FINAL

BIG TUJUNGA WASH 2001 ANNUAL REPORT

Prepared for:

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
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SECTION 1.0 – INTRODUCTION

1.1 PURPOSE/GOALS

In mid-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.

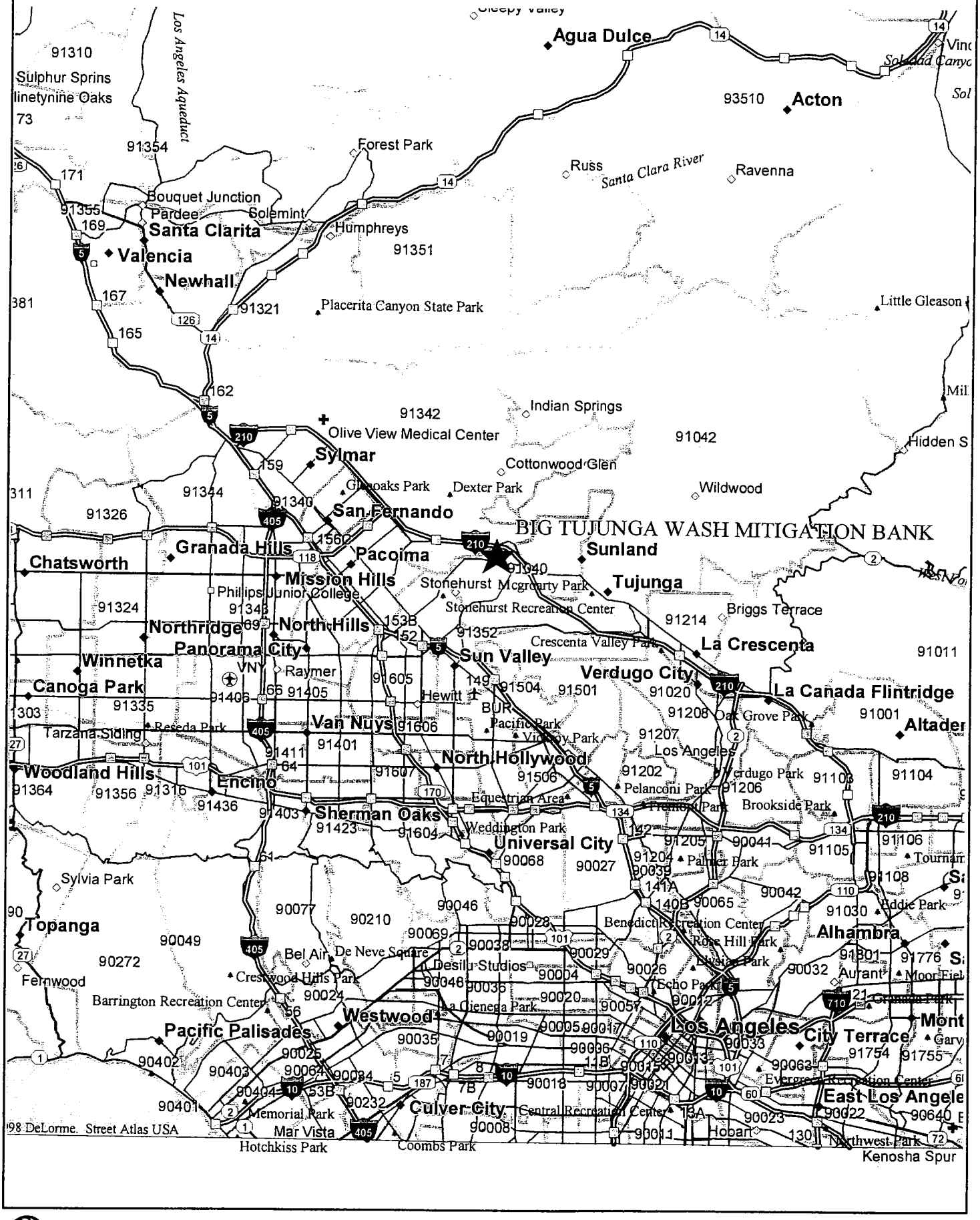
The MMP contains elements designed to restore and enhance existing habitats on the Big Tujunga Wash site by removing non-native plant, fish, amphibian, and reptile species. In addition, the MMP includes an optional program to create a diverse coast live oak-California sycamore woodland and coastal sage 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 6.0 of the MMP to document the portion of each program that was 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 2001.

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 on the north and east by the 210 Freeway and on the south by Wentworth Street. The west side of the site is contiguous with the downstream portion of Big Tujunga Wash. 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 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.



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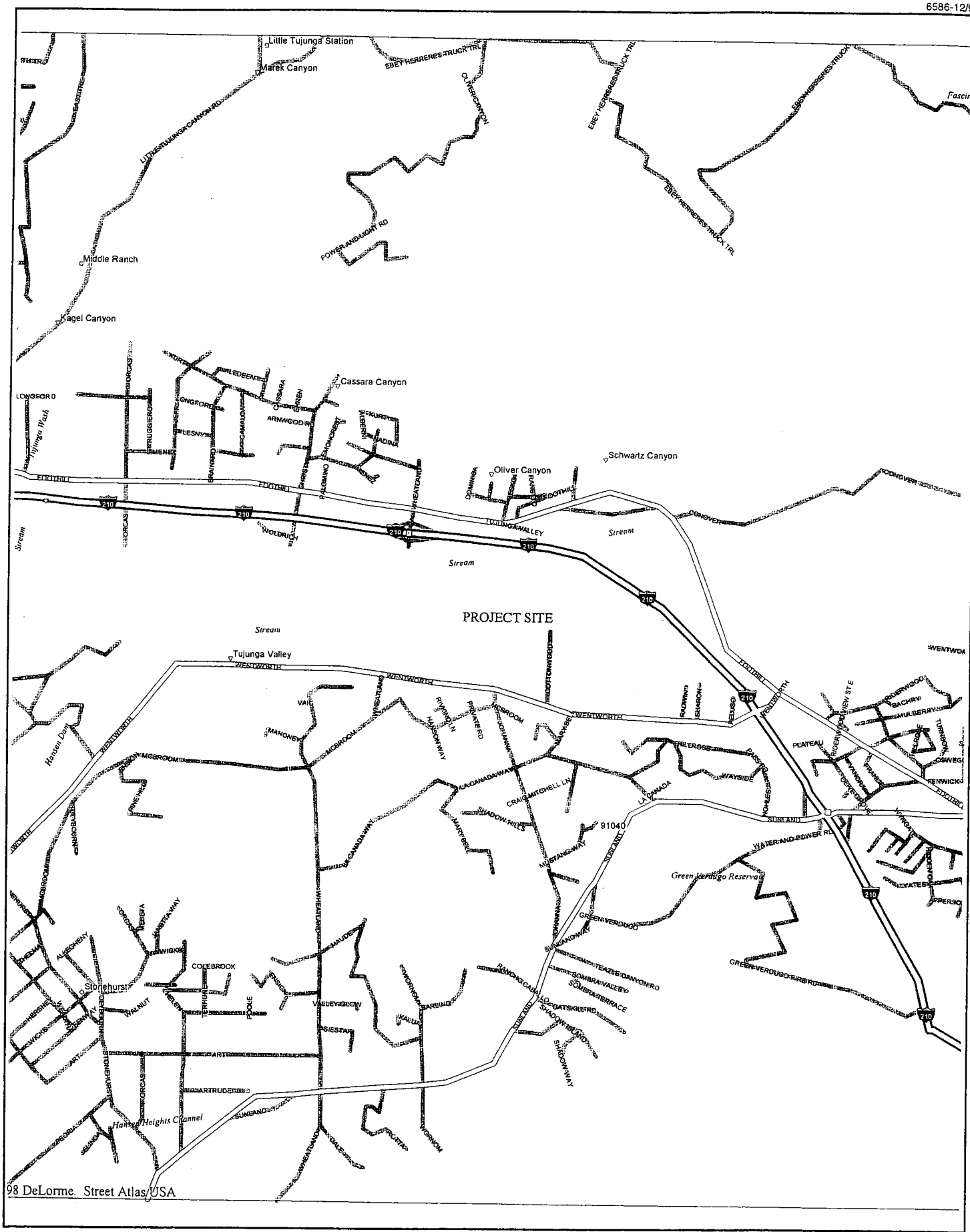
PROJECT VICINITY MAP
Figure 1-1



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BIG TIJUNGA WASH
PROJECT LOCATION MAP
Figure 1-2

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. LACDPW has included improvement of the pond habitat in the MMP.

1.3 MITIGATION PLAN

In mid-1999, Chambers Group, Inc. prepared a MMP for the Big Tujunga Wash Mitigation Bank for the LACDPW. The purpose of the MMP is to serve as a guide for implementation of the various enhancement programs and to fulfill the 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. Eradication of exotic plant species and habitat restoration and revegetation programs, which include planting and irrigation strategies, plant palettes, and long-term maintenance and monitoring of the site, are a primary component of the mitigation plan. The MMP is designed to include a 5-year program of implementation, maintenance, and monitoring of the enhancement strategies. Implementation of the MMP was initiated in late 2000.

1.4 SUMMARY OF THE ANNUAL REPORT

This summary identifies the elements of the MMP undertaken during the year 2001. 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. The purpose of the monitoring is to determine the health of 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 will prepare the monitoring reports and the LACDPW will transmit the reports to the resource agencies that are issuing the mitigation credits. The first Functional Analysis success monitoring surveys was conducted in August 2001 and is summarized with the native riparian habitat restoration program 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 removed the exotic species, and to revegetate the riparian and upland areas. Inspections occur on a monthly basis during the first year after implementation is completed in each habitat, and they occur 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 2001 is described in detail in Sections 2.0, 3.0, 4.0, and 5.0.

Sycamore-Oak Woodland Enhancement and Monitoring

This optional 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. Monthly maintenance inspections were conducted from January through October 2001. The first annual success monitoring inspection was conducted in November 2001. 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 LACDPWs property and the adjacent Tujunga Ponds. Although LACDPR owns the Tujunga Ponds instead of the LACDPW, the LACDPWs MMP includes non-native species removal within the Ponds because they are the primary introduction sites for these harmful species on the LACDPWs adjacent property. The exotic plant species removal program 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 2001. Exotic wildlife removal occurred in January, February, May, July, August, October, and December 2001. Section 5.0 describes the exotic wildlife removal program and progress. Brown-headed cowbird removal was conducted from March 15 to July 15, 2001. Section 6.0 describes the brown-headed cowbird trapping and removal program, and results for 2001.

Success Monitoring - Fish and Wildlife

This program consists of monitoring populations of sensitive fish (Santa Ana sucker, Santa Ana speckled dace, and arroyo chub), birds (least Bell's vireo and southwestern willow flycatcher), and amphibians (arroyo southwestern toad) 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 onsite 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 in July, October, and November 2001. The results of the surveys for 2001 are summarized in Section 5.0. Eight surveys for the least Bell's vireo and five surveys for the southwestern willow flycatcher took place during May, June, and July 2001. The results of the surveys for 2001 are summarized in Section 7.0.

