SECTION 1.0 - INTRODUCTION

1.1 PURPOSE/GOALS

In 1999, Chambers Group, Inc. prepared a Master Mitigation Plan (MMP) for the Big Tujunga Wash Mitigation Bank for the Los Angeles County Department of Public Works (LACDPW). The purpose of the MMP is to serve as a guide for implementation of the various enhancement programs and to fulfill the California Department of Fish and Game (CDFG) requirement for the preparation of a management plan for the site. The MMP encompasses strategies to enhance and protect existing habitat for wildlife, and to create additional natural areas that will be utilized by wildlife and by numerous user groups. In addition, the MMP includes programs for the removal of exotic fish and amphibians, bullfrogs (*Rana catesbeiana*) and crayfish (*Procambarus clarkii*), from the Tujunga Ponds, trapping to control brown-headed cowbirds (*Molothrus ater*), plans for development of a formal trails system, and development of public awareness and education at the site. Eradication of exotic plant species, giant reed (*Arundo donax*) and tamarisk (*Tamarix ramosissima*), and habitat restoration and revegetation programs are also included in the MMP. The MMP is designed to include a 5-year program of implementation, maintenance, and monitoring of the enhancement strategies.

The Master Plan also includes an optional program to create a diverse coast live oak-California sycamore woodland and coastal sage scrub habitat at a disturbed upland area on the site that may provide additional mitigation credits. 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 (*Polioptila californica californica*).

The MMP includes performance standards for restoration and includes a discussion of the target functions and values for riparian and aquatic habitats as well as for target wildlife species. This report also covers the project and goals success criteria, quality assurance/control, maintenance and performance monitoring plans.

Implementation of the MMP began in August 2000. An annual implementation report is required under Section 6 of the MMP to document the progress of the programs that were implemented during the first year of the project. This report includes detailed descriptions of the methods used to implement each program, the current monitoring status, and recommendations for maintenance and remedial actions for 2002.

1.2 SITE DESCRIPTION AND LOCATION

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. A map showing the general vicinity can be found on Figure 1-1. The site is bordered by the 210 Freeway on the north and east, and on the south by Wentworth Street. The west side of the site is contiguous with the downstream portion of Big Tujunga Wash. A map showing the project location can be found on Figure 1-2. 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

Figure 1-1 Vicinity Map

Figure 1-2 Project Location Map

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 state-wide 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 (LACDRC). An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, and the Tujunga Ponds can be found on Figure 1-3. LACDRC had no active management plan in place for these ponds and as a result, the pond habitat was severely degraded. LADPW has included improvement of the pond habitat in the MMP.

1.3 SUMMARY OF THE ANNUAL REPORT

This summary identifies the elements of the MMP undertaken during the year 2002. Table 1-1, at the end of this section, shows the implementation dates and projected completion schedules for these key elements.

Success Monitoring – Vegetation

This program consists of monitoring of the vegetation communities and the suitability of these habitats to support sensitive wildlife species during the five-year MMP implementation. Success monitoring encompasses qualitative and quantitative data analysis including a functional analysis conducted in the riparian habitat. The purpose of the monitoring is to determine the health of vegetation on the site, the level of success of the MMP measures, and the compatibility of recreational activities with the site's primary function of habitat preservation and enhancement. The Consultant prepares the monitoring reports and the LACDPW transmits the reports to the resource agencies that are issuing the mitigation credits. The second Functional Analysis success monitoring survey was conducted in August 2002 and a success monitoring survey was conducted in November 2002. the results of the monitoring surveys are summarized in Section 2.0.

Site Inspection and Maintenance

This program consists of overseeing the implementation and monitoring of the efforts to improve the trails, to remove the exotic species, and to revegetate the riparian and upland areas. Inspections occurred on a monthly basis during the first year after implementation was completed in each habitat, and on a quarterly basis during the second year. The third, fourth, and fifth years of the MMP implementation will include semi-annually monitoring. The progress of the program for 2002 is described in detail in Sections 2.0, 3.0, 4.0, and 5.0.

Sycamore-Oak Woodland Enhancement and Monitoring

This program consists of planting an 11.7-acre area near Cottonwood Avenue to create a sycamore-oak woodland. The program also includes five years of maintenance and monitoring of the revegetation success. Quarterly maintenance inspections were conducted from November 2001 through November 2002. The second annual success monitoring inspection was conducted in November 2002. Section 3.0 describes the implementation and status of the coast live oak – sycamore woodland program.

Exotic Species Eradication

This program consists of the initial removal of non-native invasive vegetation, including giant reed, tamarisk, water hyacinth (*Eichhornia crassipes*), and non-native predatory wildlife, including cowbirds, bullfrogs, and crayfish, from the LACDPW's property and the adjacent Tujunga Ponds. Although LACDRC 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. The program for the removal of exotic plant species was

initiated in November 2000 with giant reed removal at the Tujunga Ponds. Removal of water hyacinth was initiated in December 2000. Section 4.0 describes the exotic plant removal methods and progress for the year 2002. Exotic wildlife removal occurred in January, February, March, April, May, June, July, August, and xxx 2002. Section 5.0 describes the exotic wildlife removal program and progress. Brown-headed cowbird removal was conducted from March 15, 2002 to July 15, 2002. Section 6.0 describes the brown-headed cowbird trapping and removal program, and provides the results for 2002.

Success Monitoring - Fish and Wildlife

This program consists of monitoring populations of sensitive fish, including Santa Ana sucker (*Catosomus* santaanae), Santa Ana speckled dace (*Rhinichthys osculus*), and arroyo chub (*Gila orcutti*), birds including least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*), and amphibians including arroyo southwestern toad (*Bufo microscaphus californicus*), during the five-year MMP implementation. The purpose of the monitoring is to determine the status of these species 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. Monitoring reports are prepared and the LACDPW transmits the reports to the agencies that are issuing the mitigation credits. Native fish sampling surveys were conducted on July 11, 12, and 14, 2002. The results of the surveys for 2002 are summarized in Section 5.0. Seven surveys for the least Bell's vireo and five surveys for the southwestern willow flycatcher took place during April, May, June, and July, 2002. The results of the surveys for 2002 are summarized in Section 7.0.

Trails Enhancement and Reclamation

This program formalizes 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, entering into a partnership agreement with a sponsor for trash collection, and the Consultant's construction and placement of information kiosks. The trails reclamation program consists of the Consultant's 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 closed trails. Details of the program progress for 2002 is described in Section 8.0.

Community Awareness Program

This program consists of utilizing a Community Advisory Committee, and newsletters to educate the local community (the primary source of visitors to the site) about the site's habitat preservation function and the importance of preserving and protecting the site. Quarterly CAC meetings were held in March, June, September, and December 2002. Section 9.0 describes the Public Awareness and Outreach Program.

Figure 1-3 Aerial Photo map

Regular Patrolling of the Mitigation Bank

This measure consists of LACDPW employing local equestrian groups by means of a partnership agreement to provide daily patrols to discourage vandalism and unauthorized activities on the site. This measure is proposed as an option because additional information and coordination with law enforcement authorities are needed to determine the feasibility and effectiveness of using citizen patrols.

Entrance to Marybell Avenue

An equestrian step-over access was installed in May 2002, just west of the existing entrance. The new entrance is located at the junction of Wentworth and Mary Bell.

Water Quality Monitoring

This program begins with the LACDPW's collection and analysis of baseline (pre-project) water quality samples and continues with quarterly sample collection and analysis by the Consultant throughout the five-year MMP implementation. The details of the water quality monitoring status for 2002 are provided in Section 10.0 of this report.

Annual Documentation

This documentation consists of the Consultant's reporting of the results of its success monitoring of wildlife and vegetation for 2002.

Mitigation Banking Agreement

This program consists of entering into an agreement with the California Department of Fish and Game to keep track of the DPW's mitigation credit usage from the Big Tujunga Wash Mitigation Bank site.

Table 1-1
MMP Implementation Schedule

Task	Performer	Start	Finish
Basic Elements			
Consultant Contract	LADPW	04/11/2000	06/30/2000
Water Quality Monitoring	LADPW & Consultant	03/15/2000	04/04/2005
Trails Enhancement	LADPW & Consultant	07/01/2000	12/01/2005
Trails Reclamation	Consultant	07/02/2000	11/30/2002
Exotic Species Removal (Initial)	Consultant	08/15/2000	2/28/2001
Riparian Habitat Enhancement (Excluding Optional Cottonwood Ave. Area and Tujunga Ponds)	Consultant	12/01/2000	12/01/2005
Site Inspection And Maintenance (Trails, Erosion Control, Exotics Control)	Consultant	12/01/2000	12/01/2005
Annual Success Monitoring - Wildlife	Consultant	07/01/2000	08/04/2005
Annual Success Monitoring - Vegetation	Consultant	05/01/2001	08/31/2005
Annual Documentation	LADPW & Consultant	12/01/2000	01/07/2006
Community Awareness Program	LADPW & Consultant	07/15/2000	12/31/2005
Mitigation Banking Agreement	LADPW &	07/15/2000	12/15/2002

	Consultant		

Optional Elements			
Sycamore - Oak Woodland Enhancement	Consultant	10/10/2000	11/31/2005
Obtain Additional Mitigation Credits	LADPW	04/15/2001	07/15/2001
Implementation and Success Monitoring	Consultant	07/15/2001	08/31/2006
Obtain Prelim. Estimate of Additional Mitigation Credits	LADPW	05/01/2000	06/30/2000
Feasibility Study and Selection of Modification Option	Consultant	09/01/2000	07/15/2001
Obtain Additional Mitigation Credits	LADPW & Consultant	07/15/2001	12/31/2001
Regular Patrolling	LADPW & Consultant	11/15/2000	12/31/2005
Marybell Avenue Entrance	LADPW & Consultant	05/20/2002	05/22/2002

1.4 STATUS OF PERMITS

LACDPW entered into a Section 1601 Streambed Alteration Agreement (SAA), 5-247-00, with the CDFG on October 30, 2000 for the implementation of the enhancement measures at the Big Tujunga Wash site. The SAA stipulates the activities that can be undertaken in and adjacent to the stream channel. Because this project is primarily a habitat restoration project, the SAA does not require any mitigation for the activities that will be taking place. Instead, the SAA primarily focuses on measures that must be done to protect the sensitive plants, fishes, and animals on the site. The SAA for the Big Tujunga Wash site describes the accepted methods for removing the exotic (non-native) plants and animal species. The contractors performing the actual work on the site must abide by the conditions in the SAA.

The U.S Army Corps of Engineers (Corps) and the Regional Water Quality Control Board (RWQCB) do not have to issue permits because the only activities taking place on the Big Tujunga Wash site are habitat restoration and enhancement activities. On the other hand, because the federal-listed threatened Santa Ana sucker does occur in the stream on the site, the United States Fish and Wildlife Service (USFWS) does require that the project not result in negative impacts to this species. An explanation of the permitting process with USFWS is described in the Exotic Wildlife Removal section of this report.

1.5 RESPONSIBLE PARTIES

The LADPW shall be responsible for the implementation of the MMP. The contact person is:

Ms. Belinda Kwan
Water Resources Division
Los Angeles County Department of Public Works
900 S. Fremont Avenue
Alhambra, California 91803-1331
(626) 458-6135

The preparer of the MMP is Chambers Group, Inc. The contact person is:

Ms. Mari Schroeder
Project Manager
Chambers Group, Inc.
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Irvine, California 92614

(949) 261-5414

SECTION 2.0 - NATIVE HABITAT RESTORATION PROGRAM

2.1 INTRODUCTION

The ultimate goal of the Big Tujunga Wash Mitigation Bank 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 Bank will provide compensation for loss of similar resources elsewhere in the Los Angeles Basin.

2.1.1 PURPOSES AND GOALS

Restoration is intended to improve the habitat value of an existing plant community. The goal of the riparian restoration plan is to remove invasive non-native weed species such as giant reed and to replant these areas with native riparian species. In addition, several extraneous equestrian trails throughout the riparian zone were 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.

The long-term goal of the MMP is to create a site that provides habitat for common and listed species of wildlife, requires minimal maintenance, and is resistant to invasion by non-native plant species. The established communities will encourage biotic interactions from the micro-organismal to the macro-organismal level by maintaining nutrients within the organic matter and providing a self-sustaining system.

FUNCTIONAL ANALYSIS

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 is also used as a tool to assess the success of the habitat restoration program initiated in late 2000.

2.1.2 VEGETATION DESCRIPTIONS

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. The southern willow riparian woodland is dominated by arroyo willow (*Salix lasiolepis*) occurring in the area surrounding the Tujunga ponds and follows the stream running along the southern section of the property (Haines Canyon Creek). Red willow (*Salix laevigata*) and black willow (*Salix gooddingii*) are well represented. Occasional individuals of Fremont cottonwood (*Populus fremontii*) and white alder (*Alnus rhombifolia*) are also found. The understory is dominated by eupatorium (*Ageratina adenophora*), mule fat (*Baccharis salicifolia*), and mugwort (*Artemisia douglasiana*). A small stand of southern arroyo willow riparian woodland also occurs along a wash in the northern portion of the site (Big Tujunga Creek). Mule fat scrub also occurs in the restoration and enhancement areas. This tall, herbaceous riparian scrub is dominated by mule fat.

2.2 METHODOLOGY/DATE OF IMPLEMENTATION

RESTORATION

The initial site preparation included conducting a site walkover in early October 2000 to identify exotic plant removal areas, and the placement of orange snow fencing across trails and other access points to delineate the limits of the restoration areas. Trails to be reclaimed to native habitat were identified, and access to these trails was blocked with vegetative debris such as dead branches.

The first step in the restoration plan was preplanting weed control, including removal of giant reed and tamarisk from areas to be reclaimed to native habitats. Giant reed and tamarisk removal was initiated on November 13, 2000 in the riparian habitat surrounding the Tujunga Ponds and Haines Canyon Creek and concluded on February 21, 2001. The status of the exotics removal program is described in detail in Section 4.0, Exotic Plant Removal Program.

The riparian enhancement planting schedule was revised due to weather conditions and material availability. Approximately one quarter of the site immediately adjacent to the stream channel was planted February 2001, while the remaining planting was delayed until early January 2002. The 120-day maintenance period was also delayed until the completion of the riparian planting installation. Approximately 1,500 hardwood cuttings of willow (*Salix* sp.) and mule fat (*Baccharis salicifolia*) cuttings were installed in the initial planting. Planting at least a portion of the site was preferable to delaying the complete installation until the following season for several reasons. Large areas of giant reed were removed from around the ponds and stream banks, leaving many of these areas without vegetation. Immediate revegetation of these areas was critical to provide erosion protection, thus protecting the stream fauna, including the sensitive fish species. Some of the cutting materials used in these areas utilized branches trimmed from the willows during the giant reed removal process. The cuttings were installed as per the specifications in the MMP, and under the supervision of the Project Biologist. The planting of cuttings in these areas was completed on February 21, 2001.

Planting of the remaining three-quarters of the enhancement area was initiated on January 3, 2002 and completed on January 18, 2002. Approximately 5,500 cuttings of willow and mule fat were installed in the 24 separate areas along Haines Canyon Creek in Sections 3 and 4. Additional container and liner plants were installed, including Fremont Cottonwood (*Populus fremontii*), California rose (*Rosa californica*), California blackberry (*Rubus ursinus),* and coastal prickly pear (*Opuntia littoralis*). The sizes and quantities of plants were altered from the original numbers specified in the MMP. A major factor for the alteration of planting container sizes was the survival of cuttings installed in 2001. These were primarily concentrated in shaded areas. The cottonwood trees were installed in all planting areas, including the areas previously planted in Sections 1 and 2. Planting materials were installed as per the specifications in the MMP, and under the supervision of the project biologist.

Biological monitors were onsite to oversee the implementation and completion of the exotic plant removal and partial planting in the restoration areas. Maintenance monitoring was initiated in the riparian enhancement areas after planting was finished.

