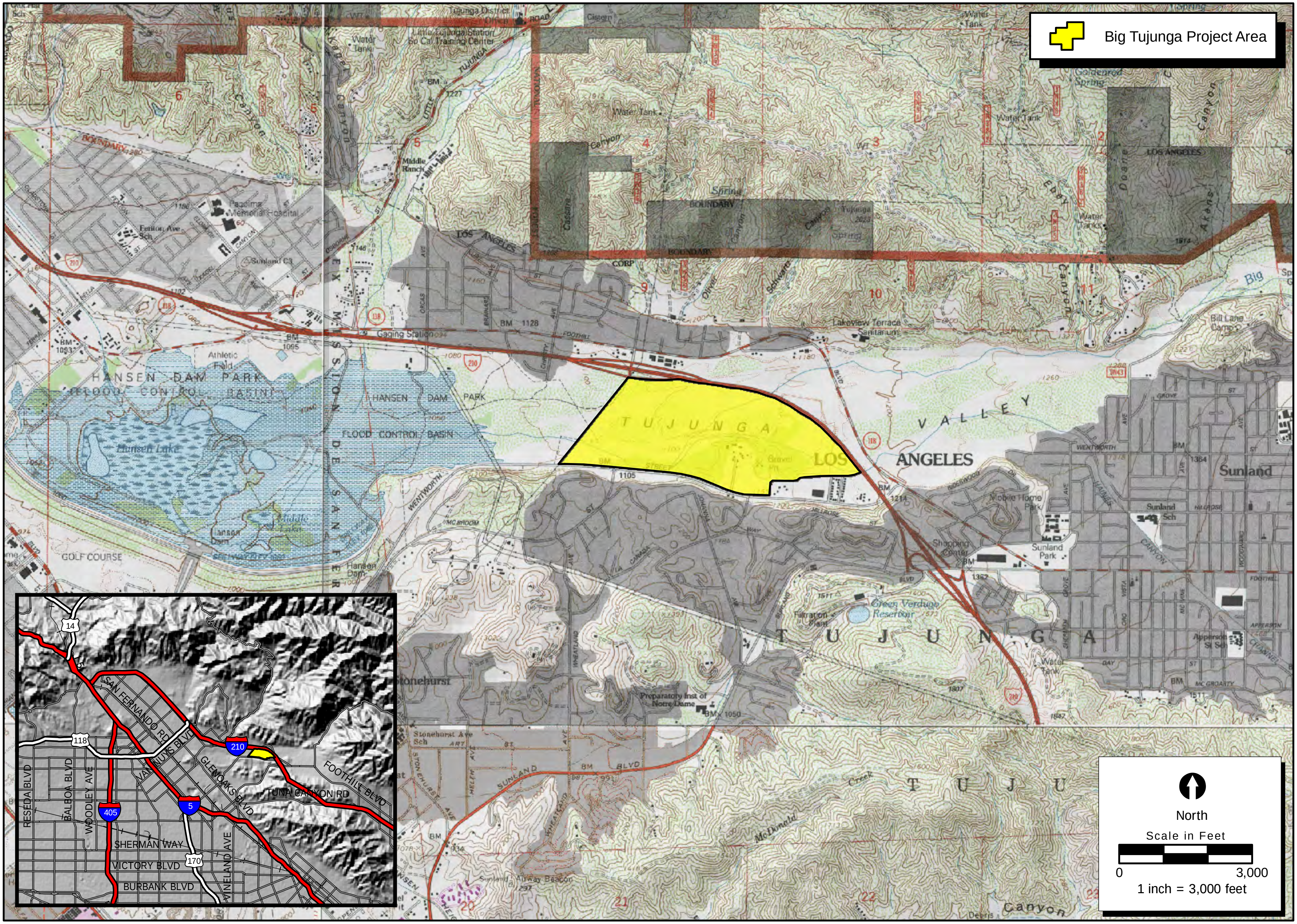
On July 31, 2007, ECORP fisheries biologists Todd Chapman, Manna Warburton, and Brian Zitt conducted an initial survey of the Big Tujunga Wash Mitigation Area to determine the methods that would result in the largest decrease in the exotic aquatic wildlife populations. The data presented in this report summarizes the results of the first year of removal efforts, which included five exotic removal efforts conducted between July 2007 and July 2008 at the Big Tujunga Mitigation Area.

## 1.1 LOCATION AND SETTING

The Big Tujunga Wash Mitigation Area is located in Big Tujunga Wash, just downstream of the Interstate 210 (I-210) Freeway overcrossing, in the Sunland area near the City of Los Angeles within the San Fernando Valley, Los Angeles County, California (Figure 1-1). The site is bordered on the north and east by I-210 and on the south by Wentworth Street. The western boundary of the site is contiguous with high power lines crossing the Big Tujunga Wash just upstream of Hansen Dam Park and Recreation area. 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, state, and federal significance. The Big Tujunga Ponds and surrounding habitat were originally created as part of the mitigation measures initiated during the construction of the I-210 Freeway.

The Big Tujunga Wash 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 local rainfall amounts and water releases from the Dam. Haines Canyon Creek, located on the south side of the site, is a relatively narrow, densely vegetated perennial stream with flow originating from the Tujunga Ponds. Haines Canyon Creek consists of a silt gravel bottom with scattered cobble and boulders and average water depths of less than 0.5 meter. Historically, Haines Canyon Creek between Big Tujunga Dam and Hansen Dam was one of the few remaining drainages in southern California known to support populations of three native fishes that are considered sensitive by the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). These species include the Santa Ana sucker (*Catostomus santaanae*), which is a federal threatened species, and the arroyo chub (*Gila orcutti*) and Santa Ana speckled dace (*Rhinichthys osculus* spp.3), which are both considered California species of concern. All southern California coastal freshwater fish species have been heavily impacted by habitat alteration and dewatering and thus are greatly reduced in their distribution and abundances (Moyle 2002; Swift et al. 1993). At present, suitable habitat on the project site for sensitive native fishes is largely confined to portions of Haines Canyon Creek downstream of the Tujunga Ponds.

The Tujunga Ponds, which are located in the northeast corner of the mitigation area, consist of two fairly large ponds (greater than 50 meters across), which are referred to as the East and West Ponds and are connected by a small channel. The East Pond is fed by an underground freshwater source located along the eastern bank and the water then flows into the West Pond and eventually into Haines Canyon Creek. Both ponds are densely vegetated along the banks with freshwater marsh and riparian woodland plant species. The substrate of both ponds consists of fine sediment with water depths ranging from 6 to 12 feet. The East Pond is more complex than the West Pond in that it has many coves and inlets. The West Pond is more oblong in shape with a relatively uniform and less convoluted bank. These ponds serve as bird habitat for both local and migratory species and they provide habitat for native reptiles, including the southwestern pond turtle and the two-striped garter snake. Historically, perennial deep-water lake/pond habitats were uncommon in southern California and this habitat is not typically suitable for most native southern California fish species. However, this habitat type is typical of that occupied by exotic aquatic species and it will mostly foster source populations of exotic aquatic species (Moyle 2002).

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Map Date: 10/15/2008

**Figure 1-1. Project Location Map**

*2007-110 Big Tujunga Mitigation Bank*

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## 2.0 METHODOLOGY

A wide range of sampling techniques were utilized during the exotic aquatic wildlife removal efforts, some of which proved to be more effective than others. Techniques that were tried and were determined to be relatively ineffective were either modified or eventually eliminated as a viable sampling method. Changing site conditions in the Big Tujunga Ponds required a dynamic sampling approach that could be adapted based on the specific conditions during each sampling session. Over the course of the first year of sampling, nine methods were used to capture and remove aquatic species, including: fyke netting, backpack electrofishing, snorkel surveys, spearfishing, bullfrog removal, seining, turtle trapping, crayfish/minnow trapping, rod and reel sampling. Sampling locations within the project site are shown on Figure 2-1.

At the start of each removal effort, potential sampling methods were evaluated based on information collected during the previous sampling efforts, while considering current site conditions (access points, water visibility, and presence of submerged aquatic vegetation). In 2007, exotic aquatic wildlife removal efforts at the Tujunga Ponds and Haines Canyon Creek were conducted on July 31 to August 2, August 27 to 30, and October 9 and 10. In 2008, the sampling took place on May 14 to 16 and July 28 and 29. The results from each sampling effort were summarized in the Exotic Wildlife Removal Memos which were submitted following each of the surveys. Locations where each of the sampling methods was utilized within the Big Tujunga Ponds and the upper portions of Haines Canyon Creek are shown on Figure 2-2.

Fyke nets were set out in the Tujunga Ponds, specifically in areas that were inaccessible to the public, in an attempt to reduce the potential for vandalism or theft of the sampling equipment. Fyke nets were checked on a daily basis and were utilized during four of the 2008 sampling efforts. Fyke nets were primarily deployed in the West Pond and in the small channel connecting the East and West Ponds. The backpack electrofisher was used along the perimeter of each pond in areas containing shallow water. In addition, several deep pocket pools along Haines Canyon Creek were also targeted with the electrofisher. In some instances, fyke nets were used in conjunction with the backpack electrofisher. In this case, the electrofishing crew worked systematically towards the opening of the fyke net and fish were herded towards the net where they would become trapped inside.

Daytime snorkel surveys were conducted in order to identify underwater habitat features within each pond and to determine which areas are being utilized by exotic aquatic species. During the snorkel surveys, all Centrarchid (Sunfish Family) nests and bullfrog egg masses that were observed were disturbed or removed from the ponds. In addition, any exotic turtles that could be captured were also removed from the ponds. Banded spear guns and Hawaiian slings equipped with barbed, 5-prong, trident tips were used during day and night surveys to capture large adult fishes. Since most fish are inactive at night they are less elusive and thus easier to capture. Night snorkel surveys involving spearfishing proved to be an effective tool for removing larger adult fishes. Bullfrog removal was also conducted in conjunction with nighttime spearfishing efforts. Bullfrog removal was primarily done at night by patrolling the perimeters of the ponds in an inflatable boat or on foot in the upper portions of Haines Canyon Creek.

Seining was accomplished with the use of a 100 foot beach seine deployed from an inflatable Zodiak boat. Seine hauls were pulled by hand in both the East and West Ponds. Locations where the beach seines were deployed were limited by bank accessibility and underwater

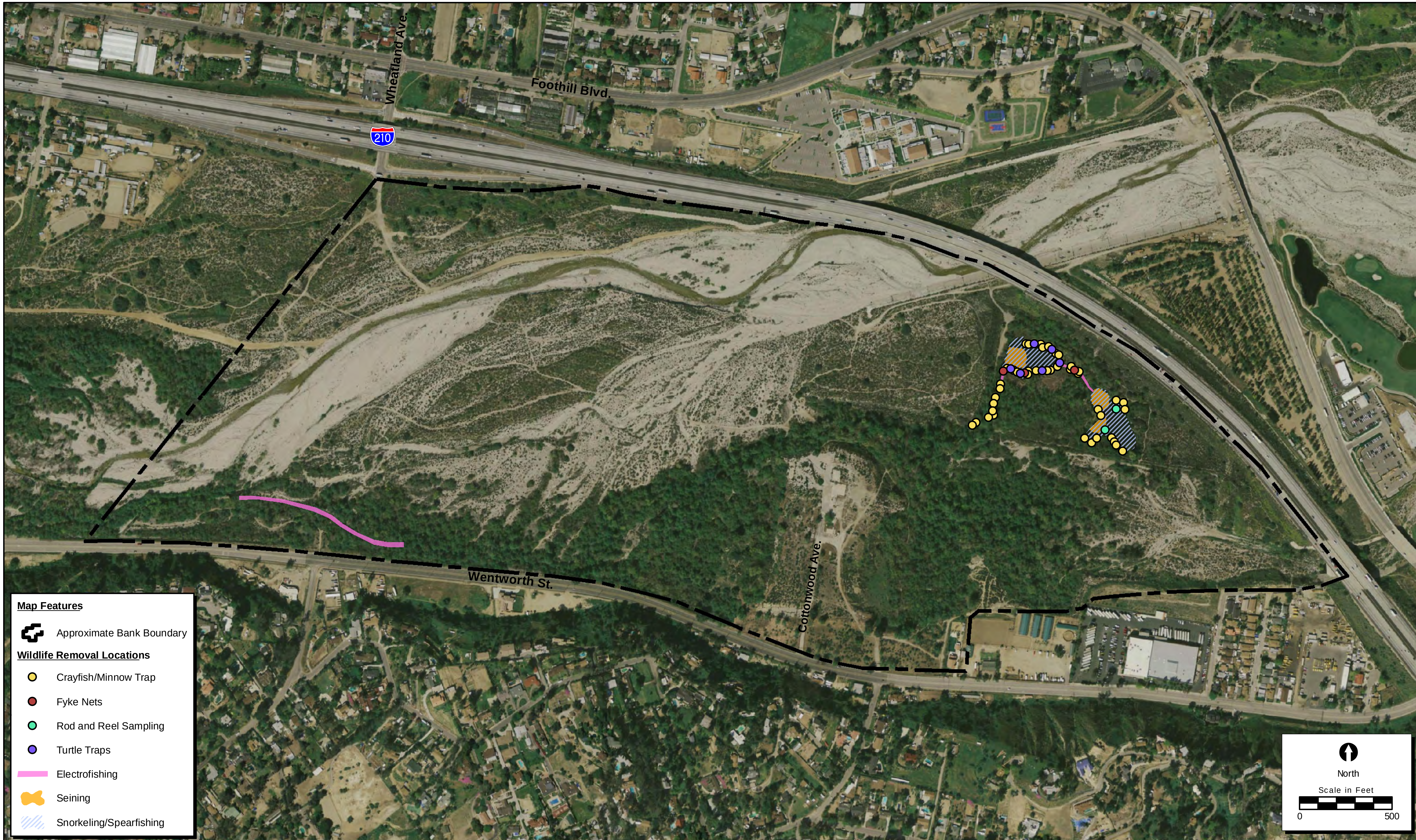


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**Figure 2-1. Exotic Wildlife Removal Locations**

*2007-110 Big Tujunga Mitigation Bank*

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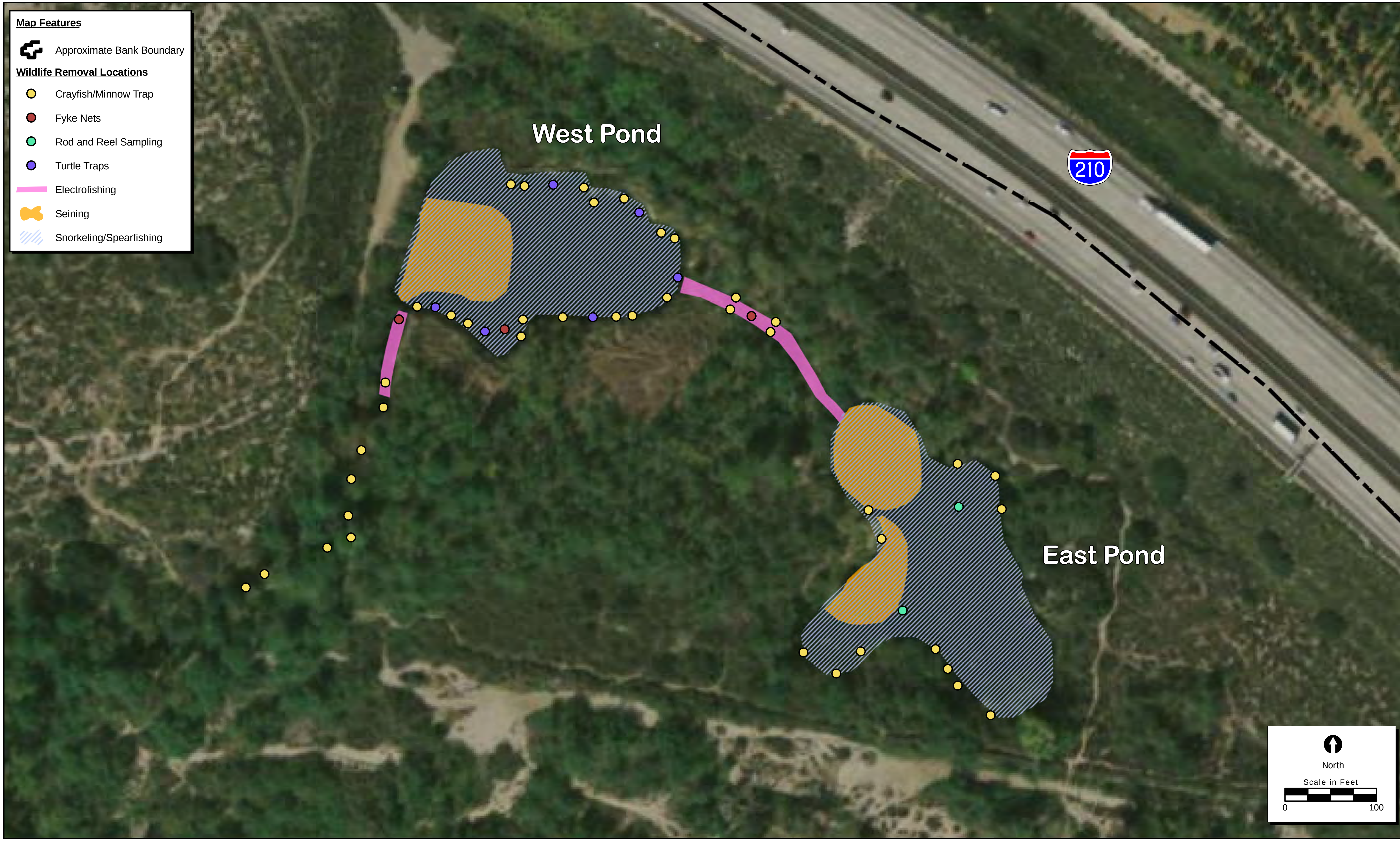


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**Figure 2-2. Sampling Methods Utilized in the Big Tujunga Ponds and the Upper Portions of Haines Canyon Creek**

*2007-110 Big Tujunga Mitigation Bank*

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topography. Turtle traps were baited with small cans of sardines and set in the most suitable habitat along the perimeter of the West Pond. Crayfish/minnow traps were baited with "seafood select" cat food and set around the perimeter of both ponds and within the upper portions of Haines Canyon Creek. All of the traps were checked on a daily basis after a minimum 12 hour period in the water. Rod and reel sampling was conducted in both ponds from an inflatable boat. A variety of lures, spinnerbaits, and worms were used in order to target individual fish or aggregations of fishes that are difficult to capture using other sampling methods. All of the animals captured were identified to species, the lengths were measured, and their general conditions (health) were noted (i.e., parasites, lesions, fin erosion). Native species were photographed and then returned unharmed to the original point of capture. All non-natives were removed from the site.

# 3.0 RESULTS

The five exotic aquatic species removal efforts resulted in the capture and removal of 842 largemouth bass, 160 bluegill (*Lepomis macrochirus*), 60 green sunfish (*Lepomis cyanellus*), 1 black bullhead (*Ameiurus melas*), 2 goldfish (*Carassius auratus*), 921 mosquitofish (*Gambusia affinis*), 6 red-eared sliders (*Trachemys scripta elegans*), 229 American bullfrogs (8 adults and 221 tadpoles), and 436 red swamp crayfish. Results of the removal efforts are summarized according to sampling session in Table 3-1. A complete listing of all exotic aquatic vertebrates and invertebrates captured is included in Appendix A. Appendix B contains photographs of some of the exotic wildlife species captured during the 2007-2008 sampling efforts. The results of the 2007-2008 exotic aquatic species removal efforts are presented for each sampling location below. Appendix C contains scanned copies of the original data sheets.

## 3.1 WEST POND

Exotic aquatic species were captured primarily with the use of five sampling techniques (fyke nets, minnow/crayfish traps, electrofishing, seining, and spearfishing/bullfrog removal) in the West Pond (Table 3-2). Fyke nets were utilized in sampling sessions 1 through 5, resulting in the capture of 241 largemouth bass, 6 green sunfish, 16 bluegill, 1 black bullhead, 37 mosquitofish, 9 American bullfrogs (2 adults and 7 tadpoles), 45 red swamp crayfish, and 1 southwestern pond turtle (*Actinemys marmorata pallida*). The West Pond numbers include animals collected with the fyke net in the channel connecting the East and West Ponds. Minnow/crayfish traps were utilized in sampling sessions 1, 2, and 4, resulting in the capture of 7 largemouth bass, 1 bluegill, 8 American bullfrog tadpoles, 39 red swamp crayfish, and 1 two-striped garter snake (*Thamnophis hammondii*). Backpack electrofishing was utilized in sampling sessions 1 through 4, resulting in the capture of 120 largemouth bass, 6 green sunfish, 19 bluegill, 484 mosquitofish, 69 American bullfrog tadpoles, and 46 red swamp crayfish. Seine hauls were pulled during sampling sessions 1, 2, and 4, resulting in the capture of 176 largemouth bass, 33 green sunfish, 96 bluegill, 317 mosquitofish, 27 American bullfrog tadpoles, and 42 red swamp crayfish. Spearfishing and bullfrog removing techniques captured an additional 135 largemouth bass, 10 green sunfish, 19 bluegill, 1 goldfish, 18 American bullfrog (5 adults and 13 tadpoles), and 2 red swamp crayfish.

Table 3-1 - Exotic Aquatic Species Removal Summary, 2007-2008

| | | Exotic Species | | | | | | | | | | Native Species | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Location | Sampling Dates | Red swamp crayfish | Black bullhead | Mosquitofish | Goldfish | Bluegill | Green sunfish | Largemouth bass | Bullfrog tadpole | Bullfrog adult | Red-eared slider | Santa Ana sucker | Two-striped garter snake | Southwestern pond turtle |
| WEST POND* | | | | | | | | | | | | | | |
| Sampling Session #1 | July 31- August 2, 2007 | 50 | | 267 | 1 | 68 | 37 | 324 | 65 | 2 | | | | |
| Sampling Session #2 | August 27-30, 2007 | 38 | | 557 | | 49 | 5 | 114 | 36 | | | | | |
| Sampling Session #3 | October 9-10, 2007 | 16 | 1 | 14 | | 10 | 7 | 66 | 4 | | | | | 1 |
| Sampling Session #4 | May 14-16, 2008 | 68 | | | | 13 | 4 | 85 | 10 | 5 | | | 1 | |
| Sampling Session #5 | July 28-29, 2008 | 2 | | | 1 | 11 | 2 | 90 | 9 | | | | | |
| **West Pond includes the small channel connecting the two ponds* | | | | | | | | | | | | | | |
| | Subtotal | 174 | 1 | 838 | 2 | 151 | 55 | 679 | 124 | 7 | | | 1 | 1 |
| EAST POND | | | | | | | | | | | | | | |
| Sampling Session #1 | July 31- August 2, 2007 | 8 | | | | | | | | | | | | |
| Sampling Session #2 | August 27-30, 2007 | 90 | | 75 | | 1 | 2 | 44 | 42 | | | | | |
| Sampling Session #3 | October 9-10, 2007 | 7 | | | | 1 | 2 | 16 | 6 | | | | | |
| Sampling Session #4 | May 14-16, 2008 | | | | | 7 | 1 | 53 | 33 | 1 | 4 | | | |
| Sampling Session #5 | July 28-29, 2008 | | | | | | | 42 | 16 | | 2 | | | 1 |
| | Subtotal | 105 | | 75 | | 9 | 5 | 155 | 97 | 1 | 6 | | | 1 |
| HAINES CANYON CREEK | | | | | | | | | | | | | | |
| Sampling Session #1 | July 31- August 2, 2007 | 8 | | 3 | | | | | | | | 2 | | |
| Sampling Session #3 | October 9-10, 2007 | 122 | | 5 | | | 1 | 8 | | | | 6 | | |
| Sampling Session #4 | May 14-16, 2008 | 27 | | | | | | | | | | | | |
| | Subtotal | 157 | | 8 | | | 1 | 8 | | | | 8 | | |
| | | | | | | | | | | | | | | |
| | GRAND TOTAL | 436 | 1 | 921 | 2 | 160 | 60 | 842 | 221 | 8 | 6 | 8 | 1 | 2 |

Table 3-2 - Species Captured in the West Pond by Sampling Method, 2007-2008

| | | Exotic Species | | | | | | | | | Native Species | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method | Date | Red swamp crayfish | Black bullhead | Mosquitofish | Goldfish | Bluegill | Green sunfish | Largemouth bass | Bullfrog tadpole | Bullfrog adult | Two-striped garter snake | Southwestern pond turtle |
| <u>Fyke Net</u> | | | | | | | | | | | | |
| | August 1, 2007 | 15 | | | 1 | 5 | 3 | 68 | 2 | 2 | | |
| | August 2, 2007 | 1 | | | | | 1 | 29 | 3 | | | |
| | August 28, 2007 | 3 | | 12 | | 1 | | 92 | | | | |
| | August 29, 2007 | | | 17 | | 1 | | | | | | |
| | October 10, 2007 | 7 | 1 | | | 4 | 1 | 29 | | | | 1 |
| | May 15, 2008 | 17 | | 8 | | 5 | 1 | 21 | 2 | | | |
| | July 29, 2008 | 2 | | | | | | 2 | | | | |
| | Subtotal | 45 | 1 | 37 | 1 | 16 | 6 | 241 | 7 | 2 | | 1 |
| <u>Minnow Trap</u> | | | | | | | | | | | | |
| | August 1, 2007 | 3 | | | | | | | 8 | | | |
| | August 28, 2007 | 11 | | | | | | 3 | | | | |
| | August 29, 2007 | 6 | | | | | | 3 | | | | |
| | August 30, 2007 | 11 | | | | | | 1 | | | | |
| | May 15, 2008 | 8 | | | | 1 | | | | | 1 | |
| | Subtotal | 39 | | | | 1 | | 7 | 8 | | 1 | |
| <u>Electrofishing</u> | | | | | | | | | | | | |
| | August 1, 2007 | 31 | | 223 | | | | 73 | 40 | | | |
| | August 29, 2007 | 7 | | 255 | | 19 | 5 | 13 | 29 | | | |
| | October 9, 2007 | 7 | | 6 | | | 1 | 13 | | | | |
| | May 15, 2008 | 1 | | | | | | 21 | | | | |
| | Subtotal | 46 | | 484 | | 19 | 6 | 120 | 69 | | | |
| <u>Seining</u> | | | | | | | | | | | | |
| | August 2, 2007 | | | 32 | | 63 | 33 | 154 | 12 | | | |
| | August 28, 2007 | | | 285 | | 28 | | 2 | 7 | | | |
| | May 15, 2008 | 42 | | | | 5 | | 20 | 8 | | | |
| | Subtotal | 42 | | 317 | | 96 | 33 | 176 | 27 | | | |
| <u>Spearfishing</u> | | | | | | | | | | | | |
| | October 10, 2007 | 2 | | | | 6 | 5 | 24 | 4 | | | |
| | May 16, 2008 | | | | | 2 | 3 | 23 | | 5 | | |
| | July 28, 2008 | | | | | | | 64 | 9 | | | |
| | July 29, 2008 | | | | 1 | 11 | 2 | 24 | | | | |
| | Subtotal | 2 | | | 1 | 19 | 10 | 135 | 13 | 5 | | |
| | GRAND TOTAL | 174 | 1 | 838 | 2 | 151 | 55 | 679 | 124 | 7 | 1 | 1 |

### 3.2 EAST POND

Exotic species were removed using four sampling techniques (minnow/crayfish traps, rod and reel, and seining, spearfishing) in the East Pond (Table 3-3). Minnow/crayfish trapping was utilized in sampling session #1, resulting in the capture of 8 red swamp crayfish. Rod and reel sampling was also utilized in sampling session #1, resulting in the capture of 12 largemouth bass and 2 green sunfish. Seine hauls were conducted during sampling sessions 2 and 4, resulting in the capture of 37 largemouth bass, 1 green sunfish, 1 bluegill, 75 mosquitofish, 42 American bullfrog tadpoles, and 90 red swamp crayfish. The spearfishing and bullfrog removal techniques resulted in the capture of 106 largemouth bass, 2 green sunfish, 8 bluegill, 6 red-eared slider, 56 American bullfrogs (1 adult and 54 tadpoles), 7 red swamp crayfish, and 1 southwestern pond turtle.

Table 3-3 - Species Captured in the East Pond by Sampling Method, 2007-2008

| | | Exotic Species | | | | | | | | Native Species |
|---|---|---|---|---|---|---|---|---|---|---|
| Method | Date | Red swamp crayfish | Mosquitofish | Bluegill | Green sunfish | Largemouth bass | Bullfrog tadpole | Bullfrog adult | Red-eared slider | Southwestern pond turtle |
| Minnow Trap | | | | | | | | | | |
| | August 1, 2007 | 8 | | | | | | | | |
| | Subtotal | 8 | | | | | | | | |
| Seining | | | | | | | | | | |
| | August 27, 2007 | 90 | 75 | 1 | | 32 | 42 | | | |
| | May 15, 2008 | | | | 1 | 5 | | | | |
| | Subtotal | 90 | 75 | 1 | 1 | 37 | 42 | | | |
| Spearfishing | | | | | | | | | | |
| | October 9, 2007 | 7 | | 1 | 2 | 16 | 6 | | | |
| | May 16, 2008 | | | 7 | | 48 | 33 | 1 | 4 | |
| | July 28, 2008 | | | | | 42 | 16 | | 2 | 1 |
| | Subtotal | 7 | | 8 | 2 | 106 | 55 | 1 | 6 | 1 |
| Rod and Reel | | | | | | | | | | |
| | August 27, 2007 | | | | 2 | 12 | | | | |
| | Subtotal | | | | 2 | 12 | | | | |
| | GRAND TOTAL | 105 | 75 | 9 | 5 | 155 | 97 | 1 | 6 | 1 |

### 3.3 HAINES CANYON CREEK

Two removal techniques (minnow/crayfish traps and backpack electrofishing) were utilized in Haines Canyon Creek (Table 3-4). Minnow/crayfish trapping was mainly utilized in the upper portions of the Creek, near the outlet of the West Pond. Minnow/crayfish traps were set during sampling sessions 1 through 4, resulting in the capture of 2 Santa Ana sucker, 8 mosquitofish, and 66 red swamp crayfish. Electrofishing was used in sampling session #2 to target species living in deep pool habitats located along portions of the Creek (Figure 2-1). Electrofishing efforts resulted in the capture of 8 largemouth bass, 6 Santa Ana sucker, 1 green sunfish, and 91 red swamp crayfish.

Table 3-4 - Species Captured in Haines Canyon Creek by Sampling Method, 2007-2008

| | | Exotic Species | | | | Native Species |
|---|---|---|---|---|---|---|
| Method | Date | Red swamp crayfish | Mosquitofish | Green sunfish | Largemouth bass | Santa Ana sucker |
| Electrofishing | | | | | | |
| | October 10, 2007 | 91 | | 1 | 8 | 6 |
| | Subtotal | 91 | | 1 | 8 | 6 |
| Minnow traps | | | | | | |
| | August 1, 2007 | 8 | 3 | | | 2 |
| | October 10, 2007 | 31 | 5 | | | |
| | May 14, 2008 | 27 | | | | |
| | Subtotal | 66 | 8 | | | 2 |
| | GRAND TOTAL | 157 | 8 | 1 | 8 | 8 |

## 4.0 DISCUSSION

The sampling efforts deployed during 2007-2008 and the success of these efforts varied depending on the time of year, the number of field personnel, and the overall site conditions. One of the most effective methods for removing exotic aquatic species from Haines Canyon Creek is backpack electrofishing. Currently, there are populations of native species Santa Ana sucker, Santa Ana speckled dace, and arroyo chub in Haines Canyon Creek. As a condition under Todd Chapman and Manna Warburton's Federal Fish and Wildlife 10(a)(1)(A) permits (TE-110094-1 and TE-106908-0, respectively), sampling must be conducted in a manner that avoids all impacts during their spawning season and to the young-of-the-year (YOY) of Santa Ana sucker. The condition 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 sampling efforts in the Creek to mainly minnow/crayfish trapping. Because the majority of non-native aquatic species exist within the Tujunga Ponds and known populations of special status species exist within Haines Canyon Creek, the majority of removal efforts were focused in the Tujunga Ponds with only supplemental work occurring in Haines Canyon Creek.

Currently, non-native fishes use the Tujunga Ponds as a breeding ground and they are able to migrate freely into Haines Canyon Creek where they take up residence in deeper pool habitats and in the undercut banks. These species pose a direct threat to the native fishes of the creek. One of the primary sources of non-native fish and turtles on the Big Tujunga site is related to people releasing either unwanted aquatic pets or live bait into the ponds and the creek. These exotic species pose a threat to the native fish through predation and competition for food and shelter. Exotic aquatic species by and large are most abundant in habitats modified by human activity, where as native fishes typically persist in undisturbed areas (Moyle 2002).

## 4.1 NATIVE SPECIES CAPTURES

The majority of the exotic species observed and collected were from the Tujunga Ponds and not Haines Canyon Creek. The native species captured during the exotic species removal efforts included 8 Santa Ana suckers, 1 two-striped garter snake, and 2 southwestern pond turtles. The captures of these species were recorded and then they were released back into the areas where they were captured. Only native fish species were captured in Haines Canyon Creek. The creek is expected to support the two-striped garter snake and the southwestern pond turtle but they were only captured in the Tujunga Ponds.

## 4.2 EFFECTIVENESS OF VARIOUS SAMPLING METHODS

### 4.2.1 Seining

Visibility in the ponds varied with each sampling event as a result of the presence or absence of submerged aquatic vegetation. The submerged aquatic vegetation in the ponds appears to have a high amount of seasonal variation (See photos A through D on Figure 4-1). During the spring and summer months, as more sunlight becomes available and water temperatures rise, there is an increase in the abundance of submerged aquatic vegetation. Our sampling sessions were timed to take advantage of the seasonal variation in submerged aquatic vegetation. Seining during the early spring through late summer was very effective in trapping large numbers of exotic juvenile fishes that would become entrapped in the filamentous algae, inhibiting their escape from the net. Snorkeling surveys and spearfishing efforts would normally be ineffective in these dense algal mats, but the seining efforts cleared openings in the aquatic vegetation and allowed snorkeling surveys and spearfishing efforts to be conducted in some areas. In both ponds, seining locations were limited to areas with suitable bank accessibility.

Photo A: West Pond in mid-spring without submerged aquatic vegetation.

Photo B: West Pond in mid-summer with scattered submerged aquatic vegetation.

**Figure 4-1 - Photos Showing Seasonal Pond Conditions**

Photo C: West Pond in late summer without submerged aquatic vegetation.

Photo D: West Pond in mid-fall with submerged aquatic vegetation.

**Figure 4-1 (Cont.) - Photos Showing Seasonal Pond Conditions**

### 4.2.2 Snorkeling / Spearfishing Surveys

The best visibility for the snorkeling and spearfishing surveys occurs in the late fall and early spring. Both ponds were surveyed by snorkeling to identify the areas in each pond that would yield the highest numbers when sampling by spearfishing. Spearfishing surveys proved to have the greatest impact on removing large fishes. The majority of the large fish that were captured were adult largemouth bass. In conjunction with the spearfishing surveys, night bullfrog removal was conducted by patrolling the upper portions of Haines Canyon Creek on foot and the banks of each pond by boat. These surveys were most effective in the late spring through the summer months when the evening temperatures were warmer and bullfrogs were generally more active. Little to no bullfrog activity was observed outside of the spring and summer months.

The snorkeling surveys also provided the biologists with the opportunity to target the removal of Centrarchid fish nests, bullfrog egg masses and tadpoles, red swamp crayfish, and red-eared sliders. All six of the red-eared sliders collected during the 2008 sampling efforts were taken as a result of snorkeling survey efforts. Turtle traps were deployed only in the West Pond but they were ineffective in capturing any turtles. Some possible reasons for the failure of the traps may have been related to the number of days the traps were in place, the bait, or the locations where the traps were placed.

### 4.2.3 Minnow / Crayfish Traps

Minnow/crayfish traps appeared to yield relatively low numbers of animals in the Tujunga Ponds, while the traps produced higher numbers of animals in the upper portions of Haines Canyon Creek. Some possible factors affecting the low success of these traps in the ponds may be attributed to the large size of the ponds versus the total number of traps deployed, the depth of the ponds, the distribution and amount of vegetation on the banks, and the placement of the traps. In contrast, the shallow water habitat, backwater areas, and deep pool habitats in Haines Canyon Creek are ideal areas for placing minnow/crayfish trapping efforts.

### 4.2.4 Fyke Nets

During the initial survey periods, fyke nets were deployed in shallow areas around the exterior of the West Pond and in the small channel connecting the ponds. In the subsequent sampling sessions, only one fyke net was deployed within the channel connecting the two ponds. The fyke net was placed at this location because the capture rate of exotic species was much higher at this location than any other area in the ponds using this method. The primary reason for only deploying one fyke net during the latter sessions was to avoid vandalism of the net. The channel between the ponds is frequented by recreational users and due to the high visibility of the fyke net, the likelihood for vandalism was high.

### 4.2.5 Backpack Electrofishing

Backpack electrofishing during the October 2007 sampling session resulted in the capture and removal of 16 largemouth bass from Haines Canyon Creek. While processing these animals, one of the bass began to regurgitate a Santa Ana sucker, the federally-threatened fish species for which the exotic aquatic wildlife removal program is designed to protect. This is among the first ever documented cases of predation upon the Santa Ana sucker by largemouth bass. Photo A in Figure 4-2 shows the largemouth bass with the Santa Ana sucker in its mouth and Photo B shows the relative sizes of the two fish.


Photo A: A largemouth bass regurgitating a Santa Ana sucker.

Photo B: Largemouth bass (left) and Santa Ana Sucker (right).

**Figure 4-2 - Largemouth Bass and Santa Ana Sucker**

## 4.3 PROBLEMS ENCOUNTERED DURING SAMPLING

During each sampling event, care was taken regarding the presence of people in and around the Big Tujunga Ponds and Haines Canyon Creek. Trapping and sampling locations were generally chosen based upon the ability to conceal the traps and nets. The traps/nets were situated out of reach of the public at each sampling location. Due to the possibility of vandalism to the equipment, the sampling locations used during the surveys were not always the optimal locations for capturing exotic species. Fortunately, none of the sampling equipment was tampered with or removed during the 2007-2008 sampling season. On several occasions, ECORP field staff encountered “locals” using the site for camping, fishing, cooking, and drinking alcoholic beverages. For the most part, these encounters were friendly and non-confrontational. However, on one occasion, one of the ECORP biologists was bitten by an un-leashed pitbull. While processing the fish captured after a backpack electrofishing effort, the crew encountered two apparently homeless men with an unleashed pitbull. Both of the men had been drinking and were questioning the sampling crew about “why they were there” and “where they had come from.” The ECORP crew politely explained the purpose and reason for the visit. One of the men began getting loud and confrontational so the crew knew it was time to leave the area with caution. The sampling crew began packing up their equipment and preparing to depart the area. One of the crew members, after turning his back to the pitbull, was bitten on the back of his lower leg. Realizing what the dog had done, the owner of the dog called his dog back and demanded we leave the area. The crew departed the area and later assessed the dog bite. Luckily, the bite did not break the skin but the biologist’s leg was bruised. The incident was reported to the police and no further incidents with unleashed dogs occurred during the 2007-2008 sampling season.

On several occasions, the biologists noticed that tree trimming and clearing was evident around the ponds and Haines Canyon Creek. This damage was attributed to recreational users.

In 2008, the construction project associated with the Foothill Avenue bridge over Big Tujunga Wash was underway and the gate that was normally locked was left open so unauthorized vehicles were able to gain access to the site. During this period, fishing platforms were observed in both the East and West Ponds in conjunction with a widening and clearing of the dirt trail adjacent to the I-210 Freeway. After looking more closely, the fishing platforms were determined to have been constructed from several pieces of plywood and 2x4’s which were taken from the bridge construction staging area. Additionally, recreational users constructed dams at several locations in Haines Canyon Creek. These dams were built with boulders, tree limbs and branches, and rocks. The presence of these dams in the creek caused ponds to form behind the dams, thus temporarily converting several stretches of creek from riffle and run habitat to pond habitat. These ponded areas are more favorable to establishment of the exotic species and they also adversely impact the native fish species within the creek.

# 5.0 CONCLUSIONS AND RECOMMENDATIONS

The current exotic species control program is effectively removing exotic aquatic predators that have the greatest impact on native species at the site. These species include the largemouth bass and adult bullfrogs. However, due to the complexities of the habitat in the ponds, total eradication of exotic species will likely not be possible. In order to maintain reduced levels of exotic species, current control activities will have to be continued.

The keys to enhancing and maintaining a successful exotic species removal program are to: 1) provide continuous monitoring efforts to keep exotic species in check and 2) maintain a dynamic sampling approach in regards to changing methods and locations as the site conditions change due to seasonal variation. In the early spring through the summer months, surveys to disrupt Centrarchid nests and to remove bullfrog egg masses appear to be one of the most effective ways to limit new recruitment of these two species. Night-time bullfrog removal around the perimeter of the ponds and in areas of Haines Canyon Creek is best accomplished in the early spring through the summer when adult bullfrogs are most active.

Increased efforts should be targeted at removing red swamp crayfish and largemouth bass from the creek in the late winter and early spring to minimize the impact on young native fishes that will be most vulnerable after a spawn. Largemouth bass typically become inactive in the winter with decreasing daylight availability and decreasing water temperatures. These seasonal changes also cause a die off in the submerged aquatic vegetation, which increases the water visibility. Therefore, additional spearfishing efforts should be conducted in the ponds to target larger individuals during these periods. Increased red swamp crayfish trapping in the winter months should also be undertaken due to the decreased pressure of largemouth bass predation during this time. Since there are known populations of special status fishes in Haines Canyon Creek, additional efforts should be made to locate and survey large pools and undercut banks in areas where exotic aquatic species may occur.

Additionally, vegetation control efforts should be conducted in a shallow concrete channel on the California Department of Transportation (Caltrans) easement at the toe of the slope along the eastbound lanes of the I-210 freeway north of the West Pond. This drainage holds water throughout the year and the dense trees and shrubs provide shelter for exotic species. LACDPW should 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 drainage for exotic species.

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

## 6.0 REFERENCES


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# APPENDIX A

## Aquatic Species Collected during the Exotic Wildlife Removal Efforts

## APPENDIX A
## Aquatic Species Collected during the Exotic Wildlife Removal Efforts at the Big Tujunga Mitigation Bank, 2007-2008

| COMMON NAME | SCIENTIFIC NAME |
|---|---|
| **CRUSTACEANS** | **CRUSTACEA** |
| Crayfish and Shrimp | Decapoda |
| * red swamp crayfish | * *Procambarus clarkii* |
| **RAY-FINNED FISHES** | **ACTINOPTERYGII** |
| * black bullhead | * *Ameiurus melas* |
| * mosquitofish | * *Gambusia affinis* |
| * goldfish | * *Carassius auratus* |
| Santa Ana sucker | *Catostomus santaanae* |
| * bluegill | * *Lepomis macrochirus* |
| * green sunfish | * *Lepomis cyanellus* |
| * largemouth bass | * *Micropterus salmoides* |
| **AMPHIBIANS** | **AMPHIBIA** |
| **True Frogs** | **Ranidae** |
| * American bullfrog | * *Rana catesbeiana* |
| **REPTILES** | **REPTILIA** |
| **Box and Water Turtles** | **Emydidae** |
| southwestern pond turtle | *Clemmys marmorata* |
| * red-eared slider | * *Trachemys scripta* |
| **Colubrids** | **Colubridae** |
| two-striped garter snake | *Thamnophis hammondii* |
| **** indicates exotic species*** | |

# APPENDIX B

## Exotic Species Photos

## Appendix B - Exotic Species Photos

Photo A: Bluegill captured in the West Pond using a fyke net.

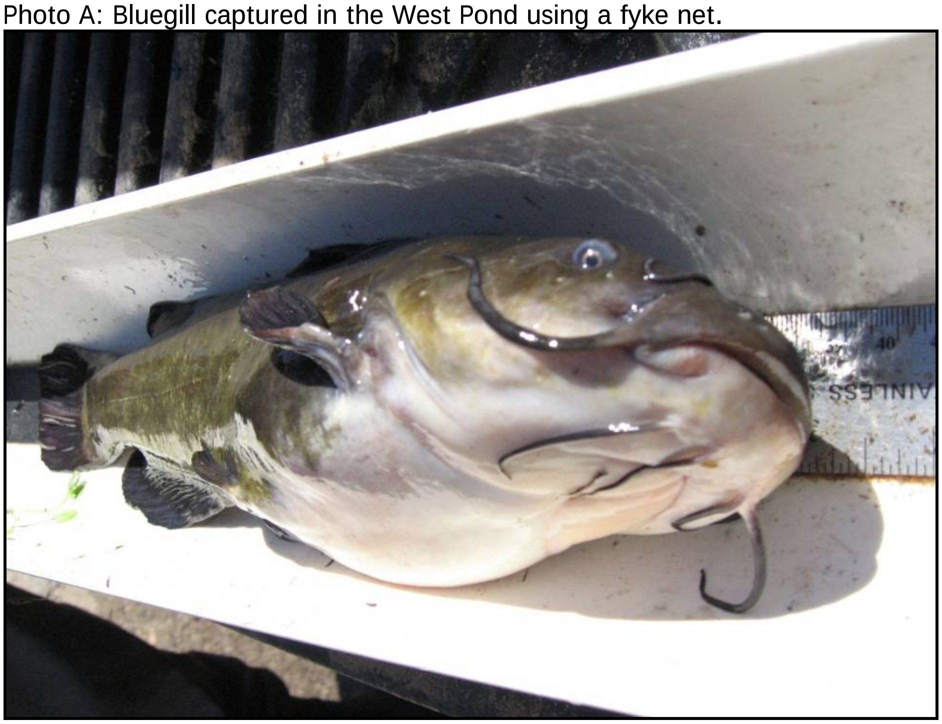

Photo B: Black bullhead captured in the West Pond using a fyke net.

Photo C: Green sunfish captured with a beach seine in the West Pond.

Photo D: Two adult largemouth bass captured by pole spear in the West Pond.

Photo E: Red-eared slider collected during snorkel surveys in the East Pond.

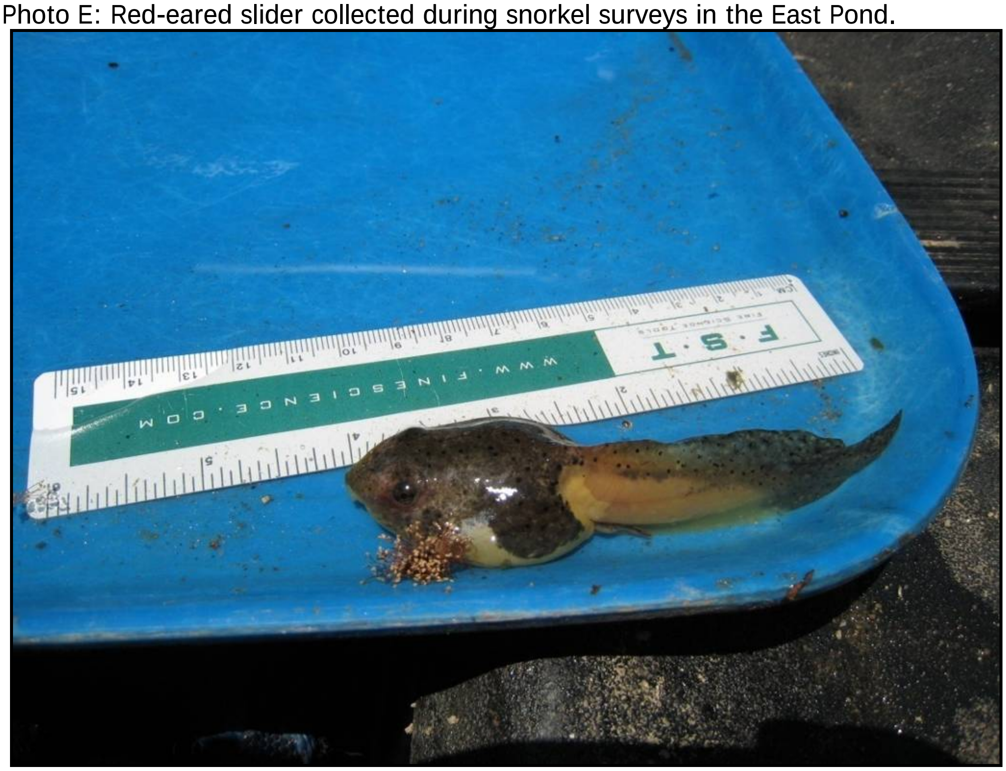


Photo F: Second year bullfrog tadpole captured in the West Pond with backpack electrofishing.

# APPENDIX C

## Data Sheets

2007-110-D-D1 Big Tujunga Exotic Removal Effort

Speacfishing Efforts

Gregorio Benevides, Brian Zitt, Manna Warburton

July 28th, 2008

Daytime effort (1400-1800)

64
24
88

**West Pond**

Largemouth Bass (<9") Count: 21

Largemouth Bass (9"-12") Count: 9 31 ✓

Largemouth Bass (>12") Count: 1

Notes: Red-eared slider adult taken by hand in west pond. Observed many thousands of very small bullfrog and largemouth bass larvae.

**East Pond**

Largemouth Bass (<9") Count: 18 27 + 15 = 42

Largemouth Bass (9"-12") Count: 8

Largemouth Bass (>12") Count: 1

Notes: Heard single bullfrog adult calling but took none. Observed many thousands of very small bullfrog and largemouth bass larvae.

Night-time effort (2000-2400)

**West Pond**

Largemouth Bass (<9") Count: 26 33 ✓

Largemouth Bass (9"-12") Count: 3

Largemouth Bass (>12") Count: 4

July 29th, 2008

Daytime effort (1200-1600)

**West Pond**

| | | |
|---|---|---|
| Largemouth Bass (<9″) | Count: 10 | |
| Largemouth Bass (9″-12″) | Count: 5 | 15 ✓ |
| Largemouth Bass (>12″) | Count: 0 | |
| Bluegill (<9″) | Count: 3 | 4 |
| Bluegill (9″-12″) | Count: 1 | |
| Goldfish (9″-12″) | Count: 1 | |

Notes: Observed many thousands of very small bullfrog tadpoles.

**East Pond**

| | | |
|---|---|---|
| Largemouth Bass (<9″) | Count: 6 | 15 ✓ |
| Largemouth Bass (9″-12″) | Count: 8 | |
| Largemouth Bass (>12″) | Count: 1 | |

Notes: Observed a single large goldfish that escaped. Observed two dead young adult bullfrogs on the bottom of the pond. Observed many thousands of very small bullfrog tadpoles.

Night-time effort (2000-2400)

**West Pond**

| | | |
|---|---|---|
| Largemouth Bass (<9″) | Count: 5 | |
| Largemouth Bass (9″-12″) | Count: 2 | 9 ✓ |
| Largemouth Bass (>12″) | Count: 2 | |
| Bluegill (<9″) | Count: 7 | |
| Green Sunfish | Count: 2 | |

Night-time effort (2000-2400) Continued...

Night bullfrog effort, perimeter of east and west ponds, small side channel running along highway berm, and upper 100 meters of Haines Creek. No bullfrog taken, observed a single adult bullfrog in side channel by trail, but it escaped.

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## BEACH SEINE DATA SHEET

Recorder: BZ

Page ____ of ____

Project: 2007-110 BIG T  Date: 5-14-08  Field Crew: BZ, TC, MW, DSS

Drainage: WEST POND  Stream: ________  Reach: ________

Time Begin: 13 : 15  Time End: 16 : 00  Site Depth: ____  Site Length: ____  Site Width: ____  Stage: ____

*SURFACE*: Water Temp (°C): ____ pH: ____ EC: ____ Salinity: ____ D.O.: ____ (ppt) ____ (%) T.D.S.: ____

*BOTTOM*: Water Temp (°C): ____ pH: ____ EC: ____ Salinity: ____ D.O.: ____ (ppt) ____ (%) T.D.S.: ____

Quad Information:

Weather Conditions:
Sunny, Hot 84°F
0-2 mph

Notes: Key: V=voucher, M=mortality, P=parasite, G=gravid, F=female, M=male, J=juvenile

Hauls 1 & 2 took place on West end of WEST POND.

| | Haul # | Species Code | Length (mm) | Key | | Haul # | Species Code | Length (mm) | Key | | Haul # | Species Code | Length (mm) | Key | Haul # | Species Code | Additional # / Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 53 | 220 | GF | 21 | 1 | 53 | 135 | | 41 | | | | | | | |
| 2 | | | 190 | | 22 | | | 100 | | 42 | | | | | | | |
| 3 | | | 275 | | 23 | | 49 | 60 | | 43 | | | | | | | |
| 4 | | | 25 | | 24 | | | 70 | | 44 | | | | | | | |
| 5 | | | 25 | | 25 | | | 55 | | 45 | | | | | | | |
| 6 | | | 20 | | 26 | | | 60 | | 46 | | | | | | | |
| 7 | | | 25 | | 27 | | | 45 | | 47 | | | | | | | |
| 8 | | | / + 5 add | | 28 | | 53 | 130 | | 48 | | | | | | | |
| 9 | | | @ 20mm | | 29 | | | | | 49 | | | | | | | |
| 10 | | 200 | / + 42 | | 30 | | | | | 50 | | | | | | | |
| 11 | | 303 | / + 8 | | 31 | | | | | 51 | | | | | | | |
| 12 | | | | | 32 | | | | | 52 | | | | | | | |
| 13 | 1 | 53 | 330 | GF | 33 | | | | | 53 | | | | | | | |
| 14 | | | 180 | | 34 | | | | | 54 | | | | | | | |
| 15 | | | 175 | | 35 | | | | | 55 | | | | | | | |
| 16 | | | 185 | | 36 | | | | | 56 | | | | | | | |
| 17 | | | 200 | | 37 | | | | | 57 | | | | | | | |
| 18 | | | 160 | | 38 | | | | | 58 | | | | | | | |
| 19 | | | 210 | | 39 | | | | | 59 | | | | | | | |
| 20 | | | 160 | | 40 | | | | | 60 | | | | | | | |

*Species Codes:*
2 California killifish
3 Bat ray
4 Diamond turbot
5 California halibut
6 Bay pipefish
8 Lamprey
11 Rainbow trout/steelhead
20 Pacific herring
24 Speckled dace
25 Speckled sanddab
26 Tule perch
28 Golden shiner
32 Carp
58 Brown bullhead
59 Prickly sculpin
60 Riffle sculpin
61 Coast Range sculpin
62 Pacific staghorn sculpin
70 Starry flounder
71 Surf Smelt
72 Night smelt
73 American shad
75 Topsmelt
76 Northern Anchovy
80 Bay goby
81 Tidewater goby
82 Yellowfin goby
84 Shimofuri goby
86 Arrow goby
89 Shiner surfperch
90 Gambusia
102 Dungeness crab
103 Hemigrapsus crab
104 Ctenophora (jellys)
105 Palaemon shrimp
108 Pachygrapsus crab

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**FYKE TRAP / MINNOW TRAP DATA SHEET**

Recorder: BZ
Page 1 of 1

Project No. & Name: 2007-110 BIGT Date: 5-14-08 Field Crew: BZ, TC, MW Crew Leader: TC

Date: 5-14 Temp (°C): 18.9 pH: 7.16 Cond. (µS/cm): 1,159 Salinity (ppt): 0.66 D.O.: 7.96 (mg/L) 86.1 (%) T.D.S. (g/L): 0.854

Date: 5-15 Temp (°C): 18.73 pH: 7.27 Cond. (µS/cm): 1,433 Salinity (ppt): 0.82 D.O.: 6.08 (mg/L) 65.7 (%) T.D.S. (g/L): 1.051

Site Description/Location: GPS coordinates:

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| F1 | 5-14 | 12:45 | 5-15 | | | 3ft | between the | | |
| M1-4 | ↓ | ↓ | | | | 3ft | PONDS | | |
| | | | | | | | | | |
| M5-12 | 5-14 | 13:00 | ↓ | 0745 | | 2ft | Haines Creek | | |
| | | | | | | | | | |
| M5-12 | 5-15 | 13:00 | 5-16 | 11:40 | | — | Haines Creek | | |
| M1-4 | | | | 12:20 | | — | between E & W | | |
| F1 | ↓ | ↓ | ↓ | 12:20 | | — | PONDS | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Notes:**

Key: V=Voucher, X=Mortality, P=Parasite, G=Gravid
F = female, M = male, J = juvenile

DATA FROM 5-15 Collection

**Weather:**

DATA FROM 5-16 COLLECTION

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M5-12 | 200 | 45 | | 23 | F1 | 200 | 45 | | 45 | | | | | 67 | M5-12 | 5-16-08 | | |
| 2 | | | 50 | | 24 | | | 45 | | 46 | | | | | 68 | | 200 | count: 13 | |
| 3 | | | 52 | | 25 | | 53 | 90 | | 47 | | | | | 69 | | | | |
| 4 | | | 48 | | 26 | | | 70 | | 48 | | | | | 70 | M1-4 | 2stripe garter | 370 | Mort |
| 5 | | | 40 | | 27 | | | 175 | | 49 | | | | | 71 | | 200 | count: 5 | |
| 6 | | | 35 | | 28 | | | 45 | | 50 | | | | | 72 | | | | |
| 7 | | | 32 | | 29 | | | 50 | | 51 | | | | | 73 | F1 | 200 | count: 10 | |
| 8 | | | 30 | | 30 | | | 175 | | 52 | | | | | 74 | | 303 | 150 length | |
| 9 | | | 21 | | 31 | | | 175 | | 53 | | | | | 75 | | 53 | 180 | |
| 10 | | | 40 | | 32 | | | 195 | | 54 | | | | | 76 | | | 156 | |
| 11 | | | 45 | | 33 | | | 165 | | 55 | | | | | 77 | | | 134 | |
| 12 | | | 50 | | 34 | | | 160 | | 56 | | | | | 78 | | | 185 | |
| 13 | | | 45 | | 35 | | 303 | | 2nd year | 57 | | | | | 79 | | | 105 | |
| 14 | | | 25 | | 36 | | 49 | 160 | | 58 | | | | | 80 | | | 168 | |
| 15 | M1-4 | 200 | 45 | | 37 | | | 150 | | 59 | | | | | 81 | | | 170 | |
| 16 | | | 15 | | 38 | | | 150 | | 60 | | | | | 82 | | | 131 | |
| 17 | | 51 | 63 | | 39 | | | 140 | | 61 | | | | | 83 | | | 130 | |
| 18 | ~~M~~ M1-4 | 200 | 40 | | 40 | | | 150 | | 62 | | | | | 84 | | | 122 | |
| 19 | F1 | 200 | 40 | | 41 | | 51 | 135 | | 63 | | | | | 85 | | | 154 | |
| 20 | | | 50 | | 42 | | 200 | 35 | | 64 | | | | | 86 | | | | |
| 21 | | | 40 | | 43 | | | | | 65 | | | | | 87 | | | | |
| 22 | | | 35 | | 44 | | | | | 66 | | | | | 88 | | | | |

Data Sheet Signoff: x

[1] Facing Upstream or Downstream?

