FINAL
MASTER MITIGATION PLAN FOR THE BIG TUJUNGA WASH MITIGATION BANK

Prepared for:

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
900 South Fremont Avenue
Alhambra, California 91803-1331

Prepared by:

CHAMBERS GROUP, INC.
17671 Cowan Avenue, Suite 100
Irvine, California 92614
(949) 261-5414

April 2000

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SECTION 1.0 - INTRODUCTION

1.1 SUMMARY OF OVERALL PROJECT

In late 1998, the County of Los Angeles Department of Public Works (LADPW) purchased a 207-acre site in the Big Tujunga Wash to serve as mitigation for the LADPW's flood control projects throughout the county Prior to the purchase, the LADPW obtained concurrence from the U.S. Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), and Regional Water Quality Control Board (RWQCB) that the site would serve as a mitigation bank. Both the Corps and the RWQCB allotted credits in the bank based on the number of acres of the site within the waters of the United States and the value of the upland habitats on the site Their allotment of credits in the bank, which was 157.6 credits from the Corps and 154 from the RWQCB, was contingent upon the implementation of a number of enhancement measures designed to improve the quality of the habitats on the site The conceptual enhancement measures, which were described in Chambers Group's August 1998 document entitled "Draft Enhancement Opportunities at Big Tujunga Wash, Los Angeles County, California" were submitted to the agencies when LADPW requested concurrence with the mitigation bank concept. This document provided general descriptions of conceptual enhancement programs, including exotic plant species removal (arundo and tamarisk), native habitat restoration and enhancement, exotic wildlife species removal (fishes and bullfrogs), and restriction of equestrian use to established trails. Comments by the agencies on the conceptual enhancement measures were positive, but the CDFG also requested that a brown-headed cowbird trapping program and crayfish control program also be included. In addition, the CDFG stated that a management plan would be required and should address proposed enhancement activities, site security, and periodic monitoring. CDFG also encouraged the LADPW to enter into an arrangement with the Los Angeles County Department of Recreation and Parks to include the management and enhancement of the adjacent Tujunga Ponds as part of the overall plan for the site The CDFG suggested that further discussion was needed to determine which species could be mitigated ' ' the bank and how many credits would be allotted by the CDFG for the mitigation bank. In addition, CDFG stated that mitigation credits for optional enhancement measures implemented at the bank site would be given full credit on an acre-for-acre basis once they are successfully established.

In mid-1999, the LADPW issued a contract to Chambers Group to prepare a Master Mitigation Plan (MMP) for the Big Tujunga Wash Mitigation Bank. 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. In addition, the MMP includes programs for the removal of exotic fish and amphibians from the Tujunga Ponds, trapping to control brown-headed cowbirds, plans for development of a formal trails system, and development of public awareness and education at the site Eradication of exotic plant species (arundo or giant reed and tamarisk) and habitat restoration and revegetation programs, which include planting and irrigation strategies, plant palettes, and long-term maintenance and monitoring of the site, 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. Long-term maintenance and monitoring of the success of the enhancement programs is not included within the scope of the MMP The long-term maintenance and monitoring commitments of the LADPW, beyond 5 years, will be the subject of separate discussions and negotiations with the resources agencies. The outcome and the success of the programs in this MMP will likely determine the level of effort required and the probable commitment necessary to ensure the long-term success of the site. Subsequent documentation, based on the outcomes of the MMP programs, will provide the details regarding the long-term maintenance and monitoring of the site.

The MMP describes the methods necessary to fulfill the conceptual enhancement measures described in Chambers Group's 1998 report. Because the 1998 Enhancement Report described very general measures for improving the site, the actual measures that are implemented in the mitigation bank needed the approval of the LADPW, CDFG, Corps, and RWQCB The Draft MMP was reviewed by CDFG, Corps, U.S Fish and Wildlife Service (USFWS), RWQCB, and the public. This final MMP addresses the

comments made by the agencies and the public and meets their requirements. The MMP provides descriptions of the basic programs that will fulfill the enhancement measures but also provides a section of optional measures designed to increase the number of mitigation credits on the site or to reduce the long-term maintenance and monitoring requirements at the site. These optional measures include a water quality monitoring program and restoration of upland habitats to create oak/sycamore woodlands and coastal sage scrub habitat that can provide habitat for listed species of wildlife. In addition, alternative configurations of the Tujunga Ponds are described that may increase the amount of habitat available for sensitive native fishes and decrease the existing and future infestations of exotic plant and wildlife species. These optional measures are considered to be outside of the scope of the conceptual enhancement measures described in Chambers Group's 1998 Enhancement Report and are subject to approval by the LADPW

The Draft MMP was released to the agencies and the public in December 1999 for the purpose of soliciting comments on the management and enhancement strategies. Comments were received between January and March from the County of Los Angeles Department of Public Works, Corps of Engineers, California Department of Fish and Game, United States Fish and Wildlife Service. and a number of individuals from the public. The comments on the Draft MMP and responses, or notations where responses were addressed, are included in Appendix J at the end of this document.

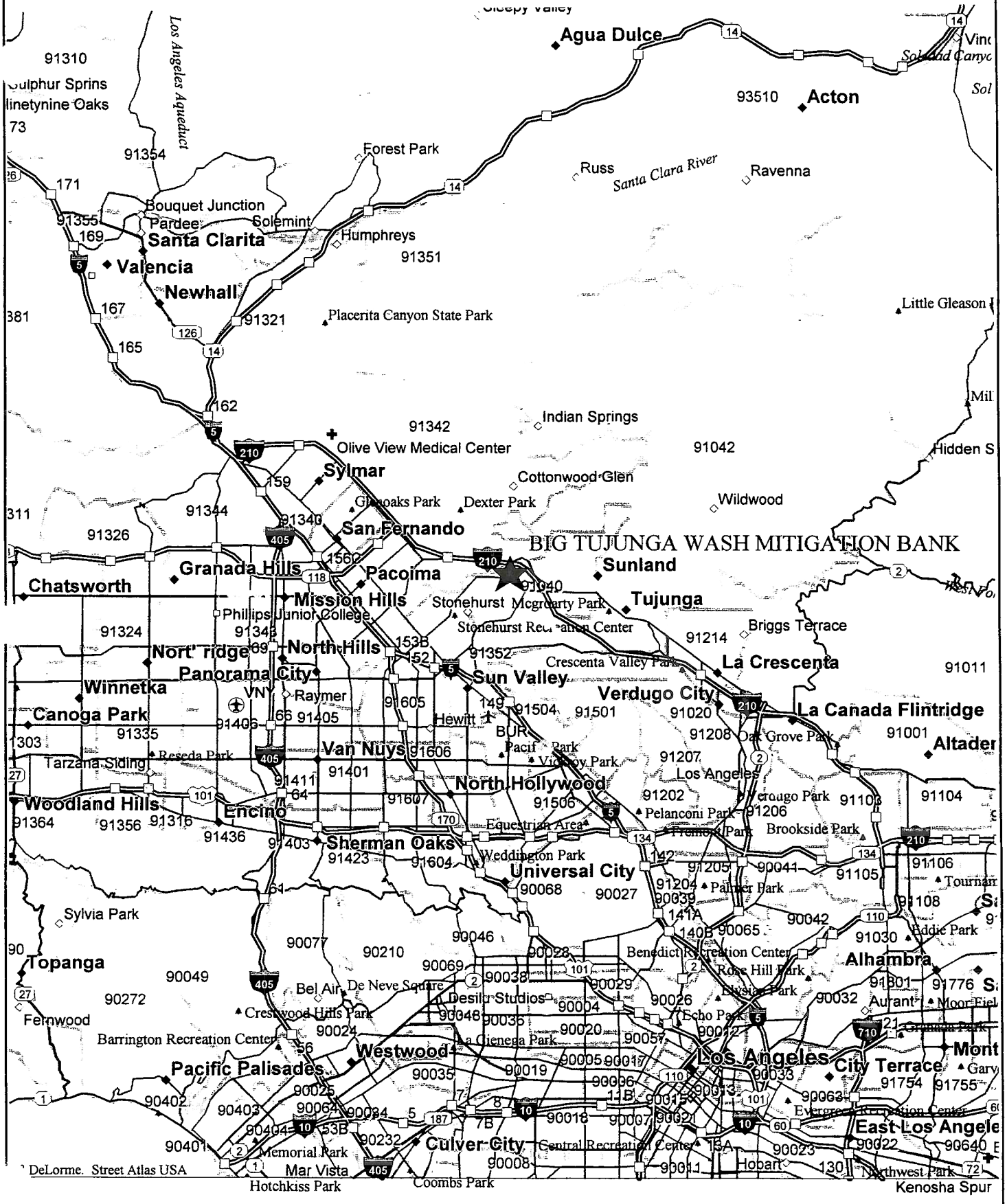
1.2 PROJECT LOCATION

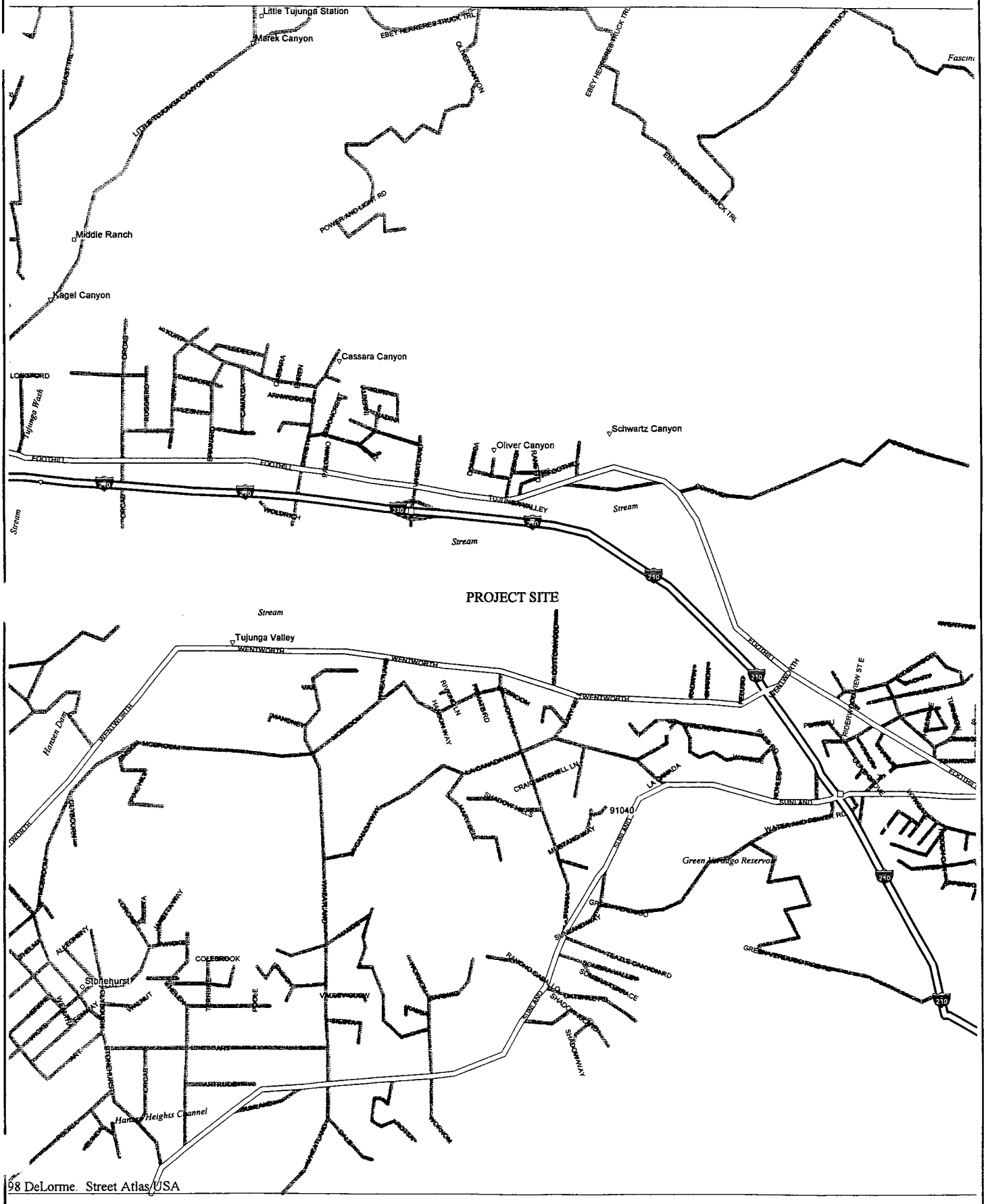
The Big Tujunga Wash Mitigation Bank is located in Big Tujunga Wash, just downstream of the 210 Freeway overcrossing, near the City of Los Angeles' Sunland area in Los Angeles County's San Fernando Valley A map showing the general vicinity can be found on Figure 1-1 The site is bordered on the north 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.

The Big Tujunga Ponds and surrounding habitat, consisting of approximately 27 acres located in the northeast corner of the site, may potentially be included as part of the Mitigation Bank, but this decision is subject to LADPW approval. These ponds were originally created as part of the mitigation measures for the construction of the 210 Freeway and are currently under the jurisdiction of the Los Angeles County Department of Recreation and Parks. An aerial photograph showing Big Tujunga Wash, Haines Canyon Creek, and the Tujunga Ponds can be found on Figure 1-3. The Department of Recreation and Parks has no active management plan in place for these ponds and as a result, the pond habitat is severely degraded.

1.3 ELEMENTS OF THE PLAN

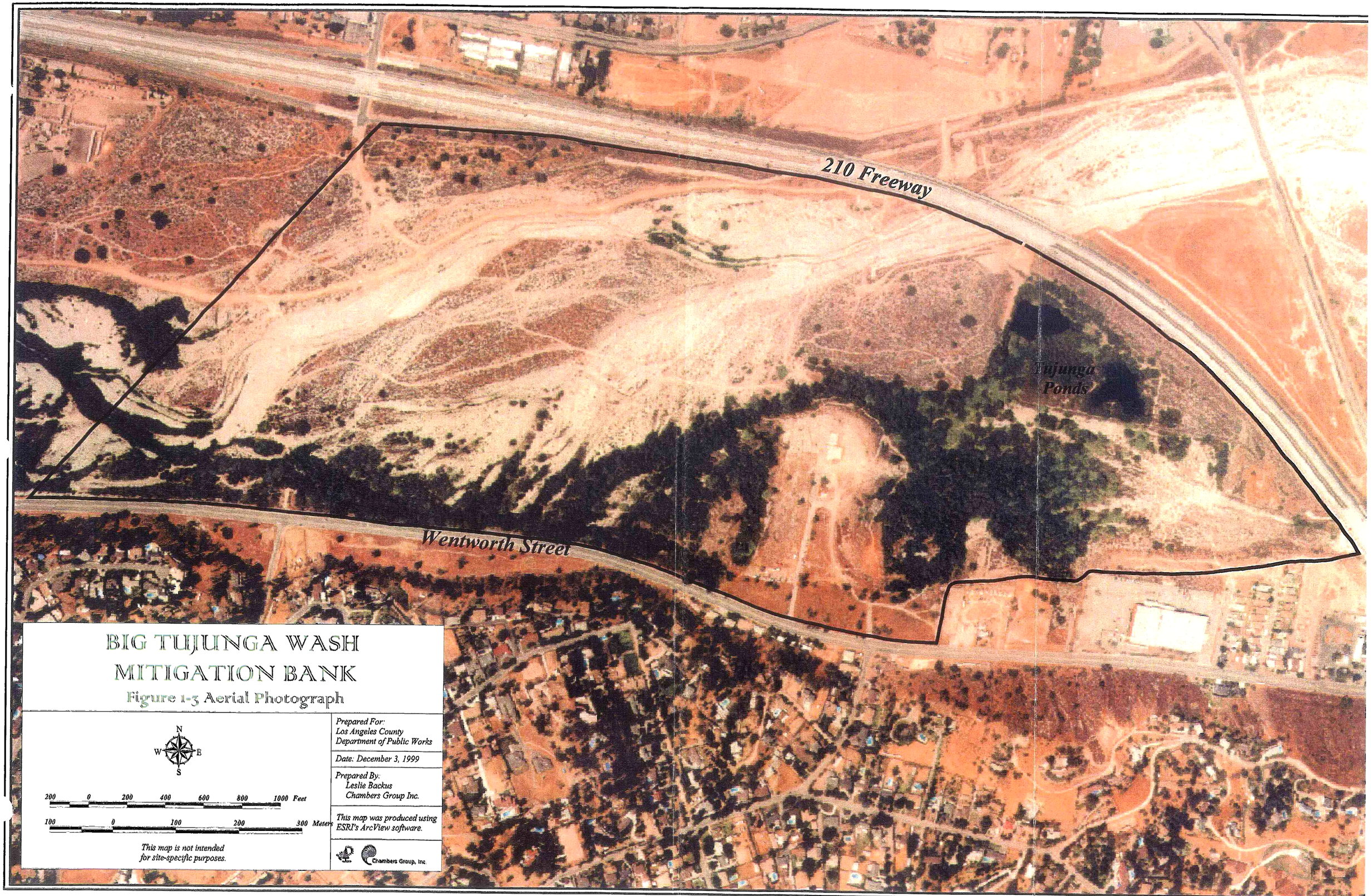
The Master Plan contains elements designed to restore and enhance existing habitats on the Big Tujunga Wash site by removing non-native plant, fish, amphibian, and reptile species. In addition, the Master Plan includes an optional program for additional mitigation credits to create a diverse coast live oak-California sycamore woodland and coastal sage scrub habitat in an area that is currently heavily disturbed The woodland is designed to provide foraging and nesting habitat for upland species as well as cover for both wildlife and equestrians using the trails incorporated into the design The coastal sage scrub is designed


BIG TUJUNGA WASH MITIGATION BANK
Agua Dulce
Acton
Santa Clarita
Valencia
Newhall
Sylmar
San Fernando
Granada Hills
Chatsworth
Pacoima
Mission Hills
Sunland
Tujunga
Sun Valley
La Crescenta
Verdugo City
La Canada Flintridge
Altadena
Winnetka
Canoga Park
Van Nuys
North Hollywood
Woodland Hills
Encino
Sherman Oaks
Universal City
Topanga
Pacific Palisades
Westwood
Los Angeles
Culver City
Alhambra
City Terrace
East Los Angeles
Monterey Park
Forest Park
Russ
Ravenna
Santa Clara River
Bouquet Junction
Pardee
Solemint
Humphreys
Placerita Canyon State Park
Indian Springs
Olive View Medical Center
Cottonwood Glen
Wildwood
Dexter Park
Stonehurst Mcgroarty Park
Stonehurst Recreation Center
Briggs Terrace
Crescenta Valley Park
Phillips Junior College
Raymer
Hewitt
Reseda Park
Tarzana Siding
Equestrian Area
Weddington Park
Pelanconi Park
Brookside Park
Oak Grove Park
Los Angeles
Sylvia Park
Fernwood
Bel Air
De Neve Square
Desilu Studios
Crestwood Hills Park
Barrington Recreation Center
La Cienega Park
Echo Park
Benedict Recreation Center
Rose Hill Park
Eddie Park
Aurant
Hobart
Memorial Park
Mar Vista
Hotchkiss Park
Coombs Park
Central Recreation Center
Evergreen Recreation Center
Northwest Park
Kenosha Spur
Los Angeles Aqueduct
Sulphur Springs
Solemint
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Chambers Group

BIG TIJUNGA WASH
PROJECT LOCATION MAP
Figure 1-2



BIG TUJUNGA WASH MITIGATION BANK

Figure 1-3 Aerial Photograph

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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.

to provide habitat for the federally listed threatened California gnatcatcher Existing equestrian trails throughout the site are defined and realigned where necessary to protect valuable wildlife habitat. A program to trap and eradicate brown-headed cowbirds is included to protect native bird species using the site Finally, a public education program is included to provide information to the community about the wildlife values of the site. The elements of the Master Plan are summarized below

Section 1 0 is an Introduction and includes a summary of the overall project. Section 1 also describes the existing conditions on the site, including riparian habitats along Haines Canyon Creek and the alluvial scrub habitat along Big Tujunga Wash. Sensitive wildlife species that occur or may occur on the site and jurisdictional wetlands and waters of the United States are also described in this section.

Section 2 0 describes the Project Goals and Success Criteria. This section describes the short- and long-term goals for the Mitigation Bank. This section also 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.

Section 3.0 describes the overall Approach, Rationale, and Methodology to the enhancement of the Big Tujunga Wash site. Each of the issue areas and their respective methodologies are discussed in a detailed step-by-step fashion. The issue areas include the· restoration, revegetation, and exotic plant removal program; exotic fish, crayfish, and bullfrog removal program for the removal of bull frogs, non-native fishes and crayfish, and alien turtle species from Haines Canyon Creek and the Tujunga Ponds area, brown-headed cowbird eradication program, public education, and trails program.

Section 4.0 describes the Quality Assurance/Quality Control Plan (QA/QC) This is a critical component of the MMP because it represents a proactive approach that provides checks and balances for addressing problems as they occur This section includes tailored checklists for each issue area designed to ensure that all aspects of the methodologies are implemented correctly This section also includes flowcharts for determining mid-course actions.

Section 5.0 details the Maintenance and Performance Monitoring Plan of the MMP This section includes a schedule and a detailed maintenance checklist for each of the inspections conducted by the Restoration Ecologist. The performance monitoring section describes the monitoring schedule as well as sampling methods for the native habitat restoration. Detailed maintenance and performance monitoring plans with associated checklists are also included for each of the issue areas.

Section 6.0 provides an Outline of the Final Implementation Report for each of the issue areas. The native habitat restoration plan includes the As-Built Plan to document what was put into the ground in the habitat restoration areas.

Section 7 0 provides an Outline of the Annual Performance Monitoring Report for each of the issue areas. The outlines include information regarding data analysis techniques, methods of data presentation, and reporting requirements of the various agencies associated with each issue area.

Section 8.0 describes the Success Criteria and Contingency Measures for mid-course corrections. The contingency measures for each of the issue areas are designed to improve the enhancements and to potentially reach the success criteria prior to the anticipated schedule

Section 9.0 describes optional enhancement measures designed to provide additional mitigation credits. These include the implementation of a water quality monitoring program, a restoration of coastal sage scrub and oak/sycamore woodland habitats, and options for redesigning the Tujunga Ponds.

Sections 10.0 is the Reference list Section 11 0 provides the contact persons utilized in the preparation of the MMP

1.4 IMPLEMENTATION PLAN SUMMARY

This summary identifies the key elements that constitute the 5-year implementation of the MMP Table 1-1, at the end of this section, shows the schedule for these key elements. A more detailed list and description of MMP tasks are included in Section 3.0.

Basic Elements

The amount of mitigation credits currently offered by the resource agencies is based upon the implementation of the basic elements of the MMP·

Consultant Contract Process

Implementation of the MMP begins with the LACDPW's process to engage the services of a Consultant to perform most of the MMP measures and monitoring. The LACDPW's contract process for a project of this magnitude includes solicitation of proposals from qualified firms, evaluating their proposals, awarding the contract, and issuing the Notice to Proceed to the selected firm.

Water Quality Monitoring

This program begins with the LACDPW's collection and analysis of baseline (pre-project) water quality samples and continues with quarterly sample collection and analysis by the Consultant throughout the five-year MMP implementation.

Trails Enhancement

This program will formalize joint equestrian and hiking trails through the Big Tujunga Wash Mitigation Bank site to allow traffic that is compatible with the site's primary function of habitat restoration and preservation. This program consists of the LACDPW's installation of portable toilets and trash receptacles, its entering into a partnership agreement with a sponsor for trash collection, the Consultant's construction and placement of information kiosks, and its replacement of the Tujunga Ponds fencing for better resistance to vandalism.

Trails Reclamation

This program consists of 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.

Exotic Species Eradication (Initial)

This program consists of the Consultant's initial removal of non-native invasive vegetation (including Arundo. Tamarisk, Water Hyacinth) and non-native predatory wildlife (including cowbirds, bullfrogs, crayfish) from the LACDPW's property and the adjacent Tujunga Ponds. Although the Los Angeles County Department of Parks and Recreation owns the Tujunga Ponds instead of the LACDPW, the LACDPW's MMP includes non-native species removal within the Ponds because they are the primary introduction sites for these harmful species on the LACDPW's adjacent property

Riparian Habitat Enhancement

This program consists of re-planting riparian (riverine) areas within the LACDPW's property that had been subject to exotic vegetation eradication

Site Inspection and Maintenance

This program consists of the Consultant's actions to oversee the effectiveness of its efforts regarding the trails, exotic species removal, and revegetation of riparian areas. Inspection will occur on a monthly basis during the first year, on a quarterly basis during the second year, and semi-annually during the third, fourth, and fifth years of the MMP implementation.

Success Monitoring - Fish and Wildlife

This program consists of the Consultant's monitoring of populations of sensitive fish (such as the Santa Ana sucker), birds (such as the least Bell's vireo and southwestern willow flycatcher), and amphibians (such as the arroyo southwestern toad) during the five-year MMP implementation The purpose of the monitoring is to determine these populations' health at the site. the level of success of the MMP's trails, exotic species eradication and restoration measures, and the compatibility of on-site recreational activities with the site's primary function of habitat preservation and enhancement. The Consultant will prepare the monitoring reports and the LACDPW will transmit the reports to the agencies that are issuing the mitigation credits.

Success Monitoring - Vegetation

This program consists of the Consultant's monitoring of vegetation communities and its capacity as wildlife habitat 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.

Annual Documentation

This documentation consists of the Consultant's reporting of the results of its success monitoring of wildlife and vegetation. The Consultant will prepare the monitoring reports and the LACDPW will transmit the reports to the agencies that are issuing the mitigation credits.

Community Awareness Program

This program consists of utilizing a Community Advisory Committee, newsletters, and fact sheets 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

Mitigation Banking Agreement

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

Optional Elements

The LACDPW may elect to include the following programs in the Consultant's scope of work if the LACDPW can obtain sufficient additional mitigation credits from the resource agencies to offset the costs of implementation.

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.

Tujunga Ponds Modification

Three options have been proposed to actually modify the Tujunga Ponds property to improve its habitat quality and further reduce its potential as a breeding ground for exotic invasive species. This optional program consists of studying the feasibility of each option, selecting the option, obtaining the additional mitigation credits and permits from the resource agencies, implementing the selected option, and maintaining and monitoring the project site for five years.

Regular Patrolling of the Mitigation Bank

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

Entrance to Marybell Avenue

This optional measure consists of creating an equestrian entrance at Marybell Avenue similar to the existing entrance at Wheatland Avenue.

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	11/30/2000
Exotic Species Removal (Initial)	Consultant	08/15/2000	10/30/2001
Riparian Habitat Enhancement (Excluding Optional Cottonwood Ave. Area and Tujunga Ponds)	Consultant	12/01/2000	12/01/2005
Site Inspection And Maintenance (Trails, Erosion Control, Exotics Control)	Consultant	12/01/2000	12/01/2005
Annual Success Monitoring - Wildlife	Consultant	07/01/2000	08/04/2005
Annual Success Monitoring - Vegetation	Consultant	05/01/2001	08/31/2005
Annual Documentation	LADPW & Consultant	12/01/2000	01/07/2006
Community Awareness Program	LADPW & Consultant	07/15/2000	12/31/2005
Mitigation Banking Agreement	LADPW & Consultant	07/15/2000	07/15/2001
Optional Elements			
Sycamore - Oak Woodland Enhancemment (Cottonwood Ave. Area)			
Obtain Additional Mitigation Credits	LADPW	04/15/2001	07/15/2001
Implementation and Success Monitoring	Consultant	07/15/2001	08/31/2006
Tujunga Ponds Modification			
Obtain Prelim. Estimate of Additional Mitigation Credits	LADPW	05/01/2000	06/30/2000

Task	Performer	Start	Finish
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	07/15/2000	12/31/2000

1.5 RESPONSIBLE PARTIES

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

Ms. Pat Wood
Water Resources Division
Los Angeles County Department of Public Works
900 S Fremont Avenue
Alhambra, California 91803-1331
(626) 458-6131

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

Ms. Mari Schroeder
Project Manager
Chambers Group, Inc.
17671 Cowan Avenue, Suite 100
Irvine, California 92614
(949) 261-5414

1.6 EXISTING BIOLOGICAL RESOURCES

This section of the MMP describes the existing biological resources in the Mitigation Bank. The description of the existing resources is included to provide a baseline of what is present at the site prior to the implementation of the enhancement measures. The vegetation communities, sensitive plants, wildlife resources, sensitive wildlife, aquatic resources, and wetlands and waters of the United States are described in this section.

Vegetation Communities

Biological resources surveys were conducted by Chambers Group at the project site in May 1997 to document the current biological diversity and assess the habitat for its potential to support native plant and wildlife species. The reconnaissance-level surveys evaluated the potential for sensitive vegetation and wildlife to occur onsite.

Seven plant communities were identified and mapped during the surveys of the Big Tujunga Wash site These include southern arroyo willow riparian woodland, sycamore alluvial woodland, Riversidean alluvial sage scrub, mule fat scrub, coastal sage scrub, non-native grassland, and disturbed areas. Table 1-2 summarizes the acreages of each vegetation community found on the site, and Figure 1-4 shows the locations of the plant communities. A discussion of the vegetation communities can be found in the Draft Biological Resources Assessment and Functional Analysis of a Site in Big Tujunga Wash, (Chambers 1998a) A complete list of the plant species observed on the site is included in Appendix A.