FUNCTIONAL ANALYSIS

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. Evaluation variable assess riparian habitat functions (e.g. cover, structure, etc.), hydrologic and biogeochemical functions, and wildlife values. A complete discussion of the functional analysis design is included in the 2002 Functional Analysis Report (Appendix A).

Annual functional analyses are scheduled to quantitatively assess the progress of the restoration effort. A functional analysis was conducted on the site in 1997 to establish baseline functional values for the riparian habitats (Chambers Group 1998). The second annual functional analysis was conducted on August 22 and 23, 2002, by Chambers Group botanists Ken McDonald and Kent Hughes. The full text of the 2002 Functional Analysis is included in Appendix A.

ENHANCEMENT/TRAILS RECLAMATION

Trails were enhanced throughout the year during periodic maintenance sessions. Large rocks and overhanging branches were removed. These materials were placed alongside the trails to further delineate the path. The closed trails were monitored and obstructive barriers were replaced as needed. No additional trails in the riparian restoration areas were reclaimed to native habitat.

ANNUAL PERFORMANCE MONITORING

Data were collected at the site by Ken McDonald and Linda Robb on November 18, 2002. Vegetation cover in the riparian areas was estimated visually. Tree survival data were collected by walking through each planting area and assessing each installed cottonwood tree. Photographs of the riparian planting areas are shown in Appendix B. Copies of all data sheets and raw data are included in Appendix C. Figure 2-1 shows the checklist for the tasks that have been completed thus far.

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. 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 survival and cover standards for the cottonwood tree plantings are summarized in Table 2-1. Height standards for cottonwood trees are shown in Table 2-2.

Table 2-1
Survival and Cover Standards

Species	1st Year	3rd Year	5th Year[1]
Cottonwood	80% survival	90% survival	100% survival
[1] **Performance standards during Year 5 must be attained without human interference (irrigation, rodent control)**			

Table 2-2
TREE HEIGHT STANDARDS

Species	Size	Average Height (Feet)	
		3rd Year	5th Year
Cotttonwood	5 Gallon	7	13

2.3 PROJECT MONITORING STATUS

MAINTENANCE, MONITORING, AND REPORTS

Maintenance monitoring of the planted areas was initiated immediately after the partial planting was completed. Monthly monitoring visits for the remaining three-quarters of the enhancement area were initiated in February 2002. Monitoring summaries for the riparian planting areas were produced as a separate report and included in the quarterly monitoring reports for the Oak/Sycamore Woodland Restoration area for the months of February, May, and August 2002 (Appendix D). Quarterly maintenance monitoring visits of the riparian planting areas will begin in May of 2003. The next Functional Analysis will be conducted in August 2003.

2.4 RESULTS

FUNCTIONAL ANALYSIS

Approximately 66 trees and 180 shrubs per acre were found in the riparian habitat at Big Tujunga Wash Mitigation Bank. Approximately 59 percent of the shrubs and 87 percent of the trees encountered during the survey were native species. The tree canopy forms a patchy canopy cover throughout the site in most areas (approximately 50 percent cover overall), and shrubs form a sparse understory cover of approximately 5 percent. The relative frequency of trees to shrubs was approximately equal. The results for overall density, dominance (percent cover), and relative frequency for the Big Tujunga Wash riparian habitat are summarized in Table 2-3.

Table 2-3
Density, Dominance, and Relative Frequency

	Density (# plants/acre)	Dominance (Percent Cover)	Relative Frequency (% of total community
Native Species			
Trees	58	41.1	-
Shrubs	107	5.7	-
Non-Native Species			
Trees	8	9.6	-
Shrubs	73	0.2	-
Summary All Species			
Trees	66	50.4	49.7
Shrubs	180	4.6	50.3

Overall organic cover was relatively high at approximately 85 percent, and the presence of annual grasses was low at approximately 7 percent cover. The average number of topographic features encountered per 100 meters was approximately 18. 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 2-4.

Figure 2-1

BIG TUJUNGA WASH MITIGATION BANK

NATIVE RIPARIAN HABITAT ENHANCEMENT PLAN CHECKLIST

- ☒ Coordinate with Corps regarding need for Nationwide Permit.
- ☒ Obtain Streambed Alternation Agreement.
- ☒ Remove invasive non-native weed species.
- ☒ Prepare equestrian trails designated for enhancement.
- ☒ Prepare enhancement sites (prune native trees as necessary).
- ☒ Install erosion control measures.
- ☒ Schedule plant materials delivery date and planting crew.
- ☒ Layout planting scheme for Landscape Contractor.
- ☒ Collect suitable plant material from site.
- ☒ Cuttings and container plants installed.
- ☒ Perform landscape maintenance.
- ☒ Inspect site monthly during the establishment period.
- ☒ Restoration Specialist submits report to LADPW and Resource Agencies.

Table 2-4
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)
85.3	6.5	2.68	17.5

For the riparian system, the FU is calculated to be 0.88 per acre.

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:

$FCU_{Big\ T} = (0.88_{FUwillows})(76 \text{ acres of willows}) = 66.88$

The Functional Capacity Unit value of the riparian habitat at the Big Tujunga Wash Mitigation Bank has increased from 59.74 in 1997 to 63.84 in 2001 and 66.88 in 2002. This is an increase of approximately 5 percent from 2001 to 2002 and 10 percent from 1997 to 2002. The overall functional unit capacity increase is a result of increases in four different variables since 1997. Increases were noted in the variables for Percent Exotic Invasive Species/Vegetation, Micro and Macro Topographic Complexity, Terrestrial Wildlife (Vertebrate) Species Richness, and Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife). These increases resulted in greater Functional Unit and Capacity values although a decrease in overall riparian cover was also noted. Details of the results of the Functional Analysis are found in Appendix A.

ENHANCEMENT/TRAILS RECLAMATION

Only minor enhancements to the trails were required during 2002. Trail users have continued to access some of the reclaimed trails. One example is the trail between the two ponds, where trail users have continually pushed aside the barrier. The removal of the connecting bridge has reduced the amount of foot traffic, but has not stopped it. The bridge has been replaced by trail users using logs and branches several times. The contractor removed the make-shift bridge each time it was erected during regular maintenance visits to the site. Detailed information on the Trails Program can be found in Section 8.0. Figure 21 shows the checklist for the riparian habitat enhancement plan implementation tasks that have been completed thus far.

SEEDING AND PLANTING IN REVEGETATION AREAS

The partial planting within the revegetation areas met with varied success. In some areas, willow (*Salix* sp.) and mule fat (*Baccharis salicifolia*) cuttings grew vigorously, while in other areas few cuttings survived. The cuttings that did well were generally in fairly close proximity to the creek or close to the water table level. The installed California rose (*Rosa californica*) and California blackberry (*Rubus ursinus*) also varied in their success due to the same reasons. The installed pads of coast prickly pear cactus (*Opuntia littoralis*) had 100% survival, as the water requirements for establishment is very low for this species. Overall survival of the cottonwood trees installed in the riparian planting area was low at approximately 38 percent, due to lack of sufficient water and some vandalism. Of the original 231 cottonwoods, only 87 living trees were located. An additional 57 dead-appearing trees were also observed. No seeding was implemented in the riparian revegetation areas.

COVER

Vegetation cover in the riparian planting areas was low, with an overall estimate of 15 percent cover. Installed cuttings were not well developed in most of the areas, and very few naturally recruited plants were emerging from the thick layer of giant reed mulch covering much of the planting areas, although the volume of the mulch has decreased by more than 50 percent since the initial reed removal.

2.5 SITE EVALUATION AND RECOMMENDATIONS

OVERALL SITE CONDITIONS

The site has been very dry for most of the year, which has affected plantings. Vegetation cover in the riparian planting areas was low, as installed cuttings were not well developed in most of the areas, and few naturally recruited plants emerged. As the mulch breaks down, an increased number of naturally recruited plants are expected to germinate. Low survivorship of cottonwood trees in the riparian planting areas was attributed to lack of sufficient water and vandalism. Vandalism accounted for approximately 20 percent of the cottonwood mortality.

The contractor kept weeds to a minimum during monthly maintenance activities throughout the year. Only a low cover of winter annual weeds was noted during the last inspection, and giant reed resprouts throughout the site were small and infrequent.

MAINTENANCE RECOMMENDATIONS AND REMEDIAL ACTIONS

Replacement plantings of cottonwood trees in the riparian planting areas should be implemented. Due to the low survivorship of cottonwood trees overall, willows should be substituted for at least half of the cottonwoods. Approximately 27 cottonwood trees in 5-gallon containers and 30 willows in 1-gallon containers should be installed to increase the survivorship to the required 80 percent survival. As much of the mortality was due to insufficient rainfall, replacements should only be installed as close to the stream, pond, or corresponding water table, and as far from areas easily accessible to trail users as possible to increase survival potential of the plantings. If it is not possible to plant in appropriate areas, the planting numbers or species used should be altered to better accommodate the existing conditions.

Weed abatement should continue throughout the riparian planting areas to prevent the spread or regrowth of unwanted exotic plants, such as giant reed, and prevent the increase of the weed-seed bank.

No additional maintenance recommendations or remedial actions are required at this time.

SECTION 3 – COAST LIVE OAK/SYCAMOREWOODLAND REVEGETATION PROGRAM

3.1 INTRODUCTION

The creation of a coast live oak-sycamore woodland with a coastal sage scrub understory community was included as an optional enhancement measure in the Draft Enhancement document for the Big Tujunga Wash Mitigation Bank site (Chambers Group 1998b). During the preparation of the MMP, the determination was made that the upland area, where the asphalt plant used to be located, could be converted from non-native grassland to a native plant community. The existing oaks and sycamores in this area provide a good indication that the area would support a native plant community. Consequently, an optional enhancement measure was developed to address the revegetation of the upland areas. Preliminary discussions with the Corps of Engineers indicated that they might offer a ratio of 0.5 to 1.0 for the establishment of coast live oak – sycamore woodland with a coastal sage scrub understory. If this mitigation ratio is accepted, then an additional 5.85 credits would be available in the Mitigation Bank. These credits would be associated with habitats that do not occur elsewhere in the bank and may potentially be used to offset impacts on these habitats from other LADPW projects.

Purpose and Goals

The goal of the revegetation plan was to create a coast live oak–sycamore woodland with an undifferentiated coastal sage scrub understory in the revegetation areas on the site previously occupied by non-native grasslands. The composition of these revegetation areas when mature will support the breeding and foraging activities of a variety of sensitive species, such as red-shouldered hawk, Cooper's hawk, and coastal California gnatcatcher. The mature revegetation area will also provide an additional buffer between the urban areas and the riparian zone. The revegetation plan consisted of various tasks from preparing the areas prior to planting to installing container plant and seed materials, and included provisions for the maintenance and monitoring of the site.

3.2 METHODOLOGY/DATE OF IMPLEMENTATION

Location

Approximately 11.7 acres of habitat was planted on the terrace south of Haines Canyon Creek along Wentworth Street. The upland terrace is elevated on a bench approximately 25 feet above the riparian habitat. Approximately 4.8 acres of this area was planted primarily as a coastal sage scrub community with occasional sycamores. The remaining 6.9 acres was revegetated as coast live oak – sycamore woodland with an undifferentiated coastal sage scrub understory. Installation was completed November 22, 2000. The portion of the upland area that is covered with the concrete pad from the old asphalt plant was not included as part of the upland revegetation area. For convenience in monitoring and reporting, the restoration area was divided into sections. Sections 1 through 5 are the woodland revegetation areas, and Sections 6 and 7 are the coastal sage scrub areas. Figure 3-1 shows the locations and types of restoration and enhancement areas on the site.

Restoration Areas

Maintenance of the mitigation site was performed by Natures Image, with the knowledge and oversight of a Chambers Group Restoration Specialist. Natures Image was responsible for conducting horticultural maintenance of the mitigation areas, including irrigation, pest control, erosion control, and weed removal throughout the mitigation areas. Replacement planting took place in February 2002. Installed shrubs included California sagebrush (*Artemisia californica*), California brittlebush (*Encelia californica*), hoary leaf ceanothus (*Ceanothus crassifolia*), and spiny redberry (*Rhamnus crocea*).

Figure 3-1 Upland Restoration Revegetation Areas map

Quarterly monitoring visits were conducted by a Chambers Group restoration specialist starting in November 2001 and continuing through November 2002. After each monitoring visit, the Chambers Group Restoration Specialist produced a letter report describing site conditions and providing recommendations for changes in maintenance activities. Copies of the quarterly maintenance monitoring reports are provided in Appendix D.

Enhancement/Trails Reclamation

The trail leading from the south eastern-most portion of the upland area was closed after the Mary Bell equestrian entrance was installed. The trail was not planted or seeded. No additional trails were reclaimed or closed during 2002. The existing trails in the upland habitat were kept clear of debris and vegetation as necessary during monthly maintenance periods.

Annual Performance Monitoring

Data were collected at the upland site by Ken McDonald and Linda Robb on November 14 and 15, 2002. A stratified random sampling scheme was devised to avoid biased data collection. A total of 62 quadrats positioned on twenty 50-meter line transects were used to measure vegetation cover quantitatively. This method provides quantitative data on density, frequency, and dominance of vegetation. Line-transect and quadrat selection was randomized. Two to four perpendicular transect lines extending from a baseline transect in each of the seven sections were selected using a random number generator. At least three quadrat plots were selected along each transect line, using numbers from a random-number generator. Each point became the center for a meter-square quadrat. Each species visually encountered in each quadrat was noted, and the number of individuals of native species was recorded. The percent cover for all species and unvegetated ground was estimated within each quadrat. Cover estimates were averaged to find Percent Cover in each section and for the site as a whole. Additional information was recorded, such as date, field crew, and location information of each quadrat area. Photos taken from pre-established locations are included as Appendix E. Figure 3-2 shows the checklist for the tasks that have been completed thus far.

Tree and Container Plant Survival

Tree and container plant survival data were collected by walking parallel transects through each section and tabulating each living container plant encountered. The species of each installed plant encountered were recorded on standardized data sheets. The results are reported as the total number found for each species. Copies of all data sheets are included in Appendix C.

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. 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 survival and cover standards for the coast live oak-sycamore woodland and coastal sage scrub plantings are summarized in Table 3-1. Height standards for oaks (*Quercus agrifolia*) and sycamores (*Platanus racemosa*) are shown in Table 3-2.

Figure 3-2

BIG TUJUNGA WASH MITIGATION BANK

UPLAND NATIVE HABITAT RESTORATION PROGRAM CHECKLIST

- ☒ Contract with Restoration Specialist.
- ☒ Contract with Landscape Contractor.
- ☒ Restoration Specialist and Landscape Contractor conduct field meeting.
- ☒ Contract with Landscape Architect to design irrigation system.
- ☒ Restoration Specialist identifies restoration areas.
- ☒ Contract for plant materials.
- ☒ Identify areas to be protected.
- ☒ Isolate areas to be protected with construction fencing prior to construction.
- ☒ Restrict construction equipment to designated areas and refueling to areas designated by Restoration Specialist.
- ☒ Restrict heavy equipment to outside of dripline of any tree preserved.
- ☒ Restoration Specialist attends pre-construction meeting(s).
- ☒ Pretreat site for weeds.
- ☒ Conduct soil analysis (if necessary).
- ☒ Install erosion control measures.
- ☒ Install, test and adjust irrigation system.
- ☒ Schedule plant materials delivery date and planting crew.
- ☒ Layout planting scheme for Landscape Contractor.
- ☒ Install container plants.
- ☒ Apply seeds.
- ☒ Initiate irrigation (if necessary).
- ☒ Coordinate replacement plantings.
- ☒ Install replacement plantings, monitored by Restoration Specialist.
- ☒ Install plant protection fencing (if herbivory is a problem).
- ☒ Perform landscape maintenance.
- ☒ Inspect site monthly during the establishment period.
- ❑ Restoration Specialist submits annual report to LADPW and revegetation contractor by January 1 each year following implementation

Table 3-1
Survival and Cover Standards

Species	1st Year	3rd Year	5th Year[1]
Shrubs	80% survival	90% survival	100% survival 75% cover
Sycamore and Oak Trees	80% survival	90% survival	100% survival
Seed Mixes[2]	None	None	None

[1] Performance standards during Year 5 must be attained without human interference (irrigation, rodent control)
[2] If adequate germination is not attained to prevent erosion or exclude weed infestations, reseeding may be necessary.