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**BEACH SEINE DATA SHEET**

Recorder: ____

Page ____ of ____

Project: 2007-110 BIGT EXOTICS Date: 5-15-08 Field Crew: BZ, DSS, JS

Drainage: ____ Stream: ____ Reach: ____

HAUL #1

Time Begin: 10:00 Time End: 10:40 Site Depth: ____ Site Length: ____ Site Width: ____ Stage: ____

*SURFACE*: Water Temp (°C): ____ pH: ____ EC: ____ Salinity: ____ D.O.: ____(ppt) ____(%) T.D.S.: ____

*BOTTOM*: Water Temp (°C): ____ pH: ____ EC: ____ Salinity: ____ D.O.: ____(ppt) ____(%) T.D.S.: ____

Quad Information:

Weather Conditions:

Notes: Key: V=voucher, M=mortality, P=parasite, G=gravid, F=female, M=male, J=juvenile

Haul 1: opening on W end of EAST POND

E, fish in center channel

shocking into fyke. Shocker seconds 287

| | Haul # | Species Code | Length (mm) | Key | | Haul # | Species Code | Length (mm) | Key | | Haul # | Species Code | Length (mm) | Key | Haul # | Species Code | Additional # / Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 167 | | 21 | E1 | 53 | 90 | | 41 | | | | | | | |
| 2 | | | 140 | | 22 | | | 150 | | 42 | | | | | | | |
| 3 | | | 160 | | 23 | | | 148 | | 43 | | | | | | | |
| 4 | | | 195 | | 24 | | | 125 | | 44 | | | | | | | |
| 5 | | | 160 | | 25 | | | 132 | | 45 | | | | | | | |
| 6 | | 51 | 150 | | 26 | | | 123 | | 46 | | | | | | | |
| 7 | E1 | 53 | 160 | | 27 | | | 110 | | 47 | | | | | | | |
| 8 | | | 145 | | 28 | | 200 | 45 | | 48 | | | | | | | |
| 9 | | | 159 | | 29 | | | | | 49 | | | | | | | |
| 10 | | | 130 | | 30 | | | | | 50 | | | | | | | |
| 11 | | | 154 | | 31 | | | | | 51 | | | | | | | |
| 12 | | | 170 | | 32 | | | | | 52 | | | | | | | |
| 13 | | | 145 | | 33 | | | | | 53 | | | | | | | |
| 14 | | | 110 | | 34 | | | | | 54 | | | | | | | |
| 15 | | | 128 | | 35 | | | | | 55 | | | | | | | |
| 16 | | | 180 | | 36 | | | | | 56 | | | | | | | |
| 17 | | | 100 | | 37 | | | | | 57 | | | | | | | |
| 18 | | | 145 | | 38 | | | | | 58 | | | | | | | |
| 19 | | | 140 | | 39 | | | | | 59 | | | | | | | |
| 20 | | | 115 | | 40 | | | | | 60 | | | | | | | |

*Species Codes:*
2 California killifish
3 Bat ray
4 Diamond turbot
5 California halibut
6 Bay pipefish
8 Lamprey
11 Rainbow trout/steelhead
20 Pacific herring
24 Speckled dace
25 Speckled sandab
26 Tule perch
28 Golden shiner
32 Carp
58 Brown bullhead
59 Prickly sculpin
60 Riffle sculpin
61 Coast Range sculpin
62 Pacific staghorn sculpin
70 Starry flounder
71 Surf Smelt
72 Night smelt
73 American shad
75 Topsmelt
76 Northern Anchovy
80 Bay goby
81 Tidewater goby
82 Yellowfin goby
84 Shimofuri goby
86 Arrow goby
89 Shiner surfperch
90 Gambusia
102 Dungeness crab
103 Hemigrapsus crab
104 Ctenophora (jellys)
105 Palaemon shrimp
108 Pachygrapsus crab

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**BEACH SEINE DATA SHEET**

Recorder: BZ

Page ___ of ___

Project: BIG T exotics Date: 5-16-08 Field Crew: BZ & MW

Drainage: ______ Stream: ______ Reach: ______

Notes: DAY & NITE SPEAR-FISHING / SNORKELING RECON EFFORTS. {Key: V=voucher, M=mortality, P=parasite, G=gravid, F=female, M=male, J=juvenile}

Fish Length: <12" = Small (S); >12" = Large (L)

Turtles: A = adult (>10"); j = juv (<10")

W = WEST POND
E = EAST POND

Used Pole spears w/ trident 5 prong tip

| Haul # | Species Code | Length (mm) | Key | Haul # | Species Code | Length (mm) | Key | Haul # | Species Code | Length (mm) | Key | Haul # | Species Code | Additional # / Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | 53 | 16 S | W | | | | | | | | | | | |
| DAY | 53 | 1 L | W | | | | | | | | | | | |
| | 53 | 29 S | E | | | | | | | | | | | |
| | 53 | 3 L | E | | | | | | | | | | | |
| | 303 | 3 | E | | | | | | | | | | | |
| DAY | 401 | 2 A | E | | | | | | | | | | | |
| NITE | 53 | 6 S | W | | | | | | | | | | | |
| | 301 | 5 | W | | | | | | | | | | | |
| | 49 | 2 | W | | | | | | | | | | | |
| | 51 | 3 | W | | | | | | | | | | | |
| | 53 | 16 | E | | | | | | | | | | | |
| | 301 | 1 | | | | | | | | | | | | |
| | 49 | 7 | | | | | | | | | | | | |
| NITE | 303 | 30 | E | | | | | | | | | | | |

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## ELECTROFISHING DATA SHEET

Recorder BZ
Page 1 of 1

Project Number/Description: 2007-110 BIG T EXOTICS
Field Crew: TAC, MLW, BAZ, CGL
Date: 10-9-07
Site Description: Inbetween Pond #1 & #2
Start Time: ____ End Time: ____ Site Depth: ____ Site Length: ____ Site Width: ____
Shocker seconds: 253

*SURFACE:* Water Temp (°C): ____ pH: ____ Cond: ____ Salinity: ____ D.O.: ____(mg/L) ____(%) T.D.S.: ____
*BOTTOM:* Water Temp (°C): ____ pH: ____ Cond: ____ Salinity: ____ D.O.: ____(mg/L) ____(%) T.D.S.: ____

Location/Coordinate Information:

Weather Conditions:

Notes: SPEARFISHING EFFORT
NOT MEASURED KILLED ON SITE
MLW - (3) Largemouth Bass kills
BAZ - (3) LMBass (4) Crayfish
(2) Bluegill
(2) Green Sunfish
all taken out of Pond #1 Night snorkeling

KEY: V=voucher, X=mortality, P=parasite, G=gravid

ELECTROFISHING — SPEARFISHING EFFORT

| | Pass # | Species Code | Length (mm) | ~~Weight (g)~~ add. #s | Key | | Pond# ~~Pass #~~ | Species Code | Length (mm) | Weight (g) | Key | | Pass # | Species Code | Length (mm) | Weight (g) | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 205 | | | 26 | 1 | 53 | 340 | | | 51 | | | | | |
| 2 | | | 113 | | | 27 | 2 | 53 | 290 | | | 52 | | | | | |
| 3 | | | 125 | | | 28 | 2 | 53 | 253 | | | 53 | | | | | |
| 4 | | | 110 | | | 29 | | | | | | 54 | | | | | |
| 5 | | | 92 | | | 30 | | | | | | 55 | | | | | |
| 6 | | | 115 | | | 31 | | | | | | 56 | | | | | |
| 7 | | | 86 | | | 32 | | | | | | 57 | | | | | |
| 8 | | | 100 | | | 33 | | | | | | 58 | | | | | |
| 9 | | | 81 | | | 34 | | | | | | 59 | | | | | |
| 10 | | | 95 | | | 35 | | | | | | 60 | | | | | |
| 11 | | | 86 | | | 36 | | | | | | 61 | | | | | |
| 12 | | | 84 | | | 37 | | | | | | 62 | | | | | |
| 13 | | 51 | 49 | | | 38 | | | | | | 63 | | | | | |
| 14 | | 90 | 37 | | | 39 | | | | | | 64 | | | | | |
| 15 | | 90 | / | +5 | | 40 | | | | | | 65 | | | | | |
| 16 | | 53 | 38 | | | 41 | | | | | | 66 | | | | | |
| 17 | | | | | | 42 | | | | | | 67 | | | | | |
| 18 | | | | | | 43 | | | | | | 68 | | | | | |
| 19 | | | | | | 44 | | | | | | 69 | | | | | |
| 20 | | | | | | 45 | | | | | | 70 | | | | | |
| 21 | | | | | | 46 | | | | | | 71 | | | | | |
| 22 | | | | | | 47 | | | | | | 72 | | | | | |
| 23 | | | | | | 48 | | | | | | 73 | | | | | |
| 24 | | | | | | 49 | | | | | | 74 | | | | | |
| 25 | | | | | | 50 | | | | | | 75 | | | | | |

*Species Codes:*

1 Santa Ana Sucker
2 CA killifish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

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## ELECTROFISHING DATA SHEET

Recorder B2
Page 1 of 1

Project Number/Description: BLM T Exotic 2007-110
Date: 10-10-07
Field Crew: TAC, MCW, BAC, CGL
Site Description: Haines Creek - Pond where 3 Goldfish where observed earlier

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

Shocker seconds: 682

*SURFACE:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

*BOTTOM:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

Location/Coordinate Information:

Weather Conditions:

Notes: *SUCKER REGURG[illegible]
5 Sucker seen during survey - one measured at 115mm [FL]

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Pass # | Species Code | Length (mm) | Weight (g) | Key | | Pass # | Species Code | Length (mm) | add #s ~~Weight (g)~~ | Key | | Pass # | Species Code | Length (mm) | Weight (g) | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 300 | | | 26 | 1st | 200 | 35 | | | 51 | | | | | |
| 2 | | | 258 | | | 27 | | | 35 | | | 52 | | | | | |
| 3 | | | 66 | | | 28 | | | 40 | | | 53 | | | | | |
| 4 | | | 250 | | | 29 | | | 39 | | | 54 | | | | | |
| 5 | | | 225 | | * | 30 | | | 41 | | | 55 | | | | | |
| 6 | | | 180 | | | 31 | | | 37 | | | 56 | | | | | |
| 7 | | *1 | 103 ← SL | | | 32 | | | 30 | | | 57 | | | | | |
| 8 | | 51 | 74 | | | 33 | | | 37 | | | 58 | | | | | |
| 9 | | 200 | 40 | | | 34 | | | 34 | | | 59 | | | | | |
| 10 | | | 35 | | | 35 | | | 30 | | | 60 | | | | | |
| 11 | | | 40 | | | 36 | | | 44 | | | 61 | | | | | |
| 12 | | | 30 | | | 37 | | | 45 | | | 62 | | | | | |
| 13 | | | 38 | | | 38 | | | 37 | | | 63 | | | | | |
| 14 | | | 30 | | | 39 | | | 42 | | | 64 | | | | | |
| 15 | | | 36 | | | 40 | | 53 | 70 | | | 65 | | | | | |
| 16 | | | 30 | | | 41 | | | 120 | | | 66 | | | | | |
| 17 | | | 46 | | | 42 | | 200 | | +60 | | 67 | | | | | |
| 18 | | | 35 | | | 43 | | | | | | 68 | | | | | |
| 19 | | | 33 | | | 44 | | | | | | 69 | | | | | |
| 20 | | | 32 | | | 45 | | | | | | 70 | | | | | |
| 21 | | | 44 | | | 46 | | | | | | 71 | | | | | |
| 22 | | | 40 | | | 47 | | | | | | 72 | | | | | |
| 23 | | | 38 | | | 48 | | | | | | 73 | | | | | |
| 24 | | | 40 | | | 49 | | | | | | 74 | | | | | |
| 25 | | | 35 | | | 50 | | | | | | 75 | | | | | |

*Species Codes:*

1 Santa Ana Sucker
2 CA killifish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

INTO FYKE NET

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## ELECTROFISHING DATA SHEET

Recorder TAC

Page 1 of 1

Project Number/Description: 2007-110 BIG T EXOTICS

Date: 10-10-07

Field Crew: TAC, MW, BAZ, CGL

Site Description: Inbetween Ponds

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

Shocker seconds: 653

*SURFACE:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

*BOTTOM:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

Location/Coordinate Information:

Weather Conditions:

Notes: White @ base of barbells
Tail ⇒ Square
Light margin @ anal fin on base of body
21 Anal fin Rays

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Fyke ~~Pass #~~ | Species Code | Length (mm) | Weight (g) | Key | | Pass # | Species Code | Length (mm) | Weight (g) | Key | | Pass # | Species Code | Length (mm) | Weight (g) | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F1 | 53 | 121 | | | 26 | | | | | | 51 | | | | | |
| 2 | | | 62 | | | 27 | | | | | | 52 | | | | | |
| 3 | | | 108 | | | 28 | | | | | | 53 | | | | | |
| 4 | | | 94 | | | 29 | | | | | | 54 | | | | | |
| 5 | | | 110 | | | 30 | | | | | | 55 | | | | | |
| 6 | | | 94 | | | 31 | | | | | | 56 | | | | | |
| 7 | | | 124 | | | 32 | | | | | | 57 | | | | | |
| 8 | | | 115 | | | 33 | | | | | | 58 | | | | | |
| 9 | | | 167 | | | 34 | | | | | | 59 | | | | | |
| 10 | | | 82 | | | 35 | | | | | | 60 | | | | | |
| 11 | | 51 | 84 | - | | 36 | | | | | | 61 | | | | | |
| 12 | | 53 | 89 | | | 37 | | | | | | 62 | | | | | |
| 13 | | | 94 | | | 38 | | | | | | 63 | | | | | |
| 14 | | | 91 | | | 39 | | | | | | 64 | | | | | |
| 15 | | 200 | 45 | | | 40 | | | | | | 65 | | | | | |
| 16 | | | 47 | | | 41 | | | | | | 66 | | | | | |
| 17 | | | 44 | | | 42 | | | | | | 67 | | | | | |
| 18 | | | 42 | | | 43 | | | | | | 68 | | | | | |
| 19 | | 57 | 312 | | | 44 | | | | | | 69 | | | | | |
| 20 | | 90 | ~~+7~~ | +7 | | 45 | | | | | | 70 | | | | | |
| 21 | | | | | | 46 | | | | | | 71 | | | | | |
| 22 | | | | | | 47 | | | | | | 72 | | | | | |
| 23 | | | | | | 48 | | | | | | 73 | | | | | |
| 24 | | | | | | 49 | | | | | | 74 | | | | | |
| 25 | | | | | | 50 | | | | | | 75 | | | | | |

*Species Codes:*

1 Santa Ana Sucker
2 CA killifish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

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**FYKE TRAP / MINNOW TRAP DATA SHEET**

Recorder: CGL
Page 1 of 1

Project No. & Name: 2007-110 Big T Exotics Date: 10/10 Field Crew: TAC, MLW, BAZ, CGL Crew Leader: TAC

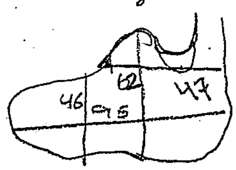
surface Date: 10/10/07 Temp (°C): 17.77 pH: 7.38 Cond. (μS/cm): 403 Salinity (ppt): 0.23 D.O.: 6.59 (mg/L) 69.3 (%) T.D.S. (g/L): 0.301 mmHg 734.1

bottom 2" Date: " Temp (°C): 17.79 pH: 7.14 Cond. (μS/cm): 376 Salinity (ppt): 0.21 D.O.: 5.2 (mg/L) 54.7 (%) T.D.S. (g/L): 0.282

Site Description/Location: ______ GPS coordinates: ______

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| T1-T9 | 10/9 | 3:30pm | 10/10 | 9:35am | Main Pond | | | | |
| T10-T11 | 10/9 | 3:30pm | 10/10 | 9:35am | Channel off Main pond | | | | |
| M1-M5 | 10/9 | 3:30pm | 10/10 | 9:35am | " | " | | | |
| M6-M14 | 10/9 | 3:30pm | 10/10 | 9:35am | Down stream | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Notes:** 95 long .46 wide 62 wide, .47




Key: V=Voucher, X=Mortality, P=Parasitic, G=Gravid
F = female, M = male, J = juvenile

**Weather:**

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1-M5 | 200 | 45 | | 23 | | | | | 45 | | | | | 67 | | | | |
| 2 | | | 44 | | 24 | | | | | 46 | | | | | 68 | | | | |
| 3 | | | 42 | | 25 | | | | | 47 | | | | | 69 | | | | |
| 4 | | | 51 | | 26 | | | | | 48 | | | | | 70 | | | | |
| 5 | | | 40 | | 27 | | | | | 49 | | | | | 71 | | | | |
| 6 | | | 42 | | 28 | | | | | 50 | | | | | 72 | | | | |
| 7 | M6-M14 | 200 | 33 | | 29 | | | | | 51 | | | | | 73 | | | | |
| 8 | | | 29 | | 30 | | | | | 52 | | | | | 74 | | | | |
| 9 | | | 26 | | 31 | | | | | 53 | | | | | 75 | | | | |
| 10 | | | 35 | | 32 | | | | | 54 | | | | | 76 | | | | |
| 11 | | | 35 | | 33 | | | | | 55 | | | | | 77 | | | | |
| 12 | | | 27 | | 34 | | | | | 56 | | | | | 78 | | | | |
| 13 | | | 50 | | 35 | | | | | 57 | | | | | 79 | | | | |
| 14 | | | 36 | | 36 | | | | | 58 | | | | | 80 | | | | |
| 15 | | | 36 | | 37 | | | | | 59 | | | | | 81 | | | | |
| 16 | | | 37 | | 38 | | | | | 60 | | | | | 82 | | | | |
| 17 | | | 38 | | 39 | | | | | 61 | | | | | 83 | | | | |
| 18 | | | 46 | | 40 | | | | | 62 | | | | | 84 | | | | |
| 19 | | | 34 | | 41 | | | | | 63 | | | | | 85 | | | | |
| 20 | | 51 | 125 | | 42 | | | | | 64 | | | | | 86 | | | | |
| 21 | | 1 | 167 | GPS coord | 43 | | | | | 65 | | | | | 87 | | | | |
| 22 | | | | " | 44 | | | | | 66 | | | | | 88 | | | | |

SUCKR"

OCTOBER 10th, 2007

BIG T EXOTIC WILDLIFE REMOVAL EFFORTS
SPEARFISHING EFFORTS

MW, BZ, CL

**LOCATION: West Pond**

| Species | Number of Individuals Captured |
|---|---|
| Largemouth bass | 24 |
| Green sunfish | 5 |
| Bluegill | 6 |
| Bullfrog tadpoles | 4 |
| Red swamp crayfish | 2 |

**LOCATION: East Pond**

| Species | Number of Individuals Captured |
|---|---|
| Largemouth bass | 16 |
| Green sunfish | 2 |
| Bluegill | 1 |
| Bullfrog tadpoles | 6 |
| Red swamp crayfish | 7 |

# ECORP Consulting, Inc.
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**SEINING DATA SHEET**

Recorder Multiple
Page 1 of 1

Project Number/Description: 2007-110 BIG T POND #1
Field Crew: TAC, MLW, BAZ, KLM, JNS

Date: 8-27-07

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

*SURFACE:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______
*BOTTOM:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

Location/Coordinate Information:

Weather Conditions:

Notes:
EAST POND

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 112 | | | 26 | 2 | 200 | 15 | | | 51 | 4 | 53 | 94 | | |
| 2 | | | 105 | | | 27 | | | 20 | | | 52 | | | 132 | | |
| 3 | | | 119 | | | 28 | | 303 | / | +5 | | 53 | | | 82 | | |
| 4 | | ↓ | 109 | | | 29 | | 90 | / | +3 | | 54 | | | 107 | | |
| 5 | | 90 | 28 | | | 30 | | 53 | 103 | | | 55 | | | 95 | | |
| 6 | | | 35 | | | 31 | | 303 | / | +2 | | 56 | | | 98 | | |
| 7 | | ↓ | 36 | | | 32 | | 53 | 108 | | | 57 | | | 165 | | |
| 8 | | 200 | 10 | | | 33 | | 90 | / | +5 | | 58 | | | 83 | | |
| 9 | | 90 | 34 | | | 34 | | 303 | / | +6 | | 59 | | | 102 | | |
| 10 | | | 32 | | | 35 | ↓ | 90 | / | +2 | | 60 | | ↓ | 108 | | |
| 11 | | | 21 | | | 36 | | | | | | 61 | | 303 | / | 1 | |
| 12 | | ↓ | 32 | | | 37 | 3 | 53 | 97 | | | 62 | | 53 | 82 | | |
| 13 | | 90 | / | +11 | | 38 | | | 103 | | | 63 | ↓ | 53 | 107 | | |
| 14 | ↓ | 303 | / | +1 | | 39 | | | 94 | | | 64 | | 303 | / | 7 | |
| 15 | | | | | | 40 | | | 81 | | | 65 | | 200 | 25 | | |
| 16 | 2 | 53 | 114 | | | 41 | | | 90 | | | 66 | ↓ | 90 | / | 15 | |
| 17 | | 90 | / | +9 | | 42 | | ↓ | 68 | | | 67 | | | | | |
| 18 | | 303 | / | +18 | | 43 | | 303 | / | +1 | | 68 | | | | | |
| 19 | | 53 | 112 | | | 44 | ↓ | 90 | / | +3 | | 69 | | | | | |
| 20 | | ↓ | 116 | | | 45 | | | | | | 70 | | | | | |
| 21 | | 90 | / | +9 | | 46 | 4 | 49 | 21 | | | 71 | | | | | |
| 22 | | 301 | / | +1 | | 47 | | 53 | 240 | | | 72 | | | | | |
| 23 | | 200 | 20 | | | 48 | | | 169 | | | 73 | | | | | |
| 24 | | 53 | 168 | | | 49 | | | 119 | | | 74 | | | | | |
| 25 | ↓ | 90 | / | +9 | | 50 | ↓ | ↓ | 123 | | | 75 | | | | | |

303?

*Species Codes:*

| | | | | |
|---|---|---|---|---|
| 2 CA killfish | 32 Carp | 54 Smallmouth bass | 77 Deep-bodied anchovy | 105 Palaemon shrimp |
| 4 Diamond turbot | 36 Black crappie | 56 Yellow bullhead | 86 Arrow goby | 108 Pachygrapsus crab |
| 5 CA halibut | 37 Arroyo chub | 57 Black bullhead | 87 Cheekspot | 200 crayfish |
| 11 Rainbow trout/steelhead | 38 striped mullet | 58 Brown bullhead | 88 Shadow goby | 301 Bullfrog adult |
| 24 Speckled dace | 49 bluegill | 62 Pacific staghorn sculpin | 90 Mosquitofish | 303 Bullfrog tadpole |
| 28 Golden shiner | 51 Green sunfish | 63 Channel catfish | 91 Longjaw mudsucker | 400 SW pond turtle |
| 30 Threespine stickleback | 53 Largemouth bass | 75 Topsmelt | 103 Hemigrapsus crab | 401 Red-eared slider |

Big T exotics removal
2007-110 /D

# Rod & Reel Sampling

→ TAC, MW, BZ, KM, JS

8/27/2007 1315

## • EAST POND •

| Species: | Counts: |
|---|---|
| Largemouth Bass | 12 |
| Green Sunfish | 2 |

all captures were ~~[illegible]~~ between 200mm - 100mm.

- observed small schools of fish

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ENVIRONMENTAL CONSULTANTS

**FYKE TRAP / MINNOW TRAP DATA SHEET**

Recorder:
Page 1 of 1

Project No. & Name: Big T exotic Removal Date: 8/28/07 Field Crew: MW, BAZ, KLM, JS Crew Leader:

Date: Temp (°C): pH: Cond. (µS/cm): Salinity (ppt): D.O.: (mg/L) (%) T.D.S. (g/L):

Date: Temp (°C): pH: Cond. (µS/cm): Salinity (ppt): D.O.: (mg/L) (%) T.D.S. (g/L):

Location (circle one): **River**: Section: GPS &/or RM:

**Canal**: Inflow or Outflow?: GPS (canal):

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| 1 (new) | 8/28 | 11:00 | 8/29/07 | 10:00 | | | | | |
| 2 (m) | | | | | | | | | |
| 3 (mt) | | | | | | | | | |
| 4 (mt) | | | | | | | | | |
| 5 (old) | | | | | | | | | |
| 6 (m) | | | | | | | | | |
| 7 (m) | | | | | | | | | |
| 8 (m) | | | | | | | | | |
| 9 (m) | | | | | | | | | |
| | | | | | | | | | |

**Notes:** #1 Found turtle trap = 5 crayfish 4 bass
#2 1 cray | old = old turtle trap
#3 1 cray | #6 1 cray #8 empty
#4 1 cray | #7 empty #9 empty

Key: V=Voucher, X=Mortality, P=Parasite, G=Gravid
F = female, M = male, J = juvenile

**Weather:**

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 200 | 37 | | 23 | | | | | 45 | | | | | 67 | | | | |
| 2 | 3 | 200 | 33 | | 24 | | | | | 46 | | | | | 68 | | | | |
| 3 | 4 | 200 | 42 | | 25 | | | | | 47 | | | | | 69 | | | | |
| 4 | 6 | 200 | 38 | | 26 | | | | | 48 | | | | | 70 | | | | |
| 5 | 1 | 200 | 28 | | 27 | | | | | 49 | | | | | 71 | | | | |
| 6 | 1 | 53 | 118 | | 28 | | | | | 50 | | | | | 72 | | | | |
| 7 | 1 | 200 | 33 | | 29 | | | | | 51 | | | | | 73 | | | | |
| 8 | 1 | 200 | 39 | | 30 | | | | | 52 | | | | | 74 | | | | |
| 9 | 1 | 200 | 44 | | 31 | | | | | 53 | | | | | 75 | | | | |
| 10 | 1 | 53 | 100 | | 32 | | | | | 54 | | | | | 76 | | | | |
| 11 | 1 | 200 | 44 | | 33 | | | | | 55 | | | | | 77 | | | | |
| 12 | 1 | 53 | 89 | | 34 | | | | | 56 | | | | | 78 | | | | |
| 13 | 1 | 200 | 39 | | 35 | | | | | 57 | | | | | 79 | | | | |
| 14 | | | | | 36 | | | | | 58 | | | | | 80 | | | | |
| 15 | | | | | 37 | | | | | 59 | | | | | 81 | | | | |
| 16 | | | | | 38 | | | | | 60 | | | | | 82 | | | | |
| 17 | | | | | 39 | | | | | 61 | | | | | 83 | | | | |
| 18 | | | | | 40 | | | | | 62 | | | | | 84 | | | | |
| 19 | | | | | 41 | | | | | 63 | | | | | 85 | | | | |
| 20 | | | | | 42 | | | | | 64 | | | | | 86 | | | | |
| 21 | | | | | 43 | | | | | 65 | | | | | 87 | | | | |
| 22 | | | | | 44 | | | | | 66 | | | | | 88 | | | | |

Data Sheet Signoff: x

[1] Facing Upstream or Downstream?

# ECORP Consulting, Inc.
**ENVIRONMENTAL CONSULTANTS**

## ELECTROFISHING DATA SHEET

Recorder JS

Page 1 of 1

Project Number/Description: 2007-110 Big T Exotics Removal

Field Crew: UWJ BAE, JS, KM

Date: 8/29/07

Site Description:

Start Time: End Time: Site Depth: Site Length: Site Width:

Shocker seconds:

***SURFACE:*** Water Temp (°C): pH: Cond: Salinity: D.O.: (mg/L) (%) T.D.S.:

***BOTTOM:*** Water Temp (°C): pH: Cond: Salinity: D.O.: (mg/L) (%) T.D.S.:

Location/Coordinate Information:
Pond #2 behind F2 just before creek begins

Weather Conditions:

Notes:

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 85 | | | 26 | 1 | 49 | 39 | | | 51 | | | | | |
| 2 | | | 70 | | | 27 | | 200 | — | 2+3+1+1 | | 52 | | = (7) | | | |
| 3 | | | 58 | | 25 | 28 | | 51 | 48 | | | 53 | | | | | |
| 4 | | | 160 | | | 29 | | 53 | 90 | | | 54 | | | | | |
| 5 | | 303 | — | 7+12+1+5 | | 30 | | | 54 | | | 55 | | | | | |
| 6 | | 90 | — | 25+30+15 | | 31 | | | 36 | | | 56 | | | | | |
| 7 | | 49 | 40 | | 70 | 32 | | 51 | 40 | | | 57 | | | | | |
| 8 | | | 35 | | | 33 | | 53 | 53 | | | 58 | | | | | |
| 9 | | | 50 | | | 34 | | | 50 | | | 59 | | | | | |
| 10 | | | 30 | | | 35 | | | 50 | | | 60 | | | | | |
| 11 | | | 49 | | | 36 | | 303 | — | 2+2+1+1 | | 61 | | = (4) | | | |
| 12 | | 53 | 69 | | | 37 | | 49 | 31 | | | 62 | | | | | |
| 13 | | 49 | 34 | | | 38 | | | 31 | | | 63 | | | | | |
| 14 | | 51 | 50 | | | 39 | | ~~53~~ 200 | 30 | | | 64 | | | | | |
| 15 | | 49 | 40 | | | 40 | | 51 | 40 | | | 65 | | | | | |
| 16 | | | 35 | | | 41 | | 49 | 35 | | | 66 | | | | | |
| 17 | | | 39 | | | 42 | | 90 | — | 15+10+45+25 | | 67 | | (95) | | | |
| 18 | | | 35 | | | 43 | | 53 | 49 | | | 68 | | | | | |
| 19 | | | 30 | | | 44 | | 90 | — | 30 | | 69 | | | | | |
| 20 | | | 35 | | | 45 | | 53 | 39 | | | 70 | | | | | |
| 21 | | | 38 | | | 46 | | | | | | 71 | | | | | |
| 22 | | 51 | 40 | | | 47 | | | | | | 72 | | | | | |
| 23 | | 49 | 35 | | | 48 | | | | | | 73 | | | | | |
| 24 | | | 32 | | | 49 | | | | | | 74 | | | | | |
| 25 | | 90 | — | 10+10+20+20 | | 50 | | (60) | | | | 75 | | | | | |

5 23

*Species Codes:*

2 CA killfish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

**ECORP Consulting, Inc.**
ENVIRONMENTAL CONSULTANTS

**FYKE TRAP / MINNOW TRAP DATA SHEET**

Recorder: KLM
Page 1 of 2

Project No. & Name: 2007- Big T Exotics Removal Date: 8/29/07 Field Crew: MW, BAZ, KLM, JS Crew Leader: ______

Date: ______ Temp (°C): ______ pH: ______ Cond. (µS/cm): ______ Salinity (ppt): ______ D.O.: ______ (mg/L) ______ (%) T.D.S. (g/L): ______

Date: ______ Temp (°C): ______ pH: ______ Cond. (µS/cm): ______ Salinity (ppt): ______ D.O.: ______ (mg/L) ______ (%) T.D.S. (g/L): ______

Location (circle one): **River**: Section: ______ GPS &/or RM: ______

**Canal**: Inflow or Outflow?: ______ GPS (canal): ______

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| F1 | 8/28/07 | | 8/29/07 | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Notes:**
Snorkled into Fyke 1

Key: V=Voucher, X=Mortality, P=Parasite, G=Gravid
F = female, M = male, J = juvenile

**Weather:**
HOT

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F1 | 53 | 335 | | 23 | F1 | 53 | 107 | | 45 | F1 | 53 | 76 | | 67 | F1 | 53 | 64 | |
| 2 | | | 78 | | 24 | | | 75 | | 46 | | | 96 | | 68 | | | 82 | |
| 3 | | | 340 | | 25 | | | 80 | | 47 | | | 92 | | 69 | | | 75 | |
| 4 | | | 275 | | 26 | | | 71 | | 48 | | | 78 | | 70 | | | 83 | |
| 5 | | | 118 | | 27 | | | 92 | | 49 | | | 87 | | 71 | | | 70 | |
| 6 | | | 98 | | 28 | | | 70 | | 50 | | | 83 | | 72 | | | 95 | |
| 7 | | | 90 | | 29 | | | 73 | | 51 | | | 92 | | 73 | | | 78 | |
| 8 | | | 99 | | 30 | | | 74 | | 52 | | | 102 | | 74 | | | 74 | |
| 9 | | | 67 | | 31 | | | 83 | | 53 | | | 103 | | 75 | | | 78 | |
| 10 | | | 72 | | 32 | | | 76 | | 54 | | | 81 | | 76 | | | 75 | |
| 11 | | | 66 | | 33 | | | 75 | | 55 | | | 97 | | 77 | | | 86 | |
| 12 | | | 78 | | 34 | | | 66 | | 56 | | 200 | 39 | | 78 | | | 80 | |
| 13 | | | 74 | | 35 | | | 79 | | 57 | | 53 | 62 | | 79 | | | 77 | |
| 14 | | | 72 | | 36 | | | 70 | | 58 | | | 56 | | 80 | | | 77 | |
| 15 | | | 95 | | 37 | | | 72 | | 59 | | | 79 | | 81 | | | 76 | |
| 16 | | | 75 | | 38 | | | 66 | | 60 | | | 88 | | 82 | | | 70 | |
| 17 | | | 71 | | 39 | | | 99 | | 61 | | | 76 | | 83 | | | 78 | |
| 18 | | | 74 | | 40 | | | 68 | | 62 | | | 78 | | 84 | | | 55 | |
| 19 | | | 77 | | 41 | | | 106 | | 63 | | | 77 | | 85 | | | 69 | |
| 20 | | | 58 | | 42 | | | 84 | | 64 | | | 135 | | 86 | | 90 | / | +17 |
| 21 | | | 109 | | 43 | | | 70 | | 65 | | | 67 | | 87 | | 200 | / | +1 |
| 22 | | | 73 | | 44 | | | 81 | | 66 | | | 75 | | 88 | | | | |

Data Sheet Signoff: x ______

[1] Facing Upstream or Downstream?
(i.e., the mouth of the trap)

**ECORP Consulting, Inc.**
ENVIRONMENTAL CONSULTANTS

**SEINING DATA SHEET**

Recorder: BZ
Page 1 of 1
Date: 8-30-07

Project Number/Description: 2007-110 BIG T
Field Crew: MLW, BAZ, KLM, JNS

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

*SURFACE:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______
*BOTTOM:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

Location/Coordinate Information:
tail end of Pond #2 ending @ man-made crossing of HAINES CREEK

Weather Conditions:

Notes:

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 55 | | | 26 | 1 | 49 | 23 | | | 51 | | | | | |
| 2 | | 49 | 25 | | | 27 | | | 20 | | | 52 | | | | | |
| 3 | | | 18 | | | 28 | | | 22 | | | 53 | | | | | |
| 4 | | | 27 | | | 29 | | 53 | 48 | | | 54 | | | | | |
| 5 | | | 21 | | | 30 | | 90 | | +285 | | 55 | | | | | |
| 6 | | | 22 | | | 31 | | 303 | | +7 | | 56 | | | | | |
| 7 | | | 27 | | | 32 | | 49 | 22 | | | 57 | | | | | |
| 8 | | | 33 | | | 33 | | | | | | 58 | | | | | |
| 9 | | | 23 | | | 34 | | | | | | 59 | | | | | |
| 10 | | | 32 | | | 35 | | | | | | 60 | | | | | |
| 11 | | | 20 | | | 36 | | | | | | 61 | | | | | |
| 12 | | | 27 | | | 37 | | | | | | 62 | | | | | |
| 13 | | | 35 | | | 38 | | | | | | 63 | | | | | |
| 14 | | | 38 | | | 39 | | | | | | 64 | | | | | |
| 15 | | | 24 | | | 40 | | | | | | 65 | | | | | |
| 16 | | | 23 | | | 41 | | | | | | 66 | | | | | |
| 17 | | | 33 | | | 42 | | | | | | 67 | | | | | |
| 18 | | | 32 | | | 43 | | | | | | 68 | | | | | |
| 19 | | | 35 | | | 44 | | | | | | 69 | | | | | |
| 20 | | | 33 | | | 45 | | | | | | 70 | | | | | |
| 21 | | | 24 | | | 46 | | | | | | 71 | | | | | |
| 22 | | | 25 | | | 47 | | | | | | 72 | | | | | |
| 23 | | | 20 | | | 48 | | | | | | 73 | | | | | |
| 24 | | | 15 | | | 49 | | | | | | 74 | | | | | |
| 25 | | | 20 | | | 50 | | | | | | 75 | | | | | |

TOTAL COUNTS:

| (90) MOSQUITOFISH | (303) BULLFROG TAD |
|---|---|
| 54 | 4 |
| 147 | 2 |
| 32 | 1 |
| 44 | |
| 8 | |
| 285 | |

*Species Codes:*

2 CA killfish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

MINNOW TRAP / FYKE ~~ELECTROFISHING~~ DATA SHEET

# ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Recorder KLM
Page 1 of 1

Project Number/Description: 2007-110 BIG T EXOTICS REMOVAL
Field Crew: MLW BAZ JNS KLM
Date: 8/30/07

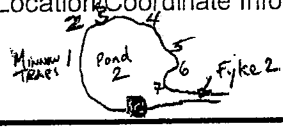
Site Description: POND #2 WEST POND

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

~~Shocker seconds~~: ______

**SURFACE:** Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______(mg/L) ______(%) T.D.S.: ______
**BOTTOM:** Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______(mg/L) ______(%) T.D.S.: ______

Location/Coordinate Information:




3 traps deployed on NORTH BANK

Weather Conditions:

Notes:
#1 NOTHING #2 NOTHING ✱
#3 (2) CRAY ✱(Deployed additional trap)
#4 (1) CRAY ✱(Deployed Turtle trap w/2 live & 1 dead cray)
#5 NOTHING, #6 NOTHING (NEW TRAP DEPLOYED)

✱ TRAPS PULLED FROM POND #1 - DEPLOYED INTO POND #2
✱ F2 pulled 8/29/07 due to human/canine disturbance
✱ patch small pimpin' turtle trap

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | TRAP ~~Pass~~ # | Species Code | Length (mm) | # ~~Weight~~ (g) | Key | | Pass # | Species Code | Length (mm) | Weight (g) | Key | | Pass # | Species Code | Length (mm) | Weight (g) | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F2 | 49 | 218 | | | 26 | | | | | | 51 | | | | | |
| 2 | | | | | | 27 | | | | | | 52 | | | | | |
| 3 | M1 | 200 | / | +5 | | 28 | | | | | | 53 | | | | | |
| 4 | M2 | 200 | / | +1 | | 29 | | | | | | 54 | | | | | |
| 5 | M3 | NO CAPS | | | | 30 | | | | | | 55 | | | | | |
| 6 | M4 | NO CAPS | | | | 31 | | | | | | 56 | | | | | |
| 7 | M5 | 200 | / | +1 | | 32 | | | | | | 57 | | | | | |
| 8 | M6 | 303 | / | +1 | | 33 | | | | | | 58 | | | | | |
| 9 | M7 | NO CAPS - 2 escapees | | | | 34 | | | | | | 59 | | | | | |
| 10 | M8 | 200 | / | +1 | | 35 | | | | | | 60 | | | | | |
| 11 | M9 | NO CAPS | | | | 36 | | | | | | 61 | | | | | |
| 12 | M10 | 200 | / | +1 | | 37 | | | | | | 62 | | | | | |
| 13 | M11 | NO CAPS | | | | 38 | | | | | | 63 | | | | | |
| 14 | M12 | NO CAPS | | | | 39 | | | | | | 64 | | | | | |
| 15 | M13 | NO CAPS | | | | 40 | | | | | | 65 | | | | | |
| 16 | M14 | NO CAPS | | | | 41 | | | | | | 66 | | | | | |
| 17 | M15 | NO CAPS | | | | 42 | | | | | | 67 | | | | | |
| 18 | M16 | NO CAPS | | | | 43 | | | | | | 68 | | | | | |
| 19 | M17 | 200 | / | +1 | | 44 | | | | | | 69 | | | | | |
| 20 | | | | | | 45 | | | | | | 70 | | | | | |
| 21 | | | | | | 46 | | | | | | 71 | | | | | |
| 22 | | | | | | 47 | | | | | | 72 | | | | | |
| 23 | | | | | | 48 | | | | | | 73 | | | | | |
| 24 | | | | | | 49 | | | | | | 74 | | | | | |
| 25 | | | | | | 50 | | | | | | 75 | | | | | |

*Species Codes*:

1 Santa Ana Sucker
2 CA killfish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

# ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

## ELECTROFISHING DATA SHEET

Recorder BZ

Page 1 of 2

Project Number/Description: BIG T (2007-110 / D / D1)

Field Crew: TAC, MLW, BAZ

Date: 31 JUL 07

Site Description: POND 2 (WEST POND) @ HEAD of HAINES CREEK

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

Shocker seconds: 666

*SURFACE:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

*BOTTOM:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

Location/Coordinate Information:

Weather Conditions:
NIGHT - FULL MOON
0% CC

Notes: (2) SANTA ANA SUCKERS OBSERVED (APPROX 100 mm + LENGTH)

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 53 | 72 | | | 26 | | 53 | 42 | | | 51 | | 53 | 183 | | |
| 2 | | | 63 | | | 27 | | | 69 | | | 52 | | | 65 | | |
| 3 | | | 40 | | | 28 | | | 34 | | | 53 | | | 79 | | |
| 4 | | | 59 | | | 29 | | | 39 | | | 54 | | | 203 | | |
| 5 | | | 70 | | | 30 | | | 63 | | | 55 | | | 60 | | |
| 6 | | | 103 | | | 31 | | | 63 | | | 56 | | | 48 | | |
| 7 | | | 47 | | | 32 | | | 40 | | | 57 | | | 68 | | |
| 8 | | | 67 | | | 33 | | | 59 | | | 58 | | 90 | 46 | | |
| 9 | | | 48 | | | 34 | | | 68 | | | 59 | | | 42 | | |
| 10 | | | 75 | | | 35 | | | 67 | | | 60 | | | 20 | | |
| 11 | | | 78 | | | 36 | | | 72 | | | 61 | | | 32 | | |
| 12 | | | 78 | | | 37 | | | 58 | | | 62 | | | 21 | | |
| 13 | | | 64 | | | 38 | | | 38 | | | 63 | | | 40 | | |
| 14 | | | 58 | | | 39 | | | 43 | | | 64 | | | 43 | | |
| 15 | | | 40 | | | 40 | | | 68 | | | 65 | | | 31 | | |
| 16 | | | 41 | | | 41 | | | 69 | | | 66 | | | 36 | | |
| 17 | | | 38 | | | 42 | | | 137 | | | 67 | | | 22 | | |
| 18 | | | 48 | | | 43 | | | 64 | | | 68 | | | 41 | | |
| 19 | | | 69 | | | 44 | | | 69 | | | 69 | | | 41 | | |
| 20 | | | 62 | | | 45 | | | 60 | | | 70 | | 53 | 75 | | |
| 21 | | | 59 | | | 46 | | | 61 | | | 71 | | 90 | 39 | | |
| 22 | | | 59 | | | 47 | | | 37 | | | 72 | | | 16 | | |
| 23 | | | 105 | | | 48 | | | 48 | | | 73 | | | 22 | | |
| 24 | | | 38 | | | 49 | | | 35 | | | 74 | | | 25 | | |
| 25 | | | 48 | | | 50 | | | 60 | | | 75 | | | 38 | | |

*Species Codes:*

2 CA killifish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

# ECORP Consulting, Inc.

ENVIRONMENTAL CONSULTANTS

**ELECTROFISHING DATA SHEET**

7-31-07

Recorder: BZ

Project/Date: BIG T (NIGHT TIME - DAY 1)

Page: 2 of 2

| | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 90 | 43 | | | 46 | | 53 | 67 | | | 91 | | | | | |
| 2 | | | 38 | | | 47 | | | 43 | | | 92 | | | | | |
| 3 | | | 35 | | | 48 | | | 48 | | | 93 | | | | | |
| 4 | | | 22 | | | 49 | | | 39 | | | 94 | | | | | |
| 5 | | | 30 | | | 50 | | | 55 | | | 95 | | | | | |
| 6 | | | 35 | | | 51 | | | 68 | | | 96 | | | | | |
| 7 | | | 33 | | | 52 | | | 78 | | | 97 | | | | | |
| 8 | | | 42 | | | 53 | | | 48 | | | 98 | | | | | |
| 9 | | | 36 | | | 54 | | | 60 | | | 99 | | | | | |
| 10 | | | 23 | | | 55 | | | 54 | | | 100 | | | | | |
| 11 | | | 27 | | | 56 | | | 88 | | | 101 | | | | | |
| 12 | | | 33 | | | 57 | | | 63 | | | 102 | | | | | |
| 13 | | | 22 | | | 58 | | | 74 | | | 103 | | | | | |
| 14 | | | 36 | | | 59 | | | 58 | | | 104 | | | | | |
| 15 | | | 25 | | | 60 | | | 62 | | | 105 | | | | | |
| 16 | | | 32 | | | 61 | | 51 | 20 | | | 106 | | | | | |
| 17 | | 51 | 98 | | | 62 | | 200 | 35 | | | 107 | | | | | |
| 18 | | | 105 | | | 63 | | | 30 | | | 108 | | | | | |
| 19 | | | 42 | | | 64 | | | 30 | | | 109 | | | | | |
| 20 | | | 40 | | | 65 | | | 28 | | | 110 | | | | | |
| 21 | | | 29 | | | 66 | | | 33 | | | 111 | | | | | |
| 22 | | | 33 | | | 67 | | | 38 | | | 112 | | | | | |
| 23 | | | 39 | | | 68 | | | 37 | | | 113 | | | | | |
| 24 | | | 28 | | | 69 | | | 32 | | | 114 | | | | | |
| 25 | | | 25 | | | 70 | | | 20 | | | 115 | | | | | |
| 26 | | | 27 | | | 71 | | | 6 | | | 116 | | | | | |
| 27 | | | 33 | | | 72 | | | 22 | | | 117 | | | | | |
| 28 | | 90 | / | +122 | | 73 | | | 26 | | | 118 | | | | | |
| 29 | | 200 | 35 | | | 74 | | | 30 | | | 119 | | | | | |
| 30 | | | 32 | | | 75 | | | 42 | | | 120 | | | | | |
| 31 | | | 45 | | | 76 | | | 22 | | | 121 | | | | | |
| 32 | | | 25 | | | 77 | | | 10 | | | 122 | | | | | |
| 33 | | | 28 | | | 78 | | | 10 | | | 123 | | | | | |
| 34 | | | 26 | | | 79 | | 303 | / | +40 | | 124 | | | | | |
| 35 | | 51 | 36 | | | 80 | | 90 | / | +68 | | 125 | | | | | |
| 36 | | 200 | 22 | | | 81 | | | | | | 126 | | | | | |
| 37 | | 51 | 35 | | | 82 | | | | | | 127 | | | | | |
| 38 | | 200 | 20 | | | 83 | | | | | | 128 | | | | | |
| 39 | | | 18 | | | 84 | | | | | | 129 | | | | | |
| 40 | | | 18 | | | 85 | | | | | | 130 | | | | | |
| 41 | | | 30 | | | 86 | | | | | | 131 | | | | | |
| 42 | | | 10 | | | 87 | | | | | | 132 | | | | | |
| 43 | | | 18 | | | 88 | | | | | | 133 | | | | | |
| 44 | | | 16 | | | 89 | | | | | | 134 | | | | | |
| 45 | | 51 | 25 | | | 90 | | | | | | 135 | | | | | |

Key: X=mort, V=voucher, G=gravid, P=parasite

Notes: Bullfrog Tadpole Counts
3+2+16+16+1+2 = 40

MOSQUITO FISH COUNTS
2+19+26+14+2+1+4 = 68

**ECORP Consulting, Inc.**
ENVIRONMENTAL CONSULTANTS

**FYKE TRAP / MINNOW TRAP DATA SHEET**

Recorder: BZ
Page 1 of 1

Project No. & Name: BIG T 2007-110 Date: 8/1/07 Field Crew: TAC/MLW/BAZ Crew Leader: TAC

Date:_____ Temp (°C):_____ pH:_____ Cond. (µS/cm):_____ Salinity (ppt):_____ D.O.:_____(mg/L)_____(%) T.D.S. (g/L):_____

Date:_____ Temp (°C):_____ pH:_____ Cond. (µS/cm):_____ Salinity (ppt):_____ D.O.:_____(mg/L)_____(%) T.D.S. (g/L):_____

Location (circle one): ~~River:~~ Section: WEST POND 2 @ START HAINES CREEK GPS &/or RM:_____

~~Canal:~~ Inflow or Outflow?:_____ GPS (canal):_____

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| F1 | 7-31-07 | 22:00 | 8-1-07 | 0820 | | 3 ft | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Notes:**

Key: V=Voucher, X=Mortality, P=Parasite, G=Gravid
F = female, M = male, J = juvenile

**Weather:**
80% cc

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F1 | 53 | 75 | | 23 | | | | | 45 | | | | | 67 | | | | |
| 2 | ↓ | ↓ | 85 | | 24 | | | | | 46 | | | | | 68 | | | | |
| 3 | | 51 | 104 | | 25 | | | | | 47 | | | | | 69 | | | | |
| 4 | | 200 | 48 | | 26 | | | | | 48 | | | | | 70 | | | | |
| 5 | | 49 | 225 | | 27 | | | | | 49 | | | | | 71 | | | | |
| 6 | | 203 | / | +3 | 28 | | | | | 50 | | | | | 72 | | | | |
| 7 | | | | | 29 | | | | | 51 | | | | | 73 | | | | |
| 8 | | | | | 30 | | | | | 52 | | | | | 74 | | | | |
| 9 | | | | | 31 | | | | | 53 | | | | | 75 | | | | |
| 10 | | | | | 32 | | | | | 54 | | | | | 76 | | | | |
| 11 | | | | | 33 | | | | | 55 | | | | | 77 | | | | |
| 12 | | | | | 34 | | | | | 56 | | | | | 78 | | | | |
| 13 | | | | | 35 | | | | | 57 | | | | | 79 | | | | |
| 14 | | | | | 36 | | | | | 58 | | | | | 80 | | | | |
| 15 | | | | | 37 | | | | | 59 | | | | | 81 | | | | |
| 16 | | | | | 38 | | | | | 60 | | | | | 82 | | | | |
| 17 | | | | | 39 | | | | | 61 | | | | | 83 | | | | |
| 18 | | | | | 40 | | | | | 62 | | | | | 84 | | | | |
| 19 | | | | | 41 | | | | | 63 | | | | | 85 | | | | |
| 20 | | | | | 42 | | | | | 64 | | | | | 86 | | | | |
| 21 | | | | | 43 | | | | | 65 | | | | | 87 | | | | |
| 22 | | | | | 44 | | | | | 66 | | | | | 88 | | | | |

Data Sheet Signoff: x_____

[1] Facing Upstream or Downstream?

# ECORP Consulting, Inc.

**SEINING DATA SHEET**

**ENVIRONMENTAL CONSULTANTS**

Recorder BZ

Page 2 of 3

Project Number/Description: BIG T

Field Crew: TAC, MLW, BAZ

Date: 8-1-07

Notes:

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 53 | 26 | | | 36 | | 303 | / | +6 | | 71 | | 90 | 22 | | |
| 2 | | 49 | 18 | | | 37 | | 49 | 18 | | | 72 | | | 23 | | |
| 3 | | ↓ | 26 | | | 38 | | | 22 | | | 73 | | | 33 | | |
| 4 | | 53 | / | +6 | | 39 | | | 23 | | | 74 | | | 22 | | |
| 5 | | 49 | 21 | | | 40 | | | 18 | | | 75 | | | 18 | | |
| 6 | | | 29 | | | 41 | | | 27 | | | 76 | | | 24 | | |
| 7 | | | 23 | | | 42 | | | 21 | | | 77 | | | 28 | | |
| 8 | | | 20 | | | 43 | | | 20 | | | 78 | | | 21 | | |
| 9 | | | 22 | | | 44 | | | 23 | | | 79 | | | 20 | | |
| 10 | | | 23 | | | 45 | | | 21 | | | 80 | | | 29 | | |
| 11 | | | 22 | | | 46 | | | 23 | | | 81 | | | 12 | | |
| 12 | | 51 | 27 | | | 47 | | | 23 | | | 82 | | | 18 | | |
| 13 | | | 28 | | | 48 | | | 21 | | | 83 | | | 18 | | |
| 14 | | | 20 | | | 49 | | | 18 | | | 84 | | | 10 | | |
| 15 | | | 32 | | | 50 | | | 25 | | | 85 | | | 23 | | |
| 16 | | | 27 | | | 51 | | | 20 | | | 86 | | | 22 | | |
| 17 | | | 20 | | | 52 | | | 21 | | | 87 | | | 33 | | |
| 18 | | | 23 | | | 53 | | | 21 | | | 88 | | | 32 | | |
| 19 | | | 24 | | | 54 | | | 23 | | | 89 | | | 26 | | |
| 20 | | | 28 | | | 55 | | 303 | / | +4 | | 90 | | | 22 | | |
| 21 | | | 25 | | | 56 | | 49 | 27 | | | 91 | | | 23 | | |
| 22 | | | 18 | | | 57 | | | 20 | | | 92 | | | 20 | | |
| 23 | | | 16 | | | 58 | | | 18 | | | 93 | | | 20 | | |
| 24 | | | 20 | | | 59 | | | 20 | | | 94 | | | 23 | | |
| 25 | | 49 | 15 | | | 60 | | | 20 | | | 95 | | | 22 | | |
| 26 | | | 16 | | | 61 | | | 22 | | | 96 | | 53 | / | +1 | |
| 27 | | | 30 | | | 62 | | | 23 | | | 97 | | 51 | 28 | | |
| 28 | | | 20 | | | 63 | | 51 | 20 | | | 98 | | | 29 | | |
| 29 | | | 24 | | | 64 | | | 22 | | | 99 | | | 22 | | |
| 30 | | | 20 | | | 65 | | ↓ | 22 | | | 100 | | | 22 | | |
| 31 | | | 25 | | | 66 | | 49 | 27 | | | 101 | | | 22 | | |
| 32 | | | 22 | | | 67 | | ↓ | 23 | | | 102 | | | 20 | | |
| 33 | | | 26 | | | 68 | | 90 | 25 | | | 103 | | | 21 | | |
| 34 | | | 20 | | | 69 | | | 18 | | | 104 | | | 12 | | |
| 35 | | | 21 | | | 70 | | ↓ | 20 | | | 105 | | | 18 | | |

*Species Codes*:

2 CA killifish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

# ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

**SEINING DATA SHEET**

Recorder BZ
Page 3 of 3

Project Number/Description: BIG T
Field Crew: TAC, MLW, BAZ

Date: 8-1-07

Start Time: ______ End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

*SURFACE:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______(mg/L) ______(%) T.D.S.: ______
*BOTTOM:* Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______(mg/L) ______(%) T.D.S.: ______

Location/Coordinate Information:
POND 2 – AT ROAD ENTRANCE
WESTPOND

Weather Conditions:

Notes: ALGAL REMOVAL METHODS

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 49 | 20 | | | 26 | | 51 | 19 | | | 51 | | | | | |
| 2 | | 90 | 23 | | | 27 | | 49 | 16 | | | 52 | | | | | |
| 3 | | | 28 | | | 28 | | ↓ | 23 | | | 53 | | | | | |
| 4 | | ↓ | 24 | | | 29 | | 53 | | +9 | | 54 | | | | | |
| 5 | | 51 | 15 | | | 30 | | 49 | 21 | | | 55 | | | | | |
| 6 | | 49 | 22 | | | 31 | | 303 | | +2 | | 56 | | | | | |
| 7 | | 51 | 23 | | | 32 | | 49 | 22 | | | 57 | | | | | |
| 8 | | | 22 | | | 33 | | 90 | 23 | | | 58 | | | | | |
| 9 | | | 23 | | | 34 | | | | | | 59 | | | | | |
| 10 | | | 18 | | | 35 | | | | | | 60 | | | | | |
| 11 | | | 18 | | | 36 | | | | | | 61 | | | | | |
| 12 | | | 20 | | | 37 | | | | | | 62 | | | | | |
| 13 | | | 20 | | | 38 | | | | | | 63 | | | | | |
| 14 | | ↓ | 18 | | | 39 | | | | | | 64 | | | | | |
| 15 | | 49 | 15 | | | 40 | | | | | | 65 | | | | | |
| 16 | | | 27 | | | 41 | | | | | | 66 | | | | | |
| 17 | | ↓ | 19 | | | 42 | | | | | | 67 | | | | | |
| 18 | | 51 | 20 | | | 43 | | | | | | 68 | | | | | |
| 19 | | ↓ | 22 | | | 44 | | | | | | 69 | | | | | |
| 20 | | 49 | 18 | | | 45 | | | | | | 70 | | | | | |
| 21 | | | 22 | | | 46 | | | | | | 71 | | | | | |
| 22 | | | 18 | | | 47 | | | | | | 72 | | | | | |
| 23 | | | 18 | | | 48 | | | | | | 73 | | | | | |
| 24 | | | 20 | | | 49 | | | | | | 74 | | | | | |
| 25 | | ↓ | 12 | | | 50 | | | | | | 75 | | | | | |

*Species Codes:*

2 CA killifish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

# ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

SEINING DATA SHEET

Recorder BZ

Page 1 of 3

Project Number/Description: BIG T 2007-100

Field Crew: TAC, MLW, BAZ

Date: 8-1-07

Start Time: 11:00 End Time: 12:30 Site Depth: ______ Site Length: ______ Site Width: ______

*SURFACE:* Water Temp (°C):______ pH:______ Cond:______ Salinity:______ D.O.:______(mg/L) ______(%) T.D.S.:______
*BOTTOM:* Water Temp (°C):______ pH:______ Cond:______ Salinity:______ D.O.:______(mg/L) ______(%) T.D.S.:______

Location/Coordinate Information:

POND 2
(WEST POND)

Weather Conditions:

Notes: USED 2 person - pole seine w/ bridal attachments

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex | | Haul # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 53 | 71 | | | 26 | | 53 | 46 | | | 51 | | 53 | 89 | | |
| 2 | | | 74 | | | 27 | | | 66 | | | 52 | | | 59 | | |
| 3 | | | 67 | | | 28 | | | 74 | | | 53 | | | 72 | | |
| 4 | | | 95 | | | 29 | | | 71 | | | 54 | | | 86 | | |
| 5 | | | 81 | | | 30 | | | 79 | | | 55 | | | 73 | | |
| 6 | | | 76 | | | 31 | | | 74 | | | 56 | | | 205 | | |
| 7 | | | 74 | | | 32 | | | 55 | | | 57 | | | 33 | | |
| 8 | | | 76 | | | 33 | | | 75 | | | 58 | | | 28 | | |
| 9 | | | 71 | | | 34 | | | 48 | | | 59 | | | 40 | | |
| 10 | | | 75 | | | 35 | | | 75 | | | 60 | | | 34 | | |
| 11 | | | 74 | | | 36 | | | 80 | | | 61 | | | 43 | | |
| 12 | | | 73 | | | 37 | | | 78 | | | 62 | | | 35 | | |
| 13 | | | 69 | | | 38 | | | 34 | | | 63 | | | 43 | | |
| 14 | | | 66 | | | 39 | | | 89 | | | 64 | | | 146 | | |
| 15 | | | 65 | | | 40 | | | 113 | | | 65 | | | 44 | | |
| 16 | | | 23 | | | 41 | | | 65 | | | 66 | | | 35 | | |
| 17 | | | 90 | | | 42 | | | 73 | | | 67 | | | 64 | | |
| 18 | | | 77 | | | 43 | | | 109 | | | 68 | | | 64 | | |
| 19 | | | 58 | | | 44 | | | 73 | | | 69 | | | 38 | | |
| 20 | | | 73 | | | 45 | | | 76 | | | 70 | | | 43 | | |
| 21 | | | 72 | | | 46 | | | 75 | | | 71 | | | 30 | | |
| 22 | | | 64 | | | 47 | | | 64 | | | 72 | | | | +32 | |
| 23 | | | 45 | | | 48 | | | 98 | | | 73 | | | | +33 | |
| 24 | | | 48 | | | 49 | | | 72 | | | 74 | | | 22 | | |
| 25 | | | 70 | | | 50 | | | 74 | | | 75 | | 49 | 94 | | |

*Species Codes:*

| | | | | |
|---|---|---|---|---|
| 2 CA killfish | 32 Carp | 54 Smallmouth bass | 77 Deep-bodied anchovy | 105 Palaemon shrimp |
| 4 Diamond turbot | 36 Black crappie | 56 Yellow bullhead | 86 Arrow goby | 108 Pachygrapsus crab |
| 5 CA halibut | 37 Arroyo chub | 57 Black bullhead | 87 Cheekspot | 200 crayfish |
| 11 Rainbow trout/steelhead | 38 striped mullet | 58 Brown bullhead | 88 Shadow goby | 301 Bullfrog adult |
| 24 Speckled dace | 49 bluegill | 62 Pacific staghorn sculpin | 90 Mosquitofish | 303 Bullfrog tadpole |
| 28 Golden shiner | 51 Green sunfish | 63 Channel catfish | 91 Longjaw mudsucker | 400 SW pond turtle |
| 30 Threespine stickleback | 53 Largemouth bass | 75 Topsmelt | 103 Hemigrapsus crab | 401 Red-eared slider |

**ECORP Consulting, Inc.**
ENVIRONMENTAL CONSULTANTS

**FYKE TRAP / MINNOW TRAP DATA SHEET**

meter not calibrated

Recorder: BZ
Page 1 of 2

Project No. & Name: BIG T 2007-110 Date: 8-2-07 Field Crew: TAC, MLW, BAZ Crew Leader: TAC

Date: 8/2 Temp (°C): 20.29 pH: 6.47 Cond. (µS/cm): 0.354 MS Salinity (ppt): 0.19 D.O.: 6.20 (mg/L) 70 (%) T.D.S. (g/L): 0.252

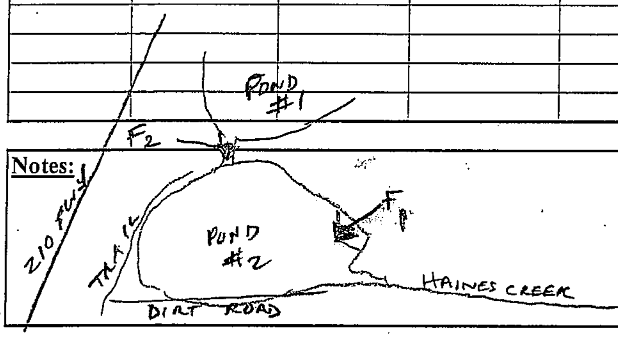
Date:____ Temp (°C):____ pH:____ Cond. (µS/cm):____ Salinity (ppt):____ D.O.:____ (mg/L)____ (%) T.D.S. (g/L):____

Location (circle one): River: Section: WEST POND POND #2 & CANAL CONNECTED POND #1 & 2 WEST EAST POND GPS &/or RM:____

Canal: Inflow or Outflow?:____ GPS (canal):____

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| F1 | 8-1-07 | 0900 | 8-2-07 | 0900 | | | | | |
| F2 | 8-1-07 | 1000 | 8-2-07 | 1045 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Notes:**




Key: V=Voucher, X=Mortality, P=Parasite, G=Gravid
F = female, M = male, J = juvenile

Largemouth 1 Tad 2

**Weather:** SUNNY 78% 0%

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F1 | 53 | 98 | | 23 | F2 | 53 | 64 | | 45 | F2 | 51 | 127 | | 67 | F2 | 53 | 68 | |
| 2 | | | 102 | | 24 | | | 78 | | 46 | | 53 | 68 | | 68 | | | 65 | |
| 3 | | | 105 | | 25 | | | 58 | | 47 | | | 62 | | 69 | | 51 | 87 | |
| 4 | | | 76 | | 26 | | | 65 | | 48 | | | 69 | | 70 | | | 69 | |
| 5 | | | 118 | | 27 | | | 74 | | 49 | | | 63 | | 71 | | 53 | | +3 |
| 6 | | 49 | 211 | F | 28 | | | 100 | | 50 | | | 67 | | 72 | | ~~303~~ | | |
| 7 | | 200 | 34 | | 29 | | | 65 | | 51 | | | 57 | | 73 | | 301 | 127 | M |
| 8 | | | | | 30 | | | 221 | | 52 | | | 67 | | 74 | | 200 | 42 | |
| 9 | | | | | 31 | | | 72 | | 53 | | | 72 | | 75 | | | 39 | |
| 10 | F2 | 49 | 206 | | 32 | | | 83 | | 54 | | | 62 | | 76 | | | 30 | |
| 11 | | | 136 | | 33 | | | 61 | | 55 | | | 81 | | 77 | | 51 | 95 | |
| 12 | | | 181 | | 34 | | 49 | 206 | M | 56 | | | 67 | | 78 | | 200 | 41 | |
| 13 | | 53 | 192 | | 35 | | 53 | 62 | | 57 | | | 71 | | 79 | | 200 | 40 | |
| 14 | | 301 | 150 | | 36 | | | 75 | | 58 | | | 68 | | 80 | | 31 | 60 | |
| 15 | | 53 | 266 | | 37 | | | 62 | | 59 | | | 62 | | 81 | | 200 | 30 | |
| 16 | | | 88 | | 38 | | | 72 | | 60 | | | 140 | | 82 | | | 34 | |
| 17 | | | 77 | | 39 | | | 86 | | 61 | | | 58 | | 83 | | | 32 | |
| 18 | | | 68 | | 40 | | | 102 | | 62 | | | 78 | | 84 | | | 41 | |
| 19 | | | 67 | | 41 | | | 87 | | 63 | | | 55 | | 85 | | | 32 | |
| 20 | | | 76 | | 42 | | | 91 | | 64 | | | 69 | | 86 | | | 35 | |
| 21 | | | 65 | | 43 | | | 67 | | 65 | | | 60 | | 87 | | | 48 | |
| 22 | | | 69 | | 44 | | | 77 | | 66 | | | 67 | | 88 | | | 38 | |

PG. 2 LINE 3

?

Data Sheet Signoff: x____

[1] Facing Upstream or Downstream?

**ECORP Consulting, Inc.**
ENVIRONMENTAL CONSULTANTS

# FYKE TRAP / MINNOW TRAP DATA SHEET

Recorder: BZ

Page 2 of 2

Project No. & Name: BIG T Date: 8/2/07 Field Crew: TAC/MCW/BRZ Crew Leader: TAR

Location Description (River Section or Canal Inflow Outflow?): Connection between Pond #1 & Pond #2

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F2 | 200 | 25 | | 31 | | | | | 61 | | | | | 91 | | | | |
| 2 | | 53 | | +7 | 32 | | | | | 62 | | | | | 92 | | | | |
| 3 | | 303 | | +2 | 33 | | | | | 63 | | | | | 93 | | | | |
| 4 | | | | | 34 | | | | | 64 | | | | | 94 | | | | |
| 5 | | | | | 35 | | | | | 65 | | | | | 95 | | | | |
| 6 | | | | | 36 | | | | | 66 | | | | | 96 | | | | |
| 7 | | | | | 37 | | | | | 67 | | | | | 97 | | | | |
| 8 | | | | | 38 | | | | | 68 | | | | | 98 | | | | |
| 9 | | | | | 39 | | | | | 69 | | | | | 99 | | | | |
| 10 | | | | | 40 | | | | | 70 | | | | | 100 | | | | |
| 11 | | | | | 41 | | | | | 71 | | | | | 101 | | | | |
| 12 | | | | | 42 | | | | | 72 | | | | | 102 | | | | |
| 13 | | | | | 43 | | | | | 73 | | | | | 103 | | | | |
| 14 | | | | | 44 | | | | | 74 | | | | | 104 | | | | |
| 15 | | | | | 45 | | | | | 75 | | | | | 105 | | | | |
| 16 | | | | | 46 | | | | | 76 | | | | | 106 | | | | |
| 17 | | | | | 47 | | | | | 77 | | | | | 107 | | | | |
| 18 | | | | | 48 | | | | | 78 | | | | | 108 | | | | |
| 19 | | | | | 49 | | | | | 79 | | | | | 109 | | | | |
| 20 | | | | | 50 | | | | | 80 | | | | | 110 | | | | |
| 21 | | | | | 51 | | | | | 81 | | | | | 111 | | | | |
| 22 | | | | | 52 | | | | | 82 | | | | | 112 | | | | |
| 23 | | | | | 53 | | | | | 83 | | | | | 113 | | | | |
| 24 | | | | | 54 | | | | | 84 | | | | | 114 | | | | |
| 25 | | | | | 55 | | | | | 85 | | | | | 115 | | | | |
| 26 | | | | | 56 | | | | | 86 | | | | | 116 | | | | |
| 27 | | | | | 57 | | | | | 87 | | | | | 117 | | | | |
| 28 | | | | | 58 | | | | | 88 | | | | | 118 | | | | |
| 29 | | | | | 59 | | | | | 89 | | | | | 119 | | | | |
| 30 | | | | | 60 | | | | | 90 | | | | | 120 | | | | |

*Species Codes:*

| | | | | |
|---|---|---|---|---|
| 2 CA killifish | 32 Carp | 54 Smallmouth bass | 77 Deep-bodied anchovy | 105 Palaemon shrimp |
| 4 Diamond turbot | 36 Black crappie | 56 Yellow bullhead | 86 Arrow goby | 108 Pachygrapsus crab |
| 5 CA halibut | 37 Arroyo chub | 57 Black bullhead | 87 Cheekspot | 200 crayfish |
| 11 Rainbow trout/steelhead | 38 striped mullet | 58 Brown bullhead | 88 Shadow goby | 301 Bullfrog adult |
| 24 Speckled dace | 49 bluegill | 62 Pacific staghorn sculpin | 90 Mosquitofish | 303 Bullfrog tadpole |
| 28 Golden shiner | 51 Green sunfish | 63 Channel catfish | 91 Longjaw mudsucker | 400 SW pond turtle |
| 30 Threespine stickleback | 53 Largemouth bass | 75 Topsmelt | 103 Hemigrapsus crab | 401 Red-eared slider |

Data Sheet Signoff: x ________________

[1] Facing Upstream or Downstream?
(i.e., the mouth of the trap)

**ECORP Consulting, Inc.**
ENVIRONMENTAL CONSULTANTS

## FYKE TRAP / MINNOW TRAP DATA SHEET

Recorder: BZ
Page 1 of 1

Project No. & Name: BIG T 2007-110 Date: 8-2-07 Field Crew: TAC, MLW, BAZ Crew Leader: TAC

Date:_____ Temp (°C):_____ pH:_____ Cond. (µS/cm):_____ Salinity (ppt):_____ D.O.:_____(mg/L)_____(%) T.D.S. (g/L):_____

Date:_____ Temp (°C):_____ pH:_____ Cond. (µS/cm):_____ Salinity (ppt):_____ D.O.:_____(mg/L)_____(%) T.D.S. (g/L):_____

Location (circle one): River: Section: POND #1 (EAST POND) & POND#2 (WEST POND) GPS &/or RM:_____
Canal: Inflow or Outflow?:_____ GPS (canal):_____

| Trap No. | Date Set/Reset | Time Set | Date Recovered | Time Recovered | Trap Direction[1] | Depth (ft) | Trap GPS Location | Tide Stage | Trap Removed? |
|---|---|---|---|---|---|---|---|---|---|
| M1-7 | 8-1-07 | 1100 | 8-2-07 | 0900 | | | | | |
| M8-13 | 8-1-07 | 1030 | 8-2-07 | 0915 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Notes:**
EAST POND
POND #1 MINNOW TRAPS 1-7
POND #2 (WEST POND) M8-13 + TURTLE TRAP
— NOTHING CAUGHT IN TURTLE TRAP

Key: V=Voucher, X=Mortality, P=Parasite, G=Gravid
F = female, M = male, J = juvenile

**Weather:**
HOT, HUMID
SUNNY 0% CC
0-2 mph WIND
82'F

| | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s | | Trap No. | Species Code | Length (mm) | Key/ add. #'s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1-7 | 200 | 40 | | 23 | | | | | 45 | | | | | 67 | | | | |
| 2 | ↓ | ↓ | 37 | | 24 | | | | | 46 | | | | | 68 | | | | |
| 3 | | | 40 | | 25 | | | | | 47 | | | | | 69 | | | | |
| 4 | | | 44 | | 26 | | | | | 48 | | | | | 70 | | | | |
| 5 | | | 36 | | 27 | | | | | 49 | | | | | 71 | | | | |
| 6 | | | 41 | | 28 | | | | | 50 | | | | | 72 | | | | |
| 7 | | | 43 | | 29 | | | | | 51 | | | | | 73 | | | | |
| 8 | | | 33 | | 30 | | | | | 52 | | | | | 74 | | | | |
| 9 | | | | | 31 | | | | | 53 | | | | | 75 | | | | |
| 10 | M8-13 | 303 | / | +8 | 32 | | | | | 54 | | | | | 76 | | | | |
| 11 | ↓ | 200 | 35 | | 33 | | | | | 55 | | | | | 77 | | | | |
| 12 | | ↓ | 37 | | 34 | | | | | 56 | | | | | 78 | | | | |
| 13 | | | 36 | | 35 | | | | | 57 | | | | | 79 | | | | |
| 14 | | | | | 36 | | | | | 58 | | | | | 80 | | | | |
| 15 | | | | | 37 | | | | | 59 | | | | | 81 | | | | |
| 16 | | | | | 38 | | | | | 60 | | | | | 82 | | | | |
| 17 | | | | | 39 | | | | | 61 | | | | | 83 | | | | |
| 18 | | | | | 40 | | | | | 62 | | | | | 84 | | | | |
| 19 | | | | | 41 | | | | | 63 | | | | | 85 | | | | |
| 20 | | | | | 42 | | | | | 64 | | | | | 86 | | | | |
| 21 | | | | | 43 | | | | | 65 | | | | | 87 | | | | |
| 22 | | | | | 44 | | | | | 66 | | | | | 88 | | | | |

Data Sheet Signoff: x

[1] Facing Upstream or Downstream?

# ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

## ELECTROFISHING DATA SHEET

Recorder BZ

Page 1 of 1

Project Number/Description: BIG T

Field Crew: TAC, MLW, BAZ

Date: 8-2-07

Site Description: CONNECTER BETWEEN POND #1 & 2 EAST & WEST

Start Time: 10:30 End Time: ______ Site Depth: ______ Site Length: ______ Site Width: ______

Shocker seconds: 1314

***SURFACE:*** Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

***BOTTOM:*** Water Temp (°C): ______ pH: ______ Cond: ______ Salinity: ______ D.O.: ______ (mg/L) ______ (%) T.D.S.: ______

Location/Coordinate Information:

Weather Conditions:

Notes: SAME AREA AS $F_2$

KEY: V=voucher, X=mortality, P=parasite, G=gravid

| | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex | | Pass # | Species Code | Length (mm) | Key/add. #'s | Sex |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 53 | 99 | | | 26 | | 53 | 80 | | | 51 | | | | | |
| 2 | | \| | 71 | | | 27 | | ↓ | 42 | | | 52 | | | | | |
| 3 | | \| | 65 | | | 28 | | 90 | 40 | | | 53 | | | | | |
| 4 | | \| | 55 | | | 29 | | \| | 22 | | | 54 | | | | | |
| 5 | | \| | 64 | | | 30 | | \| | 48 | | | 55 | | | | | |
| 6 | | \| | 67 | | | 31 | | \| | 35 | | | 56 | | | | | |
| 7 | | \| | 70 | | | 32 | | \| | 29 | | | 57 | | | | | |
| 8 | | \| | 65 | | | 33 | | \| | 35 | | | 58 | | | | | |
| 9 | | \| | 60 | | | 34 | | \| | 32 | | | 59 | | | | | |
| 10 | | \| | 78 | | | 35 | | \| | 34 | | | 60 | | | | | |
| 11 | | \| | 65 | | | 36 | | \| | 35 | | | 61 | | | | | |
| 12 | | \| | 64 | | | 37 | | \| | 30 | | | 62 | | | | | |
| 13 | | \| | 53 | | | 38 | | \| | 39 | | | 63 | | | | | |
| 14 | | \| | 48 | | | 39 | | ↓ | 30 | | | 64 | | | | | |
| 15 | | \| | 65 | | | 40 | | | | | | 65 | | | | | |
| 16 | | \| | 65 | | | 41 | | | | | | 66 | | | | | |
| 17 | | \| | 63 | | | 42 | | | | | | 67 | | | | | |
| 18 | | \| | 79 | | | 43 | | | | | | 68 | | | | | |
| 19 | | \| | 75 | | | 44 | | | | | | 69 | | | | | |
| 20 | | \| | 68 | | | 45 | | | | | | 70 | | | | | |
| 21 | | \| | 60 | | | 46 | | | | | | 71 | | | | | |
| 22 | | \| | 59 | | | 47 | | | | | | 72 | | | | | |
| 23 | | \| | 80 | | | 48 | | | | | | 73 | | | | | |
| 24 | | \| | 81 | | | 49 | | | | | | 74 | | | | | |
| 25 | | ↓ | 50 | | | 50 | | | | | | 75 | | | | | |

*Species Codes*:

2 CA killfish
4 Diamond turbot
5 CA halibut
11 Rainbow trout/steelhead
24 Speckled dace
28 Golden shiner
30 Threespine stickleback
32 Carp
36 Black crappie
37 Arroyo chub
38 striped mullet
49 bluegill
51 Green sunfish
53 Largemouth bass
54 Smallmouth bass
56 Yellow bullhead
57 Black bullhead
58 Brown bullhead
62 Pacific staghorn sculpin
63 Channel catfish
75 Topsmelt
77 Deep-bodied anchovy
86 Arrow goby
87 Cheekspot
88 Shadow goby
90 Mosquitofish
91 Longjaw mudsucker
103 Hemigrapsus crab
105 Palaemon shrimp
108 Pachygrapsus crab
200 crayfish
301 Bullfrog adult
303 Bullfrog tadpole
400 SW pond turtle
401 Red-eared slider

# APPENDIX D

## Trails Maintenance and Monitoring Quarterly Reports

September 24, 2007
(2007-110)

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

**SUBJECT: First Quarter Trails Closure, Clearing, and Maintenance Monitoring Report For The Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the trails maintenance and monitoring efforts for 2007. The first quarter of trails maintenance monitoring began on August 27, 2007 with a site visit by ECORP biologists Kristen Mobraaten and Todd Chapman. Trails surrounding the ponds, in the upland habitat, and those in the eastern portion of the Cottonwood/Willow riparian area were surveyed. A second site visit was conducted on September 21, 2007 by biologists Brian Zitt and Todd Chapman to assess trails along Haines Creek, in the alluvial and wash areas, and those not previously walked in the western portion of the riparian area.