Table 1-2
Vegetation Communities Occurring Within the Big Tujunga Wash Mitigation Bank Site

Vegetation Community*	Acreage Present on the Site
Riversidean Alluvial Fan Sage Scrub	96
Southern Arroyo Willow Riparian Woodland	61
Arundo donax	15
Mule Fat Scrub	37
Sycamore Alluvial Woodland	1
Coastal Sage Scrub	6
Non-Native Grassland	11
Disturbed Areas	20
Open Water Ponds	
TOTAL	**247**
* Plant community classifications according to Holland (1986)	

Sensitive Plants

A search of the California Natural Diversity Data Base (CNDDB) and the California Native Plant Society Electronic Inventory (CNPSEI) resulted in a list of seven threatened, endangered, or sensitive plant species that have the potential to occur on the site. A list of these species showing their current status may be found in Table 1-3.

Table 1-3
Sensitive Plant Species Potentially Occurring on the Big Tujunga Wash Site

Scientific Name/ Common Name	Status Federal/ State/CNPS	Habitat and Habit	Potential to Occur Onsite	Seen Onsite
Berberis nevinii Nevin's barberry	FE/CE/1B	Chaparral, coastal scrub, riparian scrub and cismontane woodland in sandy or gravelly places. Shrub	Low; habitat present onsite; species not observed during surveys	No
Calochortus plummerae Plummer's mariposa lily	-/-/1B	Coastal scrub, chaparral, grassland and cismontane woodland in rocky and sandy places. Perennial herb.	High; habitat present onsite.	No
Castilleja gleasonii Mt. Gleason indian paintbrush	-/CR/1B	Coniferous forest in granitic soils. Perennial herb.	Low; habitat not present onsite.	No
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	-/-/1A	Coastal scrub, dry sandy places. Annual herb.	Moderate; habitat present onsite.	No
Dodecahema leptocerus Slender-horned spineflower	FE/CE/1B	Coastal scrub, dry sandy places. Annual herb.	High; habitat present onsite.	No
Malacothamnus davidsonii Davidson's bush mallow	FSOC/-/1B	Coastal scrub and riparian woodland in sandy washes. Shrub.	Present; Species observed in wash area.	Yes
Linanthus orcuttii Orcutt's linanthus	FSOC/-/1B	Chaparral (at 4,000 feet); sometimes in disturbed areas. Annual herb.	Low; habitat not present onsite and site below specie's elevation range.	No

STATUS:				
Federal			State	
FE	=	Taxa is listed as an endangered species by the USFWS	CE	= Taxa listed by the State of California as endangered
PE	=	Taxa proposed to be listed as endangered by the USFWS	CR	= Taxa listed by the State of California as rare
FSOC	=	Taxa considered a federal species of concern	California Native Plant Society (CNPS)	
			1A	= Taxa is presumed extinct in California
			1B	= Taxa is rare, threatened, or endangered in California and elsewhere

Nevin's barbery (*Berberis nevinii*), a federal- and state-listed endangered species, is thought to be restricted to fewer than 1,000 plants as of 1992 (California Native Plant Society [CNPS]) Suitable habitat is present on the site, however, the plant was not observed during the surveys. Neven's barbery is a large, conspicuous shrub and it is unlikely that it would have been overlooked during the surveys if it occurred on the site. Three sensitive species were either found on the site or have been reported in nearby locations and therefore have a high potential to occur on the project site. Davidson's bush mallow (*Malacothamnus davidsonii*), a federal species of concern (FSOC), was found in intermediate seral stage alluvial habitat during the Chambers Group surveys. Slender-horned spineflower (*Dodecahema leptocerus*), a state- and federal-listed endangered species, has been documented within 2 miles of the site. This species was not observed during the surveys, but it has a high potential to occur in the late seral stage alluvial scrub habitat present on the site. Plummer's mariposa lily (*Calochortus plummerae*), an FSOC, is associated with sandy sites in coastal scrub habitats and has a high potential to occur on the site. This species was not observed during the surveys. San Fernando Valley spineflower (*Chorizanthe parryi* var *fernandina*) is included on the CNPS List 1A (presumed extinct). This species was, however, recently rediscovered on a ridgetop in south Ventura County (USFWS 1999). San Fernando Valley spineflower was originally evaluated as having a low potential to occur on the site (Chambers 1998a) Since it was reported at a nearby location (within approximately 20 miles) and the site supports suitable habitat, the potential for this species to occur at the Big Tujunga site has been redefined as moderate

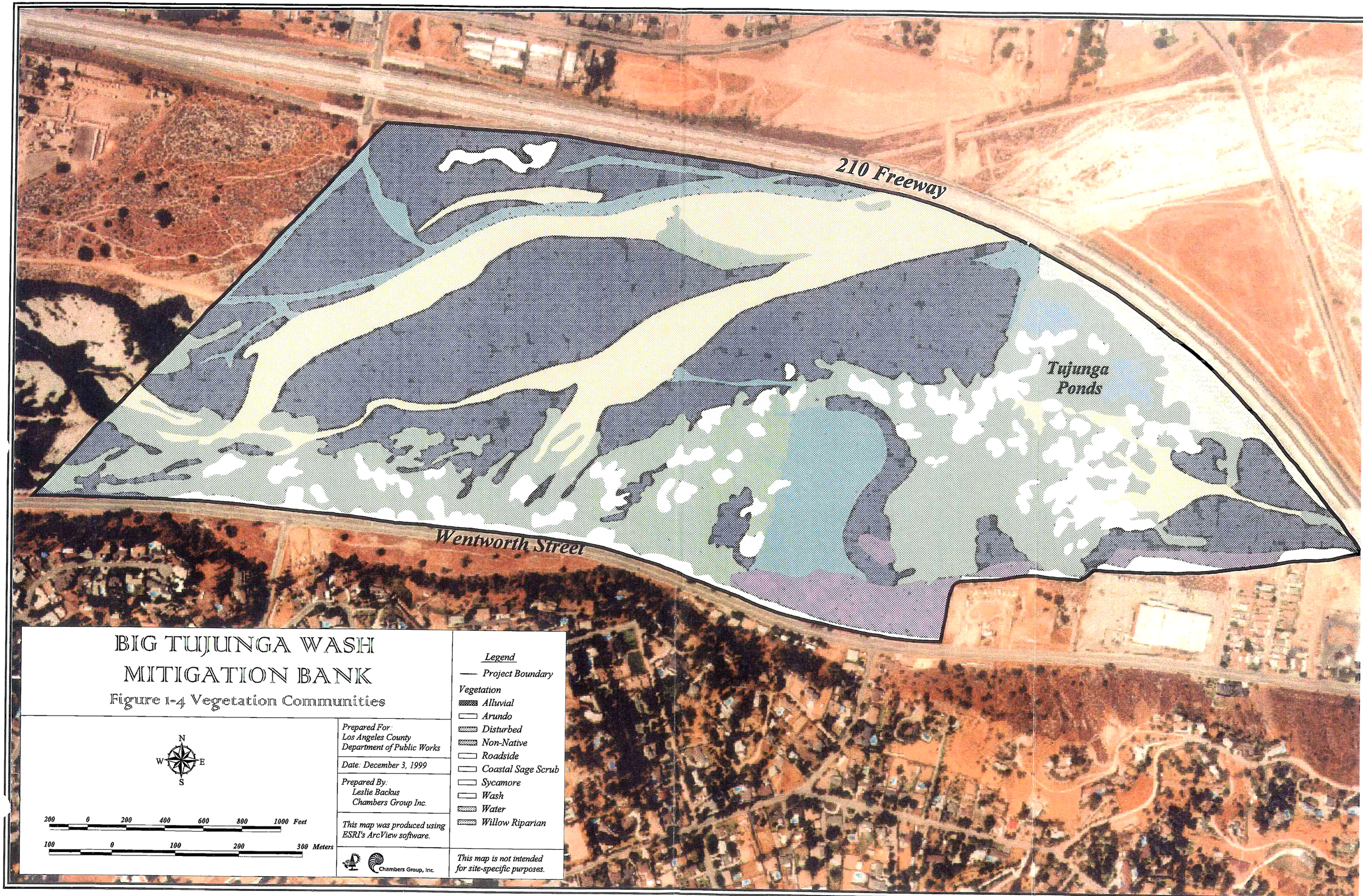
Wildlife Resources

The Big Tujunga Wash Mitigation Bank site consists of riparian, aquatic, and scrub habitats and open cobble wash areas. Much of the site is composed of dry, open habitat that does not provide much cover for wildlife species from predators or hot, dry weather conditions. The site is part of a wildlife movement corridor that extends east of the Hansen Dam and west of the Big Tujunga Wash. Together. these areas form a contiguous corridor providing important open space area for wildlife movement.

The two streams on the site (Big Tujunga Wash and Haines Canyon Creek) provide habitat for amphibians, birds and fish, particularly along the perennial flow in Haines Canyon Creek. The riparian vegetation community provides foraging, roosting, and nesting sites for bird species, cover for reptiles from predation and hot weather conditions, and breeding areas for fish and amphibians. The alluvial scrub community found on gravelly alluvial outwash terraces mainly along Big Tujunga Wash provides habitat for wildlife species that prefer open habitats including mammals, reptiles, and birds. A number of sycamore trees on the site provide suitable roosting and nesting sites for raptor species. A complete list of the wildlife species observed on the site is included Appendix B.

Sensitive Wildlife

The literature search resulted in a list of 14 sensitive wildlife species with the potential to occur on the site. Three sensitive fish species, the arroyo chub (*Gila orcutti*), Santa Ana speckled dace (*Rhinichthys osculus*), and Santa Ana sucker (*Catostomus santaanae*), were observed during the surveys. Four sensitive bird species, the Cooper's hawk (*Accipiter cooperii*), great blue heron (*Ardea herodias*), black crowned night heron (*Nycticorax nycticorax*), and the loggerhead shrike (*Lanis ludovicianus*) were observed on the site during the surveys. Six additional sensitive species were not observed, but have the



BIG TUJUNGA WASH MITIGATION BANK

Figure 1-4 Vegetation Communities

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200 0 200 400 600 800 1000 Feet

100 0 100 200 300 Meters

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.

Legend

— *Project Boundary*

Vegetation

- *Alluvial*
- *Arundo*
- *Disturbed*
- *Non-Native*
- *Roadside*
- *Coastal Sage Scrub*
- *Sycamore*
- *Wash*
- *Water*
- *Willow Riparian*

This map is not intended for site-specific purposes.

potential to occur onsite. These include the California red-legged frog (*Rana aurora draytonii*), southwestern pond turtle (*Clemmys marmorata pallida*), San Diego horned lizard (*Phrynosoma coronatum blainvillei*), California gnatcatcher (*Polioptila californica californica*), southwestern willow flycatcher (*Empidonax trallii extimus*), and least Bell's vireo (*Vireo bellii pusillus*) Additionally. the arroyo southwestern toad (*Bufo microscaphus californicus*) was not observed during the surveys, but has been reported in the vicinity A summary of the sensitive species occurring or potentially occurring on the site and their current status may be found in Table 1-4.

Aquatic Resources

Aquatic resources were evaluated based on a literature review of fish species observed in the vicinity of the site and on a 1-day field survey of the site conducted on May 10, 1997 Data on the physical attributes of the in-stream habitat, including water temperature, dissolved oxygen concentrations, and conductivity, were collected, and fish populations were sampled at 8 locations in the drainages.

Aquatic habitats on the Big Tujunga Wash site consist of two stream channels that traverse the site in an east-to-west direction, and the Tujunga Ponds. The northern drainage is the main branch of Big Tujunga Creek, a sparsely vegetation wash that originates in the San Gabriel Mountains. Big Tujunga Creek is designated as a Southern California Arroyo Chub/Santa Ana Sucker Stream in the California Natural Diversity Database (1997). Both arroyo chubs and Santa Ana suckers were collected in the surveys of Big Tujunga Creek. A portion of Big Tujunga Creek on the site does not appear to have been invaded by introduced fish species and is serving as a dispersion corridor for native species.

The south stream channel connects to the Haines Canyon Flood Control Channel east of the site and is called Haines Canyon Creek. Haines Canyon Creek is a densely vegetated perennial stream, and is dominated by largemouth bass, a non-native fish species. Two adult arroyo chub and one adult Santa Ana sucker were also collected in Haines Canyon Creek. Largemouth bass and sunfish, another introduced species, were observed in the Tujunga Ponds. A complete discussion of the methodology and results of the aquatic habitat evaluation can be found in the Draft Biological Resources Assessment and Functional Analysis document (Chambers 1998a). A list of the aquatic species observed on the site is included in Appendix C

Wetlands and Other Waters of the United States

A formal delineation of the wetlands and other waters of the United States was conducted on the site in August 1997 A total of 30.4 acres on the site was determined to be under the Corps jurisdiction as wetlands, and an additional 77.8 acres was determined to fall under Corps jurisdiction under the category of other waters of the United States. The Tujunga Ponds were not included in the formal delineation.

The delineated wetlands are located primarily along the channel of Big Tujunga Creek and the channel and banks of Haines Canyon Creek. A large area of wetlands was also delineated in the south portion of the site in an abandoned gravel pit. Wetlands along Big Tujunga Creek are characterized by scattered patches of willows and cattails. Wetlands along Haines Canyon Creek are dominated by willows with an understory of other wetland species including mule fat, white alder (*Alnus rhombifolia*), watercress (*Rorippa nasturtium-aquatica*), cattail (*Typha* sp.), sedges (*Cyperus* sp.), and willow-weed (*Polygonum lapathifolium*) Giant reed (*Arundo donax*) is also common throughout the wetland areas.

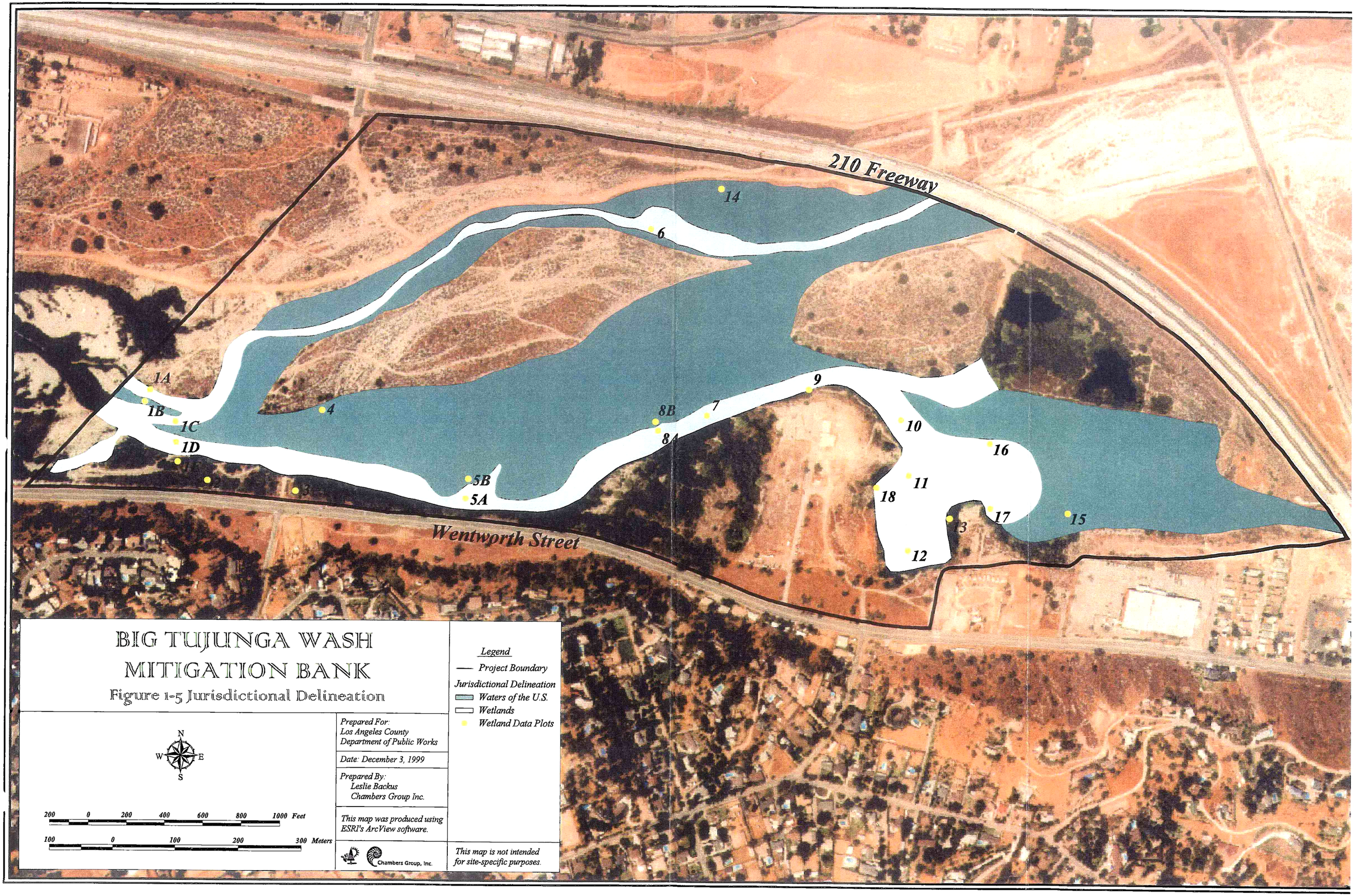
Jurisdictional waters delineated on the site occur along the stream portion of Haines Canyon Creek, and the floodplain of Big Tujunga Creek to the ordinary highwater marks along the banks of the higher bench areas.

All of the wetlands and other waters of the United States under the jurisdiction of the Corps would also be under the jurisdiction of the CDFG Figure 1-5 shows the location of the delineated waters of the U.S and wetlands. Data sheets can be found in the Draft Biological Resources Assessment and Functional Analysis Report (Chambers 1998a)

Table 1-4
Sensitive Wildlife Species Potentially Occurring at the Big Tujunga Wash Site

Scientific Name	Common Name	Listing	PFO	Comments
CLASS OSTEICTHYES	BONY FISH			
CYPRINIDAE	CARPS AND MINNOWS			
Gila orcutti	Arroyo chub	FSOC,CSC	P	Suitable habitat exists onsite.
Rhinichthys osculus	Santa Ana speckled dace	FSOC,CSC	P	Observed in Haines Canyon Creek.
CATOSTOMIDAE	SUCKERS			Suitable habitat exists onsite.
Catostomus santaanae	Santa Ana sucker	FPT,CSC	P	Observed in Haines Canyon Creek.
CLASS AMPHIBIA	AMPHIBIANS			
BUFONIDAE	TRUE TOADS			
Bufo microscaphus californicus	Arroyo southwestern toad	FE,CSC	H	Historically present along Big Tujunga Wash. Known occurrences above Big Tujunga reservoir
RANIDAE	TRUE FROGS			
Rana aurora draytonii	California red-legged frog	FT,CSC	M	Suitable habitat exists onsite.
Rana muscosa	Mountain yellow-legged frog	FPE, CSC	M	Marginal habitat exists onsite.
CLASS REPTILIA	REPTILES			
EMYDIDAE	BOX AND WATER TURTLES			
Clemmys marmorata pallida	Southwestern pond turtle	FSOC	M	Marginal habit exists onsite. Recorded sighting 1 mile downstream of site.
IGUANIDAE	IGUANID LIZARDS			
Phrynosoma coronatum blainvillei	San Diego horned lizard	CSC	P	Suitable habitat exists onsite. Exists on the upper beaches of the Big Tujunga Wash site. Known occurrences on the upper fan within 2 miles of the site.
CLASS AVES	BIRDS			
ARDEIDAE	HERONS			
Nycticorax nycticorax	black-crowned night heron	*	P	Observed onsite.
Ardea herodias	great blue heron	*	P	Individuals observed onsite, but no rookery present.
Ardea alba	Great egret	*	H	Suitable habitat exists onsite.
Egretta thula	Snowy egret	I	H	Suitable habitat exists onsite.
ACCIPITRIDAE	HAWKS			
Accipiter cooperii	Cooper's hawk	CSC	P	Observed onsite.
TYRANNIDAE	TYRANT FLYCATCHERS			
Empidonax trallii extimus	Southwestern willow flycatcher	SE	H	Suitable habitat exists onsite.
MUSCICAPIDAE	KINGLETS, GNATCATCHERS			
Polioptila californica	California gnatcatcher	FT, CSC	M	Marginal habitat (alluvial scrub) onsite.
LANIIDAE	SHRIKES			
Lanius ludovicianus	loggerhead shrike	CSC	P	Observed adjacent to Big Tujunga Creek and Haines Canyon Creek.
VIREONIDAE	VIREOS			
Vireo bellii pusillus	Least Bell's vireo	FE, SE	H	Suitable willow habitat exists onsite.

Status Codes	Potential for Occurrence (PFO)
Federal (FED) **FE = Federal-listed; Endangered** **FSOC = Federal Species of Concern** **FT = Federal-listed; Threatened** **State** **ST = State-listed; Threatened** **SE = State-listed; Endangered** **CSC = California Species of Special Concern** *** -- Taxa that are biologically rare, very restricted in distribution, declining throughout their range, or at a critical stage in their life cycle when residing in California.** **-- Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California.** **-- Taxa closely associated with a habitat that is declining in California. (e.g., wetland, riparian, old growth forest).**	**L = Low potential for occurrence** - No recent or historical records exist of the species occurring in the project area or its immediate vicinity (within approximately 5 miles) and the diagnostic habitat requirements strongly associated with the species do not occur in the project area or its immediate vicinity. **M= Moderate potential for occurrence** - Either a historical record exists of the species in the project area or its immediate vicinity or the diagnostic habitat requirements associated with the species do occur in the project area or its immediate vicinity. **H = High potential for occurrence** - Both a historical record exists of the species in the project area or its immediate vicinity and the diagnostic habitat requirements strongly associated with the species do occur in the project area or its immediate vicinity. **P = Species present** - The species was observed in the project area at the time of the survey.
Source: California Natural Diversity Data Base (CNDDB), Sunland quad, 1997	



BIG TUJUNGA WASH MITIGATION BANK

Figure 1-5 Jurisdictional Delineation

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: December 3, 1999

Prepared By:
Leslie Backus
Chambers Group Inc.

This map was produced using ESRI's ArcView software.

Chambers Group, Inc.

Legend

— Project Boundary

Jurisdictional Delineation

Waters of the U.S.

Wetlands

Wetland Data Plots

This map is not intended for site-specific purposes.

SECTION 2.0 - PROJECT GOALS AND SUCCESS CRITERIA

This section of the document identifies the goals of the MMP and the general measures of success of the enhancement programs. 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 TARGET FUNCTIONS AND VALUES

The primary goal of the enhancement program is to progress toward the performance standards detailed below. Performance standards are based on the progress of the enhancement and restoration effort toward achieving targets developed from the existing habitat for vegetation percent cover, tree height, frequency of distribution, and species diversity. Performance standards for the riparian habitats are based on the functional analysis performed in 1997 (Chambers 1998a). LADPW is responsible for performance monitoring. Performance monitoring will occur for a minimum period of 5 years or until the performance standards are achieved.

2.2 TARGET WILDLIFE SPECIES

The project site is presently used by various common and sensitive wildlife species. The primary goal of the MMP 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. The MMP provides specific methodologies for determining if additional target species inhabit the site during or following the completion of the enhancement measures. In addition, the MMP also requires that wildlife monitoring surveys document use of restoration areas by species that already occur on the site. This in itself is a measure of success and the use of these areas by additional species represents an even greater level of success. Use of restored habitats by the following list of common and sensitive wildlife species will be considered progress indicators of revegetation success.

Amphibians arroyo southwestern toad Pacific tree frog California tree frog western toad	**Birds** snowy egret great egret belted kingfisher coastal California gnatcatcher belted kingfisher lesser goldfinch great blue heron Cooper's hawk Nuttall's woodpecker downy woodpecker common yellow throat yellow-breasted chat Yellow warbler yellow-rumped warbler Bewick's wren hermit thrush blue grosbeak black-headed grosbeak song sparrow least Bell's vireo southwestern willow flycatcher	**Fishes** Santa Ana sucker Santa Ana speckled dace arroyo chub
Reptiles southwestern pond turtle* western fence lizard San Diego coast horned lizard western whiptail lizard side blotched lizard two-striped garter snake		
Mammals striped skunk raccoon burrowing rodents desert cottontail blacktail jackrabbit coyote bobcat mule deer		
* The Big Tujunga site may not be suitable for southwestern pond turtles due to lack of breeding habitat and public intrusion.		

2.3 GOALS OF ENHANCEMENT AND RESTORATION

The primary purpose of the habitat restoration portion of the MMP is to enhance the southern arroyo willow woodland and create new upland habitat onsite to improve the total habitat value of the site. The plan also provides criteria and recommendations for the protection, enhancement, maintenance, and management of the existing natural resources in the Mitigation Bank within the constraints of the proposed uses for the site.

The principal management concerns described in this section include monitoring and managing sensitive biological resources. The management guidelines presented here are chiefly concerned with the creation and enhancement of wildlife habitats, and the general biological resource areas. Another concern is the management and preservation of existing sensitive habitats, such as the southern arroyo willow riparian woodland along Haines Canyon Creek and surrounding the Tujunga Ponds. Recommended actions include subsequent monitoring of biological resources, and implementation of protective measures to preserve and protect existing habitats.

This plan incorporates measures to achieve the following goals:

- preservation and protection of existing riparian woodland;
- enhancement of degraded riparian habitat by eradicating giant reed, tamarisk, and other non-native vegetation;
- restoration of degraded riparian habitat by revegetation with native, riparian species; and
- creation of coast live oak-sycamore woodland habitat (optional enhancement measure)

2.4 TYPES OF HABITATS TO BE CREATED AND ENHANCED

The MMP includes programs that will enable the Big Tujunga Wash Mitigation Bank site to sustain native vegetation and provide suitable habitat for wildlife. Once revegetation is implemented and becomes established, it will provide a site that will minimize erosion, be resistant to invasion by non-native plant species, and increase biotic interactions between micro- and macroorganisms, thus creating a closed nutrient system in which organic matter and nitrogen are cycled in a self-sustaining system.

The enhancement and revegetation programs are designed to increase the habitat value of the Mitigation Bank through the enhancement of approximately 60 acres of southern arroyo willow woodland and the optional creation of approximately 11 7 acres of coast live oak-sycamore woodland and coastal sage scrub. The optional task of creating coast live oak-sycamore woodland (for additional mitigation credits) is proposed in an area on the site now dominated by weedy forbs and non-native grasses, and will include a diverse understory of coastal sage scrub species. Enhancement of the southern arroyo willow woodland entails the eradication of approximately 15 acres of giant reed and tamarisk within the existing woodlands, and replacement planting of native riparian species to improve the wildlife value of the wetlands.

2.5 REVEGETATION/RESTORATION DEFINITIONS

Restoration is a general term for habitat restoration that is often used interchangeably with enhancement, revegetation, and management. The term "restoration" is used as a specific strategy as defined below For purpose of this document, these terms are defined as they are generally used by restoration professionals in California and by the Society for Ecological Restoration (SER)

- Creation establishes a historical ecosystem on lands that did not previously support that ecosystem or on severely altered sites.

- Restoration is the process of intentionally altering a site to establish a defined, indigenous, historic ecosystem. The goal of this process is to emulate the structure, function, diversity, and dynamics of the specified ecosystem.

- Revegetation establishes vegetation on disturbed lands. Ideally, revegetation uses plant material previously located on the site or adjacent to it, to maintain local genetic diversity

- Enhancement alters a site for improvement of a specific value (for example· non-indigenous species eradication within an existing habitat or increasing species diversity of an area)

- Long-term management is an integral part of preserving and increasing native plant communities. Long-term management occurs on intact or restored habitats and encompasses actions to ensure that the project goals are met. Control of weeds and erosion is the most common management practice. Additional long-term management features include fencing and signing for site protection, prescribed fire, and conducting ecological studies on habitat characteristics or usage

2.6 LONG-TERM GOAL

As stated at the beginning of Section 2.0, the ultimate goal of the Bank site to provide for the long-term preservation, management, and enhancement of the biological resources and 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. 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.

2.7 SUCCESS CRITERIA

2.7.1 Baseline Habitat Functions and Values

2.7.1.1 Functional Value of Riparian and Aquatic Habitats

The success of the restoration and enhancement effort will be evaluated using a modified version of the hydrogeomorphic (HGM) approach that was developed to evaluate the functional value of the riparian and floodplain habitat at the Big Tujunga Wash site. The logic behind the HGM approach is to compare the functions of the study sites to a standard reference site determined to have the highest level of functioning (Brinson 1995). By definition, reference standard functions receive an index score of 1 0 Study sites are assigned a total score of between 0 (no function) and 1 (high function), based on the evaluation of variables that may be assigned a quantitative rating. In order to determine the functional unit per acre, the evaluation variables are combined into an algorithm that expresses their relationship in a streamlined fashion.

A functional analysis study was conducted at the Big Tujunga Wash site in 1997 to establish baseline functional values for the aquatic and riparian habitats. A complete discussion of the Functional Analysis methodology and results of the baseline study, including justification for the quantitative evaluations, can be found in the Draft Biological Resources Assessment and Functional Analysis (Chambers Group 1998a) The variables and baseline scores assigned for each variable in the baseline study for the riparian and aquatic habitats along Haines Canyon Creek are summarized in Table 2-1.