Trails Enhancement and Reclamation

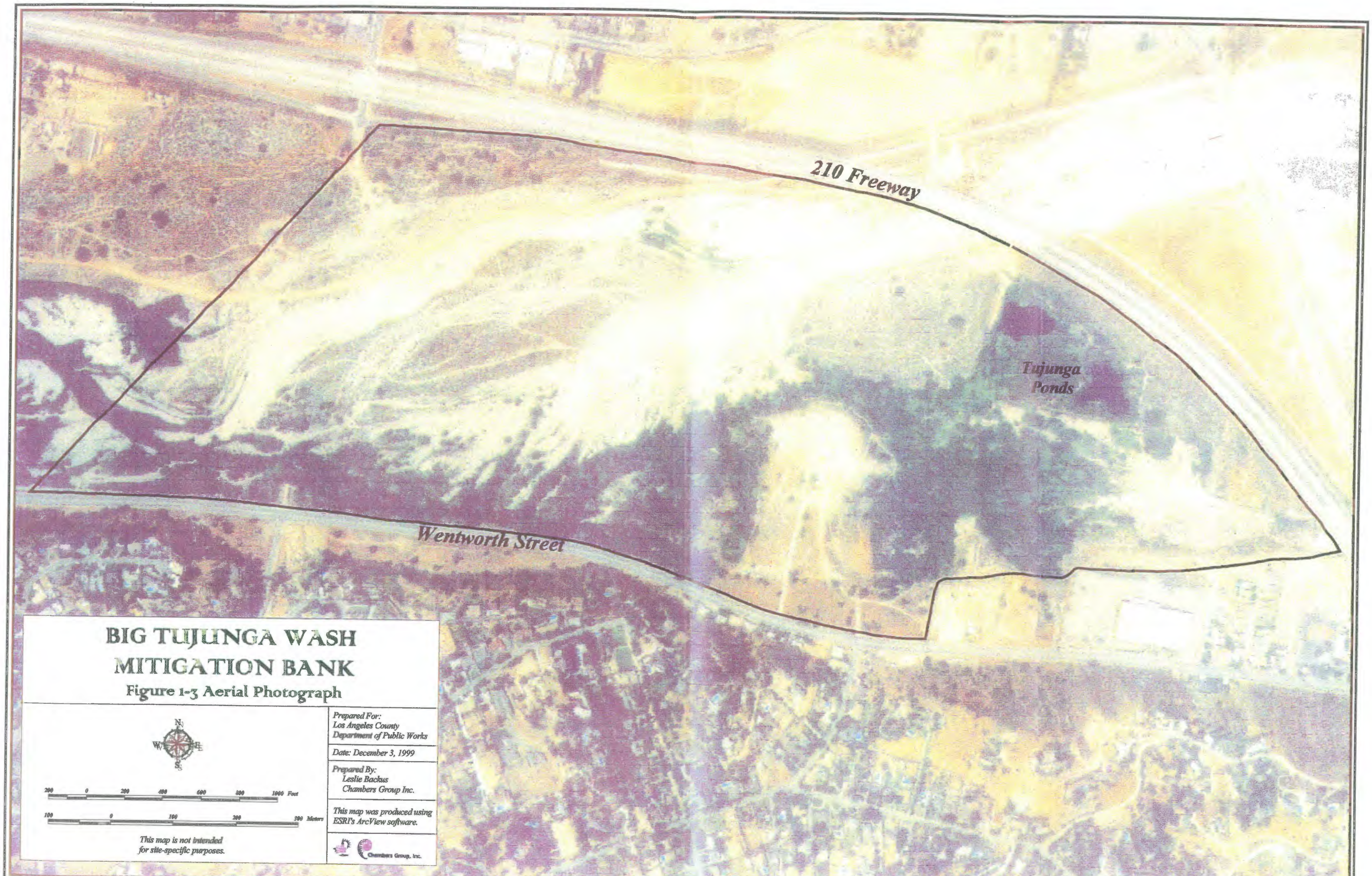
This program formalizes joint equestrian and hiking trails through the Big Tujunga Wash Mitigation Bank site to allow traffic that is compatible with the site's primary function of habitat restoration and preservation. This program consists of the LACDPWs installation of portable toilets and trash receptacles, 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. Two information kiosks were installed September 24 and 25, 2001. A trails dedication ceremony was held September 26, 2001. Details of the program progress for 2001 is described in Section 8.0.

Community Awareness Program

This program consists of utilizing a Community Advisory Committee (CAC), 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 2001. Section 9.0 describes the Public Awareness and Outreach Program.

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.


210 Freeway
Tujunga Ponds
Wentworth Street
BIG TUJUNGA WASH
MITIGATION BANK
Figure 1-3 Aerial Photograph
N
W
E
S
200 0 200 400 600 800 1000 Feet
100 0 100 200 300 Meters
This map is not intended for site-specific purposes.
Prepared For:
Los Angeles County
Department of Public Works
Date: December 3, 1999
Prepared By:
Leslie Backus
Chambers Group Inc.
This map was produced using ESRI's ArcView software.
Chambers Group, Inc.

Entrance to Marybell Avenue

The County has approved the equestrian entrance at the Mary Bell Entrance. Chambers Group is working on the design and installation of an equestrian step-over to be installed on the east side of the existing gate. Details on the entrance are included in the December 2001 community awareness meeting minutes in Section 9.0.

Water Quality Monitoring

This program begins with the LACDPWs 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 2001 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 2001.

Mitigation Banking Agreement

This program consists of entering into an agreement with the CDFG to keep track of the DPWs 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 Avenue 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 & Consultant	07/15/2000	12/15/2002

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	03/15/2002	12/31/2002

1.5 STATUS OF PERMITS

LACDPW entered into a Section 1601 Streambed Alteration Agreement (SAA) with the CDFG 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 (*Catostomus santaanae*) 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.

1.6 RESPONSIBLE PARTIES

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

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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

Enhancement 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 (*Arundo donax*) 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 provide 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 will also be 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

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. Work areas were delineated in four sections to facilitate continued use of the site during construction. Work was initiated in Sections 3.0 and 4.0, which includes the riparian habitat around Haines Canyon Creek. The riparian restoration and exotic plant removal areas are shown in Figure 2-1.

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, while the remainder will be delayed until the next growing season (late winter 2002). The 120-day maintenance period will also be 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. 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.

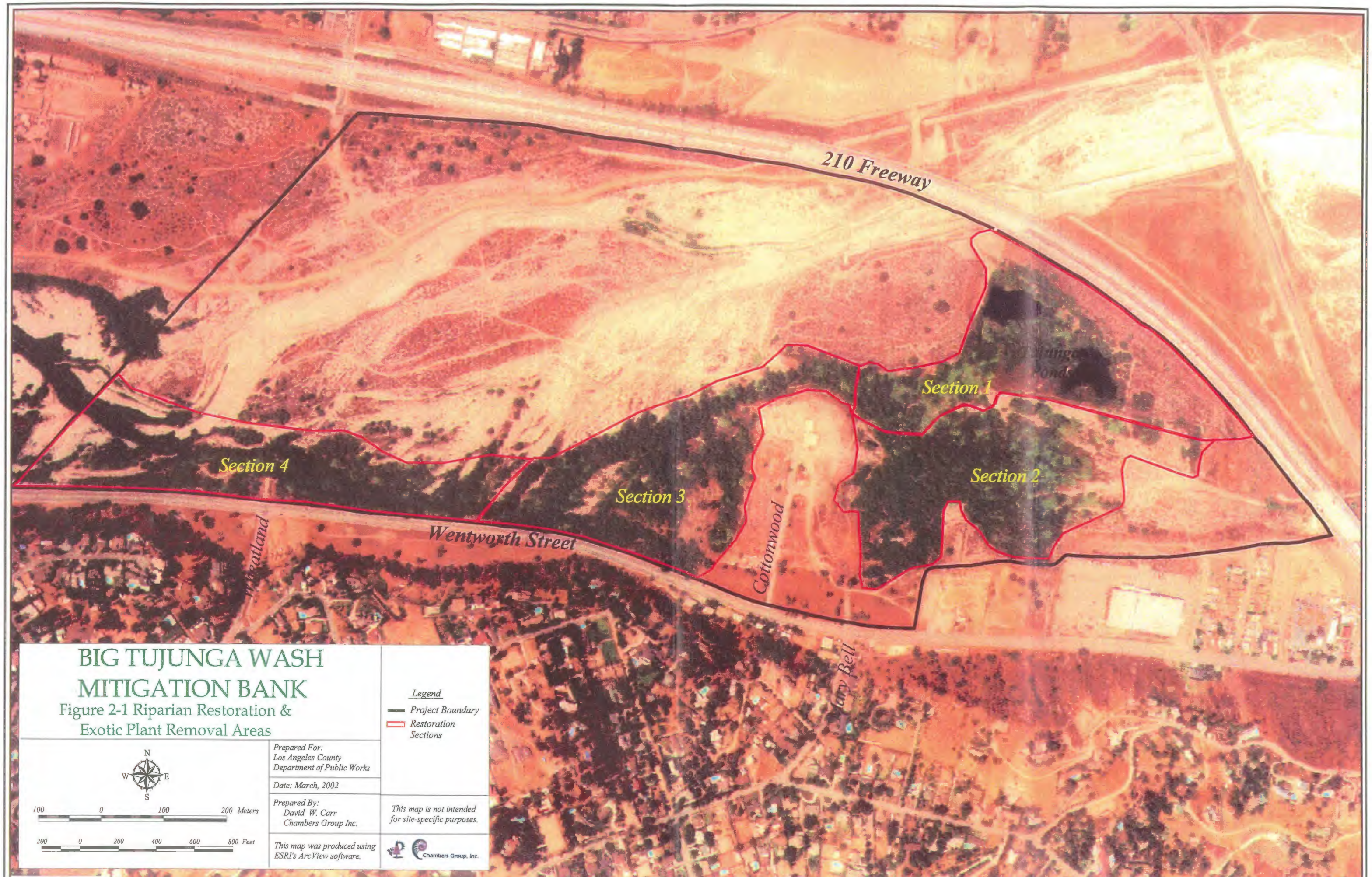
Biological monitors were onsite to oversee the implementation and completion of the exotic plant removal and partial planting in the restoration areas. Maintenance monitoring was initiated in the riparian enhancement areas after planting was finished. The surveys to evaluate progress for the first were initiated in December 2001.

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 2001 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 first annual functional analysis was conducted on August 13, 14, and 22, 2001. Data were collected by Pam De Vries, Ken McDonald, and Mike Landers.


210 Freeway
Section 1
Section 2
Section 3
Section 4
Wentworth Street
Cottonwood
Wheatland
Mary Bell
BIG TUJUNGA WASH
MITIGATION BANK
Figure 2-1 Riparian Restoration &
Exotic Plant Removal Areas
Legend
Project Boundary
Restoration Sections
N
W
E
S
100 0 100 200 Meters
200 0 200 400 600 800 Feet
Prepared For:
Los Angeles County
Department of Public Works
Date: March, 2002
Prepared By:
David W. Carr
Chambers Group Inc.
This map was produced using
ESRI's ArcView software.
This map is not intended
for site-specific purposes.
Chambers Group, Inc.
D:/proj/bigt/bigt.apr – March, 2002

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. The wooden bridge between the two ponds was removed in late September 2001 and the path leading to it was blocked with debris. No additional trails in the riparian restoration areas were reclaimed to native habitat.

2.3 PROJECT MONITORING STATUS

Maintenance, Monitoring, and Reports

Maintenance monitoring of the planted areas was initiated immediately after the partial planting was completed. The first monthly monitoring visit was conducted on March 28, 2001. Monitoring summaries for the partial riparian planting were included in the monthly monitoring reports for the Oak/Sycamore Woodland Restoration area through November 2001 and as a separate report for the month of December 2001 (Appendix B). Monthly maintenance monitoring visits will continue through January 2002. The success monitoring for the riparian plantings will be conducted in February 2002. The next Functional Analysis will be conducted in August 2002.

2.4 RESULTS

Seeding And Planting In Revegetation Areas

The partial planting within the revegetation areas met with varied success. In some areas, willow and mule fat cuttings grew and developed well, while in other areas very few surviving cuttings were observed. In still other areas, some cuttings did well while the rest were stressed or did not survive. The cuttings that did well were generally in fairly close proximity to the creek or close to the water table level. No seeding took place in the riparian revegetation areas.