In the past, existing equestrian trails throughout the site were defined and realigned where necessary to protect valuable wildlife habitats. The goal of the current trails component for this project is to monitor and maintain the existing equestrian and hiking trails throughout the Big Tujunga Wash Mitigation Bank, allowing traffic which is compatible with the primary function of the site. Closed trails will continue to be monitored, ensuring that dead tree and boulder barriers stay in place. This ongoing monitoring is necessary to determine current and potential future negative recreational use impacts on the riparian wildlife habitats.

The most notable issues of concern during this quarter was vandalism and graffiti. The trails information kiosks on both sides of the site have suffered extensive damage. The plexiglas has been broken, and the maps have been removed or destroyed. Graffiti is evident everywhere throughout the site, kiosks, portapotties, posted signage, boulders, trees, etc.

There is also quite a bit of trash and discarded construction materials. There are old steel drums and tires in the riparian area, chicken wire and other metal debris in the alluvial/wash area, and there are toys and clothing in many locations adjacent to the ponds and Haines creek. Human waste was observed in several locations along the trails, along with several new fire pits.

Several of the trails were partially or completely impassable due to low hanging branches or fallen trees. Most notable was a large eucalyptus branch which fell near the Wentworth equestrian entrance, bordering the upland restoration area. This blockage is in fact passable although a trail was blazed around it allowing for continued access. GPS coordinates for all observed problems are included in a table below.

Several other activities were observed during these site visits and should be noted. A man was observed dropping an opossum into the site off of Wentworth, and five individuals were encountered drinking beer and barbequing with a charcoal fire directly adjacent to Haines creek.

| GPS location # | Easting | Northing | Issue |
|---|---|---|---|
| 1 | 11S 0376250 | 3792339 | Large eucalyptus branch fallen across trail passage still possible |
| 2 | 11S 0376359 | 3792359 | 50 gallon steel oil drum and chicken wire debris present |
| 3 | 11S 0376492 | 3792401 | Overhanging branches/overgrown vegetation, not passable by equestrians |
| 4 | 11S 0376496 | 3792400 | Very low vegetation and branches, not passable by equestrians |
| 5 | 11S 0376562 | 3792445 | Discarded tire present |
| 6 | 11S 0376577 | 3792553 | Low hanging vegetation and branches |
| 7 | 11S 0376461 | 3792859 | Graffiti on kiosk and portable-potty |
| 8 | 11S 0376374 | 3792640 | Low hanging vegetation and branches, not passable by equestrians |
| 9 | 11S 0376265 | 3792622 | Low hanging vegetation and branches |
| 10 | 11S 0376071 | 3792692 | Metal debris present |
| 11 | 11S 0376006 | 3792643 | Low hanging vegetation and branches |
| 12 | 11S 0375984 | 3792518 | Low hanging vegetation and branches |
| 13 | 11S 0375581 | 3792503 | Trash and plastic planting pots, low hanging vegetation and branches |
| 14 | 11S 0375489 | 3792551 | Low hanging vegetation and branches |
| 15 | 11S 0375354 | 3792521 | Fire pit on bank |
| 16 | 11S 0374945 | 3792522 | Trash, clothing and children's toys |
| 17 | 11S 0375202 | 3792562 | Old trail head not clearly defined, low hanging vegetation and branches |
| 18 | 11S 0376368 | 3792462 | Large fallen tree across trail |
| 19 | 11S 0376461 | 3792516 | Discarded trash present |
| 20 | 11S 0376502 | 3792395 | Low hanging tree branches |
| 21 | 11S 0376484 | 3792399 | Low hanging tree branches |
| 22 | 11S 0376262 | 3792446 | Discarded fencing and wire material present |
| 23 | 11S 0376239 | 3792482 | Trail overgrown with vegetation |
| 24 | 11S 0376292 | 3792579 | Trail overgrown with vegetation |
| 25 | 11S 0375528 | 3793068 | Trash and other debris present |
| 26 | 11S 0375432 | 3793080 | Large pile of trash and other debris present |

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

SIGNED:__________________________ DATE:___________________

Todd Chapman
Senior Biologist

December 21, 2007
(2007-110)

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

**SUBJECT: Second Quarter Trails Closure, Clearing, and Maintenance Monitoring Report For The Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued the trails maintenance and monitoring efforts for 2007. The second quarter of trails maintenance monitoring was conducted on December 20, 2007 by ECORP biologist Todd Chapman.

Mr. Chapman had the opportunity to meet with Andrea and James Gutman, local residents and frequent users of the equestrian trails. They were able to point out some locations in the site which contained exotic plant species both in the upland Cottonwood/Sycamore area and in the willow riparian area. Photographs were taken of each location along with GPS coordinates of each location. In addition to these exotic plants, a large open cistern pipe was also pointed out. The pipe was located on the western boundary of the upland area beneath a large Cottonwood tree. The pipe was approximately three feet in diameter and approximately 5-6 feet deep. Due to fall or entrapment hazard created by this pipe, photos were taken and LADPW was notified directly to alert them of the situation and seek guidance.

Trails were surveyed throughout the upland area, the eastern portion of the willow riparian area, and those surrounding the ponds. Most of the trails were in very good shape. There were no major trail blockages observed, although a few locations still had some low hanging branches which rendered the trails passable by pedestrians but not by equestrians. Some of the trails in the willow riparian areas are apparently being supplemented with sand from offsite or other locations within the site. I appears that the sand is being placed onto trails which are remaining wet and muddy, or those which are primarily cobble substrate.

Several newly established fishing areas are also evident around both ponds. Portions of the riparian vegetation surrounding the ponds is being knocked down and tree branches are being placed on top to apparently create a more stable fishing platform. The branches are being cut from trees directly adjacent to the ponds.

It should also be noted that the main gate at the Cottonwood entrance off Wentworth was found to be compromised. One of the padlocks in the daisy chain had been cut. LADPW was also notified directly about the problem.

| GPS location # | Easting | Northing | Issue |
|---|---|---|---|
| 1 | 11S 0376012 | 3792362 | Western fan palmtree present |
| 2 | 11S 0376074 | 3792420 | Arundo present |
| 3 | 11S 0376097 | 3792520 | Arundo present |
| 4 | 11S 0376097 | 3792518 | Cistern well pipe |

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

SIGNED:__________________________ DATE:___________________

Todd Chapman
Senior Biologist

February 26, 2008
(2007-110)

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

**SUBJECT: Third Quarter Trails Closure, Clearing, and Maintenance Monitoring Report For The Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued the trails maintenance and monitoring efforts for 2007. The third quarter of trails maintenance monitoring began with a site visit by ECORP biologists Kristen Mobraaten, and Brad Burkhart who met with two representatives from Natures Image on January 29, 2008 to discuss trails maintenance throughout the Big Tujunga site. During this January site visit several areas containing dumped trash, trails containing low hanging branches or fallen trees, and those in need closure were observed throughout the site. Natures Image made note of each of these locations, with plans to perform these actions in the near future.

Natures Image visited the site on February 19, 2008, to remove debris from the trails as part of their first trail maintenance task. ECORP biologists Kristen Mobraaten, and Todd Chapman visited the site again on February 22, 2008, to assess the Natures Image maintenance progress. ECORP biologists walked throughout the areas Nature's Image performed trash and debris removal. Evidence of this maintenance was apparent throughout the upland Cottonwood area. Due to the high rainfall amounts in January and February many of the trails in the willow riparian area were flooded limiting access.

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

SIGNED:________________________ DATE:__________________

Todd Chapman
Senior Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

June 30, 2008
(2007-110/E/E2)

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

**SUBJECT: YEAR 1 Task E2 Fourth Quarter Trails Closure, Clearing, and Maintenance Monitoring Report for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. (ECORP) has continued the trails maintenance and monitoring efforts for 2008. The fourth quarter of trails maintenance monitoring began with a site visit by ECORP biologists Kristen Mobraaten and Brian Zitt on March 12, 2008 to survey the trails and document the trail maintenance performed on the site by Natures Image. The biologists documented problem areas throughout the existing trail system in the mitigation bank using a Global Positioning System unit (GPS) and took representative site photos. Areas where poison oak (*Toxicodendron diversilobum*) is growing adjacent to or within the vicinity of the trails were also recorded.

ECORP biologists also visited the site on April 9 and June 11, 2008 to survey the trails system and record areas needing maintenance, such as trash, debris, and poison oak growth. A table of coordinates recorded using a GPS unit is attached.

The 4th Annual Big Tujunga Mitigation Bank Trails Maintenance Day was held on May 17, 2008 and was attended LACDPW employees, ECORP biologists, and local residents. Over 20 bags of trash were pulled from the trail system, in addition to a bundle of razor wire, plastic crates, and old tires. A memo was submitted to LACDPW following the event.

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

SIGNED:________________________ DATE:________________

Kristen Mobraaten, Biologist

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

**ATTACHMENT – Coordinates of Maintenance Areas Throughout the Trails System**

| Date | Item | Easting | Northing | Comments |
|---|---|---|---|---|
| 3/12/2008 | trash | 376247 | 3792516 | wood debris and old paint cans |
| 3/12/2008 | trash | 376247 | 3792565 | metal debris |
| 3/12/2008 | trash | 376459 | 3792672 | fence debris |
| 3/12/2008 | trash | 376609 | 3792784 | |
| 3/12/2008 | trash | 376445 | 3792766 | |
| 3/12/2008 | trash | 376450 | 3792457 | metal debris |
| 4/9/2008 | poison oak | 376120 | 3792745 | |
| 4/9/2008 | poison oak | 375485 | 3792540 | |
| 4/9/2008 | poison oak | 375500 | 3792525 | |
| 4/9/2008 | poison oak | 375513 | 3792510 | |
| 6/11/2008 | poison oak | 376445 | 3792766 | near ponds |
| 6/11/2008 | poison oak | 376229 | 3792684 | |
| 6/11/2008 | poison oak | 375911 | 3792480 | |
| 6/11/2008 | poison oak | 375554 | 3792501 | filling both sides of trail for approximately 100' |
| 6/11/2008 | poison oak | 375526 | 3792538 | |
| 6/11/2008 | poison oak | 375485 | 3792535 | |
| 6/11/2008 | poison oak | 375471 | 3792513 | |
| 6/11/2008 | poison oak | 375364 | 3792525 | |

All coordinates are in NAD 83, UTM 11 S.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 30, 2008
(2007-110/E/E2)

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

**SUBJECT: YEAR 2 Task E1 and E2 - First Quarter (July – September 2008) Trails Closure, Clearing, and Maintenance Monitoring Report for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. (ECORP) has continued the trails maintenance and monitoring efforts for the first quarter, July through September 2008. The first quarter of trails maintenance monitoring began with a site visit by ECORP biologists Mari (Schroeder) Quillman and Kristen Mobraaten on August 7, 2008 and met with local resident Andrea Gutman to discuss areas within the site that need maintenance attention. A second site visit was conducted by ECORP biologists Kristen Mobraaten and Brian Zitt on August 15, 2008 to survey additional trails within the mitigation bank. During both site visits, ECORP biologists documented problem areas throughout the existing trail system (such as trash, debris, or new trails being trailblazed) using a Global Positioning System unit (GPS) and took representative site photos. Areas where poison oak (*Toxicodendron diversilobum*) is growing adjacent to or within the vicinity of the trails were also recorded. A table of coordinates recorded using a GPS unit is attached.

ECORP biologists did not visit the site for trails maintenance monitoring during July or September 2008.

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

SIGNED:________________________ DATE:__________________

Kristen Mobraaten, Biologist

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

**ATTACHMENT – Coordinates of Maintenance Areas Throughout the Trails System at Big Tujunga Mitigation Bank**

| Date | Item | Easting | Northing | Comments |
|---|---|---|---|---|
| 8/7/2008 | poison oak | 375985 | 3792558 | |
| 8/7/2008 | poison oak | 376439 | 3792771 | |
| 8/7/2008 | poison oak | 375926 | 3792494 | |
| 8/7/2008 | trash | 376065 | 3792691 | metal debris |
| 8/7/2008 | trash | 375978 | 3792520 | metal debris |
| 8/7/2008 | trash | 376121 | 3792674 | metal grate and pipe |
| 8/15/2008 | trash | 376552 | 3792944 | |
| 8/15/2008 | poison oak | 376483 | 3792855 | |
| 8/15/2008 | poison oak | 376440 | 3792751 | |
| 8/15/2008 | poison oak | 376448 | 3792759 | |

All coordinates are in NAD 83, UTM 11 S.

December 31, 2008
(2007-110/E/E2)

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

**SUBJECT: YEAR 2 Task E1 and E2 - Second Quarter (October - December 2008) Trails Closure, Clearing, and Maintenance Monitoring Report for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. (ECORP) has continued the trails maintenance and monitoring efforts for the second quarter, October through December 2008. ECORP biologists Kristen Mobraaten and Brian Zitt visited the site on December 12, 2008 and met with local residents Andrea and James Gutman to discuss areas that need maintenance attention. During the site visit, ECORP biologists documented problem areas throughout the existing trail system (such as trash, debris, or new trails being trailblazed) using a Global Positioning System unit (GPS) and took representative site photos. Areas where poison oak (*Toxicodendron diversilobum*) is growing adjacent to or within the vicinity of the trails were also recorded. The biologists and Mr. and Ms. Gutman also picked up small pieces of trash alongside the trails during the survey.

During this particular site visit, only one problem area coordinate was recorded. A blue oil can and large amounts of poison oak were observed near the pond area at UTM Zone 11 S 376435/3792762. The blue oil can looks as though it has been leaking its contents onto the bare ground and should be removed as soon as possible.

Natures Image visited the site on October 2, and December 11, 2008 to clean up any trash and debris littering the trails system throughout the mitigation bank.

ECORP biologists did not conduct any site visits during October or November 2008 to perform trails maintenance and monitoring.

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

SIGNED:__________________________ DATE:____________________

Kristen Mobraaten, Biologist

# APPENDIX E

## Stakeholder Mailing List

Mr. Paul Novak
Office of Supervisor Michael Antonovich
Supervisorial District 5
500 W. Temple
Los Angeles, CA 90012

Mr. Tony Klecha
California Regional Water Quality
Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

Ms. Kathy Delson
Shadow Hills Property
Owners Association
10910 Walnut Drive
Shadow Hills, CA 91040

Mr. Mike Fullerton
California Trail Users Coalition and ETI
9800 Craig Mitchell
Sunland, CA 91040

James and Andrea Gutman
Shadow Hills Property
Owners Association
10511 Mahoney Drive
Sunland, CA 91040

Ms. Tama Lockwood
Valley Horse Owners Association
11370 Ruggiero Avenue
Lake View Terrace, CA 91342

Ms. Nancy Snider
Lake View Terrace
Homeowners Association
10631 Foothill Blvd.
Lake View Terrace, CA 91342

Ms. Pat MacLaughlin
MIG
169 North Marengo Avenue
Pasadena, CA 91101

Ms. Elektra Kruger
Shadow Hills Property
Owners Association
10544 Mahoney Drive
Sunland, CA 91040

Mr. Aaron Allen
U.S. Army Corps of Engineers
Office of the Chief, Regulatory Branch
P.O. Box 532711
Los Angeles, CA 90053-2325

Mr. Ken Corey
U.S. Fish and Wildlife Service
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Rd.
Carlsbad, CA 92009-4219

Officer Larry Martinez
LAPD
12760 Osborne Street
Pacoima, CA 91331

Ms. Linda Fullerton
California Trail Users Coalition and ETI
9800 Craig Mitchell
Shadow Hills, CA 91040

Ms. Phyllis Hines
Lake View Terrace
Improvement Association
11515 Orcas Avenue
Lake View Terrace, CA 91342

Mr. Bill Mears
San Fernando Valley Rangers
11350 Clybourn Avenue
Lake View Terrace, CA 91342

Ms. Carol Roper
Shadow Hills Property
Owners Association
9635 La Canada Way
Sunland, CA 91040

Ms. Patricia Wood
LADPW
900 South Fremont Avenue
Alhambra, CA 91803-1331

Ms. Chris Arlington
Shadow Hills Property
Owners Association
9635 La Canada Way
Sunland, CA 91040

Mr. Scott Harris
California Department of Fish and Game
1508 North Harding Avenue
Pasadena, CA 91104

Ms. Cile Borman
Lake View Terrace
Improvement Association
11453 Alberni Avenue
Lake View Terrace, CA 91342

Mr. Bill Eick
Small Wilderness Area Preserve
9647 Stonehurst Avenue
Sun Valley, CA 91352

Ms. Lise Graber
Lake View Terrace
Homeowners Association
9839 Foothill Place
Lakeview Terrace, CA 91342

Mr. Terry Kaiser
Equestrian Trails, Inc. &
California Trail Users Coalition
10354 McBroom Street
Shadow Hills, CA 91040

Mr. Eddie Milligan
Hansen Dam Equestrian Center
11127 Orcas Avenue
Lake View Terrace, CA 91342

Mr. Phil Tabbi
Small Wilderness Area Preserve
11134 Sheldon Street
Sun Valley, CA 91352

Mr. Vik Bapua
LADPW
900 South Fremont Avenue
Alhambra, CA 91803-1331

Mr. James Wilson
Field Deputy
Councilmember Alex Padilla
13630 Van Nuys Boulevard
Pacoima, CA 91331

Ms. Jaqy Gamble
9915 Mc Broom Street
Shadow Hills, CA  91040

Ms. Jennifer Plaisted
Senior Deputy
Supervisor Antonovich
215 North Marengo Avenue, Suite 120
Pasadena, CA  91101

Ms. Wendy Greuel
13619 Valerio Street, Unit C
Van Nuys, CA  91405

Ms. Madeleine Jenkin
LADPW
Personnel and Public Affairs
900 South Fremont Avenue
Alhambra, CA  91803-1331

Ms. Barbara Tarnowski
10410 Las Lunitas Avenue
Tujunga, CA  91042-1841

Ms. Michele Chimienti
LADPW
900 South Fremont Avenue
Alhambra, CA  91803-1331

Ms. Mary Montgomery
770 N. Hoover Street
Los Angeles, CA  90029

Ms. Belinda Kwan
LADPW
900 South Fremont Avenue
Alhambra, CA  91803-1331

Mr. John Burton
LADPW
900 South Fremont Avenue
Alhambra, CA  91803-1331

Ms. Patricia Davenport, Field Deputy
City of Los Angeles
Sunland-Tujunga Field Office
7747 Foothill Boulevard
Tujunga, CA  91042

Ms. Mary Benson
FHTNC
11070 Sheldon Street
Sun Valley, CA  91352

Mr. Dennis Kroeplin
Hansen Dam Lakes Coalition
10942 Longford Street
Lake View Terrace, CA  91342

Mr. Jerry Piro
Sun Valley Watershed Group
8600 Robert Avenue
Sun Valley, CA  91352

Chris Olsen
6350 Laurel Canyon Boulevard, #201
North Hollywood, CA  91601

The Foothill Trails Neighborhood Council
9747 Wheatland Avenue
Sunland, CA 91040

Chris Stone
Los Angeles County
Department of Public Works
900 S. Freemont
Alhambra, CA  91803

Ms. Patti Friedman, Deputy
Supervisor Michael D. Antonovich
San Fernando Valley Field Office
21949 Plummer Street
Chatsworth, CA  91311

Ms. Stephanie V. Landregan, ASLA
Mountains Recreation and Conservation Authority
L.A. River Center & Gardens
570 West 26, Suite 100
Los Angeles, CA  90065

# APPENDIX F

## Newsletters


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

# Big Tujunga Wash Mitigation Bank

December 2007

Big Tujunga Wash Mitigation Bank (Big T) is a 207-acre parcel of land located in the City of Los Angeles Sunland area (see map on page 4). The site was purchased by the Los Angeles County Department of Public Works (LADPW) in 1998 for the purpose of compensating for habitat loss from other LADPW projects.

Big T protects one of the most rapidly-diminishing habitat types found in southern California - willow riparian woodland. The stream and pond-side natural communities are home to many native species that depend on them.

More species of birds nest in willow riparian woodlands than in any other California plant community, and up to twenty-one of these are facing threats of extinction due to habitat loss. Additionally, up to one-quarter of all California land mammals also depend on riparian habitat.

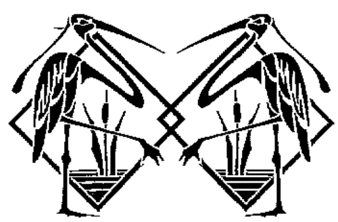
Since July 2007, ECORP Consulting, Inc., has teamed up with the County of Los Angeles Department of Public Works in order to continue to implement the habitat restoration plan at Big T.

Upcoming projects to implement the habitat restoration plan include tasks such as exotic plant and wildlife removal, native plant and animal species restoration, biological monitoring of native species, water quality monitoring, trail maintenance, and community outreach services. You may read more about these projects on page 2. Additionally, the Big T Wash Line Newsletter, which was discontinued in 2005, will resume publishing on a twice-yearly schedule.

## Announcements

- **The next Community Advisory Committee (CAC) meeting is scheduled for March 27, 2008 from 6:30 to 8:30 pm at Hanson Yard**
- **Any Others? Trail Cleanup Day?**

**The Los Angeles County Department of Public Works' implementation of the Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank has been under way since April 2000. 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. The next Big T Wash Line will be published in Spring 2008.**



# Conserving our Native Species

A largemouth bass captured by fisheries biologists that had just eaten a federal listed as threatened Santa Ana sucker.

### Fishing out the Predators

Big T has become a home to many species, including some that just don't belong there.

In Summer and Fall 2007, almost two thousand non-native fish and other aquatic species were fished out of the wash and ponds by our biologists, which included a largemouth bass which had eaten a Santa Ana sucker.

Santa Ana suckers are fish that are federally listed as threatened and are only found in Southern California. They have become threatened due to loss of habitat and competition caused by the introduction of non-native wildlife species.

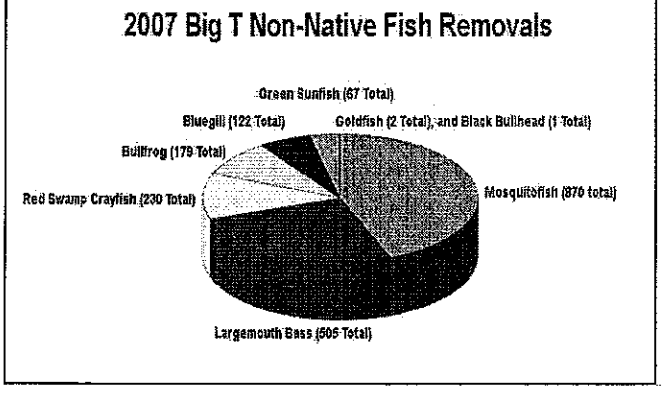
It is vitally important to remember that turtles and fish, along with any other pets, should never be released into the wild because they may harm the native species already trying to survive there.

If you have a freshwater aquarium or other aquatic pets, it is likely that they may be able to survive in the temperate waters of our southern California streams and lakes. Besides out-competing the natives, aquarium pets might introduce exotic diseases into the ecosystem, so please never release your pets in the wild! Besides, it's also against the law to transport or relocate fish and other animals in the State of California.

### Habitat Restoration

Other conservation projects to look for at the Big T will include tamarisk removal. This invasive plant was introduced from Africa by the end of the 19th century for windbreaks, firewood for steam locomotives, and shade trees. It's a water loving species that is highly salt tolerant and has been known to dry out water sources when established at desert springs. Tamarisk is highly invasive and will exclude native plants such as willows and cottonwoods.

To help fill voids where exotic plants are removed, native cottonwoods and willows, along with other native riparian plant species, will be replanted between late Winter and Spring 2008. Many of these, including willow, are fast growing and should start to green up the Big T in just a few years.




### When a Native Species goes awry...

Brown headed cowbirds are a native species known as a 'parasitic breeder,' which have spread throughout the West because they follow human development. This wouldn't be such a bad thing except for the fact that they rely on using other unsuspecting bird species to raise their own young!

Cowbird nestlings dupe the 'adoptive' parents into taking care of them and even manage to push out real chicks and eggs in order to get all the care for themselves.

Cowbird parents are also known to take mobster-like revenge on other birds if their eggs are removed from nests. One study found that cowbirds returned to a nest and smashed all of the native birds' eggs after the cowbird eggs were removed. If the cowbird eggs were left in the nest, all of the eggs would hatch and the real nestlings would lose out to the baby cowbirds.

The only way to effectively control cowbirds is to capture adults during the breeding season. Large cages containing 'bait' cowbirds are used to capture additional cowbirds. The traps contain food and water for the birds and are checked on a daily basis for newly captured birds. Sometimes non-target birds are accidentally trapped but they are quickly released. Any newly trapped cowbirds, which are attracted by the songs of the bait cowbirds, are also removed on a daily basis.

In order to protect endangered songbirds such as the least Bell's vireo and southwestern willow flycatcher at the Big T, we will be placing cowbird traps in Spring 2008 and checking them on a daily basis.

If you see cages at the Big T next Spring , remember that the birds inside may be harmful to local native songbirds if they are released, so please do not disturb them.

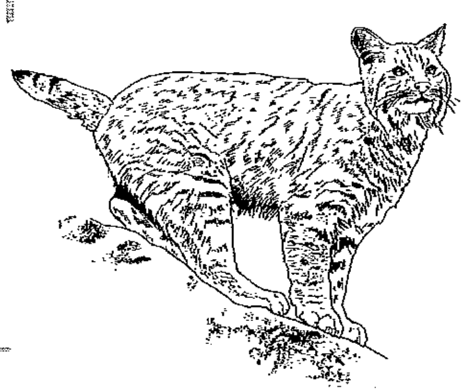
# Thank You to the Volunteer Stewards of Big T!

Many thanks and credos are owed to volunteers like Andrea and James Gutman and Terry Kaiser for recently clearing logs off the trails, and to many others who take it upon themselves to pick up trash and do other things to help protect the natural resources of the Big T. It is through your love of nature that we all benefit!

If you would like to help, here are a few simple things you can do for the Big T:

1) If you observe an unsafe situation or problem at Big T, please call the County of Los Angeles Department of Public Works contact number on the back page (or 911 in an emergency).
2) Properly dispose of trash, it's ugly and can harm animals if eaten (be careful with sharp items like glass).
3) Don't make rock dams or block the water in the wash; our native fish need running water, not pools, and plenty of stream access to survive!
4) Loose dogs may chase and harm wildlife and other people, or even themselves. So please, keep your dog on a leash at the Big T at all times.
5) Enjoy your visit, and remember to take nothing but memories, leave

*"Treat the Earth well: it was not given to you by your parents, it was loaned to you by your children."*



# Kid's Corner

## Backyard Friends

Do you know what shelled animal calls Big T its home? Well, it's the western pond turtle (*Actinemys marmorata pallida).* This cool little turtle likes to eat small fish, frogs, water insects, and plants. During the day, pond turtles like to stretch their legs out on rocks or logs and lay out in the sun to get warm.

Unfortunately, they are being threatened by the red-eared slider turtle, the type of turtle you can buy at the pet store. People have been releasing red-eared sliders into Big T when they don't want them as pets anymore. This is really bad because the southwestern pond turtle has to compete with the red-eared slider for food. The red-eared slider is much bigger and more aggressive than the pond turtle. Big T is one of the few areas in California where the pond turtle can live but their numbers keep getting smaller and smaller.

Work being done at Big T is making life better for the Southwestern Pond Turtle and other native animals.

You can do your part also – DO NOT release your pets at the Big T.

## WESTERN POND TURTLE

**Q: When is a turtle not a turtle nor a tortoise??**

A: *When it's a terrapin!*

*The Big T is home to the native southwestern pond turtle. Even though it looks like a tortoise or turtle, its really a terrapin since it lives in fresh water (unlike turtles which live in the sea and tortoises which live on land).*

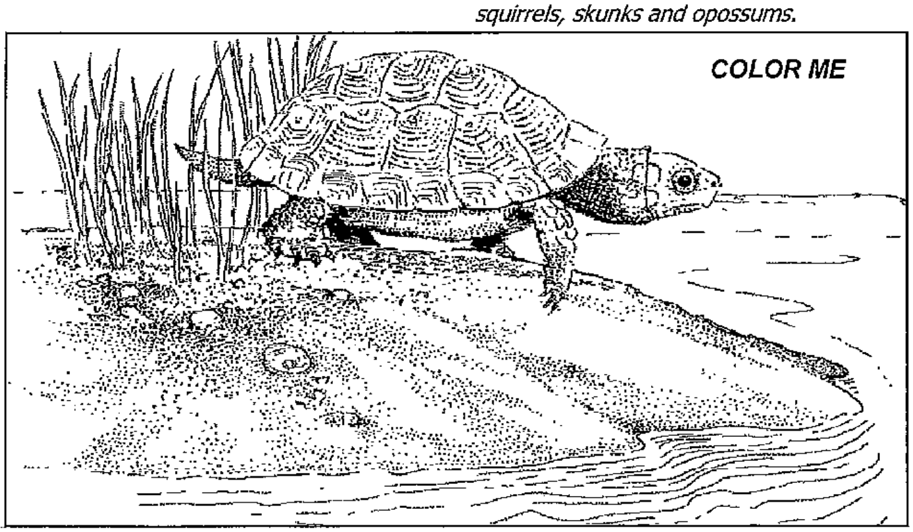
Q: How are you like a pond turtle?

*A: Pond turtles eat small fish, insects, bugs, and plants, just about anything they can find. Since they eat both meat and plants, they are omnivores just like you!*

Q: Do pond turtles have natural enemies?

A: *Yes!*

*Pond turtle predators include raccoons and coyotes. Young turtles can also be preyed upon by raptors, herons, ravens, weasels, and large fish, and turtle eggs can be eaten by rats, raccoons, ground squirrels, skunks and opossums.*



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

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**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:**

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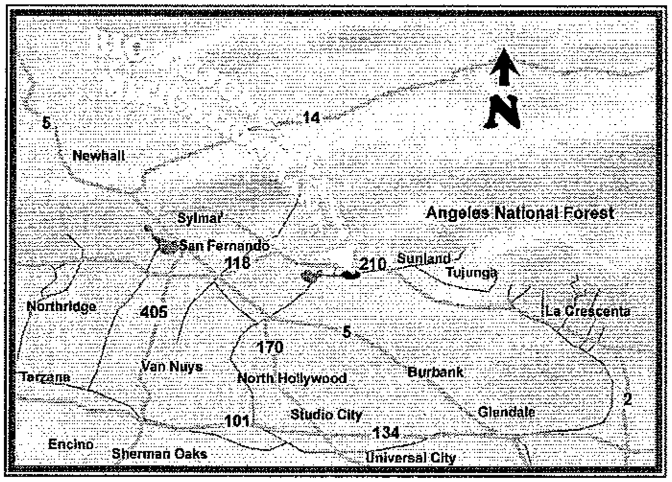


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**Ms. Belinda Kwan**
Water Resources Division
County of Los Angeles Department of Public Works
900 S. Freemont Avenue
Alhambra, CA 91803
Phone: (626) 458-6135
Fax: (626) 979-5436
Email: bkwan@ladpw.org

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

# Big Tujunga Wash Mitigation Area

**May 2008**

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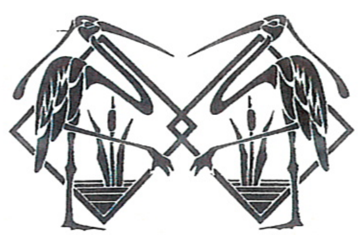
Since July 2007, ECORP Consulting, Inc., has teamed up with the County of Los Angeles Department of Public Works in order to continue to implement the habitat restoration plan at Big T.

Upcoming projects to implement the habitat restoration plan include tasks such as exotic plant and wildlife removal, native plant and animal species restoration, biological monitoring of native species, water quality monitoring, trail maintenance, and community outreach services. You may read more about these projects on page 2. Additionally, the Big T Wash Line Newsletter, which was discontinued in 2005, will resume publishing on a twice-yearly schedule.

## Announcements

- **The next Community Advisory Committee (CAC) meeting is scheduled for September 25, 2008 from 6:30 to 8:30 pm at Hansen Yard**
- **Trail Maintenance Day is May 17, 2008**

**The Los Angeles County Department of Public Works' implementation of the Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Area has been under way since April 2000. 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. The next Big T Wash Line will be published in Spring 2008.**



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**Fishing out the Predators**

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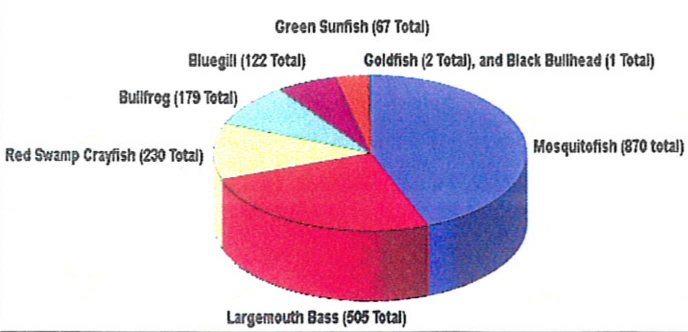
To help fill voids where exotic plants are removed, native cottonwoods and willows, along with other native riparian plant species, will be replanted between late Winter and Spring 2008. Many of these, including willow, are fast growing and should start to green up the Big T in just a few years.

**2007 Big T Non-Native Fish Removals**

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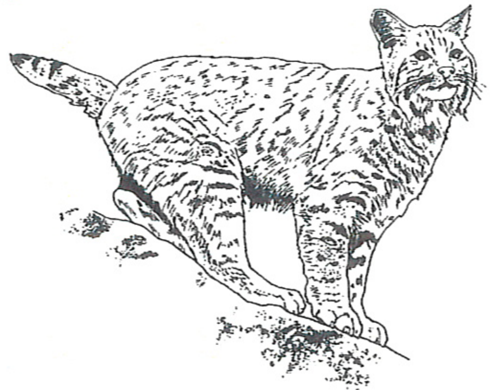

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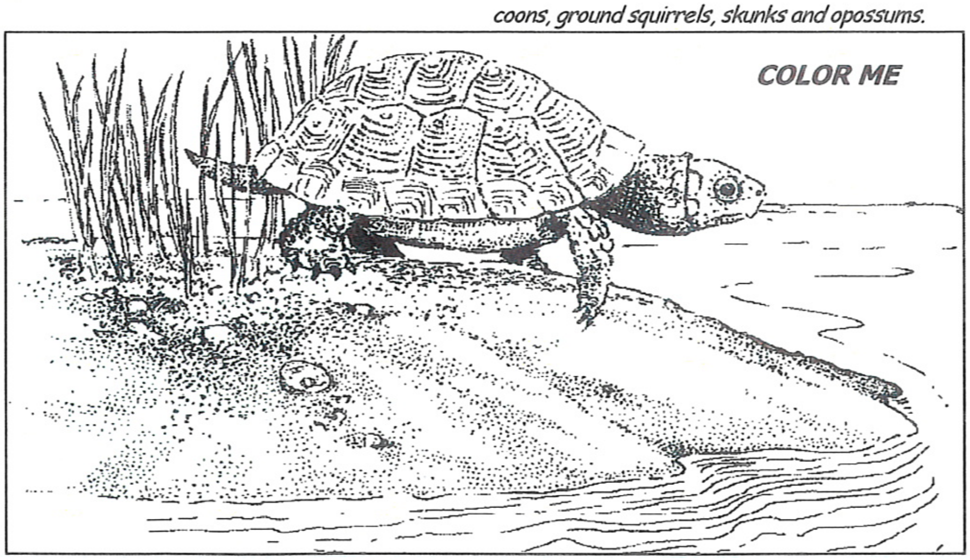

Water Resources Division
County of Los Angeles
Department of Public Works
900 S. Freemont Avenue
Alhambra, CA 91803

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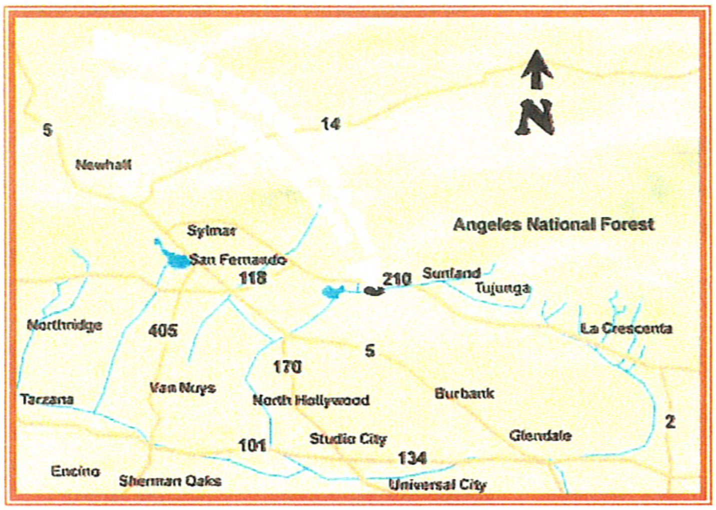


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# Big T Wash Line

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

September 2008

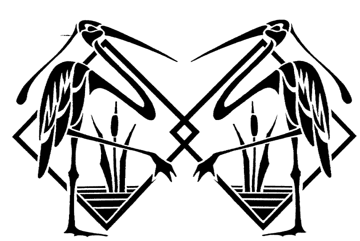
## Habitat Enhancement Work Continues

Big T protects one of the most rapidly-diminishing habitat types found in southern California—willow riparian woodland. Since 2000, the Los Angeles County Department of Public Works (LADPW) has been implementing a Master Mitigation Plan to restore and enhance habitat for native plant and animal species at Big T. Upcoming projects to continue the implementation of the Master Mitigation Plan include:

- **Exotic plant removal**—Weeding on the upland portions of the site continues to remove weed competition and allow native species to thrive. Poison oak is also being removed along the trails.
- **Exotic aquatic wildlife removal—**Exotic species, such as bullfrog, crayfish, and largemouth bass, are being removed using specialized nets, traps, and other methods. These exotic species harm native aquatic species by competing for the same food or being predators of native species.
- **Water quality monitoring—** Water samples are collected at Big T quarterly to address water quality issues from upstream land uses. In particular, excessive nutrients or pesticides in the water could affect aquatic species at Big T. Testing to date indicates that the chemical parameters are not a concern at Big T because they do not exceed the state drinking water standards.
- **Community outreach—** Community Advisory Committee (CAC) meetings are held twice yearly, and are an excellent opportunity for the community to meet with LADPW staff to find out the current status of programs at Big T and to bring up any issues of concern. The next CAC meeting will be held on September 25, 2008 (see the announcements on page 2 for details).
- **Trails use and maintenance—**A trails maintenance day was held on May 17 (see page 3). LADPW is

*(Continued on page 2)*

**The Los Angeles County 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 207-acre parcel of land located in the City of Los Angeles' Sunland area (see map on page 4). 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 LADPW projects. Big T protects one of the most rapidly-diminishing habitat types found in Southern California—willow riparian woodland. 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).**



(Continued from page 1)

in the process of having signs fabricated for the site, and posting is scheduled to begin in the middle of September. Uses that are compatible with the habitat enhancement at Big T are hiking and equestrian use on established trails. Incompatible uses include: any use of areas off of established trails, wheeled vehicles (including bicycles and ATVs), boating, fishing, swimming, hunting/shooting (including paintball guns), trash dumping, plant harvesting, release of animals, off-leash dogs, and overnight camping.

## Announcements

- The next Community Advisory Committee (CAC) meeting is scheduled for September 25, 2008 from 6:30 pm to 8:30 pm at Hansen Yard, 10179 Glenoaks Blvd., Sun Valley, CA
- Please notify LADPW if you notice holes in the fences, new trails being cut through vegetation, dumping of trash/debris, or any other activities that may be detrimental to the value of this natural area. Contact information is on the last page of this newsletter.
- The construction of rock dams in the creek is detrimental to native fishes because the pools that develop behind the rock dams become breeding grounds for non-native species. If you see any rock dams in the creek, please notify LADPW so that they can be removed.
- A fence encroachment issue between neighboring homes and the south boundary of Big T has been resolved, and restoration activities will soon be occurring in this area.

# Kid's Corner

## What a Sucker!

There's a "sucker" at Big T—the Santa Ana sucker, a little fish. The Santa Ana sucker (*Catostomus santaannae*) is a fish native to streams in the Los Angeles Basin in southern California, including at Big T. These "suckers" are not related to the "sucker fish" that are commonly found in freshwater aquariums, which are native to central and south America. The Santa Ana sucker has large lips and a small mouth that lets it "vacuum" its food from stream beds. Adult Santa Ana suckers are about 6 inches in length and have dark, blotchy backs with silvery colored undersides.

The Santa Ana sucker has been identified as a "threatened" species by the federal government. This means that the species could become endangered (in immediate danger of becoming extinct) if it is not protected. They have become threatened due to loss of habitat and competition from species that are not native, meaning they would not naturally live at Big T. Non-native species, like pet-store turtles and aquarium fish, can eat food usually eaten by the Santa Ana sucker and other native species, and can introduce exotic diseases. Work is being done to remove non-native plants and animals from Big T. You can do your part to help protect the Santa Ana sucker and other native species: **PLEASE DO NOT release your pets at the Big T site.**

# Fourth Annual Big T Trails Maintenance Day

The Fourth Annual Big Tujunga Mitigation Area (Big T) Trail Maintenance Day was held on May 17, 2008. Community volunteers, ECORP Consulting aquatic biologists, and Los Angeles County Department of Public Works' (LADPW) staff attended the event. The focus of the event was trash removal in the upland, riparian, and in-stream areas.

ECORP's biologists provided guidance and support during maintenance activities to ensure safety and protection for the Santa Ana sucker, the arroyo chub, and the Santa Ana speckled dace present in Haines Canyon Creek.

ECORP's biologists removed trash in approximately one mile of the Hanes Canyon Creek at the Tujunga Ponds. The community volunteers and LADPW staff focused their trash removal efforts on the trails in the upland and riparian habitats.

The approximately 15-person crew, working from 8 am to noon, collected and removed several large tires, a bundle of razor wire, plastic crates, and more than 20 bags of trash.

The Fourth Annual Big T Trails Maintenance Day was a success thanks to all of the hard work from the volunteers. And, a special thank you to Andrea and James Gutman and Barbara Tarnowski for helping with event coordination and preparation.

*Just a few of the volunteers from this event were: (from left to right) Andrea Gutman, James Gutman, Debra Mader, Valerie De La Cruz, Barbara Tarnowski, Pat Wood, Patricia Davenport, and Belinda Kwan (taking photo).*

*Trash waiting to be collected at the Cottonwood entrance.*

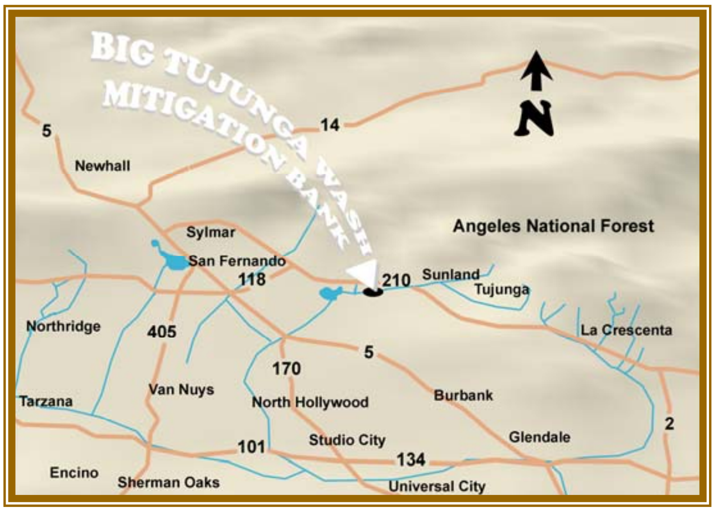
*All photos courtesy of Valerie De La Cruz*

Water Resources Division
County of Los Angeles
Department of Public Works
900 S. Freemont 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 Los Angeles Police Department's (LAPD's) non-emergency number at (877) ASK LAPD or (877) 275-5273.
- 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 LAPD 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 5:50 p.m., Monday through Thursday), please contact:

**Ms. Belinda Kwan**
Water Resources Division
County of Los Angeles Department of Public Works
900 S. Freemont Avenue
Alhambra, CA 91803
Phone: (626) 458-6135
Fax: (626) 979-5436
Email: bkwan@ladpw.org

* After work hours or on weekends, please contact the Department of Public Works at (626) 458-HELP.

# APPENDIX G

## CAC Meeting Agendas and Minutes

**Big Tujunga Wash Mitigation Bank Project**

**Community Advisory Committee Agenda**

Date: Thursday, September 27, 2007

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
Chambers Group, Inc.

I. Welcome/Introduction

II. Review of Meeting Agenda

III. Site Maintenance Issues
Discussion of Action Items From Previous Meeting

IV. Current Status of Programs and Programs Implemented in 2006 and 2007

1. Exotic Plant Eradication Program
2. Riparian Habitat Restoration
3. Exotic Wildlife Removal/Monitoring
4. Water Quality Analysis
5. Trail Restoration/Maintenance

V. Discuss and Schedule Next Trail Maintenance Day

VI. Schedule Next CAC Meeting

VII. Comments, Questions, and Answers

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**DRAFT**
**Big Tujunga Wash Mitigation Bank Project**
**Community Advisory Committee Meeting Minutes**
**September 27, 2007 Meeting**
**Hansen Yard 6:30 to 8:30 pm**

## I. Welcome/Introduction

1. Welcome
    a. Attendance list – attached to minutes
2. Review of Agenda

## II. Site Maintenance Issues and Discussion of Action Items from Previous Meeting

1. Site Safety – Belinda Kwan stated that the public should continue to call the Los Angeles Police Department to report any illegal activities within the Mitigation Bank. The numbers are (877) ASK LAPD or (877) 275-5273.
2. Website – No changes to the website from the last meeting (www.ladpw.org)
3. General Site Signage – At the last meeting, sample signs were reviewed. Chris Stone stated that the outstanding issues include (1) what "no's" to include on the signs and (2) the portion of the municipal code that will be enforced. There is a need to cover all of the important illegal activities, but if the signs are too busy or there are too many "no's" then the signs won't be effective. Legal review is currently under way to determine what portion of the municipal code applies to LADPW property on which some recreation is allowed. A straight "no trespassing" won't work because there are some allowed public uses on the site. Mary Benson suggested there may be some state laws (perhaps Regional Water Quality Control Board regulations) that may apply. Terry Kaiser suggested that there may be a benefit to having some sort of cross-over enforcement or MOU with Parks and Rec. They are building a ranger station at Hanson Dam and they now have quad runners to respond to off road areas.
4. Kiosks – DPW tried to remove the kiosk near Cottonwood in June, but there were nesting birds using the kiosks. The nesting season is over in September, and they will finish removing the kiosk soon. Mary Benson suggested combining this day with a trails cleanup day in which the debris washed into the Mitigation Bank by the recent rains could be cleaned up.
5. Cottonwood Area as a Staging Area – Terry Kaiser is still investigating using the Cottonwood area as a staging area in case of a fire or other emergency. DPW reminded the group that CDFG wants minimum use of the Mitigation Bank.

## III. Current Status of Programs

1. General – ECORP Consulting began work on the project in July.
2. Exotic Plant Removal – Nature's Image will take out all exotics in a particular area at a time, instead of by species. Mari Schroeder will notify the group if areas need to be temporarily closed. Isolated patches of exotic plants may not be removed if removal

may cause too much damage to beneficial species. CDFG permit needs to be updated to use chemicals. Terry requested that poison oak be removed 4-5 feet from edge of trails (this task may be part of trails maintenance).

3. Exotic Wildlife Removal – Todd Chapman reported that ECORP biologists have been out twice since beginning the contract in July. They have used seine nets and frog and turtle traps, and have done snorkel surveys. Many exotic fish have been removed. They also caught some Santa Ana suckers. No turtles were caught. Algae made it difficult to see during snorkel surveys and to pull nets. They may modify their methodology to do the removals in the winter when there is less algae. ECORP will take samples of the hair grass to be evaluated by the ECORP botanist to determine if it is native. However, even if it is native, it is out of control. Todd Chapman reported that the number of frogs and turtles are significantly reduced from past years. During recent visits, they were mostly dealing with fish (including goldfish) and crayfish.

4. Riparian and Upland Restoration Areas – The most recent planting was too late in the year. Terry Kaiser reported that some cuttings have started to bud with the recent rainstorm. Todd Chapman reported that he noticed that some people are pulling the "sticks" out of the ground, not realizing that they may be dormant cuttings. Mary Benson stated that more public outreach and education may help this problem. B. Kwan stated that the DPW newsletters have stopped. Mary Benson suggested that either the DPW newsletter should start again, or regular articles could be placed in the neighborhood association newsletters. Mari Schroeder stated that part of the new contract is to start the newsletter again. Andrea Gutman stated that maybe the newsletter could be posted on the site also.

   Nature's Image has been watering the cuttings and have been evaluating what survived the Summer heat and what needs to be replanted. Replanting will occur in January or February if there is rain. If there is no rain, planting may not occur.

5. Water Quality – MWH will continue to conduct water quality sampling and analysis. Water quality sampling has not occurred since the last meeting, but will occur soon. Very little change from past results (which have all been similar) is expected.

6. Trail Usage and Maintenance – ECORP biologists have walked all of the trails in the Bank and have assembled a list of maintenance items. Poison oak encroaching on the trails is a general problem. Other problems include low branches and a fallen tree behind Gibson Ranch. Andrea Gutman mentioned a big log creating a hazard to horses at a water crossing between Cottonwood and the ponds. Terry Kaiser offered to ride the trails and GPS problem areas. There has been no recent trail maintenance. ECORP's contract is for trail maintenance four times per year and on request (e.g. a tree blocking a trail).

   CDFG has requested mapping of the trails, and that the trails wider than 5 feet may be deducted from mitigation bank credits. DPW is currently surveying the trails. In general only the haul road and a few trails are wider than 5 feet. Mari knows of other banks where recreation (trail use) is allowed. She will research and write a letter with defensible arguments for negotiation. There was a general concern that if the trails are closed, then illegal uses will increase.

   Terry Kaiser to send Mari a copy of his base map. Terry would like the DPW to help fund the purchase a new aerial for a base map from CC Curtis. They fly the area in March of each year. B. Kwan will get a new aerial as part of the existing survey contract, or they can order a new aerial for a vendor. Terry would prefer an electronic map on CD and can pay the difference between a hard copy and electronic copy.

7. Graffiti and Other Unauthorized Uses – There have been several incidents during site visits since ECORP's contract began in July. Todd Chapman observed a person release an animal from a trap in the area off Wentworth. An ECORP biologist was bitten by a pit bull. The person with the dog seemed to be living on the site, although a similar dog was spotted in the yard of an adjacent house. A group of BBQers was observed near Wentworth. Mari will investigate with Nature's Image the possibility of using native plants (cactus, poison ivy) in selected areas to discourage use. Terry reported that a mountain lion was spotted in the area and crossing Wentworth by two people (two separate reports). Terry has noticed increases in mountain bike use in the National Forest that may migrate to the Mitigation Bank. Mary stated that some maps show the Bank trails as off-road bike trails. Andrea noted that there is graffiti on all of the rocks along the haul road. Terry will investigate rental of a power washer with a boiler. Mari stated that the graffiti removal and method will have to be approved by CDFG, but it is not likely to be a problem given the location of the graffiti (haul road).
8. Gibson Ranch – C. Stone stated that the issues are almost resolved. The Ranch will exchange property to the east for the arena property at a 1:1 ratio. The paperwork is expected to be completed in a couple of months.

## IV. Next Trail Maintenance Day

1. The next trail maintenance day will be in conjunction with the kiosk removal. Chris Stone will send an email. Todd Chapman would like to re-establish a rock dam clearance day. No specific date was established at this meeting. Andrew Hennigan distributed information on the Tujunga Wash Cleanup Day on October 27. This event is not within the Bank.

## V. Schedule Next CAC Meeting

1. The next CAC meeting is scheduled for March 27, 2008 from 6:30 to 8:30 pm at Hanson Yard.

## VI. Comments, Questions, and Answers

1. There were no additional issues raised.

**DRAFT**
**Big Tujunga Wash Mitigation Bank Project**
**Community Advisory Committee Meeting Minutes**
**September 27, 2007 Meeting**
**Hansen Yard 6:30 to 8:30 pm**

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2. Review of Agenda

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## VI. Comments, Questions, and Answers

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**Big Tujunga Wash Mitigation Bank Project**

**Community Advisory Committee Agenda**

Date: Thursday, March 27, 2008

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

V. Discuss and Schedule Next Trail Maintenance Day

VI. Schedule Next CAC Meeting

VII. Comments, Questions, and Answers

**DRAFT**
**Big Tujunga Wash Mitigation Bank Project**
**Community Advisory Committee Meeting Minutes**
**March 27, 2008 Meeting**
**Hansen Yard 6:30 to 8:30 pm**

## I. Welcome / Introduction

1. Welcome
    a. Attendance list – attached to minutes
2. Review of Agenda and meeting minutes from Sept. 27th 2007.

## II. Site Maintenance Issues and Discussion of Action Items from Previous Meeting

1. Site Safety – Mary Benson stated that the LAPD have been called over 100 times and they still are not getting any response. It was stated that something else should be done. The citizen patrol which was made up of local volunteers has fallen apart because they were unable to get any backup. A neighborhood watch patrol which was started three years ago has also fallen apart, because of discouragement related to the lack of support and response from law enforcement. Belinda Kwan stated that she understands their frustration, but the public should continue to call the Los Angeles Police Department to report any illegal activities within the Mitigation Bank. The numbers are still (877) ASK-LAPD or (877) 275-5273.

    There has been a problem with people carving and marking trees at various locations throughout the Big T site. There was a report of three young men wielding guns or air rifles around the ponds, possibly going after water fowl. There has also been a recurring problem with ATVs on the trails. Groups of up to 8 individuals have been seen regularly riding their vehicles on the trails and within the wash. The ATVs and mountain bikes are entering the site through Hansen dam, under Wentworth to the haul road. They are going under the railings at the equestrian center and out onto the Big Tujunga wash. They are gaining access to the site by going along the new golf course bike path trail under Foothill Avenue and under the 210 freeway to enter the site. There are currently 14 to 15 blogs on the internet promoting the Hansen dam trails and haul road as open for mountain biking and ATV riding areas. Sport Chalet is also selling a map that shows the trails designated as a mountain biking area.

    There was another pitbull attack which occurred recently near the mitigation bank. Chris Arlington was riding her horse on the trails and was approached by the dog, which began to attack her horse. The dog was eventually called off by its owner with no injuries to the horse or rider. Several phone calls were made to authorities with no response.

    The lifeguards who are stationed at the Hansen Dam cannot help during emergency situations. There are currently no rangers assigned to the Hansen Dan station, and there won't be any ATVs for them to use on patrol until the fall of 2008. These ATV patrols will be a much needed asset once they come on line. Currently there are no rangers patrolling the mitigation area, and the lifeguards are only responsible for the

Hansen Lake swimming area. It is possible that rangers will start up patrols sometime in May of 2008, on Saturday and Sunday, and in the evenings.

Enforcement is a big question out there and it was stated that the access points must be one of the control methods. The foothill bridge is currently under construction and the gate is open most of the time, including the weekends. LADPW will talk to the City about the open gate at the bridge construction area. There is also a crane blocking the county access gate on the south side of the Big T wash on Foothill avenue, so it is possible that the porta-potty cannot be serviced.

2. Website – The website has undergone some changes since the last meeting. Some of the attendees were unsure of how to access the Big T Wash Mitigation Bank site. Belinda Kwan informed everyone that the website now has meeting minutes all past CAC meetings, current meeting agendas, past reports, and the newest edition of the newsletter. The website is (www.ladpw.org), if you go to the Government Tab, and then find the Environment box on the bottom left, there is a bulleted link to the Big T Wash Mitigation Bank. Photos of the website will be brought to the next CAC meeting to assist those still unable to navigate to it.

3. General Site Signage – Chris Stone has been working with county council to ensure that the correct codes for enforcement purposes are used on the signs, and what activities should be excluded. LAPD will be the responding agency, once the correct enforceable codes are posted. The firearms issue is the only code that they have to work out. This should be resolved soon. It was brought up during the meeting that it would be a good idea to have multiple copies of the signs created as backup for ones that are destroyed or go missing. It was also suggested that they be installed up high, limiting the amount of vandalism they could sustain. Signs will be posted at all entrances to the mitigation area. A graffiti proof coating should be placed onto the signs to prohibit vandalism and facilitate ease of cleaning. No enforcement will happen until the signs go up because they can't legally enforce anything. There have not been any issues recently with paint ball warriors on site.

4. Kiosks – DPW tried to remove the kiosk near Cottonwood in June, but there were nesting birds using the kiosks. This kiosk is still there and ECORP biologists will survey it the next time they conduct a site visit along with coordinating the visit with Terry Kaiser who has expressed interest in cutting down and removing the kiosk.

5. Cottonwood Area as a Staging Area – Terry Kaiser is still interested in using the Cottonwood area as a staging area in case of a fire or other emergency. DPW reminded the group that CDFG wants minimum use of the Mitigation Bank. Terry is investigating the use of this site in addition to other nearby locations. Terry was going to talk with the management team at the equestrian center to see if they would also be open to the idea of assisting as an evacuation site also. The equestrian center has 20 acres available for parking trailers in Gabrielino Park and there is also a large area under the power lines near Gabrielino Park and Pierce College can grant emergency access. Terry is also working on getting approval from the Fire department, in order to train people who will be working at the evacuation site. Prior to becoming an established evacuation site, the operation will need to be permitted or certified according to current animal regulation and control rules. The volunteers will also have to be qualified to conduct such rescue operations, and there will also have to be veterinarians present to check on animals when they arrive. Terry will provide more details at the next meeting.

6. Current situation at the equestrian center - Jimmy Perez will be running the rental venue at the equestrian center and the residences currently on-site will be taken out.
7. Neighborhood watch program - There are four local groups which are currently putting on training for a neighborhood watch program. Complaint about this effort mirror earlier comments about a lack of law enforcement backup, although the chief ranger has said that they will provide backup for this community watch program. Terry Kaiser said that their group would not pursue this unless they have an MOU with the rangers and the LAPD. They are looking for the heaviest support on the weekends.
8. Equestrian gate installation - Terry will be submitting permit application to Belinda Kwan for the installation of a manually opened and closed gate, and the permit fee will be waved. The gate would be set back 30 feet from Wentworth incase a horse gets loose in the mitigation area preventing a collision with vehicles on Wentworth. In addition to the gate, a sign should be posted stating the safety concerns and reasons why they should close the gate. Terry will also include the removal of the kiosk on the permit application, to cover all liability issues. Prior to the removal of the kiosk he will be coordinating with ECORP biologists so they can conduct a bird nest survey prior to its removal. Terry is also going to assess the need for a gait structure at the Mary Bell entrance.

## III. Current Status of Programs

1. Exotic Plant Removal – Mari provided an update on the progress of the Exotic Plant Eradication efforts. Weeding has begun in the upland portions of the site and it looks good so far, and some other larger exotics have also been targeted. These efforts will remove weed competition allowing the natives to thrive. The application for herbicide spraying is being reviewed by the Department of fish and game. Once that permit is approved, herbicide spraying will commence in the riparian areas. Terry has requested that poison oak be removed from along the trails. A biologist will be tasked with locating areas of Poison oak which can be targeted for removal during their next site visit. The vegetation clearing which is occurring along the perimeter of the ponds is not being conducted by ECORP or Natures Image, it is most likely related to the recent installation of fishing platforms around the ponds.
2. Exotic Wildlife Removal – Todd Chapman provided an update on their efforts. Aquatic exotic species removal efforts were conducted three times in 2007 with good success using seine nets, fyke nets, turtle traps, and spear fishing snorkel surveys. ECORP's next exotic species removal effort will take place in late April or May. We are waiting to allow young fish recruits to emerge and bullfrogs to begin their spawning. One interesting thing to report was the occurrence of large mouth bass predating on a Santa Ana sucker. The adult sucker was partially hanging out of the mouth of the bass when it was captured.

   Plywood platforms have been removed by flood maintenance from around the pond. It was also mentioned that large tree branches are also being cut off the trees and placed into the reeds to provide additional support for fishing platforms. There have also been some recent impacts on the trail just north of the two ponds where vegetation clearing has been occurring, and four wheel drive vehicles have been driving.

Locations for boulder barricade installation will be considered by LADPW in order to prevent ATVs, and 4x4 vehicle usage on the site. The identity of the hair algae/grass growing in the ponds was questioned and samples will be collected during the next site visit so an ECORP botanist can identify the species and determine if it is native or non-native.

3. Riparian and Upland Restoration Areas – A few of the remaining cuttings have started to bud with the recent rainstorms. We will continue to maintain the riparian areas, and we will also commence the planting of cuttings again when the timing is correct. Adequate signage will also be installed to inform the public.

4. Water Quality – MWH will continue to conduct water quality sampling and analysis.

5. Trail Usage and Maintenance – ECORP biologists have walked all of the trails in the Bank and have assembled a list of maintenance items. Poison oak encroaching on the trails is a general problem. Other problems include low branches and a fallen tree behind Gibson Ranch. Terry Kaiser offered to ride the trails and GPS problem areas. Mosquitoes have become a big issue on some of the trails. Belinda is going to check with flood maintenance division to inquire about vector control in the mitigation area, and whether they are using mosquitofish. If they are spraying insecticides, it should be determined if vertebrate species could be affected. Several individuals recall the spreading or spraying of a dust in the past, which seemed to kill the mosquito larvae, is this still a possibility?

   There is a bog currently on the project site where a horse was caught in some of the roots. A trail has become eroded due to excessive flows and standing water which caused the trail to collapse and expose large roots which cross the trail 6-10" above the substrate. This problem area is 250 -300 feet down the water trail from the Cottonwood entrance, on one side of the creek crossing. It is suggested that this trail be closed with a route established which can avoid this area. Terry will meet with Todd to show him the problem area along the trail.

   South of Wheatland Ave, the stream has taken a turn and has gone back into the wash. Terry and others have been removing a lot of the dead alders along the trails. There is one trail which runs along the old south chain link fence which is in need of some serious maintenance, vegetation trimming. ECORP will check this out, during the next site visit.

   There was a recent effort by 13 volunteer on the site, where rocks were cleared from the trails except along the water trail. Mary Benson mentioned that the LA Trails Project has received a grant for trail planning from the National Park Service. They would like to offer assistance for trail maintenance and restoration on the site. The State also has a grant that will match 84% of funds. One area proposed for improvement was the Wheatland access trail which has been degraded and is narrowing. Some signs indicating the problem would be good. Foothill trails and Sun Valley Neighborhood council can do some matching of funds to help out, $10,000 – $15,000 would be an easy grant. Mary Benson also suggested that restoring some of the haul road and making it into a nice trail would be another alternative.

   The next trail maintenance day, to remove trash from around the ponds will be on May 17, 2008, 0800am. Terri will bring the tools needed to conduct the trail maintenance day. Terri has also expressed interest in having some fallen trees removed from the creek to allow better flow, relieve some of the overflow potential from certain crossing areas, and this will also help to cleanup some of the accumulating debris. Todd will contact Jesse Bennett of USFWS to discuss the potential removal of trees and rock dams from the creek. Rubber gloves were suggested for the trash pickup event. Carol Roper would like to be notified when planting is going to occur on site so she could put it into the Shadow Hills Property Owners Association (SHPOA) newsletter.

6. Graffiti and Other Unauthorized Uses – There have been several incidents during site visits since ECORP's contract began in July

7. Gibson Ranch – Chris Stone stated that the issues have been resolved, and the fences will be moved soon. LADPW is at the final resolution, there will be a land swap of 1 to 1, and the final approval will be brought before the board of supervisors on April 8, 2008. End of April/early May the fences will be moved. Restoration efforts will be conducted following the move.

   Gibson ranch puts on a yearly fund raiser for Parkinson's disease research. They would like to put on a wagon hay ride. They wanted to know if they can use the cottonwood area to take the wagon down the main road on the cottonwood site then turn around and go back out to Wentworth Ave.

   LADPW will be enlarging the Hansen spreading grounds. They will be deepening them to the same depth as the other basins. LADPW will be paying for part of the project. Contractors will begin work in August timeframe. All materials will go to the nearby Vulcan facility. The last phase of this construction will include the planting of vegetation and trees around the project boundaries.

## IV. Next Trail Maintenance Day

1. The next trail maintenance day will be May 17, 2008, 0800. Chris Stone will send out an email.

## V. Schedule Next CAC Meeting

1. The next CAC meeting is scheduled for September 25, 2008 from 6:30 to 8:30 pm at Hanson Yard.

## VI. Comments, Questions, and Answers

1. The Foothill Trails Neighborhood Council would like to be added to the mailing list. Their address is 9747 Wheatland Ave., Sunland, CA 91040.

**Big Tujunga Wash Mitigation Bank Project**

**Community Advisory Committee Agenda**

Date: Thursday, September 25, 2008

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

V. Discuss and Schedule Next Trail Maintenance Day

VI. Schedule Next CAC Meeting

VII. Comments, Questions, and Answers

**DRAFT**
**Big Tujunga Wash Mitigation Bank Project**
**Community Advisory Committee Meeting Minutes**
**September 25, 2008 Meeting**
**Hansen Yard 6:30 to 8:30 pm**

## I. Welcome / Introduction

1. Welcome

    a. Attendance list – attached to minutes

## II. Review of Meeting Agenda

Ms. Valerie De La Cruz, Los Angeles County Department of Public Works (LADPW) reviewed the meeting minutes from March 27, 2008 and the meeting agenda for the current meeting.

## III. Site Maintenance Issues

<u>Greater Los Angeles Vector Control District</u>: Russ Gabel, Susanne Kluh, and Mark Daniel were present from the Greater LA Vector Control District. Russ Gabel gave a summary of their activities in the Big Tujunga Wash area. The District is responsible for the vector control activities in the general area around and including Hansen Dam. Their inspection cycle is about every 10 to 15 days, depending on weather conditions. Most of their work is done on foot, but they also have one ATV with flotation tires to minimize impacts to the environment. The tire tracks recently seen at Big T could have been them. Their biggest concern is mosquitoes, because of the West Nile Virus, which is spread through mosquito bites. There was one human case of West Nile virus reported today in the area. They use two materials to control mosquitoes but this season they have only used one type, a granular material containing BTI, a bacterium that only affects mosquito larvae. BTI is a common soil bacterium targeted to mosquito larvae with no toxicity to fish or mammals. It is used in areas that are heavily vegetated where fish can't get in to eat the mosquito larvae. It is not used in open water bodies because fish and wave action generally control the mosquitoes. The goal of the District is to have a balanced site so that no mosquito control is needed. They would like some input on the vegetation management at Big Tujunga so that the streams do not get choked off and fish and flowing water can control the mosquitoes naturally. If there are mosquito problems noticed at Big Tujunga, or if more information on control methods and schedules is needed, please call Russ Gabel or Mark Daniel at 862-824-0423. It should be noted that there is also a biting black fly problem at Big Tujunga. In investigating a complaint, they may conclude that the problem is black flies, which they do not control.

The second control material is a juvenile growth hormone, which affects the development of the mosquito larvae. They have not used this recently. They also have not used mosquito fish in several years in natural water bodies because of the potential to affect the natural environment. Mark Daniel stated that he is on an Environmental Task Force investigating using native species to control mosquitoes, but that solution is in the future. The best scenario is vegetation control so that no outside controls are needed. LADPW, ECORP, and the District agreed to keep in contact about the site.

IV. Current Status of Programs

Exotic Plant Eradication Program: Arundo, hyacinth, tamarisk, castor bean, and eupatory have been targeted. The California Department of Fish and Game herbicide permit has been submitted and is in process. It is currently past the bird breeding season, and weed removal is commencing with hand crews. After the permit is received, the larger non-native plants will be targeted with herbicides. The upland habitat looks good. Native plants have seeded and sprouted and a lot of oaks are re-sprouting.

Barbara Tarnowski reported that umbrella sedge is multiplying where the bridge used to be and it is obstructing the flow in the creek. This is a native plant, but Mari Quillman will have Nature's Image check it.

Riparian Habitat Restoration: Many cuttings died or were pulled up last year. Many of those that remained have been able to be brought back through hand watering. An inventory will be conducted soon. Mari is hoping that there will be enough new plants and recovered plants to meet the success criteria so that re-planting will not have to be conducted.

Exotic Wildlife Removal: Exotic wildlife removal is scheduled to occur 4 times per year, but the aquatic biologists were able to be efficient with the budget and conduct a 5th removal session. The have removed a substantial number of bullfrogs and bullfrog larvae, goldfish, red-eared sliders, and bass. They have used spear fishing as an effective removal technique.

Water Quality Analysis: Water quality monitoring continues, and all parameters are within acceptable limits, including herbicides and pesticides. Barbara Tarnowski asked what herbicides are on the draft CDFG permit to be used for exotic plant removal. Mari Quillman will send her a list. The next sampling session is scheduled for December 2008.