Table 2-1
Baseline Functional Analysis Variable Values for
Haines Canyon Creek Riparian and Aquatic Habitats

Variable	Baseline Score
RIPARIAN HABITAT	
Structural Diversity (STD)	0.7
Riparian Habitat - Cover (COV)	1.0
Contiguity of Habitat (CON)	1.0
Urban Encroachment (URB)	0.6
Percent of Exotic Invasive Species/Vegetation (EXO)	0.8
Hydrologic Regime of Riparian Zone (REG)	1.0
Characteristics of Flood-prone Area (FPA)	0.8
Micro and Macro Topographic Complexity (TOP)	0.8
Available Organic Carbon (CAR)	1.0
Rareness - Listed and Sensitive Species (RAR)	1.0
Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	0.7
Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	0.6
AQUATIC HABITAT	
In-stream Cover (INS)	0.6
Vegetation Roughness (Channel Only) (RUF)	0.6
Epifaunal Substrate (EPI)	0.6
Sediment Deposition (SED)	0.3
Bank Vegetative Protection (BVP)	0.6
Bank Stability (BST)	0.7
Exotic Aquatic Vertebrates (EAV)	0.2

The algorithm for the riparian habitat is:

$$FU = \frac{[((STD+COV)EXO)+CON+CAR+FPA+TOP)]REG+URB+RAR+RIC+SPE}{10}$$

and the algorithm for the aquatic habitat is:

$$FU = \frac{(INS+EPI+SED+BVP+BST+RUF)EAV}{6}$$

For the baseline study, a functional unit of 0.79 was calculated for the riparian habitat along Haines Canyon Creek, and a functional unit of 0.11 was calculated for the aquatic habitat.

2.7 1.2 Performance Standards for Riparian and Aquatic Habitat

The performance standards for the riparian and aquatic habitats in Haines Canyon Creek are based on the functional analysis performed on the existing habitat in 1997 (Chambers 1998a) Target functional values for the enhanced riparian and aquatic habitats are based on an analysis of the probable effects of the restoration effort on the existing system. The variables, baseline and target scores assigned for each variable are summarized in Table 2-2

Table 2-2
Target Functional Analysis Variable Values for
Haines Canyon Creek Riparian and Aquatic Habitats

Variable	Functional Units Existing	Functional Units Target
RIPARIAN HABITAT		
Structural Diversity (STD)	0.7	0.9
Riparian Habitat - Cover (COV)	1.0	1.0
Contiguity of Habitat (CON)	1.0	1 0
Urban Encroachment (URB)	0.6	0.6
Percent of Exotic Invasive Species/Vegetation (EXO)	0.8	1.0
Hydrologic Regime of Riparian Zone (REG)	1.0	1.0
Characteristics of Flood-prone Area (FPA)	0.8	0.8
Micro and Macro Topographic Complexity (TOP)	0.8	0.8
Available Organic Carbon (CAR)	1 0	1.0
Rareness - Listed and Sensitive Species (RAR)	1.0	1.0
Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	0.7	0.8
Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	0.6	0.8
AQUATIC HABITAT		
In-stream Cover (INS)	0.6	0.8
Vegetation Roughness (Channel Only) (RUF)	0.6	1.0
Epifaunal Substrate (EPI)	0.6	0.6
Sediment Deposition (SED)	0.3	0.5
Bank Vegetative Protection (BVP)	0.6	0.8
Bank Stability (BST)	0.7	0 8
Exotic Aquatic Vertebrates (EAV)	0.2	1.0

The target functional value for the enhanced riparian habitat along Haines Canyon Creek is 0.87 and the target functional value for the aquatic habitat is 0.75. Enhancement of the existing riparian habitats include the removal of exotic plant species (giant reed and tamarisk) and protection of native bird species through a cowbird trapping program. The total gain in riparian functional capacity is 0.08 units per acre Aquatic functional capacity value is gained by removal of non-native fish and amphibian species from the aquatic habitat, revegetation of the streambank surfaces, and the reduction of erosion along the creek by restricting equestrians to established trails. The total gain in aquatic functional capacity is 0.64 units per acre

2.8 SUCCESS CRITERIA

The success criteria for the revegetation plans are described below If at any time planting and/or hydrological functions in this areas do not appear to be meeting the performance standards set forth in the plan, LADPW will be responsible for taking timely remedial actions (as determined by the Restoration Specialists) to ensure the performance standards are met. Section 8.0 of the MMP describes contingency measures for each of the enhancement programs.

2.8.1 Vegetation Performance Standards

Coast live oak-California sycamore woodland (an optional enhancement measure for additional mitigation credits) is the target vegetation community for the Restoration Plan. Arroyo willow riparian is the target vegetation community for the Riparian Enhancement Plan. Listed below are the height standards and cover/survival standards that apply to all tree plantings and seeding efforts.

2.8.1.1 Target for Coast Live Oak-Sycamore Woodland (Optional Enhancement Task)

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. During performance monitoring percent survival and cover will be estimated by visual ocular estimates of each mitigation area. Representative areas within the mitigation areas will be also photographically documented from fixed stations. If the survival and cover requirements have not been met, replacement plantings shall be implemented, as necessary, to achieve the required standards. 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 plantings are summarized in Table 2-3.

Table 2-3
Performance Standards for Coast Live Oak-Sycamore Woodland Plantings

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.**

2.8.1.2 Target for Arroyo Willow Riparian

Plantings of container stock in the riparian enhancement areas shall have the same performance standards for coverage and survival as that described for the optional coast live oak-sycamore woodland area.

2.8.1.3 Performance Standards for Oak and Sycamore Trees

Performance standards for the planted trees will be as follows:

- For sapling revegetation, all saplings that die or exhibit dieback in the primary growth leader in the first year will be replaced at the first suitable growing season to achieve 80 percent survival of the original plantings.
- At the end of 3 years, the sycamore saplings will reach a height of 7 feet, and the oak saplings will reach a height of 3 feet.
- After 3 years, 90 percent of the original plantings will survive
- At the end of 5 years, the sycamores will reach a height of 13 feet and the oaks will reach a height of 6 feet.
- After 5 years, 100 percent of the original plantings will survive

2.8.1.4 Non-Native Species

Weeds will be controlled in the revegetation areas for at least 2 years or until plantings are well established to prevent detrimental competition between the non-native, invasive species with the revegetation plantings for water, nutrients, light, and space All weeds will be removed mechanically, except in cases where mechanical removal is ineffective. In those cases, an appropriate herbicide (Rodeo®) will be used.

2.8.1.5 Evidence of Natural Reproduction

It is expected that natural reproduction of a variety of seeded and planted species will be evident by the third year after planting. If the monitor notices any areas that are deficient in the recruitment of native species, appropriate remedial actions will be taken to remedy the situation.

2.9 BREEDING OF SENSITIVE/LISTED BIRDS

Through the focused surveys proposed as part of the long-term monitoring for the Mitigation Bank, the biologist should be able to determine whether or not sensitive and listed species of birds are successfully breeding in the Bank. More specifically, the primary target birds are the federal-listed least Bell's vireo and southwestern willow flycatcher As part of the monitoring, protocol surveys will be conducted for these species during the breeding season. Observations of these species will be documented and, if present, the biologist will look for evidence of breeding behaviors (nest building, incubation, feeding of nestlings, presence of juveniles) In addition, the biologist will document breeding behavior and presence of juveniles of other sensitive birds species that may be observed during the focused avian surveys. If successful breeding by sensitive and listed species is documented, particularly in the enhancement areas, then the habitat restoration program will be considered successful. Quantitative levels of the number of successfully breeding species of sensitive/listed birds observed during the monitoring have not been developed. It would be difficult to say what number of breeding pairs constitutes success so presence of successfully breeding pairs is the most logical way to determine whether or not the enhancement is a success.

2.10 BROWN-HEADED COWBIRD TRAPPING

A successful cowbird trapping program is determined by evidence of successful breeding by riparian dependent birds such as the southwestern willow flycatcher, least Bell's vireo, and yellow warbler The overall goal of the trapping program is to remove those cowbirds impacting the target hosts while decreasing non-target capture and mortality. The actual success of a cowbird trapping program is not based on the number of cowbirds captured as many people believe The true measure of success is whether or not the riparian breeding birds are able to successfully produce young. Therefore, the success of the cowbird program will be determined during the focused protocol surveys that were previously described.

2.11 TRAILS CLOSURE AND RESTORATION

The overall goal of the trail 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 The success of the trails closure and restoration program will be incorporated into the evaluation of the success of the riparian restoration and enhancement program. This will be done primarily because the trails closure and restoration is comprised of riparian habitat restoration. Thus, it will be 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. If monitoring of recreational use shows there are negative impacts on the success of the riparian restoration and enhancement program, or if wildlife use of the site is compromised, then it may be necessary to modify the trails closure plan.

2.12 EXOTIC WILDLIFE ERADICATION

In the initial removal of exotics (non-native fish, bullfrogs, and crayfish), baseline populations of these species will be established from the seining of ponds as they are drained, seining the creek, and setting traps for crayfish. Care will be taken when trapping crayfish so as to avoid mortality of non-target species. In each of the 4 years following initial removal of exotics, less than 5 percent of the densities of exotic fishes and less than 10 percent of the densities of crayfish and bullfrogs than the baseline populations established will constitute success of the program. If these goals are not successfully met in the quarterly sampling period, then the control protocol will be modified in order to achieve the original goal.

However, as a preliminary goal, a target of a 95 percent reduction in the number of individuals of exotic fish species and bullfrogs, and a similar 90 percent reduction in the crayfish population. This standard would be assessed and evaluated by examination of the results of the initial control effort with follow-up monitoring in late 2000 and 2001, and biannual assessment after that up to 2005 The target goal would be to achieve captures of ≤5 percent of the initial total of exotic fishes and frogs in the system by spring of 2001, and ≤10 percent of the crayfish, and to maintain or increase these levels post-2001

The plan is to achieve a 95 percent reduction in the number of individuals of exotic fish species by 2001 Follow-up efforts in 2002, 2003, and subsequent years will seek to achieve similar or greater levels of reduction of the remaining population(s). Thus, a 95 percent removal of fish the first year, 95 percent of the remaining fish the second year, and so on. Similar but slightly lower levels apply to bullfrogs and crayfish due to the inherently more difficult nature of removing them.

Other exotic wildlife species that may be found on the site, such a feral dogs and cats, may need to be the subject of a removal program. If during the monitoring of the riparian restoration and associated wildlife surveys, feral dogs and/or cats are observed, then a removal program shall be implemented. In addition, if recreational users are reporting the presence of feral dogs and/or cats, then this shall be an indication that the eradication program shall be implemented. Animal control shall be contacted to remove feral dogs. Feral cats are much more difficult to control. The presence of coyotes on the site may act as a natural control; but if cats continue to be a problem, then the use of humane traps shall be investigated.

2.13 PUBLIC OUTREACH PROGRAM

Success criteria are not applicable to the public outreach program. This program is specifically designed to keep the public involved in the use and long-term care of the site so there are really no quantitative success measures that are applicable to this program. Monitoring of human impacts to native habitats will be a component of the riparian restoration program. If human impacts compromise the goal of long-term benefit for the state's fish and wildlife resources, then modifications to the public outreach and public use programs may be necessary

SECTION 3.0 - APPROACH, RATIONALE, AND METHODOLOGY

This section of the MMP provides the approach, rationale, and methodology for implementing each of the enhancement programs. The enhancement programs include. habitat restoration and revegetation, exotic plant eradication, brown-headed cowbird trapping, formal trails establishment, exotic wildlife eradication, and public outreach. For some of the programs, surveys were conducted and background information was developed to determine the most appropriate approach or methodology necessary to achieve the goals of the MMP In those cases, the results of the surveys and the background information are summarized in this section. The Implementation and Monitoring Schedule is provided in Figure 3-1, and serves as the master schedule for all of the enhancement programs.

A special section on permitting requirements is also included in this section, specifically because the Santa Ana sucker, a native fish species, has been proposed for listing as threatened by the USFWS. If this species is listed, then there will be a need for consultation with the USFWS regarding the enhancement measures implemented at the site Through consultation, the USFWS will provide an opinion on whether the proposed enhancement measures will jeopardize the future existence of this species on the site. Permitting requirements of the Corps, RWQCB, and CDFG are also described in this section.

3.1 IMPLEMENTATION PLAN

The purpose of the implementation plan is to identify what constitutes the implementation of the MMP The detailed tasks that make up the implementation of all of the programs in the MMP are described in Sections 3.2 through 3 7 and are shown on the checklists in Section 4.0 Figure 3-1 shows the master schedule for the implementation phase of the MMP The MMP has been based on a 5-year mitigation and monitoring period. The actual duration of the mitigation and monitoring period for some of the tasks will be determined by the success of the restoration and enhancement programs. For example, if the success criteria for the plantings are achieved prior to the end of the 5-year period, then that program may be completed prior to 5 years.

Implementation of the MMP begins with the LADPW's initiation of the baseline water quality monitoring and trails enhancement components and the solicitation of proposals from qualified Consultants to undertake the implementation of the MMP programs. The selected Consultant will be responsible for working closely with the LADPW to facilitate the implementation of the MMP If the Consultant has a team of subconsultant specialists, then it is the responsibility of the Consultant to secure contracts with the subconsultants in a timely manner The following summarizes the MMP programs and the major tasks within those programs.

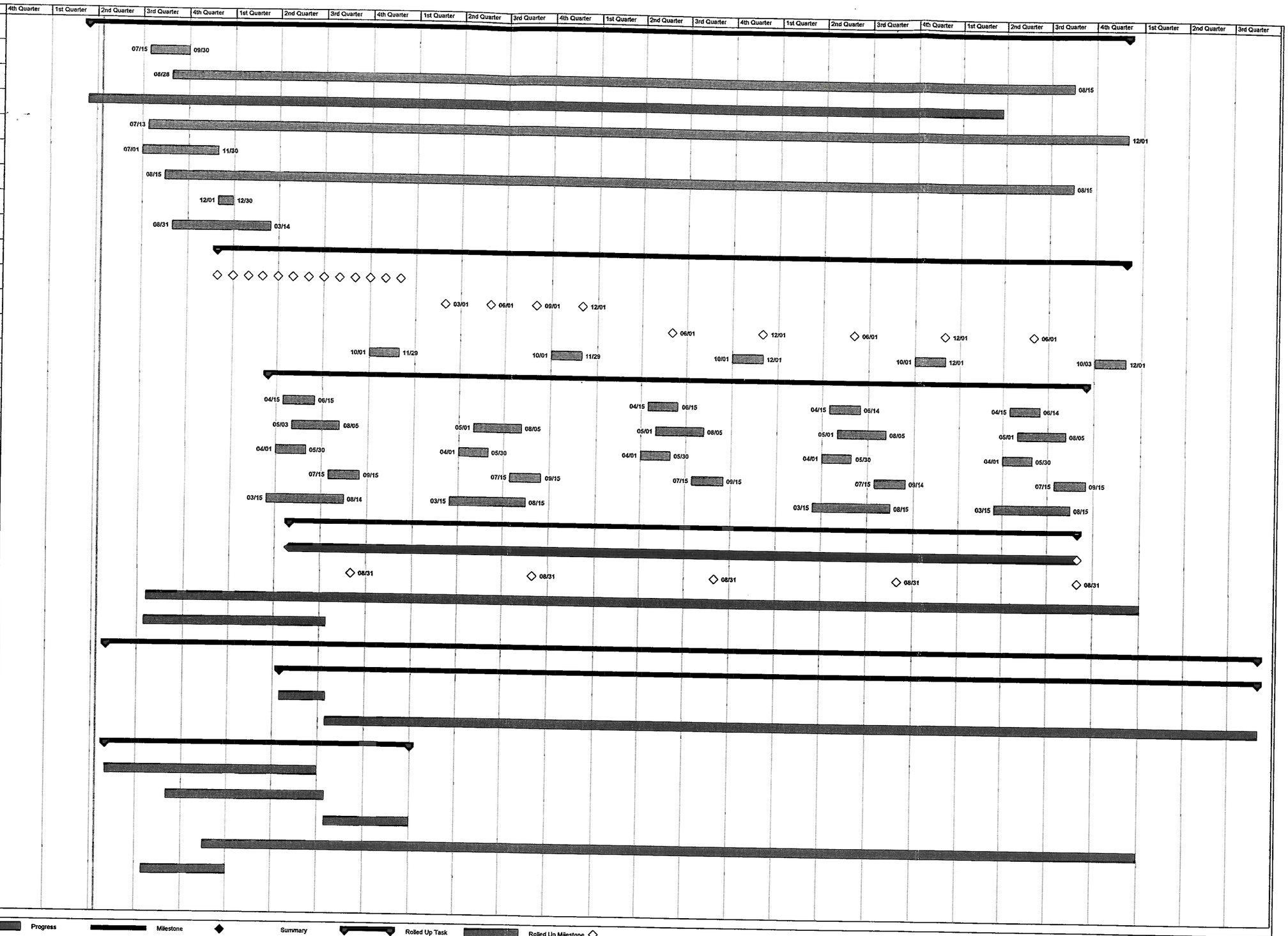
LADPW Consultant Contract Process

- Issue Request for Proposal
- Evaluate Proposals
- Select Consultant
- Issue Notice to Proceed

Riparian Habitat Enhancement Program

- Determine Needs for Permitting (404, 401, 1601, and Section 7)
- Obtain Permits (if necessary)
- Prepare Enhancement Sites (including reclaimed Trails) by Removing Invasive Weeds
- Install Erosion Control Measures
- Order and Arrange for Plant Materials Delivery
- Layout Planting Schemes
- Plant Cuttings and Container Plantings
- Conduct Maintenance and Monitoring

Task Name	Start	Finish	Predecessors
Implementation and Monitoring	Wed 03/15/00	Thu 12/01/05	
Portable Toilet and Trash Receptacle Installation	Sat 07/15/00	Sat 09/30/00	
Bullfrog, Crayfish & Exotic Fish Removal	Mon 08/28/00	Mon 08/15/05	
Water Quality Monitoring	Wed 03/15/00	Wed 03/23/05	
Trails Enhancement	Thu 07/13/00	Thu 12/01/05	
Trails Reclamation	Sat 07/01/00	Thu 11/30/00	
Arundo/Tamarisk/Water Hyacinth Removal	Tue 08/15/00	Mon 08/15/05	
Cutting and Container Plant Installation	Fri 12/01/00	Sat 12/30/00	
Kiosk and Cowbird Trap Construction	Thu 08/31/00	Wed 03/14/01	
Maintenance Schedule- Irrigation, Erosion Control, Trails, Weed Control, Wildlife & Revegetation	Fri 12/01/00	Thu 12/01/05	
Inspection and Maintenance Year 1 (Monthly)	Fri 12/01/00	Sat 12/01/01	
Inspection and Maintenance Year 2 (Quarterly)	Fri 03/01/02	Sun 12/01/02	
Inspection and Maintenance Years 3-5 (Semi-annually)	Sun 06/01/03	Wed 06/01/05	
Reseeding and Replanting (if required)	Mon 10/01/01	Thu 12/01/05	
Success Monitoring - Wildlife	Thu 03/15/01	Thu 09/15/05	
Least Bell's Vireo Monitoring	Sun 04/15/01	Tue 06/14/05	
Southwestern willow flycatcher Monitoring	Thu 05/03/01	Fri 08/05/05	
Arroyo Southwestern Toad Monitoring	Sun 04/01/01	Mon 05/30/05	
Native Fishes	Sun 07/15/01	Thu 09/15/05	
Brown-headed Cowbird Trapping & Removal	Thu 03/15/01	Mon 08/15/05	
Success Monitoring - Vegetation	Tue 05/01/01	Wed 08/31/05	
Quantitative and Qualitative Sampling (Annual Success Monitoring)	Tue 05/01/01	Wed 08/31/05	
Riparian and Aquatic Functional Analysis	Fri 08/31/01	Wed 08/31/05	
Community Awareness Program	Wed 07/19/00	Sat 12/31/05	
Mitigation Banking Agreement	Sat 07/15/00	Thu 07/12/01	
Optional Elements	Mon 05/01/00	Thu 08/31/06	
Sycamore/Oak Woodland Enhancement (Cottonwood Ave. Area)	Sun 04/15/01	Thu 08/31/06	
Obtain Additional Mitigation Credits	Sun 04/15/01	Fri 07/13/01	
Implementation and Success Monitoring	Sun 07/15/01	Thu 08/31/06	
Tujunga Ponds Modification	Mon 05/01/00	Mon 12/31/01	
Obtain Preliminary Estimate of Additional Mitigation Credits	Mon 05/01/00	Fri 06/29/01	
Feasibility Study and Selection of Modification Option	Fri 09/01/00	Fri 07/13/01	
Obtain Additional Mitigation Credits	Sun 07/15/01	Mon 12/31/01	
Regular Patrolling	Wed 11/15/00	Fri 12/30/05	
Marybell Avenue Entrance	Sat 07/15/00	Sun 12/31/00	



Project: Big Tujunga Wash Mitigation Bank
Date: Mon 04/10/00
*NOTE - Permitting Schedule Shown in Section 3

Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone

Chambers Group

BIG TUJUNGA WASH MITIGATION BANK IMPLEMENTATION AND MONITORING SCHEDULE
Figure 3-1

Conduct Annual Functional Analysis
Annual Reporting

Brown-headed Cowbird Eradication Program (5-year program)
Construct Cowbird Traps
Arrange for Storage Facility for Traps and Equipment
Conduct Cowbird Trapping Program from March 15 to July 15
Conduct Daily Maintenance and Monitoring of Traps
Annual Reporting

Trails Reclamation Program
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

Exotic Wildlife Species Eradication Program**
Secure Approval from CDFG, USFWS, RWQCB, and Corps
Determine Needs for Permitting (404, 401, 1601, and Section 7)
Obtain Permits (if necessary)
Conduct Sampling and Capture of Exotic Wildlife Species (various methods)
Implement Monthly Control Methods
Conduct Monthly or Quarterly Monitoring (Depends Upon Pond Configuration Option Selected)
Collect Physical and Biotic Parameter Data
Annual Reporting

Exotic Plant Species Eradication Program
Determine Needs for Permitting (404, 401, 1601, and Section 7)
Obtain Permits (if necessary)
Eradicate Tamarisk, Giant Reed, and Water Hyacinth
Appropriate Disposal of Cut Plant Materials
5-Year Maintenance and Monitoring of Removal Success
Annual Reporting

Community Awareness and Involvement Program
Educate Elected Officials about MMP Programs
Conduct Community Meetings
Assist in Establishing Community Advisory Committee
Prepare Public Information Materials
Coordinate with Local Schools about Education Program
Prepare Spanish Translation of Information Materials
Annual Reporting

Water Quality Monitoring Program
Initial Collection and Analysis of Baseline Water Quality Samples
Quarterly Water Quality Monitoring and Analysis
Quarterly Reporting
Annual Reporting

Native Habitat Restoration Program (Optional Program)

Prepare Layout of Restoration Plantings
Prepare Layout and Install Irrigation System
Contract for Plant Materials and Delivery of Materials
Install Erosion Control Measures and Protective Fencing
Install Plant Materials
Apply Seeding Materials
Irrigate and Maintain Plantings
Conduct Regular Maintenance and Success Monitoring
Conduct Focused Surveys for Listed Wildlife Species (Part of Success Monitoring)
Install Replacement Plantings
Annual Reporting

Optional Pond Reconfiguration Program

Conduct Feasibility Study (Hydrology and Engineering)
Determine Most Feasible Alternative
Determine Most Feasible Alternative
Determine Appropriate Permit Requirements
Obtain Necessary Permits (if applicable)
Determine and Obtain Mitigation Credits from Agencies
Construct Selected Reconfiguration Option
Perform Post-Construction Surveys of Use of Existing and Created Habitats
Annual Reporting

Permitting for Optional Pond Reconfiguration Program

Obtain Section 401 Water Quality Certification
Obtain Section 404 Permit
Obtain 1601 Streambed Alteration Agreement
*Obtain Section 7 Consultation (Endangered Species Act Incidental Take Permit)
*Obtain Section 2081 (California Endangered Species Act Incidental Take Permit)
*CEQA/NEPA Documentation
Annual Reporting

** May or may not be necessary*

Qualifications of the Consultant

In order to ensure the success of the implementation, the Consultant or Consultant Team shall have extensive experience in conducting mitigation and monitoring programs for native habitat restoration projects. In addition, the Consultant or the Team shall have experience with, and the appropriate permits to conduct the surveys for, the listed wildlife species targeted in the MMP. The following summarizes the qualifications of the specialists required to implement the MMP

The Project Manager shall be a biologist with extensive experience in conducting and implementing complicated mitigation and monitoring programs. In addition, the Project Manager shall have extensive experience in dealing with public interest groups, such as the groups that may provide input or who may use the mitigation bank site for recreational purposes. The Project Manager shall also have extensive experience in working with the resource agencies who will oversee the progress and success of the MMP

The Restoration Specialist shall be a restoration ecologist, botanist, or wetland specialist that is responsible for conducting maintenance and monitoring, functional analysis, exotic species removal, and quality assessment of restoration and enhancement activities. This person shall have extensive experience in implementing native habitat mitigation and monitoring programs and in conducting functional analyses and the associated data analysis. In addition, the Restoration Ecologist shall have

extensive experience in overseeing a Landscape Contractor and Landscape Architect in the preparation and implementation of planting and irrigation plans.

The Project Biologist shall be a wildlife biologist with extensive experience with, and the appropriate permits to conduct, the various wildlife monitoring surveys and exotic species removal programs that are part of the MMP This person shall also be experienced in overseeing a cowbird trapping and removal program.

The Landscape Contractor shall be experienced in native habitat revegetation and restoration and shall be a Certified Herbicide Applicator The Landscape Contractor will be responsible for the actual cutting, herbicide treatment, and removal of the giant reed, and site preparation, planting, seeding, irrigation, and maintenance of the native plantings.

The Landscape Architect shall have extensive experience in the preparation of plan drawings for the revegetation plantings and irrigation systems.

3.2 OVERVIEW OF THE HABITAT RESTORATION AND ENHANCEMENT PROGRAM

3.2.1 Rationale for Expecting Implementation Success

Success of the habitat restoration and enhancement plan is expected based on the following rationale:

- Plant material (seeds, container plants and cuttings) to be used for the revegetation site have been carefully selected for their adaptability to the site conditions. Cutting stock collected from the site, will preserve the genetic integrity of the willow and mule fat populations.

- The site is located within a system that supports coastal sage scrub and riparian habitat. The existence of these stands provides evidence that the enhanced community can sustain itself and support native riparian species.

- Exotic species to be removed within the site will reduce competition with existing native species and plantings associated with the revegetation project and enhance the site's ecological value

- The revegetation site will be planted with cuttings and container plants at a relatively high density and seeded with a native herbaceous seed mix that would inhibit the recolonization of invasive non-native plant species.

3.2.2 Responsible Parties

The Restoration Specialist is responsible for monitoring implementation of the project specifications and enhancement measures. This person (or team of individuals) will be responsible for tracking and preparing all progress reports for submittal to LADPW A qualified Landscape Architect, experienced in preparing plan drawings for native habitat restoration projects and preparing irrigation plans, shall be retained by the firm hired to implement the MMP A qualified Landscape Contractor, experienced in the installation and maintenance of native restoration projects and retained by the firm hired to implement the MMP, will be responsible for actual implementation of the specifications of revegetation/restoration plans and will direct all the activities associated with the plans. The Restoration Specialist will coordinate closely with the Landscape Architect and the Landscape Contractor to ensure that the specifications of the revegetation and enhancement plans are properly implemented.

The Landscape Contractor will be responsible for maintenance and survival of the plantings throughout the monitoring periods specified in the MMP (i.e., 5 years after installation is completed). Following the completion of the 5 year duration of the MMP, the LADPW will be responsible for consulting with the

CDFG, USFWS, Corps, and RWQCB regarding future ongoing MMP activities at the site or transfer of the site to a caretaking agency

3.2.3 Schedule

Site preparation may begin in late summer, with weed and exotic plant species eradication being the first tasks to be implemented. Plantings and seeding may be installed between November 1 and March 31 to take advantage of winter rainy season. If for any reason the plant materials (seeds and container plants) are undeliverable or rejected by the Restoration Specialist, planting will be completed as soon as desirable materials are available and the planting season is appropriate

Table 3-1 depicts the preliminary schedule guidelines for habitat restoration and revegetation activities.

Table 3-1
Preliminary Schedule Guidelines for Construction Activities

Site Preparation
• Restoration Specialist identifies restoration areas
• Install boundary fencing around restoration areas
• Contract for plant materials and seed materials
• Prepare Planting Plan Drawings and Specifications
• Restoration Specialist attends pre-construction meeting(s)
Planting (November through March)
• Install erosion control devices
• Schedule plant materials delivery date and planting crew
• Layout planting scheme for landscape contractor
• Arundo removal
• Collect/salvage suitable plant material from development site
• Cuttings and container plants installed
• Seed application
• Initiate irrigation
• Coordinate replacement plantings
• Install replacement plantings, monitored by Restoration Specialist
• Install plant fencing (if herbivory is a problem)
Maintenance and Monitoring
• See guidelines in text
Documentation
• Restoration Specialist submits annual report to LADPW by January 1 each year following implementation

3.2.4 General Construction Guidelines

3.2.4.1 Fencing Around Restoration Areas

Orange plastic snow fencing (or other similar device) shall be installed to define limits of restoration areas. Where possible, fencing shall be located no closer than 15 feet from the dripline of all trees identified for protection. The purpose of the fencing is to keep individuals from trampling newly installed plant materials and to delineate the limit of the restoration areas for the Landscape Contractor

3.2.4.2 Debris Removal

The removal of dead or downed wood will eliminate important microhabitats for small vertebrates and invertebrates, and reduce the reintroduction of organic material into the soil. Therefore, dead or downed wood shall not be removed except as required for safety reasons or flood control purposes. Garbage, debris, and noxious weed biomass shall be removed from all areas of the sit on an as-needed basis as debris and weeds will continue to be brought into the area from recreational use and from developed sources further up the drainage Special attention shall be given to cleanup following a large scale flood event. Trash receptacles placed onsite shall be the type that deter wildlife

3.2.4.3 Erosion Control

Only non-vegetative erosion control measures shall be used in areas with native vegetation Such erosion control measures may include sandbags, silt fencing, slope breakers, trenches, or dissipaters. These measures preclude the introduction of non-native weedy species into the seed bank of areas with native vegetation. Figure 3-2 shows a typical installation of silt fence The Restoration Specialist and the Landscape Contractor will determine the actual locations where erosion control measures will be placed.