Table 3-2
Tree Height Standards

Species	Size	Average Height (Feet)	
		3rd Year	5th Year
Sycamore	5 Gallon	7	13
Oak	1 Gallon	3	6

3.3 RESULTS

Cover and Density

The overall upland vegetation cover for the second year has increased since the first annual inspection, but was still low at approximately 47 percent. Cover of installed or seeded native species was 19 percent and cover of non-native plants was 28 percent. Density of native plants was high at approximately 1.2 per square meter overall, or about 4,830 plants per acre.

Survival Rates

A total of 452 installed container plants were observed during the 2002 inspection. Overall survival of upland plants was 74 percent. Some of the installed plants were lost to underground herbivory by gophers. A total of 501 plants were counted in November 2001, and an additional 111 container shrubs were installed in February 2002, bringing the number up to 612 container plants. A total of 701 trees and shrubs were counted in 2002, but 249 of these were attributed to recruited California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) shrubs that could not be easily distinguished from installed shrubs. The number of sycamore trees declined slightly with 46 trees counted, a loss of 5 sycamores since the previous survey. Oak trees had a more pronounced decline with a loss of 45 trees for this year, leaving 127 of the original 211 trees. Tree survival for both oak and sycamore was 78 percent for 2002, 173 of the 223 trees counted in 2001. Other than the sagebrush and California buckwheat, overall shrub survival has declined. Hoary leaf ceanothus (*Ceanothus crassifolius*) suffered the greatest loss with none of the 20 installed plants observed. Fuchsia-flowered gooseberry (*Ribes speciosum*), California brittlebush (*Encelia farinosa*), and Nevin's barberry (*Berberis nevinii*) also declined with 17, 30, and 33 percent survival respectively. Of the remaining shrubs, spiny redberry (*Rhamnus crocea*) did well with 80 percent surviving. Natural recruitment of sycamore trees and other native species was observed in several sections. Container plantings survivorship for the upland planting area is summarized in Table 3-3.

Table 3-3
Surviving Container Plantings

Common Name	Species	2001	2002	Percent Survival
Coast live oak	*Quercus agrifolia*	172	127	**74**
California sycamore	*Platanus racemosa*	51	46	**90**
California buckwheat	*Eriogonum fasciculatum*	89	89**	**100**
Fushsia-flowered gooseberry	*Ribes speciosum*	12	2	**17**
Chaparral whitethorn	*Ceanothus leucodermis*	14	8	**57**
California sagebrush	*Artemisia californica*	85 (+12*)	97***	**100**
Coastal prickly pear	*Opuntia littoralis*	39	19	**49**
Nevin's barberry	*Berberis nevinii*	3	1	**33**
Toyon	*Heteromeles arbutifolia*	36	18	**50**
California bush sunflower	*Encelia farinosa*	20*	6	**30**
Hoary-leaved ceanothus	*Ceanothus crassifolius*	20*	0	**0**
Spiny redberry	*Rhamnus crocea*	10*	8	**80**
Laurel sumac	*Malosma laurina*	49	31	**63**
	TOTAL	612	452	**74**

* - installed February 2002.
** - 283 actually counted. Gain of 194 plants attributed to natural recruitment.
*** - 152 counted. Gain of 55 attributed to natural recruitment.

3.4 SITE EVALUATION AND RECOMMENDATIONS

Overall Site Conditions

The overall site was in good condition as of the last maintenance monitoring visit on November 15, 2002. The overall cover of vegetation was low for the second year, most likely due to lack of sufficient precipitation. Fewer of the imprinted seeds germinated in the second year than was expected. The highest concentrations of germination were seen adjacent to container plants receiving supplemental irrigation. Erosion control devices have not been utilized and are not required for the site at this time. All trails in the restoration area are well marked, clear of weeds and debris, and in good repair.

Most of the installed container plants were found alive during the annual monitoring inspection. Mortality in container plantings was due to various causes such as herbivory and extreme temperatures, which also affected many of the seeded species. Loss of some of the container stock is attributed to breaks in the irrigation lines.

The irrigation system for the container plants sustained frequent damage from coyotes. Breaks in the line due to chewed hoses were reported in restoration areas on a quarterly basis. The contractor was advised immediately each time and advised that the system required repair. The irrigation system for the site operated adequately where it was undamaged.

As water was scarce in the unirrigated portions of the site, few plants were available to gophers. Consequently, the gophers were drawn to the container plants and herbivory resulted in the loss of at least 20 of the plants installed in the upland areas as well at least another 20 germinated imprinted seedlings. Replacement plantings were placed in underground herbivory cages, some of which were not adequate against underground herbivory. A limited trial control method in the form of gas "gopher bombs" was implemented and proved successful in reducing predation on the container plants.

Weed cover remains low overall, although numerous weed seedlings were observed. Many native species seedlings were also seen throughout the site.

Several minor problems were noted during the 2002 maintenance inspections. Recommendations for remedial actions are discussed below in Maintenance Recommendations.

Maintenance Recommendations

- Coyotes will continue to be a problem as long as the irrigation system is needed. Repairing and reburying the damaged tubing is time and resource consuming. Discontinuing irrigation should be considered, except for replacement planting. This may be a viable alternative, as the winter precipitation may be adequate for the planting requirements.

- The trial herbivory control of gas "gopher bombs" that was implemented appeared to have a positive effect. This method should be continued in order reduce the gopher population on the site and reduce potential vegetation losses.

- Weed cover remains low overall, although numerous seedlings, primarily weed species, were observed. A greater amount of seeded native species would aid in deterring non-native weeds. Remedial seeding throughout the areas of the revegetation area should be considered, particularly where trails have been closed. Weed abatement activities should be continued as necessary to prevent weed competition with planted native species and to prevent the increase of the weed-seed bank.

3.5 PROJECT MONITORING STATUS

Maintenance, Monitoring and Reports

Inspection monitoring for 2002 began in November 2001 and continued through November 2002. After each monitoring visit, the Chambers Group Restoration Specialist produced a letter report describing site conditions and providing recommendations for changes in maintenance activities. Copies of the 2002 maintenance monitoring reports are provided in Appendix D.

The second annual performance monitoring survey was conducted in November 2002. Semi-annual monitoring will be conducted in the oak/sycamore area through November 2003. Table 3-4 shows the maintenance and performance monitoring inspection schedule for the site, and reporting requirements

Table 3-4
Maintenance and Success Monitoring Schedule and Reporting Requirements

Year	Maintenance Inspections and Reports	Success Monitoring Surveys and Reports
1 (2001)	Monthly (through November 2001)- LACDPW	Annual (December 2001) – LACDPW, CDFG, ACOE
2 (2002)	Quarterly (February, May, August, November) - LACDPW	Annual (December 2002) – LACDPW, CDFG, ACOE
3 (2003)	Semiannually (May, November) - LACDPW	Annual (December 2003) – LACDPW, CDFG, ACOE
4 (2004)	Semiannually (May, November) - LACDPW	Annual (December 2004 – LACDPW, CDFG, ACOE
5 (2005)	Semiannually (May, November) - LACDPW	Annual (December 2005 – LACDPW, CDFG, ACOE

In addition to the required maintenance inspections, the site is briefly visited by the biological monitor while monitoring the riparian restoration on the site (i.e., exotic plant removal in the riparian habitats). Signs are repositioned when necessary, and any observed vandalism or other damage is reported in the monitoring reports.

Enhancement/Reclamation Trails

The existing upland trails are inspected during monitoring visits and maintained as necessary during routine maintenance periods.

SECTION 4.0 – EXOTIC PLANT REMOVAL PROGRAM

4.1 INTRODUCTION

The exotic plant removal program includes the removal of non-native plant species from Haines Canyon Creek, Big Tujunga Wash, 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. The non-native weed species within the creek will be eradicated, with an emphasis on giant reed (*Arundo donax*), water hyacinth, and tamarisk. 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* spp.), and tree tobacco (*Nicotiana glauca*), among others.

4.1.1 PURPOSE/GOALS

Enhancement is intended to improve the habitat value of an existing plant community. The overall goal of the riparian enhancement plan is to remove invasive non-native weed species such as giant reed and to replant these areas with native riparian species. 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 after the exotic species have been removed.

Impacts to existing habitat are minimized through project scheduling and construction monitoring. Construction on the site began after the end of the nesting season (approximately August 30th) to minimize impacts on nesting bird species and breeding activities of amphibians; and avoid violations of the Migratory Bird Treaty Act. Biological monitors oversee the activities of the contractor removing the exotics, and provide recommendations for changes in the removal methods and other activities. The following sections describe the methods used for exotic plant species removal, and the progress of the program through November 2002.

4.2 METHODS

Some incidental removal of other exotic plant species from the restoration areas and along side trails was accomplished as giant reed was removed. Exotic weed removal activities will continue as needed. Figure 4-1 shows the checklist for the exotic plant removal program tasks that have been completed thus far.

Figure 4-1

BIG TUJUNGA WASH MITIGATION BANK

EXOTIC PLANT SPECIES ERADICATION PROGRAM CHECKLIST

☒ Ensure Streambed Alteration Agreement has been obtained.

☒ Coordinate with Corps to be sure 404 permit not required.

Giant Reed

☒ Notify CDFG.

☒ Notify U.S. Forest Service that we will be consistent with the plans they have submitted.

☒ Determine offsite locations for disposal.

☒ Purchase all supplies/equipment (e.g. Rodeo®).

☒ Locate the vehicle containing Rodeo® adjacent to the site.

☒ Use existing access areas that are devoid of vegetation.

☒ Treat Rodeo® with dye.

☒ Apply 2 to 5 percent Rodeo® solution to giant reed at a rate of .5 to 1 liter per hectare.

☒ Apply Rodeo® from mid August to early November.

☒ Cut treated leaves and stems after the initial foliar treatment.

☒ Remove treated leaves and stems by hand tools.

☒ Avoid heavy equipment or other vehicles within the stream.

☒ Chip treated vegetative waste in situ for mulch.

☒ Ensure cut green stems are removed from site.

☒ Ensure dry, treated stems reduced to mulch are not placed to create a fire potential.

☒ Apply followup foliar application to resprouting stems in the third and seventh week after initial treatment.

❑ Quarterly inspect site for a minimum of 5 years.

Tamarisk

☒ Notify CDFG.

☒ Purchase all supplies/equipment (e.g. Rodeo®).

☒ August 30—Begin cutting plants within 6 inches of ground using hand tools.

☒ Determine offsite location for disposal.

☒ Remove cut material from site and dispose of at an offsite location.

☒ Ensure cut material is not left onsite.

☒ Apply undiluted Rodeo® to the entire stump surface immediately after cutting.

☒ Cover the entire circumference of the stump with Rodeo®.

☒ Inspect treated plants in the third and seventh week following the completion of the initial eradication.

☒ If any treated stumps show signs of new growth, or any new plants are found, then perform subsequent treatment as described above.

❑ Conduct quarterly inspections for a minimum of 5 years.

Water Hyacinth

☒ Notify CDFG.

☒ Purchase all supplies/equipment (e.g. Rodeo®).

☒ Determine offsite location for disposal.

☒ August 30—Begin eradication of water hyacinth.

☒ Free-floating plants, including roots, will be removed from the water by hand. Completely necrotic plants will be removed by hand. All plant fragments must be collected and removed from the site.

☒ If water hyacinth is rooted in the mud, an application of undiluted herbicide (Rodeo®) per label guidelines will be applied to the entire plant surface by spraying evenly over the plants. The applicator will ensure that the herbicide spray does not drift onto neighboring native riparian plants.

☒ Ensure dead material is not left onsite.

☒ Inspect treated plants 3 weeks and 7 weeks after application. If any treated plant shows evidence of new growth, or if any new water hyacinth plants are found, subsequent treatment will be performed as described above.

☒ To prevent oxygen depletion of the pond water due to decomposition of the treated plants, dead biomass will be removed from the water during each inspection. Biomass will be removed from the site and disposed of at an approved offsite location.

❑ Conduct quarterly inspections for a minimum of 5 years.

4.2.1 Giant Reed Removal

Giant reed removal began on November 13, 2000 near the Tujunga Ponds, and was completed on February 21, 2001. During 2002, resprouts of giant reed were treated with a highly concentrated (up to 100 percent) solution of Rodeo® using hand-held equipment during the monthly maintenance visits. The regrowth was generally allowed to reach 1 to 4 feet in height, and was then treated. All regrowth of this species was reported to the contractor during the maintenance monitoring visits.

4.2.2 Water Hyacinth Eradication

Water hyacinth eradication was initiated on December 21, 2000 and was completed on January 10, 2001.

No water hyacinth was observed during the 2002 maintenance period. Any reoccurrence of this species is identified during the maintenance monitoring visits and treated by the maintenance contractor.

4.2.3 Tamarisk Eradication

Tamarisk eradication was conducted in the riparian habitat during the giant reed removal program.

No tamarisk was observed during the 2002 maintenance period. Any regrowth or new individuals of this species is identified during the maintenance monitoring visits and treated by the maintenance contractor.

4.3 Status/Results

Some regrowth of giant reed was noted in various areas occasionally throughout the year. As described in the methods section, the regrowth was treated with herbicides during monthly maintenance periods. No water hyacinth was observed during the 2002 maintenance period. No regrowth of tamarisk was observed during the 2002 maintenance period.

4.4 Monitoring Schedule

Monitoring of exotic plants in the restoration areas will continue on a quarterly basis beginning in May of 2003.

SECTION 5.0 – EXOTIC WILDLIFE REMOVAL & NATIVE FISH SAMPLING PROGRAMS

5.1 INTRODUCTION

Dr. Dan Holland, Dr. Camm Swift, and Mr. Robert Goodman conducted initial surveys at the site to determine the most appropriate method of eradication of exotic wildlife species and enhancement for native fishes and amphibians. The MMP provides direction for the eradication of exotic aquatic wildlife during the 5-year duration and also contains a more detailed description of the various methodologies available for exotic wildlife removal. Long-term monitoring of exotic aquatic wildlife populations and periodic eradication will be negotiated between Public Works and the resources agencies.

5.1.1 Purpose and Goals

Swift et al. (1993) note "Today, natural habitats for the freshwater fishes of coastal southern California exist in hilly or mountainous headwater areas and in a few coastal localities that have remained protected. The broad lowland areas between are highly modified and largely uninhabitable for resident species and those that migrate between the headwaters and the coast. Thus, the priorities for the preservation of the native fauna are: (1) protection of the remaining coastal and interior habitats containing elements of the native fauna and (2) restoration and/or rehabilitation of some portion of the now unsuitable intervening areas." Additionally, widespread loss and alteration of habitats has resulted in major reductions of both local species diversity and changes in the status and stability of many local vertebrate populations. Due to their extremely limited extent, the nature and degree of alteration, human activities and actions have disproportionately affected riparian and wash habitats and the species they hold. These include channelization, construction of dams, changes in historic water flow patterns, the effects of exotic species and other anthropogenic factors.

At present, suitable habitat on the project site for sensitive native aquatic vertebrates is largely confined to the portions of Haines Canyon Creek downstream from the ponds and in Tujunga Ponds when there is standing water in the system. The ponds essentially do not provide habitat for most native vertebrate species. Lacustrine habitats, particularly deep-water lacustrine habitats were a historically very uncommon type of environment in southern California, usually occurring only as seasonal deep-water pools along rivers and streams. Additionally, the ponds are likely to add significant negative impacts on the native vertebrate fauna by fostering the presence of a source population of exotic invertebrates and vertebrates. These exotic species may directly impact natives through predation or competition, or indirectly through transmission of pathogens and/or parasites.