Enhancement/Trails Reclamation

Only minor enhancements to the trails have been required during 2001 and there had been no attempt to continue access of most of the reclaimed trails. One exception has been the trail between the two ponds. Trail users have pushed aside the barrier continually. The removal of the connecting bridge has reduced the amount of traffic, but has not stopped it. Detailed information on the Trails Program can be found in Section 8.0. Figure 2-2 shows the checklist for the riparian habitat enhancement plan implementation tasks that have been completed thus far.

Figure 2-2
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.

Functional Analysis

Approximately 80 trees and 420 shrubs per acre were found in the riparian habitat at Big Tujunga Wash Mitigation Bank. Approximately 70 percent of the shrubs and 91 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 62 percent cover overall), and shrubs form a sparse understory cover of approximately 7.7 percent. The relative frequency of trees to shrubs was approximately equal at 54 percent trees to 46 percent shrubs. The results for overall density, dominance (percent cover), and relative frequency for the Big Tujunga Wash riparian habitat are summarized in Table 2-1.

Table 2-1
Density, Dominance, and Relative Frequency

	Density (# plants/acre)	Dominance (Percent Cover)	Relative Frequency (% of Total Community
Native Species			
Trees	73	58.8	-
Shrubs	294	8.6	-
Non-Native Species			
Trees	7	3.5	-
Shrubs	125	0.6	-
Summary All Species			
Trees	80	62.0	54
Shrubs	420	7.7	46

Overall organic cover was relatively high at approximately 82 percent, and the presence of annual grasses was low at approximately 4.1 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 2-2.

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

Percent Organic Cover	Percent Cover of Annual Grass	Average Tree Height (Category units)	Average Topography Features (per 100 meters)
82.0	4.1	2.75	17.5

A total of 76 acres of willow habitat, calculated using the Geographic Information System, was delineated at the site during the initial study in 1997. Therefore, the total Functional Capacity Units (FCU) for riparian habitat at Big Tujunga Wash is:

$FCU_{Big\ T} = (0.84_{FUwillows})(76 \text{ acres of willows}) = 63.84$

Details of the results of the Functional Analysis are found in Appendix A.

2.5 SITE EVALUATION AND RECOMMENDATIONS

Overall Site Conditions

Most construction activities were concluded in early 2001. The large areas that have been cleared of giant reed remain mostly open. Maintenance to clear the site of giant reed occurred during monthly maintenance periods. Control of other exotics occurred intermittently throughout the year and is expected to continue into 2002.

Maintenance Recommendations and Remedial Actions

The poor survivorship of the planted cuttings indicates that the intended liner plantings may not do well. Container plantings should be substituted, as these plants have root systems that are more developed and should establish more quickly. Cuttings should be installed in areas closer to the stream or in lower areas closer to the ground water table.

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

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

SECTION 3.0 – COAST LIVE OAK/SYCAMOREWOODLAND REVEGETATION PROGRAM

3.1 INTRODUCTION

Creating a coast live oak-sycamore woodland with a coastal sage scrub understory community was not 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 may 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 created 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 1.0 through 5.0 are the woodland revegetation areas, and Sections 6.0 and 7.0 are the coastal sage scrub areas. Figure 3-1 shows the locations and types of restoration and enhancement areas on the site. The Upland Implementation As-built Report is included in Appendix C.

Restoration Areas

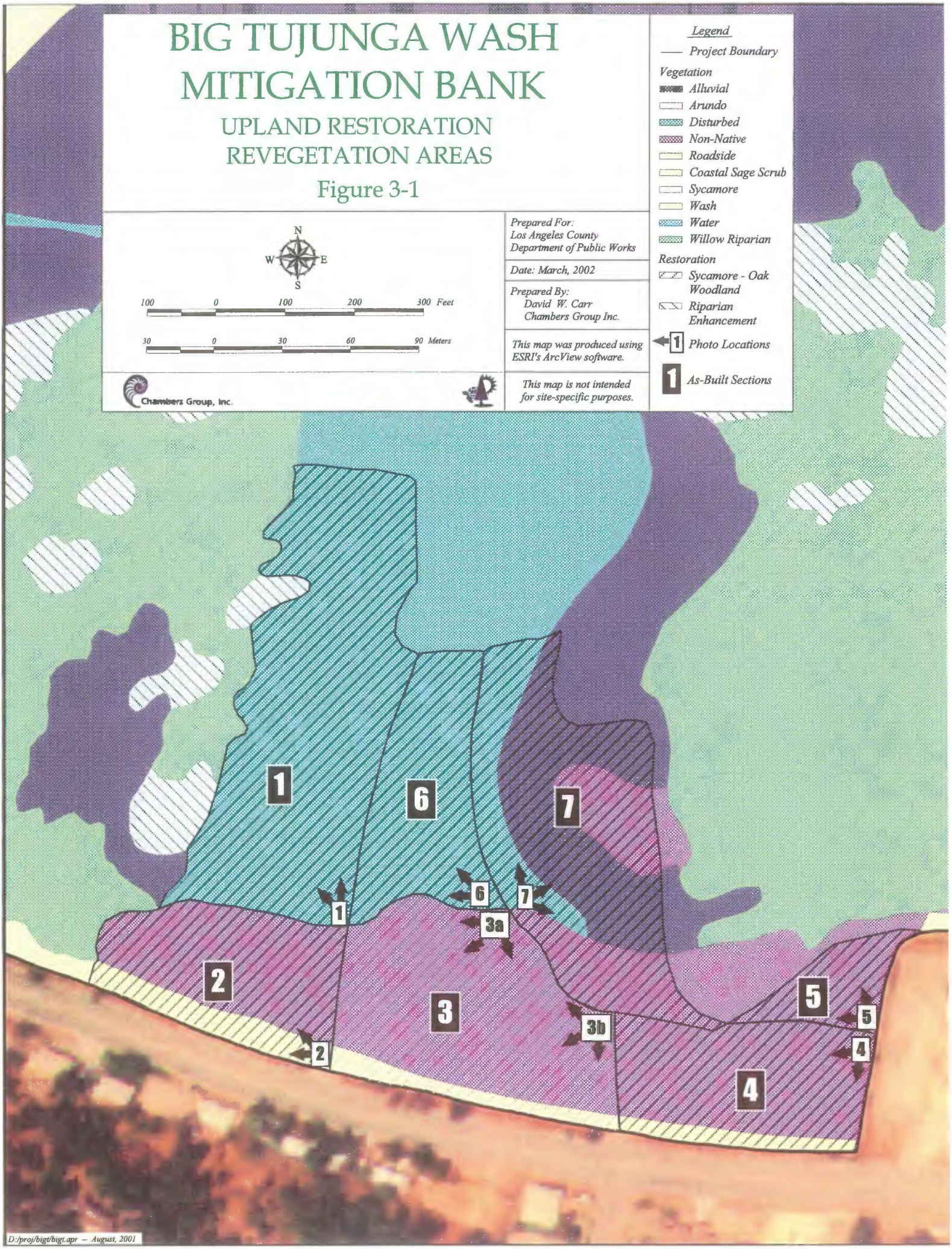
Maintenance of the mitigation site was performed by Natures Image, with the knowledge and oversight of a Chambers Group Restoration Specialist. Natures Image was responsible for conducting horticultural maintenance of the mitigation areas, including irrigation, pest control, erosion control, and weed removal throughout the mitigation areas.

Although planting was implemented in late 2000, one species, laurel sumac (*Malosma laurina*) was not included at the time of initial planting due to unavailability at the time of installation. Laurel sumac was installed in November 2001. Monthly monitoring visits were conducted by a Chambers Group restoration

BIG TUJUNGA WASH MITIGATION BANK

UPLAND RESTORATION REVEGETATION AREAS

Figure 3-1



specialist starting in November 2000 and continuing through November 2001. 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 monthly maintenance monitoring reports are provided in Appendix B.

Enhancement/Trails Reclamation

No additional trails were reclaimed or closed during 2001. 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 Pam De Vries, Ken McDonald, and Kent Hughes on November 19 and 20, 2001. 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 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. Additional information was recorded, such as date, field crew, and location information of each quadrat area. Finally, the progress of the site was documented photographically from pre-established photo locations. Site photographs are included in Appendix D. 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 number found for each species. Copies of all data sheets are included in Appendix E.

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 vegetation cover for the first year was approximately 36 percent, with 64 percent of the site unvegetated. Installed container or seeded native species comprised 10 percent cover on the site. Section 3.0 had the highest cover of native vegetation at approximately 18 percent and Section 4.0 had the lowest at 2.1 percent. Section 2.0 had the lowest amount of weed cover at about 5 percent, but also had the lowest amount of cover overall at approximately 18 percent. Native cover in Section 2.0 was approximately 13 percent. Density of native plants was high at approximately 0.8 per square meter overall, or about 3,238 plants per acre. Natural recruitment of sycamore trees and other native species was observed in several sections.

Survival Rates

Overall survival of the installed container plants was lower than anticipated. A total of 704 containers were installed in November 2000. Only 501 were counted in November 2001, a decrease of approximately 29 percent. The oak and sycamore trees did relatively well with 84 percent of the trees surviving. Five sycamore trees and 39 oaks were lost. Mortality in shrub species was higher, with only 64 percent survival. Fuchsia-flowered gooseberry (*Ribes speciosum*) suffered the greatest loss with only 12 of the original 56 plants surviving. Chaparral whitethorn (*Ceanothus leucodermis*) and toyon (*Heteromoles arbutifolia*) also had lower survival rates with 42 and 56 percent survivability, respectively. The remaining shrubs did well and surviving numbers reflect standard expectations. Survival of container plantings is summarized in Table 3-3.

Table 3-3
Surviving Container Plantings

Common Name	Species	2000 (Installation)	2001	Percent Survival
Coast live oak	*Quercus agrifolia*	211	172	**82**
California sycamore	*Platanus racemosa*	56	51	**91**
California buckwheat	*Eriogonum fasciculatum*	115	89	**77**
Fushsia-flowered gooseberry	*Ribes speciosum*	56	12	**21**
Chaparral whitethorn	*Ceanothus leucodermis*	33	14	**42**
California sagebrush	*Artemisia californica*	109	85	**78**
Coastal prickly pear	*Opuntia littoralis*	57	39	**68**
Nevin's barberry	*Berberis nevinii*	3	3	**100**
Toyon	*Heteromeles arbutifolia*	64	36	**56**
	Total	**704**	**501**	**71 (Average)**

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 19, 2001. The overall cover of vegetation was low for the first year, most likely due to lack of sufficient precipitation. The majority of the imprinted seeds did not germinate in the first year as 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.

Several minor problems were noted during the 2001 maintenance inspections. Recommendations for remedial actions are discussed below in Maintenance Recommendations.

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. Several of the container plants that did not survive were stressed by lack of irrigation due to breaks in the irrigation lines. The contractor will install replacement plants with appropriate species to raise the survival rates to first year standards.

The irrigation system for the container plants sustained frequent damage from coyotes. Breaks in the line due to chewed hoses were reported in most of the restoration sections almost on a monthly basis. Each time the tubing was repaired and reburied by the contractor, it was dug up and damaged again soon after. 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 untouched.

Underground rodent activity (gophers) resulted in the loss of many of the container plants installed in the upland areas as well as numerous germinated seedlings. Replacement plantings were placed in underground herbivory cages, some of which proved to be only a minor obstacle to the gophers.

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

Maintenance Recommendations

- Coyotes will continue to be a problem as long as the irrigation system is needed. A possible method of prevention consists of wrapping the repaired tubing loosely in chicken wire before burying. This should deter further attacks on the irrigation system. Discontinuing irrigation in areas where tubing is frequently damaged should also be considered, with deep, monthly hand-watering as an alternative.