Drainage and sedimentation control devices shall be routinely cleaned, maintained, and repaired prior to and during the rainy season. All repairs to these systems shall be immediately executed to minimize erosion problems.

3.3 DETAILS OF THE HABITAT RESTORATION AND ENHANCEMENT PLAN

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. In addition to improving existing habitat, the plan also includes an optional program for creating approximately 11 7 acres of sycamore-oak woodland in the south portion of the site (described in Section 9). Figure 3-3 shows the locations and types of restoration and enhancement areas on the site

3.3.1 Protection of Existing Habitat and Sensitive Species

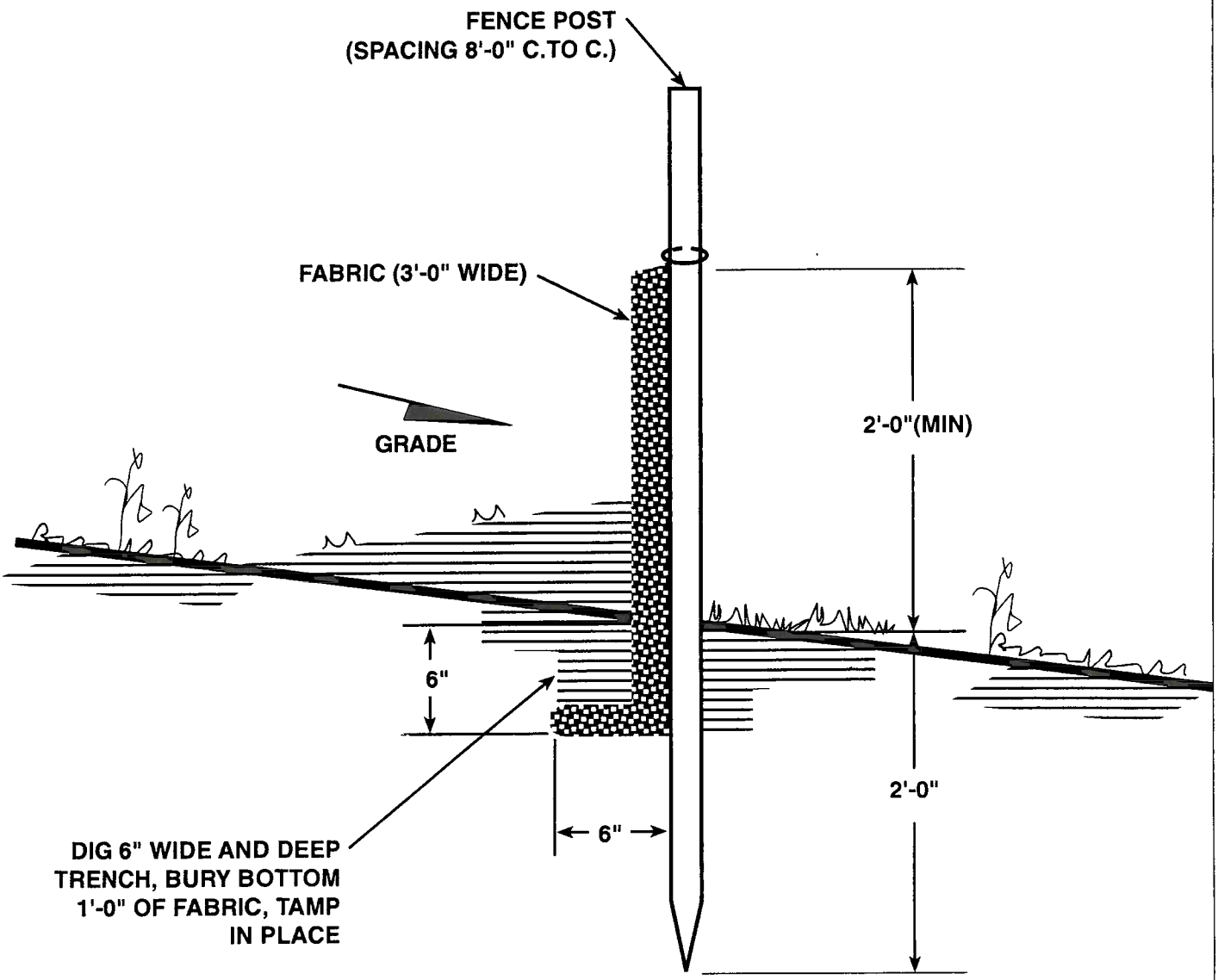
The following recommendations are presented to protect the biological and aesthetic values of the natural habitats within the site that are not directly affected by the proposed restoration project.

- A delayed start date for the removal of giant reed and tamarisk will negate impacts on nesting birds species and avoid violation of the Migratory Bird Treaty Act. This would also allow the salvaging/collection of native materials from the development site such as willow and mule fat cuttings. Removal of giant reed and tamarisk shall begin after the end of the nesting season (approximately August 30th).

- Areas to be preserved or protected shall be identified by the Restoration Specialist and isolated with construction fencing prior to any clearing or grading activities. Protected areas include existing woodland adjacent to revegetation areas and individual trees to be preserved within revegetation areas.

- Vehicles shall not be allowed to operate within the dripline of any preserved tree on the site

- Erosion control measures including silt fencing shall be installed at the discretion of the Restoration Specialist to contain sediments within graded or restoration areas. Silt fencing shall be semi-permanently installed at the boundary between upland revegetation areas and existing riparian habitat until sufficient vegetation is established in the revegetation zone to prevent erosion. Maintenance of the erosion control measures is included as part of the maintenance program.



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SILT FENCE INSTALLATION DETAIL
Figure 3-2

- Construction equipment shall be restricted to designated areas and trails identified by the Restoration Specialist Oversize equipment (greater than 10 feet in height or 8 feet wide) shall not be allowed on the trails. Only low dispersal weight vehicles (less than 20 psi) shall be operated within the riparian areas. Crossing of the creek bed shall not be permitted except where designated by the Restoration Specialist. Crossing will be limited to the minimum necessary to facilitate enhancement activities within the riparian zone

- Maintenance and refueling of construction equipment shall be limited to areas offsite. Overnight storage of potentially hazardous materials, including but not limited to fuel, paint, stains, pesticide, herbicides, solvents, oils, and solvents, will not be permitted on the site Disposal of such materials shall occur in a controlled area that is located offsite.

3.3.2 Riparian Habitat Enhancement Plan

Enhancement is intended to improve the habitat value of an existing plant community The goal of the riparian enhancement plan will be to remove invasive non-native weed species such as giant reed (*Arundo donax*) and to replant these areas with native riparian species. In addition, several extraneous equestrian trails throughout the riparian zone will be retired and reclaimed with native riparian species. A total of approximately 40 acres of habitat along Haines Canyon Creek and 20 acres of habitat surrounding the Tujunga Ponds will be enhanced. The composition of the replacement plantings in the enhancement areas will support the breeding and foraging activities of a variety of sensitive riparian species such as the least Bell's vireo The enhancement plan consists of various tasks designed to remove the non-native species, prepare the areas prior to planting, and to install cuttings and container plant materials.

Impacts will be minimized through project scheduling and construction monitoring. A delayed start date for the construction until after the nesting season (approximately August 30th) will minimize impacts on nesting bird species and breeding activities of amphibians; and avoid violation of the Migratory Bird Treaty Act. This would also allow the collection of native materials from the enhancement areas such as willow and mule fat cuttings to preserve the genetic integrity of the riparian species.

3.3.2.1 Exotic Plant Species Eradication Program

The enhancement includes the removal of non-native plant species from Haines Canyon Creek and the Tujunga Ponds. These invasive weeds compete with the native vegetation for light, water and nutrients, and decrease the ecological value of the area. Native wildlife avoid using exotic vegetation for foraging, nesting, and cover Removal of giant reed and other weed species will reduce competition pressure on the native southern arroyo willow plant community and allow for rapid recovery of the native habitat. All non-native weed species within the creek will be eradicated, with an emphasis on giant reed, water hyacinth (*Eichhornia crassipes)*, and tamarisk (*Tamarix ramosissima*). Other weed species to be removed include eucalyptus (*Eucalyptus* sp.), pepper trees (*Schinus molle* and S. *terebinthifolia*), castor bean (*Ricinus communis*), umbrella sedge (*Cyperus involucratus*), mustards (*Brassica* sp.), and tree tobacco (*Nicotiana glauca*), among others.

The enhancement plan also includes the removal of exotic plant species from rehabilitation areas and along side trails. Many non-native plants are introduced to the site by equestrians (seeds contained in horse manure) and through other human-related activities. Equestrian trails shall be monitored periodically for weeds and the weeds appropriately controlled utilizing general eradication methods.

Giant Reed Eradication Technique

Herbicide treatment to kill the root mass followed by manual removal of dead stems is the most effective means of giant reed eradication without damage to surrounding riparian vegetation (Bell 1997)

A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. The following method of eradication is recommended:

1 A 2 to 5 percent solution of Rodeo® (a glyphosate systemic herbicide approved by the Environmental Protection Agency for use in aquatic systems) shall be applied to giant reed foliage at a rate of 0.5 to 1 liter per hectare. The initial treatment shall be applied during the post-flowering and pre-dormancy period (mid-August to early November) when the plants are actively translocating storage nutrients to the rootmass in preparation for winter dormancy. The herbicide solution shall be treated with dye non toxic to wildlife to facilitate identification of treated versus untreated clumps. The herbicide shall be applied using hand-held spray containers or if a vehicle is used, it shall be located adjacent to the site, and shall only use existing access areas that are devoid of vegetation.

2. Treated leaves and stems may be cut 2 to 3 weeks after the initial foliar treatment. Removal shall be done by hand tools only; no vehicles shall be operated within the stream. Treated vegetative waste will be chipped in situ, and the waste biomass removed from the area and disposed of at an approved waste disposal site

3. Follow up foliar application shall be applied to any resprouting stems in the third and seventh week after the initial treatment. Quarterly inspections and reapplication of herbicide, if necessary, shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30)

Where large sections of giant reed are removed, the surrounding native trees will be evaluated for increased vulnerability to wind fall due to the openings in the canopy The Restoration Specialist and Landscape Contractor will conduct the evaluation. Existing native trees at the edge of the openings will be pruned as necessary to decrease the potential for wind damage. Pruned materials will be used as cutting stock for planting in the riparian habitat.

Tamarisk Eradication Technique

Tamarisk eradication shall begin after the spring and summer nesting season for riparian birds (approximately August 30). All tamarisk within the site boundaries shall be treated. Rodeo®, a glyphosate herbicide approved for use in aquatic systems, must be used. A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. The recommended eradication technique is as follows (CalEPPC 1997)

1 Plants shall be cut to within 6 inches of the ground using hand tools. Cut material must be removed from the site the day it is cut and disposed of at an offsite location. Under no circumstances is cut material to be allowed to remain onsite.

2 Undiluted herbicide (Rodeo®) shall be applied to the entire stump surface immediately after cutting. The entire circumference of the stump must be covered with herbicide

Treated plants shall be inspected in the third and seventh week following the completion of the initial eradication. If any treated stumps show evidence of new growth, or if any new tamarisk plants are found, subsequent treatment shall be performed as described above All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30) Quarterly inspections and control shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation.

Water Hyacinth Eradication Technique

Water hyacinth is a free-floating plant, which grows up to three feet in height It grows an erect thick stalk with a single spike of flowers at the top. It is a highly invasive non-native weed. Water hyacinth has a prolific growth rate; its populations can double in a little as 12 days. An infestation of water hyacinth

forms a thick mat over much of the slow moving water of the Tujunga Ponds. These mats prevent sunlight and oxygen from reaching the water, exclude native aquatic plant species, and reduce fisheries and biological diversity

The presence of water hyacinth in the Tujunga Ponds creates a difficult dilemma as far as control is concerned. The easiest way to eliminate the hyacinth is to drain the ponds, remove the hyacinth, and replace the ponds with a free-flowing shallow stream (See Section 9 – Optional Enhancement Measures) If the ponds remain as they are, the maintenance of the ponds will undoubtedly include continuous removal of water hyacinth because infestations of this plant are so difficult to control. This will undoubtedly be the most long-term, labor intensive, and costly exotic plant eradication program in the MMP The initial removal of the existing hyacinth will require a large labor effort primarily because of the large amount of plant material that will have to be removed. Disposal of water hyacinth must be at an approved dumping location to ensure that this plant material does not infest any other areas.

Water hyacinth eradication shall begin after the spring and summer nesting season for riparian birds has passed (approximately August 30) A Landscape Contractor who is also a Certified Herbicide Applicator shall implement the exotic plant eradication program. All water hyacinth within the site shall be removed or treated. The recommended eradication technique is as follows:

1 Free-floating plants, including roots, shall be removed from the water by hand. All plant fragments must be collected and removed from the site.

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

3. Treated plants shall be inspected weekly for 7 weeks after initial application. Completely necrotic plants shall be removed by hand. If any treated plant shows evidence of new growth, or if any new water hyacinth plants are found, subsequent treatment shall be performed as described above

4 Quarterly inspections shall be conducted thereafter for a minimum of 5 years to ensure control of the infestation. All applications of herbicide shall occur outside of the bird breeding season (March 1 through August 30) To prevent oxygen depletion of the pond water due to decomposition of the treated plants, dead biomass shall be removed from the water during each inspection. Biomass shall be removed from the site and disposed of at an approved offsite location.

General Eradication Methods

Exotic species to be removed will be determined by the Restoration Specialist. Wherever feasible, herbaceous species (non-native grasses, mustard) weed control will be removed using mechanical methods such as removal by hand or string trimmers. If effective weed control cannot be attained through mechanical means, a glyphosate herbicide (Rodeo®) will be applied by a certified herbicide applicator under the supervision of the Restoration Specialist. The methods for removal of large woody species (eucalyptus, pepper trees, castor bean, etc.) will follow the eradication techniques described for tamarisk.

3.3.2.2 Enhancement Planting in Eradication Zones and Reclaimed Trails

Enhancement planting of native riparian species shall be conducted in areas where giant reed and tamarisk removal creates openings in the riparian woodland canopy (approximately 15 acres) The target plant community type to be re-established is southern arroyo willow riparian woodland. Enhancement of the riparian habitat will provide habitat to a variety of resident and migratory wildlife species. Enhancement activities include planting of container stock and cuttings installations after weed abatement

is accomplished. The enhancement planting is designed to accelerate recovery of the native riparian vegetation that is beneficial to local wildlife.

Enhancement planting of native riparian species shall be conducted in open areas where equestrian trails are being reclaimed. The target plant community type to be re-established along the trails is southern arroyo willow riparian woodland, and is the same as that described for the enhancement of weed eradication areas. Enhancement planting along the closed trails is designed to accelerate recovery of the surrounding native riparian vegetation and discourage inadvertent use of reclaimed trails.

3.3.2.3 Enhancement Site Preparation

Footbridge Removal

A pedestrian footbridge placed across the stream connecting the two ponds shall be dismantled for safety reasons. Concrete footings placed at each corner of the bridge will be left in place, however, all timber installed on the footings for the footpath shall be removed. The wood and any fittings removed during the dismantling process shall be disposed of offsite. The purpose of removing the footbridge is to discourage use of the unsafe structure and to discourage pedestrian trespass into the enhancement areas around the ponds.

Erosion Control and Bank Stabilization

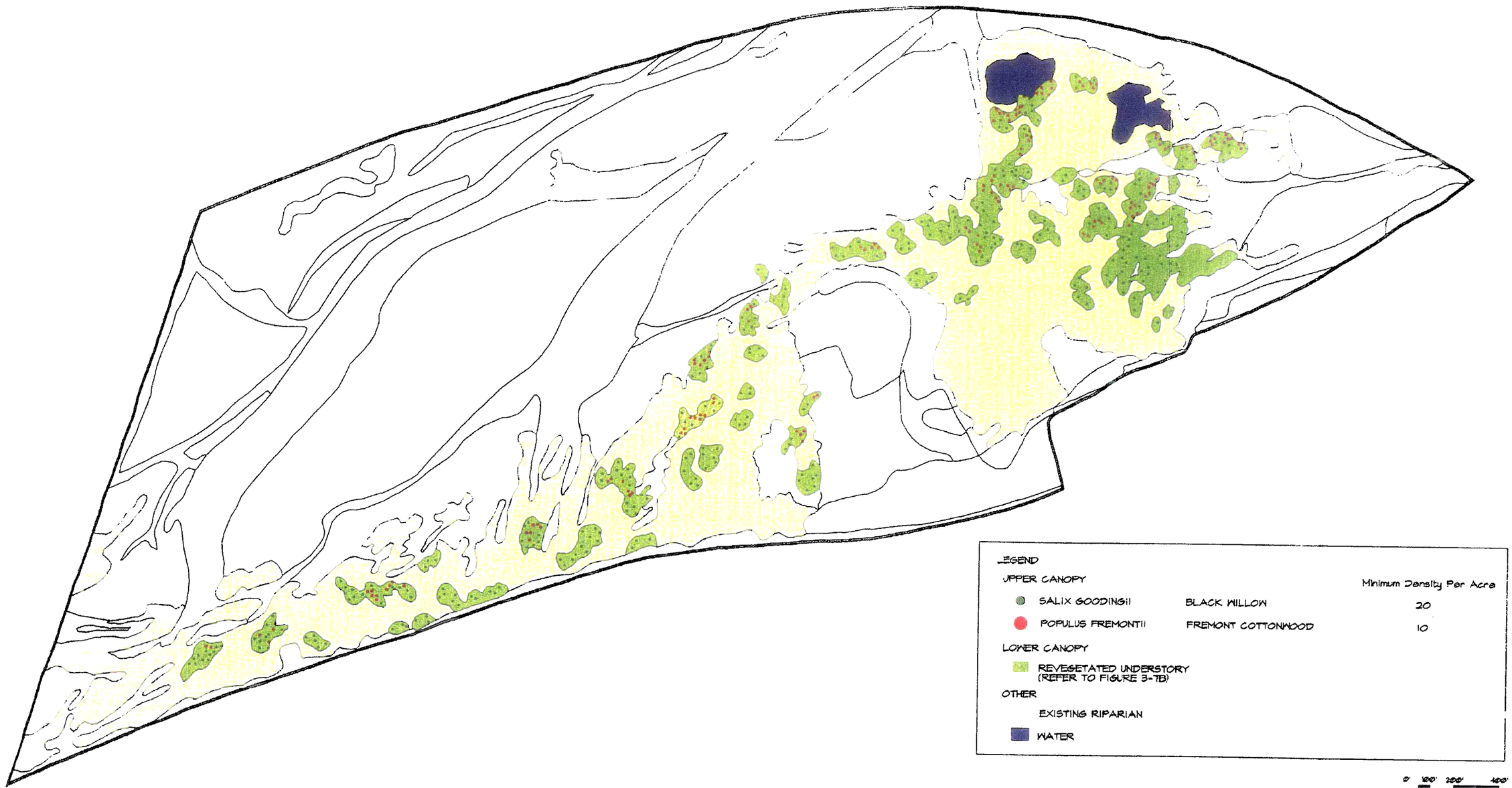
Erosion control and bank stabilization measures shall be implemented in the enhancement areas according to the guidelines discussed previously in Section 3.2.4.3.

Pre-Planting Weed Control

In addition to the giant reed and tamarisk, numerous non-native weedy species occur throughout the riparian habitat. These species shall be targeted for removal throughout the riparian zone during the giant reed and tamarisk eradication period. Prior to planting, the Landscape Contractor and Restoration Specialist shall determine whether undesirable vegetation is present in any of the enhancement planting areas and whether eradication is necessary Wherever feasible, pre-planting weed control shall use mechanical methods such as removal by hand or string trimmers. If effective weed control cannot be attained through mechanical means, appropriate systematic non-residual herbicides may be applied at the riparian sites under the supervision of the Restoration Specialist.

3.3.2.4 Enhancement Planting Plan

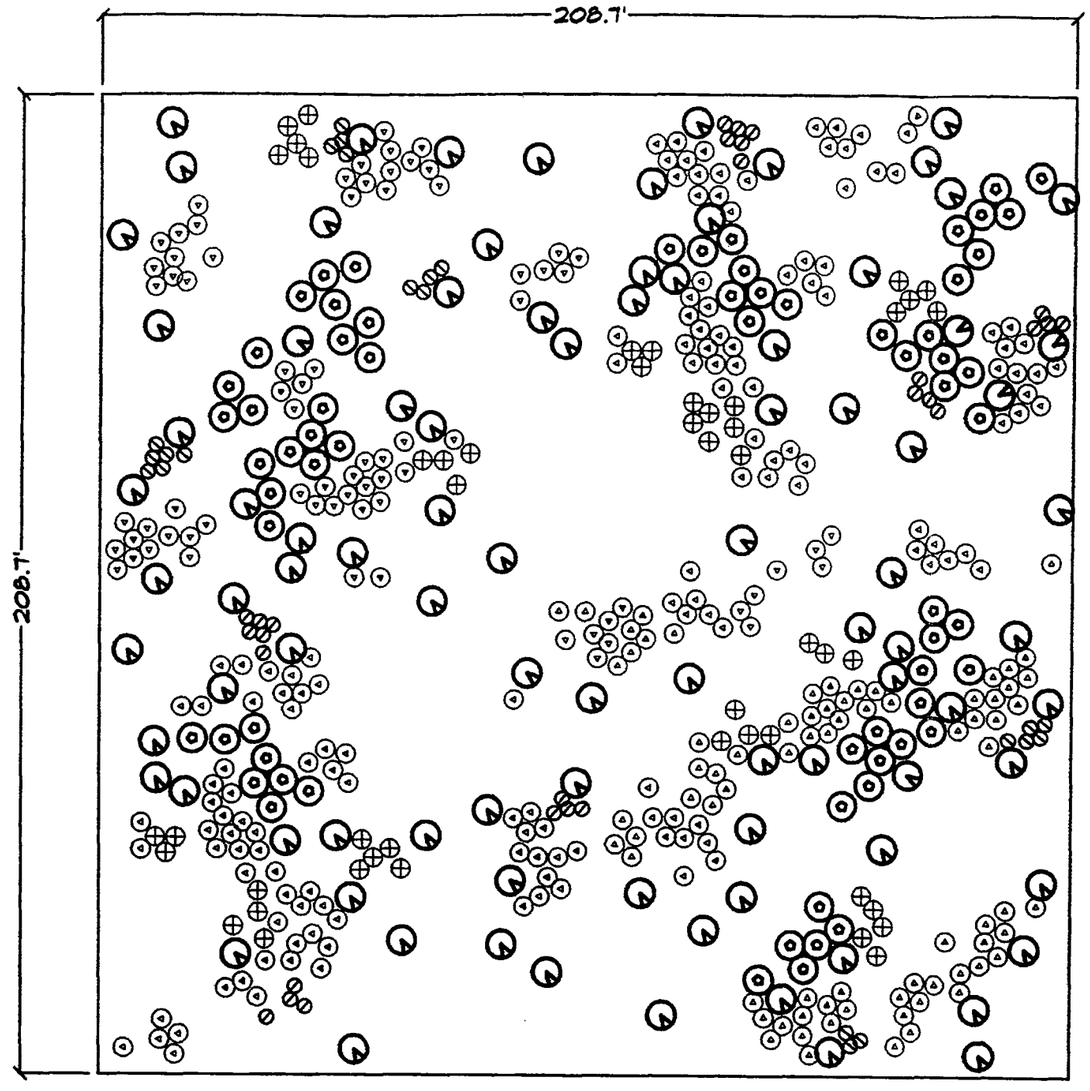
Southern arroyo willow riparian habitat shall be established in the enhancement areas along the creek and along reclaimed trails. Composition of the willow riparian plant palette is based primarily on the species composition of the existing willow riparian habitat along the creek. Consequently, a low, dense canopy comprised of arroyo and red willows, with scattered black willows and occasional groupings of Fremont cottonwoods will be created. The scattered cottonwoods shall be installed as 5-gallon specimens in areas located approximately 6 to 12 feet above the elevation of the groundwater and/or the creek. The arroyo, red, and black willows shall be planted as cuttings a minimum 18 inches in length, 2 to 12 feet above the elevation of the groundwater and creek. The species comprising the shrub understory (i.e., mule fat, California rose, and blackberry) shall be installed as liners at elevations 4 to 12 feet above the low-flow channel. Figures 3-4A and 3-4B shows the conceptual planting plan for the southern arroyo willow riparian area.



BIG TUJUNGA WASH
FORMA

ARROYO WILLOW RIPARIAN COMMUNITY REVEGETATION AREA

Figure 3-4A



LEGEND

			Minimum Density Per Acre
Lower Canopy			
	SALIX LASIOLEPIS	ARROYO WILLOW	100
	SALIX LAEVIGATA	RED WILLOW	60
Shrub Understory			
	BACCHARIS SALICIFOLIA	MULE FAT	300
	ROSA CALIFORNICA	CALIFORNIA ROSE	50
	RUBUS URSINUS	CALIFORNIA BLACKBERRY	50

NOTE:
SEE FIGURE 3-7A FOR
TREE SPECIES LAYOUT

SCALE: 1"=30'
SITE AREA = APPROX. 1 ACRE

BIG TUJUNGA WASH
FORMA

TYPICAL LAYOUT MODEL

ARROYO WILLOW RIPARIAN COMMUNITY REVEGETATION AREA (LOWER CANOPY & SHRUB UNDERSTORY)

Figure 3-4B

Plant Materials

Plant materials for container and liner planting within the enhancement areas shall be collected from appropriate sites in north Los Angeles County as close to the project site as possible Riparian cutting materials shall be collected from lower and upper reaches of Haines Canyon Creek. Table 3-2 shows the container plant palette for the enhancement areas.

Table 3-2
Container Plant Palette for Arroyo Willow Riparian Community

Common Name	Scientific Name	Minimum Density	Distribution	Plant Material	Spacing (feet)*
Upper Canopy					
Black willow	*Salix gooddingii*	20/acre	Scattered	Cutting	10
Fremont cottonwood	*Populus fremontii*	20/acre	Groups: 6-12	5 gal.	15
Lower Canopy					
Arroyo willow	*Salix lasiolepis*	100/acre	Scattered	Cutting	6
Red willow	*Salix laevigata*	60/acre	Groups: 5-10	Cutting	6
Shrub Understory					
Mule fat	*Baccharis salicifolia*	300/acre	Groups: 5-20	Cutting	4
California rose	*Rosa californica*	50/acre	Groups: 3-10	liner	3
California blackberry	*Rubis ursinus*	50/acre	Groups: 3-5	liner	4
*Distance (on-center) between plants of the same species; only applicable to species planted in groups.					

Container Planting Methods

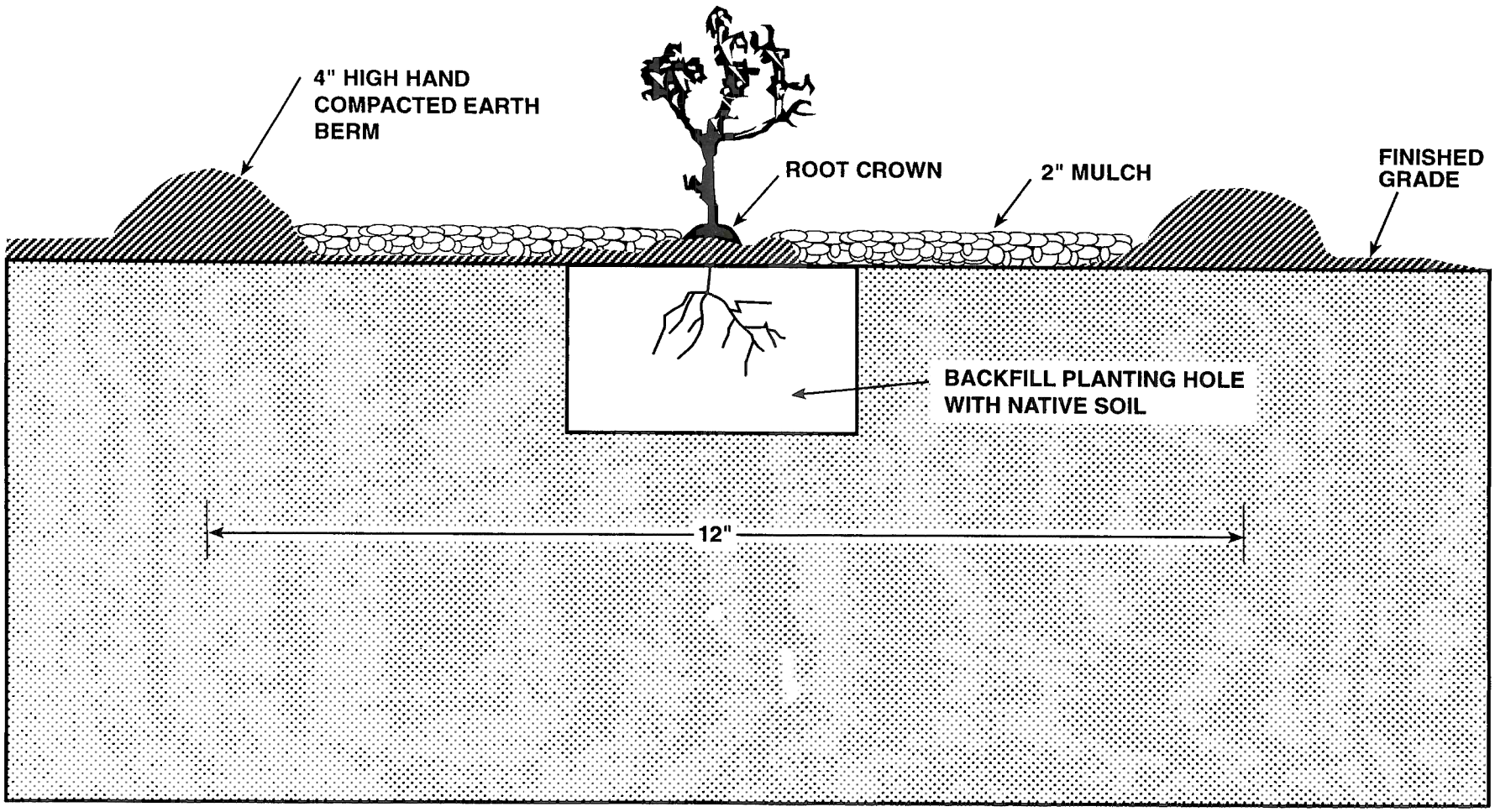
Installation of container plantings within the enhancement area shall be accomplished under the direct supervision of the Restoration Specialist. Placement and spacing of plantings shall be placed in natural groupings and patterns of vegetation similar to that growing in adjacent riparian and marsh habitats. The Restoration Specialist shall oversee and supervise placement of the larger container specimens in accordance with the planting plan

Container trees and shrubs shall be planted at an approximate density of 80 stems per acre. Plantings will be distributed in a natural pattern, with some trees grouped together and others spread farther apart. No oak plantings will be planted closer than 10 feet on center Figure 3-5 shows a diagram of a typical container plant installation.