Thus, the ultimate goals of this project are:

1. to restore or create and maintain habitat for native fishes and other sensitive vertebrate species,

2. to eliminate, diminish and/or restrict habitat which fosters the maintenance of exotic species, and

3. to engage in localized or site-by- site direct control efforts for exotic species to complement goals 1 and 2.

The exotic wildlife removal program consists of the removal of non-native fishes, bullfrogs (*Rana catesbeiana*), and crayfish (*Procambarus clarkii*) from Haines Canyon Creek and the Tujunga Ponds. Bullfrogs are not native to the area and pose a major threat to native wildlife because they have voracious appetites and prey upon the sensitive fishes, frogs, and toads.

5.2 Methodology

The native fish sampling and exotic wildlife removal program is being conducted through the individual permit of the fish expert and exotic wildlife removal subconsultant, Dr. Camm Swift. The following sections describe the two primary efforts of 1) sampling native fishes within Haines Canyon Creek and 2) sampling and subsequent removing exotic aquatic species from both the Tujunga Ponds and the Haines Canyon Creek.

5.2.1 Native Fish Sampling in Haines Canyon Creek

Transects for native fish sampling within Haines Canyon Creek were conducted on July 11-14, and November 15-18, 2002. The transects were established in December 2000 with random methods over the 1600 meters of stream, an approximately 20 percent sample. Transects were established within the first 20-meter stretch of both riffle and run habitat. A total of 16 transects were conducted. At each collection, each transect was blocked at the upper and lower end with 1/8 inch netting firmly anchored at the margins and to the bottom of the stream. This was done with minimal disturbance to the habitat. Then two persons seined for at least one hour with a variety of techniques to exhaustively sample all the fishes. Collecting began at the downstream end of each transect, with continuous hauls being taken in sequence all the way to the upstream net. Native fishes were held in large buckets (at most 1 hour) and oxygenated frequently. At the end of each collection, the fishes were counted, their sizes were estimated to the nearest 10 centimeters, and then they were released back into the transect area. In addition to collecting data on the fishes, habitat features such as water temperature, substrate type, depth, width, available cover, canopy, and gradient or slope were also measured and recorded.

5.2.2 Exotic Wildlife Removal in the Tujunga Ponds

Exotic wildlife collection and removal in the Tujunga Pond and Haines Canyon Creek occurred on January 24-27; February 27-March 2; March 21-22; April 3-5, 13-15, 16-17, and 29; May 2-3, 8, 16-17, and 25; June 9-11 and 19; July 3, 11-12, and 14; August 5-9, and 26-30, 2002. Five distinct methods were used to capture the organisms involved; primarily in the ponds where the exotic species are the most abundant: 1) gill nets, 2) small seines, 3) crayfish and minnow traps 4) turtle traps and 5) spearfishing (newly implemented during spring 2002). The gill nets were those often termed “experimental” gill nets, having several panels differing in size of mesh. Nets were rigged to sink but with foam core float line so they stood up in the water column. Since the ponds were mostly 2-3 meters deep the nets hung in 80 to 100 percent of the water column when fishing. The seines were of two sizes 17 by 6 feet and 10 by 4 feet, both with one-eighth inch “Ace” knotless mesh and “double weighted” with one ounce weights every 6 inches. The crayfish traps were 9 inches in diameter by 31 inches long with quarter-inch wire mesh and the minnow traps are 9 inches in diameter by 17.5 inches long, some with one-quarter inch mesh and others with one-eighth inch mesh. All these traps were the Gee brand, manufactured by Cuba Manufacturing Company. The turtle traps were of half-inch mesh webbing with four steel supporting hoops and approximately 3’ x 1.5’ x 1’. Before the traps were initially set, visual surveys were conducted to confirm that no native species would be encountered in the ponds. These surveys also help to establish the numbers of possible game fishes that might be salvaged by the CDFG. Traps were baited with cat food or sardines. As a result of several crayfish traps being stolen from the ponds during spring 2002, traps were placed closer to the middle of the ponds, making them harder to steal. Unfortunately, this also made them less effective because the crayfish tend to be on the outer edges of the ponds.

In addition to spearfishing, which increased the catches of larger fishes over the previous years of gill netting alone, two other techniques were newly implemented in 2002. During the fall of 2002, biologists instituted the deployment of the downstream bag seine in the outlet of the West Pond to intercept potential small bass migrating downstream. The net was set with the bag in the center of the stream and the sides (wings) to provide a barrier to downstream movement by fish. The

intent was that this net would intercept small bass going downstream from the West Pond. The other new technique was a rectangular lift net for larger fishes. This net is used by two people; one swimming and one in a boat. The coordinated effort was successful in obtaining percentages of larger fish schools as compared to the smaller dip nets.

Sampling in ponds was conducted over a three to five day period with traps and gill nets fishing continuously (in the water 24 hours a day). At first turtle traps were placed near shore, partly exposed as is typical, but later they were completely submerged to catch crayfish and larvae. Typically the traps and gill nets were placed around the perimeter of the ponds near "cover" for the target organisms. Catches are always recorded separately for each pond and in the same order in each pond, traveling in a clockwise direction (on the map) east along the north side of the ponds then south along the east shore and back along the south and western shore back to the northwest corner of the ponds where the boat could be launched.

In addition to collecting data on the fishes, habitat features such as water temperature, substrate type, depth, width, available cover, canopy, and gradient or slope were also measured and recorded. Data were taken from the surface and bottom at two or three places in each pond and once in the flowing portion of the stream. Figure 5-1 shows the checklist for the exotic wildlife species removal program tasks that have been completed thus far. Figure 5-2 shows the checklist for exotic wildlife maintenance and monitoring.

Figure 5-1

BIG TUJUNGA WASH MITIGATION BANK

EXOTIC WILDLIFE SPECIES ERADICATION PROGRAM CHECKLIST

Note: This checklist applies to the preservation of the Tujunga Ponds in their current configuration

☒ Consult with USFWS regarding the need for Section 7 Consultation.

N/A If Section 7 is required, complete Section 7 process and obtain memorandum of understanding.

☒ Notify CDFG that fish removal from Tujunga Ponds and Haines Canyon Creek is eminent (CDFG may want to do some fish salvage).

N/A Coordinate with CDFG regarding timing of fish salvage (if CDFG elects to do this).

☒ Receive authorization letters from USFWS and CDFG.

☒ Purchase all supplies/equipment.

Gill Netting in Tujunga Ponds

☒ After removal of water hyacinth, set nets of varying sizes near habitat features (cattail banks, willow overhangs) and in open water.

☒ Check nets hourly or bi-hourly.

☒ Remove any native or other species captured.

Seining

☒ Conduct 4-5 days of seining in Tujunga Ponds per quarterly sampling period (if feasible).

☒ Conduct seining in Haines Canyon Creek using smaller seines to remove exotic species.

☒ Erect block seines across the width of the stream at the upstream and downstream end of a given section (usually 10 to 12 meters in length).

☒ Retrieve native fish and place in buckets.

☒ Remove and dispose of exotic species in consultation with CDFG.

☒ Remove block seines and move to another section.

☒ Release native fishes after block seines are removed.

Electroshocking (optional sampling method based on consultation with USFWS)

❑ Use electroshocker to capture fishes that were missed during seining (best used under mass of tree roots or under boulders).

❑ Retrieve fishes and tally the capture on data sheets.

❑ Release native fishes after shocking is completed and dispose of non-native fishes.

Baited Traps for Crayfish and Non-native Fishes

☒ Bait traps with a fish carcass or punctured can of sardines in oil.

☒ Use baited traps of varying sizes and configurations (small minnow traps in Haines Canyon Creek and large traps in Tujunga Ponds).

☒ Submerge traps in areas where crayfish are likely to occur.

☒ Check traps on a regular basis and remove captured animals.

☒ Sample for a 3-day periods to remove exotic species.

Shooting and Gigging of Bullfrogs (optional method if other control methods are ineffective)

☒ Perform gigging at night from a boat with the use of a headlamp.

N/A Shoot the bullfrogs at night with a small caliber weapon or a small bore shotgun (this method would have to be approved by local law enforcement).

❑ Electroshock post-metamorphic frogs.

Figure 5-2

BIG TUJUNGA WASH MITIGATION BANK

EXOTIC WILDLIFE MAINTENANCE AND MONIT0RNG CHECKLIST

MAINTENANCE CHECKLIST

☒ Implement control methods on a monthly basis if captures are > 5% of the initial total of exotic fishes and frogs in the system by the spring of 2001.

☒ Implement control methods on a monthly basis if captures are > 10% of the initial total of crayfish in the system.

Monitoring Checklist

☒ Monitor population sizes on a monthly basis.

☒ Sample repeatedly at established transect locations within Haines Canyon and Big Tujunga Creeks.

☒ Collect data on physical and biotic parameters, including but not limited to: substrate composition, streamside vegetation characteristics, flow volume and rate, turbidity, conductivity, dissolved oxygen, temperature, species diversity and abundance, and changes since last survey.

☒ Compare initial control effort with follow-up monitoring in late 2000 and 2001 and biannual up to 2005.

❑ Perform post-construction monitoring on use of existing and "created" habitat by native fishes.

5.3 Results

5.3.1 Results of Native Fish Sampling

Sampling in both Haines Canyon Creek and the Tujunga ponds revealed that only exotic fishes are present in the ponds, while both exotics and natives are present in the stream. Native fish have never been observed during snorkeling surveys from 2000-2002 in the east or west ponds. The majority of all native fishes captured during transect sampling in Haines Canyon Creek from 2000-2002 were Santa Ana sucker (*Catastomus santaanae*), followed by arroyo chub (*Gila orcutti*), Santa Ana speckled dace (*Rhinichthys osculus* ssp. nov.), and rainbow trout (*Oncorhynchus mykiss*) comprised a small percentage of the native fish sampled. Specimens of non-native fishes, including largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanella*), mosquitofish (*Gambusia affinis*), fathead minnow (*Pimephales promelas*), and red shiner (*Cyprinella lutrensis*) along with large numbers of crayfish and bullfrog larvae, have been collected and removed from the stream during the native fish sampling.

These transects contained moderate to large numbers of all three native fish species, Santa Ana sucker, Santa Ana speckled dace, and arroyo chub. Hundreds of crayfish were removed because large numbers were caught in the seines used for sampling fishes. Please see Section 5.3.2 for the results of exotic wildlife removal for more details on crayfish removal. Overall, native fishes were the most abundant in the lower reaches of the stream.

Native Fish

The native fishes were restricted to the outlet stream; none were found in the two source ponds for Haines Canyon Creek. The data from the transect collections indicated that native fishes were most abundant in the lower reaches of the stream, and their numbers continued to decline with an increase in distance upstream. However, these native species were taken in one of the uppermost transects (15) which is approximately 200 meters downstream of the outlet from the West Pond.

The few rainbow trout taken in transects in 2002 indicated a small and possibly reproducing population of trout in the stream. It is possible that these individuals could have migrated from downstream. However, the small size and wild appearance of these fish indicate natural reproduction.

Table 5-1 summarizes the results from the native fish sampling conducted during 2002.

Table 5-1
Results of Native Fish Sampling Conducted During 2002

Quarter	Santa Ana Sucker	Arroyo Chub	Santa Ana Speckled Dace	Rainbow Trout	Other
1st (Jan.-March)	*	*	*	*	*
2nd (April-June)	*	*	*	*	1 southwestern pond turtle
3rd (July-Sept.)	50	31	10	2	**
4th (Oct.-Dec.)	28	5	0	0	**
TOTALS	**78**	**36**	**10**	**2**	**1 southwestern pond turtle**
* sampling was not conducted ** none found					

5.3.2 Results of Exotic Wildlife Removal

The exotic sampling throughout 2002 resulted in the removal of thousands of crayfish and thousands of fish. The fish consisted mainly of largemouth bass and occasionally green sunfish, mosquitofish, and goldfish (*Carassius auratus*). Thousands of bullfrog larvae were also removed throughout the year. Exotics were found primarily in the ponds and infrequently in the stream. Detailed results are included in the annual exotic aquatic wildlife removal report for 2002, included as Appendix F.

Table 5-2 summarizes the results from the non-native aquatic wildlife removal conducted during 2002.

Table 5-2
Non-Native Aquatic Wildlife Removal Conducted During 2002

Quarter	Red Swamp Crayfish	Largemouth Bass	Bullfrog Larvae	Mosquitofish	Others
1st (Jan.-March)	88	42	834	0	6 goldfish
2nd (April-June)	2,217	15,473	3,629 (plus 38 egg masses)	60	6 goldfish, 6 adult bullfrogs, 7 red-eared sliders, 2 common snapping turtles, 2 stinkpots, 1 cooter, 1 Mississippi map turtle
3rd (July-Sept.)	3,624	1063	4235 (plus 6 egg masses)	0	2 green sunfish, 1 red-eared slider, freshwater sponges becoming more abundant
4th (Oct.-Dec.)	867	269	11	21	11 green sunfish
TOTALS	**6796**	**16847**	**8709 (plus 44 egg masses)**	**81**	**13 green sunfish, 12 goldfish, 6 adult bullfrogs, 8 red-eared sliders, 2 common snapping turtles, 2 stinckpots, 1 cooter, 1 Missippi map turtle**

Totals include all non-natives removed by all methods

5.4 Discussion

Extensive sampling in both Haines Canyon Creek and the Tujunga Ponds has revealed that only exotic fishes are present in the ponds, while both exotics and native species are present in the stream habitat in Haines Canyon Creek.

Given observations during the March sampling, the area within the project site may serve as a critical refuge for native species. Current threats to the native species include evidence of

predation by largemouth bass. The massive numbers of crayfish potentially pose a more substantial threat to native fish populations.

Interpretation of the data is problematic due to the great variance between and within sample periods. However, populations of crayfish within the ponds are significantly reduced based upon both visual observations and reductions in capture rates. There seems to have been a shift in the microhabitat used by bullfrog larvae. They appear to be congregating in shallow and warmer areas on the fringes of the ponds and therefore, are not equally susceptible to capture. The catch per unit effort in the east pond versus the west pond in addition to the general crayfish catches indicate that the trapping seems to be depressing the crayfish populations in the ponds (the general crayfish catches during 2002 have been lower than in previous years). Predation of crayfish by pied-billed grebes also helped to impact the crayfish population.

The numbers of bass were down in the stream and ponds compared to 2001. The numbers of largemouth bass and bullfrog tadpoles that were taken were considerably higher in the west pond than in the east pond. The two block nets that were installed seemed to be effective in preventing movement of bass and bullfrog larvae between the ponds.

5.5 Problems Encountered and Recommendations

5.5.1 Water Quality

Due to the unusually low rainfall, the stream flow was lower in 2002 than it has been in 2000 or 2001. In general, the surface area of the stream has opened up since the implementation of the water hyacinth removal efforts. However, watercress completely choked out several areas of the stream habitat during the second quarter.

In several areas, artificial damming of the stream with boulders and rocks caused ponding of the stream and eliminated stretches that would otherwise be run or riffle habitat. As identified in the 2001 annual report, these rock dams were built for recreational purposes and to improve stream crossings for trail users. These structures tend to be washed out in the winter and are built back up in the spring and summer. The ponded and slower flowing nature of the water caused by these impoundments favors crayfish, largemouth bass, sunfishes, and bullfrogs. They also increase the amount of soft substrate at the expense of harder substrate like gravel, cobble, and rocks preferred by native species. Public education via quarterly Community Advisory Committee (CAC) meetings during 2002 helped to inform local residents of this constant issue. Several residents regularly break down the rock dams when they are observed throughout the site.

5.5.2 Trap Theft

Several traps were stolen out of the ponds throughout the spring and summer of 2002. As a result, the fish biologists began placing the traps towards the inner portion of the ponds. This strategy helped to decrease the amount of trap theft, however, the varied trap placement resulted in decreased crayfish capture rates since the crayfish are the most abundant along the edges of the ponds.