Barbara Tarnowski stated that when she does water quality sampling she makes notes on the area. She stated that, starting in 2005, she has seen a drastic decline in water snails and starting in 2007 a decline in fresh water clams. She suggested it might be a good idea to start sampling for macroinvertebrates. Mari Quillman requested her observation sheets so she can have our aquatic biologists look into the issue.

Trails Restoration and Maintenance: Trail maintenance day will be held in May. Monitoring of the trails is continuing on a regular basis to document and correct problems. Poison oak removal will be beginning as soon as it resprouts in the spring.

Two old restoration signs have been tossed over the fence by the ponds. ECORP will look into removing them.

Mari Quillman discussed the potential for installation of removable vertical barriers at the entrance to the Tujunga Ponds parking area. These could be designed to be removed when the County or Vector Control needs to gain vehicle access to the area but they would prevent motorcycles and quads from entering the area. ECORP will work with the County to determine an appropriate location. The barriers would be locked and County personnel and Vector Control personnel would have a key.

Andrea Gutman suggested removal of the porta-potties because they seem to be a vandalism magnet. Chris Stone will look into it.

The fence on Wentworth between Cottonwood and Wheatland is damaged and covering up the trail. There is a potential for a horse to be injured. Valerie De La Cruz state that she will have Flood Maintenance Division look into it.

Andrea Gutman reported that there is still an issue with rocks painted with graffiti. Chris Stone will investigate a removal solution.

Website: Valerie De La Cruz passed out website screenshots to assist in navigation of the County's website. She has recently updated the site. The newsletter appears on the site, but she requested that those who want to receive a paper copy please send her an email with their address to (vdelacruz@dpw.lacounty.gov).

Gibson Ranch: Chris Stone announced that the property boundary issue has been resolved, the fence has been moved, and restoration/planting of the site can begin. Gibson Ranch has agreed to provide a source of reclaimed water for the restoration. A conservation easement is in process. Terry Kaiser stated that the wagon ride that they had requested for an event will not be allowed because they also wanted a petting zoo.

Site Safety: Terry Kaiser said that he and another rider had an incident by Wheatland with 3 men on motorcycles riding circles around the horses. He called LAPD. Valerie De La Cruz stated that four of the signs that list the County Ordinances are now installed and a fifth one is to be installed by the transmission line. She is going to contact LAPD to let them know the signs are up and they should start enforcing the stated laws. She emphasized that residents should call LAPD and not confront people breaking the rules themselves! She brought a smaller size sample of the sign and will post a copy on the website.

There was a discussion on other places to put the signs. LADPW cannot post signs on Parks department property. Some areas mentioned were the ponds (Parks property), the road leading to the ponds and Haines Canyon Wash entrance. Barbara Tarnowski asked how can other rules not listed on the sign be enforced? Chris Stone stated that they focused on the most damaging activities. At least something is posted now and we should wait and see if it is effective.

There have been no more known dog attacks since the last CAC meeting.

Kiosk: The kiosk has been removed. Terry Kaiser asked if he could use it for another site in Azusa Canyon.

Miscellaneous: Terry Kaiser has a 2008 aerial photo and will provide a digital copy to LADPW and ECORP.

A question was asked about the triangular parcel on the Lakeview Terrace side. The back taxes were paid and the County did not acquire this land. Chris Stone will try to find the current status of the property.

Andrea Gutman commended the Korean Church, stating they have recently cleaned up the wash from the church to Wheatland.

V. Discuss and Schedule Next Trail Maintenance Day

The next trail maintenance day was scheduled for Saturday, May 2, 2009

VI. Schedule Next CAC Meeting

The next CAC meeting was scheduled for Thursday, March 26, 2009.

VII. Action Items

- Mari to send Barbara Tarnowski a list of herbicides pending approval on the CDFG permit.
- LADPW to coordinate with LAPD to let them know the signs are posted on the site.
- LADPW to investigate other areas to post signs.
- LADPW to keep site safety discussions in CAC meetings to monitor effectiveness of signs
- LADPW to post a copy of the sign on the website
- LADPW to investigate if Terry Kaiser can use removed kiosk.
- ECORP will look into removing old signs that have been thrown over the fence by the ponds.
- Terry Kaiser to provide an electronic copy of the new aerial photo to LADPW and ECORP.
- LADPW to investigate retention or removal of porta-potties.
- LADPW will investigate repair of fence on Wentworth between Cottonwood and Wheatland.
- ECORP to check the potential for umbrella sedge to obstruct flow of creek near old bridge location.
- LADPW to find out the current status of the triangular parcel on Lakeview Terrace side.
- LADPW to investigate a method for graffiti removal on rocks.
- Barbara Tarnowski to send Mari Quillman her macroinvertebrate observation sheets.

# APPENDIX H

## Erosion Control and Barrier Maintenance Quarterly Reports

September 4, 2007
(2007-110)

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

**SUBJECT: First Quarter Erosion Control and Barrier Maintenance Report for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the erosion control and barrier maintenance monitoring efforts for 2007. The first quarter of monitoring began on August 27, 2007 with a site visit by ECORP biologists Kristen Mobraaten and Todd Chapman. The entire perimeter fence was assessed while walking the trails which surround the ponds, the southeastern boundaries of Cottonwood/Willow riparian area, and the upland habitat.

There were no obvious signs of erosion issues occurring on the site at this time. There are however several locations where the chain link fencing has been cut either partially or entirely to enable access from unauthorized trails. These breaches in the fencing could be quite old, and further action may or may not be required. One of the compromised sections of fencing is directly adjacent to the west pond and is within 20 feet of the main entrance to the ponds from the Big T wash area. Another section is in the fence separating the ponds from the southeastern riparian area. This fence appears to have been an old perimeter fence surrounding the ponds prior to the establishment of restoration area. This fence has been cut in several locations to enable access for equestrians. One section of fence however has been completely knocked down, by a vehicle or something else coming off the 210 fwy. This fence is directly adjacent to the freeway near the connection between the east and west ponds. The GPS location of this downed fence is 11S 0376712m east, and 3792713m north.

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

SIGNED:____________________ DATE:_______________

Todd Chapman
Senior Biologist

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

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 23, 2007
(2007-110/G/G1)

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

**SUBJECT: Task G1 - Second Quarter Erosion Control and Barrier Maintenance Monitoring Report Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued its monitoring efforts for erosion and barrier maintenance issues into the second quarter.

ECORP biologist Todd Chapman visited the Big Tujunga site on December 20, 2007 to conduct a site walkover and meet with Andrea and James Gutman, local residents who frequently utilize the site for equestrian activities and who are actively involved with the monitoring and maintenance of the site as volunteers. Mr. Chapman was meeting with the Gutman's to discuss several issues including a hazardous open cistern pipe and the locations of several exotic plant species. During this site visit it was determined that one of the locks in the daisy chain at the Cottonwood gate had been cut. This compromised lock could have provided access to the site to non-authorized individuals. Photographs of the cut lock were taken and Belinda Kwan (LADPW) was notified the same day about the issue. Flood maintenance division was notified and the lock was replaced. There were no erosion issues or concerns evident during this quarter of monitoring.

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

SIGNED: ____________________ DATE: Dec. 23, 2007

Todd Chapman
Senior Biologist

**ECORP Consulting, Inc.**
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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

March 17, 2008
(2007-110)

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

**SUBJECT: Third Quarter Erosion Control and Barrier Maintenance Monitoring Report Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued the erosion control and barrier maintenance monitoring efforts throughout the restoration site. The third quarter of erosion control and barrier maintenance began on January 29, 2008 with a site visit by ECORP biologists Kristen Mobraaten and Brad Burkhart along with two representatives from Natures Image to discuss work plans for the site. Several trails north of the Oak/Sycamore upland area, down in the willow riparian area appear to have been inundated and scoured during the recent rain events. Standing water was still present in some locations, and this has caused the formation of several secondary trails which avoid submerged portions of trails. The recent rain events moved sediments onto the site, burying trails in several locations. Still other portions of the trail system were completely denuded of all sediment. Most of this trail erosion was confined to trails directly adjacent to Haines Canyon creek.

The site was visited on February 22, 2008 by ECORP biologists Kristen Mobraaten and Todd Chapman. It was observed during this site visit that a deep rut was beginning to form in the dirt road running east-west through the Oak/Sycamore upland area, just west of the Mary Bell equestrian entrance.

The site was visited again on March 12, 2008 by ECORP biologists Kristen Mobraaten and Brian Zitt. There were several areas observed throughout the site which had damaged or compromised perimeter fencing. Several portions of the perimeter fence along the northeastern portion of the site have been cut and bent to enable human access. Additionally, the access gate at the Wheatland Ave. entrance on the northwestern perimeter of the site is also broken. The hinges on the left swinging gate are not secure, this gate can be easily opened without any keys. Photos were taken to document the damage, and LADPW is hereby notified of this situation with this memo.

The erosion on the dirt road near the Mary Bell equestrian entrance is getting worse. Since the first sighting on February 22, 2008 the area impacted has doubled. The rut is approximately 12-18" wide, 6-8" deep and proceeds down the road for 20-25 feet. Some areas of erosion are worse than others, but it does not currently look like the road is going to fail.

It should also be noted that the dirt trail running parallel with the 210 freeway adjacent to the ponds, has been used recently by a large vehicle possibly a truck. There are also some newly discovered illegal fishing platforms which have been placed on the same side of the ponds, and it is possible that the vehicle driven up this trail is being used to access these locations. The vegetation along this trail has been cut back in some locations in order to facilitate access and the understory plants have been crushed in many locations. It is suggested that some sort of passable barrier be placed at the beginning of this trail (posts, boulders, etc.) where it connects to the asphalt driveway.

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

SIGNED:__________________________ DATE:___________________

Todd Chapman
Senior Biologist

June 30, 2008
(2007-110/G/G1)

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

**SUBJECT: YEAR 1 Task G1 - Fourth Quarter Erosion Control and Barrier Maintenance Monitoring Report Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued the erosion control and barrier maintenance monitoring efforts throughout the restoration site. The fourth quarter of erosion control and barrier maintenance began on April 9, 2008 with a site visit by ECORP biologists Todd Chapman and Kristen Mobraaten. The biologists walked throughout the mitigation bank and recorded areas of erosion and fenced areas needing maintenance attention using a Global Position System (GPS) unit. The road erosion located in the oak/sycamore woodland area (reported in the third quarter letter report) was still present. The erosion area does not seem to have gotten larger. The fence areas were surveyed, however, coordinates were not recorded during this site visit.

A second site visit was conducted on June 11, 2008 by ECORP biologists Kristen Mobraaten and Brian Zitt. Several areas were surveyed, however locations of erosion and fenced areas requiring maintenance were not recorded during this site visit.

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

SIGNED:____________________ DATE:_______________

Kristen Mobraaten
Biologist

September 30, 2008
(2007-110/G/G1)

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

**SUBJECT: YEAR 2 Task G1 - First Quarter (July – September 2008) Erosion Control and Barrier Maintenance Monitoring Report Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued the erosion control and barrier maintenance monitoring efforts throughout the restoration site. The first quarter of erosion control and barrier maintenance (July through September 2008) began on August 7, 2008 with a site visit from ECORP biologists Mari (Schroeder) Quillman and Kristen Mobraaten. The biologists met with local resident Andrea Gutman to discuss any areas potentially needing maintenance attention. A second site visit was conducted by ECORP biologists Kristen Mobraaten and Brian Zitt on August 15, 2008 to survey additional areas. During both site visits, the biologists walked throughout the mitigation bank and recorded areas of erosion and fenced areas requiring maintenance attention using a Global Position System (GPS) unit. The road erosion located in the oak/sycamore woodland area (reported in previous reports) was still present. The erosion area does not seem to have gotten larger. The fence areas surrounding the mitigation bank were surveyed as well. Several holes were observed in the fences, and the coordinates of their locations are found below.

UTM Coordinates of Problem Areas at Big Tujunga Mitigation Bank (NAD 83, Zone 11 S)

| Date | Item | Easting | Northing | Comments |
|---|---|---|---|---|
| 8/7/2008 | hole in fence | 376702 | 3792708 | fence down |
| 8/7/2008 | hole in fence | 376588 | 3762798 | |
| 8/7/2008 | hole in fence | 376552 | 3792826 | |
| 8/15/2008 | hole in fence | 376504 | 3792845 | |
| 8/15/2008 | hole in fence | 376529 | 3792824 | |
| 8/15/2008 | hole in fence | 376535 | 3792824 | |
| 8/15/2008 | hole in fence | 376549 | 3792821 | |
| 8/15/2008 | hole in fence | 376574 | 3792804 | |

| | | | | |
|---|---|---|---|---|
| 8/15/2008 | hole in fence | 376588 | 3792791 | two within close vicinity of one another |
| 8/15/2008 | hole in fence | 376602 | 3792773 | |
| 8/15/2008 | hole in fence | 376696 | 3792712 | |
| 8/15/2008 | hole in fence | 376808 | 3792440 | |
| 8/15/2008 | hole in fence | 376682 | 3792623 | |
| 8/15/2008 | hole in fence | 376617 | 3792638 | |
| 8/15/2008 | hole in fence | 376525 | 3792654 | |
| 8/15/2008 | hole in fence | 376489 | 3792660 | |
| 8/15/2008 | hole in fence | 376455 | 3792673 | |
| 8/15/2008 | hole in fence | 376734 | 3792616 | |
| 8/15/2008 | hole in fence | 376439 | 3792768 | |
| 8/15/2008 | hole in fence | 376552 | 3792944 | |

ECORP did not conduct site visits to the mitigation bank during July or September 2008.

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

SIGNED:____________________________ DATE:____________________

Kristen Mobraaten
Biologist

December 31, 2008
(2007-110/G/G1)

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

**SUBJECT: YEAR 2 Task G1 - Second Quarter (October – December 2008) Erosion Control and Barrier Maintenance Monitoring Report Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued the erosion control and barrier maintenance monitoring efforts throughout the restoration site. The second quarter of erosion control and barrier maintenance (October through December 2008) consisted of a site visit from ECORP biologists Kristen Mobraaten and Brian Zitt visited the site on December 12, 2008. The biologists met with local residents Andrea and James Gutman to discuss areas that need maintenance attention. During the site visit, the biologists walked throughout the mitigation bank and recorded areas of erosion and fenced areas requiring maintenance attention using a Global Position System (GPS) unit. The road erosion located in the oak/sycamore woodland area (reported in previous reports) was still present. The erosion area does not seem to have gotten larger. An additional area of erosion was noted in the Oak/Sycamore woodland area by the Cottonwood gate. This erosion appeared to be a large sink hole in the concrete and is found at UTM (NAD 83, Zone 11 S) 376142/3792588. The fence areas surrounding the mitigation bank were surveyed as well. However, no new holes in the fence were observed during this site visit. ECORP did not conduct site visits to the mitigation bank during October or November 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten, Biologist

# APPENDIX I

## Cottonwood/Willow Restoration Area Maintenance Quarterly Memos

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 28, 2007
(2007-110/G/G2)

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

**SUBJECT: Task G2 - First Quarter Cottonwood/Willow Restoration Areas Maintenance For The Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the monitoring and maintenance of the Cottonwood/willow riparian areas for 2007. The first quarter of monitoring began with a site visit by Brad Burkhart and two representatives from Nature's Image on July 5th, 2007. During this site visit and assessment of the cottonwood/willow restoration areas it was determined that only the 1-gallon Fremont cottonwood (*Populus fremontii*) were still alive and might survive and become established with supplemental waterings over the summer months.

Maintenance instructions were given to Nature's Image and included the preparation of a list of the number of cottonwood plantings at each restoration site planted in April 2007. Numbered orange lath stakes were to be placed at the location of each surviving cottonwood, ensuring that plants are not skipped when watering. All cottonwood plantings should be watered by hand with a minimum of 10 gallons of water poured down the PVC pipes placed at each planting within one week of this initial site visit. Hand watering will continue with a minimum of 5 gallons of water per plant once every two weeks until the first rains or the practicality of DriWater® could be considered. If DriWater® is used, they should be replaced every 3-4 months.

A second site visit occurred on September 21, 2007 with ECORP biologists Todd Chapman and Brian Zitt. All of the Cottonwood/Willow riparian areas were surveyed, and several locations had sustained substantial amounts of cuttings being removed. Despite the removal of many cuttings, there were signs that some cuttings were surviving. Some of the restoration areas still had large quantities of discarded clothing and children's toys. One of the cottonwood restoration areas near the creek, had 40-50 plastic grow-out pots which were discarded in the surrounding vegetation. This could be indicative of some illegal planting activity.

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

SIGNED:__________________________ DATE:___________________

Todd Chapman
Senior Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 30, 2007
(2007-110/G/G2)

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

**SUBJECT: Task G2 - Second Quarter Cottonwood/Willow Restoration Areas Maintenance For The Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued its cottonwood/willow restoration areas maintenance and monitoring efforts for 2007. Natures Image has continued to conduct maintenance by removing trash and non-native plant species in the riparian area and around the ponds. There has been a continued watering of all surviving cottonwood plantings in each of the restoration areas, since the initial assessment in July 2007. Most of the cottonwoods are showing signs of new leaf growth and increasing vigor. There has not been any additional removal of cuttings from these areas and the winter rains have begun to provide additional water to both cuttings and plantings.

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

SIGNED:________________________ DATE:__________________

Todd Chapman
Senior Biologist

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

March 31, 2008
(2007-110/G/G2)

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

**SUBJECT: Task G2 – Third Quarter Cottonwood/Willow Restoration Areas Maintenance for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued its cottonwood/willow restoration areas maintenance and monitoring efforts for 2008. Natures Image conducted a very large weeding effort in the riparian areas during February because with the early rains, the weeds and non-native grasses were beginning to germinate. The concerted effort was conducted in February in order to eliminate the majority of the weeds and to remove trash prior to the beginning of the bird breeding season in March. ECORP's biologists were on site on March 11, 2008 to conduct a walkover of the site to check the status of Natures Image's maintenance activities. The biologists noted wooden platforms that someone had placed near the ponds in order to gain access for fishing. These were placed subsequent to Natures Image's maintenance activities. ECORP notified Public Works about the wooden platforms so that Flood Maintenance Division staff could remove them. Additional items that were noted were the fact that a vehicle had been driven on the dirt road on the north side of the ponds and that someone has started to blaze new trails along Haines Canyon Creek (likely due to high water flooding an existing trail). ECORP notified Public Works about the vehicle access issue and suggested that some large boulders be placed at the west end of the road by the pond, where it meets the paved area near the port-a-potty. It was decided this would be discussed at the CAC meeting.

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

SIGNED:____________________ DATE:_______________

Mari Schroeder
Principal Biological Project Manager

**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

June 30, 2008
(2007-110/G/G2)

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

**SUBJECT: YEAR 1 Task G2 – Fourth Quarter (April – June 2008) Cottonwood/Willow Restoration Areas Maintenance for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued its cottonwood/willow restoration areas maintenance and monitoring efforts for 2008. Natures Image visited the site several times a month during the fourth quarter reporting period (April through June 2008) to water successful cottonwood and willow plantings in the cottonwood/willow restoration areas. Most of the cottonwoods and willows are showing signs of new leaf growth and increasing vigor. There has not been any additional removal of cuttings from these areas, nor have any other maintenance activities occurred in the restoration areas.

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

SIGNED:________________________ DATE:__________________

Kristen Mobraaten
Biologist

September 30, 2008
(2007-110/G/G2)

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

**SUBJECT: YEAR 2 Task G2 – First Quarter (July – September 2008) Cottonwood/Willow Restoration Areas Maintenance for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued its cottonwood/willow restoration areas maintenance and monitoring efforts for 2008. Natures Image visited the site several times a month during the first quarter reporting period (July through September 2008) to water successful cottonwood and willow plantings in the cottonwood/willow restoration areas. Most of the cottonwoods and willows are showing signs of new leaf growth and increasing vigor. There have not been any additional removal of cuttings from these areas, nor have any other maintenance activities occurred in the restoration areas.

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

SIGNED:________________________ DATE:__________________

Kristen Mobraaten
Biologist

December 31, 2008
(2007-110/G/G2)

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

**SUBJECT: YEAR 2 Task G2 – Second Quarter (October – December 2008) Cottonwood/Willow Restoration Areas Maintenance for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has continued its cottonwood/willow restoration areas maintenance and monitoring efforts for 2008. Natures Image visited the site several times a month during the second quarter reporting period (October through December 2008) to water successful cottonwood and willow plantings in the cottonwood/willow restoration areas. The cottonwoods and willows in the riparian area were watered on the following dates during this reporting period; October 2, 9, and 29, November 25, and December 11 and 16. Most of the cottonwoods and willows are showing signs of new leaf growth and increasing vigor. There have not been any additional removal of cuttings from these areas, nor have any other maintenance activities occurred in the restoration areas.

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

SIGNED:____________________ DATE:_______________

Kristen Mobraaten
Biologist

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

# APPENDIX J

## 2008 Functional Analysis Report

# 2008 Functional Analysis for the Big Tujunga Wash Mitigation Bank 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**

**November 2008**

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# Functional Analysis of the Big Tujunga Wash Mitigation Bank for 2008 Los Angeles County, California



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# 1.0 INTRODUCTION

## 1.1 PURPOSE OF THE STUDY

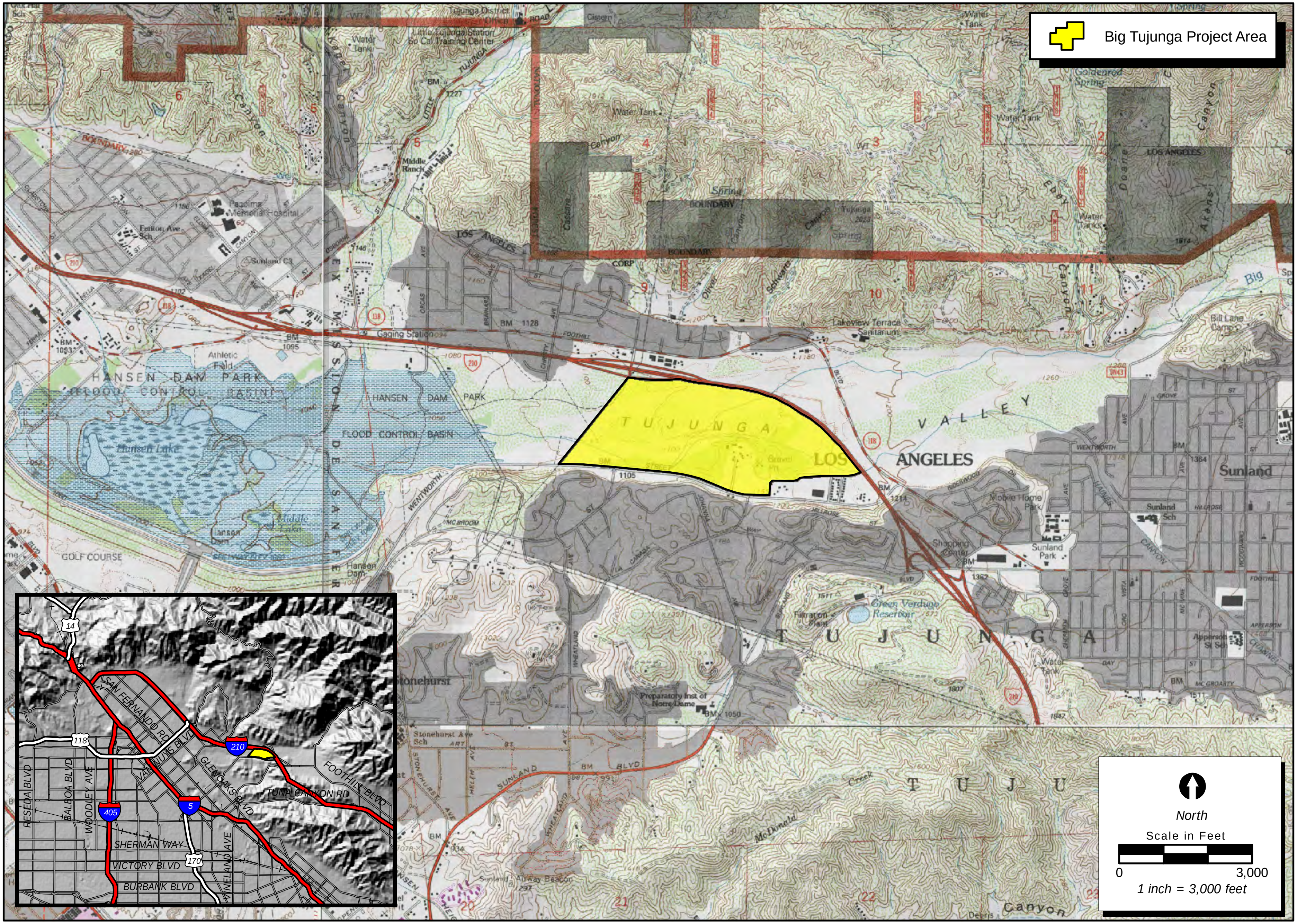
The purpose of this analysis is to use an objective, quantitative method of habitat assessment to compare the functional values of riparian habitat in the Big Tujunga Wash mitigation site with the baseline functional analysis previously completed on the site (Chambers Group 1998). The functional analysis will also be used as a tool to assess the success of the habitat restoration program initiated in late 2000.

## 1.2 LOCATION AND SETTING

The Big Tujunga Wash Mitigation Bank is located in Big Tujunga Wash, just downstream of the 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 210 Freeway and on the south by Wentworth Street. The west side of the site is bordered by high voltage powerlines. Figure 1 depicts the general vicinity of the project and the Mitigation Bank boundaries.

The Big Tujunga Wash Mitigation Bank supports two watercourses, one containing flow from Big Tujunga Wash, and the other conveying the flow from Haines Canyon to Big Tujunga Wash. The flow in the Big Tujunga Wash, on the north side of the site, is partially controlled by Big Tujunga Dam and is intermittent based on rainfall amounts and water releases from the Dam. The flow in Haines Canyon Creek, located on the south side of the site, 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 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 Big Tujunga Ponds and surrounding habitat, consisting of approximately 27 acres located in the northeast corner of the site, were originally created as part of the mitigation measures for the construction of the 210 Freeway and are currently under the jurisdiction of the Los Angeles County Department of Parks and Recreation. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, and the Tujunga Ponds can be found on Figure 2.




N:\2007\2007-110 Tujunga Mitigation Bank\MAPS\SITE_VICINITY\Tujunga_ProjectVicinity.mxd

Map Date: 10/15/2008

## Figure 1. Project Location Map

*2007-110 Big Tujunga Mitigation Bank*

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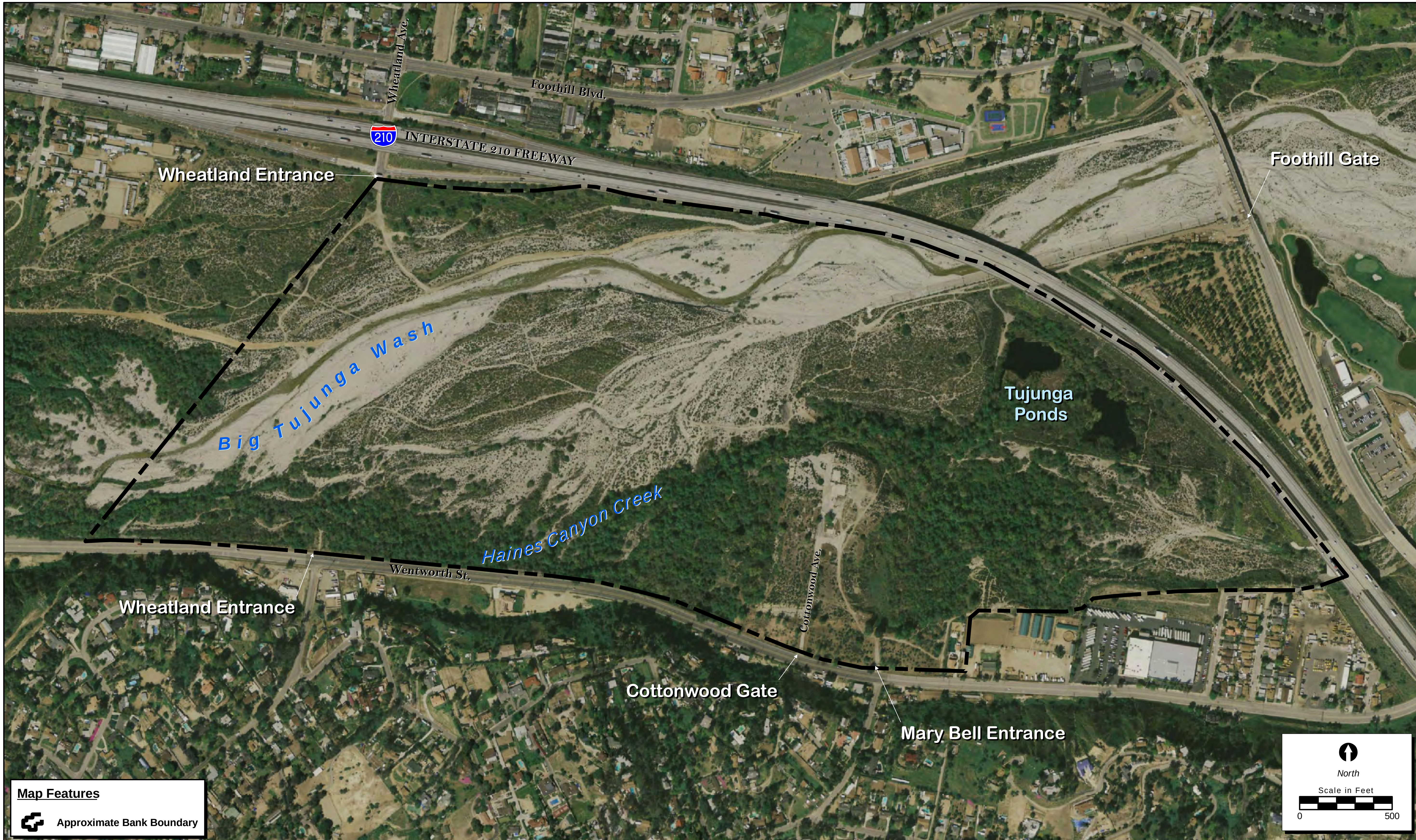



N:\2007\2007-110 Tujunga Mitigation Bank\MAPS\MITIGATION_BANK_MONITORING\Bank_Components_Aerial\BTMB_Bank_Aerial.mxd

*Aerial Date: March 2008*
*Map Date: 10/29/08*

**Figure 2. Big Tujunga Wash Mitigation Bank Aerial**

*2007-110 Tujunga Mitigation Bank*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

# 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 Big Tujunga Wash Mitigation Bank. 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 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 Macrotopographic Complexity (TOP)

**Biogeochemical**

- Available Organic Carbon (CARB)

In addition to these variables which evaluate wetlands function, three additional variables were added which address wildlife values. Although it is implicit in HGM that if the functions are high, the wildlife values will be present, 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 each 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 Manual (1989). Potential mathematical relationships to describe the relationship between evaluation variables are briefly discussed below.

It is appropriate to sum the scores of the evaluation variables (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 (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 (FU = (EV1xEV2 ....xEVn )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 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 Structural Diversity and Cover 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 (cats and dogs, human disturbance, noise, invasive lighting) would act independently of exotic vegetation.

The Hydrologic Variables (FPA and TOP) and Biogeochemical criterion (CAR) contribute to functional value in an independent and cumulative function and are added. However, all of the functional variables, 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 the Urban Encroachment variable (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 riparian habitat is:

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

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

FCU = FU * Acres of 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 |

| Value | Variables |
|---|---|
| 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. |
| **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 (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). |

| Value | Variables |
|---|---|
| 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 (i.e., during a ten year flood event). |
| 0.8 | Site is part of a flood plain which provides an opportunity for overbank flow during moderate flow events (i.e., 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, 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 2008 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 2008 surveys. Suitable habitat present on the site. |
| **Terrestrial Wildlife (Vertebrate) Species Richness (RIC)** | |
| 0.0 | Less than 10 species of wildlife detected during the surveys. |
| 0.2 | Between 11 and 30 species of wildlife detected during the surveys. |
| 0.5 | Between 31 and 50 species of wildlife detected during the surveys. |
| 0.7 | Between 51 and 60 species of wildlife detected during the surveys. |
| 1.0 | Over 60 species of wildlife detected during the surveys. |
| **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

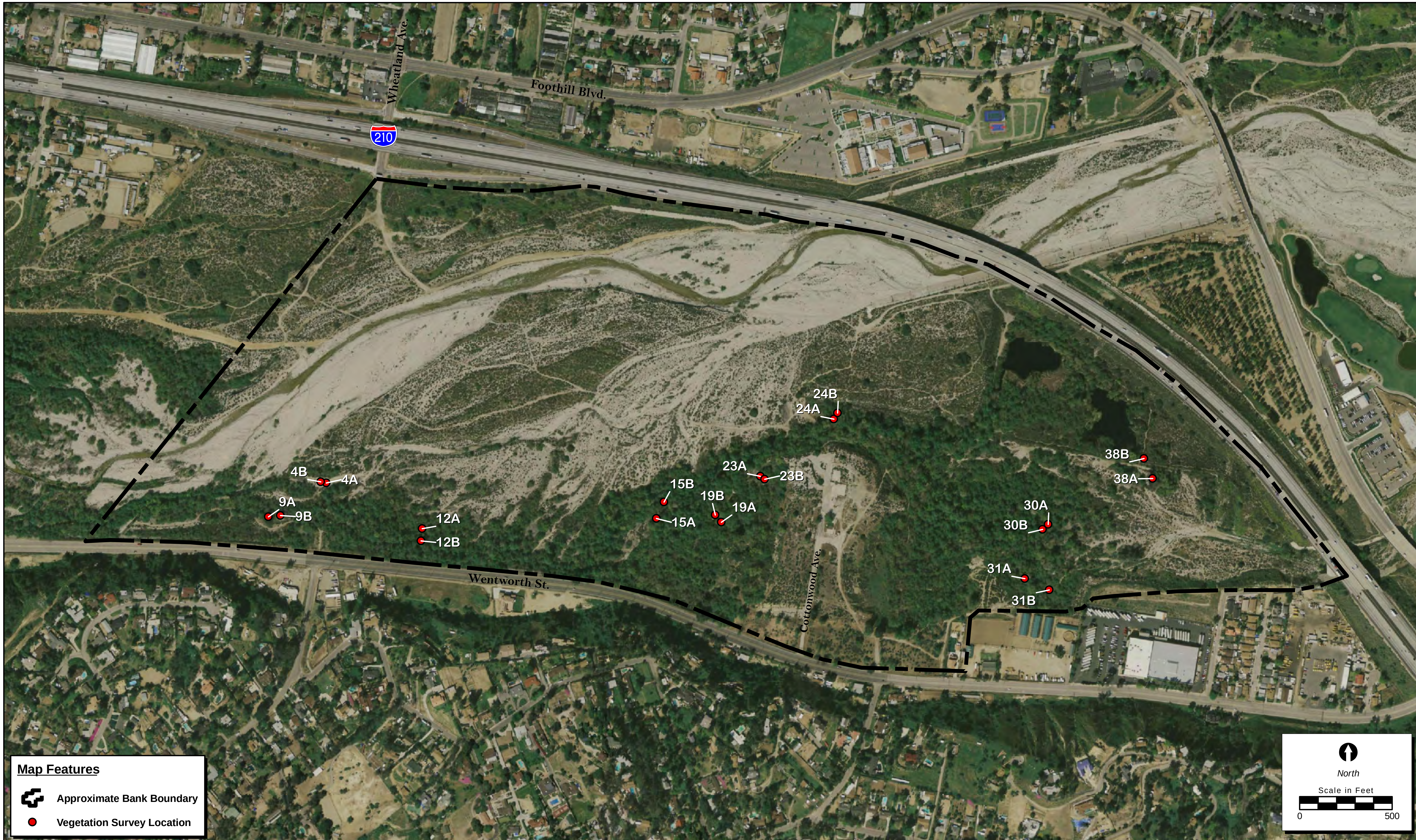
### Data Collection

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 Contiguity (CON), Urban Encroachment (URB), Hydrologic Regime (REG), and Characteristics of the Flood-prone Area (FPA). These criteria were scored based on the overall characteristics of the Big Tujunga Wash site.

The evaluation criteria derived from additional field sampling were Structural Diversity (STD), Percent Exotic Vegetation (EXO), Micro and Macro Topographic Complexity (TOP), Cover (COV), Available Organic Carbon (CAR), Rareness (RAR), Terrestrial Wildlife Species Richness (RIC), and Presence of Habitat Specialists (SPE). Field sampling was conducted on the site on May 19-20, 2008.

Structural Diversity and Percent Exotic Vegetation 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 of shrubs and trees (vegetation layers). These data can then be used to derive scores for STD and EXO. In addition, at each point a transect was done 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 size. The transect was either the distance to the farthest tree or shrub measured by the point-centered quarter method or a 10 meter transect through the 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-meter transect to count topographic features was conducted. Finally, at each sampling point a 1-square meter 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 (CAR).

A stratified random sampling scheme was used to avoid biased data collection. The points were selected by dividing the Big Tujunga Wash habitat into segments, each 300 feet 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 riparian habitat. Two sampling points were selected within each of the 300-foot grid segments for point-centered quarter samples, quadrats, and transects. The first point was selected by walking into the approximate center of the predetermined square. 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 meter-square quadrats, 20 transects, and 80 trees and 80 shrubs in the riparian areas of Big Tujunga Wash were conducted or counted. The sampling points for the Big Tujunga Wash site are shown in Figure 3.

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10/29/08

**Figure 3. Functional Analysis Sampling Points**

*2007-110 Tujunga Mitigation Bank*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Two classifications of vegetation (trees and shrubs) were included in the point-centered quadrat measurements in the riparian habitat. The distance to the closest tree, defined as a woody plant of average to tall height (i.e., greater than 2 meters) originating from a single base, was measured in each quadrat. The distance to the nearest shrub, defined as a plant of small to medium height (i.e., less than 2 meters) with a woody base, was also measured for each quadrant. 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 meters. 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 riparian sites at the Big Tujunga Wash site was impassable due to dense vegetation or steep topography. On some occasions, the distance randomly selected to be walked to determine the second sampling point was either estimated or modified by reducing the distance.

## Data Analysis

Functional analysis values for structural diversity, cover, topography, and available organic carbon were determined by analyzing data collected for the habitat at Big Tujunga Wash Mitigation Bank.

*Density*

Density, a component of structural diversity, 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). Density for all shrubs and for all trees per acre was determined by the formula:

$$\text{Absolute (total) density of all species} = \frac{\text{Area}}{D^2}$$

where area is 4,051.1 $m^2$ (1 acre) and D is the mean distance. Density and relative density of a group of species (e.g., native shrubs or native trees, etc.) were then determined by the following formulas:

$$\text{Relative density} = \frac{\text{Number of individuals of a group of species}}{\text{Total number of individuals of all species}} \times 100$$

$$\text{Density} = \frac{\text{Relative density of a group of species}}{100} \times \text{Total density of all species}$$

The value for structural diversity was determined using the results for density plus two additional sets of data. First, the relative frequency of shrubs and trees was examined for each habitat, and second, the vertical structure was examined based on the average heights of trees and shrubs encountered in the quadrats. Relative density, expressed as the proportion of trees and/or shrubs to the total number of trees and shrubs found on the site was also determined.

*Dominance (Percent Cover)*

Absolute dominance refers to the area covered by the crown of an individual species per unit area, which is a measure of cover. Relative dominance refers to the percentage of the individual's value with respect to all species. Absolute and relative dominance were calculated by the following formulas:

$$\text{Absolute dominance } (m^2) = \text{Density of a group of species} \times \text{average dominance value for that group of species}$$

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 plants) can be expressed as a percent cover by the dividing the total absolute dominance value for that species or group by the unit area (4,051.1 $m^2$) and multiplying the result by 100:

$$\text{Absolute Cover (\%)} = \frac{\text{Dominance for a group of species}}{4{,}051.1\ m^2} \times 100$$

Relative dominance, or the percent dominance of a group of species relative to the dominance of all groups, is expressed as:

$$\text{Relative dominance} = \frac{\text{Absolute dominance of a species}}{\text{Total dominance for all species}} \times 100$$

*Vertical Structural Diversity*

Another component of structural diversity involves the vertical variety of the vegetation. As an aid in estimating vertical diversity, tree and shrub heights were estimated in each quadrat and classified into categories as follows:

| Height of Tree or Shrub | Classification |
|---|---|
| < 2 meters | 1 |
| 2 – 4 meters | 2 |
| > 4 meters | 3 |

*Total available carbon*

Available organic carbon was estimated by visually estimating the percentage of organic debris and leaf litter within the boundaries of each quadrat. These values were averaged to examine the total potential available organic carbon in the habitat.

*Topography*

Topographic features were analyzed by scoring the number of rocks, ridges, slopes, or other geographic units measuring 1 foot or higher about the ground surface along a 10-meter transect line. Possible scores range from a value of 0 for a flat topography with no rocks or boulders to 2 or greater for a transect with numerous boulders and/or slopes. Scores were averaged to determine a mean value per 100 linear meters.

# 3.0 RESULTS

## 3.1 DATA ANALYSIS RESULTS

Approximately 77 trees and 488 shrubs per acre were found in the riparian habitat at Big Tujunga Wash Mitigation Bank. Approximately 75 percent of the shrubs and 90 percent of the trees encountered were native species. The tree canopy forms a dense multi-layered canopy cover throughout the site in most areas (approximately 123.3 percent cover overall), and shrubs form an open understory cover of approximately 18 percent. The relative density of trees to shrubs was approximately 14 percent trees to 86 percent shrubs. The results for overall density, dominance (percent cover), and relative density for the Big Tujunga Wash riparian habitat are summarized in Table 3-1.

**Table 3-1**
**Density, Dominance, and Relative Frequency**

| | Density (# plants/acre) | Dominance (Percent Cover) | Relative Density (% of total community) |
|---|---|---|---|
| **Native Species** | | | |
| Trees | 69 | 121.4 | - |
| Shrubs | 366 | 17.5 | - |
| **Non-Native Species** | | | |
| Trees | 8 | 4.3 | - |
| Shrubs | 122 | 2.6 | - |
| **Summary All Species** | | | |
| Trees | 77 | 123.3 | 14 |
| Shrubs | 488 | 18.3 | 86 |

Overall organic cover was relatively high at approximately 85.2 percent, and the presence of annual grasses was low at approximately 10.6 percent cover. The average number of topographic features encountered per 100 meters was approximately 16.8. The average tree height analysis indicated that most trees on the site are greater than 4 meters in height with some falling into the 2 to 4 meter height range. The results of percent organic cover, percent annual grass cover, tree height, and average topography score measurements for the riparian habitat at the Big Tujunga Wash study 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 meters) |
|---|---|---|---|
| 85.2 | 10.6 | 2.8 | 16.8 |

Copies of the original data sheets and tables of the raw data can be found in Appendix A.

## 3.2 QUALITATIVE DESCRIPTIONS AND DETERMINATION OF FUNCTIONAL VALUES

| Structural Diversity (STD) | |
|---|---|
| **Score** | **Criteria** |
| 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 trees averaging 3 meters or greater in height. The density of shrubs is high at 470 plants per acre, and tree density at 78 individuals per acre with an average aerial cover of approximately 64 $m^2$ each is consistent with the multi-layered canopy cover value of about 123.5 percent cover in the tree canopy. Relative density of shrubs was 14 percent to 86 percent for trees; shrub cover is well developed at approximately 18.4 percent. A score of 0.8 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 17 native species represented. Native tree canopy cover is approximately 121.5 percent overall. This result of cover greater than 100 percent reflects layering within the tree canopy. Native shrubs comprise 17.1 percent cover in the understory. 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 riparian willow 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. |

Interstate Highway 210 forms the boundary of the riparian willow 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 riparian habitat including eucalyptus (*Eucalyptus* sp.), sedges (*Cyperus* sp.), and castor bean (*Ricinus communis*); however, overall cover of exotic invasive species was low at approximately 4.3 percent for exotic tree species and 2.6 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 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 (i.e. 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 1987. 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** |
| 0.7 | 0.6 - Flood-prone area is characterized by micro and macro topographic features such as ponds, hummocks, bars, rills, large boulders, but is predominantly homogeneous or flat surface.<br>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 17 topographic features are present per 100 meters. A score of 0.7 assigned to this variable best represents the topographic complexity, which includes areas of relatively flat surface present in the riparian habitat.

| Available Organic Carbon (CAR) | |
|---|---|
| **Score** | **Criteria** |
| 1.0 | Site contains over 60% relative cover with debris, leaf litter or detritus. |

Available organic carbon in the form of leaf litter and organic debris was abundant on the site. Seventeen of the 20 quadrats had 90 percent cover of litter or greater. The average litter cover of 85.2 percent was slightly lower than that observed in 1997 (approximately 88 percent).

Because the average amount of litter for the site is greater than 80 percent, a score of 1.0 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 the 2008 surveys. Suitable habitat present on the site. |

A total of 1 listed wildlife species and 4 sensitive wildlife species were observed on site during 2008. Santa Ana sucker, a federal listed threatened fish species and a California Species of Special Concern (SSC), were found along upper and lower portions of Haines Canyon Creek. Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), a state SSC, was also observed in Haines Canyon Creek. Two southwestern pond turtles (*Actinemys marmorata pallida)*, a state SSC, were observed in the Tujunga ponds. Other California SSCs detected included yellow warblers (*Dendroica petechia brewsteri*) throughout the riparian habitat on site and a two-striped garter snake (*Thamnophis hammondii*) near the Tujunga ponds. Due to the detection of five listed and/or sensitive wildlife species and presence of suitable habitat, the rareness was assigned a score of 1.0.

| Terrestrial Wildlife (Vertebrate) Species Richness (RIC) | |
|---|---|
| **Score** | **Criteria** |
| 1.0 | Over 60 species of wildlife detected during the surveys. |

A total of 80 wildlife species were detected in 2008, including 1 crustacean, 6 insects, 8 fishes, 2 amphibians, 8 reptiles, 49 birds, and 6 mammals. After removing crustaceans, insects, fish, and 2 domestic mammals, 63 of the 80 species represent terrestrial wildlife species that are included in the score for this variable. Therefore, the riparian habitat was assigned a score of 1.0 for this variable.

| Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE) | |
|---|---|
| **Score** | **Criteria** |
| 0.6 | 0.6 - 5 to 10 habitat specialists observed on the site.<br>1.0 - Greater than 10 habitat specialists observed on the site. |

A total of 10 habitat specialists were observed on site during 2008. These include pied-billed grebe (*Podilymbus podiceps*), double-crested cormorant (*Phalacrocorax auritus*), green heron (*Butorides virescens*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), downy woodpecker (*Picoides pubescens*), yellow warbler, common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), 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 double-crested cormorant is associated with aquatic habitats including ponds, lakes, rivers, lagoons, estuaries, and open coastline. 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, double-crested cormorant, green heron, common yellowthroat, and red-winged blackbirds were found in and around the Tujunga ponds.

The acorn woodpecker is highly associated with oak woodlands and was observed in the oak riparian between the riparian habitat and the 11-acre oak/sycamore woodland restoration area. 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. Both woodpecker species and yellow warblers were observed in the riparian habitat throughout the site.

All wildlife species detected in 2008 were incidental observations made during exotic species removal efforts and trail maintenance visits. Focused wildlife surveys, which accounted for the majority of wildlife detections in previous years, were not necessary and were not conducted in 2008. Habitat specialists that have been consistently recorded at the site since 2003, including common moorhen (*Gallinula chloropus*), belted kingfisher (*Ceryle alcyon*), hermit thrush (*Catharus guttatus*), and Wilson's warbler (*Wilsonia pusilla*), likely continue to utilize the site, but are unlikely to be detected except during focused wildlife surveys. Due to the incidental observation of 10 habitat specialists and the likely detection of at least 4 more habitat specialists had focused wildlife surveys been conducted in 2008, this variable was assigned a score of 0.6.

## 3.3 CALCULATION OF FUNCTIONAL UNITS AND FUNCTIONAL UNIT CAPACITY

The algorithm used to obtain a functional unit value for the riparian habitats is:

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

The calculation for the Functional Unit value for the riparian habitat is therefore:

$$FU = \frac{((0.8 + 1.0)\ 1.0 + 1.0 + 1.0 + 0.8 + 0.7)\ 1.0 + 0.6 + 1.0 + 1.0 + 0.9}{10}$$

For the riparian system, the FU is calculated to be 0.88 per acre.

To calculate the total Functional Capacity Units for the riparian habitat at Big Tujunga Wash, the following formula was used:

$$FCU = FU_{willow}\ (\text{acres of willow riparian habitat})$$

A total of 76 acres of willow habitat, calculated using the GIS system, was delineated at the site during the initial study in 1997. Therefore, the total FCU for riparian habitat at Big Tujunga Wash is:

$$FCU_{Big\ T} = (0.88_{FUwillows})(76\ \text{acres of willows}) = 66.88$$

## 3.4 DISCUSSION AND COMPARISON OF FUNCTIONAL VALUES

The Functional Unit Capacity value of the riparian habitat at the Big Tujunga Wash Mitigation Bank decreased by 0.76 units from 67.64 units in 2007 to 66.88 units in 2008. This slight decrease is attributed wholly to the decrease in the score for the Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife (SPE) variable. Compared to baseline conditions, the functional unit capacity found in 2008 is approximately 12 percent greater than that recorded in 1997. Table 3-3 presents a comparison of functional capacity values for each variable in 1997 (Baseline) 2001, 2007 and 2008.

**Table 3-3**
**Comparison of Functional Capacity Values**

| Variable | 2008 | 2007 | 2001 | 1997 |
|---|---|---|---|---|
| Structural Diversity (STD) | 0.8 | 0.8 | 0.7 | 0.7 |
| Riparian Habitat Cover (COV) | 1.0 | 1.0 | 0.8 | 1.0 |
| Percent of Exotic Invasive Species/Vegetation (EXO) | 1.0 | 1.0 | 1.0 | 0.8 |
| Contiguity of Habitat (CON) | 1.0 | 1.0 | 1.0 | 1.0 |
| Available Organic Carbon (CAR) | 1.0 | 1.0 | 1.0 | 1.0 |
| Characteristics of Flood-prone Area (FPA) | 0.8 | 0.8 | 0.8 | 0.8 |
| Micro and Macro Topographic Complexity (TOP) | 0.7 | 0.7 | 0.9 | 0.8 |
| Hydrologic Regime of Riparian Zone (REG) | 1.0 | 1.0 | 1.0 | 1.0 |
| Urban Encroachment (URB) | 0.6 | 0.6 | 0.6 | 0.6 |
| Rareness – Listed and Sensitive Species (RAR) | 1.0 | 1.0 | 1.0 | 1.0 |
| Terrestrial Wildlife (Vertebrate) Species Richness (RIC) | 1.0 | 1.0 | 1.0 | 0.7 |
| Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife (SPE) | 0.6 | 1.0 | 0.6 | 0.9 |
| **FU** | **0.88** | **0.89** | **0.84** | **0.79** |
| **Acres** | **76.0** | **76.0** | **76.0** | **76.0** |
| **FCU** | **66.88** | **67.64** | **63.84** | **59.74** |

An increase in riparian habitat cover was noted in the analyses of the riparian community. An initial decrease in riparian habitat cover due to the removal of giant reed (*Arundo donax*) was noted in 2001; however, restoration efforts in the riparian community have since contributed to an increase in the total riparian habitat cover such that a well-developed multi-layered canopy of native tree species now comprise a cover value of greater than 100 percent. A well developed shrub understory is also present in the riparian habitat. The score for Riparian Habitat Cover (COV) criteria remained at the highest possible value of 1.0.

Although the score for the rareness variable has not changed since 1997, the number of listed and/or sensitive wildlife species observed declined from previous years. This is likely a reflection of the absence of focused wildlife survey tasks in 2008. Focused sensitive wildlife surveys for native fish, least Bell's vireo, southwestern willow flycatcher, and arroyo toad were conducted on an annual basis during the implementation phase of the Mitigation and Monitoring Plan (MMP) and are only required every 3 years during the long-term monitoring phase. All listed and/or sensitive wildlife species detections in 2008 were incidental observations made during exotic removal efforts and quarterly maintenance visits.

Species richness also decreased in 2008; however, the decrease did not result in a change in the score for Terrestrial Wildlife (Vertebrate) Species (RIC). The reduction in species richness is undoubtedly due to the lack of focused wildlife surveys in 2008, which resulted in the majority of species detections during previous years. The majority of wildlife species detected in 2008 were incidental observations made during exotic removal efforts and quarterly maintenance visits.

The score for the presence of habitat specialists decreased in 2008. Ten habitat specialists were recorded in 2008 while 15 habitat specialists were noted in 2007. Again, this is undoubtedly due to the lack of focused wildlife surveys in 2008, which resulted in the majority of species detections during previous years. The majority of wildlife species detected in 2008 were incidental observations made during exotic removal efforts and quarterly maintenance visits. Habitat specialists that have been consistently recorded at the site since 2003 (common moorhen, belted kingfisher, hermit thrush, Wilson's warbler) likely continue to utilize the site, but are unlikely to be detected except during focused wildlife surveys.

In conclusion, although the FCU value decreased by 0.76 units and wildlife observations decreased throughout all wildlife functional value categories, this is not a reflection of a decrease in functional value of the Big Tujunga Wash Mitigation Bank. Rather, this is the result of decreased wildlife survey requirements from previous years. Functional value results are likely to remain more or less the same during the second contract year and likely to be comparable to MMP implementation years during the third contract year when focused surveys are to be conducted once again.

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# APPENDIX A

## Functional Analysis Data Sheets

## BIG TUJUNGA WASH

Date: 5/19/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 23A Location:

### ② 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 | 12.2m | 21.34 | RIB AUR | 1.45 | 2.44 |
| 2 | SAL LAS | 3 | 9.14 | 7.62 | RIB AUR | 2.13 | 2.44 |
| 3 | SAL GOO | 3 | 8.23 | 21.34 | RIB AUR | 5.49 | 1.22 |
| 4 | SAM MEX | 3 | 12.82m | 6.10 | RIB AUR | 4.57 | 2.44 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

### ① Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: Ø

No. of seedlings/saplings: Ø Non-native Cover: Ø

GPS Coordinates: S11 0376062 UTM 3792604

### ③ Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø Transect Length: 12.82 (m)

Comments:

- Schinus molle
- Alnus rhombifolia
- Cirsium occidentale
- Heterotheca grandiflora
- mimulus pilosus
- Solanum americanum
- Prunus fasciculata
- Anagallis arvensis
- Mentzelia laevicaulis

## BIG TUJUNGA WASH

Date: 5/19/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 23B Location:

(2) Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SAM MEX | 3 | 5.49 | 30.48 | RIB AUR | 2.29 | 3.66 |
| 2 | SAL LAS | 3 | 7.62 | 30.48 | RIB AUR | 1.04 | 1.52 |
| 3 | SAL GOO | 3 | 16.15m | 21.34 | RIB AUR | 2.18 | 1.52 |
| 4 | SAL LAS | 3 | 5.18 | 7.6 m | RIB AUR | 5.79 | .31 |

[1]Height Categories: 1 = <2m; 2 = 2-4m; 3 = >4m
[2]Diameter

(1) Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: Ø

No. of seedlings/saplings: Ø Non-native Cover: 5%

GPS Coordinates: S11 0376069 UTM 3792599

(3) Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø Transect Length: 16.15 (m)

Comments:

BIG TUJUNGA WASH

Date: 5/19/08

Field Crew: Pam Devriese, Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 24A

Location:

2 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 | 3.45 | 6.83 | RIBAUR | .30 | .38 |
| 2 | SAL GOO | 3 | 6.71 | 8.84 | RIBAUR | .79 | .99 |
| 3 | POP FRE | 3 | 6.10 | 14.63 | RIBAUR | 3.66 | .69 |
| 4 | SAL GOO | 3 | 13.1 m | 4.57 | YUC WHI | 2.84 | .48 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100%

% Cover annual grasses: Ø

No. of seedlings/saplings: 1

Non-native Cover: 50%

GPS Coordinates: S11 0376184

UTM 3792697

3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 13.1 (m)

Comments:

- Bromus madritensis s. rubens
- Lobularia maritima (sweet alyssum)
- Brassica nigra
- yucca whipplei
- Lactuca seriola
- Baccharis salicifolia
- Ficus carica
- Ageratina adenophora
- Urtica dioica
- lepidospartum squamatum

## BIG TUJUNGA WASH

Date: 5/19/08 Field Crew: Pam Devriese, Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 24B Location: ____________

Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SAGO | 3 | 3.04 | 8.83 | RIB AUR | 3.35 | .69 |
| 2 | SAGO | 3 | 5.79 | 6.83 | RIB AUR | .41 | .86 |
| 3 | SALAS | 1 | 4.39 | 1.93 | RIB AUR | .91 | 1.35 |
| 4 | SALAS | 3 | 7.62m | 9.14 | RIB AUR | .91 | .51 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: 0%

No. of seedlings/saplings: 0% Non-native Cover: 0%

GPS Coordinates: S11 0376190 UTM 3792707

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2 Transect Length: 7.62 (m)

Comments:

- Vitis girdiana
- Polygonum arenastrum
- Senecio mikanoides

## BIG TUJUNGA WASH

Date: 5/19/08 Field Crew: Pam Devriese, Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 38A Location: 

### Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | Eucalyptus sp. | 3 | 8.53m | 18.28 | YUC WHI | 3.20 | .35 |
| 2 | SAM MEX | 1 | 4.57 | .66 | RIB AUR | 6.68 | .81 |
| 3 | SAL GOO | 3 | 7.82 | 13.71 | ATE ADE | 3.86 | .56 |
| 4 | SAL LAS | 2 | 3.43 | 1.82 | ARTCAL | 7.14 | .57 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

### Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: 0

No. of seedlings/saplings: 0 Non-native Cover: 0

GPS Coordinates: S11 0376708 UTM 3792594

### Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1 Transect Length: 8.53 (m)

### Comments:

- HETGRA
- Centaurea melitensis*
- Phacelia ramosissima
- ERIO FASC
- Sonchus oleraceus*
- ART CAL
- ART DOU
- Rosa californica
- Ailanthus altissima*
- Carduus apycho cephalus*
- Sisymbrium orien.
- Salvia mellifera
- Schismus barbatus
- Senecio flaccidus
- Piptatherum miliaceum*
- Ricinus communis*
- Cyperus esculentus
- Taraxacum officinale*
- Plantago major
- Rubus ursinus
- Nasturtium officinale*
- Veronica anagallis-aquatica*
- Polypogon monspeliensis*
- Marrubium vulgare*
- Cuscuta sp.
- Malosma laurina
- Ambrosia acanthicarpa
- ESCH CAL
- Sambucus mexicanus
- Quercus agrifolia
- Rumex crispus
- Stellaria media
- Gallium aparine
- Hordeum marinum
- Toxicodendron diversilobum
- Arundo donax
- Lolium perenne
- Conium maculatum
- Ulmus parvifolia*
- Foeniculum vulgare*
- Salix exigua
- Gnaphalium sp.

* = NN

# BIG TUJUNGA WASH

Date: 5/19/08

Field Crew: Pam Devriese, Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 38B

Location:

## 2 Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SAL LAS | 2 | 17.98 m | 2.43 | ERI FAS | 1.21 | .71 |
| 2 | SAM MEX | 2 | 8.83 | 1.82 | ERI FAS | 2.06 | .91 |
| 3 | SAL LAS | 3 | 13.41 | 7.62 | ERI FAS | 2.03 | 1.82 |
| 4 | SAL LAS | 3 | 13.71 | 18.28 | ERI FAS | .99 | .91 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

## 1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 95%

% Cover annual grasses: 12%

No. of seedlings/saplings: Ø

Non-native Cover: 12%

GPS Coordinates: S11 376694

UTM 3792627

## 3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 3

Transect Length: 17.98 (m)

Comments:

- ARTCAL
- MARMAC
- MALLAU
- CEANCRAS
- Silybum marianum*

## BIG TUJUNGA WASH

Date: 5/19/08

Field Crew: Pam Devriese, Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 31A

Location: 

Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | NIC GA | 2 | 1.21 | 2.43 | BAC SAL | .91 | 1.82 |
| 2 | FIC CAR | 2 | .91 | 2.13 | SAL LAS | 1.98 | .53 |
| 3 | POP FRE | 1 | 1.68 | .60 | CYP ESC | 3.65 | .91 |
| 4 | FIC CAR | 3 | 5.18 | 1.82 | BAC SAL | 2.79 | 1.21 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100%

% Cover annual grasses: Ø

No. of seedlings/saplings: Ø

Non-native Cover: 5%

GPS Coordinates: S11 Ø376496

UTM 3792431

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø

Transect Length: 5.18 (m)

Comments:

- ART DRA
- HEL ANN
- OPU LITT
- STE VIR
- Lantana camara*

**BIG TUJUNGA WASH**

Date: 5/19/08 Field Crew: Pam Devriese, Kerry Myers, Danica Schaffer Smith

Sample Plot No: 31B Location: 

(2) Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | RIC COM | 2 | 5.08 | 6.60 | BACSAL | .76 | 3.51 |
| 2 | SAL GOO | 3 | 5.13 | 9.14 | AGE ADE | 4.42 | .60 |
| 3 | SAL GOO | 3 | 1.37 | 6.09 | URT DIO | 1.21 | .60 |
| 4 | RIC COM | 3 | 2.74 | 3.04 | BAC SAL | 5.49m | 2.13 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

(1) Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 90% % Cover annual grasses: 30%.

No. of seedlings/saplings: Ø %. Non-native Cover: 50%.

GPS Coordinates: S11 376536 UTM 3792412

(3) Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1 Transect Length: 5.49 (m)

Comments:

. MIM GUT
· Gazania linearis *

## BIG TUJUNGA WASH

Date: 5/19/08

Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 30A

Location:

Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SALGOO | 2 | .46 | 1.21 | AGE ADE | .60 | .30 |
| 2 | SALGOO | 3 | 1.68 | 1.82 | AGE ADE | .91 | .60 |
| 3 | RIC COM | 2 | .60 | 2.43 | AGE ADE | .74 | .30 |
| 4 | SALGOO | 3 | 3.35m | 2.43 | AGE ADE | 2.59 | .30 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 95%

% Cover annual grasses: Ø

No. of seedlings/saplings: 1

Non-native Cover: 10%

GPS Coordinates: S11 Ø376535

UTM 379252Ø

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø

Transect Length: 3.35 (m)

Comments:

- Nerium oleander
- TYPLAT

## BIG TUJUNGA WASH

Date: 5/19/08

Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 30B

Location: 

Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SALGOO | 3 | 4.57 | 12.19 | AGE ADE | .76 | 1.21 |
| 2 | SALGOO | 3 | 5.79m | 6.09 | VRT DIO | 1.52 | 2.43 |
| 3 | Fraxinus sp. | 1 | .60 | .91 | AGE ADE | 2.43 | .91 |
| 4 | SAL GOO | 3 | 2.74 | 2.43 | AGE ADE | .60 | .91 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100 %

% Cover annual grasses: 0%

No. of seedlings/saplings: 2

Non-native Cover: 1%

GPS Coordinates: S11 0376526

UTM 3792512

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø

Transect Length: 5.79 (m)

Comments:

- ERIO CRA
- ERI SAPP
- SAL API
- HEL CURAS.
- LOT SCOP
- BAC PIL.
- ENC CAL.

## BIG TUJUNGA WASH

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 9A Location:

Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SAGO | 3 | 2.43 | 22.86 | TOXDIV | 2.74 | 1.52 |
| 2 | SAGO | 3 | 9.14 | 15.24 | TOXDIV | 3.65 | 2.43 |
| 3 | SAGO | 3 | 3.65 | 7.62 | BAC SAL | 7.31 | 4.57 |
| 4 | SAGO | 3 | 44.81m | 15.24 | BAC SAL | 2.43 | 3.65 |

[1]Height Categories: 1 = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: 60%.

No. of seedlings/saplings: 0% Non-native Cover: 70%.

GPS Coordinates: S11 0375251 UTM 3792545

Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2 Transect Length: 44.81 (m)

Comments:

- Fraxinus velutina
- Agrostis viridis*
- Rumex crispus*
- Avena barbata
- BROM DIAN
- HIRS INCA

- photo 1/2 DSS
- Wheatland Ave. Entrance

## BIG TUJUNGA WASH

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 9B Location: 

2 Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SAL LAS | 2 | 2.62 | 3.81 | BACSAL | 4.11 | 3.73 |
| 2 | SAL GOO | 3 | 6.09 | 13.94 | BACSAL | 3.35 | 2.43 |
| 3 | SAL LAS | 3 | 12.19m | 8.53 | BACSAL | 7.69 | 6.40 |
| 4 | SAL LAS | 3 | 4.87 | 10.66 | BACSAL | 10.66 | 4.57 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: 85%

No. of seedlings/saplings: Ø Non-native Cover: 85%

GPS Coordinates: S11 Ø375271 UTM 3792547

3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 2 Transect Length: 12.19 (m)

Comments:

• CYP ESC

## BIG TUJUNGA WASH

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 4A Location: ____

(2) 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 | 12.19 | 6.09 | ARTCAL | 3.04 | .60 |
| 2 | SAL LAS | 3 | 10.66 | 7.62 | BACSAL | 6.40 | 1.21 |
| 3 | SAL LAS | 3 | 15.85 m | 6.09 | LEP SQU | 3.35 | .30 |
| 4 | SAL LAS | 3 | 11.88 | 5.79 | LEP SQU | 5.48 | 1.82 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

(1) Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 15% % Cover annual grasses: 15%

No. of seedlings/saplings: Ø% Non-native Cover: 1Ø%

GPS Coordinates: S11 0375347 UTM 37926ØØ

(3) Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1 Transect Length: 15.85 (m)

Comments:

- MENT LAEV

## BIG TUJUNGA WASH

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 4B Location: ______

2 Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SALLAS | 3 | 15.84 | 7.31 | ERI FAS | 4.87 | 2.13 |
| 2 | SALLAS | 3 | 8.83 | 7.62 | ERI FAS | 4.87 | .30 |
| 3 | SALLAS | 3 | 15.85m | 10.66 | HAZ SQU | 6.09 | .60 |
| 4 | SAL LAS | 3 | 16.76 | 5.48 | HAZ SQU | 3.35 | .30 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 8% % Cover annual grasses: 4%

No. of seedlings/saplings: Ø Non-native Cover: 5%

GPS Coordinates: S11 0375338 UTM 3792602

3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1 Transect Length: 15.85 (m)

Comments:

- debris piled up (dam)

**BIG TUJUNGA WASH**

Date: 5/20/08

Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 12A

Location:

(2) Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SAM MEX | 2 | 6.10m | 3.04 | RIB AUR | .60 | 1.52 |
| 2 | SAL LAS | 3 | 5.48 | 5.48 | ROS CAL | .91 | .30 |
| 3 | SAL LAS | 3 | 3.65 | 12.19 | RIB AUR | .46 | .43 |
| 4 | SAL LAS | 3 | 1.52 | 13.71 | TOX DIV | 1.52 | .91 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

(1) Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100%

% Cover annual grasses: 5%

No. of seedlings/saplings: 1 (TOX. DIV.)