Container shrub species shall be planted in the period between October through January and prior to seeding of the site. No pruning of plant materials shall be allowed unless specified by the Restoration Specialist. The roots of the container stock shall be protected from drying during planting. All planting holes shall be augured to 2 to 3 feet in diameter and 5 to 7 feet deep. Prior to planting, the augured holes shall be filled with water, backfilled with native soil, and refilled with water to create a moisture reserve in the soil.

Containers shall be gently cut or slid away from the rootball Plants shall be placed in the premoistened holes with the root crown 1 to 2 inches above the surrounding soil. Backfill of native soil shall be gently tamped in around the rootball

A small berm shall be constructed around the perimeter of the plant, effectively forming a watering basin In level areas, excavated material shall be used to form a berm, creating an 18- to 24-inch diameter watering basin around the plant. The basin shall be filled with water. allowed to drain, and filled again.



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CONTAINER PLANT INSTALLATION DETAIL
Figure 3-5

No plantings will be staked unless staking is considered necessary by the Restoration Specialist at the time of planting. Any staking shall be done with a single 2-inch diameter by 8-foot wood post, with loose ties holding the trunk to the post. The ties will be loose enough to allow the plant to flex without snapping or bending over excessively Figure 3-6 shows a typical staked tree planting.

Cuttings Methods

Cuttings of willow and mule fat taken from populations adjacent to the creek shall be spaced throughout the streambanks in random patterns with emphasis on areas cleared of giant reed. A typical cuttings installation is shown on Figure 3-7 The following steps describe the methods used to collect and install cutting material:

- Cuttings shall be taken from the surrounding native vegetation at the direction of the Restoration Specialist. Each cutting shall be 1 to 2 feet in length with a diameter not greater than 2 inches at the largest end. The butt end shall be cut at an appropriate angle and the tip cut square The cuttings shall be immediately placed butt end down in a bucket with a sufficient amount of water to cover the lower inch of the cutting.

- Planting holes shall be prepared in the areas to be planted. Each planting hole shall be twice as wide as the cutting.

- The cuttings shall be planted the same day they are taken. Prior to placing each individual cutting, the butt end shall be treated with a commercial hormone to stimulate root development (Root-tone® or equivalent).

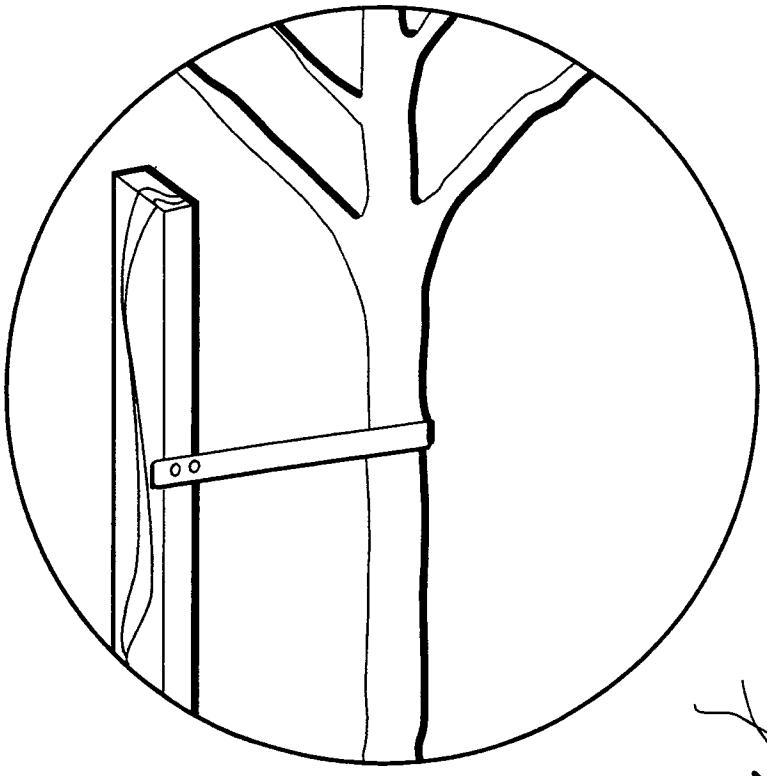
- The cutting shall be placed in the planting hole with at least 2 nodes above the ground level The hole shall be filled with native soils, and firmly tamped down.

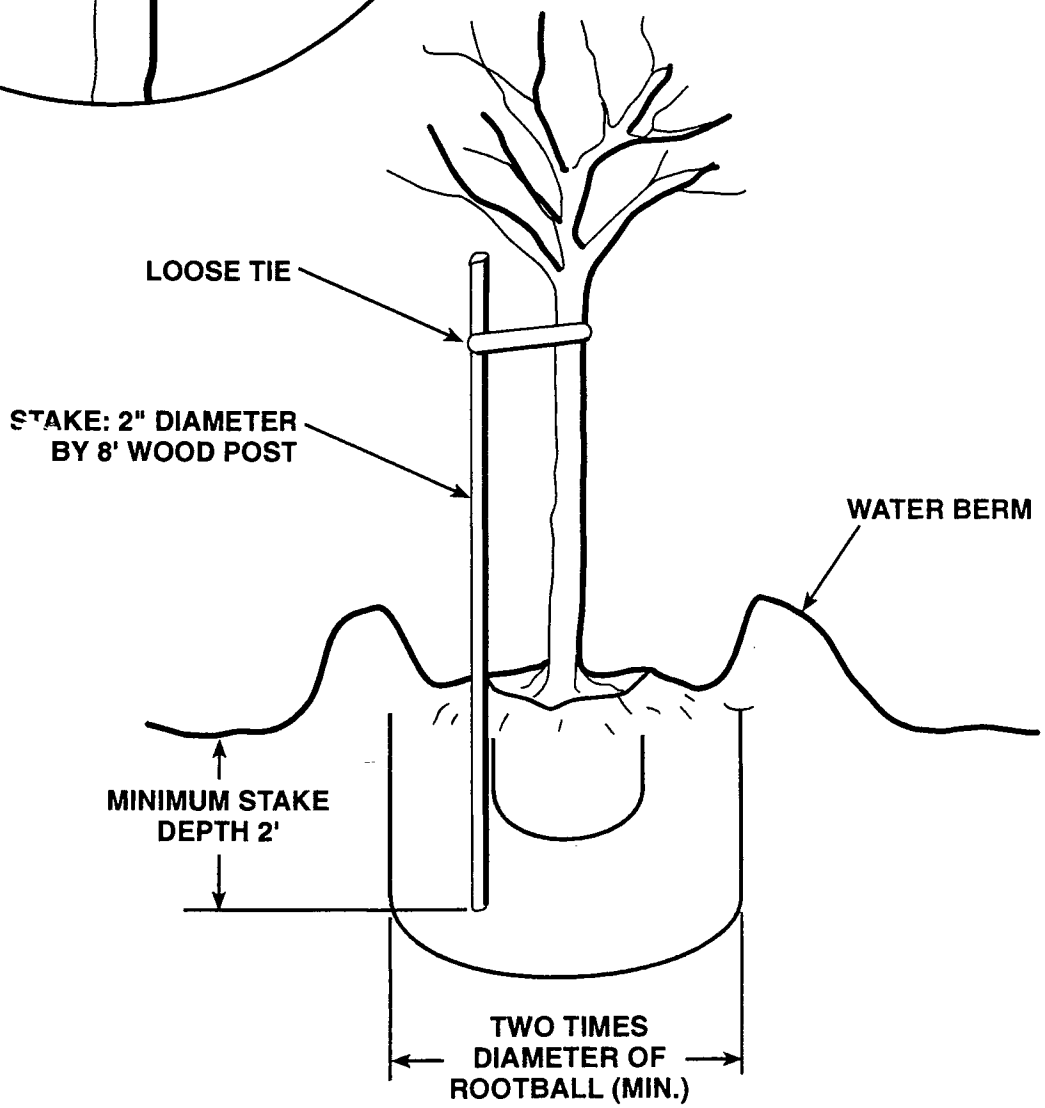
Maintenance during the Establishment Period

The plant establishment period will begin when the installation work has been accepted as complete by LADPW The plant establishment period will be a minimum of 120 days. During the establishment period, the Landscape Contractor shall furnish sufficient personnel and equipment to perform landscape maintenance of all planted areas. Maintenance visits shall be conducted at a minimum of twice monthly during the establishment period. Depending on site conditions, additional maintenance visits may be necessary and, if so, the need for them shall be determined by the Landscape Contractor and the Restoration Specialist. The required maintenance items shall include, but are not limited to, the following items:

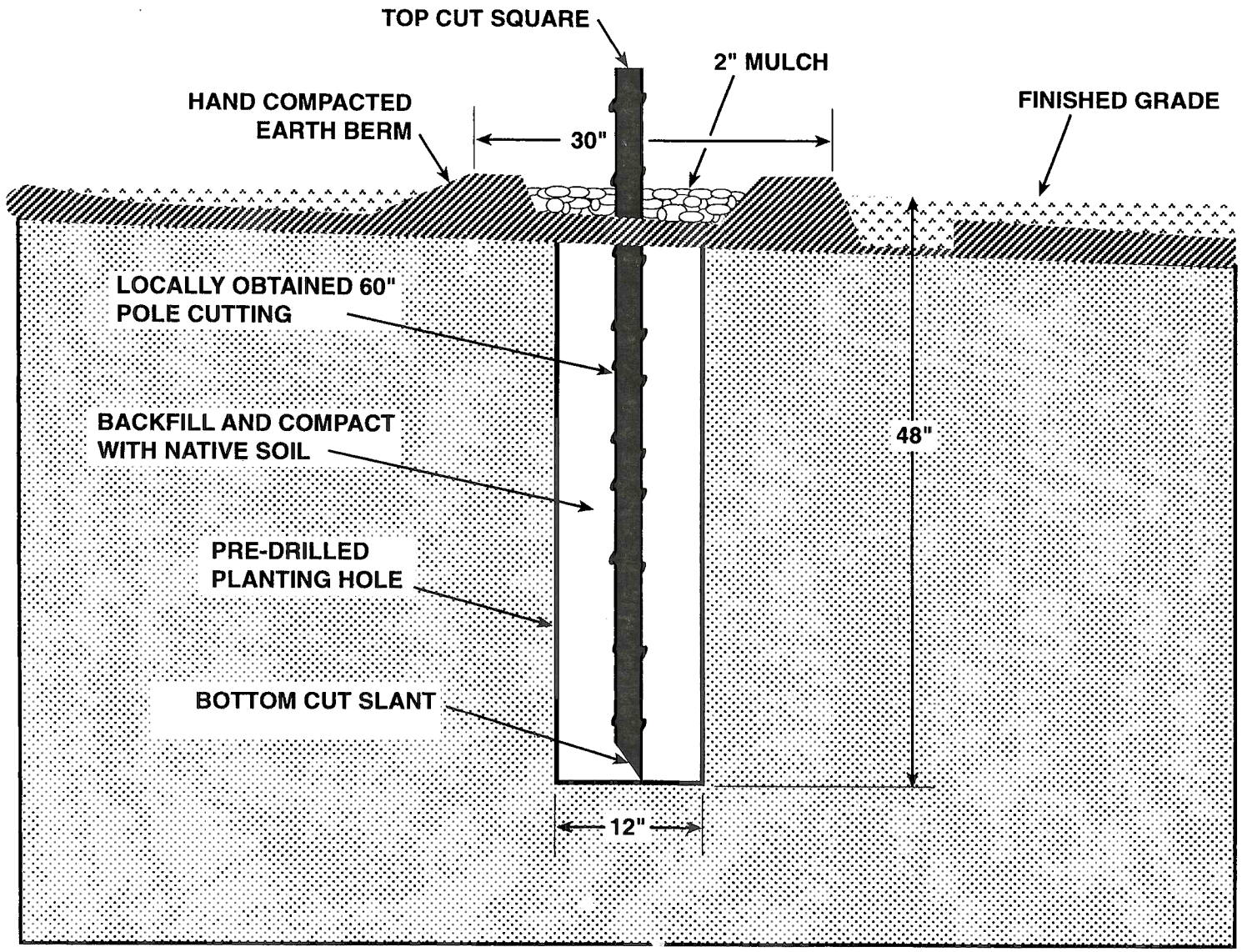
- Maintenance of erosion control devices and installation of additional erosion control devices where necessary as indicated by the Restoration Specialist,
- Maintenance of perimeter fencing,
- Weed eradication in planted areas and along trails,
- Maintenance of the irrigation system,
- Maintenance of herbivory control devices,
- Trash removal, and;
- Replacement of dead or diseased plant materials as directed by the Restoration Specialist.

The Restoration Specialist shall inspect the site monthly during the establishment period and submit a written report to the LADPW and the Landscape Contractor with specific recommendations to correct any deficiencies. At the end of 120 days, the revegetation site will enter the first maintenance and monitoring period. Maintenance activities and schedules during the maintenance period are described in Section 5.0





TYPICAL STAKE TREE PLANTING
Figure 3-6



Chambers Group

CUTTINGS INSTALLATION DETAIL
Figure 3-7

3.4 BROWN-HEADED COWBIRD ERADICATION PROGRAM

The purpose of the brown-headed cowbird eradication program is to enhance the Mitigation Bank site by allowing riparian breeding birds to successfully reproduce without being parasitized by cowbirds. Ultimately, this enhancement measure may result in a higher diversity of successfully breeding birds on the site This target species that will benefit from the implementation of this program are the least Bell's vireo, southwestern willow flycatcher, coastal California gnatcatcher This enhancement measure was not included in the Draft Enhancement report that was prepared for the Mitigation Bank site (Chambers Group 1998b) Inclusion of this program in the MMP was requested by CDFG in a comment letter to LADPW regarding the purchase of the Big Tujunga Wash site. The following sections describe the brown-headed cowbird eradication program in detail.

3.4.1 Brown-headed Cowbird Life History

Cowbirds are members of the blackbird family of icterids, which also includes grackles, orioles, meadowlarks, and bobolinks. The brown-headed cowbird (*Molothrus ater*) is one of six species of cowbirds and one of two species that occur in North America. Originally from the Great Plains of North America, brown-headed cowbirds co-evolved with bison during the 1800s. Historically, cowbirds fed in grassland areas on seeds in buffalo droppings and on insects associated with or flushed by the herds of migratory buffalo and other large herbivores. The rapid decline of the American bison caused brown-headed cowbirds to follow domestic cattle. This shift from bison to sedentary domestic cattle caused native grasslands to be replaced by agricultural crops and forests to be cleared and replaced with agricultural land. Subsequently, as the range of domestic cattle increased, the range and numbers of cowbirds began to increase, and by the mid-1970s brown-headed cowbirds had expanded their range throughout the continental United States and southern Canada (Graham 1998) Brown-headed cowbirds were first documented in California in 1896 at Borrego Springs, San Diego County (Unitt 1984) and were apparently well established by the 1930s (Willet 1933). Male brown-headed cowbirds are easily recognized by their iridescent black body plumage and brown heads. Female cowbirds are a uniform, dull-brown color

3.4.1.1 Brood Parasitism

The brown-headed cowbird is an obligate brood parasitic bird species, meaning this species does not build its own nests or tend for 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.

3.4.1.2 Impacts To Parasitized Host Species

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) 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).

3.4.2 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 a five-year brown-headed cowbird trapping and removal program at the Big Tujunga Mitigation Bank site will help to provide a safe-haven for many native bird species as well as increase the overall value of the site as a conservation bank. The majority of the following cowbird trapping methodology is taken from Griffith Wildlife Biology's brown-headed cowbird trapping protocol. This protocol has been adopted by the USFWS and is included as Appendix D

3.4.2.1 Authorization from USFWS and CDFG

Formal authorization to conduct the cowbird trapping and removal program is granted by USFWS and CDFG. Although the trapping and removal of cowbirds does not require a federal permit, USFWS' and CDFG's authorizations are prudent and necessary due to the potential for the inadvertent capture, harm, or death of non-target bird species. These non-target species can be listed or unlisted, but are all protected under the Migratory Bird Treaty Act of 1916. Therefore, before the trapping season begins, request letters shall be sent to USFWS and CDFG for authorization to conduct cowbird trapping and removal. The request letters shall include dates of the trapping season, trap locations, trapping methodology, and a list with the resumes of trained trappers/biologists. While the activity of trapping and removing cowbirds does not require a federal permit, the Project Biologist shall have a California gnatcatcher permit that allows brown-headed cowbird take and a current scientific collecting permit to take unlimited numbers of brown-headed cowbirds using modified Australian crow traps. Sample request letters are provided in Appendix E It is a good idea to obtain verbal authorization from USFWS so that the process of setting up the program can begin as soon as possible

3.4.2.2 Trap Location

The overall goal of trap location is to place the traps in areas naturally preferred or visited by cowbirds, yet close enough to the target host habitat so that the cowbirds removed are those impacting the target hosts.

A total of 7 cowbird traps shall be used for the duration of the 5-year MMP program Longer term cowbird trapping will be discussed with the resources agencies. Each trap location shall be surveyed prior to trap

placement in order to determine appropriate trap placement and orientation. Each trap shall be situated in an accessible location, visible from above, and shall also fulfill one or more of the following additional criteria placed in an area of high cowbird concentration, under a cowbird perching site, or along an observed cowbird daily migration path. Surveys conducted as part of the MMP preparation determined that four cowbird traps shall be placed in suitable locations within the boundaries of the Mitigation Bank site These locations are shown on Figure 3-8. In addition, three other cowbird traps shall be placed in appropriate locations offsite. Appropriate locations may include horse stables, cow pens, or other locations with large concentrations of livestock. These offsite locations shall be identified by contacting local equestrian groups for recommendations and then soliciting approval from the various landowners.

3.4.2.3 Trap Materials/Supplies

The following materials and supplies are necessary for each trap:

1 one-gallon guzzler,
1 feed pan,
Approximately 10 perches,
Shade cloth,
Wire mesh,
Sign identifying the purpose of the program,
Door lock, and
Identified trap number

The one-gallon guzzler is a plastic watering device commonly used by game bird breeding programs. A feed pan is necessary to hold the bird seed and should be a 12- to 18-inch diameter flat pan or plant tray A pet food dish is not appropriate as a bird seed feed pan The perches can consist of twigs and sticks collected from the surrounding habitats. These should be heavy enough to support perching of numerous birds at the same time. Shade cloth, which is commonly used in greenhouse situations, is necessary to provide shade for birds captured in the traps. The actual placement of the shade cloth is determined after the trap is placed in its field location. Quarter inch wire mesh will be used on all trap panels to deter predators from entering the trap and injuring the birds within. The wire mesh will help to deter predatory birds, mammals, and reptiles from killing the birds captured in the trap. A sign identifying the trap as part of an endangered species management program must be attached to the front of the trap in plain view Each trap shall have a key lock on the door to deter entry of unauthorized individuals. Finally, each trap needs to be identified with a number for the purpose of reporting and data analysis.

The following basic equipment is necessary for the daily servicing of each of the traps:

1 pair of sharp scissors;
1 pair wire cutters;
1 fish net,
1 holding cage;
1 shovel;
1 pair work gloves;
1 pair of snake guards,
toolbox with hammer, screwdrivers, pliers, zip ties, staple gun, U-shaped nails, and other basic tools;
bird identification book,
palmtop computer (or other similar instrument with spreadsheet software) for field data;
cowbird trapping data sheets;
blue or black pen;
extra seed;
extra water;
several heavy-duty black trash bags;
first aid kit; and
copy of USFWS' authorization letter to conduct the trapping program.

Any well-stocked hardware store such as Home Depot or Home Base will carry the wire mesh, shade cloth, zip ties, staple gun, shovel, and basic tools. The ¼ inch wire mesh is usually sold in 2x10- or 2x50-foot rolls. We recommend the 2x50-foot rolls if there is a significant amount of retrofitting that is necessary The nylon shade cloth is usually sold in 6x100 foot rolls, however we recommend buying the shade cloth by linear foot since there will only be 4 traps. The garden center of these hardware stores will carry the plant tray/base. A local feed store should carry the 1 gallon guzzlers, holding cage, and 25 pound bags of wild bird seed without sunflowers. The one gallon guzzlers that are recommended have a white plastic water container that screws onto a red plastic base. A sporting good store or pet store should carry the fish net. This MMP does not intend to endorse any hardware or feed stores. The aforementioned and the following stores have only been identified as potential suppliers located close to the Mitigation Bank site.

East Valley Feed and Tack
11084 Sheldon Street
Sun Valley, CA 91352
(818) 767-3060

Johnny's Feed and Tack
11029 Penrose Street
Sun Valley, CA 91352
(818) 768-5634

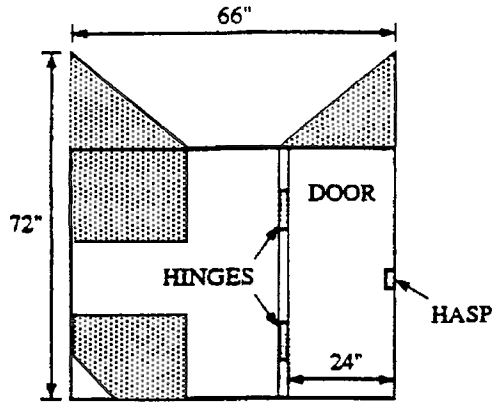
3.4.2.4 Trap Construction and Storage

As recommended by USFWS, modified Australian crow traps shall be used for the trapping of brown-headed cowbirds. These traps are 4 feet high (with two additional triangular sections, 2 feet high on either side of the top panel), 8 feet long, and 6 feet wide (Figure 3-9). The panels shall consist of wood frames covered with 1-inch mesh wire. The top slot shall be approximately 1⅝ inches. The top slot size shall be small enough to prevent larger non-target species form entering without deterring cowbirds. USFWS and CDFG shall be contacted if top slot size needs to be adjusted. Each panel needs to be built to the exact specifications so that the various pieces of the traps can be interchangeable with other traps. Although the pieces shall be interchangeable, it is a good idea that the traps and all trap parts be clearly numbered to ensure that they can be properly reassembled in future seasons. It is crucial that high quality wood is used to construct the traps. A well-built trap will be able to withstand adverse weather conditions as well as normal wear and tear and therefore can be used throughout the life of the trapping program. All traps shall be painted dull green (represents a conservative earth-tone color and results in a more natural-looking trap) and held together with bolts and screws. Signs shall be posted on the front panel of every trap to inform the public of the nature and relevance of the trapping program. These signs shall be clearly written, laminated to maintain legibility, and include the phone number of the Project Biologist. Figure 3-10 shows a sample sign. Padlocks on the doors shall be included to aid in discouraging vandalism.

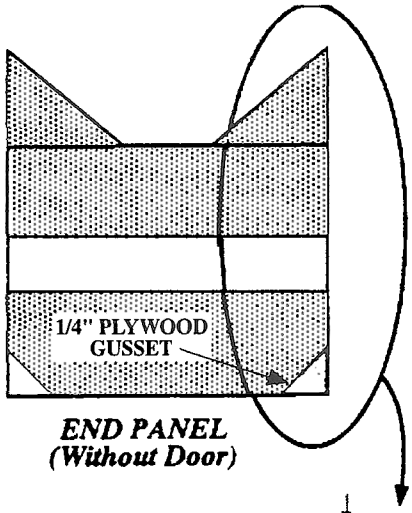
The estimated cost for trap construction is approximately $500.00 per trap (J Pike, personal communication 1999). This cost estimate represents an industry standard and can vary with trap design or with various builders. Although a specific trap builder is not recommended, anyone can build the traps according to the specifications and protocol provided in this report.

The trap site shall be leveled with a shovel so that the floor panel lies flat. Then the panels should be bolted together with a socket wrench. The front half of the mesh floor shall be covered with soil or dirt to create a foraging pad onto which bait seed can be poured. Smooth perches shall be inserted at various levels in three corners of the trap Perches shall not be placed next to the door in order to prevent escape If the trap locations do not provide morning and afternoon shade, shade cloth shall be attached to the outside of the trap in a manner that provides the most shade The shade cloth shall be a nylon mesh fabric and attached to the trap by staples so that the cloth is taut. Properly attached shade cloth can withstand normal wear and tear and can last for the length of the trapping program.

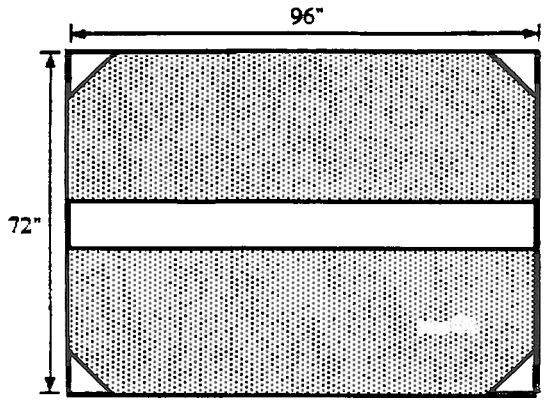
To reduce predation problems, traps shall be retrofitted or constructed with ¼-inch mesh wire at the base and tops of the side, front, and back panels, and along the entire length of the top panels. Retrofitting shall begin at the time of trap assembly and continue on an as-needed basis throughout the trapping season.



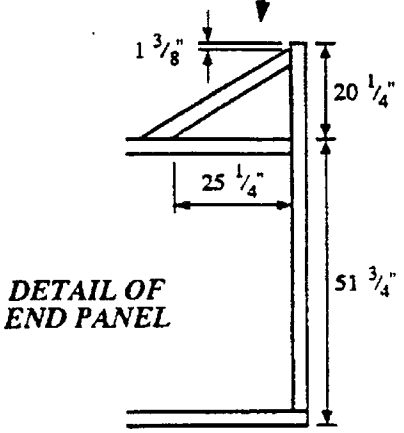
END PANEL (With Door)



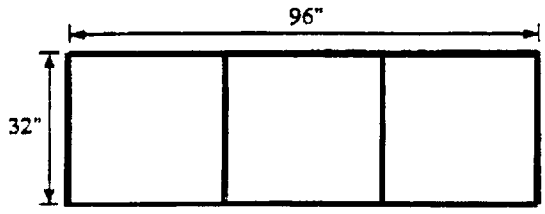
END PANEL (Without Door)



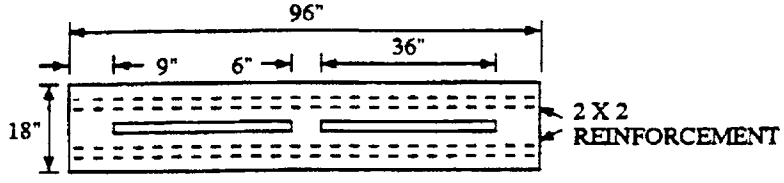
SIDE PANEL (2)



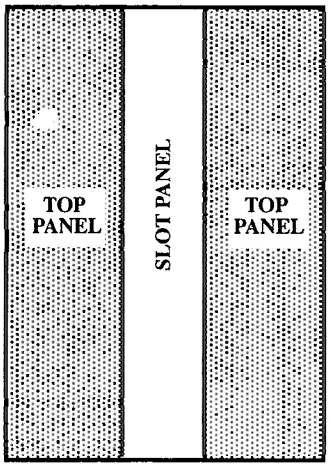
DETAIL OF END PANEL



TOP PANEL (2)



SLOT PANEL



TRAP (Top View)

Shows mesh retrofit areas

All panels (except slot panel) consist of wood frames and 1" steel mesh. This mesh is ideal; smaller birds (e.g., song sparrows) can come and go at will through mesh. Most frames are made with 2 X 2's; top panel can be made with 1 X 2's. Top slot is usually 1/4" or 3/8" plywood. Holes should be drilled so that connecting pieces are bolted in two places. Floors with mesh are recommended.