5.5.3 Sources of Non-Natives

Potential downstream and upstream sources of non-native species were identified during 2002. Scoping visits conducted in 1999, 2000, and 2001 revealed that the stream has always bypassed the burrow pits in the Hansen Dam Flood Control Basin and flowed straight to the base of Hansen Dam. However, observations made during October 2002 disclosed that the stream has been diverted into one of the burrow pits. It is not clear when the stream diversion occurred, but many small largemouth bass were observed in this downstream portion. In addition to increasing

access to the stream by exotics, some portions of the rocky stream habitat that existed below the burrow pits is now unaccessible.

Another possible source of exotics occurs approximately 1.0 mile upstream of the ponds in the Haines Canyon Creek proper. A survey done in this upstream area in the first week of August, 2002, near the lower end of the cement-lined portion of Haines Canyon Creek by San Marino Environmental Associates, disclosed some permanent pools and some exotic fishes (Jonathan Baskin, pers. comm.). Although this channel lacked flow during 2002, in 2001 it was observed to flow strongly for a few days after storms, even causing a rise in the levels of the Tujunga Ponds since some flow is diverted into the ponds (with the overflow going directly into the stream below the ponds).

Additionally, onsite sources of non-native species include exotics previously released at the site. The fish biologists have had personal communications with several people who have admitted to releasing non-native aquatic wildlife in the Tujunga Ponds.

Since the implementation of the MMP, four extralimital sources of exotics have been documented, namely downstream burrow pits, upstream in Big Tujunga Wash, upstream in Haines Canyon Creek, and unauthorized introductions by persons releasing live fish and reptiles in the area. Each of these sources needs to be addressed during the remainder of MMP implementation period. Whereas eliminating the upstream and downstream sources would require a fairly substantial amount of effort and coordination, addressing the onsite source could be accomplished by installing educational signs around the ponds.

SECTION 6.0 BROWN-HEADED COWBIRD PROGRAM

6.1 INTRODUCTION

The brown-headed cowbird (*Molothrus ater*) is an obligate brood parasitic bird species, meaning this species does not build its own nest or tend to its own young. Instead, female cowbirds deposit one or more eggs into a host species' nest, often removing or destroying some of the host eggs. The brown-headed cowbird has a variety of target host species and has been recorded as successfully parasitizing 144 of 220 species in whose nests its eggs have been observed (Ehrlich et al. 1988). Some host species, include threatened or endangered species such as the coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*). In response, many of the host species, predominantly eastern species, have behavioral adaptations to deal with parasitism, such as ejecting the foreign egg, covering over the foreign egg, or abandoning the parasitized nest altogether. However, many other host species that have not evolved defensive reactions do not recognize cowbird eggs, and readily accept and rear cowbird young. Adult cowbirds will often destroy host nests containing nestlings by puncturing, removing, or eating host eggs, all of which increase the survivorship of young cowbirds at the expense of the host's reproductive success. Cowbird eggs do not closely mimic host eggs, nor do the young cowbirds expel host eggs and young rather, cowbirds tend to hatch earlier, grow faster, and crowd out or reduce the food intake of the hosts' young (Ehrlich et al. 1988). Cowbird eggs hatch in 10 days, several days ahead of most host species. In addition, cowbird chicks develop vigorous food begging behavior after just 1 day, compared to the 4 days required for most host species. In many of the smaller host species, the cowbird chick is the only successful fledging from any parasitized nest.

Female cowbirds, which are free from the time and expense of incubating and raising young, can lay as many as 40 eggs a season, far more than the average host species. Thus, a single successful female cowbird could ultimately parasitize 40 different host nests in one breeding season and in the process significantly reduce the breeding success of 40 pairs of host species. The decline in neotropical migratory songbirds across North America has been linked to, among other factors, the increase in cowbird numbers (Brittingham and Temple 1983; Harris 1991; Laymon 1993; Stallcup 1993). Although approximately 97 percent of cowbird eggs and nestlings fail to reach adulthood, cowbird parasitism affects host species by reducing the number of successful young. Furthermore, nest abandonment by the host species results in zero production for that breeding pair and therefore the reproductive effort will be significantly lower than that of an unparasitized species (Ehrlich et al. 1988). This cowbird species is not native in the western United States, so the host bird species here have not adapted to the presence of the cowbirds. In the eastern United States, where this bird is native, the host birds typically abandon a nest where a cowbird has laid its egg. While brown-headed cowbird parasitism poses a major threat to many species of songbirds, some host species, including the California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher, have also had to contend with habitat loss and fragmentation, which increase the risk of being parasitized (Harris 1991; Laymon 1987; Mayfield 1977; Stafford and Valentine 1985).

6.2 PURPOSE AND GOALS

6.2.1 Cowbird Trapping Methodology

Cowbird traps were first used as a localized control in the early 1970s in Michigan and by the mid-1980s were in widespread use in southern California and Texas, mostly in programs associated with the protection of threatened or endangered bird species. These traps proved to be so successful at reducing cowbird numbers and levels of parasitism in the study areas that the USFWS began to require cowbird removal as mitigation for a variety of development projects. Inclusion of the five-year brown-headed cowbird trapping and removal program at the Big Tujunga Wash Mitigation Bank site will increase the overall value of the site as a conservation

bank by allowing the sensitive riparian bird species to successfully reproduce without being parasitized by cowbirds. The brown-headed cowbird trapping program was conducted in accordance with Griffith Wildlife Biology's brown-headed cowbird trapping protocol which is the USFWS recommended protocol and is provided in Appendix A of the 2002 Final Annual Brown-Headed Cowbird Trapping and Removal Report, which is included in Appendix G.

6.2.2 Trap Location

The mitigation bank and adjacent properties were surveyed two months prior to the start of the trapping season in order to locate potential trap locations. Based on surveys and recommendations made in the Final 2001 Annual Brown-Headed Cowbird Trapping and Removal Program Report, two onsite trap locations from 2001 (Creek and Pond) were replaced by two new locations (Cottonwood and Restoration) in 2002. Other criteria used in determining trap locations included: potential foraging habitat for brown-headed cowbirds, potential nesting habitat for sensitive bird species such as the least Bell's vireo and southwestern willow flycatcher, accessibility for the daily trap monitors, and seclusion from the public (to prevent vandalism).

As a result of the permitting process, the U.S. Fish and Wildlife Service (USFWS) required Public Works to run three additional offsite traps. The purpose of the offsite traps is to ensure that cowbirds in the vicinity of the site that have the potential to travel to and from Big Tujunga Wash are also trapped and removed from the area. Two of the three offsite locations from 2001 (Wentworth and Basin) were replaced by two new locations (Foothill and Equestrian B) in 2002. These changes were made in order to increase trapping success due to the proximity of the new trap locations to nearby stables. No other changes to trap locations occurred during the 2002 trapping season. The cowbird trap locations are shown on Figures 6-1 and 6-2.

6.3 TRAP MONITORING

On March 14, 2002, a total of 38 decoy cowbirds, consisting of 16 males and 22 females, were obtained from the brown-headed cowbird trapping and removal program at the Orange County Water District, Prado Dam field office. The seven traps were baited with the decoy cowbirds on March 14, 2002, but the top slot openings were kept covered until March 15, 2002, the first day of the 2002 trapping season. All seven traps were fully operational on March 15, 2002. The decoy ratio of 2:3 (male:female) cowbirds was maintained in the Cottonwood, Restoration, Upland, Alluvial, and Foothill traps (Traps 1 through 5, respectively). The Equestrian A trap (Trap 6) was given a ratio of 3:3 and Equestrian B trap (Trap 7) received a ratio of 3:4.

Traps were checked daily from March 15 through July 15, 2002, including weekends and holidays falling within this time frame. Trappers collected data on the numbers of cowbirds captured, dead, and/or missing. Data on non-target birds were also recorded. Cowbird and non-target data was entered into a palmtop computer and was also recorded by hand on datasheets.

6.4 RESULTS

The results presented in this section are a summary of the results presented in the annual trapping and removal report. Please refer to Appendix G - 2002 Annual Brown-headed Cowbird Trapping and Removal Program (Chambers Group 2002) for detailed information regarding the 2002 cowbird program.

A total of 173 cowbirds, consisting of 66 males, 105 females, and 2 juveniles, were trapped within and removed from the Big Tujunga Wash Mitigation Bank site and vicinity between March 15 and July 15, 2001. Of these, 18 cowbirds were trapped within Big Tujunga Wash Mitigation Bank and 155 cowbirds were trapped in the offsite traps. This is a significant increase in the number of

trapped cowbirds from the 2001 trapping season (70 total cowbirds, consisting of 37 males, 24 females, and 9 juveniles).

Fifty-two percent of all trapped cowbirds were captured at the Foothill trap, having the highest per trap per day capture rate. The second most productive trap was the Equestrian A trap, which caught 28 percent of all trapped cowbirds. The third most productive trap was the Equestrian B trap, which caught 10 percent of all trapped cowbirds. The Restoration trap caught 5 percent of trapped cowbirds. The Upland trap caught 3 percent of trapped cowbirds. The Cottonwood trap caught 2 percent of trapped cowbirds. The Alluvial trap did not capture any cowbirds during the 2002 season.

Table 61 lists the numbers of cowbirds trapped and total trapping efficiency at each trapping location for the 2002 trapping season. The 2002 capture totals per trap per day were significantly higher than the 2001 totals. The increase in capture totals can be attributed to the success of the Foothill trap.

Both male and female captures peaked in April and decreased steadily in the following months. Female captures outnumbered male captures during the entire season. The male to female capture rate for 2002 was 0.63 compared to 1.54 in 2001. Juveniles were captured in June and July.

Figure 6-1

Figure 6-2

Table 6-1
Numbers of Cowbirds Trapped and Total Trapping Efficiency
At Each Trapping Location for the 2002 Trapping Season

Trap #	Trap Location	Male Cowbirds Trapped	Female Cowbirds Trapped	Juvenile Cowbirds Trapped	Total Cowbirds Trapped	Total Trapped (trap/day)
1	Cottonwood	3	1	0	4	**0.033**
2	Restoration	3	6	0	9	**0.073**
3	Upland	1	3	1	5	**0.041**
4	Alluvial	0	0	0	0	**0.000**
5	Foothill	29	61	0	90	**0.732**
6	Equestrian A	24	24	1	49	**0.398**
7	Equestrian B	6	10	0	16	**0.130**
TOTAL		**66**	**105**	**2**	**173**	**1.407**

A total of 19 clipped decoy cowbirds escaped from the traps during the course of the trapping season. Nine of the 19 decoy cowbirds escaped due to vandalism events and compromised trap structure, and 10 decoys escaped during trap servicing. Of those 19 escaped cowbirds, 10 (53 percent) were recaptured, usually within three to five days of escaping. Cowbird trappers inspected every trap daily for holes or gaps, and any observed were repaired immediately. The 13 escaped cowbirds that were not recaptured were assumed to have died since each had one wing clipped, decreasing their chance of survival in the wild. A total of 2 decoy cowbirds died in the traps from excessive pecking from other cowbirds and/or unknown causes. It did not appear that any of the decoy deaths were due to predation. A total of 200 cowbirds, including original decoy cowbirds and cowbirds that were captured in the traps, were euthanized during the 2002 trapping season.

There were a total of three instances of vandalism during the 2002 trapping season. All of the vandalism occurred during the month of May and was limited to two traps, the Equestrian A and B traps. The Equestrian A trap was vandalized on two separate occasions. All nine of the decoy cowbirds escaped as a result of the first vandalism event. Of those 9 escaped decoys, approximately 3 to 5 were recaptured, usually in approximately 3 to 5 days. The second incidence of vandalism on the Equestrian A trap was not as severe; decoy cowbirds did not escape and the trap was repaired and operational that same day.

The Equestrian B trap was vandalized on one occasion and sustained minor damage. No decoy cowbirds escaped as a result of vandalism. Following the vandalism, the employees at the Hansen Dam Equestrian Center were asked to watch out for and report any suspicious activity.

Trap vandalism during 2002 was not as severe as it was during the 2001 season due to the relocation of the problem trap locations. A total of 4 days in 2002, versus 12 days in 2001, were lost due to vandalism events.

A total of 233 birds from 7 non-target species were captured during the 2002 trapping season. The most frequently captured bird species were white-crowned sparrow (*Zonotrichia leucophrys*), red-winged blackbird (*Agelaius phoeniceus*), and California thrasher (*Toxostoma rediviυm*). Of the 233 non-target birds captured, 232 were released safely. The species of the one mortality was not identified due to carcass decomposition. This is 0.4 percent of the total non-target captures and is below the 2 percent mortality rate considered acceptable by the USFWS and discussed in Griffith Wildlife Reports (GWB 1994b) on non-target birds. The exact cause of death for the non-target species was not recorded. However, cause of death was most likely due to stress (i.e., capture, heat, proximity to other birds, stress of being in a trap, and other factors)

based on the trapper's personal observations. Table 6-2 lists the number of non-target bird species captured in each trap. The trapping program did not capture any banded birds or any bird species considered sensitive by the resource agencies. Figure 6-3 shows the checklist for the program tasks that have been completed thus far.

Figure 6-3

Table 6-2
Number of Nontarget Bird Species Captured in Each Trap

Bird Species	Trap 1		Trap 2		Trap 3		Trap 4		Trap 5		Trap 6		Trap 7		Total	Total
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
CATO	3	0	0	0	2	0	1	0	2	0	4	0	1	0	13	0
HOFI	6	0	1	0	5	0	1	0	1	0	1	0	1	0	16	0
CATH	3	0	1	0	3	0	3	0	2	0	3	0	2	0	17	0
WCSP	41	0	28	0	71	0	0	0	1	0	1	0	0	0	142	0
SOSP	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
HOSP	0	0	0	0	0	0	0	0	3	0	2	0	3	0	8	0
RWBL	1	0	0	0	0	0	0	0	1	0	27	0	5	0	34	0
Unidentified	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Totals for each trap	**56**	**0**	**30**	**1**	**81**	**0**	**5**	**0**	**10**	**0**	**38**	**0**	**12**	**0**	**232**	**1**

CATO = California towhee
HOFI = house finch
CATH = California thrasher
WCSP = white-crowned sparrow
SOSP = song sparrow
HOSP = house sparrow
RWBL = red-winged blackbird

C: Caught
D: Dead

6.5 RECOMMENDATIONS

6.5.1 Procedural Recommendations

The 2002 trapping season ran smoothly and scheduling of trappers was generally not an issue. The use of the Hansen Dam Equestrian Center as the staging area was critical to the program's smooth operation. Public Works and Chambers Group should continue to maintain their relationship with Mr. Eddie Milligan in order for continued access and use of this area throughout the 5-year implementation.

6.5.2 Securing Cowbird Decoys

The total number of decoy cowbirds obtained from the Orange County Water District's Prado Dam cowbird program was sufficient to meet the desired 2:3 male to female ratio in all traps. In order to insure obtaining enough decoy cowbirds at the beginning of next season, the following measures are recommended:

- Assemble and open at least one trap during the last week of February so, as decoys become available, they can be placed into this holding trap. This will serve to promptly achieve the desired decoy ratios in each trap at the beginning of the season.

- Maintain contact with other southern California cowbird trapping programs to keep current on the status of their programs and on the availability of excess birds.

6.5.3 Vandalism

Trap vandalism was again an issue during the 2002 trapping season. Vandalism was anticipated and is expected to continue throughout the 5-year implementation because of the heavy trail use.

Informing community members of the importance of the program is ongoing and will continue throughout the 5-year implementation. Trap relocation helped decrease vandalism during the 2002 trapping season. Regardless of trap location, the traps should continue to be chained to a nearby tree or permanent object during the 2003 trapping season. Detail on potential future trap locations is discussed below in Section 6.5.4 Trap Relocation Recommendations.

6.5.4 Trap Relocation Recommendations

Regardless of trap placement, the appropriate balance of four onsite versus three offsite trap locations must be maintained in order to comply with the USFWS and CDFG terms of mitigation bank approval.

6.5.4.1 Onsite traps

The Alluvial trap location has not been a productive trap, capturing only two cowbirds in 2001 and none in 2002. Although it represents upland habitat and covers cowbirds passing through the northern portion of the site, due to its continued low productivity, the Alluvial trap location should not be used in 2003. Field surveys should be conducted during January-February 2003 to find a replacement trap location.