Non-native Cover: 20%

GPS Coordinates: S11 0375504

UTM 3792523

(3) Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 0

Transect Length: 6.10 (m)

Comments:

- CRO CAL
- Brickelia sp.
- MIM GUT
- Juncus sp.
- PRU PAS
- PHA PAR
- RIB AUR

**BIG TUJUNGA WASH**

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 12B Location: ____

(2) 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 | 4.57m | 3.65 | AGE ADE | .91 | 1.21 |
| 2 | FRA VEL | 3 | 1.21 | 7.62 | AGE ADE | 1.21 | 1.21 |
| 3 | SAL GOO | 3 | 1.52 | 10.66 | AGE ADE | .30 | .91 |
| 4 | SAL GOO | 2 | 3.04 | 3.04 | AGE ADE | .30 | .60 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

(1) Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: Ø%

No. of seedlings/saplings: 10 Non-native Cover: 20%

GPS Coordinates: S11 0375502 UTM 3792503

(3) Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø Transect Length: 4.57 (m)

Comments:

## BIG TUJUNGA WASH

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 19A Location:

2 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 | 12.19m | 13.71 | SAL MEL | 4.57 | 1.52 |
| 2 | SAL LAS | 3 | 10.36 | 10.66 | RIB AUR | 9.14 | .30 |
| 3 | SAL LAS | 3 | 4.57 | 12.19 | ARU DON | 4.57 | 1.82 |
| 4 | SAL LAS | 3 | 6.09 | 16.76 | AFE ADE | 7.31 | 1.52 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: Ø%

No. of seedlings/saplings: Ø Non-native Cover: Ø

GPS Coordinates: S11 375997 UTM 375987

3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø Transect Length: 12.19m (m)

Comments:

- Oenothera elata s-hirsutissima
- spotted towhee
- CA towhee
- oriole
- song sparrow
- Raven
- mourning dove
- Anna's h.b.
- Red failed hawk
- CA quail
- burck's wren
- W. scrubJ
- N. rough wing swallow
- failed cuttings observed

**BIG TUJUNGA WASH**

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 19B Location:

(2) Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SALLAS | 3 | 5.79 | 6.09 | ARTDOU | .91 | 1.82 |
| 2 | SALLAS | 3 | 9.14 | 12.19 | BACSAL | 1.21 | .60 |
| 3 | SAL LAS | 3 | 9.14 | 10.66 | BACSAL | 1.21 | .60 |
| 4 | SAL LAS | 3 | 12.19m | 7.62 | SALMEX | 1.82 | 1.82 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

(1) Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: Ø %

% Cover annual grasses: .5 %

No. of seedlings/saplings: Ø

Non-native Cover: .5 %

GPS Coordinates: S11 Ø375987

UTM 3792541

(3) Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: 1

Transect Length: 12.19 (m)

Comments:

**BIG TUJUNGA WASH**

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 15A Location: ______

2 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 | 11.58m | 15.24 | BACSAL | 2.74 | 1.52 |
| 2 | ALN RHO | 3 | 1.52 | 12.19 | CYP ESC | 4.87 | 1.82 |
| 3 | SAL LAS | 3 | 6.09 | 13.71 | AGE ADE | 2.74 | .91 |
| 4 | Eucalyptus sp. | 3 | 5.48 | 6.09 | BACSAL | 4.57 | 4.57 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100% % Cover annual grasses: Ø%

No. of seedlings/saplings: Ø Non-native Cover: Ø

GPS Coordinates: S11 Ø375890 UTM 3792536

3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø Transect Length: 11.58 (m)

Comments:

- bush tit
- lesser goldfinch

**BIG TUJUNGA WASH**

Date: 5/20/08 Field Crew: Kerry Myers, Danica Schaffer-Smith

Sample Plot No: 15B Location:

2 Point-Quarter Data:

| ¼ | Tree Species | Ht. Cat.[1] | Distance (m) | Cover[2] (m) | Shrub Species | Distance (m) | Cover[2] (m) |
|---|---|---|---|---|---|---|---|
| 1 | SALLAS | 3 | 1.52 | 15.24 | AGE ADE | .60 | 1.21 |
| 2 | SAL LAS | 3 | 5.49m | 10.66 | AGE ADE | 2.43 | 1.21 |
| 3 | SAL LAS | 3 | 3.04 | 10.66 | AGE ADE | 1.82 | 2.13 |
| 4 | SAL LAS | 3 | 3.04 | 1.52 | AGE ADE | 2.13 | .30 |

[1]Height Categories: **1** = <2m; **2** = 2-4m; **3** = >4m
[2]Diameter

1 Square- Meter Quadrat Data:

% Cover debris/leaf litter, etc: 100%

% Cover annual grasses: Ø%

No. of seedlings/saplings: Ø

Non-native Cover: 1%

GPS Coordinates: S11 Ø375903

UTM 3792563

3 Topographic Complexity Transect Data:

No. of topographic features > 1 foot tall: Ø

Transect Length: 5.49 (m)

Comments:

- Black phoebe
- wren tit
- common yell. throat
- LES FIL

# APPENDIX B

## Wildlife Compendium

# APPENDIX B
## Big Tujunga Wildlife Compendium

| | SCIENTIFIC NAME | | COMMON NAME | |
|---|---|---|---|---|
| | **CRUSTACEA** | | **CRUSTACEANS** | |
| | **Decapoda** | | **Crayfish and Shrimp** | |
| | | *Procambarus clarkii* | | Red swamp crayfish |
| | **INSECTA** | | **INSECTS** | |
| | **Odonata** | | **Dragonflies and Damselflies** | |
| | | | | Dragonfly spp. |
| | **Coleoptera** | | **Beetles** | |
| | | *Eleodes* sp. | | Stink beetle |
| | | *Popillia japonica* | | Japanese beetle |
| | **Diptera** | | **Flies** | |
| | | Culicidae family | | Mosquito spp. |
| | **Lepidoptera** | | **Butterflies and Moths** | |
| | | *Papilio rutulus* | | Western Tiger Swallowtail |
| | **Pieridae** | | **Whites and Sulfures** | |
| | | *Pieris rapae* | | Cabbage Butterfly |
| | | | **FISH** | |
| | **Centrarchidae** | | **Sunfishes** | |
| | | *Micropterus salmoides* | | Largemouth bass |
| | | *Lepomis cyanellus* | | Green sunfish |
| | | *Lepomis macrochirus* | | Bluegill |
| | **Cyprinidae** | | **Carps and Minnows** | |
| ** | | *Rhinichthys osculus* ssp. 3 | | Santa Ana speckled dace |
| | | *Carassius auratus* | | Goldfish |
| | **Catostomidae** | | **Suckers** | |
| *** | | *Catostomus santaanae* | | Santa Ana sucker |
| | **Ictaluridae** | | **Catfish** | |
| | | *Ameiurus melas* | | Black bullhead |
| | **Poeciliidae** | | **Freshwater Fish** | |
| | | *Gambusia affinis* | | Mosquitofish |
| | **AMPHIBIA** | | **AMPHIBIANS** | |
| | **Hylidae** | | **Treefrogs and allies** | |
| | | *Hyla cadaverina* | | California treefrog |
| | **Ranidae** | | **True frogs** | |
| * | | *Rana catesbeiana* | | Bullfrog |
| | **REPTILIA** | | **REPTILES** | |
| | **Emydidae** | | **Box and water turtles** | |
| ** | | *Actinemys marmorata pallida* | | Southwestern pond turtle |
| * | | *Trachemys scripta* | | Red-eared slider |

| SCIENTIFIC NAME | | COMMON NAME | |
|---|---|---|---|
| **Phrynosomatidae** | | **Phrynosomatids** | |
| | *Sceloporus magister* | | Desert spiny lizard |
| | *Sceloporus occidentalis biseriatus* | | Western fence lizard |
| | *Uta stansburiana* | | Side-blotched lizard |
| **Teiidae** | | **Whiptail lizards** | |
| | *Cnemidophorus tigris* | | Western whiptail |
| **Colubridae** | | **Colubrids** | |
| | *Masticophus flagellum* | | Coachwhip |
| ** | *Thamnophis hammondii* | | Two-striped garter snake |
| | | | |
| **AVES** | | **BIRDS** | |
| **Podicipedidae** | | **Grebes** | |
| | *Podilymbus podiceps* | | Pied-billed grebe |
| **Phalacrocoracidae** | | **Cormorants** | |
| | *Phalacrocorax auritus* | | Double-crested cormorant |
| **Ardeidae** | | **Herons and Egrets** | |
| | *Butorides virescens* | | Green heron |
| | *Nycticorax nycticorax* | | Black-crowned night-heron |
| **Cathartidae** | | **Vultures** | |
| | *Cathartes aura* | | Turkey vulture |
| **Anatidae** | | **Geese and ducks** | |
| | *Branta canadensis* | | Canada goose |
| | *Anas americana* | | American wigeon |
| | *Anas platyrhynchos* | | Mallard |
| | *Anas cyanoptera* | | Cinnamon teal |
| | *Lophodytes cucullatus* | | Hooded merganser |
| | *Oxyura jamaicensis* | | Ruddy duck |
| **Accipitridae** | | **Raptors** | |
| | *Buteo jamaicensis* | | Red-tailed hawk |
| **Odontophoridae** | | **Quail** | |
| | *Callipepla californica* | | California quail |
| **Rallidae** | | **Rails and coots** | |
| | *Fulica americana* | | American coot |
| **Charadriidae** | | **Plovers** | |
| | *Charadrius vociferus* | | Killdeer |
| **Columbidae** | | **Pigeons and doves** | |
| * | *Columba livia* | | Rock pigeon |
| | *Zenaida macroura* | | Mourning dove |
| **Apodidae** | | **Swifts** | |
| | *Aeronautes saxatalis* | | White-throated swift |
| **Trochilidae** | | **Hummingbirds** | |
| | *Calypte anna* | | Anna's hummingbird |
| | *Archilochus alexandri* | | Black-chinned hummingbird |
| **Picidae** | | **Woodpeckers** | |
| | *Melanerpes formicivorus* | | Acorn woodpecker |
| | *Picoides nuttallii* | | Nuttall's woodpecker |
| | *Picoides pubescens* | | Downy woodpecker |

| SCIENTIFIC NAME | | COMMON NAME | |
|---|---|---|---|
| **Tyrannidae** | | **Tyrant flycatchers** | |
| | *Sayornis nigricans* | | Black phoebe |
| | *Sayornis saya* | | Say's phoebe |
| | *Myiarchus cinerascens* | | Ash-throated flycatcher |
| **Corvidae** | | **Jays and crows** | |
| | *Aphelocoma californica* | | Western scrub-jay |
| | *Corvus brachyrhynchos* | | American crow |
| | *Corvus corax* | | Common raven |
| **Hirundinidae** | | **Swallows** | |
| | *Stelgidopteryx serripennis* | | Northern rough-winged swallow |
| **Aegithalidae** | | **Bushtits** | |
| | *Psaltriparus minimus* | | Bushtit |
| **Troglodytidae** | | **Wrens** | |
| | *Thryomanes bewickii* | | Bewick's wren |
| **Timaliidae** | | **Wrentits** | |
| | *Chamaea fasciata* | | Wrentit |
| **Mimidae** | | **Mockingbirds and thrashers** | |
| | *Mimus polyglottis* | | Northern mockingbird |
| | *Toxostoma redivivum* | | California thrasher |
| **Bombycillidae** | | **Waxwings** | |
| | *Bombycilla cedrorum* | | Cedar waxwing |
| **Parulidae** | | **Wood warblers** | |
| ** | *Dendroica petechia brewsteri* | | Yellow warbler |
| | *Dendroica coronata* | | Yellow-rumped warbler |
| | *Geothlypis trichas* | | Common yellowthroat |
| **Emberizidae** | | **Towhees and sparrows** | |
| | *Pipilo maculatus* | | Spotted towhee |
| | *Pipilo crissalis* | | California towhee |
| | *Melospiza melodia* | | Song sparrow |
| | *Zonotrichia leucophrys* | | White-crowned sparrow |
| **Icteridae** | | **Blackbirds and orioles** | |
| | *Agelaius phoeniceus* | | Red-winged blackbird |
| | *Icterus* sp. | | oriole |
| | *Molothrus ater* | | brown-headed cowbird |
| | *Quiscalus mexicanus* | | Great-tailed grackle |
| **Fringillidae** | | **Finches** | |
| | *Carpodacus mexicanus* | | House finch |
| | *Carduelis psaltria* | | Lesser goldfinch |
| | | | |
| **MAMMALIA** | | **MAMMALS** | |
| **Leporidae** | | **Hares and rabbits** | |
| | *Sylvilagus audubonii* | | Desert cottontail |
| **Sciuridae** | | **Squirrels** | |
| | *Spermophilus beecheyi* | | California ground squirrel |
| **Geomyidae** | | **Pocket gophers** | |
| | *Thomomys bottae* | | Botta's pocket gopher (burrows) |

| SCIENTIFIC NAME | | COMMON NAME |
|---|---|---|
| **Canidae** | | **Dogs/wolves/foxes** |
| * | *Canis familiarus* | Domestic dog |
| | *Canis latrans* | Coyote (scat, tracks) |
| **Equidea** | | **Horses and allies** |
| * | *Equus caballus* | Domestic horse |

*    Non-native Species
**  California Species of Special Concern
*** Federally-listed Threatened Species

# APPENDIX K

## 2007 Water Quality Monitoring Report

# T R A N S M I T T A L

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

**To:** U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, CA 90053-2325

**From:** Sarah Garber

**Attention:** Mr. Aaron Allen

**Re:** Big Tujunga Wash

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

- [ ] At your request
- [ ] For your approval
- [ ] For your review
- [ ] For your action
- [ ] For your files
- [X] For your information

**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# T R A N S M I T T A L

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

**To:** California Department of Fish and Game
402 West Ojai Avenue,
Suite 101, PMB 501
Ojai, CA 93023

**From:** Sarah Garber

**Attention:** Ms. Mary Meyer

**Re:** Big Tujunga Wash

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

- [ ] At your request
- [ ] For your approval
- [ ] For your review
- [ ] For your action
- [ ] For your files
- [X] For your information

**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# TRANSMITTAL

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

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

**From:** Sarah Garber

**Attention:** Mari Quillman

**Re:** Big Tujunga Wash

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

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- [ ] For your action
- [ ] For your approval
- [X] For your files
- [ ] For your review
- [ ] For your information

**General Remarks:**

One copy of the report was also sent to each person on the distribution list.

# T R A N S M I T T A L

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

---

**To:** County of Los Angeles
Dept. of Public Works -
Water Resources Division
900 South Fremont Ave.
Alhambra, CA 91803-1331

**From:** Sarah Garber

**Attention:** Ms. Belinda Kwan

**Re:** Big Tujunga Wash

---

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 (hard copy) |
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 (CD-ROM with PDF file) |

This data is submitted:

- [ ] At your request
- [ ] For your action
- [ ] For your approval
- [ ] For your files
- [ ] For your review
- [X] For your information

**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# TRANSMITTAL

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

**To:** Regional Water Quality Control Board, Los Angeles Region (4)
320 West 4th St., Suite 300
Los Angeles, CA 90013

**From:** Sarah Garber

**Attention:** Ms. Valerie Carrillo

**Re:** Big Tujunga Wash

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

- [ ] At your request
- [ ] For your approval
- [ ] For your review
- [ ] For your action
- [ ] For your files
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**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# TRANSMITTAL

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

---

**To:** California Department of Fish and Game
1508 N. Harding Ave.
Pasadena, CA 91104

**From:** Sarah Garber

**Attention:** Mr. Scott Harris

**Re:** Big Tujunga Wash

---

The following items are enclosed:

| No. of Copies | Description |
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| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

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**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# T R A N S M I T T A L

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

---

**To:** U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, CA 92009

**From:** Sarah Garber

**Attention:** Mr. Jesse Bennett

**Re:** Big Tujunga Wash

---

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

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- [ ] For your review
- [ ] For your action
- [ ] For your files
- [X] For your information

**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# T R A N S M I T T A L

MWH

618 Michillinda Avenue, Suite 200
Arcadia, California 91007

Tel: 626 568-6910
Fax: 626 568-6102

**Date:** April 7, 2008

**To:** Mr. William Eick
2604 Foothill Blvd.,
Suite C
La Crescenta, CA 91214

**From:** Sarah Garber

**Re:** Big Tujunga Wash

The following items are enclosed:

| No. of Copies | Description |
|---|---|
| 1 | Big Tujunga Wash Water Quality Monitoring Report – 2007 |

This data is submitted:

- [ ] At your request
- [ ] For your approval
- [ ] For your review
- [ ] For your action
- [ ] For your files
- [X] For your information

**General Remarks:**

Please call me if you have any questions on the content of the monitoring report.

# County of Los Angeles
# Department of Public Works

## December 2007 Water Quality Monitoring Report

for the

**Master Mitigation Plan**
**for the Big Tujunga Wash Mitigation Bank**

February 2008

MWH

# December 2007 Water Quality Monitoring Report

**for**

## Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank

**February 2008**

***Prepared For:***

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

***Prepared By:***

**MWH**
**618 Michillinda Avenue, Suite 200**
**Arcadia, California 91007**

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# Distribution

Water quality monitoring reports are distributed to the following agencies:

**Los Angeles County Department of Public Works**
Ms. Belinda Kwan
Water Resources Division, Facilities Section
900 South Fremont Avenue
Alhambra, California 91803-1331

**California Department of Fish and Game**
Ms. Mary Meyer
402 West Ojai Avenue, Suite 101, PMB 501
Ojai, California 93023

Mr. Scott Harris
1508 N. Harding Ave.
Pasadena, California 91104

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

**U.S. Fish and Wildlife Service**
Mr. Jesse Bennett
6010 Hidden Valley Road
Carlsbad, California 92009

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

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

# Water Quality Monitoring
## December 2007

### BACKGROUND

The County of Los Angeles Department of Public Works (LADPW) purchased a 207-acre parcel in Big Tujunga Wash as a mitigation bank 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 Master Mitigation Plan (MMP) was prepared to guide the implementation of these enhancements. The MMP also includes a monitoring program to gather data on conditions at the site during implementation of the improvements. The MMP 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 MMP. 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. This report presents the results of the water quality sampling for 2007, which was conducted in December.

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 at the far eastern portion of the site.

### Project Site Activities

A timeline of project-related activities that could influence water quality is presented in **Table 1**.

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

| Month/Year | Activity |
|---|---|
| 4/00 | Baseline water quality sampling |
| 11/00 to 11/01 | Arundo, tamarisk, and pepper tree removal<br>Chemical (Rodeo®) application |
| 12/00 to 11/02 | Water hyacinth removal |
| 12/00 | Fish Sampling at Haines Canyon Creek |
| 12/14/00 | Water quality sampling |
| 1/01 to present | Exotic aquatic wildlife (non-native fish, crayfish, bullfrog, and turtle) removal – conducted quarterly |
| 2/01 | Partial riparian planting |
| 3/01 | Selective clearing at Canyon Trails Golf Club |
| 3/12/01 | Water quality sampling |
| 6/19/01 | Water quality sampling |
| 7/01 | Fish Sampling at Haines Canyon Creek |
| 9/11/01 | Water quality sampling |

**Table 1 (Continued)**
**Major Activities to Date at the Big Tujunga Wash Mitigation Bank**

| Month/Year | Activity |
|---|---|
| 10/01 to 11/01 | Fish Sampling at Haines Canyon Creek |
| 12/12/01 | Water quality sampling |
| 1/02 | Final riparian planting |
| 2/02 | Upland replacement planting |
| 3/26/02 | Water quality sampling |
| 6/25/02 | Water quality sampling |
| 7/02 | Fish Sampling at Haines Canyon Creek |
| 9/12/02 | Water quality sampling |
| 10/02 | Grading at Canyon Trails Golf Club begins |
| 11/02 | Fish Sampling at Haines Canyon Creek |
| 12/19/02 | Water quality sampling |
| 3/20/03 | Water quality sampling |
| 4/1/03 | Meeting with Canyon Trails Golf Club to discuss future use of herbicides and fertilizers |
| 6/23/03 | Water quality sampling |
| 8/03 | Fish Sampling at Haines Canyon Creek |
| 9/30/03 | Water quality sampling |
| Fall 2003 | Completion of the golf course construction |
| 12/17/03 | Water quality sampling |
| 1/04 | Fish Sampling at Haines Canyon Creek |
| 4/2/04 | Water quality sampling |
| 4/3/04 | Rock Dam Removal Day |
| 6/04 | Angeles National Golf Club (previously named Canyon Trails) opens to the public |
| 7/2/04 | Water quality sampling |
| 10/5/04 | Water quality sampling |
| 12/9/04 | Water quality sampling |
| 4/7/05 | Water quality sampling |
| 6/30/05 | Water quality sampling |
| 10/25/05 | Water quality sampling |
| 12/22/05 | Water quality sampling |
| 7/11/06 | Water quality sampling |
| 12/29/06 | Water quality sampling |
| 12/17/07 | Water quality sampling |

## Angeles National Golf Club Activities

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.

The golf course has been operating since June 2004. Additional construction at the club house building is in progress (Angeles National Golf Club website, accessed at http://www.angelesnational.com/futureclubhouse.html on January 8, 2007).

In March 2004, the golf course maintenance staff indicated that the following chemicals may be used on an as needed basis: Primo™ (a grass growth inhibitor used for turf management; active ingredient – trinexapac-ethyl) and Rodeo® (an herbicide used to control aquatic weeds; active ingredient – glyphosate) (J. Reidinger, pers. comm. to M. Chimienti, LADPW, March 18, 2004). Based on this information, glyphosate was added to the list of sampling parameters starting in the first quarter of 2004.

In December 2004 and February 2005, the Golf Club provided MWH with the golf course's monthly pesticide use reports. The reports indicate that 10 types of chemical products (seven herbicides, one insecticide, one fungicide, and one grass growth inhibitor) were applied. Pesticide use reports were again provided by the Golf Club in April 2007 for the period from November 2006 to March 2007. During this period, pesticides were applied only in November 2006 as summarized in **Table 2**.

**Table 2**
**Pesticide Applications at the Angeles National Golf Course**
**(November 2006)**

| Active Ingredient | Manufacturer and Product Name | Applications |
|---|---|---|
| Flutolanil | Bayer Prostar 70 WP (fungicide) | One application of 37 pounds on 130,000 sq. ft. of turfgrass |
| Glyphosate | Verdicon Kleenup Pro (herbicide) | One application of 5 gallons (2% volume) as a spot treatment on turfgrass |
| Gibberellic Acid | Valent ProGibb T&O (plant growth regulator) | One application of 1 quart on 16 acres of turfgrass |
| Pyraclostrobin | BASF Insignia 20 WG (fungicide) | One application of 7.2 pounds on 130,000 sq. ft. of turfgrass |

Source: Angeles National Golf Course Monthly Summary Pesticide Use Reports for November 2006 through March 2007

In December 2004, the Golf Club also provided MWH with the golf course's water quality monitoring reports to date. The results were summarized and presented in the 2004 Annual Report for the Big Tujunga Wash Mitigation Bank Water Quality Monitoring Program (distributed in February 2005).

In August 2006, the Golf Club provided MWH with additional water quality monitoring reports from the first and second quarters of 2006. The Golf Club's monitoring activities for the first and second quarters of 2006 included:

- Groundwater samples were collected on February 24 and May 17 from two groundwater monitoring wells downgradient from the golf course (MW-1 and MW-2R, located near Foothill Boulevard).

- Surface water samples were collected from Big Tujunga Wash approximately 200 feet east of Foothill Boulevard (sampling site SW-2) on February 24 and May 17.
- For the first and second quarters of 2006, surface water samples were not collected from Haines Canyon Creek (sampling site SW-1, approximately 500 feet east of Foothill Boulevard) since water was not flowing at this site on the sampling dates.

[Source: Angeles National Golf Club First Quarter 2006 Monitoring Report (dated May 3, 2006) and Second Quarter 2006 Monitoring Report (dated July 6, 2006), prepared by Brown and Caldwell for the Los Angeles International Golf Club.]

The following parameters were sampled by the Golf Club in the first and second quarters of 2006:

- General parameters – pH, electrical conductivity, total dissolved solids (TDS), sodium, potassium, calcium, magnesium, carbonate, bicarbonate, sulfate, chloride, nitrate as nitrogen, nitrite as nitrogen, total Kjeldahl nitrogen (TKN), ammonia as nitrogen, oil and grease, and surfactants (MBAS)
- Pesticides – aldrin, chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin aldehyde, heptachlor epoxide, and methoxychlor
- Fungicides – metalaxyl, chlorothalonil, iprodione, propiconazole, vincolozoin, and quintozene
- Herbicides – prodiamine, pronamide, P-butylfluazifop, fenoxaprop, pendimethalin, triclopyr, chlopyralid, 2,4-D amine, dicamba, and MCPP
- Insecticides – chlorpyrifos, trichlorfon, and malathion

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).

**Figure 1**
**Angeles National Golf Club Groundwater and Surface Water Sampling Sites (February and May 2006)**


Source: Angeles National Golf Club First Quarter 2006 Monitoring Report (dated May 3, 2006), prepared by Brown and Caldwell for the Los Angeles International Golf Club.

## MATERIALS AND METHODS

### Sampling Stations

Four sampling locations have been identified for the monitoring program for the Big Tujunga Wash Mitigation Bank (**Figure 2**). **Table 3** summarizes sampling locations and the conditions observed on December 17, 2007. The coordinates of the sampling stations were determined by a hand-held Global Positioning System.

**Table 3**
**Water Quality Sampling Locations and Conditions for December 2007**

| | | | |
|---|---|---|---|
| **Date** | December 17, 2007 | | |
| **Air Temperature** | Approximately 62 degrees Fahrenheit | | |
| **Skies** | Sunny | | |
| **Observations** | Horses observed adjacent to stream channels. Algae levels low in Tujunga ponds. | | |
| **Sampling Locations** | **Latitude** | **Longitude** | **Time of sample** |
| Haines Canyon Creek | N 34º 16' 2.9" | W 118º 21' 22.2" | 1430 |
| Haines Canyon Creek, inflow to Tujunga Ponds | N 34º 16' 6.9" | W 118º 20' 18.7" | 1345 |
| Haines Canyon Creek, outflow from Tujunga Ponds | N 34º 16' 7.1" | W 118º 20' 28.3" | 1310 |
| Big Tujunga Wash | N 34º 16' 11.7" | W 118º 21' 4.0" | 1220 |

### 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 and temperature – HACH SensION 6 DO meter
- pH – Orion 230A with HACH 51935 electrode

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 the laboratory followed the methods described in the MWH Laboratories *Quality Assurance Manual*.

## Table 4
## Water Quality Sampling Parameters

| Parameter | Analysis Location | Analytical Method |
|---|---|---|
| total Kjeldahl nitrogen (TKN) | laboratory | EPA 351.2 |
| nitrite ($NO_2$) | laboratory | EPA 300.0 by IC |
| nitrate ($NO_3$) | 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 625 |
| Pesticides/PCBs[3] | laboratory | EPA 608 |
| dissolved oxygen | field | Standard Methods 4500-O G |
| total residual chlorine | laboratory | Standard Methods 4500-Cl G |
| temperature | field | Standard Methods 2550 |
| pH | field | Standard Methods 4500-H+ |

Sources for analytical methods:

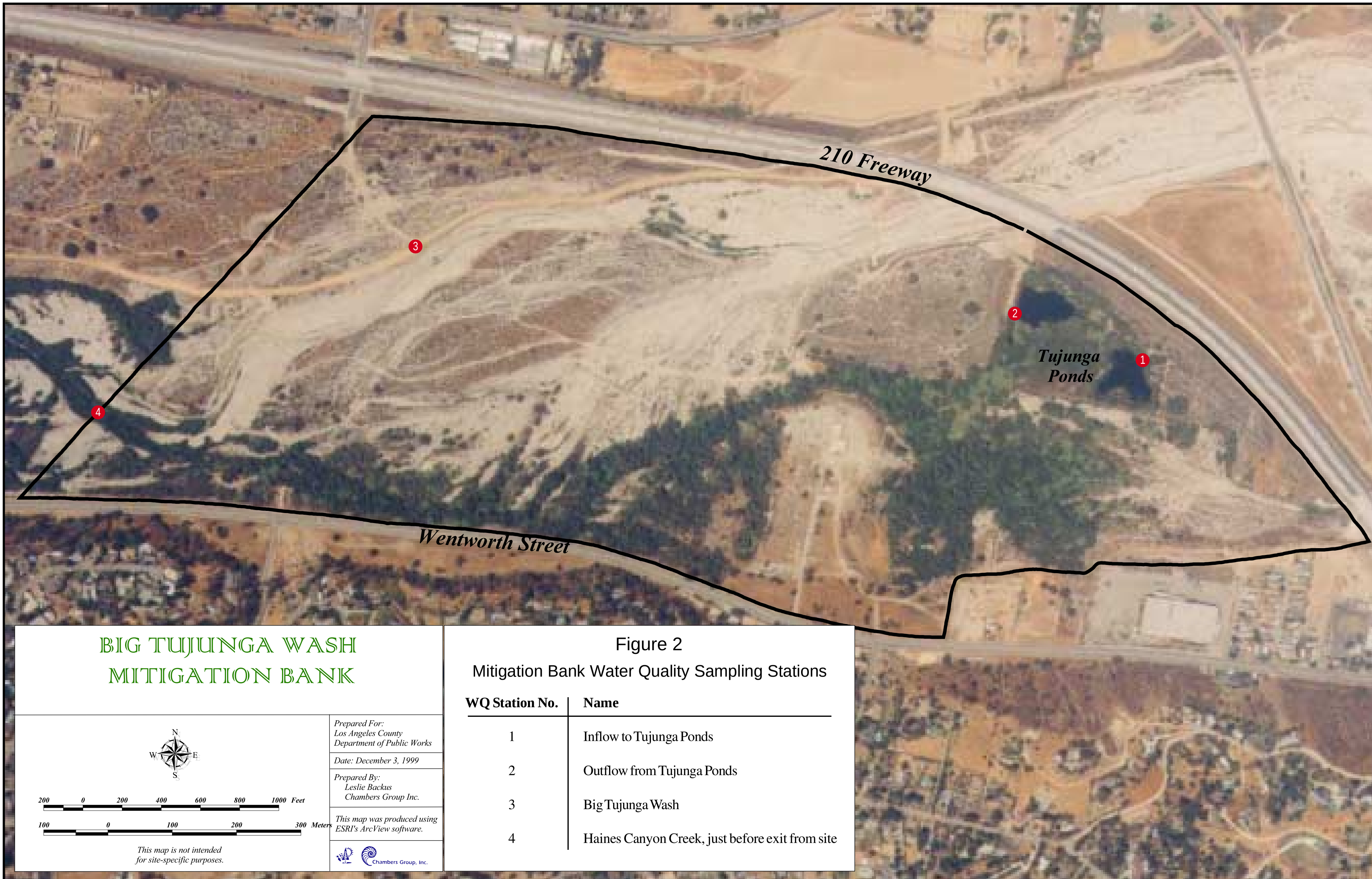
EPA. Method and Guidance for Analysis of Water.

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 (diazinon/chlorpyrifos by GCMS, EPA 625) tests for the following chemicals: diazinon, sulprofos, chlorpyrifos, demeton, dichlorvos, disulfoton, dimethoate, ethoprop, fenchlorophos, fensulfothion, fenthion, merphos, mevinphos, malathion, parathion-methyl, phorate, tokuthion, tetrachlorovinphos, and trichloronate.

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




# BIG TUJUNGA WASH MITIGATION BANK

*Prepared For:*
*Los Angeles County*
*Department of Public Works*

*Date: December 3, 1999*

*Prepared By:*
*Leslie Backus*
*Chambers Group Inc.*

*This map was produced using ESRI's ArcView software.*

Chambers Group, Inc.

## Figure 2

Mitigation Bank Water Quality Sampling Stations

| WQ Station No. | Name |
|---|---|
| 1 | Inflow to Tujunga Ponds |
| 2 | Outflow from Tujunga Ponds |
| 3 | Big Tujunga Wash |
| 4 | Haines Canyon Creek, just before exit from site |

**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 (a small plastic ball) to measure stream velocity.

Calculating flow then involves solving the following equation:

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

Where:

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

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

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

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

## RESULTS

### Baseline Water Quality

Sampling and analysis conducted by LADPW 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 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, perhaps due to release from sediments.

### December 2007 Results

#### Water Quality

Results of analyses conducted by MWH 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 – December 17, 2007**

| Parameter | Units | Inflow to Tujunga Ponds | Outflow from Tujunga Ponds | Big Tujunga Wash | Haines Cyn Creek exiting site |
|---|---|---|---|---|---|
| Temperature | °C | 16.8 | 15.6 | 12.4 | 14.8 |
| Dissolved Oxygen | mg/L | 5.42 | 7.24 | 10.42 | 8.15 |
| pH | std units | 6.34 | 6.72 | 8.22 | 7.40 |
| Total residual chlorine | mg/L | ND | ND | ND | ND |
| Ammonia-Nitrogen | mg/L | ND | ND | ND | ND |
| Kjeldahl Nitrogen | mg/L | 0.23 | ND | ND | ND |
| Nitrite-Nitrogen | mg/L | ND | ND | ND | ND |
| Nitrate-Nitrogen | mg/L | 8.6 | 5.7 | ND | 5.1 |
| Orthophosphate-P | mg/L | 0.31 | 0.15 | 0.05 | 0.29 |
| Total phosphorus-P* | mg/L | 0.05 | 0.031 | ND | 0.04 |
| Glyphosate | µg/L | ND | ND | ND | ND |
| Chloropyrifos** | ng/L | ND | ND | ND | ND |
| Pesticides/PCBs (EPA 608)*** | µg/L | ND | ND | ND | ND |
| Turbidity | NTU | 0.40 | 0.45 | 0.45 | 0.40 |
| Fecal Coliform Bacteria | (MPN/100 ml) | 21 | 140 | 50 | 30 |
| Total Coliform Bacteria | (MPN/100 ml) | 500 | 900 | 220 | 500 |

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

** The analytical method used for chloropyrifos (diazinon/chlorpyrifos by GCMS, EPA 625) also tests for the following chemicals: diazinon, sulprofos, demeton, dichlorvos, disulfoton, dimethoate, ethoprop, fenchlorophos, fensulfothion, fenthion, merphos, mevinphos, malathion, parathion-methyl, phorate, tokuthion, tetrachlorovinphos, and trichloronate.

*** EPA method 608 tests for aroclor, BHC, aldrin, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, mirex, 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 December 2007 are summarized in **Table 7**.

**Table 7**
**Estimated Flows for December 2007**

| Sampling Date | Flow (cubic feet per second) | | |
|---|---|---|---|
| | Outlet of Big Tujunga Ponds | Haines Canyon Creek leaving the site | Big Tujunga Wash |
| 12/17/2007 | 7.5 | 5.3 | 1.0 |

**Comparison of Results with Baseline Data**

Water quality in December 2007 was generally similar to baseline conditions for parameters such as pH, nitrate, ammonia, and Kjeldahl nitrogen. Substantially higher bacteria and turbidity levels were observed in the 4/18/00 baseline samples due to a rain event. Phosphorus levels were also higher in the April 2000 samples than in December 2007, perhaps due to release from sediments.

**Comparison of Results with Aquatic Life Criteria**

**Tables 8** and **12** present objectives established by the Los Angeles Regional Water Quality Control Board (Regional Board) for protection of beneficial uses in Big Tujunga Wash including wildlife habitat. EPA's criteria for freshwater aquatic life are also presented in **Tables 8, 9, 10, 11** and **13**.

## 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 11 | See Table 11 | -- |
| Dissolved oxygen (mg/L) | >7.0 mean<br>>5.0 min | 5.0[c]<br>(warmwater, early life stages, 1-day minimum) | 6.0[c]<br>(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<br>(maximum residual disinfectant level goal) |
| Fecal coliform (MPN/100 ml) | 200[f]<br>(water contact recreation) | -- | -- | Swimming stds:<br>33[g] (geometric mean for enterococci)<br>126[g] (geometric mean for *E. coli*) |
| Ammonia-nitrogen (mg/L) | See Table 12 | See Tables 9, 10, and 11 | See Tables 9, 10, and 11 | -- |
| Nitrite-nitrogen (mg/L) | 1 | -- | -- | 1<br>(primary drinking water std.) |
| Nitrate-nitrogen (mg/L) | 10 | -- | -- | 10<br>(primary drinking water std.) |
| Total phosphorus (mg/L) | -- | <0.05 – 0.1[e]<br>(recommendation for streams, no criterion) | | -- |
| Turbidity (NTU) | h | i | i | 5<br>(secondary drinking water standard)<br>0.5 – 1.0<br>(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**
**Numeric Values of the Criterion Maximum Concentration (CMC) with Salmonids Present and Absent and the Criterion Continuous Concentration (CCC) for Ammonia Nitrogen (mg/L)**

| pH | CMC with Salmonids Present | CMC with Salmonids Absent | CCC |
|---|---|---|---|
| 6.5 | 32.6 | 48.8 | 3.48 |
| 6.6 | 31.3 | 46.8 | 3.42 |
| 6.7 | 29.8 | 44.6 | 3.36 |
| 6.8 | 28.1 | 42.0 | 3.28 |
| 6.9 | 26.2 | 39.1 | 3.19 |
| 7.0 | 24.1 | 36.1 | 3.08 |
| 7.1 | 22.0 | 32.8 | 2.96 |
| 7.2 | 19.7 | 29.5 | 2.81 |
| 7.3 | 17.5 | 26.2 | 2.65 |
| 7.4 | 15.4 | 23.0 | 2.47 |
| 7.5 | 13.3 | 19.9 | 2.28 |
| 7.6 | 11.4 | 17.0 | 2.07 |
| 7.7 | 9.65 | 14.4 | 1.87 |
| 7.8 | 8.11 | 12.1 | 1.66 |
| 7.9 | 6.77 | 10.1 | 1.46 |
| 8.0 | 5.62 | 8.4 | 1.27 |
| 8.1 | 4.64 | 6.95 | 1.09 |
| 8.2 | 3.83 | 5.72 | 0.935 |
| 8.3 | 3.15 | 4.71 | 0.795 |
| 8.4 | 2.59 | 3.88 | 0.673 |
| 8.5 | 2.14 | 3.2 | 0.568 |
| 8.6 | 1.77 | 2.65 | 0.480 |
| 8.7 | 1.47 | 2.2 | 0.406 |
| 8.8 | 1.23 | 1.84 | 0.345 |
| 8.9 | 1.04 | 1.56 | 0.295 |
| 9.0 | 0.885 | 1.32 | 0.254 |

Source: USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

## Table 10
## Temperature and pH-Dependent Values of the Ammonia-Nitrogen CCC (Chronic Criterion) for Fish Early Life Stages Absent

| CCC for Fish Early Life Stages Absent, mg N/L | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | Temperature (°Celsius) | | | | | | | | | |
| | 0-7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15* | 16* |
| 6.5 | 10.8 | 10.1 | 9.51 | 8.92 | 8.36 | 7.84 | 7.35 | 6.89 | 6.46 | 6.06 |
| 6.6 | 10.7 | 9.99 | 9.37 | 8.79 | 8.24 | 7.72 | 7.24 | 6.79 | 6.36 | 5.97 |
| 6.7 | 10.5 | 9.81 | 9.20 | 8.62 | 8.08 | 7.58 | 7.11 | 6.66 | 6.25 | 5.86 |
| 6.8 | 10.2 | 9.58 | 8.98 | 8.42 | 7.90 | 7.40 | 6.94 | 6.51 | 6.10 | 5.72 |
| 6.9 | 9.93 | 9.31 | 8.73 | 8.19 | 7.68 | 7.20 | 6.75 | 6.33 | 5.93 | 5.56 |
| 7.0 | 9.60 | 9.00 | 8.43 | 7.91 | 7.41 | 6.95 | 6.52 | 6.11 | 5.73 | 5.37 |
| 7.1 | 9.20 | 8.63 | 8.09 | 7.58 | 7.11 | 6.67 | 6.25 | 5.86 | 5.49 | 5.15 |
| 7.2 | 8.75 | 8.20 | 7.69 | 7.21 | 6.76 | 6.34 | 5.94 | 5.57 | 5.22 | 4.90 |
| 7.3 | 8.24 | 7.73 | 7.25 | 6.79 | 6.37 | 5.97 | 5.60 | 5.25 | 4.92 | 4.61 |
| 7.4 | 7.69 | 7.21 | 6.76 | 6.33 | 5.94 | 5.57 | 5.22 | 4.89 | 4.59 | 4.30 |
| 7.5 | 7.09 | 6.64 | 6.23 | 5.84 | 5.48 | 5.13 | 4.81 | 4.51 | 4.23 | 3.97 |
| 7.6 | 6.46 | 6.05 | 5.67 | 5.32 | 4.99 | 4.68 | 4.38 | 4.11 | 3.85 | 3.61 |
| 7.7 | 5.81 | 5.45 | 5.11 | 4.79 | 4.49 | 4.21 | 3.95 | 3.70 | 3.47 | 3.25 |
| 7.8 | 5.17 | 4.84 | 4.54 | 4.26 | 3.99 | 3.74 | 3.51 | 3.29 | 3.09 | 2.89 |
| 7.9 | 4.54 | 4.26 | 3.99 | 3.74 | 3.51 | 3.29 | 3.09 | 2.89 | 2.71 | 2.54 |
| 8.0 | 3.95 | 3.70 | 3.47 | 3.26 | 3.05 | 2.86 | 2.68 | 2.52 | 2.36 | 2.21 |
| 8.1 | 3.41 | 3.19 | 2.99 | 2.81 | 2.63 | 2.47 | 2.31 | 2.17 | 2.03 | 1.91 |
| 8.2 | 2.91 | 2.73 | 2.56 | 2.40 | 2.25 | 2.11 | 1.98 | 1.85 | 1.74 | 1.63 |
| 8.3 | 2.47 | 2.32 | 2.18 | 2.04 | 1.91 | 1.79 | 1.68 | 1.58 | 1.48 | 1.39 |
| 8.4 | 2.09 | 1.96 | 1.84 | 1.73 | 1.62 | 1.52 | 1.42 | 1.33 | 1.25 | 1.17 |
| 8.5 | 1.77 | 1.66 | 1.55 | 1.46 | 1.37 | 1.28 | 1.20 | 1.13 | 1.06 | 0.990 |
| 8.6 | 1.49 | 1.40 | 1.31 | 1.23 | 1.15 | 1.08 | 1.01 | 0.951 | 0.892 | 0.836 |
| 8.7 | 1.26 | 1.18 | 1.11 | 1.04 | 0.976 | 0.915 | 0.858 | 0.805 | 0.754 | 0.707 |
| 8.8 | 1.07 | 1.01 | 0.944 | 0.885 | 0.829 | 0.778 | 0.729 | 0.684 | 0.641 | 0.601 |
| 8.9 | 0.917 | 0.860 | 0.806 | 0.756 | 0.709 | 0.664 | 0.623 | 0.584 | 0.548 | 0.513 |
| 9.0 | 0.790 | 0.740 | 0.694 | 0.651 | 0.610 | 0.572 | 0.536 | 0.503 | 0.471 | 0.442 |

* At 15° C and above, the criterion for fish ELS absent is the same as the criterion for fish ELS present.
Source: USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

**Table 11**
**Temperature and pH-Dependent Values of the Ammonia-Nitrogen CCC (Chronic Criterion) for Fish Early Life Stages Present**

| CCC for Fish Early Life Stages Present, mg N/L | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | Temperature (° Celsius) | | | | | | | | | |
| | 0 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
| 6.5 | 6.67 | 6.67 | 6.06 | 5.33 | 4.68 | 4.12 | 3.62 | 3.18 | 2.80 | 2.46 |
| 6.6 | 6.57 | 6.57 | 5.97 | 5.25 | 4.61 | 4.05 | 3.56 | 3.13 | 2.75 | 2.42 |
| 6.7 | 6.44 | 6.44 | 5.86 | 5.15 | 4.52 | 3.98 | 3.50 | 3.07 | 2.70 | 2.37 |
| 6.8 | 6.29 | 6.29 | 5.72 | 5.03 | 4.42 | 3.89 | 3.42 | 3.00 | 2.64 | 2.32 |
| 6.9 | 6.12 | 6.12 | 5.56 | 4.89 | 4.30 | 3.78 | 3.32 | 2.92 | 2.57 | 2.25 |
| 7.0 | 5.91 | 5.91 | 5.37 | 4.72 | 4.15 | 3.65 | 3.21 | 2.82 | 2.48 | 2.18 |
| 7.1 | 5.67 | 5.67 | 5.15 | 4.53 | 3.98 | 3.50 | 3.08 | 2.70 | 2.38 | 2.09 |
| 7.2 | 5.39 | 5.39 | 4.90 | 4.31 | 3.78 | 3.33 | 2.92 | 2.57 | 2.26 | 1.99 |
| 7.3 | 5.08 | 5.08 | 4.61 | 4.06 | 3.57 | 3.13 | 2.76 | 2.42 | 2.13 | 1.87 |
| 7.4 | 4.73 | 4.73 | 4.30 | 3.78 | 3.32 | 2.92 | 2.57 | 2.26 | 1.98 | 1.74 |
| 7.5 | 4.36 | 4.36 | 3.97 | 3.49 | 3.06 | 2.69 | 2.37 | 2.08 | 1.83 | 1.61 |
| 7.6 | 3.98 | 3.98 | 3.61 | 3.18 | 2.79 | 2.45 | 2.16 | 1.90 | 1.67 | 1.47 |
| 7.7 | 3.58 | 3.58 | 3.25 | 2.86 | 2.51 | 2.21 | 1.94 | 1.71 | 1.50 | 1.32 |
| 7.8 | 3.18 | 3.18 | 2.89 | 2.54 | 2.23 | 1.96 | 1.73 | 1.52 | 1.33 | 1.17 |
| 7.9 | 2.80 | 2.80 | 2.54 | 2.24 | 1.96 | 1.73 | 1.52 | 1.33 | 1.17 | 1.03 |
| 8.0 | 2.43 | 2.43 | 2.21 | 1.94 | 1.71 | 1.50 | 1.32 | 1.16 | 1.02 | 0.897 |
| 8.1 | 2.10 | 2.10 | 1.91 | 1.68 | 1.47 | 1.29 | 1.14 | 1.00 | 0.879 | 0.773 |
| 8.2 | 1.79 | 1.79 | 1.63 | 1.43 | 1.26 | 1.11 | 0.973 | 0.855 | 0.752 | 0.661 |
| 8.3 | 1.52 | 1.52 | 1.39 | 1.22 | 1.07 | 0.941 | 0.827 | 0.727 | 0.639 | 0.562 |
| 8.4 | 1.29 | 1.29 | 1.17 | 1.03 | 0.906 | 0.796 | 0.700 | 0.615 | 0.541 | 0.475 |
| 8.5 | 1.09 | 1.09 | 0.990 | 0.870 | 0.765 | 0.672 | 0.591 | 0.520 | 0.457 | 0.401 |
| 8.6 | 0.920 | 0.920 | 0.836 | 0.735 | 0.646 | 0.568 | 0.499 | 0.439 | 0.386 | 0.339 |
| 8.7 | 0.778 | 0.778 | 0.707 | 0.622 | 0.547 | 0.480 | 0.422 | 0.371 | 0.326 | 0.287 |
| 8.8 | 0.661 | 0.661 | 0.601 | 0.528 | 0.464 | 0.408 | 0.359 | 0.315 | 0.277 | 0.244 |
| 8.9 | 0.565 | 0.565 | 0.513 | 0.451 | 0.397 | 0.349 | 0.306 | 0.269 | 0.237 | 0.208 |
| 9.0 | 0.486 | 0.486 | 0.442 | 0.389 | 0.342 | 0.300 | 0.264 | 0.232 | 0.204 | 0.179 |

Source: USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

**Table 12**
**Maximum One-Hour Average Concentration for Total Ammonia**
**(mg/L $NH_3$)**

| pH | Temperature (°Celsius) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
| 6.50 | 35 | 33 | 31 | 30 | 29 | 20 | 14.3 |
| 6.75 | 32 | 30 | 28 | 27 | 27 | 18.6 | 13.2 |
| 7.00 | 28 | 26 | 25 | 24 | 23 | 16.4 | 11.6 |
| 7.25 | 23 | 22 | 20 | 19.7 | 19.2 | 13.4 | 9.5 |
| 7.50 | 17.4 | 16.3 | 15.5 | 14.9 | 14.6 | 10.2 | 7.3 |
| 7.75 | 12.2 | 11.4 | 10.9 | 10.5 | 10.3 | 7.2 | 5.2 |
| 8.00 | 8.0 | 7.5 | 7.1 | 6.9 | 6.8 | 4.8 | 3.5 |
| 8.25 | 4.5 | 4.2 | 4.1 | 4.0 | 3.9 | 2.8 | 2.1 |
| 8.50 | 2.6 | 2.4 | 2.3 | 2.3 | 2.3 | 1.71 | 1.28 |
| 8.75 | 1.47 | 1.40 | 1.37 | 1.38 | 1.42 | 1.07 | 0.83 |
| 9.00 | 0.86 | 0.83 | 0.83 | 0.86 | 0.91 | 0.72 | 0.58 |

Source: California Regional Water Quality Control Board, Los Angeles Region. 1994. Water Quality Control Plan (Basin Plan). Taken from USEPA. 1986. Quality Criteria for Water. EPA 440/5-86-001. 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 December 2007 sampling program are described by parameter in **Table 14**.

**Table 14**
**Discussion of December 2007 Big Tujunga Wash Sampling Results**

| Parameter | Discussion |
|---|---|
| Temperature | • Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations. |
| Dissolved oxygen | • Dissolved oxygen levels ranged from 5.42 mg/L in the inflow to the ponds to 10.42 in Big Tujunga Wash. DO levels at all stations were above the recommended minimum for warmwater fish species (5.0 mg/L). |
| pH | • Lowest pH was observed in the inflow to the ponds (6.34), with highest pH observed in Big Tujunga Wash (8.22). On this date, pH measurements at all stations except the inflow to the ponds were within the 6.5 to 8.5 range identified in the Basin Plan. |
| Total residual chlorine | • No residual chlorine was detected at any station. |
| Nitrogen | • Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L and nitrate levels were below the method reporting limit (0.44 mg/L) at the Big Tujunga Wash station.<br>• Ammonia and nitrite were not detected at any station. |
| Phosphorus | • Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range was ND to 0.05 mg/L; recommended range is <0.05 – 0.1 mg/L).<br>• Higher orthophosphate measurements are suspected to be caused by interference, possibly by arsenate (concentrations as low as 0.1 mg As/L interfere (positively) with the phosphate determination). |
| Glyphosate | • No glyphosate was detected at any station. |
| Chloropyrifos | • Chloropyrifos and the other pesticides tested using EPA's analytical method 625 were not detected at any station. |
| Pesticides/ PCBs (EPA 608 compounds) | • Pesticides and PCBs analyzed by EPA Method 608 were non-detect at all stations. |
| Turbidity | • Turbidity levels were low (<0.50 NTU) at all stations. |
| Bacteria | • Fecal coliform levels at all stations were below the water contact recreation standard of 200 MPN. Total coliform levels were generally low at all stations. |

## GLOSSARY

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

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

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

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

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

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

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

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

**Nitrite-Nitrogen** – $NO2^-$-N is an intermediate oxidation state of nitrogen, both in the oxidation of ammonia to nitrate and in the reduction of nitrate.

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

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

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

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

**APPENDIX A**

**BIG TUJUNGA WASH MITIGATION BANK**
**WATER QUALITY MONITORING PROGRAM**

**LABORATORY RESULTS**
**December 2007**

**MWH Laboratories**
A Division of MWH Americas, Inc.

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
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**Laboratory Report**

for

MWH/ECORP - Big Tujunga
618 Michillinda Ave, Suite 200

Arcadia , CA 91007

Attention: Sarah Garber
Fax: 626-568-6102

DATE OF ISSUE
JAN 11 2008
MWH LABORATORIES

DST David S. Tripp
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac 01114CA

Report#: 225245
Project: BIG TUJUNGA
PO#: 1342951.0101

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 Comments,QC Report,QC Summary,Data Report,Hits Report, totaling 19 page[s].

# MWH Laboratories

750 Royal Oaks Drive, Monrovia, CA 91016
PHONE: 626-386-1100/FAX: 626-386-1101

## ACKNOWLEDGMENT OF SAMPLES RECEIVED

MWH/ECORP - Big Tujunga
618 Michillinda Ave, Suite 200
Arcadia, CA 91007
Attn: Sarah Garber
Phone: 626-568-6910

Customer Code: MWH-ECORP
PO#: 1342951.010101
Group#: 225245
Project#: BIG TUJUNGA
Proj Mgr: David Tripp
Phone: 626-386-1158

The following samples were received from you on **12/17/07**. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using MWH Laboratories.

| Sample# | Sample Id | Matrix | Sample Date | Tests Scheduled |
|---|---|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Water | 17-dec-2007 14:30:00 | @608EDD @DIAZEDD CHLTOT FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB |
| 2712170341 | PONDS IN PIN12172007 | Water | 17-dec-2007 13:45:00 | @608EDD @DIAZEDD CHLTOT FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB |
| 2712170342 | PONDS OUT POT12172007 | Water | 17-dec-2007 13:10:00 | @608EDD @DIAZEDD CHLTOT FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB |
| 2712170343 | BIG T WASH BT12172007 | Water | 17-dec-2007 12:20:00 | @608EDD @DIAZEDD CHLTOT FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB |

### Test Acronym Description

| Test Acronym | Description |
|---|---|
| @608EDD | Subcontracted Pesticides/PCBs |
| @DIAZEDD | Diazinon/Chlorpyrifos by GCMS |
| CHLTOT | Total Chlorine Residual |
| FECCOL | Fecal Coliform Bacteria |
| GLYPHOS | Glyphosate |
| NH3 | Ammonia Nitrogen |
| NO2-N | Nitrite, Nitrogen by IC |
| NO3 | Nitrate as Nitrogen by IC |
| NO3A | Nitrate as NO3 (calc) |
| OPO4 | Orthophosphate as P |
| T-P | Total phosphorus as P |
| TKN | Kjeldahl Nitrogen |
| TOTCOL | Total Coliform Bacteria |

MWH/ECORP - Big Tujunga
618 Michillinda Ave, Suite 200
Arcadia, CA 91007
Attn: Sarah Garber
Phone: 626-568-6910

Customer Code: MWH-ECORP
PO#: 1342951.010101
Group#: 225245
Project#: BIG TUJUNGA
Proj Mgr: David Tripp
Phone: 626-386-1158

Test Acronym Description

| Test Acronym | Description |
| --- | --- |
| TURB | Turbidity |

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Report
Comments
#225245

**Group Comments**

Analytical results for Pesticides & PCBs by 608 are submitted by Weck Laboratories, City of Industry, CA. ELAP #1132CA exp 3/08

Analytical results for Organophosphorus Pesticides by EPA Method 625 are submitted by CRG Marine Laboratories, Torrance, CA. ELAP 2261

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**Laboratory Hits Report #225245**

MWH/ECORP - Big Tujunga
Sarah Garber
618 Michillinda Ave, Suite 200
Arcadia , CA 91007

Samples Received
17-dec-2007 16:22:48

| Analyzed | Sample# | Sample ID | Result | Federal MCL | UNITS | MRL |
|---|---|---|---|---|---|---|
| | **2712170340** | **HAINS CYN CK HCC12172007** | | | | |
| 12/17/07 | Fecal Coliform Bacteria | | 30 | | MPN/100 mL | 2.0 |
| 12/17/07 | Nitrate as NO3 (calc) | | 23 | 45 | mg/l | 0.88 |
| 12/17/07 | Nitrate as Nitrogen by IC | | 5.1 | 10 | mg/l | 0.20 |
| 12/18/07 | Orthophosphate as P | | 0.29 | | mg/l | 0.010 |
| 12/17/07 | Total Coliform Bacteria | | 500 | | MPN/100 mL | 2.0 |
| 12/20/07 | Total phosphorus as P | | 0.04 | | mg/l | 0.020 |
| 12/17/07 | Turbidity | | 0.40 | 5 | NTU | 0.050 |
| | **2712170341** | **PONDS IN PIN12172007** | | | | |
| 12/17/07 | Fecal Coliform Bacteria | | 21 | | MPN/100 mL | 2.0 |
| 01/04/08 | Kjeldahl Nitrogen | | 0.23 | | mg/l | 0.20 |
| 12/19/07 | Nitrate as NO3 (calc) | | 38 | 45 | mg/l | 0.88 |
| 12/19/07 | Nitrate as Nitrogen by IC | | 8.6 | 10 | mg/l | 0.20 |
| 12/18/07 | Orthophosphate as P | | 0.31 | | mg/l | 0.010 |
| 12/17/07 | Total Coliform Bacteria | | 500 | | MPN/100 mL | 2.0 |
| 12/20/07 | Total phosphorus as P | | 0.05 | | mg/l | 0.020 |
| 12/17/07 | Turbidity | | 0.40 | 5 | NTU | 0.050 |
| | **2712170342** | **PONDS OUT POT12172007** | | | | |
| 12/17/07 | Fecal Coliform Bacteria | | 140 | | MPN/100 mL | 2.0 |
| 12/19/07 | Nitrate as NO3 (calc) | | 25 | 45 | mg/l | 0.88 |
| 12/19/07 | Nitrate as Nitrogen by IC | | 5.7 | 10 | mg/l | 0.20 |
| 12/18/07 | Orthophosphate as P | | 0.15 | | mg/l | 0.010 |
| 12/17/07 | Total Coliform Bacteria | | 900 | | MPN/100 mL | 2.0 |
| 12/20/07 | Total phosphorus as P | | 0.031 | | mg/l | 0.020 |
| 12/17/07 | Turbidity | | 0.45 | 5 | NTU | 0.050 |
| | **2712170343** | **BIG T WASH BT12172007** | | | | |

**SUMMARY OF POSITIVE DATA ONLY.**

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Laboratory
Hits Report
#225245

MWH/ECORP - Big Tujunga
Sarah Garber
618 Michillinda Ave, Suite 200
Arcadia , CA 91007

Samples Received
17-dec-2007 16:22:48

| Analyzed | Sample# | Sample ID | Result | Federal MCL | UNITS | MRL |
|---|---|---|---|---|---|---|
| | 2712170343 | BIG T WASH BT12172007 | | | | |
| 12/17/07 | Fecal Coliform Bacteria | | 50 | | MPN/100 mL | 2.0 |
| 12/18/07 | Orthophosphate as P | | 0.05 | | mg/l | 0.010 |
| 12/17/07 | Total Coliform Bacteria | | 220 | | MPN/100 mL | 2.0 |
| 12/17/07 | Turbidity | | 0.45 | 5 | NTU | 0.050 |

**SUMMARY OF POSITIVE DATA ONLY.**

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# Laboratory Data Report #225245

MWH/ECORP - Big Tujunga
Sarah Garber
618 Michillinda Ave, Suite 200
Arcadia , CA 91007

Samples Received
12/17/07

## HAINS CYN CK HCC12172007 (2712170340) Sampled on 12/17/07 14:30

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 12/17/07 00:00 | 402641 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 12/17/07 17:20 | | ( SM 9221C ) | Fecal Coliform Bacteria | 30 | MPNM | 2.0 | 1 |
| | 12/18/07 00:00 | 402819 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 12/19/07 16:22 | 402911 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/17/07 22:36 | 402704 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/17/07 22:36 | 402707 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | 5.1 | mg/l | 0.20 | 2 |
| | 12/17/07 22:36 | 402699 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | 23 | mg/l | 0.88 | 2 |
| | 12/18/07 15:03 | 402893 | ( 4500P-E/365.1 ) | Orthophosphate as P | 0.29 | mg/l | 0.010 | 1 |
| | 12/20/07 17:08 | 403387 | ( S4500PE/ 365.1) | Total phosphorus as P | 0.04 | mg/l | 0.020 | 1 |
| | 01/04/08 19:20 | 404864 | ( EPA 351.2 ) | Kjeldahl Nitrogen | ND | mg/l | 0.20 | 1 |
| | 12/17/07 17:20 | | ( SM 9221B ) | Total Coliform Bacteria | 500 | MPNM | 2.0 | 1 |
| | 12/17/07 19:44 | 402736 | ( EPA 180.1 ) | Turbidity | 0.40 | NTU | 0.050 | 1 |

### Diazinon/Chlorpyrifos by GCMS

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 10 | 1 |

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MWH/ECORP - Big Tujunga
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 10 | 1 |
| | | | | **Subcontracted Pesticides/PCBs** | | | | |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1016 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1221 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1232 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1242 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1248 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1254 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1260 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Alpha-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Aldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Beta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Chlordane | ND | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Delta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDD | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDE | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDT | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Dieldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Aldehyde | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Ketone | NA | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan I (alpha) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan II (beta) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan sulfate | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Gamma-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor Epoxide | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Methoxychlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Mirex | NA | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Toxaphene | ND | ug/l | 2.0 | 1 |
| | | | ( EPA 608 ) | Dibutyl Chlorendate(24-150) | NA | % Rec | | |
| | | | ( EPA 608 ) | Tetrachlorometaxylene(50-150) | NA | % Rec | | |

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MWH/ECORP - Big Tujunga
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| **PONDS IN PIN12172007 (2712170341) Sampled on 12/17/07 13:45** | | | | | | | | |
| | 12/17/07 00:00 | 402641 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 12/17/07 17:20 | | ( SM 9221C ) | Fecal Coliform Bacteria | 21 | MPNM | 2.0 | 1 |
| | 12/18/07 00:00 | 402819 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 12/19/07 16:22 | 402911 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/19/07 12:01 | 403156 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/19/07 12:01 | 403159 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | 8.6 | mg/l | 0.20 | 2 |
| | 12/19/07 12:01 | 403151 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | 38 | mg/l | 0.88 | 2 |
| | 12/18/07 15:03 | 402893 | ( 4500P-E/365.1 ) | Orthophosphate as P | 0.31 | mg/l | 0.010 | 1 |
| | 12/20/07 17:08 | 403387 | ( S4500PE/ 365.1) | Total phosphorus as P | 0.05 | mg/l | 0.020 | 1 |
| | 01/04/08 19:20 | 404864 | ( EPA 351.2 ) | Kjeldahl Nitrogen | 0.23 | mg/l | 0.20 | 1 |
| | 12/17/07 17:20 | | ( SM 9221B ) | Total Coliform Bacteria | 500 | MPNM | 2.0 | 1 |
| | 12/17/07 19:44 | 402736 | ( EPA 180.1 ) | Turbidity | 0.40 | NTU | 0.050 | 1 |
| | | | **Diazinon/Chlorpyrifos by GCMS** | | | | | |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 10 | 1 |

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1 800 566 LABS (1 800 566 5227)



MWH/ECORP - Big Tujunga
(continued)

## Subcontracted Pesticides/PCBs

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1016 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1221 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1232 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1242 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1248 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1254 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1260 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Alpha-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Aldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Beta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Chlordane | ND | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Delta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDD | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDE | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDT | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Dieldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Aldehyde | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Ketone | NA | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan I (alpha) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan II (beta) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan sulfate | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Gamma-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor Epoxide | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Methoxychlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Mirex | NA | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Toxaphene | ND | ug/l | 2.0 | 1 |
| | | | ( EPA 608 ) | Dibutyl Chlorendate(24-150) | NA | % Rec | | |
| | | | ( EPA 608 ) | Tetrachlorometaxylene(50-150) | NA | % Rec | | |

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MWH/ECORP - Big Tujunga
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| **PONDS OUT POT12172007 (2712170342)** | | | **Sampled on** | **12/17/07 13:10** | | | | |
| | 12/17/07 00:00 | 402641 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 12/17/07 17:20 | | ( SM 9221C ) | Fecal Coliform Bacteria | 140 | MPNM | 2.0 | 1 |
| | 12/18/07 00:00 | 402819 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 12/19/07 16:22 | 402911 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/19/07 12:15 | 403156 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/19/07 12:15 | 403159 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | 5.7 | mg/l | 0.20 | 2 |
| | 12/19/07 12:15 | 403151 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | 25 | mg/l | 0.88 | 2 |
| | 12/18/07 15:03 | 402893 | ( 4500P-E/365.1 ) | Orthophosphate as P | 0.15 | mg/l | 0.010 | 1 |
| | 12/20/07 18:12 | 403391 | ( S4500PE/ 365.1) | Total phosphorus as P | 0.031 | mg/l | 0.020 | 1 |
| | 01/04/08 19:20 | 404864 | ( EPA 351.2 ) | Kjeldahl Nitrogen | ND | mg/l | 0.20 | 1 |
| | 12/17/07 17:20 | | ( SM 9221B ) | Total Coliform Bacteria | 900 | MPNM | 2.0 | 1 |
| | 12/17/07 19:44 | 402736 | ( EPA 180.1 ) | Turbidity | 0.45 | NTU | 0.050 | 1 |
| | | | **Diazinon/Chlorpyrifos by GCMS** | | | | | |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 10 | 1 |

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MWH/ECORP - Big Tujunga
(continued)

## Subcontracted Pesticides/PCBs

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1016 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1221 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1232 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1242 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1248 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1254 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1260 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Alpha-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Aldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Beta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Chlordane | ND | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Delta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDD | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDE | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDT | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Dieldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Aldehyde | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Ketone | NA | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan I (alpha) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan II (beta) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan sulfate | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Gamma-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor Epoxide | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Methoxychlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Mirex | NA | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Toxaphene | ND | ug/l | 2.0 | 1 |
| | | | ( EPA 608 ) | Dibutyl Chlorendate(24-150) | NA | % Rec | | |
| | | | ( EPA 608 ) | Tetrachlorometaxylene(50-150) | NA | % Rec | | |

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MWH/ECORP - Big Tujunga
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| **BIG T WASH BT12172007 (2712170343) Sampled on 12/17/07 12:20** | | | | | | | | |
| | 12/17/07 00:00 | 402641 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 12/17/07 17:20 | | ( SM 9221C ) | Fecal Coliform Bacteria | 50 | MPNM | 2.0 | 1 |
| | 12/18/07 00:00 | 402819 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 12/19/07 16:22 | 402911 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/17/07 23:44 | 402704 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.10 | 1 |
| | 12/17/07 23:44 | 402707 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | ND | mg/l | 0.10 | 1 |
| | 12/17/07 23:44 | 402699 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | ND | mg/l | 0.44 | 1 |
| | 12/18/07 15:03 | 402893 | ( 4500P-E/365.1 ) | Orthophosphate as P | 0.05 | mg/l | 0.010 | 1 |
| | 12/20/07 18:12 | 403391 | ( S4500PE/ 365.1) | Total phosphorus as P | ND | mg/l | 0.020 | 1 |
| | 01/04/08 19:20 | 404864 | ( EPA 351.2 ) | Kjeldahl Nitrogen | ND | mg/l | 0.20 | 1 |
| | 12/17/07 17:20 | | ( SM 9221B ) | Total Coliform Bacteria | 220 | MPNM | 2.0 | 1 |
| | 12/17/07 19:44 | 402736 | ( EPA 180.1 ) | Turbidity | 0.45 | NTU | 0.050 | 1 |
| | | | **Diazinon/Chlorpyrifos by GCMS** | | | | | |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 5.0 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 10 | 1 |
| | 01/02/08 00:00 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 10 | 1 |

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MWH/ECORP - Big Tujunga
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | | | | **Subcontracted Pesticides/PCBs** | | | | |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1016 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1221 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1232 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1242 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1248 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1254 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | PCB 1260 Aroclor | ND | ug/l | 1.0 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Alpha-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Aldrin | ND | ug/l | 0.02 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Beta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Chlordane | ND | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Delta-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDD | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDE | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | p,p' DDT | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Dieldrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Aldehyde | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin Ketone | NA | ug/l | 0.5 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endrin | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan I (alpha) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan II (beta) | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Endosulfan sulfate | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Gamma-BHC | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Heptachlor Epoxide | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Methoxychlor | ND | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Mirex | NA | ug/l | 0.05 | 1 |
| 12/20/07 | 12/27/07 00:00 | | ( EPA 608 ) | Toxaphene | ND | ug/l | 2.0 | 1 |
| | | | ( EPA 608 ) | Tetrachlorometaxylene(50-150) | NA | % Rec | | |
| | | | ( EPA 608 ) | Dibutyl Chlorendate(24-150) | NA | % Rec | | |

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Laboratory
QC Summary
#225245

MWH/ECORP - Big Tujunga

**QC Ref #402641 - Total Chlorine Residual** **Analysis Date: 12/17/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: mav |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: mav |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: mav |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: mav |

**QC Ref #402699 - Nitrate as NO3 (calc)** **Analysis Date: 12/17/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: jkz |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: jkz |

**QC Ref #402704 - Nitrite, Nitrogen by IC** **Analysis Date: 12/17/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: jkz |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: jkz |

**QC Ref #402707 - Nitrate as Nitrogen by IC** **Analysis Date: 12/17/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: jkz |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: jkz |

**QC Ref #402736 - Turbidity** **Analysis Date: 12/17/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: sar |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: sar |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: sar |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: sar |

**QC Ref #402819 - Glyphosate** **Analysis Date: 12/18/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: szz |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: szz |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: szz |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: szz |

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MWH/ECORP - Big Tujunga
(continued)

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**QC Ref #402893 - Orthophosphate as P** **Analysis Date: 12/18/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: anh |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: anh |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: anh |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: anh |

**QC Ref #402911 - Ammonia Nitrogen** **Analysis Date: 12/19/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: njr |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: njr |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: njr |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: njr |

**QC Ref #403151 - Nitrate as NO3 (calc)** **Analysis Date: 12/19/2007**

| | | |
|---|---|---|
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: jkz |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: jkz |

**QC Ref #403156 - Nitrite, Nitrogen by IC** **Analysis Date: 12/19/2007**

| | | |
|---|---|---|
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: jkz |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: jkz |

**QC Ref #403159 - Nitrate as Nitrogen by IC** **Analysis Date: 12/19/2007**

| | | |
|---|---|---|
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: jkz |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: jkz |

**QC Ref #403387 - Total phosphorus as P** **Analysis Date: 12/20/2007**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: njr |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: njr |

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MWH/ECORP - Big Tujunga
(continued)

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**QC Ref #403391 - Total phosphorus as P** **Analysis Date: 12/20/2007**

| | | |
|---|---|---|
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: njr |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: njr |

**QC Ref #404864 - Kjeldahl Nitrogen** **Analysis Date: 01/04/2008**

| | | |
|---|---|---|
| 2712170340 | HAINS CYN CK HCC12172007 | Analyzed by: njr |
| 2712170341 | PONDS IN PIN12172007 | Analyzed by: njr |
| 2712170342 | PONDS OUT POT12172007 | Analyzed by: njr |
| 2712170343 | BIG T WASH BT12172007 | Analyzed by: njr |

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QC Report
#225245

MWH/ECORP - Big Tujunga

## QC Ref #402641 Total Chlorine Residual

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| LCS1 | Total Chlorine Residual | 1.0 | 0.94 | MGL | 94.0 | ( 85-115 ) | |
| MRL_CHK | Total Chlorine Residual | 0.1 | 0.06 | MGL | 60.0 | ( 50-150 ) | |

## QC Ref #402704 Nitrite, Nitrogen by IC

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| AASPKSMP | Spiked sample | Lab # 27 | 12170340 | MGL | | ( 0-0 ) | |
| LCS1 | Nitrite, Nitrogen by IC | 1.0 | 0.984 | MGL | 98.4 | ( 90-110 ) | |
| LCS2 | Nitrite, Nitrogen by IC | 1.0 | 0.955 | MGL | 95.5 | ( 90-110 ) | |
| MBLK | Nitrite, Nitrogen by IC | ND | <0.10 | MGL | | | |
| MRL_CHK | Nitrite, Nitrogen by IC | 0.050 | 0.0543 | MGL | 108.6 | ( 50-150 ) | |
| MS | Nitrite, Nitrogen by IC | 0.500 | 0.470 | MGL | 94.0 | ( 78-135 ) | |
| MSD | Nitrite, Nitrogen by IC | 0.500 | 0.480 | MGL | 96.0 | ( 78-135 ) | |
| RPD_LCS | Nitrite, Nitrogen by IC | 98.400 | 95.500 | MGL | 3.0 | ( 0-20 ) | |
| RPD_MS | Nitrite, Nitrogen by IC | 94.000 | 96.000 | MGL | 2.1 | ( 0-20 ) | |

## QC Ref #402707 Nitrate as Nitrogen by IC

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| AASPKSMP | Spiked sample | Lab # 27 | 12170340 | MGL | | ( 0-0 ) | |
| LCS1 | Nitrate as Nitrogen by IC | 2.5 | 2.41 | MGL | 96.4 | ( 90-110 ) | |
| LCS2 | Nitrate as Nitrogen by IC | 2.5 | 2.35 | MGL | 94.0 | ( 90-110 ) | |
| MBLK | Nitrate as Nitrogen by IC | ND | <0.10 | MGL | | | |
| MRL_CHK | Nitrate as Nitrogen by IC | 0.050 | 0.0458 | MGL | 91.6 | ( 50-150 ) | |
| MS | Nitrate as Nitrogen by IC | 1.25 | 1.15 | MGL | 92.0 | ( 80-112 ) | |
| MSD | Nitrate as Nitrogen by IC | 1.25 | 1.20 | MGL | 96.0 | ( 80-112 ) | |
| RPD_LCS | Nitrate as Nitrogen by IC | 96.400 | 94.000 | MGL | 2.5 | ( 0-20 ) | |
| RPD_MS | Nitrate as Nitrogen by IC | 92.000 | 96.000 | MGL | 4.3 | ( 0-20 ) | |

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.