- Control of gophers should be implemented to prevent further losses. Gas or trapping is a possible control method. Bait poisons that could affect other species preying on the carcasses should be avoided. One recommended method of control is to place raptor poles at intervals throughout the areas where the gophers are concentrated. The presence of these poles encourages birds of prey, such as the Cooper's hawk, to perch and hunt in the area.
- 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. 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 for the next appropriate planting season (late fall 2002).

3.5 PROJECT MONITORING STATUS

Maintenance, Monitoring and Reports

Inspection monitoring for 2001 began in January and continued through November 2001. 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 monthly maintenance monitoring reports are provided in Appendix B.

The site entered the 120-day maintenance period on November 18, 2000, which concluded in March 2001. The first annual performance monitoring survey was conducted in November 2001. Quarterly monitoring will continue in the oak/sycamore area through November 2002. 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 monthly maintenance inspection, 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 implementation monitoring reports.

Enhancement/Reclamation Trails

Only minor trail delineation was required for the upland restoration area trails during 2001. Trail users have kept to the main paths.

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 construction activities. The following sections describe the methods used for exotic plant species removal, and the progress of the program through December 2001.

4.2 METHODS

Locations

Work areas were delineated in 4 sections to facilitate continued use of the site during construction. Sections 1.0 and 2.0 includes the Big Tujunga Ponds and the surrounding riparian habitat, while Sections 3.0 and 4.0 includes the riparian habitat along and adjacent to Haines Canyon Creek. These sections are shown in Figure 2-1 of Section 2.0.

To facilitate continued use of the site by equestrians, the exotic plant removal was phased in different sections of the site. Removal of giant reed was concluded in and confined to the downstream portions of the site (Sections 3.0 and 4.0). The trails through areas were reopened when the initial removal was completed in these sections. Orange plastic construction fencing was used to block access to trails leading into areas where machinery and crews were active. Signs were also posted at strategic locations advising equestrians and hikers of the temporary closures. Where large areas of giant reed were removed near the stream, silt fencing was installed along the stream banks to prevent the flow of debris into the stream. Some incidental removal of other exotic plant species from the restoration areas and along side trails was accomplished as giant reed and hyacinth was removed. Exotic weed removal activities will continue before planting begins in Sections 3.0 and 4.0 in early 2002 and 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. The delayed start of the project necessitated a change in the recommended removal technique. Rather than applying a foliar spray to standing giant reed that had entered a dormant stage, the larger masses of reed were mowed and chipped in place to reduce the standing biomass. Regrowth was treated with a high-concentration solution of Rodeo® prior to replanting the riparian areas in Sections 1.0 and 2.0. Retreatment occurred throughout the year to facilitate replanting of the rest of the site during the next appropriate season (i.e., late winter 2002).

Removal techniques included mechanical cutting and mulching, chain pulling, and hand-cutting the material with chain saws. Mechanical cutting/mulching was accomplished using a mulcher attachment on a small tractor. The mulcher is a large, toothed cylinder that operates much like a lawn mower. The reed was first cut near the base. The stalks were then pulled into the cylinder by the teeth, where it was chipped into mulch and redistributed over the ground surface. The stalks were cut close to the ground to prevent damaging the tractor tires as it traveled farther into the stands of reed. Giant reed stumps cut using the mulcher were not treated with herbicide because the mulched material immediately covered the stumps to a depth of 3 to 6 inches. The regrowth was allowed to reach 3 to 4 feet in height, and was then treated with a highly concentrated (up to 100 percent) solution of Rodeo® using hand-held equipment.

A chain pulled by a small tractor was used to remove large clumps of reed growing adjacent to the stream. The chain was positioned around a clump about 2 feet above the ground, and attached to a tractor. When pulled, the chain cuts through the stalks, and drags the bundle away from the stream edge. The stalks were stacked in a clear area where the mulcher attachment was then used to reduce the biomass to chips. Hand cutting using a chain saw was used where giant reed was growing immediately adjacent to preserved native vegetation (i.e., willows and mule fat). The reed was cut, and the canes dragged to an open area for mulching. Stumps cut with either the pull chain or chain saw methods were immediately sprayed with Rodeo®.

All regrowth of this species was reported to the contractor during the maintenance monitoring visits. The resprouts were treated with Rodeo® when they had reached at least 1 foot in height during periodic maintenance activities.

4.2.2 Water Hyacinth Eradication

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

The free-floating plant material was removed from the water by hand. Two small boats powered by outboard engines were used to gather the material into floating bundles, which were then pulled to the bank where it was removed. Removed hyacinth biomass was spread over the ground away from the pond edge to allow excess water to drain. The drained plant material was collected from the site and disposed of at an offsite location.

Crews first worked to clear the eastern-most pond and then directed their efforts to the west pond. All free-floating material was removed. Water hyacinth that was rooted in the mud was treated during the growing season with an application of undiluted herbicide (Rodeo®) per label guidelines. The dead biomass was removed after the herbicide treatment.

Small amounts of water hyacinth were observed throughout the year and reported to the contractor. It was removed during periodic maintenance activities.

4.2.3 Tamarisk Eradication

Tamarisk eradication was conducted in the riparian habitat during the giant reed removal program. Individuals of this species were identified by the work crew and flagged for removal. Each tamarisk encountered on the site was hand cut to within 6 inches of the ground using chainsaws for larger individuals or hand-held pruning equipment for smaller individuals. The cut stumps were immediately treated with herbicide (Rodeo®) per the label instructions. All cut material was collected and removed from the site.

Any regrowth or new individuals of this species will be identified during the maintenance monitoring visits and retreated.

4.3 STATUS/RESULTS

No regrowth of tamarisk was observed during the 2001 maintenance period. Some regrowth (up to 5 feet in height) 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. The hyacinth was almost completely eradicated from the site. Only small amounts remain in the ponds area.

4.4 MONITORING SCHEDULE

Biological monitors were present on the site during the initiation of giant reed, hyacinth, and tamarisk removal activities. Monitors were onsite daily during the first weeks of the giant reed removal activities to oversee the removal technique and to ensure that the workers understood the constraints on the site (i.e., protection of native vegetation and the stream channel). Monitors overseeing the giant reed removal were scheduled randomly during the week, and without prior notification to the contractor. A monitor was present on the site not less than twice per week. The construction activities were recorded on a daily monitoring report form. The implementation monitoring reports are included as an appendix to the monthly implementation monitoring report, which includes all construction activity on the site during the month. Copies of the implementation and inspection maintenance reports for 2001 are included in Appendix F.

SECTION 5.0 – EXOTIC WILDLIFE REMOVAL & NATIVE FISH SAMPLING PROGRAMS

5.1 INTRODUCTION

Dr. Dan Holland, Dr. Camm Swift, and 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 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. 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 10 to 16, October 26 to 27, and November 10 to 11, 2001. Transects were established at random by measuring two 20-meter transects for every 200 meters of stream habitat. 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 an 8-inch mesh seine. This was done with minimal disturbance to the transect. Then two persons seined for at least 1 hour with a variety of techniques to exhaustively sample all the fishes. Native fishes were held in large buckets 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 the fishes were counted, sizes estimated to the nearest 10 centimeters, and released back into the, 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 16 to 18, February 7 to 16, May 16 to 19, July 10 to 13, August 14 to 17, October 5 to 8 and 26 to 27, and December 12 to 13 and 17 to 20, 2001. Four distinct methods were used to the catch the aquatic organisms, including gill nets, small seines, crayfish and minnow traps, and turtle traps. Traps were baited with cat food or sardines. Snorkeling and spearfishing were also conducted during the December sapling effort. The exotic removal and native fish sampling in Haines Canyon Creek was accomplished with a small seine. Miscellaneous seining in the stream was conducted to remove crayfish and small largemouth bass. 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. In addition to collecting data on the fishes, habitat features such as water temperature the fishes were counted, sizes estimated to the nearest 10 centimeters, and released back into the, substrate type, depth, width, available cover, canopy, and gradient or slope were also measured and recorded.

During the sampling from January through June, the traps were checked both morning and evening. However, experience showed very few catches during the daytime (in the traps checked in the late afternoon) and subsequently nets and traps were checked only in the mornings. Turtle traps were initially placed near shore, partly exposed as is typical, but later they were completely submerged to catch crayfish and tadpoles. With the acquisition of more crayfish traps in mid-year, use of turtle traps was discontinued (for crayfish). Both ponds were trapped and netted simultaneously except in December when only the West Pond was sampled due to loss of equipment (by theft). Typically the traps and gill nets were placed around the perimeter of the ponds near "cover" for the target organisms. Catches were always recorded separately for each pond and in the same order. Starting east (on the map) and traveling in a clockwise direction 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. 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 Monitoring 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 Creek and the east and west 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 Creek from 2000-2001 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*) and fathead minnows (*Pimephales promelas*), along with large numbers of crayfish were collected and removed from the stream during native fish sampling.

The transects in the stream 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 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 end of the stream.

Table 5-1 summarizes the results from the native fish sampling conducted during 2001.

Table 5-1
Results of Native Fish Sampling Conducted During 2001

Quarter	Santa Ana Sucker	Arroyo Chub	Santa Ana Speckled Dace	Rainbow Trout
1st (January-March)	*	*	*	*
2nd (April-June)	127	72	0	1
3rd (July-September)	463	246	31	3
4th (October-December)	162	78	11	2
Totals	**752**	**396**	**42**	**6**
* Sampling was not conducted.				

5.3.2 Results of Exotic Wildlife Removal

The exotic sampling throughout 2001 resulted in the removal of thousands of crayfish and hundreds of fish. The fish consisted mainly of largemouth bass and occasionally bluegill (*Lepomis macrochirus*) and green sunfish (*Lepomis cyanellus*). 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 2001as Appendix G.

Table 5-2 summarizes the results from the non-native aquatic wildlife removal conducted during 2001.

Table 5-2
Non-Native Aquatic Wildlife Removal Conducted During 2001

Quarter	Red Swamp Crayfish	Largemouth Bass	Bullfrog	Mosquitofish	Others
1st (January-March)	3006	8	520	222	6
2nd (April-June)	631	1590	157	240	3
3rd (July-September)	2234	528	217	250+	4
4th (October-December)	1967	158	1624	60	279
Totals	**5138**	**2284**	**2518**	**772+**	**292**

* **Sampling was not conducted.**
** **Totals include all non-natives removed by all methods.**

Crayfish

Crayfish were abundant in both the ponds and the whole length of the stream. For a brief period they appeared lower in abundance in the stream after high winter flows, but were in high numbers again by the fall transect surveys. These numbers were not as high as the first transects in December 2000, before the winter storms. Crayfish were always present in large numbers in the ponds, but catches were higher in the colder months. The catches based on actual numbers or on catch per unit effort (CPUE) show this distribution. There was some change in the number and kind of traps, but these were relatively minor and the data reflected the same pattern when using CPUE that adjusts for catch effort of the traps in the ponds.

In the stream, the crayfish were caught by seine incidental to the fishes in the transects so the effort was similar for all collections. The numbers also declined with the season into the summer and then increased slightly into the late fall, but not to the high levels of the previous year (December 2000). Additional crayfish were taken with miscellaneous seining in the stream in addition to the transect samples (Table 9, Appendix G).

Native Fish

The native fishes were restricted to the outlet stream; none were found in the two source ponds for Haines Creek. The data from the transect collections indicated that native fishes were most abundant in the lower part of the stream and declined in abundance upstream. However, at least a few individuals of all three native fishes were taken in one of the uppermost transects (14 to 16) within approximately 200 meters downstream of the outlet of the West Pond.