Although the remaining three onsite trap locations (Cottonwood, Restoration, and Upland) are not as productive as offsite traps, these three locations represent both upland and riparian habitats and were not vandalized due to their semi-secluded access routes. Therefore, these remaining onsite trap locations should continue to be used during 2003.

Based on recommendations made following the 2001 trapping season, traps should not be placed near Haines Canyon Creek or the Tujunga Ponds.

6.5.4.2 Offsite traps

The Foothill trap was by far the most productive trap during 2002. However, the lease for this private residence will not be renewed next year; therefore, the future land use for this parcel is uncertain. It will be important to place at least one offsite trap in the immediate vicinity of the Foothill trap location. Efforts should be made in January-February 2003 to solicit a comparable offsite trap location.

The equestrian center traps were the second and third most productive traps due to their close proximity to active stables. However, despite the traps being within a gated area, both traps were vandalized during 2002 (versus no vandalism during 2001). These trap locations are still recommended for the 2003 trapping season due to their productiveness. Perhaps the employees at the hansen dam equestrian center can be asked to check the traps on a daily basis to further deter vandals.

Figure 6-3

BIG TUJUNGA WASH MITIGATION BANK

BROWN-HEADED COWBIRD ERADICATION PROGRAM CHECKLIST

- ☒ Send request letters to USFWS and CDFG for authorization (obtain verbal authorization to begin process).
- ☒ Receive authorization letters from USFWS and CDFG.
- ☒ Authorize trap construction.
- ☒ Purchase all supplies/equipment.
- ☒ Site inspection and preparation of trap locations.
- ☒ Hire trap checkers.
- ☒ Obtain decoys.
- ☒ Make signs for trap.
- ☒ Program palmtop computer (or other instrument for field data collection).
- ☒ Create process for downloading/storing field data.
- ☒ Create data sheets.
- ☒ Coordinate transportation for trap placement at designated locations.
- ☒ Follow approved protocol for trap set-up.
- ☒ Train trappers in both office and field procedures.
- ☒ March 8-15 - bait seed should be spread on the top of the trap as well as on foraging areas inside and outside the trap.
- ☒ Make sure traps are unlocked if they are in place before daily servicing.
- ☒ March 15 - begin daily servicing.
- ☒ Submit daily data sheet to Project Biologist.
- ☒ Dispose of cowbirds as necessary throughout the season.
- ☒ July 15 - end daily servicing.
- ☒ Follow approved protocol for trap disassembly and storage for next trapping season.
- ☒ Arrange for pickup and storage of traps.
- ☒ Submit report by November 30 (or by date specified by USFWS or by any other agency).

SECTION 7.0 WILDLIFE SUCCESS MONITORING

7.1 PURPOSE AND GOALS

The ultimate goal of the Big Tujunga Wash Mitigation Bank 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. The project site is presently used by various common and sensitive wildlife species. The primary goal of the Big Tujunga Wash Mitigation Plan is to establish breeding and foraging habitat for resident and migratory wildlife species associated with the riparian, alluvial scrub, and aquatic habitats. Observations of common wildlife and plant species within the mitigation area have been documented in previous surveys. In addition, the MMP requires that wildlife monitoring surveys be conducted in order to document use of restoration areas by wildlife. Use of restored habitats by the following list of sensitive wildlife species will be considered progress indicators of revegetation success.

7.2 LEAST BELL'S VIREO

7.2.1 Methodology

Seven focused protocol surveys were conducted by Chambers Group wildlife biologists familiar with the songs, calls, and visual identification of the least Bell's vireo. These surveys were conducted at 10-day intervals during May, June, and July. No more than 50 hectares of suitable riparian habitat were surveyed by the biologist per day. The surveys were conducted on April 29, May 9, 28, June 10, 21, July 1, and 11, 2002. All surveys were conducted between the hours of 6:00 a.m. and 11:00 a.m. and were in accordance with USFWS guidelines (2001). The surveyors conducted the surveys by walking all suitable riparian habitat as well as stationing themselves in the best locations within the riparian habitat in order to listen, and look for vireos. All vireo detection, including number of individuals, sex, age, and leg bands, was recorded on standardized data sheets. Appendix H contains the report and field data sheets from each of the surveys.

7.2.2 Status/Results

Least Bell's vireos were not observed or detected during the seven focused surveys at the Big Tujunga Wash Mitigation Bank project site. Riparian habitat on the site provides moderate to high quality habitat for this species. No southwestern willow flycatchers or western yellow-billed cuckoos were seen or heard during any of the vireo surveys.

7.3 SOUTHWESTERN WILLOW FLYCATCHER

7.3.1 Methodology

Five focused surveys for the southwestern willow flycatcher were conducted by Brian Leatherman, a permitted wildlife biologist (permit #TE 827493-3). Survey methods followed the mandatory protocol developed by Sogge et. al (1997) and the subsequent revised protocol developed by the U.S. Fish and Wildlife Service (USFWS 2000). Surveys were conducted on May 15, June 12, 25, July 2, and 9, 2002. Surveys were conducted between dawn and 10:00 a.m. during suitable weather conditions. Surveys were conducted by walking slowly and methodically under the canopy of the willow riparian woodland. Taped vocalizations of the species were played every 75 to 100 feet in an attempt to elicit a response from potentially present individuals. The tape was played for roughly 15 seconds and then stopped for one or two minutes to listen for a response. All wildlife observed or detected during the surveys were documented.

7.3.2 Results

Two southwestern willow flycatchers were observed in the cottonwood-willow riparian woodland habitat during the first survey of the Big Tujunga Wash Mitigation Bank on May 15, 2002. One flycatcher was observed and subsequently responded to a tape playback. Approximately one-half hour later, two willow flycatchers were heard giving a series of calls to each other. No behaviors or evidence to indicate that the flycatchers might nest at the sight were observed. No southwestern willow flycatchers were observed or detected during the subsequent four focused surveys, and no nesting southwestern willow flycatchers were reported in the vicinity in the California Natural Diversity Data Base (CDFG 2000). In addition, no critical habitat for the southwestern willow flycatcher has been designated in the Big Tujunga watershed, or any other streams in Los Angeles County (USFWS 1997). Interpretation of the survey results leads to the conclusion that the observed willow flycatchers were migrants. The first two survey periods (May 15-31 and June 1-21) are conducted during a time when migrant willow flycatchers of all three California subspecies might occur in the project area. Unless nesting behavior is observed during these first two surveys, it is the final survey period (June 22 to July 17) in which detected birds are likely either breeding birds or non-breeding resident floaters (non-paired birds). Migrant willow flycatchers are typically no longer moving through the southwest during this third survey period. Based on the negative survey results for the latter four surveys and lack of documented nesting records for the region, the southwestern willow flycatcher is likely absent from the Big Tujunga Wash Mitigation Bank project site at this time. No western yellow-billed cuckoos were seen or heard during any of the flycatcher surveys. The complete report of findings and field data sheets for the southwestern willow flycatcher surveys is included as Appendix H.

7.4 ARROYO SOUTHWESTERN TOAD

7.4.1 Methodology

Surveys are conducted annually by a qualified biologist familiar with the habits, appearance, and vocalizations of the arroyo southwestern toad. Surveys follow the 1999 USFWS Survey Protocol Guidelines for the arroyo toad. The protocol states that at least six surveys must be conducted during the breeding season, which generally occurs from March 15 through July 1, with at least seven days between surveys and with at least one survey per month during April, May, and June. Surveys include both daytime and nighttime components conducted within the same 24-hour period (except when arroyo toads are detected in the survey area).

Daytime surveys are conducted by walking slowly along stream margins and in adjacent riparian habitat, visually searching for (but not disturbing) eggs, larvae, and juveniles. Nighttime surveys (assuming eggs, larvae, and/or juveniles have not been detected) are conducted by walking slowly and carefully on stream banks. Surveyors stop periodically and remain still and silent for approximately 15 minutes at appropriate sites to wait for arroyo toads to call. Nighttime surveys are conducted between one hour after dusk and midnight, when air temperature at dusk is 55 degrees Fahrenheit or greater.

7.4.2 Results

Surveys for the endangered arroyo southwestern toad were not conducted during spring 2002. The presence of large numbers of exotic fishes and bullfrogs, which are detrimental to arroyo toads, in addition to low water levels in Big Tujunga Wash did not warrant surveys during 2002 (D. Holland, personal communications).

SECTION 8.0 - TRAILS PROGRAM

8.1 Introduction

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, and the Consultant's construction and placement of information kiosks. The trails reclamation program consists of the Consultant's 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. The trails reclamation program was initiated in November 2000.

8.1.1 Purpose/Goals

The overall goal of the trails system is to allow for recreational activity while minimizing impacts on the habitat quality at the Big Tujunga Wash Mitigation Bank site. Essential to this process is the effort of returning unnecessary trails to their natural condition for the overall improvement of habitat quality. Because the trails closure and restoration is comprised of riparian habitat restoration, the trails program is an integral part of the evaluation process to help determine the success of the overall riparian restoration and enhancement program. Thus, it is evaluated and reported as part of the functional analysis of the riparian habitat and during the regular maintenance and monitoring of the riparian habitat restoration sites. It is also essential for determining if recreational use is having negative impacts on the success of the riparian restoration and enhancement program, or if wildlife use of the site is being compromised. The following sections describe implementation tasks that were conducted during the second year of MMP implementation, current status of the program, problems that were encountered during the implementation process, and future proposed implementation tasks.

8.1.2 Location

Figure 8-1 shows the trails map of the Big Tujunga Wash Mitigation Bank. The trails map was overlayed on a 1 inch=200 feet aerial photograph of the site and shows the trails as they exist, trails that are currently present, and the four designated main trails that serve as safe and scenic recreational trails. The four main trails include the Water Trail, Bert Bonnett Trail Loop, Dr. Au Trail, and Pond Trail.

Pedestrians and equestrians can access the mitigation bank site at four locations. One entrance is located in the southwest portion of the site at the junction of Wentworth and Wheatland Avenue. Two entrances are located in the southeast corner of the site, one of which is adjacent to an existing parcel of private land, and the other is a recently installed equestrian step-over entrance, at the junction of Wentworth and Mary Bell. The private landowner just east of these two entrances has installed a gate at the back of his property, which allows for access to the site. The third entrance point consists of the main east-west trail in Big Tujunga Wash. This trail cannot be fenced off from the adjacent properties located west and northeast of the site because a fence placed across Big Tujunga Wash would interfere with water flow. Therefore, the public can freely enter the site via the adjacent properties. In addition to the public entrances, locked gates are located at the Wheatland entrance in the northwest portion of the site, at the Cottonwood/Wentworth intersection on the south side of the site, and at Foothill Blvd. near the junction with Big Tujunga Wash.

Figure 8-1 Trails Map

8.2 Methodology

The following is an outline of the trails reclamation tasks as taken from the 2000 MMP. Trails implementation tasks were based on this outline and modified in the field as needed. Trails implementation is not complete and will continue on a quarterly basis until each of the following tasks has been successfully implemented.

Trails Program Tasks:

- Determine Needs for Permitting (404, 401, 1601, and Section 7)
- Obtain Permits (if necessary)
- Place and Maintain Trash Receptacles and Portable Toilets
- Construct and Place Information Kiosks
- Prepare Information for Inclusion in Kiosks
- Place Barriers Across Entrances to Reclaimed Trails
- Construct and Place Trail Signs
- Remove Debris from Reclaimed Trails
- Plant Native Plant Materials on Reclaimed Trails
- Maintain Reclaimed Trails
- Monitor Success of Trails Reclamation
- Annual Reporting

8.3 Implemented Tasks

Trail implementation began in August 2000 and continued on an intermittent basis. Enhancement of trails in 2002 primarily consisted of keeping the trails safe for pedestrians and equestrians. This program is exempt from CEQA under Section 15301(c) because it involves public safety issues. The implementation of the formal trails system program will not involve grading in waterways or wetlands. No mechanical clearing of trails or alteration of waterways was implemented, therefore 404, 401, 1601, and Section 7 permits were not necessary. Figure 8-2 shows the checklist for the trails implementation tasks that have been completed thus far.

8.3.1 Trails Enhancement

Trash receptacles with lids and portable toilets were placed at the designated locations (Figure 8-1) and were maintained on a regular basis. Local equestrian groups frequently conducted trash removal along the trails, usually on a weekly basis. The removal of large stones (over 4" diameter) was conducted along the Water Trail, Pond Trail, and secondary trails within the riparian areas when necessary. Overhanging branches and plant materials that obstructed the trails were trimmed back as necessary.

Figure 8-2

BIG TUJUNGA WASH MITIGATION BANK

TRAILS ENHANCEMENT PROGRAM CHECKLIST

- ❑ ~~Coordinate with Corps and CDFG regarding Nationwide Permit and Streambed Alteration Agreement.~~
- ☒ Place barriers (logs, rocks, etc.) in front of designated reclaimed trails.
- ☒ Place informative/restrictive signs at closure point of each closed trail.
- ☒ Place portable toilet at main staging area and near Tujunga Ponds.
- ☒ Place trash receptacles along trails in designated areas.
- ☒ Clear large stones, debris, etc. from main trails to an approximately 8' width.
- ☒ Trim overhanging branches to approximately 10' above ground level (as-need basis).
- ❑ Place trail location signs at designated areas along the main trails.
- ☒ Rake compacted ground of reclaimed trails after closure.
- ☒ Plant cuttings along reclaimed trails. (Still in progress)
- ☒ Conduct bimonthly visits. (Monthly)
- ☒ Maintain trails on a bimonthly basis. (Monthly)
- ☒ Monitor success along reclaimed trails as part of the monitoring and maintenance program. (Still in progress)

8.3.3 Trails Reclamation

Reclaimed Willow Woodland Trail

No trails were closed during 2002.

Reclaimed Alluvial Scrub Trails

Passive reclamation of the trail leading from the south eastern-most portion of the upland area was implemented after the Mary Bell equestrian entrance was installed. The trail was not planted or seeded. Seeding of this closed trail is recommended. No other trails were closed during 2002.

8.4 Problems Encountered and Corrective Actions

8.4.1 Signs/Kiosks

Kiosk displays were installed in two locations on September 24 and 25, 2001. One kiosk was installed in the Cottonwood area and the other was installed on the south side of the haul road in the western portion of the project site. The alluvial (haul road) kiosk was subjected to vandalism in early May 2003 and has been repaired. No further concerns were noted.

8.4.2 Trail Closures

Trail users have generally remained on the designated trails; however, there is evidence of continued use along several closed trails. The barriers used for the trail closures have been shifted and/or ignored in order to access preferred trails. These closed trails were monitored and obstructive barriers were put back in place each time they were moved, only to be shifted or bypassed again. This course of action will continue as necessary, but either permanent blockades will be required or the closure of those particular trails may have to be abandoned. Figure 8-3 shows the checklist for the trails monitoring tasks that have been completed thus far.

Figure 8-3

BIG TUJUNGA WASH MITIGATION BANK

TRAIL MONITORING CHECKLIST

- ☒ Project Biologist performs monthly inspection of each trail.
- ☒ Remove trash from trails and adjacent areas and place in trash receptacles on an as-needed basis.
- ☒ Remove overgrowing vegetation from trail paths on an as-needed basis.
- ☒ Trim low overhanging branches to minimum of 10-feet above ground level on an as-needed basis.
- ☒ Document any flooding and erosion problems. If unsafe trail conditions occur, temporarily close the trails and notify LADPW. Do not re-open trails until the problem has been resolved.
- ☒ Remove any obstructions from the paths on an as-needed basis. If large objects block the main trail, note the location and remove at a later time using proper equipment, etc.
- ☒ Ensure the use of trails by only equestrians and pedestrians. Place restrictive signs and barriers in proper locations in key problem areas. Notify enforcement authorities if problems continue.
- ☒ Correct all problems same day or document and take corrective actions as soon as possible/reasonable.
- ☒ Ensure the working condition of kiosks, trash receptacles, and portable toilets on an as-needed basis. Refill the brochures at each kiosk as necessary.
- ☒ Make sure all trail signs are standing, legible, and facing the appropriate direction on an as-needed basis.
- ☒ Document any differences in the path of trails if they seem altered or new paths “appear.” Use field maps, photographs, and descriptive text to identify the location and notify LADPW. Restrict these areas from further use through use of signs and barriers.
- ☒ Ensure that reclaimed trails are no longer in use. Modify barriers and signs as needed to prevent the use of reclaimed trails.
- ❑ Remove barriers and restrictive signs from reclaimed trails once area is deemed successful by Restoration Specialist.