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## QC Ref #402736 Turbidity

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| DUP | Turbidity | 0.15 | 0.15 | NTU | | ( 0-20 ) | 0.0 |
| DUP2 | Turbidity | 0.15 | 0.15 | NTU | | ( 0-20 ) | 0.0 |
| LCS1 | Turbidity | 20 | 20.4 | NTU | 102.0 | ( 50-150 ) | |
| MBLK | Turbidity | ND | <0.050 | NTU | | | |
| MRL_CHK | Turbidity | 0.0500 | 0.053 | NTU | 106.0 | ( 50-150 ) | |

## QC Ref #402819 Glyphosate

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 27 | 12130621 | UGL | | ( 0-0 ) | |
| LCS1 | Glyphosate | 10 | 10.1 | UGL | 101.0 | ( 74-133 ) | |
| MBLK | Glyphosate | ND | <6.0 | UGL | | | |
| MRL_CHK | Glyphosate | 6.00 | 5.97 | UGL | 99.5 | ( 50-150 ) | |
| MS | Glyphosate | 10 | 10.5 | UGL | 105.0 | ( 70-120 ) | |
| MSD | Glyphosate | 10 | 10.4 | UGL | 104.0 | ( 70-120 ) | |
| RPD_MS | Glyphosate | 105.000 | 104.000 | UGL | 1.0 | ( 0-20 ) | |

## QC Ref #402893 Orthophosphate as P

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 27 | 12179343 | MGL | | ( 0-0 ) | |
| LCS1 | Orthophosphate as P | 0.5 | 0.52 | MGL | 104.0 | ( 90-110 ) | |
| LCS2 | Orthophosphate as P | 0.5 | 0.53 | MGL | 106.0 | ( 90-110 ) | |
| MBLK | Orthophosphate as P | ND | <0.010 | MGL | | | |
| MRL_CHK | Orthophosphate as P | 0.010 | 0.01 | MGL | 100.0 | ( 50-150 ) | |
| MS | Orthophosphate as P | 0.5 | 0.49 | MGL | 98.0 | ( 80-120 ) | |
| MSD | Orthophosphate as P | 0.5 | 0.52 | MGL | 104.0 | ( 80-120 ) | |

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.

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(continued)

## QC Ref #402911 Ammonia Nitrogen

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 27 | 12120474 | MGL | | ( 0-0 ) | |
| LCS1 | Ammonia Nitrogen | 1.00 | 1.08 | MGL | 108.0 | ( 90-110 ) | |
| LCS2 | Ammonia Nitrogen | 1.00 | 1.07 | MGL | 107.0 | ( 90-110 ) | |
| MBLK | Ammonia Nitrogen | ND | <0.050 | MGL | | | |
| MRL_CHK | Ammonia Nitrogen | 0.05 | 0.046 | MGL | 92.0 | ( 50-150 ) | |
| MS | Ammonia Nitrogen | 1.00 | 0.967 | MGL | 96.7 | ( 90-110 ) | |
| MSD | Ammonia Nitrogen | 1.00 | 0.976 | MGL | 97.6 | ( 90-110 ) | |
| MS_2ND | Ammonia Nitrogen | 1 | 1.04 | MGL | 104.0 | ( 90-110 ) | |
| RPD_LCS | Ammonia Nitrogen | 108.000 | 107.000 | MGL | 0.9 | ( 0-20 ) | |
| RPD_MS | Ammonia Nitrogen | 96.700 | 97.600 | MGL | 0.9 | ( 0-20 ) | |

## QC Ref #403156 Nitrite, Nitrogen by IC

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| AASPKSMP | Spiked sample | Lab # 27 | 12180429 | MGL | | ( 0-0 ) | |
| LCS1 | Nitrite, Nitrogen by IC | 1.0 | 0.979 | MGL | 97.9 | ( 90-110 ) | |
| LCS2 | Nitrite, Nitrogen by IC | 1.0 | 1.00 | MGL | 100.0 | ( 90-110 ) | |
| MBLK | Nitrite, Nitrogen by IC | ND | <0.10 | MGL | | | |
| MRL_CHK | Nitrite, Nitrogen by IC | 0.050 | 0.0507 | MGL | 101.4 | ( 50-150 ) | |
| MS | Nitrite, Nitrogen by IC | 0.500 | 0.486 | MGL | 97.2 | ( 78-135 ) | |
| MSD | Nitrite, Nitrogen by IC | 0.500 | 0.486 | MGL | 97.2 | ( 78-135 ) | |
| RPD_LCS | Nitrite, Nitrogen by IC | 97.900 | 100.000 | MGL | 2.1 | ( 0-20 ) | |
| RPD_MS | Nitrite, Nitrogen by IC | 97.200 | 97.200 | MGL | 0.0 | ( 0-20 ) | |

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## QC Ref #403159 Nitrate as Nitrogen by IC

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| AASPKSMP | Spiked sample | Lab # 27 | 12180429 | MGL | | ( 0-0 ) | |
| LCS1 | Nitrate as Nitrogen by IC | 2.5 | 2.42 | MGL | 96.8 | ( 90-110 ) | |
| LCS2 | Nitrate as Nitrogen by IC | 2.5 | 2.47 | MGL | 98.8 | ( 90-110 ) | |
| MBLK | Nitrate as Nitrogen by IC | ND | <0.10 | MGL | | | |
| MRL_CHK | Nitrate as Nitrogen by IC | 0.050 | 0.0469 | MGL | 93.8 | ( 50-150 ) | |
| MS | Nitrate as Nitrogen by IC | 1.25 | 1.23 | MGL | 98.4 | ( 80-112 ) | |
| MSD | Nitrate as Nitrogen by IC | 1.25 | 1.22 | MGL | 97.6 | ( 80-112 ) | |
| RPD_LCS | Nitrate as Nitrogen by IC | 96.800 | 98.800 | MGL | 2.0 | ( 0-20 ) | |
| RPD_MS | Nitrate as Nitrogen by IC | 98.400 | 97.600 | MGL | 0.8 | ( 0-20 ) | |

## QC Ref #403387 Total phosphorus as P

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 27 | 12170340 | MGL | | ( 0-0 ) | |
| LCS1 | Total phosphorus as P | 0.4 | 0.417 | MGL | 104.2 | ( 90-110 ) | |
| LCS2 | Total phosphorus as P | 0.4 | 0.406 | MGL | 101.5 | ( 90-110 ) | |
| MBLK | Total phosphorus as P | ND | <0.020 | MGL | | | |
| MRL_CHK | Total phosphorus as P | 0.02 | 0.024 | MGL | 120.0 | ( 50-150 ) | |
| MS | Total phosphorus as P | 0.4 | 0.408 | MGL | 102.0 | ( 90-110 ) | |
| MS2 | Total phosphorus as P | 0.4 | 0.409 | MGL | 102.2 | ( 90-110 ) | |
| MSD | Total phosphorus as P | 0.4 | 0.404 | MGL | 101.0 | ( 90-110 ) | |
| RPD_LCS | Total phosphorus as P | 104.250 | 101.500 | MGL | 2.7 | ( 0-10 ) | |
| RPD_MS | Total phosphorus as P | 102.000 | 101.000 | MGL | 1.0 | ( 0-20 ) | |

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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.

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## QC Ref #403391 Total phosphorus as P

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 27 | 12170342 | MGL | | ( 0-0 ) | |
| LCS1 | Total phosphorus as P | 0.4 | 0.409 | MGL | 102.2 | ( 90-110 ) | |
| LCS2 | Total phosphorus as P | 0.4 | 0.406 | MGL | 101.5 | ( 90-110 ) | |
| MBLK | Total phosphorus as P | ND | <0.020 | MGL | | | |
| MRL_CHK | Total phosphorus as P | 0.02 | 0.024 | MGL | 120.0 | ( 50-150 ) | |
| MS | Total phosphorus as P | 0.4 | 0.412 | MGL | 103.0 | ( 90-110 ) | |
| MSD | Total phosphorus as P | 0.4 | 0.421 | MGL | 105.2 | ( 90-110 ) | |
| RPD_LCS | Total phosphorus as P | 102.250 | 101.500 | MGL | 0.7 | ( 0-10 ) | |
| RPD_MS | Total phosphorus as P | 103.000 | 105.250 | MGL | 2.2 | ( 0-20 ) | |

## QC Ref #404864 Kjeldahl Nitrogen

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 01020384 | MGL | | ( 0-0 ) | |
| LCS1 | Kjeldahl Nitrogen | 4 | 4.36 | MGL | 109.0 | ( 90-110 ) | |
| LCS2 | Kjeldahl Nitrogen | 4 | 4.31 | MGL | 107.7 | ( 90-110 ) | |
| MBLK | Kjeldahl Nitrogen | ND | <0.20 | MGL | | | |
| MRL_CHK | Kjeldahl Nitrogen | 0.1 | 0.132 | MGL | 132.0 | ( 50-150 ) | |
| MS | Kjeldahl Nitrogen | 4 | 3.84 | MGL | 96.0 | ( 90-110 ) | |
| MSD | Kjeldahl Nitrogen | 4 | 3.95 | MGL | 98.8 | ( 90-110 ) | |
| MS_2ND | Kjeldahl Nitrogen | 4 | 3.87 | MGL | 96.8 | ( 90-110 ) | |
| RPD_LCS | Kjeldahl Nitrogen | 109.000 | 107.750 | MGL | 1.2 | ( 0-20 ) | |
| RPD_MS | Kjeldahl Nitrogen | 96.000 | 98.750 | MGL | 2.8 | ( 0-20 ) | |

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.

# APPENDIX L

## 2008 Water Quality Monitoring Report

## County of Los Angeles
## Department of Public Works

**December 2008 Water Quality Monitoring Report**

**for the**

**Master Mitigation Plan**
**for the Big Tujunga Wash Mitigation Bank**

**March 2009**

MWH

# December 2008 Water Quality Monitoring Report

**for**

## Master Mitigation Plan
## for the Big Tujunga Wash Mitigation Bank

**March 2009**

***Prepared For:***

**ECORP Consulting, Inc.**
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***Prepared By:***

**MWH**
**618 Michillinda Avenue, Suite 200**
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**Interested Party**
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La Crescenta, California 91214

# Water Quality Monitoring
## December 2008

## BACKGROUND

The County of Los Angeles Department of Public Works (LADPW) purchased a 207-acre parcel in Big Tujunga Wash as a mitigation bank 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 Master Mitigation Plan (MMP) was prepared to guide the implementation of these enhancements. The MMP also includes a monitoring program to gather data on conditions at the site during implementation of the improvements. The MMP 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 MMP. 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, monitoring was conducted annually, in December. This report presents the results of the water quality sampling for 2008, which was also conducted in December.

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 at the far eastern portion of the site.

### Project Site Activities

A timeline of project-related activities that could influence water quality is presented in **Table 1**.

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

| Month/Year | Activity |
|---|---|
| 4/00 | Baseline water quality sampling |
| 11/00 to 11/01 | Arundo, tamarisk, and pepper tree removal<br>Chemical (Rodeo®) application |
| 12/00 to 11/02 | Water hyacinth removal |
| 12/00 | Fish Sampling at Haines Canyon Creek |
| 12/14/00 | Water quality sampling |
| 1/01 to present | Exotic aquatic wildlife (non-native fish, crayfish, bullfrog, and turtle) removal – conducted quarterly |
| 2/01 | Partial riparian planting |
| 3/01 | Selective clearing at Canyon Trails Golf Club |
| 3/12/01 | Water quality sampling |
| 6/19/01 | Water quality sampling |
| 7/01 | Fish Sampling at Haines Canyon Creek |
| 9/11/01 | Water quality sampling |

**Table 1 (Continued)**
**Major Activities to Date at the Big Tujunga Wash Mitigation Bank**

| Month/Year | Activity |
|---|---|
| 10/01 to 11/01 | Fish Sampling at Haines Canyon Creek |
| 12/12/01 | Water quality sampling |
| 1/02 | Final riparian planting |
| 2/02 | Upland replacement planting |
| 3/26/02 | Water quality sampling |
| 6/25/02 | Water quality sampling |
| 7/02 | Fish Sampling at Haines Canyon Creek |
| 9/12/02 | Water quality sampling |
| 10/02 | Grading at Canyon Trails Golf Club begins |
| 11/02 | Fish Sampling at Haines Canyon Creek |
| 12/19/02 | Water quality sampling |
| 3/20/03 | Water quality sampling |
| 4/1/03 | Meeting with Canyon Trails Golf Club to discuss future use of herbicides and fertilizers |
| 6/23/03 | Water quality sampling |
| 8/03 | Fish Sampling at Haines Canyon Creek |
| 9/30/03 | Water quality sampling |
| Fall 2003 | Completion of the golf course construction |
| 12/17/03 | Water quality sampling |
| 1/04 | Fish Sampling at Haines Canyon Creek |
| 4/2/04 | Water quality sampling |
| 4/3/04 | Rock Dam Removal Day |
| 6/04 | Angeles National Golf Club (previously named Canyon Trails) opens to the public |
| 7/2/04 | Water quality sampling |
| 10/5/04 | Water quality sampling |
| 12/9/04 | Water quality sampling |
| 4/7/05 | Water quality sampling |
| 6/30/05 | Water quality sampling |
| 10/25/05 | Water quality sampling |
| 12/22/05 | Water quality sampling |
| 7/11/06 | Water quality sampling |
| 12/29/06 | Water quality sampling |
| 12/17/07 | Water quality sampling |
| 12/29/08 | Water quality sampling |

## Angeles National Golf Club Activities

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.

The golf course has been operating since June 2004. Additional construction at the club house building is in progress (Angeles National Golf Club website, accessed at http://www.angelesnational.com/futureclubhouse.html March 26, 2009).

In March 2004, the golf course maintenance staff indicated that the following chemicals may be used on an as needed basis: Primo™ (a grass growth inhibitor used for turf management; active ingredient – trinexapac-ethyl) and Rodeo® (an herbicide used to control aquatic weeds; active ingredient – glyphosate) (J. Reidinger, pers. comm. to M. Chimienti, LADPW, March 18, 2004). Based on this information, glyphosate was added to the list of sampling parameters starting in the first quarter of 2004.

In December 2004 and February 2005, the Golf Club provided MWH with the golf course's monthly pesticide use reports. The reports indicate that 10 types of chemical products (seven herbicides, one insecticide, one fungicide, and one grass growth inhibitor) were applied. Pesticide use reports were again provided by the Golf Club in April 2007 for the period from November 2006 to March 2007. During this period, pesticides were applied only in November 2006 as summarized in **Table 2**.

**Table 2**
**Pesticide Applications at the Angeles National Golf Course**
**(November 2006)**

| Active Ingredient | Manufacturer and Product Name | Applications |
|---|---|---|
| Flutolanil | Bayer<br>Prostar 70 WP (fungicide) | One application of 37 pounds on 130,000 sq. ft. of turfgrass |
| Glyphosate | Verdicon<br>Kleenup Pro (herbicide) | One application of 5 gallons (2% volume) as a spot treatment on turfgrass |
| Gibberellic Acid | Valent ProGibb T&O (plant growth regulator) | One application of 1 quart on 16 acres of turfgrass |
| Pyraclostrobin | BASF<br>Insignia 20 WG (fungicide) | One application of 7.2 pounds on 130,000 sq. ft. of turfgrass |

Source: Angeles National Golf Course Monthly Summary Pesticide Use Reports for November 2006 through March 2007

In December 2004, the Golf Club also provided MWH with the golf course's water quality monitoring reports to date. The results were summarized and presented in the 2004 Annual Report for the Big Tujunga Wash Mitigation Bank Water Quality Monitoring Program (distributed in February 2005).

In August 2006, the Golf Club provided MWH with additional water quality monitoring reports from the first and second quarters of 2006. The Golf Club's monitoring activities for the first and second quarters of 2006 included:

- Groundwater samples were collected on February 24 and May 17 from two groundwater monitoring wells downgradient from the golf course (MW-1 and MW-2R, located near Foothill Boulevard).

- Surface water samples were collected from Big Tujunga Wash approximately 200 feet east of Foothill Boulevard (sampling site SW-2) on February 24 and May 17.
- For the first and second quarters of 2006, surface water samples were not collected from Haines Canyon Creek (sampling site SW-1, approximately 500 feet east of Foothill Boulevard) since water was not flowing at this site on the sampling dates.

[Source: Angeles National Golf Club First Quarter 2006 Monitoring Report (dated May 3, 2006) and Second Quarter 2006 Monitoring Report (dated July 6, 2006), prepared by Brown and Caldwell for the Los Angeles International Golf Club.]

The following parameters were sampled by the Golf Club in the first and second quarters of 2006:

- General parameters – pH, electrical conductivity, total dissolved solids (TDS), sodium, potassium, calcium, magnesium, carbonate, bicarbonate, sulfate, chloride, nitrate as nitrogen, nitrite as nitrogen, total Kjeldahl nitrogen (TKN), ammonia as nitrogen, oil and grease, and surfactants (MBAS)
- Pesticides – aldrin, chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin aldehyde, heptachlor epoxide, and methoxychlor
- Fungicides – metalaxyl, chlorothalonil, iprodione, propiconazole, vincolozoin, and quintozene
- Herbicides – prodiamine, pronamide, P-butylfluazifop, fenoxaprop, pendimethalin, triclopyr, chlopyralid, 2,4-D amine, dicamba, and MCPP
- Insecticides – chlorpyrifos, trichlorfon, and malathion

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).

**Figure 1**
**Angeles National Golf Club Groundwater and Surface Water Sampling Sites (February and May 2006)**


Source: Angeles National Golf Club First Quarter 2006 Monitoring Report (dated May 3, 2006), prepared by Brown and Caldwell for the Los Angeles International Golf Club.

## MATERIALS AND METHODS

### Sampling Stations

Four sampling locations have been identified for the monitoring program for the Big Tujunga Wash Mitigation Bank (**Figure 2**). **Table 3** summarizes sampling locations and the conditions observed on December 29, 2008. The coordinates of the sampling stations were determined by a hand-held Global Positioning System.

**Table 3**
**Water Quality Sampling Locations and Conditions for December 2008**

| | | | |
|---|---|---|---|
| **Date** | December 29, 2008 | | |
| **Air Temperature** | Approximately 70 degrees Fahrenheit | | |
| **Skies** | Sunny | | |
| **Observations** | People, dogs and horses in Haines Canyon Creek. Algae levels low in Tujunga ponds. | | |
| **Sampling Locations** | **Latitude** | **Longitude** | **Time of sample** |
| Haines Canyon Creek | N 34º 16' 2.9" | W 118º 21' 22.2" | 1500 |
| Haines Canyon Creek, inflow to Tujunga Ponds | N 34º 16' 6.9" | W 118º 20' 18.7" | 1310 |
| Haines Canyon Creek, outflow from Tujunga Ponds | N 34º 16' 7.1" | W 118º 20' 28.3" | 1400 |
| Big Tujunga Wash | N 34º 16' 11.7" | W 118º 21' 4.0" | 1200 |

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

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 the laboratory followed the methods described in the MWH Laboratories *Quality Assurance Manual*.

## Table 4
## Water Quality Sampling Parameters

| Parameter | Analysis Location | Analytical Method |
|---|---|---|
| total Kjeldahl nitrogen (TKN) | laboratory | EPA 351.2 |
| nitrite ($NO_2$) | laboratory | EPA 300.0 by IC |
| nitrate ($NO_3$) | 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 625 |
| Pesticides/PCBs[3] | laboratory | EPA 608 |
| dissolved oxygen | field | Standard Methods 4500-O G |
| total residual chlorine | laboratory | Standard Methods 4500-Cl G |
| 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 (diazinon/chlorpyrifos by GCMS, EPA 625) tests for the following chemicals: diazinon, sulprofos, chlorpyrifos, demeton, dichlorvos, disulfoton, dimethoate, ethoprop, fenchlorophos, fensulfothion, fenthion, merphos, mevinphos, malathion, parathion-methyl, phorate, tokuthion, tetrachlorovinphos, and trichloronate.

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


# BIG TUJUNGA WASH MITIGATION BANK

*Prepared For:*
*Los Angeles County*
*Department of Public Works*

*Date: December 3, 1999*

*Prepared By:*
*Leslie Backus*
*Chambers Group Inc.*

*This map was produced using ESRI's ArcView software.*

Chambers Group, Inc.

## Figure 2

Mitigation Bank Water Quality Sampling Stations

| WQ Station No. | Name |
|---|---|
| 1 | Inflow to Tujunga Ponds |
| 2 | Outflow from Tujunga Ponds |
| 3 | Big Tujunga Wash |
| 4 | Haines Canyon Creek, just before exit from site |

**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:

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

Where:

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

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

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

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

## RESULTS

### Baseline Water Quality

Sampling and analysis conducted by LADPW 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 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, perhaps due to release from sediments.

### December 2008 Results

#### Water Quality

Results of analyses conducted by MWH 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 – December 29, 2008

| 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 | 18.2 | 16.4 | 14.4 | 15.9 |
| Dissolved Oxygen | mg/L | 5.53 | 7.05 | 10.90 | 9.25 |
| pH | std units | 6.98 | 7.01 | 8.56 | 6.88 |
| Total residual chlorine | mg/L | ND | ND | ND | ND |
| Ammonia-Nitrogen | mg/L | ND | ND | ND | ND |
| Kjeldahl Nitrogen | mg/L | 0.21 | ND | 0.20 | ND |
| Nitrite-Nitrogen | mg/L | ND | ND | ND | ND |
| Nitrate-Nitrogen | mg/L | 8.4 | 6.3 | ND | 5.2 |
| Orthophosphate-P | mg/L | 0.028 | 0.019 | ND | 0.019 |
| Total phosphorus-P | mg/L | 0.04 | 0.03 | ND | 0.03 |
| Glyphosate | μg/L | ND | ND | ND | ND |
| Chloropyrifos* | ng/L | ND | ND | ND | ND |
| Pesticides/PCBs (EPA 608)** | μg/L | ND | ND | ND | ND |
| Turbidity | NTU | 1.00 | 0.40 | 0.90 | 0.30 |
| Fecal Coliform Bacteria | (MPN/100 ml) | 7 | 36 | 4 | 90 |
| Total Coliform Bacteria | (MPN/100 ml) | 500 | 50 | 50 | 280 |

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

* The analytical method used for chloropyrifos (diazinon/chlorpyrifos by GCMS, EPA 625) also tests for the following chemicals: diazinon, sulprofos, demeton, dichlorvos, disulfoton, dimethoate, ethoprop, fenchlorophos, fensulfothion, fenthion, merphos, mevinphos, malathion, parathion-methyl, phorate, tokuthion, tetrachlorovinphos, and trichloronate.

** EPA method 608 tests for aroclor, BHC, aldrin, Chlordane, DDD, DDE, DDT, dieldrin, endrin, endosulfan, heptaclor, methoxychlor, mirex, 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 December 2008 are summarized in **Table 7**.

**Table 7**
**Estimated Flows for December 2008**

| Sampling Date | Approximate Flow (cubic feet per second) | | |
|---|---|---|---|
| | Outlet of Big Tujunga Ponds | Haines Canyon Creek leaving the site | Big Tujunga Wash |
| 12/29/2008 | 5.5 | 6.1 | 2.7 |

### Comparison of Results with Baseline Data

Water quality in December 2008 was generally similar to baseline conditions for parameters such as pH, nitrate, ammonia, and Kjeldahl nitrogen. Substantially higher bacteria and turbidity levels were observed in the 4/18/00 baseline samples due to a rain event. Phosphorus levels were also higher in the April 2000 samples than in December 2008, perhaps due to release from sediments.

### Comparison of Results with Aquatic Life Criteria

**Tables 8** and **12** present objectives established by the Los Angeles Regional Water Quality Control Board (Regional Board) for protection of beneficial uses in Big Tujunga Wash including wildlife habitat. EPA's criteria for freshwater aquatic life are also presented in **Tables 8, 9, 10, 11** and **13**.

**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 11 | See Table 11 | -- |
| Dissolved oxygen (mg/L) | >7.0 mean<br>>5.0 min | 5.0[c]<br>(warmwater, early life stages, 1-day minimum) | 6.0[c]<br>(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<br>(maximum residual disinfectant level goal) |
| Fecal coliform (MPN/100 ml) | 200[f]<br>(water contact recreation) | -- | -- | Swimming stds:<br>33[g] (geometric mean for enterococci)<br>126[g] (geometric mean for *E. coli*) |
| Ammonia-nitrogen (mg/L) | See Table 12 | See Tables 9, 10, and 11 | See Tables 9, 10, and 11 | -- |
| Nitrite-nitrogen (mg/L) | 1 | -- | -- | 1<br>(primary drinking water std.) |
| Nitrate-nitrogen (mg/L) | 10 | -- | -- | 10<br>(primary drinking water std.) |
| Total phosphorus (mg/L) | -- | <0.05 – 0.1[e]<br>(recommendation for streams, no criterion) | | -- |
| Turbidity (NTU) | h | i | i | 5<br>(secondary drinking water standard)<br>0.5 – 1.0<br>(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**
**Numeric Values of the Criterion Maximum Concentration (CMC) with Salmonids Present and Absent and the Criterion Continuous Concentration (CCC) for Ammonia Nitrogen (mg/L)**

| pH | CMC with Salmonids Present | CMC with Salmonids Absent | CCC |
|---|---|---|---|
| 6.5 | 32.6 | 48.8 | 3.48 |
| 6.6 | 31.3 | 46.8 | 3.42 |
| 6.7 | 29.8 | 44.6 | 3.36 |
| 6.8 | 28.1 | 42.0 | 3.28 |
| 6.9 | 26.2 | 39.1 | 3.19 |
| 7.0 | 24.1 | 36.1 | 3.08 |
| 7.1 | 22.0 | 32.8 | 2.96 |
| 7.2 | 19.7 | 29.5 | 2.81 |
| 7.3 | 17.5 | 26.2 | 2.65 |
| 7.4 | 15.4 | 23.0 | 2.47 |
| 7.5 | 13.3 | 19.9 | 2.28 |
| 7.6 | 11.4 | 17.0 | 2.07 |
| 7.7 | 9.65 | 14.4 | 1.87 |
| 7.8 | 8.11 | 12.1 | 1.66 |
| 7.9 | 6.77 | 10.1 | 1.46 |
| 8.0 | 5.62 | 8.4 | 1.27 |
| 8.1 | 4.64 | 6.95 | 1.09 |
| 8.2 | 3.83 | 5.72 | 0.935 |
| 8.3 | 3.15 | 4.71 | 0.795 |
| 8.4 | 2.59 | 3.88 | 0.673 |
| 8.5 | 2.14 | 3.2 | 0.568 |
| 8.6 | 1.77 | 2.65 | 0.480 |
| 8.7 | 1.47 | 2.2 | 0.406 |
| 8.8 | 1.23 | 1.84 | 0.345 |
| 8.9 | 1.04 | 1.56 | 0.295 |
| 9.0 | 0.885 | 1.32 | 0.254 |

Source: USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

## Table 10
## Temperature and pH-Dependent Values of the Ammonia-Nitrogen CCC (Chronic Criterion) for Fish Early Life Stages Absent

| CCC for Fish Early Life Stages Absent, mg N/L | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | Temperature (°Celsius) | | | | | | | | | |
| | 0-7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15* | 16* |
| 6.5 | 10.8 | 10.1 | 9.51 | 8.92 | 8.36 | 7.84 | 7.35 | 6.89 | 6.46 | 6.06 |
| 6.6 | 10.7 | 9.99 | 9.37 | 8.79 | 8.24 | 7.72 | 7.24 | 6.79 | 6.36 | 5.97 |
| 6.7 | 10.5 | 9.81 | 9.20 | 8.62 | 8.08 | 7.58 | 7.11 | 6.66 | 6.25 | 5.86 |
| 6.8 | 10.2 | 9.58 | 8.98 | 8.42 | 7.90 | 7.40 | 6.94 | 6.51 | 6.10 | 5.72 |
| 6.9 | 9.93 | 9.31 | 8.73 | 8.19 | 7.68 | 7.20 | 6.75 | 6.33 | 5.93 | 5.56 |
| 7.0 | 9.60 | 9.00 | 8.43 | 7.91 | 7.41 | 6.95 | 6.52 | 6.11 | 5.73 | 5.37 |
| 7.1 | 9.20 | 8.63 | 8.09 | 7.58 | 7.11 | 6.67 | 6.25 | 5.86 | 5.49 | 5.15 |
| 7.2 | 8.75 | 8.20 | 7.69 | 7.21 | 6.76 | 6.34 | 5.94 | 5.57 | 5.22 | 4.90 |
| 7.3 | 8.24 | 7.73 | 7.25 | 6.79 | 6.37 | 5.97 | 5.60 | 5.25 | 4.92 | 4.61 |
| 7.4 | 7.69 | 7.21 | 6.76 | 6.33 | 5.94 | 5.57 | 5.22 | 4.89 | 4.59 | 4.30 |
| 7.5 | 7.09 | 6.64 | 6.23 | 5.84 | 5.48 | 5.13 | 4.81 | 4.51 | 4.23 | 3.97 |
| 7.6 | 6.46 | 6.05 | 5.67 | 5.32 | 4.99 | 4.68 | 4.38 | 4.11 | 3.85 | 3.61 |
| 7.7 | 5.81 | 5.45 | 5.11 | 4.79 | 4.49 | 4.21 | 3.95 | 3.70 | 3.47 | 3.25 |
| 7.8 | 5.17 | 4.84 | 4.54 | 4.26 | 3.99 | 3.74 | 3.51 | 3.29 | 3.09 | 2.89 |
| 7.9 | 4.54 | 4.26 | 3.99 | 3.74 | 3.51 | 3.29 | 3.09 | 2.89 | 2.71 | 2.54 |
| 8.0 | 3.95 | 3.70 | 3.47 | 3.26 | 3.05 | 2.86 | 2.68 | 2.52 | 2.36 | 2.21 |
| 8.1 | 3.41 | 3.19 | 2.99 | 2.81 | 2.63 | 2.47 | 2.31 | 2.17 | 2.03 | 1.91 |
| 8.2 | 2.91 | 2.73 | 2.56 | 2.40 | 2.25 | 2.11 | 1.98 | 1.85 | 1.74 | 1.63 |
| 8.3 | 2.47 | 2.32 | 2.18 | 2.04 | 1.91 | 1.79 | 1.68 | 1.58 | 1.48 | 1.39 |
| 8.4 | 2.09 | 1.96 | 1.84 | 1.73 | 1.62 | 1.52 | 1.42 | 1.33 | 1.25 | 1.17 |
| 8.5 | 1.77 | 1.66 | 1.55 | 1.46 | 1.37 | 1.28 | 1.20 | 1.13 | 1.06 | 0.990 |
| 8.6 | 1.49 | 1.40 | 1.31 | 1.23 | 1.15 | 1.08 | 1.01 | 0.951 | 0.892 | 0.836 |
| 8.7 | 1.26 | 1.18 | 1.11 | 1.04 | 0.976 | 0.915 | 0.858 | 0.805 | 0.754 | 0.707 |
| 8.8 | 1.07 | 1.01 | 0.944 | 0.885 | 0.829 | 0.778 | 0.729 | 0.684 | 0.641 | 0.601 |
| 8.9 | 0.917 | 0.860 | 0.806 | 0.756 | 0.709 | 0.664 | 0.623 | 0.584 | 0.548 | 0.513 |
| 9.0 | 0.790 | 0.740 | 0.694 | 0.651 | 0.610 | 0.572 | 0.536 | 0.503 | 0.471 | 0.442 |

* At 15° C and above, the criterion for fish ELS absent is the same as the criterion for fish ELS present.

Source: USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

**Table 11**
**Temperature and pH-Dependent Values of the Ammonia-Nitrogen CCC (Chronic Criterion) for Fish Early Life Stages Present**

| CCC for Fish Early Life Stages Present, mg N/L | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | Temperature (° Celsius) | | | | | | | | | |
| | 0 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
| 6.5 | 6.67 | 6.67 | 6.06 | 5.33 | 4.68 | 4.12 | 3.62 | 3.18 | 2.80 | 2.46 |
| 6.6 | 6.57 | 6.57 | 5.97 | 5.25 | 4.61 | 4.05 | 3.56 | 3.13 | 2.75 | 2.42 |
| 6.7 | 6.44 | 6.44 | 5.86 | 5.15 | 4.52 | 3.98 | 3.50 | 3.07 | 2.70 | 2.37 |
| 6.8 | 6.29 | 6.29 | 5.72 | 5.03 | 4.42 | 3.89 | 3.42 | 3.00 | 2.64 | 2.32 |
| 6.9 | 6.12 | 6.12 | 5.56 | 4.89 | 4.30 | 3.78 | 3.32 | 2.92 | 2.57 | 2.25 |
| 7.0 | 5.91 | 5.91 | 5.37 | 4.72 | 4.15 | 3.65 | 3.21 | 2.82 | 2.48 | 2.18 |
| 7.1 | 5.67 | 5.67 | 5.15 | 4.53 | 3.98 | 3.50 | 3.08 | 2.70 | 2.38 | 2.09 |
| 7.2 | 5.39 | 5.39 | 4.90 | 4.31 | 3.78 | 3.33 | 2.92 | 2.57 | 2.26 | 1.99 |
| 7.3 | 5.08 | 5.08 | 4.61 | 4.06 | 3.57 | 3.13 | 2.76 | 2.42 | 2.13 | 1.87 |
| 7.4 | 4.73 | 4.73 | 4.30 | 3.78 | 3.32 | 2.92 | 2.57 | 2.26 | 1.98 | 1.74 |
| 7.5 | 4.36 | 4.36 | 3.97 | 3.49 | 3.06 | 2.69 | 2.37 | 2.08 | 1.83 | 1.61 |
| 7.6 | 3.98 | 3.98 | 3.61 | 3.18 | 2.79 | 2.45 | 2.16 | 1.90 | 1.67 | 1.47 |
| 7.7 | 3.58 | 3.58 | 3.25 | 2.86 | 2.51 | 2.21 | 1.94 | 1.71 | 1.50 | 1.32 |
| 7.8 | 3.18 | 3.18 | 2.89 | 2.54 | 2.23 | 1.96 | 1.73 | 1.52 | 1.33 | 1.17 |
| 7.9 | 2.80 | 2.80 | 2.54 | 2.24 | 1.96 | 1.73 | 1.52 | 1.33 | 1.17 | 1.03 |
| 8.0 | 2.43 | 2.43 | 2.21 | 1.94 | 1.71 | 1.50 | 1.32 | 1.16 | 1.02 | 0.897 |
| 8.1 | 2.10 | 2.10 | 1.91 | 1.68 | 1.47 | 1.29 | 1.14 | 1.00 | 0.879 | 0.773 |
| 8.2 | 1.79 | 1.79 | 1.63 | 1.43 | 1.26 | 1.11 | 0.973 | 0.855 | 0.752 | 0.661 |
| 8.3 | 1.52 | 1.52 | 1.39 | 1.22 | 1.07 | 0.941 | 0.827 | 0.727 | 0.639 | 0.562 |
| 8.4 | 1.29 | 1.29 | 1.17 | 1.03 | 0.906 | 0.796 | 0.700 | 0.615 | 0.541 | 0.475 |
| 8.5 | 1.09 | 1.09 | 0.990 | 0.870 | 0.765 | 0.672 | 0.591 | 0.520 | 0.457 | 0.401 |
| 8.6 | 0.920 | 0.920 | 0.836 | 0.735 | 0.646 | 0.568 | 0.499 | 0.439 | 0.386 | 0.339 |
| 8.7 | 0.778 | 0.778 | 0.707 | 0.622 | 0.547 | 0.480 | 0.422 | 0.371 | 0.326 | 0.287 |
| 8.8 | 0.661 | 0.661 | 0.601 | 0.528 | 0.464 | 0.408 | 0.359 | 0.315 | 0.277 | 0.244 |
| 8.9 | 0.565 | 0.565 | 0.513 | 0.451 | 0.397 | 0.349 | 0.306 | 0.269 | 0.237 | 0.208 |
| 9.0 | 0.486 | 0.486 | 0.442 | 0.389 | 0.342 | 0.300 | 0.264 | 0.232 | 0.204 | 0.179 |

Source: USEPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 822-R-99-014. Washington, D.C.

**Table 12**
**Maximum One-Hour Average Concentration for Total Ammonia ($mg/L\ NH_3$)**

| pH | Temperature (°Celsius) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
| 6.50 | 35 | 33 | 31 | 30 | 29 | 20 | 14.3 |
| 6.75 | 32 | 30 | 28 | 27 | 27 | 18.6 | 13.2 |
| 7.00 | 28 | 26 | 25 | 24 | 23 | 16.4 | 11.6 |
| 7.25 | 23 | 22 | 20 | 19.7 | 19.2 | 13.4 | 9.5 |
| 7.50 | 17.4 | 16.3 | 15.5 | 14.9 | 14.6 | 10.2 | 7.3 |
| 7.75 | 12.2 | 11.4 | 10.9 | 10.5 | 10.3 | 7.2 | 5.2 |
| 8.00 | 8.0 | 7.5 | 7.1 | 6.9 | 6.8 | 4.8 | 3.5 |
| 8.25 | 4.5 | 4.2 | 4.1 | 4.0 | 3.9 | 2.8 | 2.1 |
| 8.50 | 2.6 | 2.4 | 2.3 | 2.3 | 2.3 | 1.71 | 1.28 |
| 8.75 | 1.47 | 1.40 | 1.37 | 1.38 | 1.42 | 1.07 | 0.83 |
| 9.00 | 0.86 | 0.83 | 0.83 | 0.86 | 0.91 | 0.72 | 0.58 |

Source: California Regional Water Quality Control Board, Los Angeles Region. 1994. Water Quality Control Plan (Basin Plan). Taken from USEPA. 1986. Quality Criteria for Water. EPA 440/5-86-001. 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 December 2008 sampling program are described by parameter in **Table 14**.

**Table 14**
**Discussion of December 2008 Big Tujunga Wash Sampling Results**

| Parameter | Discussion |
|---|---|
| Temperature | • Observed temperatures were below levels of concern for growth and survival of warmwater fish species at all stations. |
| Dissolved oxygen | • Dissolved oxygen levels ranged from 5.53 mg/L in the inflow to the ponds to 10.90 in Big Tujunga Wash. DO levels at all stations were above the recommended minimum for warmwater fish species (5.0 mg/L). |
| pH | • Lowest pH was observed in Haines Canyon Creek exiting the site (6.88), with highest pH observed in Big Tujunga Wash (8.56). On this date, pH measurements at all stations except Big Tujunga Wash were within the 6.5 to 8.5 range identified in the Basin Plan. |
| Total residual chlorine | • No residual chlorine was detected at any station. |
| Nitrogen | • Nitrate-nitrogen measurements at all stations were below the drinking water standard of 10 mg/L and nitrate levels were below the method reporting limit (0.20 mg/L) at the Big Tujunga Wash station.<br>• Ammonia and nitrite were not detected at any station. |
| Phosphorus | • Total phosphorus levels at all sites were below EPA's recommended range for streams to prevent excess algae growth (observed range was ND to 0.04 mg/L; recommended range is <0.05 – 0.1 mg/L). |
| Glyphosate | • No glyphosate was detected at any station. |
| Chloropyrifos | • Chloropyrifos and the other pesticides tested using EPA's analytical method 625 were not detected at any station. |
| Pesticides/ PCBs (EPA 608 compounds) | • Pesticides and PCBs analyzed by EPA Method 608 were not detected at any station. |
| Turbidity | • Turbidity levels were low (≤1 NTU) at all stations. |
| Bacteria | • Fecal coliform levels at all stations were below the water contact recreation standard of 200 MPN. Total coliform levels were generally low at all stations. |

## GLOSSARY

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

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

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

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

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

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

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

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

**Nitrite-Nitrogen** – $NO2^-$-N is an intermediate oxidation state of nitrogen, both in the oxidation of ammonia to nitrate and in the reduction of nitrate.

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

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

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

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

# APPENDIX A

# BIG TUJUNGA WASH MITIGATION BANK
# WATER QUALITY MONITORING PROGRAM

# LABORATORY RESULTS
# December 2008

**MWH Laboratories**
*A Division of MWH Americas, Inc.*

750 Royal Oaks Drive, Suite 100
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# Laboratory Report

for

MWH/ECORP
618 Michillinda Ave, Suite 200

Arcadia , CA 91007

Attention: Sarah Garber
Fax: 626-568-6101

DATE OF ISSUE
Jan 27 2009
MWH LABORATORIES

DST David S. Tripp
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
01114CA

Report#: 262260
Project: BIG TUJUNGA
PO#: 1342951.0101


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 Comments, QC Report, QC Summary, Data Report, Hits Report, totaling 15 page[s].

**MWH Laboratories**
750 Royal Oaks Drive, Monrovia, CA 91016
PHONE: 626-386-1100/FAX: 626-386-1101

ACKNOWLEDGMENT OF SAMPLES RECEIVED

MWH/ECORP
618 Michillinda Ave, Suite 200
Arcadia, CA 91007
Attn: Sarah Garber
Phone: 626-568-6910

Customer Code: MWH-ECORP
PO#: 1342951.010102
Group#: 262260
Project#: BIG TUJUNGA
Proj Mgr: David Tripp
Phone: 626-386-1158

The following samples were received from you on **12/29/08.** They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using MWH Laboratories.

| Sample# | Sample Id / Tests Scheduled | Matrix | Sample Date |
|---|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Water | 29-dec-2008 15:00:00 |
| | @DIAZEDD CHLTOT CUSTSUB FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB | | |
| 2812300120 | TJ PONDS IN TJPIN122908 | Water | 29-dec-2008 13:10:00 |
| | @DIAZEDD CHLTOT CUSTSUB FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB | | |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Water | 29-dec-2008 14:00:00 |
| | @DIAZEDD CHLTOT CUSTSUB FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB | | |
| 2812300122 | BIG T WASH BTW122908 | Water | 29-dec-2008 12:00:00 |
| | @DIAZEDD CHLTOT CUSTSUB FECCOL GLYPHOS NH3 NO2-N NO3 NO3A OPO4 T-P TKN TOTCOL TURB | | |

Test Acronym Description

| Test Acronym | Description |
|---|---|
| @DIAZEDD | Diazinon/Chlorpyrifos by GCMS |
| CHLTOT | Total Chlorine Residual |
| CUSTSUB | Subcontract Test-See Attached |
| FECCOL | Fecal Coliform Bacteria |
| GLYPHOS | Glyphosate |
| NH3 | Ammonia Nitrogen |
| NO2-N | Nitrite, Nitrogen by IC |
| NO3 | Nitrate as Nitrogen by IC |
| NO3A | Nitrate as NO3 (calc) |
| OPO4 | Orthophosphate as P |
| T-P | Total phosphorus as P |
| TKN | Kjeldahl Nitrogen |
| TOTCOL | Total Coliform Bacteria |

| | |
|---|---|
| MWH/ECORP | |
| 618 Michillinda Ave, Suite 200 | Customer Code: MWH-ECORP |
| Arcadia, CA 91007 | PO#: 1342951.010102 |
| Attn: Sarah Garber | Group#: 262260 |
| Phone: 626-568-6910 | Project#: BIG TUJUNGA |
| | Proj Mgr: David Tripp |
| | Phone: 626-386-1158 |

## Test Acronym Description

| Test Acronym | Description |
|---|---|
| TURB | Turbidity |

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Report
Comments
#262260

**Group Comments**

Analytical results for Diazinon/Chlorpyrifos by GCMS are submitted by CRG Marine Laboratories, Torrance, CA. ELAP#2261

Analytical results for Pesticides by 8081 are submitted by Emax Lab, Inc. Torrance, CA.

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Laboratory
Hits Report
#262260

MWH/ECORP
Sarah Garber
618 Michillinda Ave, Suite 200
Arcadia , CA 91007

Samples Received
29-dec-2008 16:33:00

| Analyzed | Sample# | Sample ID | Result | Federal MCL | UNITS | MRL |
|---|---|---|---|---|---|---|
| | **2812300119** | **HAINES CYN CRK HCC122908** | | | | |
| 12/29/08 | Fecal Coliform Bacteria | | 90 | | MPN/100 mL | 2.0 |
| 12/30/08 | Nitrate as NO3 (calc) | | 23 | 45 | mg/l | 0.88 |
| 12/30/08 | Nitrate as Nitrogen by IC | | 5.2 | 10 | mg/l | 0.20 |
| 12/30/08 | Orthophosphate as P | | 0.019 | | mg/l | 0.010 |
| 12/29/08 | Total Coliform Bacteria | | 280 | | MPN/100 mL | 2.0 |
| 12/30/08 | Total phosphorus as P | | 0.03 | | mg/l | 0.020 |
| 12/29/08 | Turbidity | | 0.30 | 5 | NTU | 0.050 |
| | **2812300120** | **TJ PONDS IN TJPIN122908** | | | | |
| 12/29/08 | Fecal Coliform Bacteria | | 7 | | MPN/100 mL | 2.0 |
| 01/07/09 | Kjeldahl Nitrogen | | 0.21 | | mg/l | 0.20 |
| 12/30/08 | Nitrate as NO3 (calc) | | 37 | 45 | mg/l | 0.88 |
| 12/30/08 | Nitrate as Nitrogen by IC | | 8.4 | 10 | mg/l | 0.20 |
| 12/30/08 | Orthophosphate as P | | 0.028 | | mg/l | 0.010 |
| 12/29/08 | Total Coliform Bacteria | | 500 | | MPN/100 mL | 2.0 |
| 12/30/08 | Total phosphorus as P | | 0.04 | | mg/l | 0.020 |
| 12/29/08 | Turbidity | | 1.0 | 5 | NTU | 0.050 |
| | **2812300121** | **TJ PONDS OUT THPOUT122908** | | | | |
| 12/29/08 | Fecal Coliform Bacteria | | 36 | | MPN/100 mL | 2.0 |
| 12/30/08 | Nitrate as NO3 (calc) | | 28 | 45 | mg/l | 0.88 |
| 12/30/08 | Nitrate as Nitrogen by IC | | 6.3 | 10 | mg/l | 0.20 |
| 12/30/08 | Orthophosphate as P | | 0.019 | | mg/l | 0.010 |
| 12/29/08 | Total Coliform Bacteria | | 50 | | MPN/100 mL | 2.0 |
| 12/30/08 | Total phosphorus as P | | 0.03 | | mg/l | 0.020 |
| 12/29/08 | Turbidity | | 0.40 | 5 | NTU | 0.050 |
| | **2812300122** | **BIG T WASH BTW122908** | | | | |

**SUMMARY OF POSITIVE DATA ONLY.**

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Laboratory
Hits Report
#262260

MWH/ECORP
Sarah Garber
618 Michillinda Ave, Suite 200
Arcadia , CA 91007

Samples Received
29-dec-2008 16:33:00

| Analyzed | Sample# | Sample ID | Result | Federal MCL | UNITS | MRL |
|---|---|---|---|---|---|---|
| | 2812300122 | BIG T WASH BTW122908 | | | | |
| 12/29/08 | Fecal Coliform Bacteria | | 4 | | MPN/100 mL | 2.0 |
| 01/07/09 | Kjeldahl Nitrogen | | 0.20 | | mg/l | 0.20 |
| 12/29/08 | Total Coliform Bacteria | | 50 | | MPN/100 mL | 2.0 |
| 12/29/08 | Turbidity | | 0.90 | 5 | NTU | 0.050 |

SUMMARY OF POSITIVE DATA ONLY.

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# Laboratory Data Report #262260

MWH/ECORP
Sarah Garber
618 Michillinda Ave, Suite 200
Arcadia , CA 91007

Samples Received
12/29/08

## HAINES CYN CRK HCC122908 (2812300119) Sampled on 12/29/08 15:00

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 12/30/08 00:00 | 466215 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 01/16/09 00:00 | | ( NONE ) | Subcontract Test-See Attached | SUB_EMAX | None | 0 | 1 |
| | 12/29/08 17:40 | | ( SM 9221C ) | Fecal Coliform Bacteria | 90 | MPNM | 2.0 | 1 |
| | 01/07/09 00:00 | 467234 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 01/05/09 12:48 | 466822 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/30/08 03:10 | 466012 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/30/08 03:10 | 466015 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | 5.2 | mg/l | 0.20 | 2 |
| | 12/30/08 03:10 | 466006 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | 23 | mg/l | 0.88 | 2 |
| | 12/30/08 17:45 | 466373 | ( 4500PE/HACH ) | Orthophosphate as P | 0.019 | mg/l | 0.010 | 1 |
| | 12/30/08 21:09 | 466219 | ( S4500PF/ 365.1) | Total phosphorus as P | 0.03 | mg/l | 0.020 | 1 |
| | 01/07/09 14:18 | 467021 | ( EPA 351.2 ) | Kjeldahl Nitrogen | ND | mg/l | 0.20 | 1 |
| | 12/29/08 17:40 | | ( SM 9221B ) | Total Coliform Bacteria | 280 | MPNM | 2.0 | 1 |
| | 12/29/08 18:02 | 466055 | ( EPA 180.1 ) | Turbidity | 0.30 | NTU | 0.050 | 1 |

### Diazinon/Chlorpyrifos by GCMS

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 0 | 1 |

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(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 0 | 1 |
| | 01/10/09 00:00 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 0 | 1 |

## TJ PONDS IN TJPIN122908 (2812300120) Sampled on 12/29/08 13:10

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 12/30/08 00:00 | 466215 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 01/16/09 00:00 | | ( NONE ) | Subcontract Test-See Attached | SUB_EMAX | None | 0 | 1 |
| | 12/29/08 17:40 | | ( SM 9221C ) | Fecal Coliform Bacteria | 7 | MPNM | 2.0 | 1 |
| | 12/30/08 00:00 | 466292 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 01/05/09 12:48 | 466822 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/30/08 03:24 | 466012 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/30/08 03:24 | 466015 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | 8.4 | mg/l | 0.20 | 2 |
| | 12/30/08 03:24 | 466006 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | 37 | mg/l | 0.88 | 2 |
| | 12/30/08 17:45 | 466373 | ( 4500PE/HACH ) | Orthophosphate as P | 0.028 | mg/l | 0.010 | 1 |
| | 12/30/08 21:09 | 466219 | ( S4500PF/ 365.1) | Total phosphorus as P | 0.04 | mg/l | 0.020 | 1 |
| | 01/07/09 14:18 | 467021 | ( EPA 351.2 ) | Kjeldahl Nitrogen | 0.21 | mg/l | 0.20 | 1 |
| | 12/29/08 17:40 | | ( SM 9221B ) | Total Coliform Bacteria | 500 | MPNM | 2.0 | 1 |
| | 12/29/08 18:02 | 466055 | ( EPA 180.1 ) | Turbidity | 1.0 | NTU | 0.050 | 1 |

### Diazinon/Chlorpyrifos by GCMS

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 0 | 1 |

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1 800 566 LABS (1 800 566 5227)



MWH/ECORP
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:48 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 0 | 1 |

## TJ PONDS OUT THPOUT122908 (2812300121) Sampled on 12/29/08 14:00

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 12/30/08 00:00 | 466215 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 01/16/09 00:00 | | ( NONE ) | Subcontract Test-See Attached | SUB_EMAX | None | 0 | 1 |
| | 12/29/08 17:40 | | ( SM 9221C ) | Fecal Coliform Bacteria | 36 | MPNM | 2.0 | 1 |
| | 12/30/08 00:00 | 466292 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 01/05/09 12:48 | 466822 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/30/08 03:37 | 466012 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/30/08 03:37 | 466015 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | 6.3 | mg/l | 0.20 | 2 |
| | 12/30/08 03:37 | 466006 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | 28 | mg/l | 0.88 | 2 |
| | 12/30/08 17:45 | 466373 | ( 4500PE/HACH ) | Orthophosphate as P | 0.019 | mg/l | 0.010 | 1 |
| | 12/30/08 21:53 | 466220 | ( S4500PF/ 365.1) | Total phosphorus as P | 0.03 | mg/l | 0.020 | 1 |
| | 01/07/09 14:18 | 467021 | ( EPA 351.2 ) | Kjeldahl Nitrogen | ND | mg/l | 0.20 | 1 |
| | 12/29/08 17:40 | | ( SM 9221B ) | Total Coliform Bacteria | 50 | MPNM | 2.0 | 1 |
| | 12/29/08 18:02 | 466055 | ( EPA 180.1 ) | Turbidity | 0.40 | NTU | 0.050 | 1 |

### Diazinon/Chlorpyrifos by GCMS

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 0 | 1 |

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MWH/ECORP
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Tetrachlorovinphos (Stirophos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:50 | | ( EPA 625 MOD ) | Trichloronate | NA | ng/l | 0 | 1 |

**BIG T WASH BTW122908 (2812300122) Sampled on 12/29/08 12:00**

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 12/30/08 00:00 | 466215 | ( 4500CL-G/HACH ) | Total Chlorine Residual | ND | mg/l | 0.1 | 1 |
| | 01/16/09 00:00 | | ( NONE ) | Subcontract Test-See Attached | SUB_EMAX | None | 0 | 1 |
| | 12/29/08 17:40 | | ( SM 9221C ) | Fecal Coliform Bacteria | 4 | MPNM | 2.0 | 1 |
| | 01/07/09 00:00 | 467234 | ( EPA 547 ) | Glyphosate | ND | ug/l | 6.0 | 1 |
| | 01/05/09 12:48 | 466822 | ( EPA 350.1 ) | Ammonia Nitrogen | ND | mg/l | 0.050 | 1 |
| | 12/30/08 06:35 | 466012 | ( ML/EPA 300.0 ) | Nitrite, Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/30/08 06:35 | 466015 | ( ML/EPA 300.0 ) | Nitrate as Nitrogen by IC | ND | mg/l | 0.20 | 2 |
| | 12/30/08 06:35 | 466006 | ( ML/EPA 300.0 ) | Nitrate as NO3 (calc) | ND | mg/l | 0.88 | 2 |
| | 12/30/08 17:45 | 466373 | ( 4500PE/HACH ) | Orthophosphate as P | ND | mg/l | 0.010 | 1 |
| | 12/30/08 21:53 | 466220 | ( S4500PF/ 365.1) | Total phosphorus as P | ND | mg/l | 0.020 | 1 |
| | 01/07/09 14:18 | 467021 | ( EPA 351.2 ) | Kjeldahl Nitrogen | 0.20 | mg/l | 0.20 | 1 |
| | 12/29/08 17:40 | | ( SM 9221B ) | Total Coliform Bacteria | 50 | MPNM | 2.0 | 1 |
| | 12/29/08 18:02 | 466055 | ( EPA 180.1 ) | Turbidity | 0.90 | NTU | 0.050 | 1 |

**Diazinon/Chlorpyrifos by GCMS**

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Diazinon | ND | ng/l | 4.0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Bolstar (Sulprofos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Chlorpyrifos | ND | ng/l | 2.0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Demeton | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Dichlorvos | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Disulfoton | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Dimethoate | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Ethoprop (Ethoprophos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Fenchlorophos (Ronnel) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Fensulfothion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Fenthion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Merphos | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Mevinphos (Phosdrin) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Malathion | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Parathion-methyl | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Phorate | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD ) | Tokuthion | NA | ng/l | 0 | 1 |

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MWH/ECORP
(continued)

| Prepared | Analyzed | QC Ref# | Method | Analyte | Result | Units | MRL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 01/25/09 21:51 | | ( EPA 625 MOD | ) Tetrachlorovinphos (Stirophos) | NA | ng/l | 0 | 1 |
| | 01/25/09 21:51 | | ( EPA 625 MOD | ) Trichloronate | NA | ng/l | 0 | 1 |

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Laboratory
QC Summary
#262260

MWH/ECORP

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**QC Ref #466006 - Nitrate as NO3 (calc) Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: sxk |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: sxk |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: sxk |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: sxk |

**QC Ref #466012 - Nitrite, Nitrogen by IC Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: sxk |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: sxk |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: sxk |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: sxk |

**QC Ref #466015 - Nitrate as Nitrogen by IC Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: sxk |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: sxk |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: sxk |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: sxk |

**QC Ref #466055 - Turbidity Analysis Date: 12/29/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: sar |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: sar |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: sar |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: sar |

**QC Ref #466215 - Total Chlorine Residual Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: mav |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: mav |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: mav |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: mav |

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MWH/ECORP
(continued)

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**QC Ref #466219 - Total phosphorus as P** **Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: njr |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: njr |

**QC Ref #466220 - Total phosphorus as P** **Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: njr |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: njr |

**QC Ref #466292 - Glyphosate** **Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: szz |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: szz |

**QC Ref #466373 - Orthophosphate as P** **Analysis Date: 12/30/2008**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: vxt |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: vxt |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: vxt |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: vxt |

**QC Ref #466822 - Ammonia Nitrogen** **Analysis Date: 01/05/2009**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: njr |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: njr |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: njr |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: njr |

**QC Ref #467021 - Kjeldahl Nitrogen** **Analysis Date: 01/07/2009**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: njr |
| 2812300120 | TJ PONDS IN TJPIN122908 | Analyzed by: njr |
| 2812300121 | TJ PONDS OUT THPOUT122908 | Analyzed by: njr |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: njr |

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(continued)

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**QC Ref #467234 - Glyphosate** **Analysis Date: 01/07/2009**

| | | |
|---|---|---|
| 2812300119 | HAINES CYN CRK HCC122908 | Analyzed by: szz |
| 2812300122 | BIG T WASH BTW122908 | Analyzed by: szz |

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QC Report
#262260

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## QC Ref #466012 Nitrite, Nitrogen by IC

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| AASPKSMP | Spiked sample | Lab # 28 | 12300121 | MGL | | ( 0-0 ) | |
| LCS1 | Nitrite, Nitrogen by IC | 1.0 | 0.960 | MGL | 96.0 | ( 90-110 ) | |
| LCS2 | Nitrite, Nitrogen by IC | 1.0 | 0.958 | MGL | 95.8 | ( 90-110 ) | |
| MBLK | Nitrite, Nitrogen by IC | ND | <0.10 | MGL | | | |
| MRL_CHK | Nitrite, Nitrogen by IC | 0.050 | 0.0498 | MGL | 99.6 | ( 50-150 ) | |
| MS | Nitrite, Nitrogen by IC | 0.500 | 0.494 | MGL | 98.8 | ( 69-123 ) | |
| MSD | Nitrite, Nitrogen by IC | 0.500 | 0.492 | MGL | 98.4 | ( 69-123 ) | |
| RPD_LCS | Nitrite, Nitrogen by IC | 96.000 | 95.800 | MGL | 0.2 | ( 0-20 ) | |
| RPD_MS | Nitrite, Nitrogen by IC | 98.800 | 98.400 | MGL | 0.4 | ( 0-20 ) | |

## QC Ref #466015 Nitrate as Nitrogen by IC

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| AASPKSMP | Spiked sample | Lab # 28 | 12300121 | MGL | | ( 0-0 ) | |
| LCS1 | Nitrate as Nitrogen by IC | 2.5 | 2.43 | MGL | 97.2 | ( 90-110 ) | |
| LCS2 | Nitrate as Nitrogen by IC | 2.5 | 2.42 | MGL | 96.8 | ( 90-110 ) | |
| MBLK | Nitrate as Nitrogen by IC | ND | <0.10 | MGL | | | |
| MRL_CHK | Nitrate as Nitrogen by IC | 0.050 | 0.0496 | MGL | 99.2 | ( 50-150 ) | |
| MS | Nitrate as Nitrogen by IC | 1.25 | 1.30 | MGL | 104.0 | ( 87-121 ) | |
| MSD | Nitrate as Nitrogen by IC | 1.25 | 1.29 | MGL | 103.2 | ( 87-121 ) | |
| RPD_LCS | Nitrate as Nitrogen by IC | 97.200 | 96.800 | MGL | 0.4 | ( 0-20 ) | |
| RPD_MS | Nitrate as Nitrogen by IC | 104.000 | 103.200 | MGL | 0.8 | ( 0-20 ) | |

## QC Ref #466055 Turbidity

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| DUP | Turbidity | 0.10 | 0.10 | NTU | | ( 0-20 ) | 0.0 |
| DUP2 | Turbidity | 0.10 | 0.10 | NTU | | ( 0-20 ) | 0.0 |
| LCS1 | Turbidity | 20 | 19.7 | NTU | 98.5 | ( 50-150 ) | |
| MBLK | Turbidity | ND | <0.050 | NTU | | | |
| MRL_CHK | Turbidity | 0.0500 | 0.062 | NTU | 124.0 | ( 50-150 ) | |

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.

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MWH/ECORP
(continued)

## QC Ref #466215 Total Chlorine Residual

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| LCS1 | Total Chlorine Residual | 1.0 | 0.99 | MGL | 99.0 | ( 85-115 ) | |
| MRL_CHK | Total Chlorine Residual | 0.1 | 0.11 | MGL | 110.0 | ( 50-150 ) | |

## QC Ref #466219 Total phosphorus as P

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 12260013 | MGL | | ( 0-0 ) | |
| LCS1 | Total phosphorus as P | 0.4 | 0.407 | MGL | 101.7 | ( 90-110 ) | |
| LCS2 | Total phosphorus as P | 0.4 | 0.396 | MGL | 99.0 | ( 90-110 ) | |
| MBLK | Total phosphorus as P | ND | <0.020 | MGL | | | |
| MRL_CHK | Total phosphorus as P | 0.02 | 0.019 | MGL | 95.0 | ( 50-150 ) | |
| MS | Total phosphorus as P | 0.4 | 0.400 | MGL | 100.0 | ( 90-110 ) | |
| MS2 | Total phosphorus as P | 0.4 | 0.403 | MGL | 100.8 | ( 90-110 ) | |
| MSD | Total phosphorus as P | 0.4 | 0.394 | MGL | 98.5 | ( 90-110 ) | |
| RPD_LCS | Total phosphorus as P | 101.750 | 99.000 | MGL | 2.7 | ( 0-10 ) | |
| RPD_MS | Total phosphorus as P | 100.000 | 98.500 | MGL | 1.5 | ( 0-20 ) | |

## QC Ref #466220 Total phosphorus as P

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 12300121 | MGL | | ( 0-0 ) | |
| LCS1 | Total phosphorus as P | 0.4 | 0.393 | MGL | 98.2 | ( 90-110 ) | |
| LCS2 | Total phosphorus as P | 0.4 | 0.410 | MGL | 102.5 | ( 90-110 ) | |
| MBLK | Total phosphorus as P | ND | <0.020 | MGL | | | |
| MRL_CHK | Total phosphorus as P | 0.02 | 0.019 | MGL | 95.0 | ( 50-150 ) | |
| MS | Total phosphorus as P | 0.4 | 0.396 | MGL | 99.0 | ( 90-110 ) | |
| MSD | Total phosphorus as P | 0.4 | 0.397 | MGL | 99.2 | ( 90-110 ) | |
| RPD_LCS | Total phosphorus as P | 98.250 | 102.500 | MGL | 4.2 | ( 0-10 ) | |
| RPD_MS | Total phosphorus as P | 99.000 | 99.250 | MGL | 0.3 | ( 0-20 ) | |

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.

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(continued)

## QC Ref #466292 Glyphosate

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 12220202 | UGL | | ( 0-0 ) | |
| LCS1 | Glyphosate | 10 | 10.0 | UGL | 100.0 | ( 77-119 ) | |
| MBLK | Glyphosate | ND | <6.0 | UGL | | | |
| MRL_CHK | Glyphosate | 6.00 | 6.09 | UGL | 101.5 | ( 50-150 ) | |
| MS | Glyphosate | 10 | 10.1 | UGL | 101.0 | ( 74-126 ) | |
| MSD | Glyphosate | 10 | 10.1 | UGL | 101.0 | ( 74-126 ) | |
| RPD_MS | Glyphosate | 101.000 | 101.000 | UGL | 0.0 | ( 0-20 ) | |

## QC Ref #466373 Orthophosphate as P

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 200812300030 | MGL | | ( 0-0 ) | |
| LCS1 | Orthophosphate as P | 0.5 | 0.487 | MGL | 97.4 | ( 90-110 ) | |
| LCS2 | Orthophosphate as P | 0.5 | 0.482 | MGL | 96.4 | ( 90-110 ) | |
| MBLK | Orthophosphate as P | ND | <0.010 | MGL | | | |
| MRL_CHK | Orthophosphate as P | 0.010 | 0.013 | MGL | 130.0 | ( 50-150 ) | |
| MS | Orthophosphate as P | 0.5 | 0.507 | MGL | 101.4 | ( 80-120 ) | |
| MSD | Orthophosphate as P | 0.5 | 0.506 | MGL | 101.2 | ( 80-120 ) | |

## QC Ref #466822 Ammonia Nitrogen

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 12300268 | MGL | | ( 0-0 ) | |
| LCS1 | Ammonia Nitrogen | 1.00 | 1.05 | MGL | 105.0 | ( 90-110 ) | |
| LCS2 | Ammonia Nitrogen | 1.00 | 1.05 | MGL | 105.0 | ( 90-110 ) | |
| MBLK | Ammonia Nitrogen | ND | <0.050 | MGL | | | |
| MRL_CHK | Ammonia Nitrogen | 0.05 | 0.049 | MGL | 98.0 | ( 50-150 ) | |
| MS | Ammonia Nitrogen | 1.00 | 1.00 | MGL | 100.0 | ( 90-110 ) | |
| MSD | Ammonia Nitrogen | 1.00 | 1.00 | MGL | 100.0 | ( 90-110 ) | |

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.