PLEASE DO NOT DISTURB

BIOLOGICAL STUDY IN PROGRESS

A COWBIRD TRAPPING AND REMOVAL PROGRAM IS BEING CONDUCTED ON THIS SITE IN CONJUNCTION WITH THE U.S. FISH AND WILDLIFE SERVICE. THE PROGRAM WILL REDUCE THE NUMBER OF PARASITIC BROWN-HEADED COWBIRDS IN THIS AREA AND HELP TO PROMOTE THE SUCCESSFUL BREEDING OF SONGBIRDS, SUCH AS THE LEAST BELL'S VIREO AND THE CALIFORNIA GNATCATCHER. BIRD SPECIES (OTHER THAN THE COWBIRD) THAT ARE UNINTENTIONALLY TRAPPED ARE RELEASED ON A DAILY BASIS.

IF YOU HAVE ANY QUESTIONS REGARDING THIS STUDY, PLEASE CONTACT name of Project Biologist AT phone number.

THANK YOU FOR YOUR COOPERATION.

SAMPLE INFORMATION SIGN
COWBIRD TRAPPING PROGRAM
FIGURE 3-10

The live cowbird decoys shall be placed in the traps at a ratio of 2 males to 3 wing-clipped females. While building the number of decoys to the 2:3 preferred ratio, at least one decoy cowbird should be placed in each trap and additional decoys should be added as they become available Placing more than 2 male decoys in a trap should be avoided. At the beginning of the trapping season, there may be a shortage of decoy cowbirds. Thus, the initial decoy ratio may be less than the target decoy ratio of 2 males to 3 females. It can be difficult obtaining the proper number of decoys for a trapping program, therefore the Project Biologist shall begin calling local trapping programs prior to the beginning of the trapping season and throughout the season until the appropriate number of decoys is obtained. If predation or vandalism results in the loss of decoys, then the Project Biologist shall continue to screen other trapping programs for excess decoys.

If sufficient numbers of decoys are not available at the beginning of the trapping season, efforts shall be made to secure cowbirds from other trapping programs. The results of the trapping program are not expected to be criticized if sufficient numbers of cowbirds are not available at the beginning of the season as long as every effort is made to secure adequate numbers of cowbirds throughout the season

At the end of the trapping season, the traps shall be disassembled and stored for the next trapping season if the traps are to be reused. Salvageable perches shall be collected and bundled. After the traps are taken apart, a light coating of lubricant shall be sprayed onto the bolts prior to storage in a sealed container All door locks shall be lubricated with graphite prior to storage. Shade cloth shall also be stored for the next trapping season. All vegetative debris that may be caught in the mesh of the trap sides and floor shall be removed prior to storage. The panels shall be stacked in a safe location and kept out of direct sunlight. The traps should not be covered with plastic tarps because condensation under the tarps may cause subsequent wood rot. Tarps made from some other material may be used to cover the traps. All water guzzlers shall be scrubbed to remove algal growth from the rim and tank. The guzzlers shall be stored out of direct sunlight. The Project Biologist shall identify an appropriate location where the traps can be safely stored between seasons. The Project Biologist will arrange for the traps to be transferred from the Big Tujunga Wash Mitigation Bank site to the storage location

At the beginning of each season, the Project Biologist shall arrange to have the traps delivered to the Big Tujunga Wash Mitigation Bank site. The traps shall be reassembled in the field and the necessary repairs shall be made approximately two to four weeks prior to the beginning of the trapping season (March 15)

3.4.2.5 Potential Labor Sources

It is pertinent that a reputable consulting firm with experience conducting a cowbird trapping and removal program is responsible for the implementation of this program. The Project Biologist shall have a California gnatcatcher permit that allows brown-headed cowbird take and a current scientific collecting permit to take unlimited numbers of brown-headed cowbirds using modified Australian crow traps.

A cowbird trapping effort is labor-intensive because the traps need to be checked daily during the trapping season, including all weekends and holidays. It is possible for the Project Biologist to enlist the help of biology students from local colleges such as California State University, Northridge The trappers shall be familiar with southern California bird species, have prior field experience (school field trips acceptable), have a general knowledge of biology, and be willing to work weekends and holidays. While students can conduct daily trap monitoring, the Project Biologist (or another experienced trapper) shall monitor the traps once a week to make sure that the program is running smoothly This proactive approach will identify any problems early on. The following is a list of potential sources for the Project Biologist to find part-time cowbird trappers.

California State University Northridge (818) 677-1200
San Fernando Valley Audubon Society (323) 876-0202
Pierce College (818) 347-0696

Glendale Community College (818) 240-1000
Los Angeles Valley College (818) 781-1200
Regional Occupational Program for LA County (562) 922-6850

California Regional Occupational Programs (ROP) provides qualified students and adults with the opportunities to attend an entry-level career or a technical training program regardless of the geographical location of their residence ROP's consolidate state and federal funds at the local, direct service level to offer comprehensive employment, training, placement, and support to high school students and adults.

3.4.2.6 Trap Maintenance

Throughout the trapping season, the traps shall be inspected and repaired as necessary to maintain structural integrity Retrofitting shall performed and shade cloth added on an as-needed basis. The traps shall be thoroughly inspected if larger non-target species are entering and if decoys are escaping. If this trend continues and there are no significant gaps in the panels, the top slot can be reduced. The top slot size shall be small enough to prevent larger non-target species from entering without deterring cowbirds. USFWS and CDFG shall be contacted if the top slot size needs to be adjusted. If vandalism is a continual problem, any damage shall be immediately repaired and the trap shall be relocated to a more discreet site. In this case, the Project Biologist will coordinate with the LADPW Project Manager to disassemble the trap, move it to a new location, and reassemble it in the field. If traps are moved during the trapping season, then a record must be kept on a map of the original location and any subsequent locations.

3.4.2.7 Trap Monitoring

Prior to trap activation, a one-gallon water guzzler shall be placed in the middle of the floor and situated to prevent fouling of water by seed or perched birds. It is necessary that the water outlet of the guzzler faces downhill. During the first week of trapping, bait seed shall be spread on the top of the trap as well as on foraging areas inside and outside the trap. It is crucial to use wild bird seed that does not contain sunflower seeds because cowbirds are not attracted to them and the sunflower seeds do attract non-target species.

Traps shall be checked daily during the trapping season, including all weekends and holidays falling within this time frame. Trappers shall always carry a copy of the USFWS permit to conduct the trapping program. A palmtop computer or similar instrument with spreadsheet software can be used in the field to input cowbird and non-target data for each trap. The data shall include the sex, number of cowbirds caught, missing (seen escaping or presumed dead), dead, and remaining in each trap. Non-target data shall be broken down by species and include the number of non-targets caught and dead in each trap. During daily trap servicing, the cowbird and non-target data shall be entered into the palmtop which should then be downloaded to a computer on a daily basis. Backup files of the downloaded data shall be made on a weekly basis.

In addition to the cowbird and non-target data that is entered into the palmtop computer, cowbird trapping datasheets containing information on daily cowbird captures and on the season totals shall also be filled out The "comments" section of the data sheets shall include information on retrofitting with additional wire mesh or shade cloth, predation on cowbirds and non-target birds, number and species of sensitive birds captured, and any other relevant data At the end of each day, the trapper shall provide a copy of the cowbird trapping datasheets to the Project Biologist. Examples of the cowbird trapping datasheet as well as a cowbird performance checklist are provided in Section 5 of the MMP

After entering the trap, all cowbirds within the trap shall be netted by the trapper and placed within a portable holding cage All newly captured cowbirds shall be wing-clipped at the edge of the secondary feathers, thereby removing the primary feathers. The wings of the cowbirds shall be clipped immediately,

regardless of whether they will be left in traps, to lower the probability that any escaped bird will survive Once all of the cowbirds are placed into the holding cage, the non-target birds shall be carefully flushed out of the trap. In addition to the cowbirds, non-native bird species such as the house sparrow, European starling, and rock dove, will also be kept in the trap to be euthanized as discussed in Section 3.4.2.8. With the non-target birds removed, the seed shall be replenished and the 1 gallon water guzzlers scrubbed and refilled with clean water as needed. The rim and inside of the guzzler shall be cleaned daily of dirt and algal growth. An abundant supply of wild bird seed and a 1-gallon guzzler of water shall always be kept in each trap.

Perches in the traps shall be adjusted according to the pattern of usage by the birds. This is indicated by the accumulation of droppings on the cage floor The number of perches shall vary and correspond with the number of trapped birds. Extra perches will help to eliminate the pecking associated with overcrowding. Perches that are unstable or knocked down shall be checked and repositioned on a daily basis. In general, at least 10 perches can be placed in the traps, 3 located in each corner, except over the door, and 1 in the middle of one or both of the long sides of the trap. By keeping the perches away from the door, the birds are discouraged from finding gaps in the doorway or escaping when the door is opened. In addition, perches shall not be placed below knee level in order to prevent cowbirds from seeing the slot opening and possibly escaping by flying up through the top slot.

Weed grasses in the traps shall be removed to ensure the safety of the birds, and to protect the trappers from predators, especially rattlesnakes. After trap maintenance is complete, the decoy cowbirds shall be placed back in each trap. Upon leaving the trap, the shading shall be adjusted or added to suit the needs of the birds, taking into consideration the different locations of the sun throughout the day Also, a detailed inspection shall be given to locate and repair any damage from vandalism that could jeopardize bird safety In addition to the maintenance of the trap, time shall be taken to observe the surrounding area to monitor the behavior of birds and identify other cowbird activity to determine whether better trap locations exist.

Locked traps shall not be left unattended for more than 24 hours because animals that enter the locked traps could die from dehydration or starvation. Therefore, if the traps are assembled before daily servicing of the traps begins, the front door shall remain open or the top slot board shall be left off

3.4.2.8 Cowbird Disposal

Local bird rescue organizations (e.g., Shadow Hills Wild Bird Rescue), raptor rehabilitation centers, educational institutions, museums, and the Wildlife Waystation will be contacted and offered any live or terminated birds.

Several times during the season or whenever deemed necessary, excess cowbirds and non-native bird species such as the house sparrow, European starling, and rock dove, shall be terminated in a discreet location. One option for termination is by carbon monoxide poisoning. A holding cage with cowbirds shall be placed into a large, black trash bag. The bag shall be closed with wire ties, and attached to a length of aluminum vent hose, connected to the tailpipe of an automobile To ensure maximum efficiency, the car shall be left running for 5 minutes. This fast method was developed by USFWS personnel and is the standard method of terminating cowbirds; it is considered to be the most humane method. Upon completion of termination, the cowbirds shall be placed into a clear plastic bag, labeled, dated, and if necessary, placed into a freezer specifically designated for the storage of cowbirds. Any cowbirds not needed by the above-mentioned organizations shall be disposed of in accordance with local, state, and federal laws.

3.4.2.9 Trap Activation and End Dates

The trapping program at the Big Tujunga Wash Mitigation Bank site shall be conducted from March 15 to July 15, which represents the standard southern California trapping period for riparian hosts. The

beginning date for trap operation shall be determined by the date of cowbird dispersal from winter flocks (in San Diego and Orange Counties, this usually occurs during the third week of March) and the date of the earliest egg-laying by the target host. All traps shall be put in place and activated, with at least 1 male decoy, approximately 2 weeks prior to the first egg-laying by the target host.

The end date for the trapping shall be determined based on the nesting period of the target host Traps shall be operated until almost all of the host nests are past the egg stage If nest-monitoring of target hosts is not performed, then the trapping shall extend through July 15 If the trapping period must be shortened, the season shall not begin until after April 1 or end prior to June 30

3.4.3 Reporting

3.4.3.1 Submission of Reports

The standard deadline for submission of trapping results is the last day of November, immediately following the end of the trapping season. The trapping results shall be submitted in accordance with the reporting requests or guidelines specified in the authorization letter from USFWS and notification letter from CDFG

3.4.3.2 Data Analysis and Report Contents

The annual report shall include information on the number of cowbirds captured in each trap; the sex, number, date, and location of any banded birds captured; and the number and species of non-target birds incidentally captured, harmed, or killed in cowbird traps. The following is a section-by-section discussion of the required elements of an annual report. Much of the data that is generated is statistical and reads much easier if displayed in a table or graph format, therefore the report shall include as many visual aids as possible or necessary All relevant tables and graphs shall be generated prior to data analysis. Useful tools include Microsoft Word tables and Excel spreadsheets. A sample outline of the annual report is provided in Section 6.6.

Section 1 – Introduction

Section 1 is an introduction to the cowbird trapping program that shall discuss the project, general vicinity, and any prior trapping history at the project site. Background and natural history of the brown-headed cowbird and impacts on host species shall also be discussed. The introduction shall include site descriptions of the trap locations along with a map showing numbered trap locations. The discussion of trap locations shall include a description of the habitat surrounding the trap and any other information relevant to the trap location. A United States Geological Survey (USGS) quadrangle map or aerial photograph shall serve as the base map for the project and trap locations. Although there is no specified scale for the base map, a 1 inch:24,000 feet USGS map and 1 inch=300 feet aerial photograph is recommended.

Section 2 – Methodology

The methodology section shall describe the process of trap construction, location, maintenance, monitoring, and cowbird disposal. A figure depicting the trap specifications shall be included. Any significant repairs, trap modifications, or retrofitting efforts shall be discussed in Section 2. Discussion shall include the methodology of surveying for and determining trap location as well as explanations for trap movement during the season, if applicable. If traps are moved during the season, a USGS map at a scale of 1 inch:24,000 feet or an aerial photograph at a scale of 1 inch=300 feet showing the start and end dates and locations shall be provided. The trap monitoring section shall include a description of the data collection and organization process.

Section 3 – Results

Section 3 is a detailed discussion of the trapping results broken out by the following subsections. It is important to track and analyze the trapping program from year-to-year, therefore each of the following subsections shall include a yearly analysis of the data displayed in a table or graph format

Brown-Headed Cowbird Capture Totals: This is a summary of the male, female, and juvenile capture totals. This section shall also include the totals of any dead or missing decoy cowbirds.

Male To Female Capture And Decoy Ratio: This section shall include the male to female decoy capture ratios in each of the traps throughout the trapping season. Include any rationale behind certain decoy ratios, if applicable, such as a certain trap not having the proper 2:3 male to female ratio because raptors or blackbirds were constantly observed in the area. Additionally, attempts to build the proper decoy ratio shall be discussed here. The names of contacts or companies and dates of when cowbird decoys were obtained shall also be included.

Juvenile Cowbird Captures: This section shall include the total number of juvenile cowbirds captured throughout the trapping season. Discuss any patterns of capture, if applicable.

Site Variation in Cowbird Capture Totals: This section shall discuss the capture variation between site locations for a trapping effort with multiple site locations. For instance, a site abundant in riparian habitat near an observed cowbird pathway will most likely have a higher capture total than a site dominated by upland habitat. This discussion shall include the trapping efficiency of each site location broken out by the number of cowbirds trapped per day This section shall include a table and/or graph of each site location that lists the total male, female, and juvenile cowbird captures. A graph is especially helpful if the trapping effort will be repeated over a consecutive number of years.

Cowbird Capture Totals By Trap: Considerable variation in capture totals usually exists between individual traps. For instance, a trap placed in a riparian woodland near an observed cowbird pathway will most likely have a higher capture total than a trap placed in an upland area This section shall discuss why the difference in trap locations resulted in various capture totals. If applicable, the results of this discussion shall be used to determine trap placement during the next trapping season This section shall also include any weather-related (e.g., flooding) or other miscellaneous situations (e.g., predation or vandalism) that caused the closure or inefficiency of any traps during the season. The information shall be displayed in a table that is broken out by trap and lists the total number of males, females, juveniles, and total cowbirds trapped.

Seasonal Variation in Cowbird Capture Totals: This section shall discuss the seasonal variation of cowbird captures. Typically, the highest number of cowbird captures occurs in the first several months of the trapping effort (April-May) with another peak period around July This section shall include a graph depicting the number of cowbirds captured (males, females, and juveniles shall be given distinct symbols) in relation to the months of the trapping effort.

Banded Cowbirds Caught: Any banded cowbirds or non-target species that are captured during the trapping season shall to be reported to the USGS North American Bird Banding Program at 1-800-327-BAND within 24 to 48 hours. The hotline operator will ask for the following information: leg band number (usually 9 digits with a dash after the fourth number), species, any other colored bands or rings, nearest city, town, and County This section shall discuss any banded cowbirds captured during the trapping season and shall include the date and location the banded bird was captured as well as any information pertaining to when and where the bird was banded.

Trap Predation: Trap predation is often a continual issue throughout the trapping season. Predators include raptors, snakes, weasels, and non-target species such as scrub jays. Observations of predators and any corrective efforts shall be discussed in this section It has

been found that retrofitting the panels with ¼-inch steel mesh greatly reduces trap predation. Reducing the top slot size from 1⅝ to 1⅜ inches can further reduce trap predation. The smaller slot size not only deters larger non-target species (e.g., raptors or scrub jays) from attacking the birds, but it also aids in decreasing decoy escape.

Incidence of Parasitism: This section shall discuss any local or regional monitoring efforts of target species such as the coastal California gnatcatcher during the trapping season. This information is helpful in determining the need for and/or success of the trapping effort.

Trap Vandalism: This section shall discuss instances of vandalism and any avoidance measures taken (e.g., trap repair or movement) Proper trap placement and location can often reduce instances of vandalism.

Non-target Captures: While a high rate of cowbird captures is important to the trapping effort, it is also essential to reduce the number of and keep the stress of non-target species to a minimum. The mortality rate of non-target species captured shall be less than 2 percent It is therefore pertinent to collect and maintain accurate non-target species data. This section shall discuss the total number of non-target species captured throughout the trapping program and mention the most frequently captured species as well as sensitive and unusual species captured. Non-target mortality shall also be discussed. Since the trapping program will occur over a period of several years, it is important to identify any trends regarding the overall number of as well as any differences in the non-target species composition from year to year This section shall also include retrofitting or trap modification measures to use in the following year to decrease the incidence of mortality among non-target species. The non-target species data shall be listed in a table format (this can be set up in Microsoft Excel) that lists the number of live captures and dead non-target species found in each trap as well as a total number of non-target species captured Discuss any sensitive species that were captured and state their condition upon release (e.g.. whether they were released unharmed or whether they died in the traps)

Section 4 – Discussion

The discussion section shall summarize the results of the trapping program. This section shall also include the identification and analysis of annual trends of the trapping program. For example, if an unusual pattern of capture occurred during the current trapping season as compared to the previous trapping season, the proposed explanation shall be discussed in this section. Any other program-specific issues and potential explanations shall also be discussed in this section.

Section 5 – Recommendations

This section shall provide recommendations to ensure the successful operation of future trapping seasons. Recommendations shall include procedural improvements, how to improve upon obtaining cowbird decoys, trap retrofitting, predation, how to reduce non-target capture and mortality, and suggest trap locations for the next season. This section shall also include a summary of all agency meetings and issues during the trapping season.

Section 6 – References

Section 6 should include a list of all references or personal communications used during the course of the trapping report and during the preparation of the report.

Section 7 – List of Preparers

The list of preparers shall include the names of all personnel who participated in the cowbird- trapping program and in the preparation of the report.

Appendices

The appendices shall include all data sheets and lists of wildlife observed during the trapping program.

3.5 FORMAL TRAILS SYSTEM PROGRAM

The implementation of the formal trails system program will not involve any grading in waterways or wetlands. Enhancement of trails will consist of keeping the trails safe for pedestrians and equestrians and restoration of closed trails with native riparian habitat. This program should be exempt from CEQA under Section 15301(c) because it involves public safety issues.

3.5.1 Introduction

The equestrian trails system was designed based on the findings of the surveys and the input from the equestrians. The main trails onsite were designated and mapped based on current utilization, general condition, minimization of impacts on the surrounding natural community, and proposed habitat restoration and creation areas. These trails are to be improved and maintained by LADPW in partnership with the equestrian community and ultimately by whatever agency or group becomes the long-term caretaker of the site. LADPW will ultimately be responsible for providing safe trail conditions, for the subsequent maintenance of open trails, and for the restoration of closed trails. A Consultant or jConsultant team will be hired by LADPW to undertake the initial debris removal and trimming of trees along open trails. In addition, the Consultant will be responsible for trails closure and restoration. The LADPW in partnership with the local equestrian groups and volunteers, will be responsible for the subsequent maintenance of open trails. Signs (in English and Spanish) shall be placed at the trails edge in areas adjacent to newly revegetated areas to keep hikers and equestrians on the main trails.

Numerous trails throughout the site are currently utilized by local residents for walking as well as for horseback riding. Although trails are informally maintained by local equestrians, several trails have been neglected, re-routed, or have been naturally obstructed. An equestrian trail development program has been developed as part of the enhancement and conservation efforts for the Mitigation Bank site. This program includes developing a formal trails system with a trails map, signage, and closure and restoration of unnecessary trails. The local equestrian groups have historically maintained many of the trails on the site and they have volunteered in some capacity to help ensure the ongoing success of the program. Ultimately, LADPW will be held responsible for the ecological restoration and maintenance of trails on the site The goal of the trails system will be to restore unnecessary trails, to protect the sensitive biological resources, and to continue to provide a pleasing atmosphere where pedestrians and equestrians can enjoy the outdoor environment.

3.5.2 Identification and Locations of Existing Trails

A reconnaissance-level survey was conducted on foot by two Chambers Group wildlife biologists on July 19, 1999 The site was assessed to determine locations of existing trails, current trail conditions, locations and sensitivities of biological resources, and the locations of potential habitat restoration areas. Approximate locations of the trails and biological resources were sketched onto a 1 inch=200 feet aerial photograph of the site Trails that led to dead-ends or that were obstructed (fallen trees, wash outs) were noted General site conditions and observations were recorded on standardized data sheets and are included as Appendix F

A second site visit was conducted on August 12, 1999, with the assistance of the Equestrian Trails, Inc.. Corral 20 (Terry Kaiser) equestrian group. The most heavily utilized and preferred equestrian trails were noted and surveyed by horseback. Points along the trails were accurately mapped utilizing a handheld Global Positioning System (GPS) GPS readings were taken by collecting and averaging approximately 90 data points from a single stationary position. The process took approximately 5 minutes per position

depending on satellite accessibility (little or no overhead canopy) Points were recorded at 200- to 500-foot intervals along the trails or as overhead cover permitted. Due to the thick tree canopy, GPS readings were not obtainable along many of the trails within the riparian areas. The locations of these trails were approximated and drawn with the help of the equestrians in combination with compass readings and the aerial photograph. Figure 3-11 shows the existing trails on the site A portion of the trails on this figure will be closed and reclaimed in order to protect and enhance the site for sensitive species of plants and wildlife

On November 17, 1999, a community outreach meeting was held in Lakeview Terrace with the local equestrian groups and other interested parties. The focus of the meeting was to inform the public about the goals of the Mitigation Bank Site and to educate them about the planned enhancement programs. A primary focus of the meeting was to solicit input from the equestrians about their preference on which trails to keep open. The equestrians expressed interest in identifying the formal trails and designating names for these trails. Following the meeting, some of the equestrians actually rode the trails on the site and provided a map showing four different trails, with designated names that they wanted as "formal trails." Their information was incorporated into a formal trails map and a trails brochure was subsequently developed (See map pocket).

In addition to trail improvements, four recreational trails that provide scenic hikes for the public, have been named and mapped. The trails include the Pond Trail, Water Trail, Dr Au Trail, and the Bert Bonnett Trail. A description of the flora and fauna found along each of the trails was developed and included in the trails brochure (see map pocket). The trials brochure not only includes a map showing the trails but also includes descriptions of the resources along the trails and estimates of trail lengths.

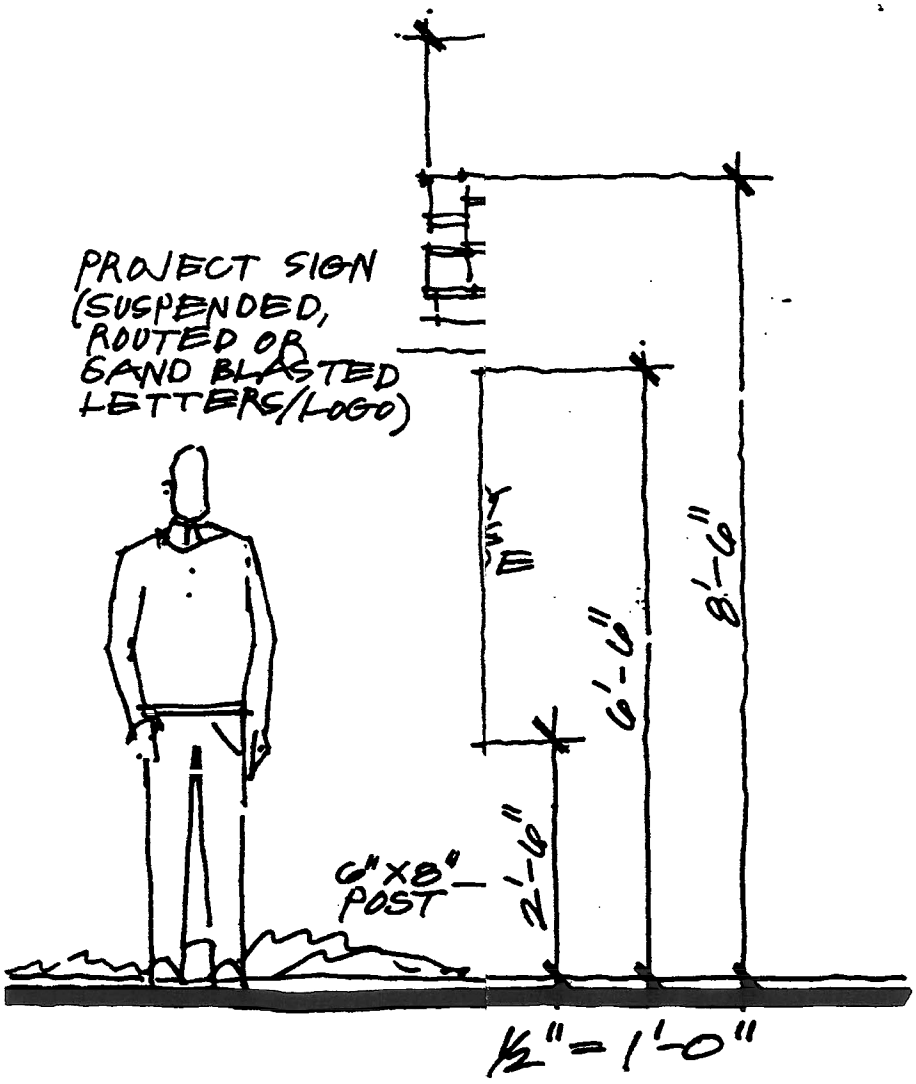
3.5.3 Trails Enhancement

Additional trail enhancement shall be done by placing information kiosks at strategic points on the site The kiosks shall display information about the biological resources onsite, the listed species of plants and wildlife, the site enhancement programs, and the formal trails system. In addition, the kiosks may be used to display announcements regarding organized and permitted events at the site and public interest (equestrian public education) events in the vicinity The LADPW's Consultant for the implementation of the management plan shall be responsible for developing the biological information displayed on the kiosk. Figures 3-12 and 3-13 show conceptual designs for the information kiosks. Appendix G contains the wording for the information kiosks.

LADPW will oversee the placement of portable toilets and trash receptacles on the site Two portable toilets and two trash receptacles shall be placed in areas of high use where they are easily accessible when servicing is necessary These shall consist of the type of trash receptacles that are designed to deter wildlife. All trash and debris shall be removed from the site by equestrians or pedestrians who are assisting with policing the site and by biologists who conduct the regular maintenance or monitoring visits to the site. Presently, members of the local equestrian groups and the public who use the site take responsibility for picking up trash and removing it from the site. If LADPW enters into a partnership agreement with the local equestrian groups, then the continuation of this practice should be discussed The partnership agreement should designate a contractor for portable toilet servicing and for regular trash pickup at the site.