8.4.3 Reestablishment of Trails

Prior to its removal, the dense giant reed defined the boundaries of many of the trails. After removal was complete, the trails were initially difficult to distinguish. Efforts focused on delineating the main trails were successful. The main trails were marked by clearing the path of giant reed chips obscuring the ground, along with delineating the path with rock, branches, and other natural materials on hand, thus making the path clearly visible. Repeated use by equestrians has helped to identify the prominent trail locations. Planting of willow and mule fat cuttings in the exotic plant removal areas within the riparian habitat have also helped to delineate the trails. Efforts to re-establish these trails will continue as necessary for the duration of the project.

8.5 Future Trail Implementation Measures

Trail closures will continue if necessary during the course of the fourth calendar year (2003). This will include the closure of trails within the alluvial scrub habitat and a continued effort to prevent use of closed riparian trails. Reclaimed trails will be monitored periodically to ensure that they are successfully closed. In addition, maintenance of the existing trails will occur on a monthly basis. This includes removal of trash and debris, trimming of branches, and posting of signs along the four main recreational trails.

SECTION 9.0 PUBLIC AWARENESS AND OUTREACH PROGRAM

9.1 INTRODUCTION

Public awareness and involvement are major components of the MMP process. The local community generally supports the Big Tujunga Wash Mitigation Bank project and has been pro-active in its planning and implementation. Due to the community's history of taking care of the site for years, there is every reason to believe that with the proper education and training, local residents will continue to be dedicated caretakers of the site.

9.1.1 PURPOSE AND GOALS

There are many key stakeholders and community groups that have shown great interest in the Big Tujunga Wash Mitigation Bank project. These stakeholders include elected officials who are sensitive to the needs of the community and who must respond to residents concerns; local, state, and federal agencies; and local residents. Given the community's involvement with the site, the goal of the Public Awareness and Outreach Program is to keep the stakeholders and public informed of the ongoing enhancement activities at Big Tujunga Wash Mitigation Bank.

In order to facilitate the outreach program, a Community Advisory Committee (CAC) was created. The CAC is made up of representatives from various agencies and local organizations, and meets on a quarterly basis. The CAC meetings serve as an effective communication avenue between the Project Team (LACDPW and Chambers Group) and the local community.

The list of key stakeholders has been revised since the final MMP due to CAC participation and contacts. All current key stakeholders and persons on the mailing list are included in Figure 9-1. Figure 9-2 contains the current checklist for the community awareness and involvement program.

The CAC consists of community residents and representatives from local community organizations including, but not limited to:

- Shadow Hills Property Owners Association
- Lake View Terrace Homeowners Association
- Small Wilderness Area Preservation group
- California Trail Users Coalition and Equestrian Trails, Inc., Corrals 10 and 20
- Hansen Dam Community Advisory Committee
- Valley Horse Owners Association
- Lake View Terrace Improvement Association
- San Fernando Valley Rangers

The committee also includes agency and elected officials with representatives from, but not limited to:

- U.S. Fish and Wildlife Service
- California Department of Fish and Game
- U.S. Army Corps of Engineers
- Regional Quality Control Board
- Mayor Mike Antonovich's Office
- Councilman Joel Wachs' Office
- Councilman Alex Padilla's Office
- Assemblyman Tony Cardenas' Office
- Los Angeles Police Department

Figure 9-1 Current Key Stakeholders/Mailing List

Figure 9-2

COMMUNITY AWARENESS AND INVOLVEMENT PROGRAM CHECKLIST

☒ Initiate formation of CAC in July 2000.

☒ Prepare letter and send to agencies and key community organizations inviting them to join CAC (late July 2000).

☒ Establish CAC and meet formally to discuss plans (mid August 2000)
- Identify CAC Chairperson
- Establish communications protocols amongst CAC members
- Schedule future meeting date(s)

☒ Prepare initial newsletter and mail to stakeholders September 2000.

☒ Prepare fact sheets and post in kiosk, distribute to CAC members (Fall, 2000).

☒ Identify community meetings, events, fairs, trail rides where public information materials can be distributed. This can be accomplished by working closely with CAC members, elected officials offices, homeowner and business groups in the area.

☒ Work with project landscape architects and technical consultants to establish appropriate signage and kiosks on site. Signs shall be bilingual English/Spanish. Post public information materials and community updates (in kiosks within 1 week of preparation).

❑ Contact local schools.

❑ Attend onsite meeting with local school personnel.

☒ Prepare newsletters for distribution in September 2000; March, June, and September 2001.

❑ Prepare newsletters for distribution in March and September of years 2002-2005.

❑ Hold quarterly CAC meetings in years 2000-2003.

❑ Hold bi-annual CAC meeting in years 2004-2005 (March and September).

Contact elected officials and agency personnel bi-annually to offer updates on the project (2000-2005).

9.2 ACTIONS TAKEN

9.2.1 Community Advisory Committee Meetings

Quarterly CAC meetings were held on March 7, June 6, September 5, and December 5, 2002.

The meetings were very successful, providing the community and Public Works with an opportunity to work together on issues including habitat restoration, trail closures, site security/safety and accessibility, and other enhancement measures. Before each meeting, a meeting reminder with the agenda and list of action items was mailed to all stakeholders. After each meeting, the minutes, attendance, and wall graphic were mailed to all meeting participants. Appendix I contains all of the CAC meeting minutes, attendance, and wall graphics. The following is a list of the major action items discussed during the 2002 CAC meetings:

- Habitat restoration: Riparian planting of willows, cottonwood, blackberry and California rose took place in February 2002. There was some loss of cuttings due to the unusually dry year, therefore, replacement plantings may take place in early 2003. Exotic plant removal was in a maintenance and monitoring mode during 2002. Exotic plant removal was conducted on an as-needed basis only in specific areas. Gopher control efforts conducted throughout the year in the upland areas were successful.
- Mary Bell Entrance: Many local equestrians and trail users expressed interest in re-opening the Mary Bell Entrance. Therefore, the Mary Bell Entrance was installed on May 22, 2002. The other opening to the east has been kept open so people can train their horses to use the new entrance. The old entrance will be closed off sometime in early 2003. This new entrance will have a "no wheeled vehicles" sign.
- Tamayo Property: Public Works is still waiting for finalization on the acquisition of this property. The process will take longer than anticipated and the August 2002 deadline was not met.
- Unauthorized Overnight Campers: Several unauthorized overnight campers were seen throughout the site during 2002 (Haines Canyon Creek crossing, Tujunga Ponds, SE of Tujunga Ponds, 210 Freeway/Wentworth entrance). Efforts to coordinate with the LA Homeless Services Authority were unsuccessful. Relocation efforts will continue in 2003.
- Wentworth Street Property Encroachment: The property encroachment is still a legal issue at Public Works. LADPW sent several letters giving the owner 30 days to relocate. LADPW needs to go through the Board before initiating legal action. Although the Construction Division usually handles these situations, Water Resources has taken control and drafted a letter for Board approval. Unfortunately, this issue was put on hold in light of the fall forest fires that demanded higher priority. This process is expected to become active again in early 2003.
- Formal Trails System: The kiosk on the haul road was vandalized. The broken plexiglass was replaced in the fall 2002. Additional location legends and arrows were placed on both kiosk maps in order to help trail users read them better. There was a shooting incident in the spring when the fish biologists ran into several teenagers with pellet guns. A police report was filed and CAC members were asked to keep their eyes out for suspicious activity. It was decided that trail signs would be installed throughout the site. Chambers Group will coordinate placement and installation with CAC members Carol Roper and Terry Kaiser during 2003. A couple of unfortunate equestrian accidents occurred in the summer-fall of 2002. A total of 2 horses were killed in the vicinity of the project site. As a result, the City is looking into installing a signal at Wheatland.
- Governor's Award: Public Works submitted the Big Tujunga Wash Mitigation Bank for the 2002 Governor's Environmental and Economic Leadership Award. Unfortunately, the EPA chose another project for the award.

9.2.2 Newsletters

The "Big T Wash Line" is the project's newsletter that was published bi-annually in 2002. The newsletters supplement the CAC meetings in that they provide detail on the various enhancement activities and are distributed to all identified key stakeholders. Appendix J contains the March and September issues of the 2002 Big T Wash Line newsletters.

9.2.3 Elected Official Contact

Chambers Group subcontracted Moore, Iacofano, & Goltsman Inc. (MIG) to provide expertise in public involvement and facilitation. MIG has facilitated all CAC meetings and has actively contacted local officials and agency personnel to update them on the status of the MMP measures. In an effort to keep elected officials up-to-date on happenings and emerging issues with the site, MIG has implemented periodic briefings for the offices of City Councilmembers Joel Wachs and Alex Padilla and State Assembly Representative Tony Cardenas and Mayor Michael D. Antonovich. Thusfar, the offices of the elected officials are supportive of the project and are interested in participating in advisory group meetings, coordinating their offices' activities with the project, and in serving as communications links with constituents. Individual briefings of the elected officials' offices were conducted before the June and September 2002 CAC meetings.

Table 9-1 contains the elected official briefing contacts for 2002.

9.2.4 Signage/Kiosks

Two information kiosks were designed and placed strategically at the Cottonwood bluff area and along the haul road on the western portion of the site. The kiosks were erected for the Trails Dedication Ceremony that took place on September 26, 2001. The kiosks establish appropriate, visible signs that provide information on program goals, restrictions, LACDPW contact information, and a place to post seasonal announcements.

Since the establishment of the kiosks, there has only been one instance of vandalism. The plexiglass on the haul road kiosk was broken in the summer. The plexiglass was replaced in November 2002. Despite encouragement of local residents to post announcements in the kiosks, there has only been one community event posted in the Cottonwood kiosk.

Local residents requested that the map on the haul road kiosk be flipped to reflect how it is oriented in regards to the site. During the kiosk revision process, additional location legends were added to both kiosk maps in order to help the trail users. Revised kiosk layouts are expected in early 2003.

9.2.5 Citizen Patrol

Site safety is an issue that local residents would like addressed. As previously mentioned, the community has been actively involved in the site for years, therefore, Chambers Group is looking into the feasibility of a citizen patrol group made up of trained local residents. Thusfar, a mounted posse seems to be the most logical type of patrol group. Local law enforcement and park rangers have been contacted. However, coordination of information has been a challenge since such a citizen patrol group does not exist in the general vicinity. Based on preliminary contacts, it does not seem as though a citizen patrol group is feasible. Although the LAPD seems enthusiastic, they do not have a training program, and the park rangers whose jurisdiction encompasses the project site have not been responsive. Contacts will continue to be made during 2003.

9.2.6 Project Fact Sheets

Project fact sheets are brief descriptions of each of the MMP programs. Several fact sheets were distributed to the CAC members during the December meeting and were subsequently posted in the kiosks in December 2002. Additional fact sheets will be posted in the kiosks during 2003.

Table 9-1 – Elected Official Contacts

BIG TUJUNGA WASH MITIGATION BANK
ELECTED OFFICIAL BRIEFING CONTACTS
Updated May 24, 2002

Name	Phone	Contact/Issues
Conal McNamara Supervisor Antonovich (Supervisorial District 5) 869 Kenneth Hahn Hall of Administration 500 West Temple Street Los Angeles, CA 90012	(213) 974-5555	**May 24:** Informed of meeting/left message.
Patricia Davenport Council Member Joel Wachs (Council District 2) 6350 Laurel Canyon Bl. Suite 201 North Hollywood, CA 91606	(818) 755-7676 pdavenpo@council.lacity.org	**May 24:** Informed of meeting/left message.
James Wilson Council Member Alex Padilla (Council District 7) 13630 Van Nuys Bl. Pacoima, CA 91331 Mark Dierking, Legislative Deputy	(818) 756-9115 (818) 756-9270(fax) jwilson@council.lacity.org (213) 847-7777 (213) 847-0707 (fax) mdierkin@c07.ci.la.ca.us	**May 24:** Informed of meeting/left message. Informed of meeting/left message. Faxed copy of letter.
Alvin Kelly Assemblyman Tony Cardenas (Assembly District 39) 11541 Laurel Canyon Boulevard Suite C Mission Hills, CA 91345	(818) 838-3939 (818) 838-3931 (fax)	**May 24:** Informed of meeting/left message.
Dave Vannatta (Interim) Supervisor Antonivich (Supervisorial District 5) 869 Kenneth Hahn Hall of Administration 500 West Temple Street Los Angeles, CA 90012	(213) 974-5555	**March 4, 2003:** Informed of meeting/left message.
Patricia Davenport Council Member Joel Wachs (Council District 2) 7747 Foothill Blvd. Tujunga, CA 91042	(818) 352-3287 pdavenpo@council.lacity.org	**March 4, 2003:** Informed of meeting. Left message.

James Wilson Council Member Alex Padilla (Council District 7) 13630 Van Nuys Blvd. Pacoima, CA 91331 Mark Dierking, Legislative Deputy	Sylmar Office (818) 756-8409 (818) 362-4857 (fax) (818) 756-9115 (818) 756-9270 (fax) jwilson@council.lacity.org (213) 847-7777 (213) 847-0707 (fax) mdierkin@c07.ci.la.ca.us	**March 4, 2003:** Informed of meeting and faxed copy of material. Left message. **March 4, 2003:** Informed of meeting/left message.
Miguel Santiago/Ruth Luevanos Assembly-person Cindy Montanez (Assembly District 39) 11541 Laurel Canyon Boulevard, Suite C Mission Hills, CA 91345	(818) 838-3939 (818) 838-3931 (fax)	**March 4, 2003:** Informed of meeting and faxed copy of material. Left message.

9.3 STATUS

The next CAC meeting will be held on Thursday, March 6, 2003 at the Hansen Dam Equestrian Center. A meeting reminder and agenda will be mailed to all CAC members and stakeholders. The first issue of the 2003 Big T Wash Line will also be published in March 2003.

In 2001 through 2003, CAC meetings will be held quarterly in March, June, September, and December. The Big T Wash Line newsletters were published in March, June, and September of 2001, and will be published bi-annually in March and September from 2002 through 2005.

Elected officials will continued to be contacted and briefed on current events on a regular basis.

SECTION 10.0 - WATER QUALITY MONITORING PROGRAM

10.1 INTRODUCTION

In order to address both upstream and downstream water quality issues at the Big Tujunga Wash site, a water-quality monitoring program was implemented. The monitoring program addresses specific water quality issues, such as pesticide/fertilizer percolation or run-off and subsequent groundwater contamination, which may occur due to upstream development. Monitoring for elevated levels of nitrogen and organophosphates in the flow entering the site will help determine whether nitrate-laden irrigation water or pesticide containing run-off from upstream developments is affecting the Big Tujunga Wash Mitigation Bank. The water quality monitoring program at Big Tujunga Wash shall complement the monitoring program that is a requirement of the upstream Canyon Trails Golf Course.