Extrapolation from the figures to a total population size for the 1.75-km of Haines Creek within the mitigation area should be treated with extreme caution and for purposes of approximation only. Roughly, there were approximately 2,000 to 2,500 Santa Ana suckers, 1,400 to 1,500 arroyo chub, and 170 Santa Ana speckled dace. There were also an indeterminate number of rainbow trout, probably not numbering more than a few dozen. Several of these fish were about the size that YOY should be and indicated that some spawning by rainbow trout took place.

5.4 DISCUSSION

There was a well-established population of native fishes in Haines Creek within the mitigation area as of the last survey. The most common species was the Santa Ana sucker, followed by the arroyo chub and the speckled dace. Rainbow trout, while originally native to this system, may originate from plants in

other areas of the drainage. Native fish populations are expected to vary through time, as the sampling results reflected; however, whether these variations are "normal" cannot be determined in the absence of comparative data. In general, populations peaked in the spring during spawning, and appeared to reach a low point in the late winter. High flows or other conditions may further reduce populations.

Native fish populations during the low point of the cycle may only number 25 to 30 percent of the "normal". For species such as the Santa Ana speckled dace and rainbow trout, this situation warrants extreme caution, as small populations of a few dozen fish are disproportionately vulnerable to extirpation or other negative impacts. Observations in March 2002 of apparently extremely reduced populations of natives downstream of the mitigation site (Swift and Holland unpubl. data), suggest that the area within the mitigation site serves as a critical refuge for native species. Perhaps such spawning was farther downstream and these fish swam upstream into the mitigation area.

The efforts of reducing populations of exotic species appeared to be successful, although to varying degrees. The removal of 2,500+ largemouth bass from the mitigation site indicated the presence of a large and actively recruiting population of this species. Fish of several size/age classes were observed and captured in the ponds. Evidence from seining in December 2000 and early 2001 in Haines Creek indicated that bass were very uncommon in this system prior to this time. The removal of water hyacinth from the pond surface likely allowed for an increase in temperature and primary productivity that fostered successful spawning, and thousands of small fish subsequently moved downstream in March to April 2001. The interpretation of the data showed a significant reduction in the population of largemouth bass within Haines Creek, and that the population of breeding-size adults within the ponds was also reduced. However, it is estimated that at least a few dozen adult bass remain in the ponds, and at least several dozen smaller, and as yet immature, fish remain. It is likely that several hundred to well over a thousand smaller largemouth bass remain in Haines Creek.

Results for the creek indicated a small reduction of red swamp crayfish, such that a very large population still persists in this area. The data indicated that there was a substantial reduction in the crayfish population for the ponds, approximately 90 percent. The linkage of this population to the status of the population in the stream is unknown; the presence of numerous small crayfish in the stream indicated that intrinsic recruitment is well-established there. An estimated number of several hundred to well over a thousand adult crayfish remain in the ponds, and the population in the stream probably numbers in the several thousands, perhaps well over 10,000.

There was little suitable habitat in the stream for bullfrogs. The occasional captures of both larvae and adults in this system indicated only transient "leakage" from the ponds. In the ponds, control efforts focused on larvae, and the data indicated a substantial reduction in the overall larval population. Removal of adults was opportunistic; observations indicated that the population of adult frogs at this site may be modest, perhaps only a few dozen individuals. The larval population probably numbers at least 1,000+ individuals, but is likely much higher.

For other species, populations of fathead minnow and red shiner in Haines Creek appeared to be low to very low, and were of minimal concern. Goldfish and carp in the ponds probably number less than a few dozen individuals and will likely be further reduced by spearfishing efforts. Sunfishes were very rare but apparently successfully spawned to a limited extend because a few YOY were taken in traps in the ponds, and at the outlet of the West Pond in December 2001 (Transect 16). Conditions appeared to be marginal for the sunfishes, and there was no indication that significant numbers of sunfishes were going downstream, in contrast to the largemouth bass.

The known exotic turtle population of the site consisted of a single large female Florida soft-shell, although captures of red-eared sliders are anticipated.

5.5 PROBLEMS ENCOUNTERED AND RECOMMENDATIONS

5.5.1 Rock Dams

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. Apparently, these were built for recreational purposes and to improve stream crossings for horseback riders. 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. After winters with few storms additional effort might be required to go in and remove these structures. The lack of high winter flows (such as has occurred in 2001 to 2002) fosters the maintenance of these artificial structures. The local populace should be educated about the adverse effects of these dams on the native aquatic fauna to reduce or eliminate their occurrence. Possibly volunteer groups may be interested in going in and removing those dams as habitat restoration projects. However, this has to be done with care since the release of potentially large amounts of silt into the stream flow could smother gravel and cobble habitat farther downstream. Continued public education to decrease the frequency of construction of these features, and an ongoing program to remove existing and new dams under careful supervision is recommended.

5.5.2 Sources of Non-Natives

There are currently several sources for non-native fish ingress into the project site. One is from the confluence downstream of the project site. The now dry flood channels in the lower mitigation area indicate that during very high flows, some confluence between these two may occur within the lower part of the mitigation area. Second is the stocking of live bait fish or aquarium fish by recreational users. A third source is the downstream Haines Creek Flood control channel that flows only during brief periods of storms. Although these flows primarily bypass the ponds, they occasionally enter the lower (outlet) end of the West Pond as well as flowing into uppermost Haines Creek. Some appraisal of the potential sources for non-natives upstream along this flood control channel may help prevent future introductions from subverting the efforts to control exotics in the mitigation area. Additionally, mosquitofish are introduced by mosquito abatement districts. A final source of concern for the mosquitofish, crayfish, and bullfrog populations is the concrete-lined channel along the southern base of the 210 Freeway. This channel is located outside the footprint of the mitigation area and is isolated by the slightly higher ground with a road between the West Pond and the channel. However, after high winter flows in 2000, the water level of the ponds rose, thereby flooding parts of the road and providing an aquatic connection for several months. Thus, this freeway channel provides a reservoir population of these three non-native species.

Efforts to alleviate ingress of non-native species include reconfiguring the ponds to a modified stream habitat, constructing a downstream trap to minimize downstream movement of newly spawned exotics in the ponds, and appraising and preventing potential sources of exotic introductions upstream of the site.

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).

6.1.1 Purpose and Goals

6.1.1.1 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 2001 Final Annual Brown-Headed Cowbird Trapping and Removal Report, which is included in Appendix H.

6.1.1.2 Trap Location

The four onsite trap locations were determined during Phase I of the MMP. As a result of the permitting process USWFS required Public Works to run three additional offsite traps. The addition of the offsite traps is to ensure that cowbirds from the entire basin are trapped and removed. The three offsite locations included, a local equestrian's residence, the Hansen Dam Equestrian Center, and the Hansen Dam Recreation Area. Site visits were conducted in order to familiarize the landowners with the purpose and anticipated schedule of the cowbird program and ultimately to decide on the exact placement of these offsite traps. These offsite trap locations were strategically chosen in an effort to intersect all brown-headed cowbird ingress and egress near the project site. The cowbird trap locations are shown on Figures 6-1 and 6-2.

6.2 TRAP MONITORING

On March 13, 2001, a total of 35 decoy cowbirds, consisting of 14 males and 21 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 13, 2001, but the top slot openings were kept covered until March 15, 2001, the first day of the 2001 trapping season.

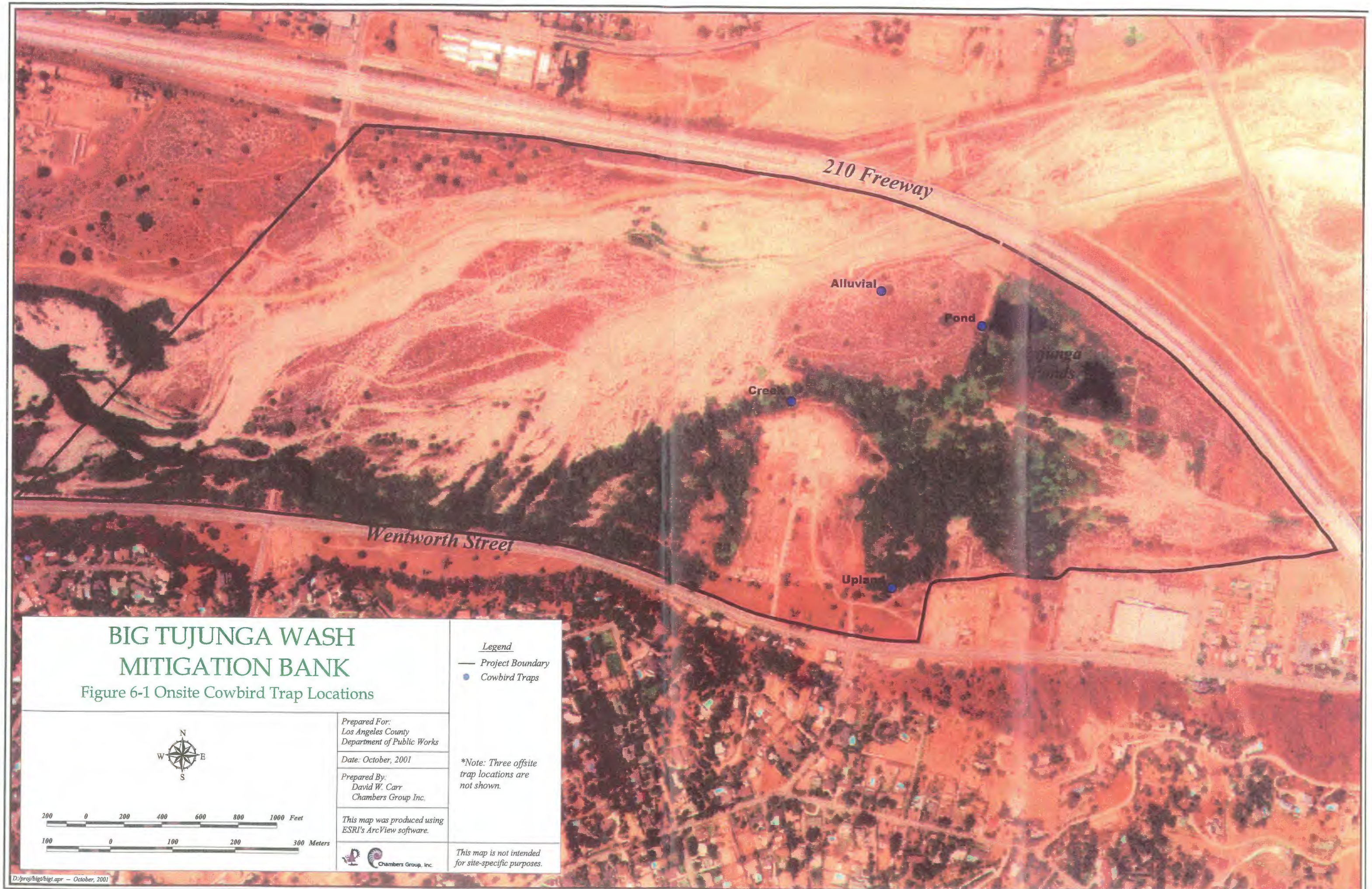
Traps were checked daily from March 15 through July 15, 2001, including weekends and holidays falling within this time frame. The 2001 trapping season consisted of a possible 861 trap days (7 traps for 123 days). However, a total of 12 days were lost as a result of trap closures (Creek and Pond traps) due to vandalism events, therefore, the traps were in operation for 849 days, or 98.6 percent of the total possible trap days. 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.