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(continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| MS_2ND | Ammonia Nitrogen | 1 | 1.03 | MGL | 103.0 | ( 90-110 ) |
| RPD_LCS | Ammonia Nitrogen | 105.000 | 105.000 | MGL | 0.0 | ( 0-20 ) |
| RPD_MS | Ammonia Nitrogen | 100.000 | 100.000 | MGL | 0.0 | ( 0-20 ) |

## QC Ref #467021 Kjeldahl Nitrogen

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 12300119 | MGL | | ( 0-0 ) | |
| LCS1 | Kjeldahl Nitrogen | 4 | 4.09 | MGL | 102.2 | ( 90-110 ) | |
| LCS2 | Kjeldahl Nitrogen | 4 | 4.01 | MGL | 100.2 | ( 90-110 ) | |
| MBLK | Kjeldahl Nitrogen | ND | <0.20 | MGL | | | |
| MRL_CHK | Kjeldahl Nitrogen | 0.1 | 0.114 | MGL | 114.0 | ( 50-150 ) | |
| MS | Kjeldahl Nitrogen | 4 | 3.93 | MGL | 98.2 | ( 90-110 ) | |
| MSD | Kjeldahl Nitrogen | 4 | 4.10 | MGL | 102.5 | ( 90-110 ) | |
| MS_2ND | Kjeldahl Nitrogen | 4 | 4.20 | MGL | 105.0 | ( 90-110 ) | |
| RPD_LCS | Kjeldahl Nitrogen | 102.250 | 100.250 | MGL | 2.0 | ( 0-20 ) | |
| RPD_MS | Kjeldahl Nitrogen | 98.250 | 102.500 | MGL | 4.2 | ( 0-20 ) | |

## QC Ref #467234 Glyphosate

| QC | Analyte | Spiked | Recovered | Units | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|---|
| MS | Spiked sample | Lab # 28 | 12310140 | UGL | | ( 0-0 ) | |
| LCS1 | Glyphosate | 10 | 10.0 | UGL | 100.0 | ( 77-119 ) | |
| MBLK | Glyphosate | ND | <6.0 | UGL | | | |
| MRL_CHK | Glyphosate | 6.00 | 6.08 | UGL | 101.3 | ( 50-150 ) | |
| MS | Glyphosate | 10 | 10.2 | UGL | 102.0 | ( 74-126 ) | |
| MSD | Glyphosate | 10 | 10.0 | UGL | 100.0 | ( 74-126 ) | |
| RPD_MS | Glyphosate | 102.000 | 100.000 | UGL | 2.0 | ( 0-20 ) | |

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.

262260
MWH - Group

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**PROJECT:** **262260**

**SDG:** **08L333**



** - Not Requested

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**LABORATORIES, INC.**
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Date: 01-22-2009
EMAX Batch No.: 08L333

Attn: Joseph Ureno

MWH Laboratories
750 Royal Oaks Dr., Suite 100
Monrovia CA 91016-3629

Subject: Laboratory Report
Project: 262260

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Enclosed is the Laboratory report for samples received on 12/31/08.
The data reported include :

| Sample ID | Control # | Col Date | Matrix | Analysis |
|---|---|---|---|---|
| HAINES CYN CRK HCC1122908 | L333-01 | 12/29/08 | WATER | PESTICIDES ORGANOCHLORINE |
| TJ PONDS IN TJPINI122908 | L333-02 | 12/29/08 | WATER | PESTICIDES ORGANOCHLORINE |
| TJ PONDS OUT THPOUT122908 | L333-03 | 12/29/08 | WATER | PESTICIDES ORGANOCHLORINE |
| BIG T WASH BTW122908 | L333-04 | 12/29/08 | WATER | PESTICIDES ORGANOCHLORINE |

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
Acting Laboratory Director



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

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Date 12/30/08

# Submittal Form & Purchase Order 99-36362

*REPORTING REQUIREMENTS: *Do Not Combine Report with any other samples submitted under different MWH project numbers!*
Report & Invoice must have the MWH Project Number **262260** Sub PO# **99-36362** and Job # **Find Out**

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.** *See reverse side for List of Terms and Conditions*

082333

Ship To **Richard Beauvil**
**Emax Laboratories, Inc.**

**1835 205th Street**
**Torrance, CA 90501**

(310) 618-8889 ext 118 Fax

**Reports:** Elena Montanez / Christine Lewis Sub-contracting Administrator
EMAIL TO: mwhlabs-subcontractreports@mwhglobal.com
MWH Laboratories 750 Royal Oaks Dr. Ste. 100, Monrovia, CA 91016
Phone (626) 386-1118 / 1137 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

California DW

**COMMENT: SENT TO EMAX, SAMPLE BOTTLES LISTED EMAX AS SUB LAB.**

| MWH Project # | Report Due: | Sub PO# |
|---|---|---|
| 262260 | 01/14/09 | 99-36362 |

| | MWH | Use MWH Lab # for ID | *Client Sample ID for reference only* | Analysis Requested | Sample Date & Time | Matrix | Container |
|---|---|---|---|---|---|---|---|
| 1 | CUSTSUB | 2812300119 | HAINES CYN CRK HCC1122908 | 8081 | 12/29/08 15:00 | dw | |
| 2 | CUSTSUB | 2812300120 | TJ PONDS IN TJPINI122908 | 8081 | 12/29/08 13:10 | dw | |
| 3 | CUSTSUB | 2812300121 | TJ PONDS OUT THPOUT1229008 | 8081 | 12/29/08 14:00 | dw | |
| 4 | CUSTSUB | 2812300122 | BIG T WASH BTW122908 | 8081 | 12/29/08 12:00 | dw | |

T - 3.2°C

1001

Relinquished by: [signature] Sample Control Date 12/~~30~~31/08 Time 12:30 MUST HAVE NOTIFICAION IF TEMP IS GREATER THAN 6 OR LESS THAN 2 CELSIUS

Page 1

Received by: [signature] Date 12/31/08 Time 1505 An Acknowledgement of Receipt is requested to attn: Christine Lewis

EMAX LABORATORIES, INC.

# SAMPLE RECEIPT FORM 1

| Type of Delivery | Delivered By/Airbill | | |
|---|---|---|---|
| ☐ EMAX Courier | | RCN | 08L333 |
| ☑ Client Delivery | | Recipient | J-LUNA |
| ☐ Third Party | | Date | 12-31-08 |
| | | Time | 1505 |

**COC inspection**

☑ Client Name ☑ Client PM/FC ☐ Sampler Name ☑ Sampling Date/Time/Location ☑ Sample ID ☑ Matrix

☑ Address ☑ Tel # / Fax # ☐ Courier Signature ☑ Analysis Required ☐ Preservative (if any) ☑ TAT

Safety Issues

☑ None ☐ High concentrations expected ☐ Superfund Site samples ☐ Rad screening required

Comments:

**Packaging inspection**

Container: ☑ Cooler ☐ Box ☐ Other

Condition: ☐ Custody Seal ☑ Intact ☐ Damaged

Packaging: ☐ Bubble Pack ☐ Styrofoam ☐ Popcorn ☑ Sufficient ☐ ______

Temperatures: ☐ Cooler 3.2 °C ☐ Cooler 2 ______ °C ☐ Cooler 3 ______ °C ☐ Cooler 4 ______ °C ☐ Cooler 5 ______ °C

☐ Cooler 6 ______ °C ☐ Cooler 7 ______ °C ☐ Cooler 8 ______ °C ☐ Cooler 9 ______ °C ☐ Cooler 10 ______ °C

Comments: ☐ PM was informed on non-compliant coolers imediately.

**DISCREPANCIES**

| LSID | LSCID | Sample Label ID/COC ID | Discrepancy Code | Corrective Action Code |
|---|---|---|---|---|
| | | | | |
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REVIEWS

Sample Labeling [signature] Date 12/31/08

SRF [signature] Date 12/31/08

PM [signature] Date 1/5/09

LEGEND:

| Code | Description- Sample Management |
|---|---|
| A1 | Analysis is not indicated in COC |
| A2 | Analysis is not indicated in label |
| A3 | Analysis is inconsistent in COC vis-a-vis label |
| B1 | Sample ID is not indicated in COC |
| B2 | Sample ID is not indicated in label |
| B3 | Sample ID is inconsistent in COC vis-a-vis label |
| C1 | Wrong container |
| C2 | Broken container |
| C3 | Leaking container |
| D1 | Date and/or time is not indicated in COC |
| D2 | Date and/or time is not indicated in label |
| D3 | Date and/or time is inconsistent in COC vis-a-vis label |

| Code | Description-Sample Management |
|---|---|
| E1 | Preservative needed; sample has no preservative |
| E2 | Preservative not needed but sample is preserved |
| F1 | Not enough quantity of samples |
| F2 | Bubble is> 6mm |
| G1 | Temperature is out of range ( 4 ± 2°C ) |
| G2 | Out of Holding Time |
| G3 | >20 % solid particle |
| H1 | ______ |
| H2 | ______ |

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

## 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

262260

METHOD 3520C/8081A
PESTICIDES

SDG#: 08L333

## CASE NARRATIVE

**CLIENT:** **MWH LABORATORIES**

**PROJECT:** **262260**

**SDG:** **08L333**

### METHOD 3520C/8081A
### PESTICIDES

Four (4) water samples were received on 12/31/08 for Pesticides analysis by Method 3520C/8081A in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd ed.

1. **Holding Time**

   Analytical holding time was met.

2. **Instrument Performance and Calibration**

   Initial calibration was calibrated for Pesticides, all RSDs were within 20%. All continue calibrations were analyzed at 12 hours interval and mean recoveries were within 85-115%. Endrin and DDT breakdown were within QC limits.

3. **Method Blank**

   Method blank was free of contamination at the reporting limit.

4. **Surrogate Recovery**

   Recoveries were within QC limit.

5. **Lab Control Sample/Lab Control Sample Duplicate**

   All recoveries were within QC limits.

6. **Matrix Spike/Matrix Spike Duplicate**

   No MS/MSD sample was designated in this SDG.

7. **Sample Analysis**

   Samples were analyzed according to the prescribed QC procedures. All criteria were met.

   When sample results are confirmed by a second column, the relative percentage difference (RPD) between the two results is calculated. If RPD is less than 40%, and no evidence of chromatographic problems, the higher result is reported. If RPD is greater than 40%, the chromatogram is checked for anomalies and results are selected based on the best professional judgment. If no evidence of any chromatographic problems, the higher result is reported.

LAB CHRONICLE
PESTICIDES

Client : MWH LABORATORIES
Project : 262260

SDG NO. : 08L333
Instrument ID : GCT016

WATER

| Client Sample ID | Laboratory Sample ID | Dilution Factor | % Moist | Analysis DateTime | Extraction DateTime | Sample Data FN | Calibration Data FN | Prep. Batch | Notes |
|---|---|---|---|---|---|---|---|---|---|
| MBLK1W | CPA002WB | 1 | NA | 01/16/0922:36 | 01/05/0911:30 | WA15116A | WA15111A | CPA002W | Method Blank |
| LCS1W | CPA002WL | 1 | NA | 01/16/0922:53 | 01/05/0911:30 | WA15117A | WA15111A | CPA002W | Lab Control Sample (LCS) |
| LCD1W | CPA002WC | 1 | NA | 01/16/0923:11 | 01/05/0911:30 | WA15118A | WA15111A | CPA002W | LCS Duplicate |
| HAINES CYN CRK HCC1122908 | L333-01 | 0.97 | NA | 01/16/0923:28 | 01/05/0911:30 | WA15119A | WA15111A | CPA002W | Field Sample |
| TJ PONDS IN TJPIN1122908 | L333-02 | 0.94 | NA | 01/16/0923:45 | 01/05/0911:30 | WA15120A | WA15111A | CPA002W | Field Sample |
| TJ PONDS OUT THPOUT122908 | L333-03 | 0.94 | NA | 01/17/0900:02 | 01/05/0911:30 | WA15121A | WA15111A | CPA002W | Field Sample |
| BIG T WASH BTW122908 | L333-04 | 0.94 | NA | 01/17/0900:19 | 01/05/0911:30 | WA15122A | WA15111A | CPA002W | Field Sample |

FN - Filename
% Moist - Percent Moisture

# SAMPLE RESULTS

METHOD 3520C/8081A
PESTICIDES

| | | | |
|---|---|---|---|
| Client | : MWH LABORATORIES | Date Collected: | 12/29/08 |
| Project | : 262260 | Date Received: | 12/31/08 |
| Batch No. | : 08L333 | Date Extracted: | 01/05/09 11:30 |
| Sample ID: | HAINES CYN CRK HCC1122908 | Date Analyzed: | 01/16/09 23:28 |
| Lab Samp ID: | L333-01 | Dilution Factor: | 0.97 |
| Lab File ID: | WA15119A | Matrix | : WATER |
| Ext Btch ID: | CPA002W | % Moisture | : NA |
| Calib. Ref.: | WA15111A | Instrument ID | : GCT016 |

| PARAMETERS | RESULTS (ug/L) | RL (ug/L) | MDL (ug/L) |
|---|---|---|---|
| ALPHA-BHC | ND\|(ND) | 0.097 | 0.019\|0.019 |
| GAMMA-BHC (LINDANE) | ND\|(ND) | 0.097 | 0.019\|0.019 |
| BETA-BHC | (ND)\|0.028J | 0.097 | 0.019\|0.019 |
| HEPTACHLOR | ND\|(ND) | 0.097 | 0.019\|0.019 |
| DELTA-BHC | ND\|(ND) | 0.097 | 0.019\|0.019 |
| ALDRIN | ND\|(ND) | 0.097 | 0.019\|0.019 |
| HEPTACHLOR EPOXIDE | ND\|(ND) | 0.097 | 0.019\|0.019 |
| GAMMA-CHLORDANE | ND\|(ND) | 0.097 | 0.019\|0.019 |
| ALPHA-CHLORDANE | ND\|(ND) | 0.097 | 0.019\|0.019 |
| ENDOSULFAN I | ND\|(ND) | 0.097 | 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) | 0.97 | 0.19\|0.19 |
| TOXAPHENE | ND\|(ND) | 1.9 | 0.97\|0.97 |

| SURROGATE PARAMETERS | % RECOVERY | QC LIMIT |
|---|---|---|
| TETRACHLORO-M-XYLENE | 102\|(93) | 30-140 |
| DECACHLOROBIPHENYL | 110\|(110) | 40-150 |

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

METHOD 3520C/8081A
PESTICIDES

| | | | |
|---|---|---|---|
| Client | : MWH LABORATORIES | Date Collected: | 12/29/08 |
| Project | : 262260 | Date Received: | 12/31/08 |
| Batch No. | : 08L333 | Date Extracted: | 01/05/09 11:30 |
| Sample ID: | TJ PONDS IN TJPINI122908 | Date Analyzed: | 01/16/09 23:45 |
| Lab Samp ID: | L333-02 | Dilution Factor: | 0.94 |
| Lab File ID: | WA15120A | Matrix | : WATER |
| Ext Btch ID: | CPA002W | % Moisture | : NA |
| Calib. Ref.: | WA15111A | Instrument ID | : GCT016 |

| PARAMETERS | RESULTS (ug/L) | RL (ug/L) | MDL (ug/L) |
|---|---|---|---|
| ALPHA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| GAMMA-BHC (LINDANE) | ND\|(ND) | 0.094 | 0.019\|0.019 |
| BETA-BHC | (ND)\|0.042J | 0.094 | 0.019\|0.019 |
| HEPTACHLOR | ND\|(ND) | 0.094 | 0.019\|0.019 |
| DELTA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ALDRIN | ND\|(ND) | 0.094 | 0.019\|0.019 |
| HEPTACHLOR EPOXIDE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| GAMMA-CHLORDANE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ALPHA-CHLORDANE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ENDOSULFAN I | ND\|(ND) | 0.094 | 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) | 0.94 | 0.19\|0.19 |
| TOXAPHENE | ND\|(ND) | 1.9 | 0.94\|0.94 |

| SURROGATE PARAMETERS | % RECOVERY | QC LIMIT |
|---|---|---|
| TETRACHLORO-M-XYLENE | 101\|(94) | 30-140 |
| DECACHLOROBIPHENYL | 110\|(110) | 40-150 |

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

METHOD 3520C/8081A
PESTICIDES

| | | | |
|---|---|---|---|
| Client | : MWH LABORATORIES | Date Collected: | 12/29/08 |
| Project | : 262260 | Date Received: | 12/31/08 |
| Batch No. | : 08L333 | Date Extracted: | 01/05/09 11:30 |
| Sample ID: | TJ PONDS OUT THPOUT122908 | Date Analyzed: | 01/17/09 00:02 |
| Lab Samp ID: | L333-03 | Dilution Factor: | 0.94 |
| Lab File ID: | WA15121A | Matrix | : WATER |
| Ext Btch ID: | CPA002W | % Moisture | : NA |
| Calib. Ref.: | WA15111A | Instrument ID | : GCT016 |

| PARAMETERS | RESULTS (ug/L) | RL (ug/L) | MDL (ug/L) |
|---|---|---|---|
| ALPHA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| GAMMA-BHC (LINDANE) | ND\|(ND) | 0.094 | 0.019\|0.019 |
| BETA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| HEPTACHLOR | ND\|(ND) | 0.094 | 0.019\|0.019 |
| DELTA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ALDRIN | ND\|(ND) | 0.094 | 0.019\|0.019 |
| HEPTACHLOR EPOXIDE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| GAMMA-CHLORDANE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ALPHA-CHLORDANE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ENDOSULFAN I | ND\|(ND) | 0.094 | 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) | 0.94 | 0.19\|0.19 |
| TOXAPHENE | ND\|(ND) | 1.9 | 0.94\|0.94 |

| SURROGATE PARAMETERS | % RECOVERY | QC LIMIT |
|---|---|---|
| TETRACHLORO-M-XYLENE | 100\|(96) | 30-140 |
| DECACHLOROBIPHENYL | 111\|(111) | 40-150 |

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

METHOD 3520C/8081A
PESTICIDES

| | | | |
|---|---|---|---|
| Client | : MWH LABORATORIES | Date Collected: | 12/29/08 |
| Project | : 262260 | Date Received: | 12/31/08 |
| Batch No. | : 08L333 | Date Extracted: | 01/05/09 11:30 |
| Sample ID: | BIG T WASH BTW122908 | Date Analyzed: | 01/17/09 00:19 |
| Lab Samp ID: | L333-04 | Dilution Factor: | 0.94 |
| Lab File ID: | WA15122A | Matrix | : WATER |
| Ext Btch ID: | CPA002W | % Moisture | : NA |
| Calib. Ref.: | WA15111A | Instrument ID | : GCT016 |

| PARAMETERS | RESULTS (ug/L) | RL (ug/L) | MDL (ug/L) |
|---|---|---|---|
| ALPHA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| GAMMA-BHC (LINDANE) | ND\|(ND) | 0.094 | 0.019\|0.019 |
| BETA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| HEPTACHLOR | ND\|(ND) | 0.094 | 0.019\|0.019 |
| DELTA-BHC | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ALDRIN | ND\|(ND) | 0.094 | 0.019\|0.019 |
| HEPTACHLOR EPOXIDE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| GAMMA-CHLORDANE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ALPHA-CHLORDANE | ND\|(ND) | 0.094 | 0.019\|0.019 |
| ENDOSULFAN I | ND\|(ND) | 0.094 | 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) | 0.94 | 0.19\|0.19 |
| TOXAPHENE | ND\|(ND) | 1.9 | 0.94\|0.94 |

| SURROGATE PARAMETERS | % RECOVERY | QC LIMIT |
|---|---|---|
| TETRACHLORO-M-XYLENE | 101\|(95) | 30-140 |
| DECACHLOROBIPHENYL | 110\|(110) | 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 3520C/8081A
PESTICIDES

| | | | |
|---|---|---|---|
| Client | : MWH LABORATORIES | Date Collected: | NA |
| Project | : 262260 | Date Received: | 01/05/09 |
| Batch No. | : 08L333 | Date Extracted: | 01/05/09 11:30 |
| Sample ID: | MBLK1W | Date Analyzed: | 01/16/09 22:36 |
| Lab Samp ID: | CPA002WB | Dilution Factor: | 1 |
| Lab File ID: | WA15116A | Matrix | : WATER |
| Ext Btch ID: | CPA002W | % Moisture | : NA |
| Calib. Ref.: | WA15111A | Instrument ID | : GCT016 |

| 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 | % RECOVERY | QC LIMIT |
|---|---|---|
| TETRACHLORO-M-XYLENE | 95\|(96) | 30-130 |
| DECACHLOROBIPHENYL | 109\|(109) | 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: 262260
BATCH NO.: 08L333
METHOD: METHOD 3520C/8081A

| | | | | | |
|---|---|---|---|---|---|
| MATRIX: | WATER | | | % MOISTURE: | NA |
| DILUTION FACTOR: | 1 | 1 | 1 | | |
| SAMPLE ID: | MBLK1W | | | | |
| LAB SAMP ID: | CPA002WB | CPA002WL | CPA002WC | | |
| LAB FILE ID: | WA15116A | WA15117A | WA15118A | | |
| DATE EXTRACTED: | 01/05/0911:30 | 01/05/0911:30 | 01/05/0911:30 | DATE COLLECTED: | NA |
| DATE ANALYZED: | 01/16/0922:36 | 01/16/0922:53 | 01/16/0923:11 | DATE RECEIVED: | 01/05/09 |
| PREP. BATCH: | CPA002W | CPA002W | CPA002W | | |
| CALIB. REF: | WA15111A | WA15111A | WA15111A | | |

ACCESSION:

| PARAMETER | BLNK RSLT (ug/L) | SPIKE AMT (ug/L) | BS RSLT (ug/L) | BS % REC | SPIKE AMT (ug/L) | BSD RSLT (ug/L) | BSD % REC | RPD ( % ) | QC LIMIT ( % ) | MAX RPD ( % ) |
|---|---|---|---|---|---|---|---|---|---|---|
| gamma-BHC (Lindane) | ND\|(ND) | 0.400 | 0.399\|(0.394) | 100\|(98) | 0.400 | 0.408\|(0.408) | 102\|(102) | 2\|(3) | 40-130 | 30 |
| Heptachlor | ND\|(ND) | 0.400 | 0.373\|(0.409) | 93\|(102) | 0.400 | 0.367\|(0.407) | 92\|(102) | 2\|(0) | 30-140 | 30 |
| Aldrin | ND\|(ND) | 0.400 | 0.396\|(0.386) | 99\|(96) | 0.400 | 0.393\|(0.396) | 98\|(99) | 1\|(3) | 40-130 | 30 |
| Dieldrin | ND\|(ND) | 0.400 | 0.394\|(0.401) | 98\|(100) | 0.400 | 0.397\|(0.403) | 99\|(101) | 1\|(0) | 60-140 | 30 |
| Endrin | ND\|(ND) | 0.400 | 0.386\|(0.399) | 96\|(100) | 0.400 | 0.393\|(0.400) | 98\|(100) | 2\|(0) | 50-140 | 30 |
| 4,4'-DDT | ND\|(ND) | 0.400 | 0.427\|(0.405) | 107\|(101) | 0.400 | 0.427\|(0.403) | 107\|(101) | 0\|(0) | 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 | 0.400 | 0.406\|(0.353) | 102\|(88) | 0.400 | 0.417\|(0.404) | 104\|(101) | 30-130 |
| Decachlorobiphenyl | 0.400 | 0.430\|(0.433) | 108\|(108) | 0.400 | 0.436\|(0.437) | 109\|(109) | 40-150 |

## APPENDIX M

# Restoration of 11-Acre Oak/Sycamore Woodland Quarterly Reports

July 24, 2007
(2007-110)

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

**SUBJECT: First Quarter Status Report on the Weeding of the Oak/Sycamore Upland Area Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the upland weeding efforts in the oak/sycamore area efforts for summer and fall 2007. The weeding efforts began on July 5, 2007 with a site visit by ECORP biologists Mari (Schroeder) Quillman and Brad Burkhart and two representatives from Natures Image (Dan Parker and Mitchell Farr).

The entire upland oak/sycamore area was walked and future weeding efforts were discussed. Upcoming efforts include weed whipping the areas around large patches of flat-top buckwheat (*Eriogonum fasciculatum*) to remove annual weeds in preparation for possible seeding in the fall. It was decided that no weeding would be necessary in the oak/elderberry areas along the fence unless exotic plants and/or ornamental trees become established. The possible removal of two non-native trees along the entry road in this area (atlas cedar [*Cedrus atlantica*] and Aleppo pine [*Pinus halepensis*]) was discussed although no actions will be taken without permission from the client.

To date, no weeding removal efforts have begun.

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

SIGNED:________________________ DATE:__________________

Kristen Mobraaten
Biologist

September 24, 2007
(2007-110)

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

**SUBJECT: Fall 2007 Status Report on the Upland Weeding in the Oak/Sycamore Area for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

In an ongoing effort to enhance and protect the existing habitat at the Big Tujunga Wash Mitigation Bank for native wildlife species, ECORP Consulting Inc. has commenced the upland weeding efforts in the oak/sycamore area efforts for summer and fall 2007. The weeding efforts began on July 5, 2007 with a site visit by ECORP biologists Mari (Schroeder) Quillman and Brad Burkhart and two representatives from Natures Image (Dan Parker and Mitchell Farr).

The entire upland oak/sycamore area was walked and future weeding efforts were discussed. Upcoming efforts include weed whipping the areas around large patches of flat-top buckwheat (*Eriogonum fasciculatum*) where annual weeds have been established in order to prepare for possible seeding in the fall. It was decided that no weeding would be necessary in the oak/elderberry areas along the fence unless exotic plants and/or ornamental trees have become established. The removal of two non-native trees along the entry road in this area (atlas cedar [*Cedrus atlantica*] and Aleppo pine [*Pinus halepensis*]) were discussed but no action will be taken without permission from the client.

To date, no weeding removal efforts have begun.

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

SIGNED:________________________ DATE:__________________

Todd Chapman
Senior Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 30, 2007
(2007-110)

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

**SUBJECT: Winter 2007 Status Report on the Upland Weeding in the Oak/Sycamore Area for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the upland weed removal activities at the Big Tujunga Wash Mitigation Bank. Weed removal activities were commenced by ECORP Consulting, Inc. in July 2007. No weed removal efforts have been begun by Natures Image, however the site was visited by ECORP biologist Mari (Schroeder) Quillman on September 27, 2007. Ms. Quillman surveyed the oak/sycamore upland area for additional areas to focus weed removal efforts on in the future. The first weed removal effort by Natures Image is tentatively scheduled for January or February of 2008.

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
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

March 26, 2008
(2007-110)

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

**SUBJECT: Third Quarter Status Report on the Weeding of the Oak/Sycamore Upland Area Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the Oak/Sycamore upland weed removal activities at the Big Tujunga Wash Mitigation Bank. ECORP biologists Brad Burkhart and Kristen Mobraaten met with two representatives from Natures Image on January 29, 2008 to discuss weeding in the oak/sycamore area of the Big Tujunga site. Several areas throughout the upland portion of the site were inundated by castor bean, mustard, tree tobacco, pepper trees, etc. Natures Image made note of these locations and planned on conducting eradication efforts in the future. Natures Image was also instructed to spray weed killer (Round-Up) on the weeds in the upland area of the site.

The Big Tujunga site was visited on February 22, 2008 by ECORP biologists Kristen Mobraaten and Todd Chapman following the first round of weeding efforts in the Oak/Sycamore upland area performed by Natures Image. Natures Image visited the site on five occasions during the month of February (2/13, 2/19, 2/20, 2/25, and 2/26). The crew focused their efforts mostly on the Oak/Sycamore upland area near the Cottonwood gate, spraying Round-Up weed remover, and using hand tools to remove weeds from around the bases of native shrubs and trees, and removing other weeds throughout the coastal sage scrub area.

ECORP biologists walked throughout the areas Nature's Image performed weed spraying and removal activities. The use of Round-Up on exotic plant and weed species was noted in several areas of the upland region. Due to the recent rains, however, it seemed that much of the green color marking where the Round-Up was sprayed had washed off the plants. Remnants of it were still apparent on many plants such as mustard (*Brassica* sp.), milkthistle (*Silybum marianum*), redstem filaree (*Erodium cicutarium*), and white horehound (*Marrubium vulgare*). Weeds had been successfully cleared from around the base of many native oaks (*Quercus* sp.), laurel sumac

(*Malosma laurina*), ceanothus (*Ceanothus* sp.), and toyon (*Heteromeles arbutifolia*). In addition, the weeds east of the entrance road from Cottonwood gate had been cut and trimmed throughout the area.

The site was visited for a third time during this quarter by ECORP biologists Kristen Mobraaten and Brian Zitt on March 12, 2008. The Oak/Sycamore upland area was surveyed first to observe the weed removal activities performed by Natures Image. Both of the Brazillian pepper trees (*Schinus terebinthifolius*) have been cut down and removed from the site, and the weedy plant species sprayed with Round-Up in February all appear to be dead. The seed pods of all castor bean (*Ricinus communis*) located on the western portion of the upland area had all been cut off and removed from the site. Areas cleared around the bases of oaks (*Quercus* sp.), laurel sumac (*Malosma laurina*), toyon (*Hetermeles arbutifolia*), and other native upland plant species near the Cottonwood gate were still clear. Due to the recent rains and reduced competition from weedy plants, lots of new growth was observed on the native shrubs and trees. Areas of mustard (*Brassica* sp.), arundo (*Arundo donax*), and other exotic species are still located on the slopes leading down into the riparian areas. These areas will not be addressed until pesticide use is approved by California Department of Fish and Game. GPS coordinates of the weedy plant locations were recorded and placed in a list for future reference.

| GPS location # | Easting | Northing | Issue |
|---|---|---|---|
| 1 | 11S 0376411 | 3792495 | Castor bean plant nearby |
| 2 | 11S 0376398 | 3792504 | Castor bean plant |
| 3 | 11S 0376574 | 3792540 | Large castor bean plant |
| 4 | 11S 0376543 | 3792454 | Eupatory and arundo |
| 5 | 11S 0376513 | 3792413 | Castor bean plant |
| 6 | 11S 0376142 | 3792661 | Castor bean plant, eupatory |
| 7 | 11S 0375031 | 3792536 | Eupatory and arundo |

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

SIGNED:__________________________ DATE:___________________

Kristen Mobraaten
Biologist

June 30, 2008
(2007-110/C/C3)

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

**SUBJECT: YEAR 1 Task C3 - Fourth Quarter Status Report on the Weeding of the Oak/Sycamore Upland Area Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the Oak/Sycamore upland weed removal activities at the Big Tujunga Wash Mitigation Bank. The Big Tujunga site was visited on April 9, 2008 by ECORP biologists Kristen Mobraaten and Todd Chapman along with Terry Kaiser, a local resident involved in site maintenance, Pat Wood, and Valerie De La Cruz from Los Angeles County Department of Public Works. The purpose of the meeting on site was to look at problem areas along the trails in the riparian area, cut down the kiosk in the upland area near the Cottonwood gate, and to discuss several other issues pertaining to site maintenance and security.

Natures Image visited the site on April 15 and 24, 2008, performing weeding activities in the oak/sycamore upland area near the Cottonwood gate. The crew sprayed Round-Up weed remover and used hand tools to remove weeds from around the bases of native shrubs and trees, and removed other weeds throughout the coastal sage scrub area.

ECORP Consulting did not visit the site and weed removal activities were not conducted in the oak/sycamore upland area by Natures Image during May 2008.

ECORP biologists Kristen Mobraaten and Brian Zitt conducted a site visit on June 11, 2008 to survey the result of weeding activities performed by Natures Image in April. The biologists surveyed the condition of the native shrubs and trees in which the weeds were cleared out from under. The native trees and shrubs appeared to be thriving without the added competition of weed presence. Site photographs were taken to document site conditions.

Natures Image did not conduct weed removal activities at the Big Tujunga site during June 2008.

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

SIGNED:____________________________ DATE:____________________

Kristen Mobraaten
Biologist

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

September 30, 2008
(2007-110/C/C3)

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

**SUBJECT: YEAR 2 Task C3 - First Quarter (July – September 2008) Status Report on the Weeding of the Oak/Sycamore Upland Area Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the Oak/Sycamore upland weed removal activities at the Big Tujunga Wash Mitigation Bank. ECORP biologists Mari (Schroeder) Quillman and Kristen Mobraaten visited the site on August 7, 2008 and met with local resident Andrea Gutman to discuss areas that need maintenance attention. Ms. Quillman and Ms. Mobraaten surveyed the area behind the Gibson Ranch property for planning a revegetation plan. A second site visit was conducted by ECORP biologists Kristen Mobraaten and Brian Zitt on August 15, 2008 to survey additional areas within the Big Tujunga site. During both site visits, he biologists surveyed the condition of the native shrubs and trees in which the weeds were cleared out from under. The native trees and shrubs appeared to be thriving without the added competition of weed presence. Site photographs were taken to document site conditions.

Natures Image did not perform any weeding in the oak/sycamore upland area during this reporting period. In addition, ECORP Consulting did not visit the site during July or September 2008.

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

SIGNED:________________________ DATE:__________________

Kristen Mobraaten
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

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 31, 2008
(2007-110/C/C3)

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

**SUBJECT: YEAR 2 Task C3 – Second Quarter (October – December 2008) Status Report on the Weeding of the Oak/Sycamore Upland Area Big Tujunga Wash Mitigation Bank, Los Angeles County, California**

Dear Ms. Kwan;

This letter serves as an update to the Oak/Sycamore upland weed removal activities at the Big Tujunga Wash Mitigation Bank. ECORP biologists Kristen Mobraaten and Brian Zitt visited the site on December 12, 2008 and met with local residents Andrea and James Gutman to discuss areas that need maintenance attention. The ECORP biologists surveyed the condition of the native shrubs and trees in which the weeds were cleared out from under. Since little rainfall has occurred during this quarter, no weed growth has been observed. Site photographs were taken to document site conditions.

Natures Image visited the site on November 12, 2008 to perform weeding activities in the oak/sycamore upland area near the Cottonwood gate. The crew sprayed Round-Up weed remover and used hand tools to remove weeds from around the bases of native shrubs and trees, and removed other weeds throughout the coastal sage scrub area.

ECORP Consulting did not visit the site during October or November 2008.

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

SIGNED:____________________ DATE:_______________

Kristen Mobraaten
Biologist

# APPENDIX N

## Streambed Alteration Agreement and Application

# Expired Streambed Alteration Agreement

# Department of Fish and Game

South Coast Region - Region 5
4949 Viewridge Avenue
San Diego, CA 92123
Tel.# (858) 636-3160
Fax# (858) 467-4299

## Facsimile Transmittal

To: Jason Pereira

From: Mari

Date: 10/30/00

No. of Pages including cover sheet: 11

Comments: Streambed agreement for Big Tijunga Mitigation Bank.

| Post-it® Fax Note 7671 | Date 10/31/00 | # of pages ▸ 11 |
|---|---|---|
| To Mari Schroeder | From Jason Pereira | |
| Co./Dept. Chambers Group | Co. LACDPW | |
| Phone # 949-261-5414 | Phone # 626-458-6138 | |
| Fax # 949-261-8150 | Fax # 626-979-5436 | |

Expired SAA

STATE OF CALIFORNIA-THE RESOURCES AGENCY
**DEPARTMENT OF FISH AND GAME**
South Coast Region
4949 Viewridge Avenue
San Diego, California 92123
(858) 467-4201
FAX (858) 467-4235

GRAY DAVIS, Governor

October 30, 2000

Los Angeles County Department of Public Works
Water Resources Division
Attn: Pat Wood
900 South Fremont Avenue
Alhambra, CA 91803-1331

Dear Ms. Wood:

Enclosed is Streambed Alteration Agreement #5-247-00 that authorizes work on the Big Tujunga Mitigation Bank project impacting Big Tujunga Wash in Los Angeles County. This action is authorized under Section 1600 of the Fish and Game Code and has been approved by the California Department of Fish and Game. Pursuant to the requirements of the California Environmental Quality Act (CEQA), the Department filed a Notice of Exemption (NOE) on the project on 10/30/2000. Under CEQA regulations, the project has a 35-day statute of limitations on court challenges of the Department's approval under CEQA.

The Department believes that the project fully meets the requirements of the Fish and Game Code and CEQA. However, if court challenges on the NOE are received during the 35-day period, then an additional review or even modification of the project may be required. If no comments are received during the 35-day period, then any subsequent comments need not be responded to. This information is provided to you so that if you choose to undertake the project prior to the close of the 35-day period, you do so with the knowledge that additional actions may be required based on the results of any court challenges that are filed during that period.

Please contact Betty Courtney at (661) 263-8306 if you have any questions regarding the Streambed Alteration Agreement.

Sincerely,

C.F. Raysbrook

C.F. Raysbrook
Regional Manager

Enclosure

cc: Betty Courtney

CALIFORNIA DEPARTMENT OF FISH AND GAME
4949 Viewridge Ave.
San Diego, California 92123

Notification No. 5-247-00 revision 2
Page 1 of 9

October 26, 2000

## 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 Ms. Pat Wood of Water Resources Division Los Angeles County Department of Public Works, 900 South Fremont Avenue, Alhambra, CA 91803-1331 (626) 458-6131, State of California, hereinafter called the **Operator**, is as follows:

WHEREAS, pursuant to **Section** 1601 of California Fish and Game Code, the Operator, on the 5th day of September, 2000, 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 the streambed(s) of, the following water(s): Big Tujunga Wash, **Los Angeles** County, California, Section __ Township 2N, Range 14W, USGS Sunland Quadrangle, County Assessor's Parcel Number: MR29-51-52; MB16-166-167; MB562-44; MB198-8-10.

WHEREAS, the Department (represented by Betty J. Courtney) through a site visit on August 31, 2000, has determined that such construction may substantially adversely affect those existing fish and wildlife resources within the Big Tujunga Wash, specifically identified as follows: ********** California Red-legged Frog, Southwestern Pond Turtle, San Diego Horned Lizard, California gnatcatcher, Southwestern Flycatcher, Least Bell's Vireo, Nevin's Barberry, Plummer's Mariposa Lily, Mt. Gleason Indian Paintbrush, San Fernando Valley Spineflower, Davidson' Bush Mallow, Orcutt's linanthus.

THEREFORE, the Department hereby proposes measures to protect fish and wildlife resources during the Operator's work. The Operator hereby agrees to accept the following measures/conditions as part of the proposed work.

If the Operator'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, 5937, and 5948, may result in prosecution.

Nothing in this Agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator 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 construction portion **terminates on 12/31/2001**. This Agreement shall remain in effect until to satisfy the terms/conditions of this Agreement. 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.

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

1. 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.

2. The Operator proposes to alter the streambed by removing invasive species (Arundo donax, tamarisk, eucalyptus, pepper trees, caster bean, umbrella sedge, mustards and tree tobacco, water hyacinth, etc.) from the Big Tujunga Wash Mitigation Bank. The proposed work also includes temporary fencing, Riparian Habitat Enhancement and Enhancement Planting. The proposed work also includes the Best Management Practices and Mitigation and Monitoring conditions stated within the Big Tujunga Wash Mitigation Bank Final Master Mitigation Plan (MMP).

3. The agreed work includes activities associated with No. 2 above. The project area is located in the **Big Tujunga Mitigation Bank in the Sunland area of the City of Los Angeles** in **Los Angeles** County. Specific work areas and mitigation measures are described on/in the plans and documents submitted by the Operator, including the Final Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank, and shall be implemented as proposed unless directed differently by this agreement. Contact **Ms. Pat Wood** at Phone:**(626)'458-6131** for additional information.

4. **COPIES OF THIS AGREEMENT** AND ALL REQUIRED PERMITS AND SUPPORTING DOCUMENTS, **PROVIDED WITH NOTIFICATION OR REQUIRED BY THIS AGREEMENT SHALL BE READILY AVAILABLE AT THE WORK SITE(S) AT ALL TIMES DURING PERIODS OF WORK.**

5. The Operator may request an extension of this agreement, but must do so prior to its termination. Extensions may be granted for up to 12 months from the date of termination of the agreement and are subject to Departmental approval. The extension request and fees shall be submitted to the Department's Region 5 Office at the above address. If the Operator fails to request the extension prior to the agreement's termination, then the Operator shall submit a new notification with fees and required information to the Department. Any activities conducted under an expired agreement are a violation of Fish and Game Code Section 1600 et. seq. The Operator may request a maximum of 5 extension(s) of this agreement.

<< WORK AREAS AND VEGETATION REMOVAL>>

6. The Operator shall not permanently adversely impact the stream/river.

7. Disturbance or removal of vegetation shall not exceed the limits approved by the Department at the August 31, 2000 meeting.

8. The work area shall be identified to all workers, as represented in plans. Native vegetation shall not be removed or intentionally damaged within or beyond these limits.

9. No living native vegetation shall be removed from the channel, bed, or banks of the stream, except as otherwise provided for in this agreement.

10. The Operator shall not remove vegetation from the project site from March 1 to September 1 to avoid impacts to nesting birds, or The Operator shall conduct a nesting bird survey no more than 5 days prior to activities, If nest sites are observed, the nest site shall be fenced a minimum of 200 feet (500 feet for raptors) in all directions, and this area shall not be disturbed until the nest becomes inactive.

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

11. Vegetation removed from the stream shall not be stockpiled in the stream bed or on its bank. The sites selected on which to push this material out of the stream should be selected in compliance with the other provisions in this Agreement.

<<EQUIPMENT AND ACCESS>>

12. 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. If crossings are required, they shall be in a designated crossing area and limited to 2 crossing per day.

13. Staging/storage areas for equipment and materials shall be located outside of the stream/lake.

14. Access to the worksite shall be via existing roads and access ramps and shall be placed where the least vegetation removal or grading is necessary.

<<FILL AND SPOIL>>

15. Spoil sites shall not be located within a stream/lake, where spoil shall be washed back into a stream/lake, or where it will cover aquatic or riparian vegetation.

16. Fill length, width, and height dimensions shall not exceed those of the original installation or the original naturally occurring topography, contour, and elevation. Fill shall be limited to the minimal amount necessary to accomplish the agreed activities, as specified in the application as 10 cubic yards. Except as otherwise specified in this Agreement, fill construction materials other than on-site alluvium, shall consist of clean silt-free gravel or river rock.

<<STRUCTURES>>

17. Structures and associated materials not designed to withstand high seasonal flows shall be removed to areas above the high water mark before such flows occur.

18. Any materials placed in seasonally dry portions of the 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.

<<POLLUTION, SEDIMENTATION, AND LITTER>>

19. Preparation shall be made so that runoff from steep, erodible surfaces will be diverted into stable areas with little erosion potential. Frequent water checks shall be placed on dirt roads, cat tracks, or other work trails to control erosion.

20. Water containing mud, silt or other pollutants from aggregate washing or other activities shall not be allowed to enter a lake or flowing stream or placed in locations that may be subjected to high storm flows.

21. **Raw cement/concrete or washings thereof, asphalt**, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream/lake, by Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately.

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

22. The Operator 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 operator to ensure compliance.

23. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction, or associated activity of whatever nature shall be allowed to enter into or placed where it may be washed by rainfall or runoff into, waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream or lake.

24. 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.

25. Any equipment or vehicles driven and/or operated within or adjacent to the stream/lake shall be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.

26. Stationary equipment such as motors, pumps, generators and welders, located within or adjacent to the stream/lake shall be positioned over drips pans.

27. Equipment shall not be operated in wetted areas (including but not limited to ponded, flowing or wetland areas) without the prior written approval of the Department. If crossings are required, they shall be in a designated crossing area and limited to 2 crossing per day.

28. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. All precautionary measures shall be approved by the Department and may include the negotiation of additional Agreement provisions. Debris and dust from construction activities shall be prevented from entering the water or stream bottom.

29. This agreement does not authorize the construction of any temporary or permanent dam, structure, flow restriction or fill.

30. 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 Operator's ability to minimize turbidity/siltation shall be the subject of pre-construction planning and feature implementation.

31. Upon the Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation, shall be halted until effective Department approved control devices are installed, or abatement procedures are initiated.

32. If a stream's low flow channel, bed, or banks/lake bed or banks have been altered, these shall be returned as nearly as possible to their original configuration and width, without creating future erosion problems.

33. 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.

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

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

35. Temporary fills shall be constructed of nonerodible materials and shall be removed immediately upon work completion, and shall be approved by the Department prior to implementation.

<<REMOVAL OF NON-NATIVE VEGETATION>>

36. The Operator shall remove non-native vegetation per the MMP as sited below.

**3.3.2.1 Exotic Plant Species Eradication Program**

The enhancement includes the removal of non-native plant species from Haines Canyon Creek and the Tujunga Ponds. These invasive weeds compete with the native vegetation for light, water and nutrients, and decrease the ecological value of the area. Native wildlife avoid using exotic vegetation for foraging, nesting, and cover. Removal of giant reed and other weed species will reduce competition pressure on the native southern arroyo willow plant community and allow for rapid recovery of the native habitat. All non-native weed species within the creek will be eradicated, with an emphasis on giant reed, water hyacinth (*Eichhornia crassipes*), and tamarisk (*Tamarix ramosissima*). Other weed species to be removed include eucalyptus (*Eucalyptus* sp.), pepper trees (*Schinus molle* and *S. terebinthifolia*), castor bean (*Ricinus communis*), umbrella sedge (*Cyperus involucratus*), mustards (*Brassica* sp.), and tree tobacco (*Nicotiana glauca*), among others.

The enhancement plan also includes the removal of exotic plant species from rehabilitation areas and along side trails. Many non-native plants are introduced to the site by equestrians (seeds contained in horse manure) and through other human-related activities. Equestrian trails shall be monitored periodically for weeds and the weeds appropriately controlled utilizing general eradication methods.

Giant Reed Eradication Technique

Herbicide treatment to kill the root mass followed by manual removal of dead stems is the most effective means of giant reed eradication without damage to surrounding riparian vegetation (Bell 1997).

A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. The following method of eradication is recommended:

1. A 2 to 5 percent solution of Rodeo (a glyphosate systemic herbicide approved by the Environmental Protection Agency for use in aquatic systems) shall be applied to giant reed foliage at a rate of 0.5 to 1 liter per hectare. The initial treatment shall be applied during the post-flowering and pre-dormancy period (mid-August to early November) when the plants are actively translocating storage nutrients to the rootmass in preparation for winter dormancy. The herbicide solution shall be treated with dye non toxic to wildlife to facilitate identification of treated versus untreated clumps. The herbicide shall be applied using hand-held spray containers or if a vehicle is used, it shall be located adjacent to the site, and shall only use existing access areas that are devoid of vegetation.

2. Treated leaves and stems may be cut 2 to 3 weeks after the initial foliar treatment. Removal shall be done by hand tools only; no vehicles shall be operated within the stream. Treated vegetative waste will be chipped in situ, and the waste biomass removed from the area and disposed of at an approved waste disposal site.

3. Follow up foliar application shall be applied to any resprouting stems in the third and seventh week after the initial treatment. Quarterly inspections and reapplication of herbicide, if necessary, shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30).

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Where large sections of giant reed are removed, the surrounding native trees will be evaluated for increased vulnerability to wind fall due to the openings in the canopy. The Restoration Specialist and Landscape Contractor will conduct the evaluation. Existing native trees at the edge of the openings will be pruned as necessary to decrease the potential for wind damage. Pruned materials will be used as cutting stock for planting in the riparian habitat.

Tamarisk Eradication Technique

Tamarisk eradication shall begin after the spring and summer nesting season for riparian birds (approximately August 30). All tamarisk within the site boundaries shall be treated. Rodeo ®, a glyphosate herbicide approved for use in aquatic systems, must be used. A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. The recommended eradication technique is as follows (CalEPPC 1997):

1. Plants shall be cut to within 6 inches of the ground using hand tools. Cut material must be removed from the site the day it is cut and disposed of at an offsite location. Under no circumstances is cut material to be allowed to remain onsite.

2. Undiluted herbicide (Rodeo) shall be applied to the entire stump surface immediately after cutting. The entire circumference of the stump must be covered with herbicide. Treated plants shall be inspected in the third and seventh week following the completion of the initial eradication. If any treated stumps show evidence of new growth, or if any new tamarisk plants are found, subsequent treatment shall be performed as described above. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30). Quarterly inspections and control shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation.

Water Hyacinth Eradication Technique

Water hyacinth is a free-floating plant, which grows up to three feet in height. It grows an erect thick stalk with a single spike of flowers at the top. It is a highly invasive non-native weed. Water hyacinth has a prolific growth rate; its populations can double in a little as 12 days. An infestation of water hyacinth forms a thick mat over much of the slow moving water of the Tujunga Ponds. These mats prevent sunlight and oxygen from reaching the water, exclude native aquatic plant species, and reduce fisheries and biological diversity.

The presence of water hyacinth in the Tujunga Ponds creates a difficult dilemma as far as control is concerned. The easiest way to eliminate the hyacinth is to drain the ponds, remove the hyacinth, and replace the ponds with a free-flowing shallow stream (See Section 9 – Optional Enhancement Measures).

If the ponds remain as they are, the maintenance of the ponds will undoubtedly include continuous removal of water hyacinth because infestations of this plant are so difficult to control. This will undoubtedly be the most long-term, labor intensive, and costly exotic plant eradication program in the MMP. The initial removal of the existing hyacinth will require a large labor effort primarily because of the large amount of plant material that will have to be removed. Disposal of water hyacinth must be at an approved dumping location to ensure that this plant material does not infest any other areas.

Water hyacinth eradication shall begin after the spring and summer nesting season for riparian birds has passed (approximately August 30). A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. All water hyacinth within the site shall be removed or treated. The recommended eradication technique is as follows:

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

1) Free-floating plants, including roots, shall be removed from the water by hand. All plant fragments must be collected and removed from the site.

2) If water hyacinth is rooted in the mud, an application of undiluted herbicide (Rodeo ) per label guidelines shall be applied to the entire plant surface by spraying evenly over the plants. The applicator shall ensure that the herbicide spray does not drift onto neighboring native riparian plants.

3) Treated plants shall be inspected weekly for 7 weeks after initial application. Completely necrotic plants shall be removed by hand. If any treated plant shows evidence of new growth, or if any new water hyacinth plants are found, subsequent treatment shall be performed as described above.

4) Quarterly inspections shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30). To prevent oxygen depletion of the pond water due to decomposition of the treated plants, dead biomass shall be removed from the water during each inspection. Biomass shall be removed from the site and disposed of at an approved offsite location

General Eradication Methods

Exotic species to be removed will be determined by the Restoration Specialist. Wherever feasible, herbaceous species (non-native grasses, mustard) weed control will be removed using mechanical methods such as removal by hand or string trimmers. If effective weed control cannot be attained through mechanical means, a glyphosate herbicide (Rodeo ) will be applied by a certified herbicide applicator under the supervision of the Restoration Specialist. The methods for removal of large woody species (eucalyptus, pepper trees, castor bean, etc.) will follow the eradication techniques described for tamarisk.

<<PROTECTION FOR WILDLIFE AND AQUATIC SPECIES>>

37. All exotic fish, bull frogs and other invasion aquatic life shall be eliminated from the project site per requirements of the Final MMP.

38. The Operator shall have a qualified wildlife biologist survey the area to confirm the presence/absence of any Threatened or Endangered Species and other species of concern likely to be found in the area during the proposed operations. Survey techniques, timing, and schedule shall be approved by the Department. Survey results, analysis, and recommendations, along with the field notes shall be provided to the Department prior to commencing construction or within two weeks of completion of field surveys, whichever is earlier. Should any sensitive species be found during pre-project surveys and work must be done in identified areas during sensitive periods, the Operator shall develop and implement a plan for the protection of these species. This plan shall be approved by the department prior to commencing work. The results of any surveys and any protective measures instituted, as a part of the protection and monitoring plan, shall be provided to the Department within one week from implementation. The Operator shall be responsible for reporting all observations of threatened/endangered species or of species of special concern to the Department's Natural Diversity Data Base within ten (10) days of sighting.

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

39. Should any federal listed threatened/endangered (T/E) species occur in the area or will be impacted by the work proposed, the Department herein advises the Operator that a Federal Endangered Species Permit may be required to address possible impacts to any T/E species. Should such permit(s) be required, the Operator shall provide copies to the Department. All conditions contained therein, shall become a part of this agreement and shall be enforceable by the Department.

<<ADMINISTRATIVE-MISCELLANEOUS >>

40. 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 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.

41. If the Department determines that there has been a breach of a material term of this Agreement, and that it is one that either has or may substantially adversely affect any of the resources described in this Agreement, the Department will notify the Operator in writing and the Operator shall immediately cease the work that is the subject of the alleged breach. The Operator may appeal this order to cease work to the Regional Manager or his/her designee for the South Coast Region. Within two (2) working days of the cessation of work, the Regional Manager or designee will issue his/her decision on the appeal. The Regional Manager or designee can authorize the Operator to cure the breach. If the Operator fails to cure the breach within the time period specified by the Regional Manager or designee, the Department may terminate this Agreement. If the Department determines that the breach has not or may not substantially adversely affect the resources described in this Agreement, the Department will provide the Operator with immediate notice of the breach. This written notice will describe the specific nature of the alleged breach. The Operator will then have 15 days from the date of the notice to cure that breach. If the Department determines that a longer time is needed to cure the breach, a longer period may be specified. If the Operator fails to cure the breach within the specified period, the Department may terminate this Agreement.

42. The Operator shall provide a copy of this Agreement to all contractors, subcontractors, and the Operator's project supervisors. Copies of the Agreement shall be readily available at work sites at all times during periods of active work and must be presented to any Department personnel, or personnel from another agency upon demand.

43. The Operator 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 terms and conditions of this Agreement and /or determine the impacts of the project on wildlife and aquatic resources and /or their habitats.

44. The Operator **shall** notify the Department, **in writing, at least five (5) days prior to initiation of construction (project) activities (**) and at least five (5) days prior to completion of construction (project) activities.** Notification shall be sent to the Department at 4949 Viewridge Ave., San Diego, CA 92123, Attn: ES. SAA # 5-247-00 revision 2.

STREAMBED ALTERATION CONDITIONS FOR NOTIFICATION NUMBER: 5-247-00 revision 2

45. The Department reserves the right to suspend or cancel this Agreement, after giving notice to the Operator, if the Department determines that the Operator has breached any of the terms or conditions of this Agreement, or for other reasons, including but not limited to the following:

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

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

c. The project or project activities as described in the Notification/Agreement have changed;

d. The conditions affecting fish and wildlife resources change or the Department determines that project activities will result in a substantial adverse effect on the environment.

CONCURRENCE

This Agreement becomes effective on the Departments signature and the construction portion terminates on 12/31/2001. This Agreement shall remain in effect to satisfy the mitigation terms/conditions of this Agreement.

This agreement was prepared by Betty Courtney ,

(Operator's name)

[signature] 10/30/2000

(signature) (date)

Ass't Deputy Director

(title)

California Dept. of Fish and Game

[signature] 10/30/2000

Charles Raysbrook (date)
Regional Manager

SAA# 5-247-00 revision 2

# 2008 Streambed Alteration Agreement Application

| FOR DEPARTMENT USE ONLY | | | | |
|---|---|---|---|---|
| Date Received | Amount Received | Amount Due | Date Complete | Notification No. |
| | $ | $ | | |

STATE OF CALIFORNIA

DEPARTMENT OF FISH AND GAME

# NOTIFICATION OF LAKE OR STREAMBED ALTERATION

**Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.**

## 1. APPLICANT PROPOSING PROJECT

| | | | |
|---|---|---|---|
| Name | Christopher Stone | | |
| Business/Agency | Los Angeles County Department of Public Works Water Resources Division | | |
| Street Address | 900 S. Fremont Ave. | | |
| City, State, Zip | Alhambra, CA 91803 | | |
| Telephone | (626) 458-6102 | Fax | (626) 979-5436 |
| Email | cstone@dpw.lacounty.gov | | |

## 2. CONTACT PERSON (*Complete only if different from applicant*)

| | | | |
|---|---|---|---|
| Name | | | |
| Street Address | | | |
| City, State, Zip | | | |
| Telephone | | Fax | |
| Email | | | |

## 3. PROPERTY OWNER (*Complete only if different from applicant*)

| | | | |
|---|---|---|---|
| Name | | | |
| Street Address | | | |
| City, State, Zip | | | |
| Telephone | | Fax | |
| Email | | | |

## 4. PROJECT NAME AND AGREEMENT TERM

| | |
|---|---|
| A. Project Name | Big Tujunga Mitigation Bank |
| B. Agreement Term Requested | ☑ Regular (*5 years or less*)<br>☐ Long-term (*greater than 5 years*) |

| C. Project Term | | D. Seasonal Work Period | | E. Number of Work Days |
|---|---|---|---|---|
| Beginning (*year*) | Ending (*year*) | Start Date (*month/day*) | End Date (*month/day*) | |
| 2008 | 2013 | 08/01 | 03/31 | |

## 5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.

| | |
|---|---|
| A. | ☑ Standard *(Most construction projects, excluding the categories listed below)* |
| B. | ☐ Gravel/Sand/Rock Extraction (*Attachment A*) *Mine I.D. Number:* ______ |
| C. | ☐ Timber Harvesting (*Attachment B*) THP *Number:* ______ |
| D. | ☐ Water Diversion/Extraction/Impoundment (*Attachment C*) *SWRCB Number:* ______ |
| E. | ☐ Routine Maintenance (*Attachment D*) |
| F. | ☐ DFG Fisheries Restoration Grant Program (FRGP) *FRGP Contract Number:* ______ |
| G. | ☐ Master |
| H. | ☐ Master Timber Harvesting |

## 6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. ***Note: The Department may not process this notification until the correct fee has been received.***

| | A. Project | B. Project Cost | C. Project Fee |
|---|---|---|---|
| 1 | Big Tujunga Mitigation Bank | | $4,000.00 |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | | D. Base Fee *(if applicable)* | |
| | | **E. TOTAL FEE ENCLOSED** | $4,000.00 |

## 7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?

☑ Yes (*Provide the information below*) ☐ No

Applicant: LA County Dept of Public Works Notification Number: 5-247-00 Date: 10/30/00

B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?

☑ No ☐ Yes (*Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.*)

☐ *Continued on additional page(s)*

## 8. PROJECT LOCATION

A. Address or description of project location.

(*Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway*)

Big Tujunga Wash Mitigation Bank is located in Big Tujunga Wash, just downstream of the 210 Freeway overcrossing, near the City of Los Angeles' Sunland area in Los Angeles County's San Gernando Valley. The site is bordered on the north and east by I-210 and on the south by Wentworth Street. The west side of the site is contiguous with the downstream portion of Big Tujunga Wash. Please see attached location map and driving directions. See pages 1-4 of attachment.

☑ *Continued on additional page(s)*

| | |
|---|---|
| B. River, stream, or lake affected by the project. | Big Tujunga Wash and Haines Canyon Creek |
| C. What water body is the river, stream, or lake tributary to? | Hansen Dam Flood Control Basin |
| D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts? | ☐ Yes ☑ No ☐ Unknown |
| E. County | Los Angeles |

| F. USGS 7.5 Minute Quad Map Name | G. Township | H. Range | I. Section | J. ¼ Section |
|---|---|---|---|---|
| Sunland | 2 North | 14 West | | |
| | | | | |
| | | | | |
| | | | | |

☐ *Continued on additional page(s)*

K. Meridian (*check one*) ☐ Humboldt ☐ Mt. Diablo ☑ San Bernardino

L. Assessor's Parcel Number(s)

County Assessors Parcel Numbers: MR 29-51-52, MB 16-166-167, MB 662-44, MB 198-8-10

☐ *Continued on additional page(s)*

M. Coordinates (*If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes)*

| | | | |
|---|---|---|---|
| Latitude/Longitude | *Latitude:* 34.16'06.80"N | *Longitude:* 118.20'45.53'W | |
| | ☑ Degrees/Minutes/Seconds | ☐ Decimal Degrees | ☐ Decimal Minutes |
| UTM | *Easting:* | *Northing:* | ☐ Zone 10 ☐ Zone 11 |
| Datum used for Latitude/Longitude or UTM | ☑ NAD 27 | ☐ NAD 83 or WGS 84 | |

**9. PROJECT CATEGORY AND WORK TYPE** *(Check each box that applies)*

| PROJECT CATEGORY | NEW CONSTRUCTION | REPLACE EXISTING STRUCTURE | REPAIR/MAINTAIN EXISTING STRUCTURE |
|---|---|---|---|
| Bank stabilization – bioengineering/recontouring | ☐ | ☐ | ☐ |
| Bank stabilization – rip-rap/retaining wall/gabion | ☐ | ☐ | ☐ |
| Boat dock/pier | ☐ | ☐ | ☐ |
| Boat ramp | ☐ | ☐ | ☐ |
| Bridge | ☐ | ☐ | ☐ |
| Channel clearing/vegetation management | ☐ | ☐ | ☐ |
| Culvert | ☐ | ☐ | ☐ |
| Debris basin | ☐ | ☐ | ☐ |
| Dam | ☐ | ☐ | ☐ |
| Diversion structure – weir or pump intake | ☐ | ☐ | ☐ |
| Filling of wetland, river, stream, or lake | ☐ | ☐ | ☐ |
| Geotechnical survey | ☐ | ☐ | ☐ |
| Habitat enhancement – revegetation/mitigation | ☐ | ☐ | ☑ |
| Levee | ☐ | ☐ | ☐ |
| Low water crossing | ☐ | ☐ | ☐ |
| Road/trail | ☐ | ☐ | ☐ |
| Sediment removal – pond, stream, or marina | ☐ | ☐ | ☐ |
| Storm drain outfall structure | ☐ | ☐ | ☐ |
| Temporary stream crossing | ☐ | ☐ | ☐ |
| Utility crossing : Horizontal Directional Drilling | ☐ | ☐ | ☐ |
| Jack/bore | ☐ | ☐ | ☐ |
| Open trench | ☐ | ☐ | ☐ |
| **Other** *(specify)*: | ☐ | ☐ | ☐ |

**10. PROJECT DESCRIPTION**

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

The project consists of the removal of invasive species (Giant reed, eucalyptus, pepper trees, caster bean, umbrella sedge, mustards, tree tobacco, water hyacinth, etc.) from the Big Tujunga Wash Mitigation Bank. The proposed work also includes temporary fencing and riparian habitat enhancement planting. Also included are best management practices (BMP's) and Mitigation and Monitoring conditions stated within the Big Tujunga Wash Final Master Mitigation and Monitoring Plan.

Herbicides for invasive species included the following:

In or near water:

Aquamaster (active ingredient glypsophosphate)

For use in floodplain areas for exotic tree control near but not in water:

Pathfinder II (active ingredient ticlopyr)
Garlon (active ingredient ticlopyr)
Tahoe (active ingredient ticlopyr)

Please see attached supplemental information ( Pages 5-16 of Attachment)

☑ *Continued on additional page(s)*

B. Specify the equipment and machinery that will be used to complete the project.

Primary tools will be hand tools and weed whips. Construction equipment shall be restricted to designated areas and trails identified by the Restoration Specialist. Oversize equipment (greater than 10 feet in height or 8 feet wide) shall not be allowed on the trails. Only low dispersal weight vehicles (less than 20 psi) shall be operated within the riparian areas. Work will be in the wetted portion of the wash and ponds, as the removal of exotics requires that work take place there.

☐ *Continued on additional page(s)*

| | |
|---|---|
| C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B). | ☑ Yes ☐ No (*Skip to box 11*) |
| D. Will the proposed project require work in the wetted portion of the channel? | ☑ Yes (*Enclose a plan to divert water around work site*)<br>☐ No |

## 11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

Impacts will occur during the removal of invasive species, and during revegetation. Please see attached information (Pages 16- 26 of Attachment.)

☑ *Continued on additional page(s)*

B. Will the project affect any vegetation? ☑ Yes (*Complete the tables below*) ☐ No

| Vegetation Type | Temporary Impact | Permanent Impact |
|---|---|---|
| Invasive species | Linear feet: approximately 5000'<br>Total area: 207 acres | Linear feet: ____<br>Total area: ____ |
| | Linear feet: ____<br>Total area: ____ | Linear feet: ____<br>Total area: ____ |

| Tree Species | Number of Trees to be Removed | Trunk Diameter (range) |
|---|---|---|
| | | |
| | | |
| | | |

☐ *Continued on additional page(s)*

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

☑ Yes (*List each species and/or describe the habitat below*) ☐ No ☐ Unknown

Please see attached information pages 26-29.

☑ *Continued on additional page(s)*

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

Please see Attachment pages 26-29.

☑ *Continued on additional page(s)*

E. Has a biological study been completed for the project site?

☑ Yes (*Enclose the biological study*) ☐ No

*Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.*

F. Has a hydrological study been completed for the project or project site?

☐ Yes (*Enclose the hydrological study*) ☑ No

*Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.*

## 12. MEASURES TO PROTECT FISH, WILDIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

Erosion control measures including silt fencing shall be installed at the discretion of the Restoration Specialist to contain sediments within graded or restoration areas. Silt fencing shall be semi- permanently installed at the boundary between upland revegetation areas and existing riparian habitat until sufficient vegetation is established in the revegetation zone to prevent erosion. Maintenance of the erosion control measures is included as part of the maintenance program. Please see attached information, pages 29-30.

☑ *Continued on additional page(s)*

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

A delayed start date for the removal of giant reed and tamarisk will negate impacts on nesting birds species and avoid violation of the MBTA. This would also allow the salvaging/collection of native materials from the development site such as willow and mule fat cuttings. Removal of giant reed and tamarisk shall begin after the end of the nesting season (approximately August 30th).☐

☑ *Continued on additional page(s)*

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

Areas to be preserved or protected shall be identified by the Restoration Specialist and isolated with construction fencing prior to any clearing or grading activities. Protected areas include existing woodland adjacent to revegetation areas and individual trees to be preserved within revegetation areas. Vehicles shall not be allowed to operate within the dripline of any preserved tree on site.

☑ *Continued on additional page(s)*

## 13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

A. N/A ☐ Applied ☐ Issued

B. N/A ☐ Applied ☐ Issued

C. N/A ☐ Applied ☐ Issued

D. Unknown whether ☐ local, ☐ state, or ☐ federal permit is needed for the project. (*Check each box that applies*)

☐ *Continued on additional page(s)*

**14. ENVIRONMENTAL REVIEW**

A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?

☑ Yes (*Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each*)

☐ No (*Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared*)

| | | |
|---|---|---|
| ☑ Notice of Exemption | ☐ Mitigated Negative Declaration | ☐ NEPA document (*type*): ______ |
| ☐ Initial Study | ☐ Environmental Impact Report | ☐ CESA document (*type*): ______ |
| ☐ Negative Declaration | ☐ Notice of Determination *(Enclose)* | ☐ ESA document (*type*): ______ |
| ☐ THP/ NTMP | ☐ Mitigation, Monitoring, Reporting Plan | |

| | | | |
|---|---|---|---|
| B. State Clearinghouse Number (*if applicable*) | | | |
| C. Has a CEQA lead agency been determined? | ☑ Yes (*Complete boxes D, E, and F*) | ☐ No (*Skip to box 14.G*) | |
| D. CEQA Lead Agency | County of Los Angeles Department of Public Works | | |
| E. Contact Person | Patricia Wood | F. Telephone Number | (626) 458-6131 |

G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.

☐ *Continued on additional page(s)*

H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?

☐ Yes (*Enclose proof of payment*) ☑ No (*Briefly explain below the reason a filing fee has not been paid)*

No effect on fish and wildlife

*Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.*

**15. SITE INSPECTION**

Check one box only.

☑ In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.