3.5.3.1 Trails Modifications

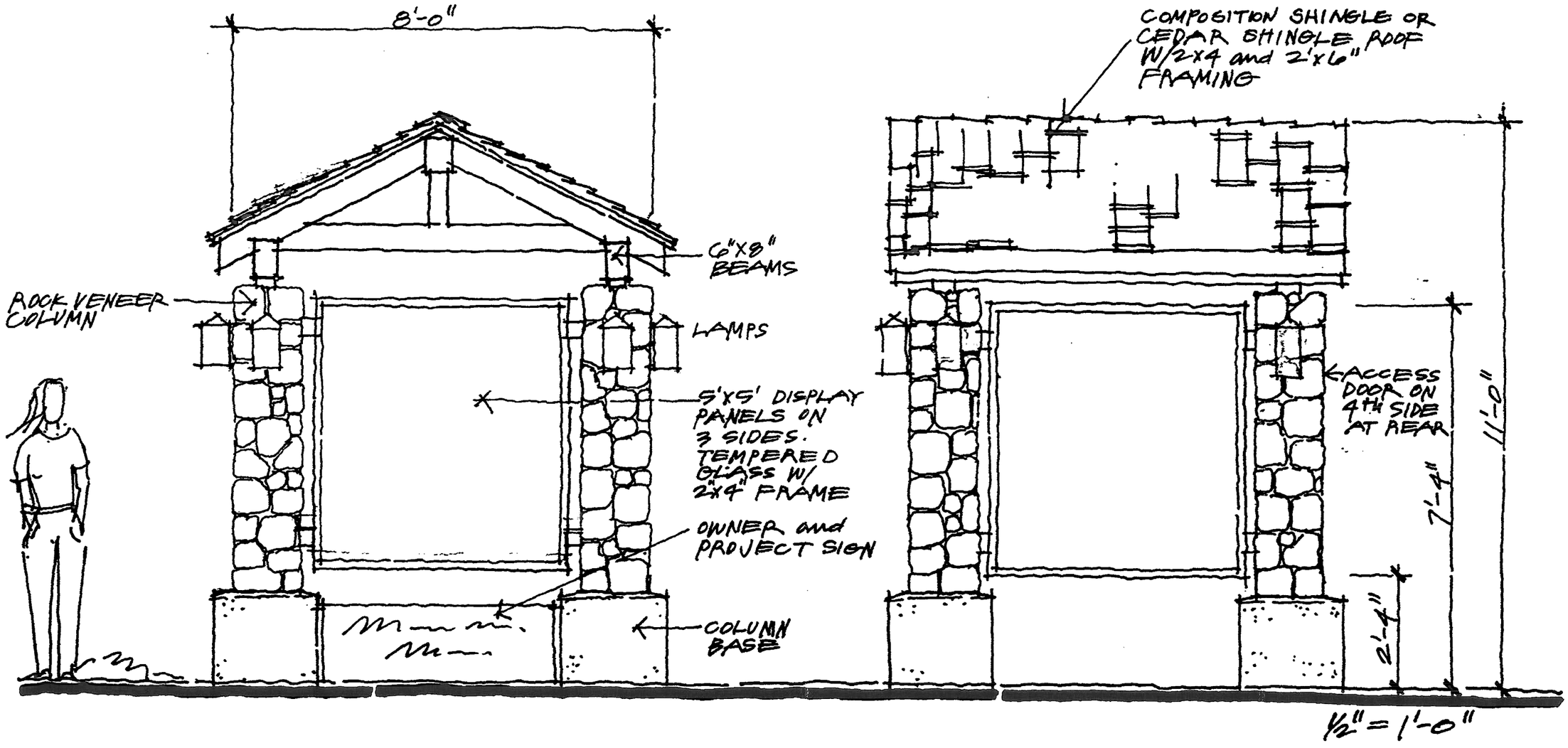
Currently, the Big Tujunga Wash Mitigation Bank can be accessed via three entry points A chain-link fence borders the south side of the mitigation bank along Wentworth Street. Currently, pedestrians and equestrians can access the site via an entryway in the southwest portion of the site east of Marybell, and through a broken part of the fence near the industrial complex in the southeast portion of the site A locked gate along Cottonwood allows for the entrance of maintenance vehicles. A fence is located along



BIG TUJUNGA WASH KIOSK - CONCEPT A

FORMA

Figure 3-12



BIG TUJUNGA WASH

KIOSK - CONCEPT B

Figure 3-13

the northern portion of the site south of the 210 freeway and in the west and north of the 210 freeway in the east. Locked vehicular entryways are located in the northwest and northeast portions of the site. The site is not fenced on the west side, primarily because a fence placed across Big Tujunga Wash would interfere with water flow by capturing debris. The lack of fencing along the western border allows for uncontrolled access to the site.

In order to more effectively control nuisance access to the site, the recommendation in this MMP shall be to repair the fence in the southeast portion of the site and to provide an entryway near the main gate on Cottonwood. This will direct traffic along the existing dirt access road and will decrease the traffic flow through the upland area. An LADPW permit shall be required for the use of any vehicles onsite. The Southern California Edison right-of-ways in the northwestern portion of the site shall be utilized by authorized maintenance vehicles. Until a decision is made regarding the fate of the Tujunga Ponds, the fence around the ponds shall be replaced in order to control access to the ponds and to protect the restoration areas. Should authorized vehicles or nuisance traffic become a problem, LADPW will need to consult with ACOE to limit the access to the site from the adjoining downstream property.

3.5.3.2 Trails Reclamation

A number of old or little used trails occur throughout the Big Tujunga Wash Mitigation Bank Site. Some of these trails occur in sensitive habitat areas. In order to minimize potential impacts on sensitive wildlife species and to decrease the fragmentation of habitat in these areas, a number of these trails will be closed and restored with native habitat. In order to prevent harm to both hikers and the revegetated trails, temporary barriers and explanatory signage will be placed at the point of closure for each of these reclaimed trails.

Reclaimed Willow Woodland Trails

Barriers within the willow riparian vegetation will consist of fallen logs, rocks, and other natural debris that is strategically placed so as to deter humans and horses from the continued use of trails that are designated for closure. If such barriers are not successfully restricting use of these areas, barrier ribbon or other artificial barriers shall be strung across the closed trails until they are successfully revegetated. In addition, signs (in English and Spanish) shall be posted at the closure point to identify that these areas are being restored. Signs should be approximately 12" x 24", ultraviolet and water-resistant, and mounted onto a 4-foot-high wood or steel stake that can be placed in the ground. These signs shall be prominently displayed in such a manner that they do not scare horses. Appendix H contains the wording for signs that will be displayed throughout the site.

In order to restore the native vegetation, willow and mule fat cuttings shall be planted along the length of the reclaimed willow woodland trails. Cuttings of willow and mule fat taken from existing vegetation adjacent to the trails will be spaced throughout the trails in random patterns. See Section 5 (cutting methods) for a detailed description of cutting and planting procedures for the reclaimed trails.

Reclaimed Alluvial Scrub Trails

Trails within the alluvial sage scrub habitat shall be closed by placing large rocks or boulders at the points where the trails are closed. In addition to the use of these barriers, signs shall 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 in these reclaimed trails. There is probably a large enough seed bank in the soil to revegetate these trails naturally.

3.6 EXOTIC WILDLIFE ERADICATION PROGRAM

This section of the MMP contains a detailed description of the native and non-native amphibians and fishes present or expected to occur on the site. Dr Dan Holland, Dr Camm Swift, and Mr Robert Goodman conducted 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 of the MMP Long-term monitoring of exotic aquatic wildlife populations and periodic eradication will be negotiated between LADPW and the resources agencies. This section of the MMP was prepared by the aforementioned scientists and has been included with few changes. A number of options that were not included as part of the Draft Enhancement Document (Chambers Group 1998b) were developed because they have the potential to greatly enhance the habitat onsite for native fishes, particularly the Santa Ana Sucker which has been proposed for listing by the USFWS. Some of these options would require more detailed hydrology and engineering studies to determine their viability These options are mentioned briefly in this section of the document and are presented in more detail in Section 9.0 - Optional Enhancement Measures.

3.6.1 Introduction

The vertebrate fauna of cismontane southern California was (prior to the advent of European colonization) diverse and occurred in a regional setting of significant topographic and climatic variability Regional endemism in plants, insects and fishes was high. Of the six (possibly seven) species of primary freshwater fishes, at least four and possibly five were autochthonous (evolved locally) (Moyle 1976: Swift et al. 1993) These include the Santa Ana sucker (*Catostomus santaanae*), the Santa Ana speckled dace (*Rhinichthys osculus*), the arroyo chub (*Gila orcutti*) and the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). Although the southern steelhead (*Oncorhynchus mykiss*) ranged throughout southern and central coastal drainages, there is a high degree of site philopatry/fidelity in this species, and genetically distinct local stocks are likely to have existed. Pacific lamprey (*Lampetra tridentata*) occur widely in the northwestern Pacific. The Los Angeles basin form of the Pacific brook lamprey *(Lampetra* cf *pacifica*) may have been taxonomically distinct; however the limited number of specimens of this now locally extinct form render this question unresolvable

Amphibian and reptile species diversity in this region was relatively high, with moderate levels of species restricted to the region. The arroyo toad (*Bufo californicus*), the southern California populations of the mountain yellow-legged frog (*Rana muscosa*), the San Gabriel Mountains slender salamander (*Batrachoseps gabrieli*) and the large-blotched salamander *(Ensatina eschscholtzii klauberi*) are all regional occurring species. Among the reptiles, the coastal rosy boa (*Charina trivirgata roseofusca*), the southern rubber boa *(Charina bottae umbratica*), the coastal patch-nosed snake (*Salvadora hexalepis virgultea*), the San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*), the San Diego mountain kingsnake *(Lampropeltis zonata pulchra*), the San Diego gopher snake (*Pituophis melanoleucus annectens*), the San Bernardino ringneck snake (*Diadophis punctatus modestus*), the San Diego ringneck snake (*Diadophis punctatus similis*), the coastal western whiptail (*Cnemidophorus tigris multiscutatus*), the California horned lizard (*Phrynosoma coronatum*) and other taxa were present in this area.

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, riparian and wash habitats and the species they hold have been disproportionately affected by human activities and actions. These include channelization, construction of dams, changes in historic water flow patterns, the effects of exotic species and other anthropogenic factors. Of the native fishes in the Los Angeles basin and adjacent areas, two are federally listed as endangered (unarmored threespine stickleback and southern steelhead), one is likely to be listed as threatened within the immediate future (Santa Ana sucker), and the remainder (arroyo chub and Santa Ana speckled dace) are State Species of Special Concern. Of the amphibians, the arroyo toad is listed as federally endangered and the California red-legged frog (*Rana aurora draytonii*)is listed as federally threatened. There are no federally listed reptile species in the immediate area of the project site, but there are several State Species of Special Concern, including the southwestern pond

turtle (*Clemmys marmorata pallida*), the California horned lizard (*Phrynosoma coronatum*) and the two-striped garter snake (*Thamnophis hammondii*)

The widespread loss and alteration of remaining native habitats has lead a variety of state and federal agencies to attempt to mitigate for or minimize impacts on remaining areas. To this end, the Big Tujunga Wash site was purchased as a mitigation site for various projects anticipated to be initiated by LADPW

3.6.2 Description of Site

The Big Tujunga Wash Mitigation Bank site consists of approximately 207 acres located within the drainage area of Big Tujunga Creek watershed. The site is bordered on the north by the 210 freeway, on the west by the north bank of Big Tujunga Creek, on the south by Wentworth Street, and on the east by the channel of the south fork of Tujunga Creek/Haines Canyon Creek. Figures 1-1 and 1-2 show the project vicinity and location, respectively Adjacent to the site are the Tujunga Ponds (about 33 acres) Figure 1-3 shows Big Tujunga Wash and the Tujunga Ponds. The site drains approximately 810 acres (Hamilton 1997) of the local watershed. Rainfall averages 46.7 cm/year (18.4 inches) and the range is from 5 cm (2 inches) to 120 cm (47 inches) (Hamilton 1997) The western portion of the site is dominated by the channel of Big Tujunga Creek, which is currently an intermittent stream. Flow proceeds downstream from Big Tujunga Dam and is retained behind Hansen Dam. Both sites provide source areas for exotic species which are present in Big Tujunga Creek (see below) Alluvial scrub habitats dominate the east bank of the stream, and are located on a large berm which separates the wash eastern side of the site. This area is dominated by the channel of Haines Canyon Creek, and there is an extensive riparian area associated with the floodplain of this drainage. The riparian vegetation also surrounds the two ponds (hereafter referred to as east pond and west pond). The canopy is composed of a mixture of willows (*Salix* spp.) and white alder (*Alnus rhombifolia*), with occasional Fremont cottonwood (*Populus fremontii*), some up to 10 to 12 m+ tall. Understory vegetation consists of a mixture of native and exotic woody and herbaceous species, including mule fat (*Baccharis salicifolia*), mugwort (*Artemesia douglasiana*) and large stands of giant reed (*Arundo donax*). A more detailed account of the physical and biotic characteristics of the site is contained in the Chambers Group report (Chambers Group 1998a)

3.6.3 Description of Aquatic Habitat

There are functionally two types of aquatic habitat onsite. The first is essentially lacustrine (ponded/slackwater) in nature, and consists of two large ponds on the northeastern edge of the site. The second is essentially palustrine (stream/flowing water) in nature. and consists of two stream segments. The first stream segment is an estimated 3 to 4 m (10 to 13 ft) wide and 70 to 80 m (230 to 260 ft) in length and connects the two ponds. The second segment originates from the outflow of the west pond, and continues for a distance of several kilometers in a generally easterly direction. Big Tujunga Creek is located on the west side of the project site and is a larger-order system, which appears to be currently intermittent due to restriction of flows from Big Tujunga dam upstream

The two ponds apparently originated as borrow pits (Hamilton 1997) The east pond covers approximately 0.37 ha (0 91acres) The banks are relatively steep, and a snorkeling survey on 17 May 1999 indicated that the maximum depth is approximately 3.0 to 3.2 m (10 to 11 ft). The bottom is relatively uniform in both depth and composition; the substrate appears to consist of a mixture of sand, small amounts of gravel, moderate amounts of cobble and an overlying layer of decaying organic material and silt an estimated 6 to 15 cm (2.5 to 7 in) deep. Visibility was excellent (up to 20+ ft). Rooted aquatic vegetation was scarce in the deeper portions of the pond at the time of the survey; however there was a significant fringe of cattails (*Typha* sp.) on the western edge of the pond. Floating microphytic aquatic vegetation (*Wolfia*?) covered most of the surface at this site

A small stream (10 to 14 ft wide) connects the east pond to the west pond. This stream contained numerous rooted aquatic macrophytes and some substantial growths of exotic water hyacinth (*Eichhornia crassipes*) The range of depth in the stream is unknown

The western pond was unsurveyable due to the presence of a massive infestation of water hyacinth that covered an estimated 99+ percent of the surface area of the pond. The surface area of the pond is estimated at 0.42 ha (1.04 acres) Removal of a small portion of the hyacinth on the western edge of the pond indicated that the bank in this area was moderately steep, and the substrate was a mixture of sand and limited amounts of gravel. The water beneath the water hyacinth was essentially aphotic (without penetrating light), small beams of sunlight were observed penetrating small gaps in the vegetative coverage.

Haines Canyon Creek from the outflow point for approximately several hundred meters downstream is a perennial stream averaging 4+ m (13+ ft) in width, and variable in depth. Haines Canyon Creek is at a minimum a second order stream whose origin is approximately seven miles east of the ponds. More precisely, Haines Canyon Creek becomes intermittent as it approaches the 210 Freeway The substrate is a mixture of sand, gravel, cobble and boulders. Some sections flow over bedrock. For several hundred meters below the outflow, the stream is heavily shaded by white alder and willow, with canopy cover approaching 90+ percent in some areas. Flow is moderate to rapid, estimated at >0.5 m/sec (1.5 ft/sec) in several reaches. The canopy cover decreases as the stream approaches the confluence with the wash from Big Tujunga Creek, and becomes somewhat wider (5+ m on average) and shallower Although tree species are present, most vegetative cover along the banks is composed of herbaceous or small woody species. Turbidity was low at the time of all surveys, and visibility was usually 4+ m when snorkeling.

3.6.4 Native Species Onsite: Historical and Current Presence

Existing literature (Swift et al. 1993, Jennings and Hayes 1994, Chambers Group 1998a) and surveys of the site in May, June and November 1999 indicate that this site is known or likely to host a significant number of sensitive native vertebrate species. A brief discussion is presented below; for more detail see the species accounts included in Appendix I.

3.6.4.1 Invertebrates

Records of a native crayfish (*Pacifasticus* sp.) collected onsite (Chambers Group 1998a) on 10 May 1997 are in error; there are no native crayfish species in southern California. A species of now-extinct freshwater shrimp was known from the Los Angeles basin in similar habitats; however there are no specific or recent records from this or other sites. Similarly, the California freshwater mussel (*Anodonta californiensis*) may have historically occurred in the Los Angles River drainage but there are no recent records.

3.6.4.2 Fishes

At least three and possibly as many as seven species of native fishes are likely to have occurred in Big Tujunga Creek onsite. The Pacific brook lamprey (*Lampetra* cf *pacifica*) was historically present in the Los Angeles River drainage. However, the last collection records for this species in this drainage was approximately 1930 (Swift et al. 1993) The taxonomic status of this species is unresolved. It may be distinct from the Pacific lamprey; sufficient preserved material apparently does not exist to examine this question (Swift et al. 1993)

The larger parasitic anadromous Pacific lamprey (*Lampetra tridentata*) was also historically known from the Los Angeles River drainage, where it spawned in smaller streams. However, all records are for the drainage are prior to 1970 and it is likely that the species is extirpated in this system

Rainbow trout (*Oncorhynchus mykiss*) in the form of southern steelhead were collected in the Los Angeles River drainage prior 1970 (Swift et al. 1993), however there are no recent records for this system. The possible status of native, non-migratory fish in this and other drainages has probably been confused beyond any hope of resolution by repeated introductions of hatchery fish into local streams.

Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) were historically present in the Los Angeles River drainage (Swift et al. 1993), although no specific records exist for the site. This may be due in part to the somewhat sporadic nature of collections in this area prior to the extensive loss and/or alteration of habitat. For a general discussion of this topic see Bell (1978).

Surveys conducted by the Chambers Group on May 10, 1997, indicated the presence of only a single individual of a native fish species (a Santa Ana sucker) in Haines Canyon Creek and two native species (sucker and arroyo chub) in Big Tujunga Creek. Surveys on May 17, 1999, revealed the presence of at least three species of sensitive native fishes in Big Tujunga Creek and Haines Canyon Creek within the project site. Approximately 6 to 8 Santa Ana sucker (*Catostomus santaanae*) were observed during a snorkeling survey in a large pool approximately 100 to 150 m (330 to 490 ft) downstream of the I-210 bridge over Big Tujunga Creek. Approximately 15 to 20 fish were observed and several captured in 3 to 4 seine hauls of the pool. Most fish were immatures or small adults, up to approximately 15 cm (5.9 in) standard length (SL). Surveys on July 1 and on November 28, 1999, revealed the presence of numerous suckers in Haines Canyon Creek upstream from the area south of the equestrian park. Seine hauls on November 28 in several areas along the stream course produced approximately 1 to 6 suckers per haul, ranging from 10 to 15 cm (4 to 6 in) SL. Fish were most common in riffle areas, but were also taken in areas where water had pooled, such as behind artificial cobble dams.

Santa Ana speckled dace (*Rhinichthys osculus*) were not observed during sampling in the previously noted pool in Big Tujunga Creek on May 17, 1999. However, dace were moderately common in Haines Canyon Creek when sampled on July 1, 1999, and November 28, 1999. Fish were most common in riffle areas, only occasionally being found in slackwater habitats and on only one occasion in a pool above a cobble dam.

Arroyo chub (*Gila orcutti*) were moderately abundant in the pool below I-210 previously noted on May 17, 1999, with approximately 2 to 3 dozen fish being observed during a snorkeling survey. Approximately 2 dozen fish were collected in several seine hauls of the spool. All were adults or large subadults, averaging 4 to 6 cm (1.5 to 2.5 in) in length. Chub were commonly observed in Haines Canyon Creek in surveys on July 1, 1999, and November 28, 1999. Several fish were seined out of a pool behind a cobble dam at a frequently used equestrian crossing.

Two rainbow trout (*Oncorhynchus mykiss*) were observed in the pool in Big Tujunga on May 17, 1999 and in pools along lower Haines Canyon Creek on July 1. Although trout were historically native to this area of this system, these undoubtedly represent planted fish either moving upstream from Hansen Reservoir or downstream from Big Tujunga Reservoir.

3.6.4.3 Amphibians

The historical presence of the arroyo toad (*Bufo californicus*) in the immediate area of the site is verified by collection records from Big Tujunga Creek near Sunland between 1915 and 1954 at the site of the current crossing of I-210 (USFWS 1999). However, recent surveys conducted by other surveyors in 1998 did not reveal toads in the immediate area of the Red-tailed Hawk golf course site. Toads are still present upstream beyond Tujunga dam. Suitable habitat may exist in the area; however management for this species on the project site might require reintroduction (if absent) and a change in water flow strategies, which is discussed in Section 3.6.7.

Other non-sensitive native amphibians are known to occur onsite, including the Pacific treefrog (*Hyla regilla*). It is possible that Pacific slender salamanders (*Batrachoseps pacificus*) may occur on the fringes of the side in areas with heavy vegetative cover.

3.6.4.4 Reptiles

No listed species of reptiles are known to occur onsite. However, at least five State Species of Special Concern are likely to occur or have recently occurred on or near the site The southwestern pond turtle (*Clemmys marmorata pallida*) was historically widespread in southern California, occurring in most if not all permanent water habitats and many ephemeral watersources below approximately 4,500 feet (Holland and Bury in press). Brattstrom and Messer (1988) recommended the Big Tujunga ponds as a recipient mitigation site for translocated turtles. We do not know if any turtles were ever relocated to this site.

The two-striped garter snake (*Thamnophis hammondii*) was formerly widespread in many aquatic habitats in southern and central coastal California. This species was not observed during any surveys onsite; however it is likely that it exists onsite as suitable habitat and a plentiful food supply exists in the form of native fishes and treefrogs. Records exist for this drainage (Jennings and Hayes 1994)

The South Coast garter snake (*Thamnophis sirtalis* ssp. nov.) was historically known from sites in the upper Los Angles River drainage, records exist from the upper Arroyo Seco area (Jennings and Hayes 1994) The habits and habitat requirements of this species are poorly understood (Jennings and Hayes 1994), however existing evidence indicates that it is probably somewhat more specialized than the two-striped garter snake. It seems unlikely that the species currently exists in the area.

The coastal patch-nosed snake *(Salvadora hexalepis virgultea)* is a taxon that occurs throughout a large area of southern California, being most common in coastal sage scrub and chaparral habitats. However, the species is also found in alluvial scrub habitats (personal observation) and may be or have been present onsite in some upland areas. Records exist for the lower portion of the Big Tujunga drainage (Jennings and Hayes 1994)

The California horned lizard (*Phrynosoma coronatum*) is another species that was formerly widespread in southern California. The horned lizard occurs or occurred over a wide habitat and elevational range Many records are from wash habitats, and there are locality records for (Chamber Group 1998a) and near the immediate project site (Jennings and Hayes 1994).

3.6.5 Exotic Species Known or Likely to Currently Occur at the Site

Southern California is host to a wide range of exotic invertebrate and vertebrate species; however tracking the timing and extent of their distribution has been hampered by a lack of systematic collections in many areas. This is particularly true of exotic amphibian and reptile species. The following discussion indicates the exotic invertebrates and vertebrates that are known or likely to occur onsite; for a more detailed discussion of their ecology please refer to the species accounts.

3.6.5.1 Invertebrates

The most common large exotic invertebrate in southern California freshwater systems is probably the red swamp crayfish (*Procambarus clarkii*). Several individuals of this species were collected by seining in Haines Canyon Creek on May 10, 1997 (Chambers Group 1998a) Several adult individuals of this species were observed in Haines Canyon Creek approximately 200 to 300 m (650 to 985 ft) below the pond outflow on May 17, 1999 Additional small specimens (1 5 to 2.5 in total length) were seined from the lower reaches of the stream on November 28, 1999, near the equestrian crossing. Asiatic clams (*Corbicula fluminea*) were also observed in this area on May 17, although they were not common.

3.6.5.2 Fishes

Several species of exotic fishes are known to occur onsite Surveys conducted onsite on May 10, 1997, (Chambers Group 1998a) indicate the presence of at least three species of exotic fishes. Largemouth

bass (*Micropterus salmoides*) were seined in several locations in Haines Canyon Creek, as were mosquitofish (*Gambusia affinis*). Surveys on May 17, 1999, at a pool 100 to 150 m (330 to 490 ft) below I-210 noted the presence of carp (*Cyprinus carpio*). Snorkeling surveys in the east pond on the same date revealed the presence of largemouth bass and bullhead (*Ameiurus* sp.), most likely black bullhead (*Ameiurus melas*). Mosquitofish were also noted in Haines Canyon Creek and the ponds on May 17 and November 28, and in Big Tujunga Creek on May 17

Green sunfish (*Lepomis cyanellus*) are widespread in many watersources in southern California. Although most common in reservoirs and ponds, they also move into stream habitats readily and can become quite abundant therein. Bluegill (*Lepomis macrochirus*) are likely to be at least transient species in Big Tujunga and Haines Canyon Creek, moving into the area from the reservoirs associated with Hansen and Big Tujunga dams. The Chambers Group report (1997) records the presence of "large individuals" of an unidentified sunfish species in the ponds on May 10, 1997

Red shiner (*Cyprinella lutrensis*) and fathead minnow (*Pimephales promelas*) are known to occur in both Haines Canyon Creek and (at least seasonally) in Big Tujunga Creek onsite Both species occur in low-moderate numbers and appear to be most abundant in pool microhabitats.

3.6.5.3 Amphibians

Two species of exotic amphibians are known or likely to occur onsite or nearby The bullfrog (*Rana catesbeiana*) is widespread within most watercourses in southern California, and is known to occur onsite (Chambers Group 1998a) The African clawed frog (*Xenopus laevis*) is found in all major drainages in the Los Angeles basin and occurs below Hansen dam (R.H. Goodman, unpublished data) Both species can disperse through watercourses, either as larval or post-metamorphic individuals. Both species are capable of dispersing overland; in the case of the bullfrog distances of up to 8+ km (5 miles) are known (M. Hayes, personal communication)

3.6.5.4 Reptiles

There are no exotic reptiles known to occur onsite; however it is likely that at least one or more exotic turtle species occasionally occur in the immediate area and onsite The red-eared slider (*Trachemys scripta elegans*) is widely established in southern California. Resident populations are established by the escape or deliberate release of turtles purchased as food or pets. This species can move considerable distances overland as well as within the watercourse Common snapping turtles (*Chelydra serpentina*) also occur frequently in the Los Angeles basin, although they are apparently not as common as red-eared sliders. This species is also known to engage in large-scale overland movements.

3.6.6 Project 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."

At present, suitable habitat for sensitive native aquatic vertebrates is largely confined to the portions of Haines Canyon Creek downstream from the ponds and in Tujunga Creek 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 analyses of the existing conditions at the site resulted in the development of several options designed to address the project goals. The options may not be feasible due to unknowns related to the rate of flow into the ponds and whether or not the flow would be enough to support continuous flows downstream. Uncertainties about the ability to redirect and control flow during elimination of the ponds need to be seriously considered and evaluated by a hydrologist with expertise in this specific area. A delineation and discussion of options follows; in one case the options (1 and 2) are mutually complementary. In other cases, some options are mutually exclusive - Option 4 precludes any other option. The discussion of each option and concordant advantages and disadvantages should not be considered to be exhaustive; review and input from other sources is solicited.

All options and the planned retention of the ponds contain at least two common elements:

1 The need to avoid impacts on listed species during habitat elimination and restoration. In particular, the need to avoid siltation of and downstream transport of exotics to Haines Canyon Creek and accompanying impacts on Santa Ana sucker are paramount. Additionally, seasonal restrictions on certain types of activities and operations such as exotic weed control will apply to the site because of likely impacts on least Bell's vireo from March 15 to September 15. Potential impacts on Santa Ana suckers during the spawning season (approximately March 15 to September 15) also need to be avoided.

2. All habitat-modification based options may potentially provide significant benefits to native species; however because this system is connected hydrologically to other watersources (Hansen Reservoir and Big Tujunga Reservoir), some level of monitoring and direct removal of exotics will be required This will include gill-netting and seining at the time of the dewatering of the existing ponds, seining and trapping in Haines Canyon Creek downstream from the ponds, and periodic resampling and control efforts.

3.6.7 Retention of Current Pond Structure, Continuous Exotics Control

The MMP includes retaining the existing pond structure while incorporating ongoing direct control of exotic species. At present, the existing ponds provide only marginal habitat for native species due to their degraded condition, but they do provide excellent habitat for exotic fishes, frogs, invertebrates, and plants. Continuous, aggressive maintenance and monitoring measures shall be implemented to effectively control these species. The LADPW may, at a later date, select a reconfiguration option for the Tujunga Ponds. This decision would be based on a determination that additional mitigation credits would be alotted to LADPW for the creation of new stream habitat. The control strategies are discussed in the following sections.

3.6.7.1 Direct Control of Exotics

All the options discussed above will require some supplemental direct control efforts to reduce and in some cases attempt to locally eradicate populations of exotics. There are a variety of potential control measures available for dealing with exotic species at this site; however as with most situations, their applicability and potential effectiveness is constrained and affected by a variety of factors over which none of the entities or agencies involved may have any direct control For example, the use of rotenone for control of unwanted fish species can be highly effective, up to and including the point of local eradication. Rotenone is derived from a naturally occurring plant compound and works by blocking the uptake of oxygen across the gills in organisms that derive their respiratory oxygen requirements from the water In even small concentrations, it can be highly effective in both a biological control and economic context.