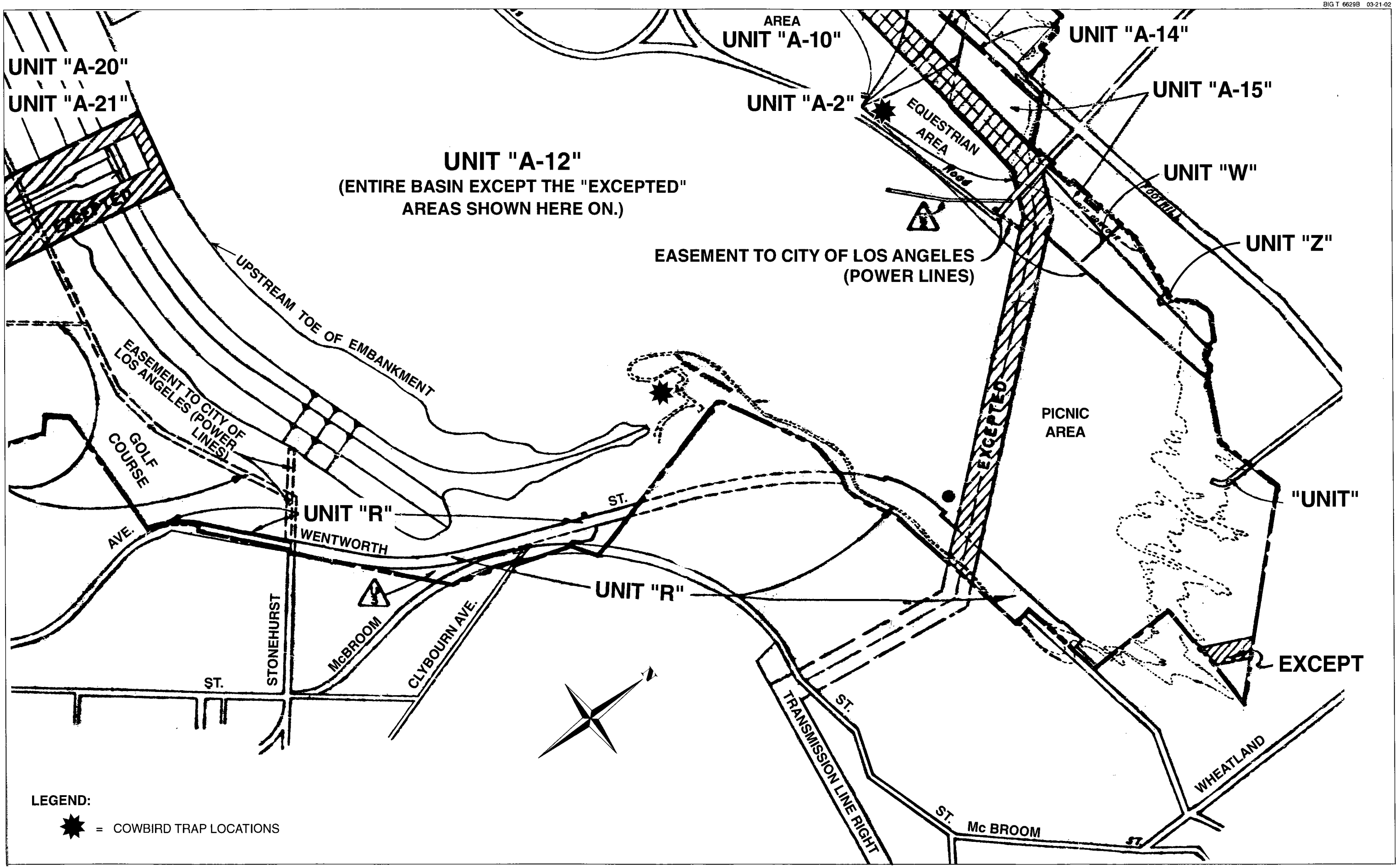
6.3 RESULTS

The results presented in this section are a summary of the results presented in the annual trapping and removal report. Please refer to Appendix H - 2001 Annual Brown-headed Cowbird Trapping and Removal Program (Chambers Group 2001) for detailed information regarding the 2001 cowbird program.

A total of 70 cowbirds, consisting of 37 males, 24 females, and 9 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, 13 cowbirds were trapped within Big Tujunga Wash Mitigation Bank and 57 cowbirds were trapped in the offsite traps. 63 percent of all trapped cowbirds were captured at the Equestrian Center, the most productive trap location. Both male and female captures peaked in April and decreased steadily in the following months, whereas all juveniles were captured in July. Table 6-1 lists the numbers of cowbirds trapped and total trapping efficiency at each trapping location for the 2001 trapping season.

Male captures outnumbered female captures at the Upland, Wentworth, and Equestrian traps. Female captures outnumbered male captures at the Pond and Alluvial traps. The Alluvial trap captured only females. The male captures equaled the female captures at the Basin trap.


210 Freeway
Wentworth Street
Alluvial
Pond
Creek
Upland
BIG TUJUNGA WASH
MITIGATION BANK
Figure 6-1 Onsite Cowbird Trap Locations
Legend
Project Boundary
Cowbird Traps
*Note: Three offsite trap locations are not shown.
N
W
E
S
200 0 200 400 600 800 1000 Feet
100 0 100 200 300 Meters
Prepared For:
Los Angeles County
Department of Public Works
Date: October, 2001
Prepared By:
David W. Carr
Chambers Group Inc.
This map was produced using ESRI's ArcView software.
Chambers Group, Inc.
This map is not intended for site-specific purposes.
D:/proj/bigt/bigt.apr – October, 2001



LEGEND:

✸ = COWBIRD TRAP LOCATIONS

Chambers Group

Scale: 1" = 666'

Source: Army Corps of Engineers

COWBIRD TRAP LOCATIONS
Figure 6.2

Juvenile cowbirds were captured at the Pond, Equestrian, and Basin traps. Table 6-1 shows the number of male, female, and juvenile cowbirds caught at each trapping location during the 2001 trapping season.

Table 6-1
Numbers of Cowbirds Trapped and Total Trapping Efficiency at Each Trapping Location for the 2001 Trapping Season

Trap #	Trap Location	Male Cowbirds Trapped	Female Cowbirds Trapped	Juvenile Cowbirds Trapped	Total Cowbirds Trapped	Total Trapped (trap/day)
1	Creek	0	0	0	0	.000
2	Upland	5	2	0	7	.057
3	Pond	1	2	1	4	.033
4	Alluvial	0	2	0	2	.016
5	Wentworth	3	1	0	4	.033
6	Equestrian	26	15	3	44	.358
7	Basin	2	2	5	9	.073
TOTAL		**37**	**24**	**9**	**70**	**.569**

A total of 28 clipped decoy cowbirds escaped from the traps during the course of the trapping season. Twenty-five of the 28 decoy cowbirds escaped due to vandalism events and compromised trap structure, and 3 decoys escaped through the trap's open door when a trapper was entering or leaving the trap. Of those 28 escaped cowbirds, 15 (54 percent) were recaptured, usually within 3 to 5 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 nine decoy cowbirds died in the traps from either natural causes or vandalism events. It did not appear that any of the decoy deaths were due to predation. A total of 83 cowbirds, including original decoy cowbirds and cowbirds that were captured in the traps, were euthanized during the 2001 trapping season.

There were a total of seven instances of vandalism during the 2001 trapping season. The majority of vandalism occurred during the last month and a half of trapping. Twenty-five cowbirds escaped due to trap vandalism and subsequent compromised trap structure. Of those 25 escaped decoys, approximately 12 to 15 were recaptured, usually in 3 to 5 days. The vandalism was limited to two traps, the Creek and Pond traps. A total of 12 days were lost as a result of trap closures due to vandalism events.

A total of 74 birds from 10 nontarget species were captured during the 2001 trapping season. The most frequently captured bird species were western meadowlark (*Sturnella neglecta*), California towhee (*Pipilo crissalis*), and song sparrow (*Melospiza melodia*). Seventy-three of the 74 nontarget birds were released safely. Of the 74 nontarget birds captured, only one, a male song sparrow, died in the trap. This is 1.4 percent of the total nontarget captures and is below the 2 percent mortality rate considered acceptable by the USFWS and discussed in Griffith Wildlife Reports (GWB 1994b) on nontarget birds. The exact cause of death for the nontarget 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 nontarget 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
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 to 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).

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	1	0	1	0	5	0	2	0	3	0	0	0	2	0	14	0
HOWR	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
CATH	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
WCSP	0	0	0	0	0	0	1	0	2	0	1	0	6	0	10	0
RWBL	0	0	0	0	2	0	1	0	0	0	7	0	0	0	10	0
SOSP	5	0	0	0	1	0	0	0	0	0	7	0	0	1	13	1
HOFI	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0
GCSP	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
WEME	0	0	0	0	0	0	0	0	0	0	15	0	0	0	15	0
BEWR	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Totals for each trap	**9**	**0**	**2**	**0**	**8**	**0**	**4**	**0**	**5**	**0**	**36**	**0**	**9**	**1**	**73**	**1**

CATO = California towhee
HOWR = house wren
CATH = California thrasher
WCSP = white-crowned sparrow
RWBL = red-winged blackbird
SOSP = song sparrow
HOFI = house finch
GCSP = golden-crowned sparrow
WEME = western meadowlark
BEWR = Bewick's wren

C: Caught
D: Dead

6.4 RECOMMENDATIONS

6.4.1 Procedural Recommendations

The 2001 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.

6.4.2 Securing Cowbird Decoys

The total number of decoy cowbirds obtained from the Orange County Water District's Prado Dam cowbird program was not sufficient to meet the desired 2:3 male to female ratio in all traps. In order to secure 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.

6.4.3 Vandalism

Trap vandalism was a constant issue during the 2001 trapping season. Vandalism was anticipated and is expected to continue throughout the 5-year implementation because of the heavy use of the trails and Tujunga Ponds. Informing community members of the importance of the program is ongoing and will continue throughout the 5-year implementation. Trap relocation to more discreet locations should be the main strategy to reducing future trap vandalism. However, there are few discreet and secure locations within the Mitigation Bank site because of the habitat that occurs in the alluvial wash and riparian habitat. The alluvial wash is characterized by open scrub habitat with few trees for cover and seclusion while the riparian habitat is well used by hikers and equestrians. Regardless of trap location, the traps should continue to be chained to a nearby tree or permanent object during the 2002 trapping season. Detail on potential future trap locations is discussed below in Trap Relocation Recommendations.

6.4.4 Trap Relocation Recommendations

6.4.4.1 Onsite traps

Due to continued vandalism during the 2001 cowbird trapping season and the variance of trap efficiency, the seven trap locations should be re-evaluated for the 2002 season. All trap relocations should be discussed with USFWS and CDFG in order to maintain the appropriate balance of onsite versus offsite trap locations. The Creek and Pond traps were continually vandalized and should be relocated to similar habitat types either within the Mitigation Bank or perhaps offsite. The Creek trap did not capture any cowbirds while the Pond trap captured four cowbirds. These low capture numbers suggest that these are not the most productive trap locations, therefore, relocation of these two traps should result in higher capture and numbers.

The Upland trap was the third most productive trap, capturing seven cowbirds, and represents both upland and riparian habitats. Because it is located along a closed trail, foot traffic near this trap location is limited and therefore should be used again during the 2002 trapping season. Although the Alluvial trap was not very productive, capturing only two cowbirds, it represents upland habitat and covers cowbirds passing through the northern portion of the site. Additionally, it is located in a semi-secluded area within the alluvial habitat. Therefore this trap location should be used again during the 2002 trapping season.

6.4.4.2 Offsite traps

The Wentworth trap was not vandalized because it was located on private property and hidden from view. However, this trap location was not very productive and this parcel of land is currently for sale. Due to the uncertainty of the future of this trap location in addition to the low trap efficiency, this trap should be relocated during the 2002 trapping season.