10.2 PURPOSE/GOALS

The proposed water quality program is specifically designed to look for changes in water quality that may potentially affect sensitive native fishes and amphibians in the aquatic environment. The LACDPW personnel established baseline water quality conditions on April 12, 2000, prior to the implementation of the MMP programs. The LACDPW personnel conducted the baseline water quality sampling in accordance with accepted protocols, and a certified water quality laboratory conducted the analyses. The water quality program at Big Tujunga Wash includes quarterly monitoring for the following water quality parameters:

Total Kjeldahl-Nitrogen (TKN)	Total Residual Chlorine
Nitrite-Nitrogen (NO_2^--N)	Total Coliform bacteria
Nitrate-Nitrogen (NO_3^--N)	Fecal Coliform bacteria
Ammonia-Nitrogen (NH_3-N)	Turbidity
Orthophosphorus	Dissolved Oxygen (DO)
Organophosphate	Temperature (ºC)
Total Phosphorus	pH (pH units)

10.3 METHODOLOGY

An experienced Water Quality Specialist sampled on March 26, June 25, September 12, and December 19, 2002 and the samples were taken to Montgomery Watson Laboratories, Pasadena, California, to be analyzed immediately after sampling was completed. The results of the water quality analyses were summarized in quarterly letters and in an annual report distributed to LACDPW, CDFG, RWQCB, and USFWS. The Water Quality Monitoring Program will continue on a quarterly basis throughout the 5-year duration of the MMP Program. Table 10-1 lists locations of the four water quality monitoring sites and the 2002 sampling dates.

10.3.1 Location of Sampling Sites

Water quality monitoring sites were permanently established with a Global Positioning System (GPS) at various locations along the Haines Canyon Creek and Big Tujunga Wash. Three monitoring sites were located along Haines Canyon Creek. One site was located at the inflow to the Tujunga Ponds; a second site was located at the outflow of the Tujunga Ponds; and a third site was located in Haines Canyon Creek, just before it exits the Mitigation Bank. A fourth water quality monitoring station was also established in the Big Tujunga Wash, and sampling was performed only when flowing water was present during the quarterly sampling visits. Figure 10-1 shows the locations of the four sampling locations. Figure 10-2 shows the checklist for the water quality monitoring tasks.

Figure 10-1 Sampling Locations

Figure 10-2 Water Quality Checklist

Table 10-1
Big Tujunga Wash
2001 Water Quality Sampling Locations and Dates

Sampling Locations	Latitude	Longitude	Date of Sample
Haines Canyon Creek, just before exit from site	N 34 16' 2.9"	W 118 21' 22.2"	March 26, June 25, September 12, December 19
Haines Canyon Creek, inflow to Tujunga Ponds	N 34 16' 6.9"	W 118 20' 18.7"	March 26, June, 25, September 12, December 19
Haines Canyon Creek, outflow from Tujunga Ponds	N 34 16' 7.1"	W 118 20' 28.3"	March 26, June 25, September 12, December 19
Big Tujunga Wash	N 34 16' 11.7"	W 118 21' 4.0"	

10.3.2 Description of Analyses

A portion of the water quality parameters were analyzed in the field using the following field equipment:

- YSI Model 57 - dissolved oxygen and temperature
- HACH DR 700 - total residual chlorine
- Orion 230A - pH

All other analyses were performed in duplicate at Montgomery Watson Laboratories, Pasadena, California.

10.4 RESULTS

The following table summarizes the results from the 2002 sampling efforts. Detailed descriptions of the analyses are located in Appendix K.

10.4.1 Comparison of Quarterly Monitoring

In general, the water quality on the site was relatively good. Sampling during 2002 did not detect any contamination of the waters due to pesticides or fertilizers. In general, pH levels varied by 0.4 units or less for waters flowing into and out of the ponds. Nitrate-nitrogen was consistently higher in the waters flowing into the ponds than from the outflow. Without flows from the Big Tujunga Wash, nitrates in Haines Canyon Creek was consistently lower than values observed in the ponds. Water quality in 2002 was similar to the April 12, 2000 baseline conditions. The higher bacteria, phosphorus, and turbidity that were observed in the April 18, 2000 samples were most likely due to seasonal rain events. Table 10-3 lists the baseline conditions. Results of analyses conducted by Montgomery Watson Laboratories for samples collected in 2001 are summarized in Tables 10-4 through 10-7. Where duplicate analyses were conducted, the average value is graphed. Note that the yields (percent recoveries) of samples were within acceptable limits (percentages) for all samples except phosphorous (which was within parameters in duplicate testing) in 2002.

10.5 RECOMMENDATIONS

The water quality at the mitigation bank during 2002 was good and there was no contamination of the waters due to pesticides or fertilizers. There are no recommendations at this time.

Table 10-2
Big Tujunga Wash
Summary of 2002 Water Quality Sampling Results

Parameter	Summary
pH	In general, pH values observed in Haines Canyon Creek leaving the site were approximately 1 unit higher than values observed in the ponds. For any given data, the pH of waters flowing into and out of the ponds varied by 0.4 units or less. The maximum seasonal pH fluctuation at any station in 2002 was 0.58 units. The pH values of water from all stations for all four sampling periods were within the 6.5 to 8.5 range identified in the basin plan.
Dissolved Oxygen	Dissolved oxygen (DO) levels in Haines Canyon Creek leaving this site correlated with temperature – higher DO values were observed on dates with lower temperature. DO concentrations in the ponds did not follow this pattern, but readings of inflow to and outflow from the ponds were very similar. Seasonal fluctuations of up to 2.9 mg/L in DO were observed – highest overall readings were observed in December. All DO readings in 2002 were above the recommended minimum for warmwater fish species of 5.0 mg/L.
Temperature	Temperatures in Haines Canyon Creek leaving the site were generally 1-3 ºC cooler than temperatures in the Tujunga ponds. Seasonal fluctuations of up to 9 ºC were observed – December readings were lowest, and June readings were highest. Observed temperatures during all sample periods were below levels of concern for growth and survival of warm water fish species.
Bacteria	Fecal coliform levels in 2002 ranged from <2 to 300 MPN/100 ml. Total coliforms were much higher – up to 5,000 MPN/100 ml in two samples (Outflow from the ponds in September and Haines Canyon Creek leaving the site in December). Again, due to the rain event, baseline coliform data from April 18th 2000 showed the highest total coliform levels (170,000 MPN/100 ml in the outflow from the ponds). Fecal coliform levels exceeded the water contact recreation standard of 200 MPN/100 ml in December in one sample from Haines Canyon Creek leaving the site (although sufficient samples were not taken per the standard). Note, the duplicate sample on this date at this location was lower than the standard.
Total residual chlorine	Total residual chlorine readings on all sampling dates were below the detection limit
Nitrogen	Ammonia-nitrogen and nitrite-nitrogen were not detected in any of the samples during 2002. Kjeldahl nitrogen (organic plus ammonia) readings were consistently low (<1 mg/L) at all stations on all dates. Nitrate-nitrogen was consistently higher in waters flowing into the ponds than the outflow (up to 2.25 mg/L higher). Nitrate in Haines Canyon Creek was consistently lower than values observed in the ponds. Nitrate-nitrogen values observed at the ponds were consistently higher (0.6 to 2.7 mg/L higher) in 2002 than in 2001. All except one (Inflow to Tujunga Ponds 1 in December at 10 mg/L) nitrate-nitrogen readings were below the drinking water standard of 10 mg/L.
Turbidity	Turbidity values in 2002 were similar to those of 2001. All 2002 turbidity values were below the drinking water standard of 5 NTU and were not excessive for aquatic life.
Phosphorus	Phosphorus was not detected from the ponds in March and June. The proportion of total phosphorus present as reactive orthophosphate ranged from all to approximately 30 percent. Baseline total phosphorus observed in April 2000 was significantly higher than 2001 and 2002 readings (up to 0.211 mg/L in April 2000). This may be attributable to releases from sediment disturbances caused by a rain event in 2000. Total phosphorus values at all stations for all four quarters were at or below the low end of EPA's recommendation for streams of <0.05 – 1.0 mg/L total phosphates. (The reading of 0.37 mg/L in June at Haines Canyon Creek is most likely a sampling or laboratory error since the result for the duplicate sample was non-detect.)

Table 10-3
Big Tujunga Wash
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	4,070	737

Table 10-4
Summary of Big Tujunga Wash Water Quality Results
1st Quarter 2002 (3/26/02)

Parameter	Units	Inflow to Tujunga Ponds 1	Inflow to Tujunga Ponds 2 (Duplicate)	Outflow From Tujunga Ponds 1	Outflow From Tujunga Ponds 2 (Duplicate)	Big Tujunga Wash 1	Big Tujunga Wash 2 (Duplicate)	Haines Canyon Creek Exiting Site 1	Haines Canyon Creek Exiting Site 2 (Duplicate)
Temperature	°C	18.5	--	18.0	--	*	*	17.0	--
Dissolved Oxygen	mg/L	9.3	--	9.2	--	*	*	8.9	--
pH	std units	7.3	--	7.7	--	*	*	8.3	--
Total residual chlorine	mg/L	ND	--	ND	--	*	*	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Kjeldahl Nitrogen	mg/L	0.28	0.30	ND	ND	*	*	ND	ND
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	9.1	8.9	7.3	7.0	*	*	6.4	6.4
Orthophosphate-P	mg/L	ND	ND	ND	ND	*	*	0.015	0.014
Total phosphorus-P	mg/L	ND	ND	ND	ND	*	*	ND (MRL 0.02)	ND (MRL 0.02)
Turbidity	NTU	1.2	1.1	0.70	0.70	*	*	0.35	0.30
Fecal Coliform Bacteria	MPN/100ml	4	<2	4	8	*	*	50	50
Total Coliform Bacteria	MPN/100ml	500	900	130	220	*	*	900	900

***** **No sample on this date – station dry**
NTU **nephelometric turbidity units**
MRL **method reporting limit**
MPN **most probable number**
ND **non-detect**

Table 10-5
Summary of Big Tujunga Wash Water Quality Results
2nd Quarter 2002 (6/25/02)

Parameter	Units	Inflow to Tujunga Ponds 1	Inflow to Tujunga Ponds 2 (Duplicate)	Outflow From Tujunga Ponds 1	Outflow From Tujunga Ponds 2 (Duplicate)	Big Tujunga Wash 1	Big Tujunga Wash 2 (Duplicate)	Haines Canyon Creek Exiting Site 1	Haines Canyon Creek Exiting Site 2 (Duplicate)
Temperature	°C	22.5	--	22.5	--	*	--	20.5	--
Dissolved Oxygen	mg/L	8.3	--	8.4	--	*	--	8.6	--
pH	std units	7.5	--	7.6	--	*	--	8.2	--
Total residual chlorine	mg/L	ND	--	ND	--	*	--	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Kjeldahl Nitrogen	mg/L	0.56	0.37	0.32	0.60	*	*	0.26	0.28
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	8.9	8.9	7.1	6.7	*	*	5.6	5.9
Orthophosphate-P	mg/L	ND	ND	0.05	0.02	*	*	0.02	0.02
Total phosphorus-P	mg/L	ND	ND	ND	ND	*	*	ND (MRL 0.02)	0.37 (MRL 0.02)
Turbidity	NTU	0.70	0.70	1.0	1.5	*	*	1.4	1.6
Fecal Coliform Bacteria	MPN/100ml	8	7	11	13	*	*	170	60
Total Coliform Bacteria	MPN/100ml	1300	1400	300	300	*	*	2300	3000

***** **No sample on this date - station dry**
NTU **nephelometric turbidity units**
MRL **method reporting limit**
MPN **most probable number**
ND **non-detect**

Table 10-6
Summary of Big Tujunga Wash Water Quality Results
3rd Quarter 2002 (9/12/02)

Parameter	Units	Inflow to Tujunga Ponds 1	Inflow to Tujunga Ponds 2 (Duplicate)	Outflow From Tujunga Ponds 1	Outflow From Tujunga Ponds 2 (Duplicate)	Big Tujunga Wash 1	Big Tujunga Wash 2 (Duplicate)	Haines Canyon Creek Exiting Site 1	Haines Canyon Creek Exiting Site 2 (Duplicate)
Temperature	°C	21.3	--	22.0	--	*	--	21.0	--
Dissolved Oxygen	mg/L	8.5	--	8.3	--	*	--	8.3	--
pH	std units	7.1	--	7.3	--	*	--	8.3	--
Total residual chlorine	mg/L	ND	--	ND	--	*	--	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Kjeldahl Nitrogen	mg/L	0.20	0.47	ND	ND	*	*	0.23	ND
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	9.1	9.0	6.8	6.8	*	*	6.1	6.1
Orthophosphate-P	mg/L	0.014	0.016	ND	ND	*	*	0.011	0.011
Total phosphorus-P	mg/L	0.03	0.05	ND	ND	*	*	ND (MRL 0.02)	ND (MRL 0.02)
Turbidity	NTU	2.4	2.7	0.75	0.70	*	*	2.6	4.5
Fecal Coliform Bacteria	MPN/100ml	7	2	4	2	*	*	<2	<2
Total Coliform Bacteria	MPN/100ml	2400	3000	5000	500	*	*	500	3000

***** **No sample on this date - station dry**
NTU **nephelometric turbidity units**
MRL **method reporting limit**
MPN **most probable number**
ND **non-detect**

Table 10-7
Summary of Big Tujunga Wash Water Quality Results
4th Quarter 2002 (12/19/02)

Parameter	Units	Inflow to Tujunga Ponds 1	Inflow to Tujunga Ponds 2 (Duplicate)	Outflow From Tujunga Ponds 1	Outflow From Tujunga Ponds 2 (Duplicate)	Big Tujunga Wash 1	Big Tujunga Wash 2 (Duplicate)	Haines Canyon Creek Exiting Site 1	Haines Canyon Creek Exiting Site 2 (Duplicate)
Temperature	°C	15.8	--	14.7	--	*	--	11.7	--
Dissolved Oxygen	mg/L	6.98	--	6.31	--	*	--	9.75	--
pH	std units	7.06	--	7.12	--	*	--	8.19	--
Total residual chlorine	mg/L	ND	--	ND	--	*	--	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Kjeldahl Nitrogen	mg/L	ND	0.2	0.51	0.24	*	*	0.29	ND
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	10	9.8	7.8	7.9	*	*	4.9	5
Orthophosphate-P	mg/L	0.043	0.046	0.029	0.028	*	*	0.035	0.032
Total phosphorus-P	mg/L	0.03	0.04	0.03	0.03	*	*	0.06	0.021
Turbidity	NTU	0.65	0.60	0.60	0.65	*	*	4.8	2.8
Fecal Coliform Bacteria	MPN/100ml	30	13	94	80	*	*	300	30
Total Coliform Bacteria	MPN/100ml	1400	2800	300	1700	*	*	5000	3000

***** **No sample on this date - station dry**
NTU **nephelometric turbidity units**
MPN **most probable number**
ND **non-detect**

Figure 10-2

BIG TUJUNGA WASH MITIGATION BANK

WATER QUALITY MONITORING PROGRAM CHECKLIST

- ❑ Notify resource agencies.
- ❑ Authorization from resource agencies.
- ❑ Site visit to identify water quality monitoring stations.
- ❑ Establish monitoring stations in Haines Canyon Creek and Big Tujunga Wash with GPS.
- ❑ March 1 - Conduct baseline water quality on the site prior to implementation of enhancement measures.
- ❑ Submit samples to laboratory for analysis.
- ❑ April 1 - Submit baseline monitoring report.
- ❑ June 1 - 1st Quarterly sampling.
- ❑ Submit samples to laboratory for analysis.
- ❑ July 1 - Submit first quarterly monitoring report including a summary of baseline data to resource agencies and consultant.
- ❑ September 1 - 2nd Quarterly sampling.
- ❑ Submit samples to laboratory for analysis.
- ❑ October 1 - Submit quarterly monitoring report to resource agencies and consultant.
- ❑ December 1 - 3rd Quarterly sampling.
- ❑ Submit samples to laboratory for analysis.
- ❑ January 1 - Submit quarterly monitoring report to resource agencies and consultant.
- ❑ March 1 - 4th Quarterly sampling.
- ❑ Submit samples to laboratory for analysis.
- ❑ April 1 - Submit to resource agencies and consultant first quarterly monitoring report.
- ❑ May 1 - Submit annual monitoring report to resource agencies and consultant.

*Note: If at any time notable discrepancies occur between baseline data and quarterly sampling results, the resource agencies and consultant shall be notified within 7 days of receiving water quality analysis.

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