☐ I request the Department to first contact (*insert name*) ______________________ at (*insert telephone number*) ______________________ to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

## 16. DIGITAL FORMAT

Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

☑ Yes (Please enclose the information via digital media with the completed notification form)

☐ No

## 17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.

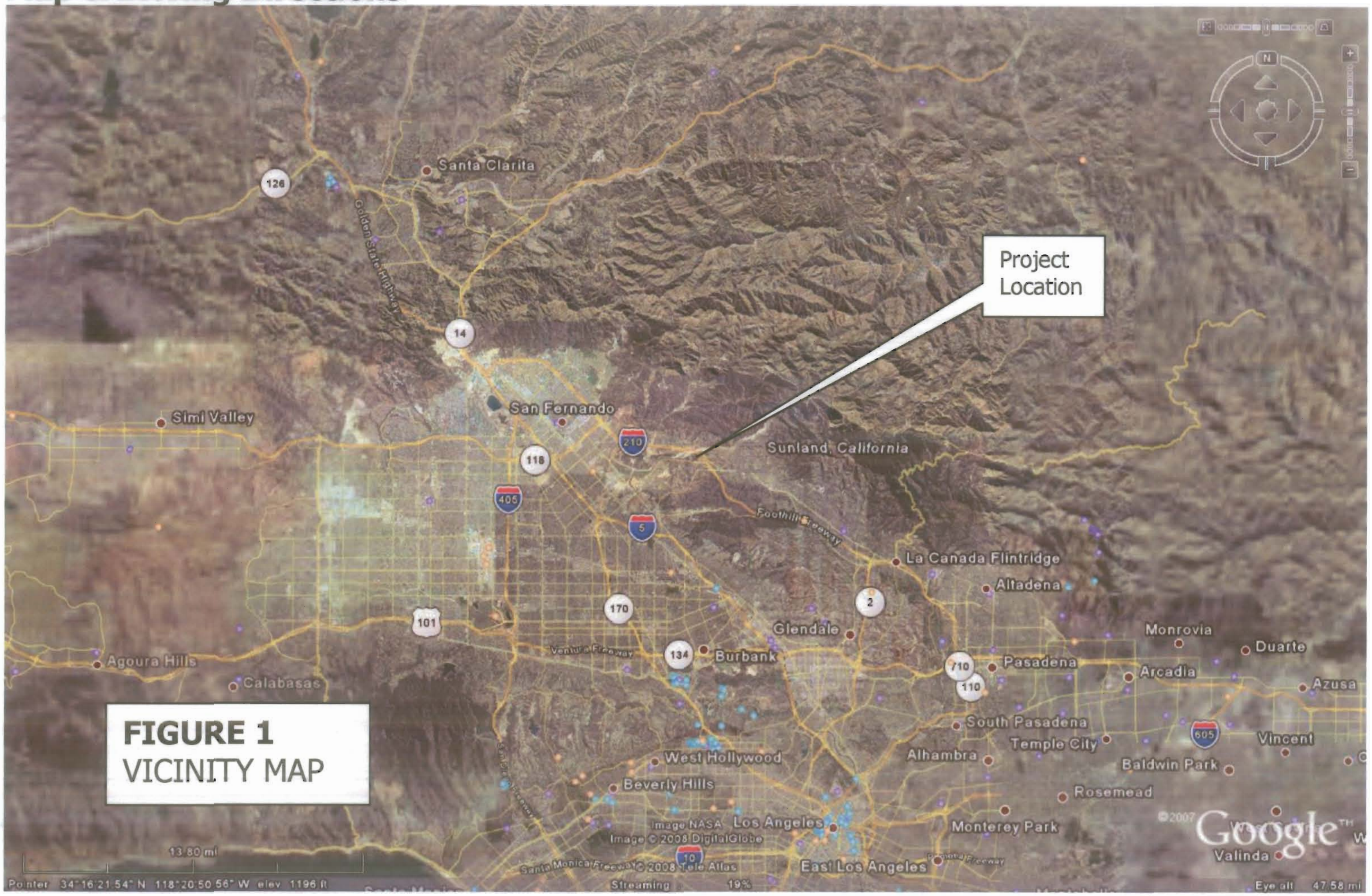
Christopher Stone — 7-17-08

Signature of Applicant or Applicant's Authorized Representative — Date

Christopher Stone

Print Name

## 8. Project Location
## Map & Driving Directions




210 Freeway
Tujunga Ponds
Wentworth Street
Mary Bell Avenue
BIG TUJUNGA WASH
MITIGATION BANK
Figure 2 Aerial Photograph

**Driving Directions**

From Pasadena take Interstate 210 west, exit at Sunland Blvd exit. Proceed east (right) on Sunland Blvd. Take a left (northbound) on Foothill Blvd. Take a left (west) on Wentworth Street. Turn right (north) on Mary Bell Avenue. Project site will be straight ahead.

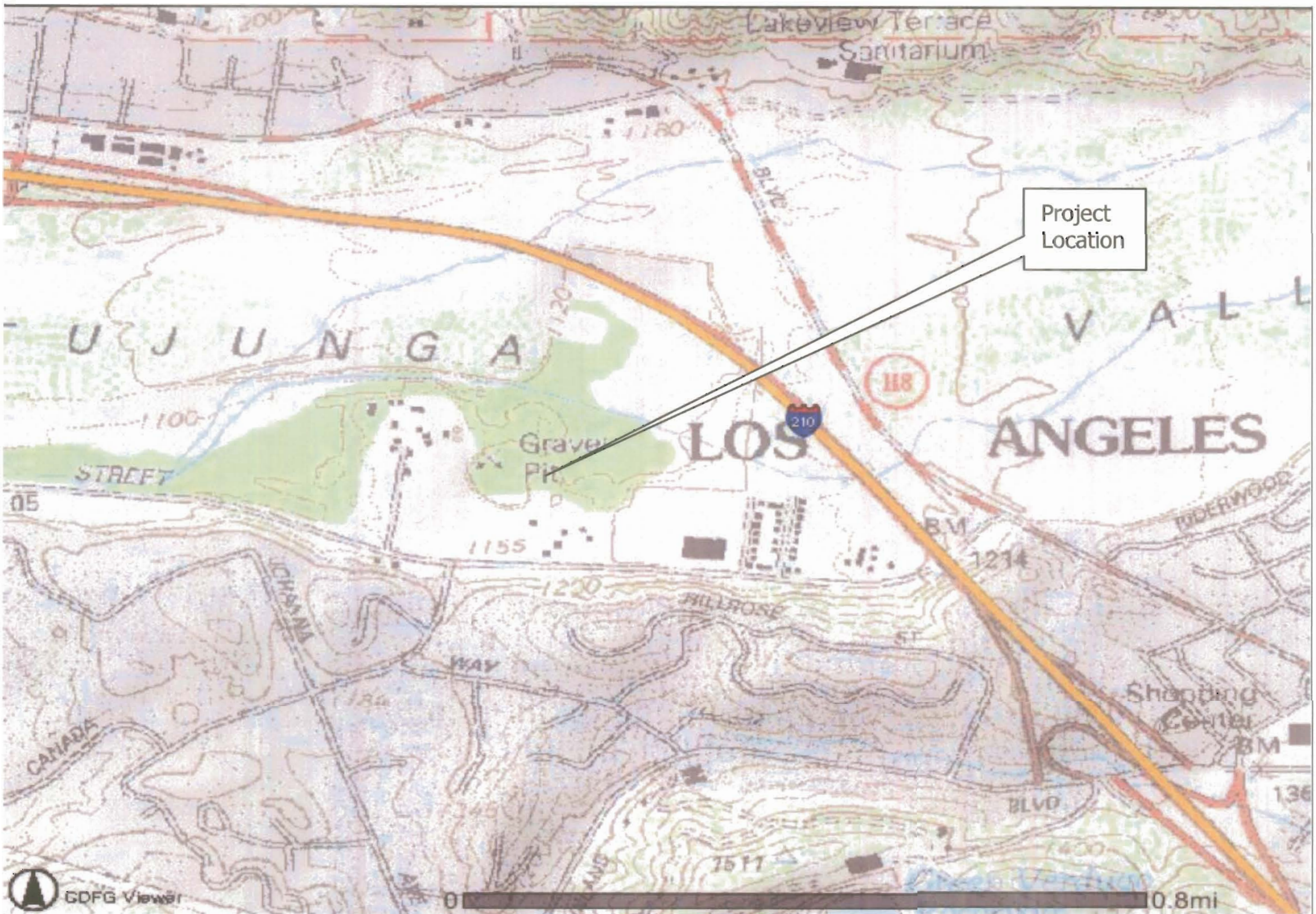



**FIGURE 3**
QUADRANGLE MAP

## 10. Project Description

**Describe the project in detail. Photographs of the project location and immediate surrounding area should be included. Include any structures that will be place, built or completed in or near the stream, river, or lake. Specify the type and volume of materials that will be used. If water will be diverted or drafted, specify the purpose or use.**

**Enclose diagrams, drawings, plans and/or maps that provide all the following, site specific construction details, the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area showing the location of each structure and or activity, significant area features, and where the equipment machinery will enter and exit the project area.**

The Master Plan contains 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 Master Plan includes an optional program for additional mitigation credits to create a diverse coast live oak-California sycamore woodland and coastal sage scrub habitat in an area that is currently heavily disturbed. The woodland is designed to provide foraging and nesting habitat for upland species as well as cover for both wildlife and equestrians using the trails incorporated into the design. The coastal sage scrub is designed to provide habitat for the federally listed threatened California gnatcatcher. Existing equestrian trails throughout the site are defined and realigned where necessary to protect valuable wildlife habitat. A program to trap and eradicate brown-headed cowbirds is included to protect native bird species using the site. Finally, a public education program is included to provide information to the community about the wildlife values of the site.

***Water Quality Monitoring***

This program begins with the Los Angeles County Department of Public Work's (LACDPW's) collection and analysis of baseline (pre-project) water quality samples and continues with quarterly sample collection and analysis throughout the five-year MMP implementation.

***Trails Enhancement***

This program will formalize joint equestrian and hiking trails through the Big Tujunga Wash Mitigation Bank site to allow traffic that is compatible with the site's primary function of habitat restoration and preservation. This program consists of the LACDPW's installation of portable toilets and trash receptacles, its entering into a partnership agreement with a sponsor for trash collection, construction and placement of information kiosks, and its replacement of the Tujunga Ponds fencing for better resistance to vandalism.

***Trails Reclamation***

This program consists of actions to close non-essential trails and reclaim them for habitat. These actions include the installation of necessary barriers and signs, and the planting of native vegetation in the retired pathways.

***Exotic Species Eradication (Initial)***

This program consists of the initial removal of non-native invasive vegetation (including Arundo, Tamarisk, Water Hyacinth) and non-native predatory wildlife (including cowbirds, bullfrogs, crayfish) from the LACDPW's property and the adjacent Tujunga Ponds. Although the Los Angeles County Department of Parks and Recreation owns the Tujunga Ponds instead of the LACDPW, the LACDPW's MMP includes non-native species removal within the Ponds because they are the primary introduction sites for these harmful species on the LACDPW's adjacent property.

***Riparian Habitat Enhancement***

This program consists of re-planting riparian (riverine) areas within the LACDPW's property that had been subject to exotic vegetation eradication.

***Site Inspection and Maintenance***

This program consists of actions to oversee the effectiveness of its efforts regarding the trails, exotic species removal, and revegetation of riparian areas. Inspection will occur on a monthly basis during the first year, on a quarterly basis during the second year, and semi-annually during the third, fourth, and fifth years of the MMP implementation.

***Success Monitoring - Fish and Wildlife***

This program consists of monitoring of populations of sensitive fish (such as the Santa Ana sucker), birds (such as the least Bell's vireo and southwestern willow flycatcher), and amphibians (such as the arroyo southwestern toad) during the five-year MMP implementation. The purpose of the monitoring is to determine these populations' health at the site, the level of success of the MMP's trails, exotic species eradication and restoration measures, and the compatibility of on-site recreational activities with the site's primary function of habitat preservation and enhancement. The Consultant will prepare the monitoring reports and the LACDPW will transmit the reports to the agencies that are issuing the mitigation credits.

## EXISTING BIOLOGICAL RESOURCES

This section describes the existing biological resources in the Mitigation Bank. The description of the existing resources is included to provide a baseline of what is present at the site prior to the implementation of the enhancement measures. The vegetation communities, sensitive plants, wildlife resources, sensitive wildlife, aquatic resources, and wetlands and waters of the United States are described in this section.

### Vegetation Communities

Biological resources surveys were conducted by Chambers Group at the project site in May 1997 to document the current biological diversity and assess the habitat for its potential to support native plant and wildlife species. The reconnaissance-level surveys evaluated the potential for sensitive vegetation and wildlife to occur onsite.

Seven plant communities were identified and mapped during the surveys of the Big Tujunga Wash site. These include southern arroyo willow riparian woodland, sycamore alluvial woodland, Riversidean alluvial sage scrub, mule fat scrub, coastal sage scrub, non-native grassland, and disturbed areas. Table 1 summarizes the acreages of each vegetation community found on the site.

**Table 1**
**Vegetation Communities Occurring Within the Big Tujunga Wash Mitigation Bank Site**

| Vegetation Community* | Acreage Present on the Site |
|---|---|
| Riversidean Alluvial Fan Sage Scrub | 96 |
| Southern Arroyo Willow Riparian Woodland | 61 |
| *Arundo donax* | 15 |
| Mule Fat Scrub | 37 |
| Sycamore Alluvial Woodland | 1 |
| Coastal Sage Scrub | 6 |
| Non-Native Grassland | 11 |
| Disturbed Areas | 20 |
| Open Water Ponds | |
| **TOTAL** | **247** |
| *** Plant community classifications according to Holland (1986)** | |

## Sensitive Plants

A search of the California Natural Diversity Data Base (CNDDB) and the California Native Plant Society Electronic Inventory (CNPSEI) resulted in a list of seven threatened, endangered, or sensitive plant species that have the potential to occur on the site. A list of these species showing their current status may be found in Table 2.

**Table 2**
**Sensitive Plant Species Potentially Occurring on the Big Tujunga Wash Site**

| Scientific Name/ Common Name | Status Federal/ State/CNPS | Habitat and Habit | Potential to Occur Onsite | Seen Onsite |
|---|---|---|---|---|
| *Berberis nevinii* Nevin's barberry | FE/CE/1B | Chaparral, coastal scrub, riparian scrub and cismontane woodland in sandy or gravelly places. Shrub. | Low; habitat present onsite; species not observed during surveys. | No |
| *Calochortus plummerae* Plummer's mariposa lily | -/-/1 B | Coastal scrub, chaparral, grassland and cismontane woodland in rocky and sandy places. Perennial herb. | High; habitat present onsite. | No |
| *Castilleja gleasonii* Mt. Gleason indian paintbrush | -/CR/1 B | Coniferous forest in granitic soils. Perennial herb. | Low; habitat not present onsite. | No |
| *Chorizanthe parryi* var. *fernandina* San Fernando Valley spineflower | -/-/1A | Coastal scrub, dry sandy places. Annual herb. | Moderate; habitat present onsite. | No |
| *Dodecahema leptocerus* Slender-horned spineflower | FE/CE/1B | Coastal scrub, dry sandy places. Annual herb. | High; habitat present onsite. | No |
| *Malacothamnus davidsonii* Davidson's bush mallow | FSOC/-/1 B | Coastal scrub and riparian woodland in sandy washes. Shrub. | Present; Species observed in wash area. | Yes |
| *Linanthus orcuttii* Orcutt's linanthus | FSOC/-/1 B | Chaparral (at 4,000 feet); sometimes in disturbed areas. Annual herb. | Low; habitat not present onsite and site below specie's elevation range. | No |

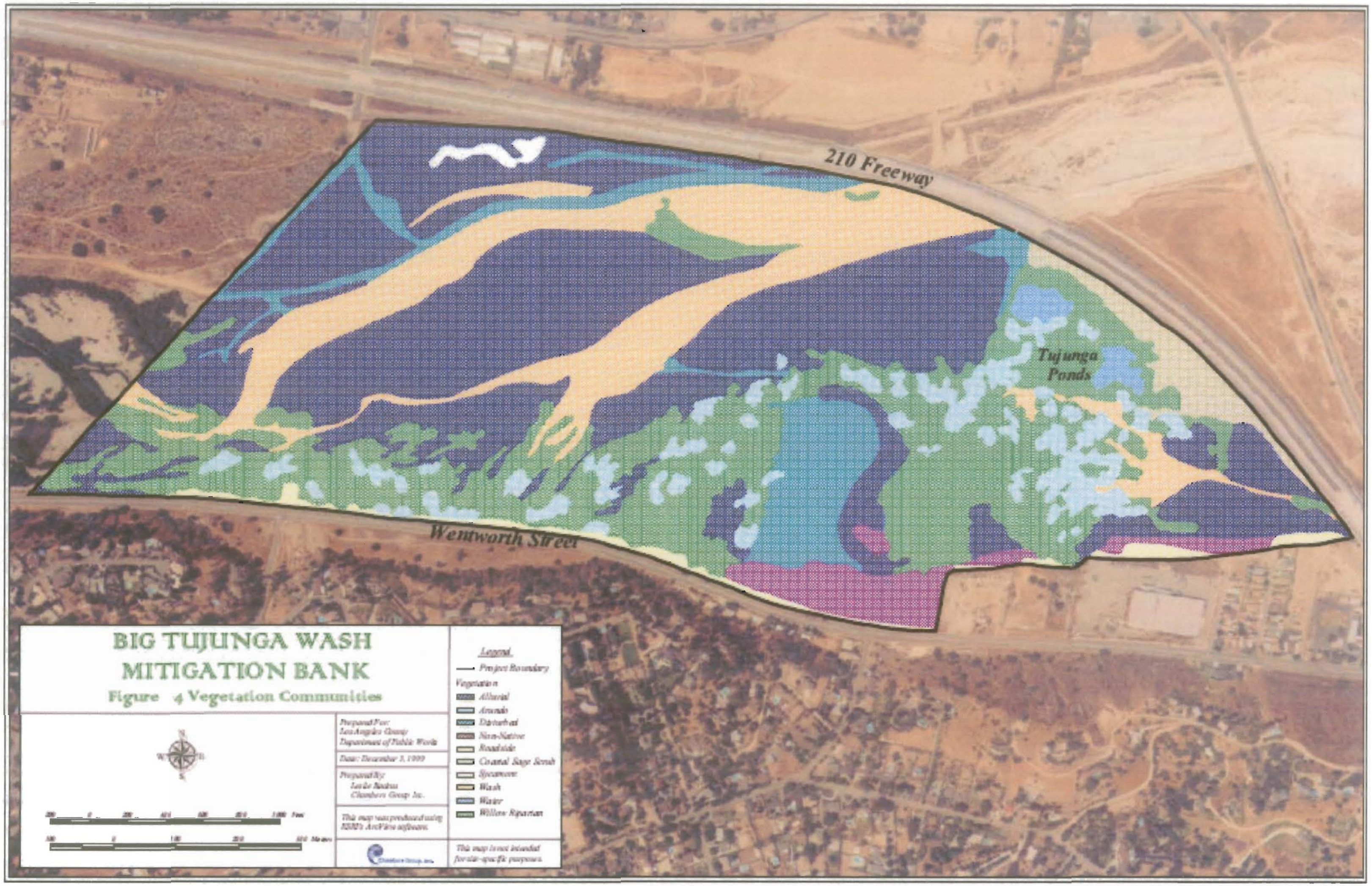
Status:

Federal
FE = Taxa is listed as an endangered species by USFWS
PE = Taxa proposed to be listed as endangered by USFWS
FSOC= Taxa considered a federal species of concern

State
CE = Taxa listed by the State of California as endangered
CR = Taxa listed by the State of California as rare

California Native Plant Society (CNPSI
1A = Taxa is presumed extinct in California
1B = Taxa is rare, threatened, or endangered in California and elsewhere

Nevin's barbery (*Berberis nevinii*), a federal- and state-listed endangered species, is thought to be restricted to fewer than 1,000 plants as of 1992 (California Native Plant Society [CNPS]). Suitable habitat is present on the site, however, the plant was not observed during the surveys. Neven's barbery is a large, conspicuous shrub and it is unlikely that it would have been overlooked during the surveys if it occurred on the site. Three sensitive species were either found on the site or have been reported in nearby locations and therefore have a high potential to occur on the project site. Davidson's bush mallow (*Malacothamnus davidsonii*), a federal species of concern (FSOC), was found in intermediate seral stage alluvial habitat during the Chambers Group surveys. Slender-horned spineflower (*Dodecahema leptocerus*), a state- and federal-listed endangered species, has been documented within 2 miles of the site. This species was not observed during the surveys, but it has a high potential to occur in the late seral stage alluvial scrub habitat present on the site. Plummer's mariposa lily (*Calochortus plummerae*), an FSOC, is associated with sandy sites in coastal scrub habitats and has a high potential to occur on the site. This species was not observed during the surveys. San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) is included on the CNPS List 1A (presumed extinct). This species was, however, recently rediscovered on a ridgetop in south Ventura County (USFWS 1999). San Fernando Valley spineflower was originally evaluated as having a low potential to occur on the site (Chambers 1998a). Since it was reported at a nearby location (within approximately 20 miles) and the site supports suitable habitat, the potential for this species to occur at the Big Tujunga site has been redefined as moderate.


210 Freeway
Tujunga Ponds
Wentworth Street
BIG TUJUNGA WASH
MITIGATION BANK
Figure 4 Vegetation Communities
Prepared For:
Los Angeles County
Department of Public Works
Date: December 3, 1999
Prepared By:
Leslie Bodrus
Chambers Group Inc.
This map was produced using
ESRI's ArcView software.
Legend
Project Boundary
Vegetation
Alluvial
Arundo
Disturbed
Non-Native
Roadside
Coastal Sage Scrub
Sycamore
Wash
Water
Willow Riparian
This map is not intended
for site-specific purposes.
N
S
W
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Feet
Meters

### Wildlife Resources

The Big Tujunga Wash Mitigation Bank site consists of riparian, aquatic, and scrub habitats and open cobble wash areas. Much of the site is composed of dry, open habitat that does not provide much cover for wildlife species from predators or hot, dry weather conditions. The site is part of a wildlife movement corridor that extends east of the Hansen Dam and west of the Big Tujunga Wash. Together, these areas form a contiguous corridor providing important open space area for wildlife movement.

The two streams on the site (Big Tujunga Wash and Haines Canyon Creek) provide habitat for amphibians, birds and fish, particularly along the perennial flow in Haines Canyon Creek. The riparian vegetation community provides foraging, roosting, and nesting sites for bird species, cover for reptiles from predation and hot weather conditions, and breeding areas for fish and amphibians. The alluvial scrub community found on gravelly alluvial outwash terraces mainly along Big Tujunga Wash provides habitat for wildlife species that prefer open habitats including mammals, reptiles, and birds. A number of sycamore trees on the site provide suitable roosting and nesting sites for raptor species.

### Sensitive Wildlife

The literature search resulted in a list of 14 sensitive wildlife species with the potential to occur on the site. Three sensitive fish species, the arroyo chub (*Gila orcutti*), Santa Ana speckled dace (*Rhinichthys osculus*), and Santa Ana sucker (*Catostomus santaanae*), were observed during the surveys. Four sensitive bird species, the Cooper's hawk (*Accipiter cooperii*), great blue heron (*Ardea herodias*), black crowned night heron (*Nycticorax nycticorax*), and the loggerhead shrike (*Lanis ludovicianus*) were observed on the site during the surveys. Six additional sensitive species were not observed, but have the potential to occur onsite. These include the California red-legged frog (*Rana aurora draytonii*), southwestern pond turtle (*Clemmys marmorata pallida*), San Diego horned lizard (*Phrynosoma coronatum blainvillei*), California gnatcatcher (*Polioptila californica californica*), southwestern willow flycatcher (*Empidonax trallii extimus*), and least Bell's vireo (*Vireo bellii pusillus*). Additionally, the arroyo southwestern toad (*Bufo microscaphus californicus*) was not observed during the surveys, but has been reported in the vicinity. A summary of the sensitive species occurring or potentially occurring on the site and their current status may be found in Table 3.

## Aquatic Resources

Aquatic resources were evaluated based on a literature review of fish species observed in the vicinity of the site and on a 1-day field survey of the site conducted on May 10, 1997. Data on the physical attributes of the in-stream habitat, including water temperature, dissolved oxygen concentrations, and conductivity, were collected, and fish populations were sampled at 8 locations in the drainages.

Aquatic habitats on the Big Tujunga Wash site consist of two stream channels that traverse the site in an east-to-west direction, and the Tujunga Ponds. The northern drainage is the main branch of Big Tujunga Creek, a sparsely vegetation wash that originates in the San Gabriel Mountains. Big Tujunga Creek is designated as a Southern California Arroyo Chub/Santa Ana Sucker Stream in the California Natural Diversity Database (1997). Both arroyo chubs and Santa Ana suckers were collected in the surveys of Big Tujunga Creek. A portion of Big Tujunga Creek on the site does not appear to have been invaded by introduced fish species and is serving as a dispersion corridor for native species.

The south stream channel connects to the Haines Canyon Flood Control Channel east of the site and is called Haines Canyon Creek. Haines Canyon Creek is a densely vegetated perennial stream, and is dominated by largemouth bass, a non-native fish species. Two adult arroyo chub and one adult Santa Ana sucker were also collected in Haines Canyon Creek. Largemouth bass and sunfish, another introduced species, were observed in the Tujunga Ponds.

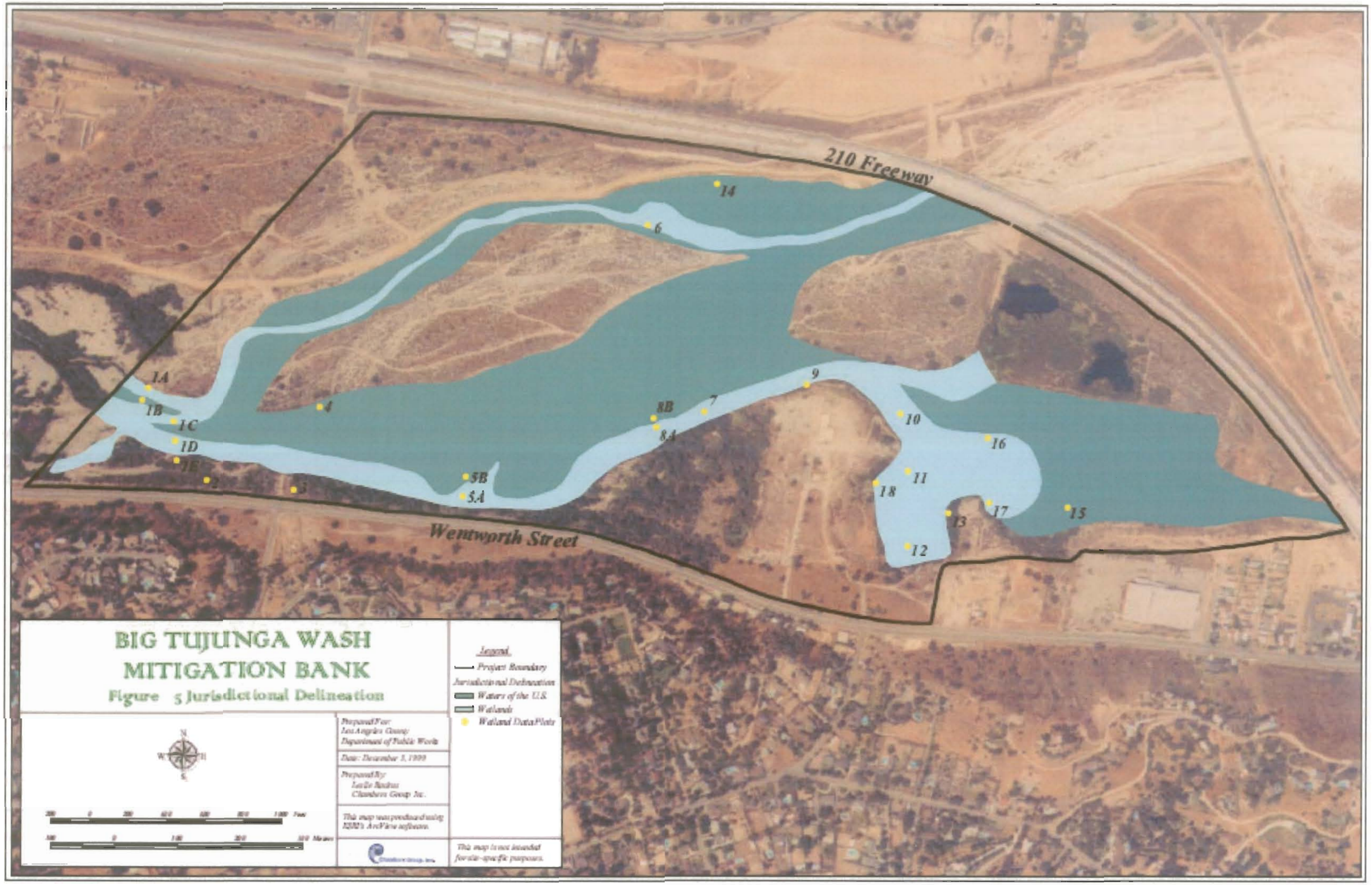
## Wetlands and Other Waters of the United States

A formal delineation of the wetlands and other waters of the United States was conducted on the site in August 1997. A total of 30.4 acres on the site was determined to be under the Corps jurisdiction as wetlands, and an additional 77.8 acres was determined to fall under Corps jurisdiction under the category of other waters of the United States. The Tujunga Ponds were not included in the formal delineation.

The delineated wetlands are located primarily along the channel of Big Tujunga Creek and the channel and banks of Haines Canyon Creek. A large area of wetlands was also delineated in the south portion of the site in an abandoned gravel pit. Wetlands along Big Tujunga Creek are characterized by scattered patches of willows and cattails. Wetlands along Haines Canyon Creek are dominated by willows with an understory of other wetland species including mule fat, white alder (*Alnus rhombifolia*), watercress (*Rorippa nasturtium-aquatica*), cattail (*Typha* sp.), sedges (*Cyperus* sp.), and willow-weed (*Polygonum lapathifolium*). Giant reed (*Arundo donax*) is also common throughout the wetland areas.

Jurisdictional waters delineated on the site occur along the stream portion of Haines Canyon Creek, and the floodplain of Big Tujunga Creek to the ordinary highwater marks along the banks of the higher bench areas.

All of the wetlands and other waters of the United States under the jurisdiction of the Corps would also be under the jurisdiction of the CDFG. Figure 1-5 shows the location of the delineated waters of the U.S. and wetlands.


210 Freeway
Wentworth Street
1A
1B
1C
1D
1E
2
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8A
8B
9
10
11
12
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17
18
BIG TUJUNGA WASH
MITIGATION BANK
Figure 5 Jurisdictional Delineation
Legend
Project Boundary
Jurisdictional Delineation
Waters of the U.S.
Wetlands
Wetland DataPlots
N
W
E
S
Prepared For:
Los Angeles County
Department of Public Works
Date: December 3, 1999
Prepared By:
Leslie Backus
Chambers Group Inc.
This map was produced using ESRI's ArcView software.
This map is not intended for site-specific purposes.
Feet
Meters

## Table 3
## Sensitive Wildlife Species Potentially Occurring at the Big Tujunga Wash Site

| Scientific Name | Common Name | Listing | PFO | Comments |
|---|---|---|---|---|
| **CLASS OSTEICHTHYES** | **BONY FISH** | | | |
| **CYPRINIDAE**<br>*Gila orcutti*<br>*Rhinichthys osculus* | **CARPS AND MINNOWS**<br>Arroyo chub<br>Santa Ana speckled dace | FSOC,CSC<br>FSOC,CSC | P<br>P | Suitable habitat exists onsite. Observed in Haines Canyon Creek. |
| **CATOSTOMIDAE**<br>*Catostomus santaanae* | **SUCKERS**<br>Santa Ana sucker | FPT,CSC | P | Suitable habitat exists onsite. Observed in Haines Canyon Creek. |
| **CLASS AMPHIBIA** | **AMPHIBIANS** | | | |
| **BUFONIDAE**<br>*Bufo microscaphus californicus* | **TRUE TOADS**<br>Arroyo southwestern toad | FE,CSC | H | Historically present along Big Tujunga Wash. Known occurrences above Big Tujunga reservoir. |
| **RANIDAE**<br>*Rana aurora draytonii*<br>*Rana muscosa* | **TRUE FROGS**<br>California red-legged frog<br>Mountain yellow-legged frog | FT,CSC<br>FPE, CSC | M<br>M | Suitable habitat exists onsite.<br>Marginal habitat exists onsite. |
| **CLASS REPTILIA** | **REPTILES** | | | |
| **EMYDIDAE**<br>*Clemmys marmorata pallida* | **BOX AND WATER TURTLES**<br>Southwestern pond turtle | FSOC | M | Marginal habit exists onsite.<br>Recorded sighting 1 mile downstream of site. |
| **IGUANIDAE**<br>*Phrynosoma coronatum blainvillei* | **IGUANID LIZARDS** San Diego horned lizard | CSC | P | Suitable habitat exists onsite. Exists on the upper beaches of the Big Tujunga Wash site. Known occurrences on the upper fan within 2 miles of the site. |
| **CLASS AVES** | **BIRDS** | | | |
| **ARDEIDAE**<br>*Nycticorax nycticorax*<br>*Ardea herodias*<br>*Ardea alba*<br>*Egretta thula* | **HERONS**<br>black-crowned night heron<br>great blue heron<br>Great egret<br>Snowy egret | *<br>*<br>*<br>I | P<br>P<br>H<br>H | Observed onsite.<br>Individuals observed onsite, but no rookery present.<br>Suitable habitat exists onsite.<br>Suitable habitat exists onsite. |
| **ACCIPITRIDAE**<br>*Accipiter cooperii* | **HAWKS**<br>Cooper's hawk | CSC | P | Observed onsite. |
| **TYRANNIDAE**<br>*Empidonax trallii extimus* | **TYRANT FLYCATCHERS**<br>Southwestern willow flycatcher | SE | H | Suitable habitat exists onsite. |
| **MUSCICAPIDAE**<br>*Polioptila californica* | **KINGLETS, GNATCATCHERS**<br>California gnatcatcher | FT, CSC | M | Marginal habitat (alluvial scrub) onsite. |
| **LANIIDAE**<br>*Lanius ludovicianus* | **SHRIKES**<br>loggerhead shrike | CSC | P | Observed adjacent to Big Tujunga Creek and Haines Canyon Creek. |
| **VIREONIDAE**<br>*Vireo bellii pusillus* | **VIREOS**<br>Least Bell's vireo | FE, SE | H | Suitable willow habitat exists onsite. |

| Status Codes | Potential for Occurrence (PFO) |
|---|---|
| Federal (FED)<br>FE = Federal-listed; Endangered<br>FSOC = Federal Species of Concern<br>FT = Federal-listed; Threatened<br>State<br>ST = State-listed; Threatened<br>SE = State-listed; Endangered<br><br>CSC = California Species of Special Concern | L = Low potential for occurrence - No recent or historical records exist of the species occurring in the project area or its immediate vicinity (within approximately 5 miles) and the diagnostic habitat requirements strongly associated with the species do not occur in the project area or its immediate vicinity.<br>M= Moderate potential for occurrence - Either a historical record exists of the species in the project area or its immediate vicinity or the diagnostic habitat requirements associated with the species occur in the project area or its immediate vicinity. |

| | |
|---|---|
| * – Taxa that are biologically rare, very restricted in distribution, declining throughout their range, or at a critical stage in their life cycle when residing in California.<br>-- Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California.<br>-- Taxa closely associated with a habitat that is declining in California. (e.g., wetland, riparian, old growth forest). | H= High potential for occurrence - Both a historical record exists of the species in the project area or its immediate vicinity and the diagnostic habitat requirements strongly associated with the species do occur in the project area or its immediate vicinity.<br>P = Species present - The species was observed in the project area at the time of the survey. |
| Source: California Natural Diversity Data Base (CNDDB), Sunland quad, 1997 | |

## C. Will the proposed project require work in the wetted portion of the channel?

The project will require the removal of invasive species (both plant and animal) within the wetted portion of the channel. Work within the wetted portion of the channel and ponds will be primarily by the use of hand tools.

## 11. Project Impacts

## A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modification in length and area and the type and volume of material that will be moved, displaced, or otherwise disturbed.

The habitat restoration and enhancement plan will improve the habitat quality of approximately 60 acres of southern arroyo willow woodlands along Haines Canyon Creek and the Big Tujunga Ponds. Figure 6 shows the locations and types of restoration and enhancement areas on the site.

Minor, temporary impacts to the bed, bank and channel of Big Tujunga Wash and associated riparian habitat will occur as a result of the project.

**Description of Aquatic Habitat**

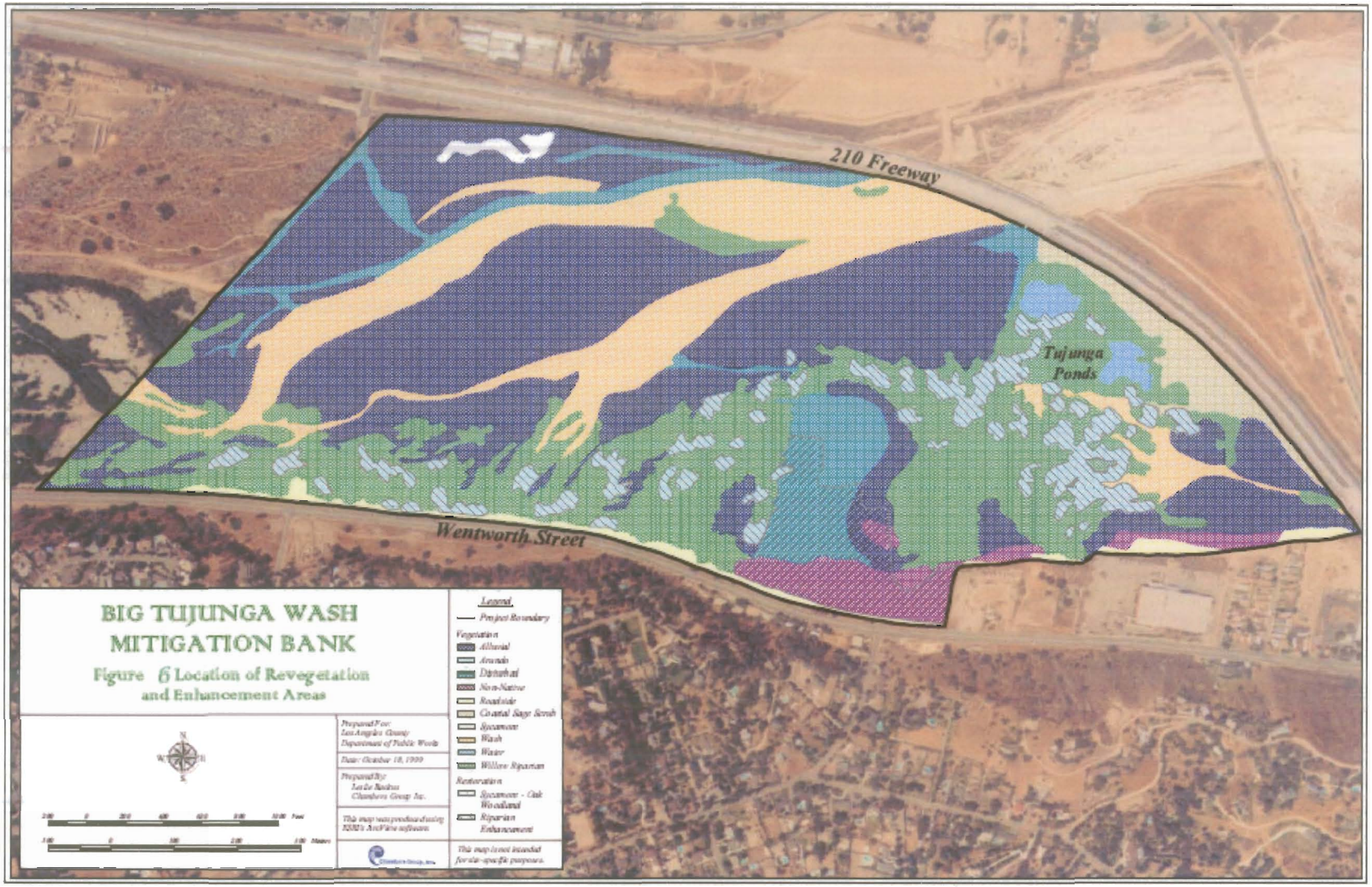
There are functionally two types of aquatic habitat onsite. The first is essentially lacustrine (ponded/slackwater) in nature, and consists of two large ponds on the northeastern edge of the site. The second is essentially palustrine (stream/flowing water) in nature, and consists of two stream segments. The first stream segment is an estimated 3 to 4 m (10 to 13 ft) wide and 70 to 80 m (230 to 260 ft) in length and connects the two ponds. The second segment originates from the outflow of the west pond, and continues for a distance of several kilometers in a generally easterly direction. Big Tujunga Creek is located on the west side of the project site and is a larger-order system, which appears to be currently intermittent due to restriction of flows from Big Tujunga dam upstream.

The two ponds apparently originated as borrow pits (Hamilton 1997). The east pond covers approximately 0.37 ha (0.91 acres). The banks are relatively steep, and a snorkeling survey on 17 May 1999 indicated that the maximum depth is approximately 3.0 to 3.2 m (10 to 11 ft). The bottom is relatively uniform in both depth and composition; the substrate appears to consist of a mixture of sand, small amounts of gravel, moderate amounts of cobble and an overlying layer of decaying organic material and silt an estimated 6 to 15 cm (2.5 to 7 in) deep. Visibility was excellent (up to 20+ ft). Rooted aquatic vegetation was scarce in the deeper portions of the pond at the time of the survey; however there was a significant fringe of cattails (*Typha* sp.) on the western edge of the pond. Floating microphytic aquatic vegetation (*Wolfia*?) covered most of the surface at this site.

A small stream (10 to 14 ft wide) connects the east pond to the west pond. This stream contained numerous rooted aquatic macrophytes and some substantial growths of exotic water hyacinth (*Eichhornia crassipes*). The range of depth in the stream is unknown.

The western pond was unsurveyable due to the presence of a massive infestation of water hyacinth that covered an estimated 99+ percent of the surface area of the pond. The surface area of the pond is estimated at 0.42 ha (1.04 acres). Removal of a small portion of the hyacinth on the western edge of the pond indicated that the bank in this area was moderately steep, and the substrate was a mixture of sand and limited amounts of gravel. The water beneath the water hyacinth was essentially aphotic (without penetrating light); small beams of sunlight were observed penetrating small gaps in the vegetative coverage.

Haines Canyon Creek from the outflow point for approximately several hundred meters downstream is a perennial stream averaging 4+ m (13+ ft) in width, and variable in depth. Haines Canyon Creek is at a minimum a second order stream whose origin is approximately seven miles east of the ponds. More precisely, Haines Canyon Creek becomes intermittent as it approaches the 210 Freeway. The substrate is a mixture of sand, gravel, cobble and boulders. Some sections flow over bedrock. For several hundred meters below the outflow, the stream is heavily shaded by white alder and willow, with canopy cover approaching 90+ percent in some areas. Flow is moderate to rapid, estimated at >0.5 m/sec (1.5 ft/sec) in several reaches. The canopy cover decreases as the stream approaches the confluence with the wash from Big Tujunga Creek, and becomes somewhat wider (5+ m on average) and shallower. Although tree species are present, most vegetative cover along the banks is composed of herbaceous or small woody species. Turbidity was low at the time of all surveys, and visibility was usually 4+ m when snorkeling.


210 Freeway
Tujunga Ponds
Wentworth Street
BIG TUJUNGA WASH
MITIGATION BANK
Figure 6 Location of Revegetation and Enhancement Areas
Legend
Project Boundary
Vegetation
Alluvial
Arundo
Disturbed
Non-Native
Roadside
Coastal Sage Scrub
Sycamore
Wash
Water
Willow Riparian
Restoration
Sycamore - Oak Woodland
Riparian Enhancement
This map is not intended for site-specific purposes.
Prepared For:
Los Angeles County
Department of Public Works
Date: October 18, 1999
Prepared By:
Leslie Backus
Chambers Group Inc.
N
W
E
S
Feet
Meters

## Riparian Habitat Enhancement Plan

Enhancement is intended to improve the habitat value of an existing plant community. The goal of the riparian enhancement plan will be to remove invasive non-native weed species such as giant reed (*Arundo donax*) and to replant these areas with native riparian species. In addition, several extraneous equestrian trails throughout the riparian zone will be retired and reclaimed with native riparian species. A total of approximately 40 acres of habitat along Haines Canyon Creek and 20 acres of habitat surrounding the Tujunga Ponds will be enhanced. The composition of the replacement plantings in the enhancement areas will support the breeding and foraging activities of a variety of sensitive riparian species such as the least Bell's vireo. The enhancement plan consists of various tasks designed to remove the non-native species, prepare the areas prior to planting, and to install cuttings and container plant materials.

Impacts will be minimized through project scheduling and construction monitoring. A delayed start date for the construction until after the nesting season (approximately August 30$^{th}$) will minimize impacts on nesting bird species and breeding activities of amphibians; and avoid violation of the Migratory Bird Treaty Act. This would also allow the collection of native materials from the enhancement areas such as willow and mule fat cuttings to preserve the genetic integrity of the riparian species.

## Exotic Plant Species Eradication Program

The enhancement includes the removal of non-native plant species from Haines Canyon Creek and the Tujunga Ponds. These invasive weeds compete with the native vegetation for light, water and nutrients, and decrease the ecological value of the area. Native wildlife avoid using exotic vegetation for foraging, nesting, and cover. Removal of giant reed and other weed species will reduce competition pressure on the native southern arroyo willow plant community and allow for rapid recovery of the native habitat. All non-native weed species within the creek will be eradicated, with an emphasis on giant reed, water hyacinth (*Eichhornia crassipes*), and tamarisk (*Tamarix ramosissima*). Other weed species to be removed include eucalyptus (*Eucalyptus* sp.), pepper trees (*Schinus molle* and S. *terebinthifolia*), castor bean (*Ricinus communis*), umbrella sedge (*Cyperus involucratus*), mustards (*Brassica* sp.), and tree tobacco (*Nicotiana glauca*), among others.

The enhancement plan also includes the removal of exotic plant species from rehabilitation areas and along side trails. Many non-native plants are introduced to the site by equestrians (seeds contained in horse manure) and through other human-related activities. Equestrian trails shall be monitored periodically for weeds and the weeds appropriately controlled utilizing general eradication methods.

### Giant Reed Eradication Technique

Herbicide treatment to kill the root mass followed by manual removal of dead stems is

the most effective means of giant reed eradication without damage to surrounding riparian vegetation (Bell 1997).
A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. The following method of eradication is recommended:

1. A 2 to 5 percent solution of Rodeo® (a glyphosate systemic herbicide approved by the Environmental Protection Agency for use in aquatic systems) shall be applied to giant reed foliage at a rate of 0.5 to 1 liter per hectare. The initial treatment shall be applied during the post-flowering and pre-dormancy period (mid-August to early November) when the plants are actively translocating storage nutrients to the rootmass in preparation for winter dormancy. The herbicide solution shall be treated with dye non toxic to wildlife to facilitate identification of treated versus untreated clumps. The herbicide shall be applied using hand-held spray containers or if a vehicle is used, it shall be located adjacent to the site, and shall only use existing access areas that are devoid of vegetation.

2. Treated leaves and stems may be cut 2 to 3 weeks after the initial foliar treatment. Removal shall be done by hand tools only; no vehicles shall be operated within the stream. Treated vegetative waste will be chipped in situ, and the waste biomass removed from the area and disposed of at an approved waste disposal site.

3. Follow up foliar application shall be applied to any resprouting stems in the third and seventh week after the initial treatment. Quarterly inspections and reapplication of herbicide, if necessary, shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30).

Where large sections of giant reed are removed, the surrounding native trees will be evaluated for increased vulnerability to wind fall due to the openings in the canopy. The Restoration Specialist and Landscape Contractor will conduct the evaluation. Existing native trees at the edge of the openings will be pruned as necessary to decrease the potential for wind damage. Pruned materials will be used as cutting stock for planting in the riparian habitat.

Tamarisk Eradication Technique

Tamarisk eradication shall begin after the spring and summer nesting season for riparian birds (approximately August 30). All tamarisk within the site boundaries shall be treated. Rodeo®, a glyphosate herbicide approved for use in aquatic systems, must be used. A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. The recommended eradication technique is as follows (CalEPPC 1997):

1. Plants shall be cut to within 6 inches of the ground using hand tools. Cut material must be removed from the site the day it is cut and disposed of at an offsite location. Under no circumstances is cut material to be allowed to remain onsite.

2. Undiluted herbicide (Rodeo®) shall be applied to the entire stump surface immediately after cutting. The entire circumference of the stump must be covered with herbicide.

Treated plants shall be inspected in the third and seventh week following the completion of the initial eradication. If any treated stumps show evidence of new growth, or if any new tamarisk plants are found, subsequent treatment shall be performed as described above. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30). Quarterly inspections and control shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation.

Water Hyacinth Eradication Technique

Water hyacinth is a free-floating plant, which grows up to three feet in height. It grows an erect thick stalk with a single spike of flowers at the top. It is a highly invasive non-native weed. Water hyacinth has a prolific growth rate; its populations can double in a little as 12 days. An infestation of water hyacinth forms a thick mat over much of the slow moving water of the Tujunga Ponds. These mats prevent sunlight and oxygen from reaching the water, exclude native aquatic plant species, and reduce fisheries and biological diversity.

The presence of water hyacinth in the Tujunga Ponds creates a difficult dilemma as far as control is concerned. The easiest way to eliminate the hyacinth is to drain the ponds, remove the hyacinth, and replace the ponds with a free-flowing shallow stream. If the ponds remain as they are, the maintenance of the ponds will undoubtedly include continuous removal of water hyacinth because infestations of this plant are so difficult to control. This will undoubtedly be the most long-term, labor intensive, and costly exotic plant eradication program in the MMP. The initial removal of the existing hyacinth will require a large labor effort primarily because of the large amount of plant material that will have to be removed. Disposal of water hyacinth must be at an approved dumping location to ensure that this plant material does not infest any other areas.

Water hyacinth eradication shall begin after the spring and summer nesting season for riparian birds has passed (approximately August 30). A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. All water hyacinth within the site shall be removed or treated. The recommended eradication technique is as follows:

1. Free-floating plants, including roots, shall be removed from the water by hand. All plant fragments must be collected and removed from the site.
2. If water hyacinth is rooted in the mud, an application of undiluted herbicide (Rodeo®) per label guidelines shall be applied to the entire plant surface by spraying evenly over the plants. The applicator shall ensure that the herbicide spray does not drift onto neighboring native riparian plants.
3. Treated plants shall be inspected weekly for 7 weeks after initial application. Completely necrotic plants shall be removed by hand. If any treated plant shows evidence of new growth, or if any new water hyacinth plants are found, subsequent treatment shall be performed as described above.
4. Quarterly inspections shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation. All applications of herbicide shall occur

outside of the bird breeding season (March 1 through August 30). To prevent oxygen depletion of the pond water due to decomposition of the treated plants, dead biomass shall be removed from the water during each inspection. Biomass shall be removed from the site and disposed of at an approved offsite location.

General Eradication Methods

Exotic species to be removed will be determined by the Restoration Specialist. Wherever feasible, herbaceous species (non-native grasses, mustard) weed control will be removed using mechanical methods such as removal by hand or string trimmers. If effective weed control cannot be attained through mechanical means, a glyphosate herbicide (Rodeo®) will be applied by a certified herbicide applicator under the supervision of the Restoration Specialist. The methods for removal of large woody species (eucalyptus, pepper trees, castor bean, etc.) will follow the eradication techniques described for tamarisk.

**Enhancement Planting in Eradication Zones and Reclaimed Trails**

Enhancement planting of native riparian species shall be conducted in areas where giant reed and tamarisk removal creates openings in the riparian woodland canopy (approximately 15 acres). The target plant community type to be re-established is southern arroyo willow riparian woodland. Enhancement of the riparian habitat will provide habitat to a variety of resident and migratory wildlife species. Enhancement activities include planting of container stock and cuttings installations after weed abatement is accomplished. The enhancement planting is designed to accelerate recovery of the native riparian vegetation that is beneficial to local wildlife.

Enhancement planting of native riparian species shall be conducted in open areas where equestrian trails are being reclaimed. The target plant community type to be re-established along the trails is southern arroyo willow riparian woodland, and is the same as that described for the enhancement of weed eradication areas. Enhancement planting along the closed trails is designed to accelerate recovery of the surrounding native riparian vegetation and discourage inadvertent use of reclaimed trails.

Erosion Control and Bank Stabilization

Erosion control and bank stabilization measures shall be implemented in the enhancement areas according to the guidelines discussed above.

Pre-Planting Weed Control

In addition to the giant reed and tamarisk, numerous non-native weedy species occur throughout the riparian habitat. These species shall be targeted for removal throughout the riparian zone during the giant reed and tamarisk eradication period. Prior to planting, the Landscape Contractor and Restoration Specialist shall determine whether undesirable vegetation is present in any of the enhancement planting areas and whether eradication is necessary. Wherever feasible, pre-planting weed control shall use mechanical methods such as removal by hand or string trimmers. If effective weed control cannot be attained through mechanical means, appropriate systematic non-residual herbicides may be applied at the riparian sites under the supervision of the Restoration Specialist.

### Enhancement Planting Plan

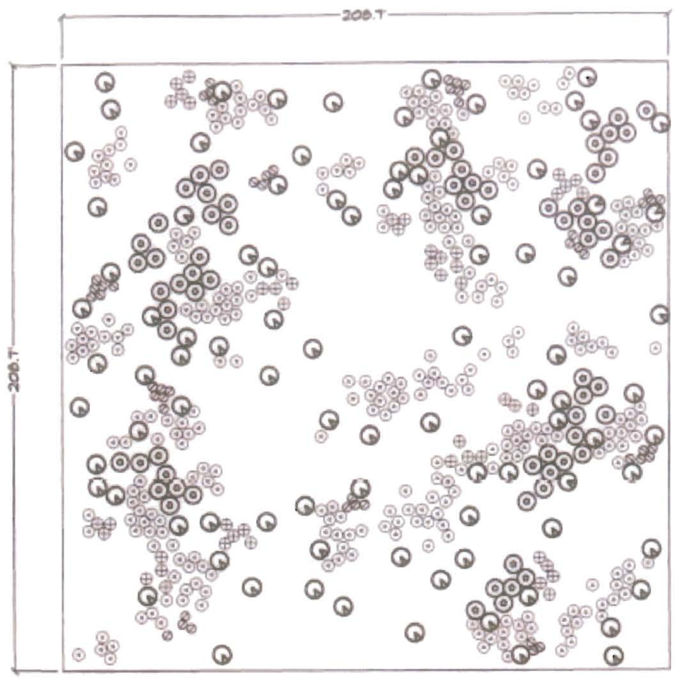
Southern arroyo willow riparian habitat shall be established in the enhancement areas along the creek and along reclaimed trails. Composition of the willow riparian plant palette is based primarily on the species composition of the existing willow riparian habitat along the creek. Consequently, a low, dense canopy comprised of arroyo and red willows, with scattered black willows and occasional groupings of Fremont cottonwoods will be created. The scattered cottonwoods shall be installed as 5-gallon specimens in areas located approximately 6 to 12 feet above the elevation of the groundwater and/or the creek. The arroyo, red, and black willows shall be planted as cuttings a minimum 18 inches in length, 2 to 12 feet above the elevation of the groundwater and creek. The species comprising the shrub understory (i.e., mule fat, California rose, and blackberry) shall be installed as liners at elevations 4 to 12 feet above the low-flow channel. Figures 3-4A and 3-4B shows the conceptual planting plan for the southern arroyo willow riparian area.


BIG TUJUNGA WASH

FORMA

ARROYO WILLOW RIPARIAN COMMUNITY
REVEGETATION AREA

*Figure 7*




LEGEND

| Lower Canopy | | Minimum Density Per Acre |
|---|---|---|
| SALIX LASIOLEPIS | ARROYO WILLOW | 100 |
| SALIX LAEVIGATA | RED WILLOW | 60 |
| **Shrub Understory** | | |
| BACCHARIS SALICIFOLIA | MULE FAT | 300 |
| ROSA CALIFORNICA | CALIFORNIA ROSE | 50 |
| RUBUS URSINUS | CALIFORNIA BLACKBERRY | 50 |

NOTE:
*See Figure 7 for planting layout*

SCALE: 1"=30'
SITE AREA = APPROX. 1 ACRE

**BIG TUJUNGA WASH**
FORMA

# TYPICAL LAYOUT MODEL
ARROYO WILLOW RIPARIAN COMMUNITY REVEGETATION AREA (LOWER CANOPY & SHRUB UNDERSTORY)

*Figure 8*

**Table 4**
**Container Plant Palette for Arroyo Willow Riparian Community**

| Common Name | Scientific Name | Minimum Density | Distribution | Plant Material | Spacing (feet)* |
|---|---|---|---|---|---|
| **Upper Canopy** | | | | | |
| Black willow | *Salix gooddingii* | 20/acre | Scattered | Cutting | 10 |
| Fremont cottonwood | *Populus fremontii* | 20/acre | Groups: 6-12 | 5 gal. | 15 |
| **Lower Canopy** | | | | | |
| Arroyo willow | *Salix lasiolepis* | 100/acre | Scattered | Cutting | 6 |
| Red willow | *Salix laevigata* | 60/acre | Groups: 5-10 | Cutting | 6 |
| **Shrub Understory** | | | | | |
| Mule fat | *Baccharis salicifolia* | 300/acre | Groups: 5-20 | Cutting | 4 |
| California rose | *Rosa californica* | 50/acre | Groups: 3-10 | liner | 3 |
| California blackberry | *Rubis ursinus* | 50/acre | Groups: 3-5 | liner | 4 |
| ***Distance (on-center) between plants of the same species; only applicable to species planted in groups.** | | | | | |

## B.Vegetation type Temporary Impact linear feet and total area; Permanent Impact linear feet and total area. Tree species-Number of trees to be removed, trunk diameter

Approximately 5,000 linear feet of streambed will be temporarily impacted by the removal of exotics and revegetation. The mitigation bank encompasses 207 acres. Exotic trees will be removed.

## C. Any special status species near project site or on it? Bio reports need to be attached

Please see pages 7-11 of this document.

**<u>Native Species Onsite: Historical and Current Presence</u>**

Existing literature (Swift et al. 1993, Jennings and Hayes 1994, Chambers Group 1998a) and surveys of the site in May, June and November 1999 indicate that this site is known or likely to host a significant number of sensitive native vertebrate species. A brief discussion is presented below; for more detail see the species accounts included in Appendix I.

### Invertebrates

Records of a native crayfish (*Pacifasticus* sp.) collected onsite (Chambers Group 1998a) on 10 May 1997 are in error; there are no native crayfish species in southern California. A species of now-extinct freshwater shrimp was known from the Los Angeles basin in similar habitats; however there are no specific or recent records from this or other sites. Similarly, the California freshwater mussel (*Anodonta californiensis*) may have historically occurred in the Los Angles River drainage but there are no recent records.

### Fishes

At least three and possibly as many as seven species of native fishes are likely to have occurred in Big Tujunga Creek onsite. The Pacific brook lamprey (*Lampetra* cf. *pacifica*) was historically present in the Los Angeles River drainage. However, the last collection records for this species in this drainage was approximately 1930 (Swift et al. 1993). The taxonomic status of this species is unresolved. It may be distinct from the Pacific lamprey; sufficient preserved material apparently does not exist to examine this question (Swift et al. 1993).

The larger parasitic anadromous Pacific lamprey (*Lampetra tridentata*) was also historically known from the Los Angeles River drainage, where it spawned in smaller streams. However, all records are for the drainage are prior to 1970 and it is likely that the species is extirpated in this system.
Rainbow trout (*Oncorhynchus mykiss*) in the form of southern steelhead were collected in the Los Angeles River drainage prior 1970 (Swift et al. 1993); however there are no recent records for this system. The possible status of native, non-migratory fish in this and other drainages has probably been confused beyond any hope of resolution by repeated introductions of hatchery fish into local streams.

Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) were historically present in the Los Angeles River drainage (Swift et al. 1993), although no specific records exist for the site. This may be due in part to the somewhat sporadic nature of collections in this area prior to the extensive loss and/or alteration of habitat. For a general discussion of this topic see Bell (1978).

Surveys conducted by the Chambers Group on May 10, 1997, indicated the presence of only a single individual of a native fish species (a Santa Ana sucker) in Haines Canyon Creek and two native species (sucker and arroyo chub) in Big Tujunga Creek. Surveys on May 17, 1999, revealed the presence of at least three species of sensitive native fishes in Big Tujunga Creek and Haines Canyon Creek within the project site. Approximately 6 to 8 Santa Ana sucker (*Catostomus santaanae*) were observed during a snorkeling survey in a large pool approximately 100 to 150 m (330 to 490 ft) downstream of the I-210 bridge over Big Tujunga Creek. Approximately 15 to 20 fish were observed and several captured in 3 to 4 seine hauls of the pool. Most fish were immatures or small adults, up to approximately 15 cm (5.9 in) standard length (SL). Surveys on July 1 and on November 28, 1999, revealed the presence of numerous suckers in Haines Canyon Creek upstream from the area south of the equestrian park. Seine hauls on November 28 in several areas along the stream course produced approximately 1 to 6 suckers per haul, ranging from 10 to 15 cm (4 to 6 in) SL. Fish were most common in riffle areas, but were also taken in areas where water had pooled, such as behind artificial cobble dams.

Santa Ana speckled dace (*Rhinichthys osculus*) were not observed during sampling in the previously noted pool in Big Tujunga Creek on May 17, 1999. However, dace were moderately common in Haines Canyon Creek when sampled on July 1, 1999, and November 28, 1999. Fish were most common in riffle areas, only occasionally being found in slackwater habitats and on only one occasion in a pool above a cobble dam.

Arroyo chub (*Gila orcutti*) were moderately abundant in the pool below I-210 previously noted on May 17, 1999, with approximately 2 to 3 dozen fish being observed during a snorkeling survey. Approximately 2 dozen fish were collected in several seine hauls of the spool. All were adults or large subadults, averaging 4 to 6 cm (1.5 to 2.5 in) in length. Chub were commonly observed in Haines Canyon Creek in surveys on July 1, 1999, and November 28, 1999. Several fish were seined out of a pool behind a cobble dam at a frequently used equestrian crossing.

Two rainbow trout (*Oncorhynchus mykiss*) were observed in the pool in Big Tujunga on May 17, 1999 and in pools along lower Haines Canyon Creek on July 1. Although trout were historically native to this area of this system, these undoubtedly represent planted fish either moving upstream from Hansen Reservoir or downstream from Big Tujunga Reservoir.

### Amphibians

The historical presence of the arroyo toad (*Bufo californicus*) in the immediate area of the site is verified by collection records from Big Tujunga Creek near Sunland between 1915 and 1954 at the site of the current crossing of I-210 (USFWS 1999). However, recent surveys conducted by other surveyors in 1998 did not reveal toads in the immediate area of the Red-tailed Hawk golf course site. Toads are still present upstream beyond Tujunga dam. Suitable habitat may exist in the area; however management for this species on the project site might require reintroduction (if absent) and a change in water flow strategies, which is discussed in Section 3.6.7.

Other non-sensitive native amphibians are known to occur onsite, including the Pacific treefrog (*Hyla regilla*). It is possible that Pacific slender salamanders (*Batrachoseps pacificus*) may occur on the fringes of the side in areas with heavy vegetative cover.

### Reptiles

No listed species of reptiles are known to occur onsite. However, at least five State Species of Special Concern are likely to occur or have recently occurred on or near the site. The southwestern pond turtle (*Clemmys marmorata pallida*) was historically widespread in southern California, occurring in most if not all permanent water habitats and many ephemeral watersources below approximately 4,500 feet (Holland and Bury in press). Brattstrom and Messer (1988) recommended the Big Tujunga ponds as a recipient mitigation site for translocated turtles. We do not know if any turtles were ever relocated to this site.

The two-striped garter snake (*Thamnophis hammondii*) was formerly widespread in many aquatic habitats in southern and central coastal California. This species was not observed during any surveys onsite; however it is likely that it exists onsite as suitable habitat and a plentiful food supply exists in the form of native fishes and treefrogs. Records exist for this drainage (Jennings and Hayes 1994).

The South Coast garter snake (*Thamnophis sirtalis* ssp. nov.) was historically known from sites in the upper Los Angles River drainage; records exist from the upper Arroyo Seco area (Jennings and Hayes 1994). The habits and habitat requirements of this species are poorly understood (Jennings and Hayes 1994); however existing evidence indicates that it is probably somewhat more specialized than the two-striped garter snake. It seems unlikely that the species currently exists in the area.

The coastal patch-nosed snake *(Salvadora hexalepis virgultea)* is a taxon that occurs throughout a large area of southern California, being most common in coastal sage scrub and chaparral habitats. However, the species is also found in alluvial scrub habitats (personal observation) and may be or have been present onsite in some upland areas. Records exist for the lower portion of the Big Tujunga drainage (Jennings and Hayes 1994).

The California horned lizard (*Phrynosoma coronatum*) is another species that was formerly widespread in southern California. The horned lizard occurs or occurred over a wide habitat and elevational range. Many records are from wash habitats, and there are locality records for (Chamber Group 1998a) and near the immediate project site (Jennings and Hayes 1994).

## D. Identify the source(s) of information that supports a "yes" or "no" answer.

## E. Has a Biological Study been completed for the project site?

Big Tujunga Wash Final Master Mitigation and Monitoring Plan provides a biological background for response to these questions. Portions of that report have been used to answer the questions in a compact format.

## 12. Measures to Protect fish, wildlife and plant resources

The following recommendations are presented to protect the biological and aesthetic values of the natural habitats within the site that are not directly affected by the proposed restoration project.

- A delayed start date for the removal of giant reed and tamarisk will negate impacts on nesting birds species and avoid violation of the Migratory Bird Treaty Act. This would also allow the salvaging/collection of native materials from the development site such as willow and mule fat cuttings. Removal of giant reed and tamarisk shall begin after the end of the nesting season (approximately August 30$^{th}$).

- Areas to be preserved or protected shall be identified by the Restoration Specialist and isolated with construction fencing prior to any clearing or grading activities. Protected areas include existing woodland adjacent to revegetation areas and individual trees to be preserved within revegetation areas.

- Vehicles shall not be allowed to operate within the dripline of any preserved tree on the site.

- Erosion control measures including silt fencing shall be installed at the discretion of the Restoration Specialist to contain sediments within graded or restoration areas. Silt fencing shall be semi- permanently installed at the boundary between upland revegetation areas and existing riparian habitat until sufficient vegetation is established in the revegetation zone to prevent erosion. Maintenance of the erosion control measures is included as part of the maintenance program.

- Construction equipment shall be restricted to designated areas and trails identified by the Restoration Specialist. Oversize equipment (greater than 10 feet in height or 8 feet wide) shall not be allowed on the trails. Only low dispersal weight vehicles (less than 20 psi) shall be operated within the riparian areas. Crossing of the creek bed shall not be permitted except where designated by the Restoration Specialist. Crossing will be limited to the minimum necessary to facilitate enhancement activities within the riparian zone.

- Maintenance and refueling of construction equipment shall be limited to areas offsite. Overnight storage of potentially hazardous materials, including but not limited to fuel, paint, stains, pesticide, herbicides, solvents, oils, and solvents, will not be permitted on the site. Disposal of such materials shall occur in a controlled area that is located offsite.

THIS IS WATERMARKED PAPER - DO NOT ACCEPT WITHOUT NOTING WATERMARK - HOLD TO LIGHT TO VERIFY WATERMARK

COUNTY OF LOS ANGELES · CALIFORNIA

# COUNTY OF LOS ANGELES

AUDITOR CONTROLLER'S GENERAL WARRANT
WARRANT CLEARANCE FUND. LOS ANGELES, CALIFORNIA

TS 0008218971

THE TREASURER OF THE COUNTY OF LOS ANGELES
500 W. TEMPLE ST. ROOM 502, LOS ANGELES, CA 90012

June 23, 2008

NOT PAYABLE AFTER TWO YEARS FROM DATE ISSUED

CONTROLLED DISBURSEMENT
PAYABLE THROUGH: BANK OF AMERICA, N.A
NORTH BROOK, ILLINOIS

70-2328
0719

PAY TO THE ORDER OF:

513282

01

CALIFORNIA DEPARTMENT OF FISH & GAME
4949 VIEWRIDGE AVENUE
SAN DIEGO, CA 92123

| Amount |
|---|
| $*******4,000.00 |

PAY: Four Thousand And 00/100 Dollars

APPROVED
WENDY L. WATANABE, ACTING AUDITOR-CONTROLLER
BY Arlene Barrera

⑈0008218971⑈ ⑆071923284⑆ 87659⑉15848⑈

NOTICE OF EXEMPTION

TO: County Clerk
Environmental Filings
12400 East Imperial Highway
Norwalk, CA 90650-3134

FROM: Los Angeles County
Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

**Project Title**

Big Tujunga Mitigation Bank

**Project Location - Specific**

Big Tujunga Wash

**Project Location - City**

City of Los Angeles

**Project Location - County**

Los Angeles

**Description of Nature, Purpose, and Beneficiaries of Project**

The project consists of the removal of invasive species (Arundo donax, eucalyptus, pepper trees, caster bean, umbrella sedge, mustards, tree tobacco, water hyacinth, etc.) from the Big Tujunga Mitigation Bank. The proposed work also includes temporary fencing and riparian habitat enhancement planting.

**Name of Public Agency Approving Project**

Los Angeles County Department of Public Works

**Name of Person or Agency Carrying Out Project**

Los Angeles County Department of Public Works

**Exempt Status: (Check One)**

ORIGINAL FILED

JUN 12 2008

LOS ANGELES, COUNTY CLERK

_____ Ministerial (Sec. 21080(b)(1); 15268);
_____ Declared Emergency (Sec. 21080(b)(3); 15269(a));
_____ Emergency Project (Sec. 21080(b)(2) and (4); CEQA Guidelines Section 15269(b)and (c));
__X__ Categorical Exemption: Class 4, item (d)

**Reasons why project is exempt:**

This project involves the removal of invasive species of vegetation and for this reason is exempt from CEQA per Section 15304 of the State's CEQA Guidelines.

**Contact Person**

Patricia Wood

**Area Code/Telephone/Extension**

(626) 458-6131

Patricia M. Wood — 6/12/2008 — Senior Civil Engineer

Signature — Date — Title

P:\wrd\GENERAL\Facilities\Users\Hans\Big T Miti Bank\Big Tujunga Miti Bank NOE.doc