The Equestrian Center trap was the most productive trap location due to its close proximity to active stables and was very secure because it was within a gated area. With the Corps and Equestrian Center's permission, at least one more trap should be located within the Equestrian Center during the 2002 trapping season. The trap that was at the Wentworth location would be more effective if it was placed at the Equestrian Center.

The Basin trap was the second most productive trap and captured the most juveniles. Although there are trails located throughout the Flood Control Basin, this was a productive area and was not vandalized during the 2001 trapping season. With the Corps' permission, one more trap should be located within the Basin during the 2002 trapping season. If the Wentworth trap were not placed at the Equestrian Center, the basin would be an appropriate alternate location.

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

Eight 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 May 1, 11, 21, June 1, 12, 22, and July 3, and 13, 2001. 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 I contains the field data sheets from each of the surveys.

7.2.2 Status/Results

Least Bell's vireos were not observed or detected during the eight 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. Western yellow-billed cuckoos were also not 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 21, June 18, June 28, July 6, and July 12, 2001. Surveys were conducted between dawn and 10:00 a.m. during suitable weather conditions. The first survey lasted until 11:20 a.m. in order to establish the survey area and suitable survey routes throughout the habitat. 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

Southwestern willow flycatchers were not observed or detected in the cottonwood-willow riparian woodland on the project site during the 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). Based on the negative survey results and lack of documented nesting records for the region, the southwestern willow flycatcher can be considered absent from the study area at this time. The complete report of findings and field data sheets for the southwestern willow flycatcher surveys is included as Appendix I.

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°F or greater.

7.4.2 Results

Surveys for the endangered arroyo southwestern toad were not conducted during spring 2001. 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 2001 (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 LACDPWs 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, but that will be closed (reclaimed) during the second year of implementation, 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 three locations. One entrance is located in the southwest portion of the site at the junction of Wentworth and Wheatland Avenue. A second entrance is located in the southeast corner of the site adjacent to an existing parcel of private land. Formerly, a gap in the fence in the southeast corner of the site along Wentworth served as an entryway for pedestrians and equestrians. This gap in the fence has since been repaired. However, the private landowner just east of this fence 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 Boulevard near the junction with Big Tujunga Wash.

BIG TUJUNGA WASH MITIGATION BANK

Figure 8-1 Reclaimed and Existing Trails

210 Freeway

Bert Bonnett Trail Loop 1.52 Miles

0.47 Miles
0.28 Miles
0.11 Miles
0.09 Miles
0.07 Miles
0.14 Miles
0.09 Miles
0.11 Miles
0.09 Miles
0.06 Miles
0.19 Miles
0.20 Miles
0.16 Miles
To Hansen Dam

Water Trail 0.80 Miles

To Hansen

Dr. Au Trail 0.46 Miles 0.14 Miles

0.15 Miles
0.10 Miles
0.23 Miles

Pond Trail 0.52 Miles

0.14 Miles
0.17 Miles
0.12
0.07 Miles
0.12 Miles
0.21 Miles
Cottonwood

Wentworth Street

Mary Bell

Legend

- Project Boundary
- Reclaimed Trails
- Existing Trails
- Water Trail
- Dr Au Trail
- PondTrail
- Bert Bonnett Loop Trail
- Fence
- Kiosk
- Toilet
- Trash

N W E S

200 0 200 400 600 800 1000 Feet

100 0 100 200 300 Meters

Prepared For:
Los Angeles County
Department of Public Works

Date: March, 2002

Prepared By:
Jim Hall
Chambers Group Inc.

This map was produced using ESRI's ArcView software.

Projection: UTM
Datum: NAD27
Units: Feet

Chambers Group, Inc.

This map is not intended for site-specific purposes.

D:/proj/bigt/bigt.apr – March, 2002

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 2001 primarily consisted of keeping the trails safe for pedestrians and equestrians and preparing the trails for restoration with native habitat. This program is exempt from California Environmental Quality Act (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 inches 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.

8.3.2 Trails Reclamation

Reclaimed Willow Woodland Trail

Only one trail was closed during 2001. This small footpath was situated between the two ponds, causing some damage to the willow plantings in that area. The small, wooden bridge that connected this trail with the Pond Trail was removed from the site. This trail served no purpose other than providing an alternate route to a destination that could be reached by the main trail. It was determined that this path should beclosed in order to minimize the impacts on the riparian habitat quality and wildlife species. Large fallen logs, rocks, and other natural debris were strategically placed in order to deter continued use of this trail.

Figure 8-2
Big Tujunga Wash Mitigation Bank
Trails Enhancement Program Checklist

- ☒ 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)

Reclaimed Alluvial Scrub Trails

The alluvial scrub trails that have been designated for closure will be closed during the third year of implementation (2002). Trails within the alluvial sage scrub habitat will be closed by strategically placing large rocks or boulders across the trails. In addition to the use of these barriers, large logs from some of the nonnative trees that will be removed may be used to barricade the trails and signs will be posted indicating that the area is being restored.

Because the alluvial habitat is such a dry area and it typically receives water only during rainfall events, no planting will be conducted on these reclaimed trails. There is probably a large enough existing seed bank in the soil to revegetate these trails naturally.

8.4 PROBLEMS ENCOUNTERED AND CORRECTIVE ACTIONS

8.4.1 Signs/Kiosks

Attempts at temporary trail closures with barriers were not successful during 2000; therefore, only signs were used to notify trail users of restoration activities during 2001. Exotic plant removal in 2001 occurred away from the ponds and the majority of the trails.

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. These information kiosks were installed and trail maintenance was conducted prior to the Trails Dedication ceremony, which took place Wednesday, September 26, 2001. Mayor Michael Antonovich, the media, CAC members, and many people who have been involved in the creation of the Mitigation Bank attended the event.

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. Occasionally, the barriers used for these trail closures have been shifted and/or ignored. As a result, these closed trails were monitored and obstructive barriers were put back in place each time they were moved. Large branches and boulders that are not easily movable were added each time. This course of action will continue as necessary, but if it continues to be inefficient, permanent blockades may have to be situated at the ends of the reclamation trails. Figure 8-3 shows the checklist for the trails monitoring tasks that have been completed thus far.

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 during the course of the third calendar year (2002). This will include the closure of trails within the alluvial scrub habitat and a continued effort to prevent use of closed riparian

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 LACDPW. 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 LACDPW. 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.

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.

In late winter of 2002, the final willow and mule fat plantings will occur within the riparian habitat of the exotic plant removal areas. Once these cuttings become established they will help to delineate the main trails. Signs will be placed around the restoration areas to discourage people from disturbing the plantings.

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 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
- Supervisor Mike Antonovich's Office
- Councilman Joel Wachs' Office
- Councilman Alex Padilla's Office
- Assemblyman Tony Cardenas' Office
- Los Angeles Police Department

Figure 9-1

KEY STAKEHOLERS

Government Officials

- California Department of Fish and Game: Mary Meyer and Scott Harris
- California Regional Water Quality Control Board: Tony Klecha
- U.S. Army Corps of Engineers: Aaron Allen
- U.S. Fish and Wildlife Service: David Zoutendyk

Elected Officials

- Office of Supervisor Michael Antonovich: Conal McNamara
- Office of Assemblyman Tony Cardenas: Mark Chapa and Alvin Kelly
- Office of Council Member Alex Padilla: James Wilson and Mark Dierking
- Office of Council Member Joel Wachs: Patricia Davenport

Local Law Enforcement

- LAPD: Officer Harold Egger

Community Organizations

- California Trail Users Coalition and Equestrian Trails, Inc. (ETI), Corrals 10 and 20: Mike and Linda Fullerton, and Terry Kaiser
- Hansen Dam Community Advisory Committee: Eddie Milligan
- Lake View Terrace Homeowners Association (LVTHOA): Brenda Franklin, Lise Graber, and Nancy Snider
- Lake View Terrace Improvement Association (LVTIA): Cile Borman, Phyllis Hines, and Dena Shroy
- San Fernando Valley Rangers: Bill and Sheila Mears
- Shadow Hills Property Owners Association (SHPOA): Terry Kaiser, Chris Arlington, Kathy Delson, James and Andrea Gutman, Elektra Kruger, and Carol Roper
- Small Wilderness Area Preservation group (SWAP): William Eick and Phil Tabbi
- Valley Horse Owners Association (VHOA): Tama Lockwood

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 onsite. 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 1, June 7, September 6, and December 6, 2001. 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 J contains all of the CAC meeting minutes, attendance, and wall graphics. The following is a list of the major action items discussed during the 2001 CAC meetings:

- Habitat restoration: Exotic plant removal and native habitat restoration occurred throughout the site during the first quarter. Therefore, updating the trail users on the location of restoration areas to avoid was crucial.
- Establishing formal trails: The winter rains of 2000 and all of the habitat restoration during 2000 through the first quarter of 2001 dramatically altered the previous trail system. Therefore, with the cooperation of local equestrians and constant trail maintenance, a formal trails system was established by the latter half of 2001.
- Trails dedication ceremony: The trails system was officially dedicated on September 26, 2001 during the Trails Dedication Ceremony. Mayor Michael Antonovich, other elected officials, the media, CAC members, and many other people who were involved in the creation of the Mitigation Bank were invited to and attended the event.
- Mary Bell Entrance: Many local equestrians and trail users expressed interest in re-opening the Mary Bell Entrance. Therefore, subsequent to the City of Los Angeles' traffic study findings and recommendations and County Counsel approval, LACDPW issued a notice to proceed on the design of the entrance to Chambers Group. Although the entrance has not been installed (anticipated installation date is scheduled for spring 2002) the design has benefited from input acquired during the CAC meetings.

9.2.2 Newsletters

The "Big T Wash Line" is the project's newsletter that was published in March, June, September, and December of 2001. 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 K contains all four issues of the 2001 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 County Supervisor, now 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. MIG assembled elected official background and briefing books that were updated quarterly via providing CAC meeting minutes and action lists. In addition, individual briefings of the elected officials' offices were conducted before the March and June 2001 CAC meetings.

Table 9-1 contains the elected official briefing contacts for 2001.

Table 9-1 - Elected Official Contacts

Big Tujunga Wash Mitigation Bank
Elected Official Briefing Contacts
Updated 2-27-01

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	**February 27:** ➢ Left detailed message offering briefing and reminding of meeting/location.
Patricia Davenport Council Member Joel Wachs (Council District 2) 6350 Laurel Canyon Boulevard Suite 201 North Hollywood, CA 91606	(818) 755-7676 pdavenpo@council.lacity.org	**February 27:** ➢ Received materials. ➢ Believes what we're doing onsite and with fencing will mitigate the problem on Radwin with the camping out. The Councilman's office will continue to monitor the situation as summer comes on and consider other alternatives if what has been done so far doesn't work. ➢ Will try to be at 3/1 meeting but is on jury duty.
James Wilson Council Member Alex Padilla (Council District 7) 13630 Van Nuys Boulevard 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	**February 27:** ➢ Left detailed message offering briefing and reminding of meeting/location.
Mark Chapa Assemblyman Tony Cardenas (Assembly District 39) 9140 Van Nuys Boulevard, Suite 109 Panorama City, CA 91402	(818) 894-3671	**February 27:** ➢ Left detailed message offering briefing and reminding of meeting/location.

Big Tujunga Wash Mitigation Bank
Elected Official Briefing Contact
Updated 7-23-01

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	**July 17:** ➢ Left detailed message offering briefing and informing of next CAC meeting.
Patricia Davenport Council Member Joel Wachs (Council District 2) 6350 Laurel Canyon Boulevard Suite 201 North Hollywood, CA 91606	(818) 755-7676 pdavenpo@council.lacity.org	**July 17:** ➢ Acquisition of Mr. Tamayo property is important-recent murder at site shows it's still a hazard with homeless people there. ➢ Brush along Wentworth has been cleared between the fence and the roadway. ➢ Traffic study for signal crossing should be completed in time for report out at September 6 CAC meeting.
James Wilson Council Member Alex Padilla (Council District 7) 13630 Van Nuys Boulevard 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	**July 17:** ➢ Left detailed message for James Wilson mentioning CAC issue with potential Children's' Museum and giving date/time of next meeting. ➢ Mentioned CAC concern with proposed Children's Museum on PM Entertainment site. Mark will be at next CAC meeting to address and discuss. No funding has been identified for museum - it is in the architectural design phase. A meeting to review the results has been scheduled to take place at 7 p.m. on July 31 at 7 p.m. at the Lake View Terrace Recreation Center.
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)	**July 17:** ➢ Left detailed message offering briefing and informing of next CAC meeting. **July 23:** ➢ Returned call. Interested in attending next CAC meeting. Asked to have minutes, action items and other information re-sent: contact information has changed (changes reflected on this matrix).

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.

9.2.5 Site Safety/Citizen Patrol

Although unauthorized campers living on the project site has been a continual problem, the number and frequency of observations seems to have decreased during 2001. This decrease can be attributed to the removal of the pepper trees near Wheatland and giant reed removal throughout the site, both which were formerly used for encampments. Unauthorized campers were an issue during March and December of 2001. The Los Angeles Homeless Services Authority was contacted each time an unauthorized camper was observed in order to place them in an appropriate shelter.

In addition to the unauthorized camper issue, site safety is another issue the 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 agencies have been and will continue to be contacted.

9.2.6 Project Fact Sheets

Project fact sheets are brief descriptions of each of the MMP programs. These fact sheets will be distributed to the CAC members and will be posted in the kiosks.

9.3 STATUS

The next CAC meeting will be held on Thursday, March 7, 2002 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 2002 Big T Wash Line will also be published in March 2002.

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 run-off from upstream developments are 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 the analyses were conducted by a certified water quality laboratory. The water quality program at Big Tujunga Wash includes quarterly monitoring for the following water quality parameters:

- Total Kjeldahl Nitrogen (TKN)
- Nitrite (NO2)
- Nitrate (NO3)
- Ammonia (NH4)
- Orthophosphate
- Dissolved Oxygen (DO)
- Total Fecal Coliform
- Organochlorides
- Total Phosphate
- Organophosphate
- Chlorine
- Turbidity
- Temperature (degrees Celsius)
- pH (pH units)
- Pesticides

10.3 METHODOLOGY

An experienced Water Quality Specialist sampled on March 12, June 19, September 11, and December 12, 2001 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 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 the locations of the four water quality monitoring sites and the 2001 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 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 the 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 Big Tujunga Wash and sampling was performed if flowing water is present during the quarterly sampling visits. Figure 10-1 shows the locations of the four sampling locations.

BIG TUJUNGA WASH MITIGATION BANK

N
W E
S

200 0 200 400 600 800 1000 Feet

100 0 100 200 300 Meters

This map is not intended for site-specific purposes.

Prepared For:
Los Angeles County Department of Public Works

Date: December 3, 1999

Prepared By:
Leslie Backus
Chambers Group Inc.

This map was produced using ESRI's ArcView software.

Chambers Group, Inc.

Figure 1
Water Quality Sampling Stations

WQ Station No.	Name
1	Inflow to Tujunga Ponds
2	Outflow from Tujunga Ponds
3	Big Tujunga Wash
4	Haines Canyon Creek, just before exit from site

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 12, June, 19, September 11, December 12
Haines Canyon Creek, inflow to Tujunga Ponds	N 34 16' 6.9"	W 118 20' 18.7"	March 12, June, 19, September 11, December 12
Haines Canyon Creek, outflow from Tujunga Ponds	N 34 16' 7.1"	W 118 20' 28.3"	March 12, June, 19, September 11, December 12
Big Tujunga Wash	N 34 16' 11.7"	W 118 21' 4.0"	March 12

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 2001 sampling efforts. Detailed descriptions of the analyses are located in Appendix L. Figure 10-2 shows the checklist for the program tasks that have been completed thus far.

10.4.1 Comparison of Quarterly Monitoring

In general, the water quality on the site is relatively good. Sampling during 2001 did not detect any contamination of the waters due to pesticides or fertilizers. In general, pH levels varied by 0.2 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 Wash, nitrate in Haines Canyon Creek was similar or just slightly lower than values observed in the ponds. Water quality in 2001 was similar to the April 12, 2000 baseline conditions. The higher bacteria, phosphorus, and turbidity that was observed in the April 18, 2000 samples were most likely due to a rain event. 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 in 2001.

10.5 RECOMMENDATIONS

As previously stated, the water quality at the mitigation bank during 2001 was relatively good and there was no contamination of the waters due to pesticides or fertilizers. Therefore, there are no recommendations at this time.

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.

Table 10-2
Big Tujunga Wash
Summary of 2001 Water Quality Sampling Results

Parameter	Summary
pH	Values observed in Haines Canyon Creek leaving the site (and the one data point for Big Tujunga Wash) were 1 unit higher than values observed in the ponds. The pH of water from all stations for all four sampling periods was within the 6.5 to 8.5 range identified in the Basin Plan.
Dissolved Oxygen	Dissolved oxygen (DO) levels in Haines Canyon Creek leaving the 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 similar. Seasonal fluctuations of up to 3.7 mg/L in DO were observed-highest overall readings were observed in December.
Temperature	Temperatures in Haines Canyon Creek leaving the site are generally 1-3 degrees cooler than temperatures in the Tujunga ponds. Seasonal fluctuations of up to 9 degrees Celcius were observed with the December readings being the lowest, and the June readings being the highest. Observed temperatures during all sample periods were below levels of concern for growth and survival of warm water fish species.
Fecal Coliform	Fecal coliform levels in 2001 ranged from <2 to 900 MPN/100ml. Total coliforms were higher (16,000 MPN/100ml) in one sample from the inflow to the ponds in September. Fecal coliform levels exceeded the water contact recreation standard of 200 MPN/100ml in September in one sample from the outflow from the ponds and one sample from Haines Canyon Creek leaving the site (although sufficient samples were not taken per the standard).
Nitrate	Ammonia-nitrogen was detected in only one sample. This was a very low reading in September at the Haines Canyon Creek sampling location leaving the site. Similarly, nitrite-nitrogen was only detected at one station on one date, at the inflow to the ponds in June. Kjeldahl nitrogen (organic plus ammonia) readings were consistently low (<1 mg/L) at all stations on all dates. Nitrate-nitrogen readings at all stations were below the drinking water standard of 10 mg/L.
Ammonia	Ammonia levels were below the detection threshold at all sampling stations.
Turbidity	Turbidity levels were low, except in March when flow was present in Big Tujunga Wash. Flows in the Wash and Haines Creek leaving the site were slightly turbid in March. Turbidity values in 2001 were not excessive for aquatic life. The drinking water standard was only exceeded in March in the Wash and in Haines Canyon Creek.
Phosphorus	Phosphorus levels were the lowest in September and generally similar in the other three quarters. 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.

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 2001 (3/12/01)

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	17.5	--	16.7	--	13.5	--	14.3	--
Dissolved Oxygen	mg/L	4.9	--	5.4	--	10.2	--	9.7	--
pH	std units	7.0	--	7.0	--	8.3	--	8.2	--
Total residual chlorine	mg/L	0.03	--	0.02	--	0.05	--	0.03	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	ND	ND	ND	ND
Kjeldahl Nitrogen	mg/L	0.28	0.41	0.51	0.48	0.49	0.57	0.47	0.43
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-Nitrogen	mg/L	8.19	8.10	4.48	4.41	0.12	0.12	0.45	0.43
Orthophospate-P	mg/L	0.035 (MRL 0.010)	0.037 (MRL 0.010)	0.039	0.039 (MRL 0.010)	0.012	0.012	0.016	0.016
Total phosphorus-P	mg/L	0.03 (MRL 0.020)	0.03 (MRL 0.020)	0.06	0.03 (MRL 0.020)	0.04	ND (<0.020)	0.05	0.05
Turbidity	NTU	0.60	0.50	0.75	0.80	9.6	9.1	9.4	12
Fecal Coliform Bacteria	MPN/100 ml	4	4	80	30	140	60	23	130
Total Coliform Bacteria	MPN/100 ml	2,200	1,600	2,800	7,000	3,000	800	350	280

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 2001 (6/19/01)

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	22.3	--	22.7	--	*	--	21.5	--
Dissolved Oxygen	mg/L	5.8	--	5.1	--	*	--	7.3	--
pH	std units	6.9	--	6.9	--	*	--	7.9	--
Total residual chlorine	mg/L	ND	--	ND	--	*	--	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Kjeldahl Nitrogen	mg/L	ND	ND	0.31	0.36	*	*	ND	ND
Nitrite-Nitrogen	mg/L	0.1	0.1	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	7.6	7.5	4.7	4.8	*	*	9.6	4.8
Orthophospate-P	mg/L	0.022	0.023	0.021	0.023	*	*	0.027	0.027
Total phosphorus-P	mg/L	0.04	0.04	0.06	0.04	*	*	0.03	0.04
Turbidity	NTU	1.5	1.9	4.2	2.9	*	*	1.4	1.2
Fecal Coliform Bacteria	MPN/100 ml	4	8	17	7	*	*	23	40
Total Coliform Bacteria	MPN/100 ml	300	300	1,600	1,400	*	*	5,000	93

*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 2001 (9/11/01)

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	--	21.3	--	*	--	20.3	--
Dissolved Oxygen	mg/L	8.4	--	8.8	--	*	--	7.3	--
pH	std units	7.0	--	7.2	--	*	--	8.0	--
Total residual chlorine	mg/L	ND	--	ND	--	*	--	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	0.093	ND
Kjeldahl Nitrogen	mg/L	0.37	0.71	0.35	0.47	*	*	0.45	0.54
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	7.2	7.2	5.2	5.3	*	*	4.8	4.8
Orthophospate-P	mg/L	ND	ND	ND	ND	*	*	0.016	0.016
Total phosphorus-P	mg/L	0.02	ND	ND	ND	*	*	0.04	ND (MRL 0.02)
Turbidity	NTU	0.60	1.1	0.95	0.75	*	*	0.45	0.40
Fecal Coliform Bacteria	MPN/100 ml	11	17	900	130	*	*	240	110
Total Coliform Bacteria	MPN/100 ml	1,100	16,000	900	500	*	*	1,400	1,100

*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 2001 (12/12/01)

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	--	14	--	*	--	12	--
Dissolved Oxygen	mg/L	6.9	--	7.1	--	*	--	10.0	--
pH	std units	7.5	--	7.7	--	*	--	8.4	--
Total residual chlorine	mg/L	ND	--	ND	--	*	--	ND	--
Ammonia-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Kjeldahl Nitrogen	mg/L	0.31	0.43	ND	0.44	*	*	0.45	0.54
Nitrite-Nitrogen	mg/L	ND	ND	ND	ND	*	*	ND	ND
Nitrate-Nitrogen	mg/L	8.9	8.9	7.3	7.3	*	*	6.1	6.4
Orthophospate-P	mg/L	0.028	0.029	0.024	0.026	*	*	0.024	0.034
Total phosphorus-P	mg/L	0.04	0.05	0.04	0.03	*	*	0.03	0.04
Turbidity	NTU	0.50	0.45	0.40	0.50	*	*	0.25	0.40
Fecal Coliform Bacteria	MPN/100 ml	<2	4	4	14	*	*	30	17
Total Coliform Bacteria	MPN/100 ml	2,400	500	110	500	*	*	900	900

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

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