However, there are other considerations Generally, the substance is highly toxic and must be applied by accredited applicators. Other compounds contained in the mixture are known or suspected to be carcinogens. Certain species (such as black bullhead) have a greater resistance to the compound than other species (such as bass) and as such concentrations must be sufficient to eliminate the most resistant species. It is a nondiscriminatory agent, affecting both target and non-target species (native frog larvae, aquatic insects, native fishes) In the case of the Big Tujunga pond sites, the application of this material (even in the presence of multiple detoxification stations downstream) might negatively affect the very native species the project is designed to benefit. As such, when the Santa Ana sucker is listed, use of rotenone would require Section 7 consultation with the U.S. Fish and Wildlife Service. It is extremely unlikely that either USFWS or the CDFG would allow the use of rotenone onsite. Finally, even if such approval with appropriate safeguards was forthcoming, the public relations aspect of use of this chemical would have to be considered. Given the recent experience at Lake Davis with northern pike, it would probably be appropriate to consider other control measures even if this measure was effective in a practical sense

The following is a brief discussion of general control methods and species-specific considerations. As noted in other sections, this discussion should not be considered exhaustive nor exclusive. It should also be noted that it is likely that all of these control methods would require formal Section 7 consultation with the USFWS and formal concurrence (most likely through a memorandum of understanding) of the CDFG, given potential effects to the Santa Ana sucker and the other native fishes (which are State Species of Special Concern)

3.6.7.2 Gill Netting

The use of nylon monofilament nets to traps fishes and other aquatic species can be highly effective as a control measure. However, except in unusual circumstances this practice is unlikely to eradicate the target species. Fish become entangled in the net and are unable to swim, thus depriving them of water flow across the gills and resulting in eventual asphyxiation. The vulnerability of species varies; catfish tend to survive for prolonged periods in gill nets while species such as trout and bass suffer much more rapid mortality The mesh size on the net affects the size and in some cases species likely to be captured. We plan to use several nets of varying sizes (½" to 1.5") set near habitat features (cattail banks, willow overhangs) and in open water (after removal of water hyacinth) that are likely to maximize capture rates. Two nets would also be set across the outflow to minimize downstream movement (into Haines Canyon Creek) of individuals displaced by dewatering activities. Nets would be set to cover the period of time prior to and during dewatering. Nets need to be checked on an hourly or bi-hourly basis to maximize their effectiveness and remove any native or other species captured to minimize the potential for mortality Fish removed are edible and could be used for other purposes. All target species - bass, sunfish, carp, bullhead, bullfrogs and crayfish - are likely to be captured by this method Gill nets in Haines Canyon Creek proper shall not be used due to the potential for take of Santa Ana suckers and other sensitive native species.

3.6.7.3 Seining

Seining involves the use of a net, usually braided nylon, of a given size. Seine length, width and mesh size vary depending upon the target species. The use of larger seines is recommended (50 feet x 6 feet x ⅜ inch) to remove exotic species from the ponds as they are de-watered. Control efforts downstream in Haines Canyon Creek would involve use of smaller (10 feet and 25 feet) seines with ¼ inch or ⅜ inch mesh. In the case of Haines Canyon Creek, "block seines" would be erected across the width of the stream at the upstream and downstream end of a given section (usually 30 to 40 ft in length) to minimize escape of fishes in a given area being worked. Native fishes are retrieved and placed in live buckets, and the exotics are removed and disposed of The block seines are then removed and moved to another section, and the native fishes released. Working the entire creek is possible but likely to be expensive; the target goal would be to conduct approximately 3 to 4 days of seining during dewatering efforts and 4 to 5 days per quarterly sampling period. All exotic species of concern are likely to be captured by this method.

3.6.7.4 Electroshock

Use of electroshock has been a standard method for survey and control of exotic fishes for several decades. This involves the use a man-portable, high-voltage unit that delivers (via a cathode and an anode) a strong electrical field between these two points. Fishes and other species are stunned and in some cases killed by the electrical current. This can be a very effective method for the location and removal of exotic species, especially in microhabitats where seines are ineffective (such as under a mass of tree roots or under a boulder). The shocker can be used in conjunction with block seines, and an assistant to retrieve and tally the catch. While this method is highly effective (particularly in small streams such as Haines Canyon Creek), it must be used with caution for two reasons. First, there is a potential direct threat to the operator and assistants from the electric current. Second, there are documented negative impacts up to and including mortality to the species affected. Thus, any shocking in Haines Canyon Creek would (as with the use of rotenone) require Section 7 consultation with the USFWS and concurrence of CDFG. Use of this technique may be appropriate on a limited site-by-site basis on this project All exotic species of concern would be likely to be captured by this method.

3.6.7.5 Baited Traps

Use of baited traps has also been a standard method for the survey and to a lesser extent control of exotic species. This technique involves the use of wire or nylon mesh traps of varying sizes and configurations, depending upon the target species. The trap is baited (usually with a fish carcass or punctured can of sardines in oil), submerged in the area to be worked, and checked on a regular basis to remove any animals captured. The size of the traps varies; small minnow traps are approximately 18 inch x 6 inch with a mesh funnel on each end. These are highly effective in capturing crayfish and small sunfish, particularly in shallow streams. Larger traps (3 foot to 4 foot x 1 foot) can be set in deeper water and typically catch bullhead, sunfish, carp and crayfish. We would plan to utilize traps of both sizes set during seining efforts. In Haines Canyon Creek, the smaller minnow traps would be utilized. In the ponds, the larger traps would be set in a variety of locations. All exotic species of concern would be likely to be captured by this method.

3.6.7.6 Shooting and Gigging

This is a species-specific control measure, designed to control bullfrogs. Gigging involves the use of a gig (fish spear) with multiple tines and requires a fair degree of skill to be effective Gigging is done at night, usually from a boat with the use of a headlamp to immobilize the frog, which is then gigged/speared. Shooting also occurs at night, and involves the use of small-caliber weapons (such as a .22 rifle or pistol) or a small-bore shotgun (.410 gauge) The .22s use "dust" shot or "shot-shells", a package containing hundreds of very small (0.2 to 0.3 mm) lead pellets in a plastic cone on the end of the

cartridge. When the gun is fired, the pellets are ejected and act in a fashion similar to shot from a shotgun. This ammunition is highly effective on small (recently metamorphosed) frogs over short distances (<20 feet). We also occasionally use .22 Beegum rounds, which have a solid slug, are propelled by only a primer charge and are subsonic. For larger frogs and at greater distances, we use single-shot .410 shotguns with a 7½ gauge shot. This is highly effective for frogs of all sizes at distances of up to 40 feet. Experiences with this method on Camp Pendleton indicate an approximate 99+ percent mortality in frogs where a shotgun is used. However, lead contamination caused by shooting can cause serious problems to the environment. Shooting is a last resort and, if available, steel shot will be used

While all life stages of bullfrogs can be sampled by the control measures just noted, their amphibious habits make them less vulnerable to some control methods. Post-metamorphic individuals, for example, often leave the water and move (rapidly) into surrounding terrestrial habitats when the area is electroshocked. Existing control efforts on Camp Pendleton focus on control of post-metamorphic individuals by shooting, and indicate that this can be a highly effective method of controlling bullfrogs.

However, there are obvious constraints on the use of this method, particularly when control efforts must occur in close proximity to an urbanized area. As such, this method should not be used unless other control methods previously discussed during dewatering prove ineffective

In summary, we anticipate using direct control methods of gill-netting, trapping and seining in the ponds. We anticipate using seining, trapping and possibly electroshocking in Haines Canyon Creek.

3.7 COMMUNITY AWARENESS PROGRAM

3.7.1 Introduction

Public awareness and involvement are a major component of the master plan process for the proposed Big Tujunga Wash Mitigation Bank site

Consensus Planning Group conducted a community involvement program for the Big Tujunga Wash Mitigation Bank that is proposed to be created in the Sunland-Tujunga area. The goals of the public involvement program were to share project, information with stakeholders, identify the issues and concerns of greatest importance regarding the project and integrate public feedback into the project planning process. A public information brochure was prepared to provide background information to community members and interested individuals and is included in Appendix I

An important part of the community awareness program was the formal community meeting that provided the public with an opportunity to interact with project planners. A total of 55 community members attended the meeting. The meeting provided interested attendees the opportunity to gather information directly from project managers and experts, while also hearing concerns from fellow residents. The topics on the agenda for the meeting included:

- project mission,
- enhancement program,
- current status of the project,
- the Tujunga Ponds,
- trails and access, and
- long-term management.

A comment station, placed near the welcome/sign-in table, in the center of the room, provided the public an opportunity to formally document their concerns and/or suggestions for the mitigation bank site plans. A total of eight comment sheets were received. Please see Appendix I for copies of the comment sheets and for "Public Comments Summary and Responses"

This portion of the MMP discusses the outcome of the public community meeting, identifies key stakeholders in the community, synthesizes the public's concerns as expressed in comment sheets and in conversations at the meeting.

Finally, this section recommends an approach for community awareness and involvement as the implementation of the mitigation and monitoring bank programs are initiated.

3.7.2 Key Stakeholders

There are many key stakeholders and community groups that have shown great interest in the Big Tujunga Wash Mitigation Bank project. The first group consists of elected officials who are sensitive to the needs of the community and who must respond to residents' concerns.

State Assemblyman Tony Cardenas, District 39, a well-respected member of the Sunland-Tujunga area and an active force in community affairs, made an appearance at the public meeting, along with an advisor, Mark Chapa. Both seemed very interested in keeping up-to-date on the status of the project. Patricia Davenport, Field Deputy for Los Angeles City Councilman Joel Wachs' office, District 2, was also present at the meeting, as was James Wilson, a Field Deputy for Los Angeles City Councilman Alex Padilla, District 7

Various conversations were held with David Vannatta of the Office of Supervisor Mike Antonovich, member of the Los Angeles County Board of Supervisors for District 5. Mr Vannatta was involved in all aspects of the outreach process. Supervisor Antonovich hosted the October 23 trail ride event previously held at the site.

Residents surrounding the Big Tujunga Wash site are very active in many local community organizations. In fact, many residents belong to more than one of these organizations, all of which have developed strong community ties and present a major influence The Shadow Hills Property Owners Association (SHPOA) and the Lake View Terrace Homeowners Association (LVTHOA) are the two most prominent homeowner organizations in the area. Both the current president of SHPOA and current president of LVTHOA were present at the meeting.

Local organizations concerned with the environment such as the Small Wilderness Area Preservation group (SWAP), Equestrian Trails, Inc. (ETI), the Sierra Club, the California Trail Users' Coalition (CTUC), and the Audubon Society of San Fernando Valley, are very active in the area and had at least one representative present at the community meeting.

3.7.3 Community Meeting

A community meeting was held on Wednesday, November 17th, 1999 at the Lake View Terrace Recreation Center The local community generally supports the Big Tujunga Wash Mitigation Bank project and would like to become pro-active in its planning and implementation As one resident stated during the meeting, the community has been taking care of the site for years. With this in mind, there is every reason to believe that with proper education and training, local residents will continue to be dedicated caretakers of the site

Given the local residents' existing relationship with the site, community members want the success criteria for the project, the budget, and the water quality report made open for public review They also want to receive information on limited access to the trails and when these plans will be finalized. Most residents would also appreciate another opportunity to meet with officials from the Department of Public Works and other related agencies to discuss the future of the project.

Appendix I provides the comprehensive summary of comments from community members, along with responses to each comment.

3.7.4 Future Community Awareness and Involvement

The objective of the future community awareness and involvement program will be to further raise community awareness of the Big Tujunga Wash Mitigation Bank site goals:

- obtain mitigation credits for other LADPW projects,
- remove exotic plant and wildlife species,
- eliminate the introduction of exotic species into the local water and onto the site,
- restore the site to its native habitat,
- enhance the site for listed and sensitive wildlife and plant species,
- establish formal equestrian and walking trails, and
- implement an education program onsite.

In order to meet these goals, the following community relations approach is recommended as the programs are implemented. A summary table showing a task list and timing of action items is provided following the explanations of the program components.

3.7.4.1 Community Advisory Committee

At the November 17, 1999 meeting, several members of the audience voiced a desire to see a community advisory committee (CAC) formed in which local residents would have the opportunity to provide input. A CAC made up of representatives from various local organizations would serve to consolidate opinions and ideas, therefore simplifying communications between LADPW and the public. The CAC will provide a communication avenue between project planners and community representatives. The CAC will also be notified of different milestones throughout the project and will assist in informing the greater community

Formation of Community Advisory Committee

The Consultant Team shall initiate the formation of the CAC in July of 2000, just after the LADPW completes the contract process for the project.

Some of the local organizations identified at the community meeting include:

- Shadow Hills Property Owners Association (SHPOA),
- Lake View Terrace Homeowners Association (LVTHOA),
- Small Wilderness Area Preservation group (SWAP),
- Equestrian Trails, Inc. (ETI), Corrals 10 and 20,
- Hansen Dam Community Advisory Committee, and
- California Trail Users' Coalition (CTUC).

The committee may also include representatives from the various resource agencies overseeing the project:

- The Consultants responsible for implementing the enhancement program,
- U.S. Fish and Wildlife Service,
- California Department of Fish and Game,
- Regional Water Quality Control Board, and
- U.S Army Corps of Engineers.

Elected officials shall be notified of scheduled CAC meetings and of the progress of implementation via newsletters. These officials shall include:

- Supervisor Mike Antonovich's Office, District 5,
- Councilman Joel Wachs' Office, District 2,
- Councilman Alex Padilla's Office, District 5, and
- Assemblyman Tony Cardenas' Office, District 39

Initially, the Consultant shall prepare a letter, in coordination with LADPW, that shall be sent to the key community organizations listed above. This letter shall describe the purpose of the CAC and an invitation will be made to provide two representatives to participate on the CAC. The letter will also serve as the meeting notice for the first CAC meeting that shall be scheduled between August 1, 2000 and August 21, 2000. The letter shall be mailed by LADPW on or before July 22, 2000. The Consultant shall contact each of the key groups in late July to make sure they are acting upon the letter they received.

At the August CAC meeting, the technical Consultant shall give an overview of the final MMP, the exotic plant and wildlife removal programs, the Tujunga Ponds, the water quality analysis, and the trails restoration program so the CAC members are aware of what these programs entail. The LADPW will explain the role of the CAC in explaining the role of the MMP programs to their constituencies and to set guidelines for establishing communication with the CAC members.

Initial Mailing to Stakeholders

The Consultant shall prepare and send out an initial mailing to the stakeholders to announce the completion of the Final Mitigation Monitoring Plan for the Big Tujunga Wash Mitigation Bank and to summarize the following programs:

- Kiosk and public information,
- Trail maps,
- Exotic plant removal,
- Water quality monitoring sites,
- Bullfrog, crayfish, exotic fish removal,
- Trail closures and restoration, and
- Native revegetation/habitat restoration.

The initial mailing shall be prepared in late July by the Consultant in coordination with the LADPW. The mailing shall then be sent to the stakeholder mailing list on or before the August CAC meeting by LADPW

August 2000 Newsletter

The first newsletter shall be enclosed in the initial mailing to stakeholders in August. A draft of the newsletter shall be prepared and submitted to LADPW for review and then finalized by mid-August. Due to the importance of the exotic plants, bullfrog, and exotic fish removal programs, it is essential to make community members aware of the trapping, removal and monitoring programs prior to their implementation. As mentioned above, a newsletter shall be prepared that addresses each program. A discussion of the current conditions of the Tujunga Ponds shall also be included, as well as a discussion of the upcoming native habitat restoration activities. A schedule of activities shall be included in the newsletter

Kiosk Information Materials

The initial mailing and the newsletter shall announce to area stakeholders that construction of onsite kiosks shall be initiated in the Fall of 2000. Community members shall be notified that kiosks will provide information, announcements, and materials regarding the Mitigation Bank site. LADPW in conjunction

with the Consultant shall prepare kiosk materials and post them in the kiosks. Updated newsletters and fact sheets shall be posted in the kiosks within 1 week of preparation of the materials.

Fact Sheets

Given that the MMP programs are very technical and detailed, the Consultant shall be responsible for developing fact sheets about each program. For instance, a fact sheet on the cowbird trapping program should discuss why cowbirds need to be trapped, how the trapping occurs and its management, and should highlight the benefits of the cowbird trapping program as it relates to the site Fact sheets shall be prepared by the Consultant, in coordination with the LADPW, and shall be distributed to the CAC members at future meetings. The fact sheets shall also be placed in the kiosks within 1 week of distribution to CAC members. The fact sheets shall be drafted by September 1, 2000 and finalized by September 15, 2000.

Community Advisory Committee Meetings

Following the initial CAC meeting, the Consultant in conjunction with LADPW, shall hold regular meetings of the CAC to keep the public informed of project implementation status. The meetings shall be held quarterly for the first 3 years of implementation and then every 6 months during the remaining 2 years of implementation. The CAC meetings shall be held in December, March, June, and September The Consultant shall send a meeting reminder announcement to each of the CAC members approximately 2 weeks prior to the scheduled meeting date. The Consultant, in conjunction with the LADPW, shall develop an agenda for each meeting and shall prepare necessary handouts for each meeting.

The purpose of each CAC meeting will be to focus on the status of the implementation of each of the programs. In addition, the Consultant and the LADPW shall inform the CAC members of any problems that have arisen on the site and shall seek solutions with the CAC members. The LADPW and Consultant shall solicit comments and questions from the CAC members in order to address any issues that may arise At each meeting, the Consultant and LADPW shall set the date, time, and location for the next CAC meeting.

Subsequent Newsletters

The Consultant, in conjunction with the LADPW, shall prepare subsequent newsletters that are designed to inform the public and the stakeholders of the status of program implementation. Each newsletter shall contain a brief description of the ongoing programs and any unique information the public needs to know. The newsletter shall include announcements of when activities will be undertaken (such as arundo removal, plantings, exotic wildlife removal, cowbird trapping, or maintenance and monitoring activities) In addition, the newsletter shall identify off-limits areas and problem areas that the users need to help to repair or avoid. The newsletters shall also identify the results of some of the ongoing programs that the public may be interested in, such as the restoration monitoring or the endangered species monitoring. Informing the public of successes in program implementation is essential so they will know that their stewardship is appreciated and that they are helping to improve the site The newsletter shall also identify the LADPW contact person in case the public has questions, comments, or problems they feel need to be addressed.

The Consultant shall prepare newsletters on a quarterly basis for the first year of implementation and every 6 months for the 4 subsequent years. A draft of each of the newsletters shall be submitted to the LADPW for review approximately 2 weeks prior to when the newsletter is sent to the public. The Consultant shall revise the newsletters based on LADPW's input and then send them to the stakeholders. During the first year, the newsletters shall be sent out in December 2000 and March, June, and September of 2001 During the following 4 years, the newsletter shall be sent out in March and September

Educational Programs

Area residents understand the educational importance and uniqueness of the Big Tujunga Wash site. The public awareness program will include a plan for allowing an educational program onsite that could allow for supervised educational tours. The educational programs shall be conducted in accordance with the goals of the Mitigation Bank. Educational tours will heighten community awareness and teach community members the importance of protecting and preserving the Big Tujunga Wash Mitigation Bank. The Consultant shall coordinate with the following schools to inform them of the potential for providing an educational program:

- Verdugo Hills High School
- Mount Gleason Middle School
- Sunland Elementary School
- Brainard Avenue Elementary School

The variety of habitats at Big Tujunga Wash provides an excellent opportunity for year-round public education programs. During the school year, the local schools can create an outdoor education program at the site. Some school districts, such as Orange County Unified School District, have an organized outdoor science program that conducts classroom activities at sites like the Big Tujunga Wash site. The school staff is responsible for setting up the activities on the site prior to the arrival of the school children. They then conduct the programs and following completion of the program, they remove all of their educational materials from the site. If desired, the local schools can arrange a schedule for outdoor classroom activities at the site with LADPW. The schools would be responsible for arranging for permitted access with the LADPW The LADPW shall notify the Consultant of when school groups are scheduling tours or programs at the site. The Consultant shall be responsible for including tour dates in newsletters and for informing the CAC members of tour dates. In addition, the Consultant shall post a list of tour dates in each kiosk on a quarterly basis. If the schools show an interest in using the site for educational purposes, then the Consultant shall arrange a meeting onsite with the local school teachers. The purpose of the tour would be to introduce them to the site, to show them the area, and to explain the goals of the Mitigation Bank. The Consultant shall also explain the importance of staying on trails and staying away from restoration areas. In addition, the Consultant shall explain the need to avoid breeding areas for listed and sensitive species during the breeding season.

It will be the Consultant's responsibility to inspect the areas where tours have occurred to ensure that undo harm is not resulting from school tours of the site. The Consultant shall conduct these inspections during the regular maintenance and monitoring of the site If the Consultant determines that the school tours are having a negative impact on the site, then the Consultant shall notify the LADPW and the local schools to inform them of the problems. If the problems cannot be resolved, then the Consultant in conjunction with the LADPW shall determine if the educational tours should be discontinued.

During the summer months, the site can be used for daytime activities by various summer schools. Additionally, the site can be available to the general public on weekends.

The basis for the outdoor education program will be to teach children and the general public the value of the natural environment through a hands-on, ecological approach The following is a discussion of some of the potential programs the local schools or other educational groups can conduct for children Table 3-3 lists examples of the vegetation and wildlife that can be discussed within each of the habitat types at Big Tujunga Wash.

Plant Identification

In each of the habitat types, numbered signs identifying the common and scientific names of various plants can be placed to identify each species. For certain lessons, the signs can discuss any historical uses of the plants (e.g., cactus fruit used for dye or acorns used for meal). In addition, numbered posts staked in front of the same plant species in other areas can test their identification skills.

Table 3-3
Vegetation and Wildlife Within Each Habitat Type
at Big Tujunga Wash

ALLUVIAL FAN SAGE SCRUB		
Vegetation	**Wildlife**	
cacti	horned lizard	variety of raptor species
yucca	whiptail lizard	raven
California buckwheat	variety of snake species	black-tailed jackrabbit
California sagebrush	California quail	desert cottontail
	California thrasher	coyote
	loggerhead shrike	
WILLOW RIPARIAN		
Vegetation	**Wildlife**	
arroyo willow	Lorquin's admiral (butterfly)	least Bell's vireo
black willow	coastal western whiptail (lizard)	ash-throated flycatcher
red willow	black-crowned night heron	black phoebe
	great blue heron	red-shouldered hawk
AQUATIC HABITAT		
Vegetation	**Wildlife**	
cattails	Santa Ana sucker	water boatmen
rushes	Santa Ana speckled dace	toe biters
sedges	arroyo chub	black-crowned night heron
duckweed	native crayfish	great blue heron

Animal Tracks

Stations can be set up that include either pictures of or pre-made casts of various animal tracks that occur within the habitat types. After an explanation of the various tracks, the teacher can scout the area for actual tracks and have the kids identify them or follow the tracks to see which way the animals have gone. After the kids have identified the actual tracks, plaster casts of the tracks can be made so the kids can have something to take back to the classroom.

Wildlife

The teacher can lead an interactive discussion about the wildlife that occurs within the habitat types and discuss why certain animals use the alluvial habitat versus the willow riparian or aquatic habitats. The discussion should be based on general ecological principles and also include how the animals use the vegetation for food or shelter

Aquatic Habitat

The Tujunga Ponds and Haines Canyon Creek provide excellent areas to teach kids about the macro- and microinvertebrates that live within aquatic habitats. At designated areas along the Pond and Water Trails, stations can be set up that include microscopes for viewing water and sediment samples. Studying the water and sediment samples in addition to a discussion of the wildlife will provide a good basis for aquatic ecology Because Haines Canyon Creek is one of the last remaining habitats for the arroyo chub, Santa Ana speckled dace, and Santa Ana sucker, the kids need to be careful not to disturb

the habitat around the creek. The teacher can pass around pictures of the fish and lead an interactive discussion on how the kids think we can help save these fish.

General Principles

Another value of such an outdoor education program is the kids can be taught general principles such as the importance of keeping natural areas clean and free of trash. To reinforce this, during the lessons the kids can help pick up any litter along the trails. The kids can also be taught cautionary measures such as what to do if they encounter dangerous animals such as coyotes, rattlesnakes, and mountain lions. The kids can learn to identify poison oak and stinging nettle (plant species that cause skin irritation) that occur throughout the site. The kids can also learn about the value of restoration and to respect staying on designated trails. Since the invasion of exotic species can outcompete and threaten native species, the kids can be taught not to release pets into natural areas and watercourses.

Contact with Elected Officials and Agency Personnel

The Consultant shall be responsible for ensuring that the agency personnel and the elected officials and their staff (on the stakeholders list) are receiving the newsletters and fact sheets about the site In addition, the Consultant shall ensure that CAC meeting reminders are sent to each of these individuals prior to each of the CAC meetings. The Consultant shall also be responsible for calling the elected officials and the government officials twice per year to offer update briefings on the status of the Mitigation Bank and the ongoing programs.

3.7.5 Key Stakeholder Contacts

Government Officials

U.S. Fish and Wildlife Service
Carlsbad Field Office
(760) 431-9440

Mary Meyer
California Department of Fish and Game
(805) 640-8019

Alex Fu
California Regional Water Quality Control Board
323-266-7500

Aaron Allen
U.S. Army Corps of Engineers
Los Angeles District
213-452-3413

Elected Officials

Conal McNamara
Office of Supervisor Michael Antonovich
Supervisorial District 5
213-974-5555

Patricia Davenport
Office of Council Member Joel Wachs
Council District 2
213-473-7002

James Wilson
Office of Council Member Alex Padilla
Council District 7
818-756-9115

Mark Chapa
Office of Assemblyman Tony Cardenas
Assembly District 39
818-894-3671

Homeowner Associations

Shadow Hills Property Owners Associations
818-353-4682

Lake View Terrace Homeowners Association
818-890-1238

Lake View Terrace Improvement Association
818-896-6058

Environmental Groups

Small Wilderness Area Preservation
818-248-0050 – work

San Fernando Valley Audubon Society
818-894-9332

Equestrian Groups

ETI, Inc.
818-951-1589

California Trail Users Coalition
818-353-4682

Hansen Dam Advisory Committee
818-896-6514

Business Groups

Sunland-Tujunga Chamber of Commerce
818-897-5097

Summary Table
Community Awareness and Involvement Program - Tasklist

Task #	Description	Timing/Deadline	Lead
1.	Initiation of CAC formation · Letter to community organizations inviting them to participate on CAC	Prepare Letter: On or before July 15, 2000 Mail letter: On or before July 22, 2000	Consultant LADPW
2.	Meet with Community Advisory Committee to discuss: • Final monitoring plan • Trails Restoration • Bullfrog/crayfish/exotic fish removal • Tujunga Ponds • Water quality monitoring	Contact key groups: July 2000 Meeting: August 2000	Consultant Consultant, LADPW
3.	Prepare initial letter to stakeholders	Draft: July 2000 Mail: On or before July 22, 2000	Consultant, LADPW LADPW
4.	Prepare newsletter #1 that will include information on: • Kiosks and Public Information • Exotic Plant Removal • Bullfrog/crayfish/exotic fish removal • Tujunga Ponds • Water quality monitoring • Trails closure and restoration • Habitat enhancement and restoration	Draft: Early August Finalize: mid-August Mail: On or before August 15, 2000	Consultant, LADPW Consultant, LADPW LADPW
5.	Prepare kiosk fact sheets for each program.	Draft: September 1. 2000 Finalize: September 15, 2000	Consultant Consultant, LADPW
6.	Conduct subsequent CAC meetings	Mail meeting notice: 2 weeks prior to each meeting Meeting: Quarterly in 2000 to 2003, Bi-annually in 2004 and 2005	Consultant Consultant, LADPW
7.	Prepare subsequent newsletters	Mail: Quarterly in 2000 - 2001, Bi-annually in 2002 · 2005	Consultant, LADPW
8.	Contact elected officials and agency personnel	Bi-annually	Consultant
9.	Contact local schools and conduct onsite meeting with school staff	Draft: September 30, 2000 Finalize: Late Fall 2000	Consultant Consultant, LADPW

3.8 PERMITTING REQUIREMENTS

3.8.1 Introduction

The discharge of dredged or fill material (temporarily or permanently) into waters of the United States requires prior authorization from the U.S Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act and from the Regional Water Quality Control Board (Water Board) pursuant to Section 401 of the Clean Water Act. Activities that affect the channel and/or associated riparian vegetation require a streambed alteration agreement from the California Department of Fish and Game (CDFG) pursuant to Section 1601 of the California Fish and Game Code. The potential permitting requirements for pond reconfiguration options 1 through 3 (discussed in Section 9) would include the modification of the channel and would therefore require authorization from these three agencies. If the LADPW elects to go forward with one of the pond reconfiguration options then the permitting requirements would have to be determined. The exotic weed removal program may require a streambed alteration agreement from CDFG because removal of riparian vegetation (including exotics) constitutes alteration to a streambed. No authorization is required from the Corps or RWQCB for this activity

3.8.2 Anticipated Permitting Schedule

Prior to initiating any programs, the Consultant and LADPW shall conduct an informal meeting with the USFWS and Corps to determine the need for a Corps permit and a Section 7 consultation. Regardless of what these agencies decide, a 1601 Streambed Alteration Agreement will be required. The timeframe for preparing the draft permit applications for LAPWD review and comment is approximately six weeks. Another two weeks would be required to deliver final applications to the resource agencies, excluding USFWS. If the 1601, 401, and 404 are required, then the resource agencies should take no longer than 60 days to issue the permits for the proposed project from the time they receive a complete application (assuming that the Corps would not require authorization by individual permit). Consequently, it is anticipated that it would take approximately four months to obtain the necessary permits for the Big Tujunga project after receiving authorization from LAPWD to proceed. Therefore, we estimate that if permits are required from the Corps, CDFG, and RWQCB, then the appropriate permits would be obtained by the end of December 2000 (assuming that authorization to proceed from LAPWD is given by July 2000) If a Section 7 Consultation is required, then the Corps and Water Board permits will not be issued until a final Biological Opinion is issued by the U.S. Fish and Wildlife Service pursuant to the federal Endangered Species Act (estimated to occur on March 15, 2001 if required) Furthermore, the CDFG streambed alteration agreement will not be issued until CDFG issues their final biological Opinion pursuant to the California Endangered Species Act (estimated to occur in March 2001) If a Section 7 Consultation is required, then the timeframe for completion is March 15, 2001 Figure 3-14 shows the anticipated timeframe for the permitting requirements.

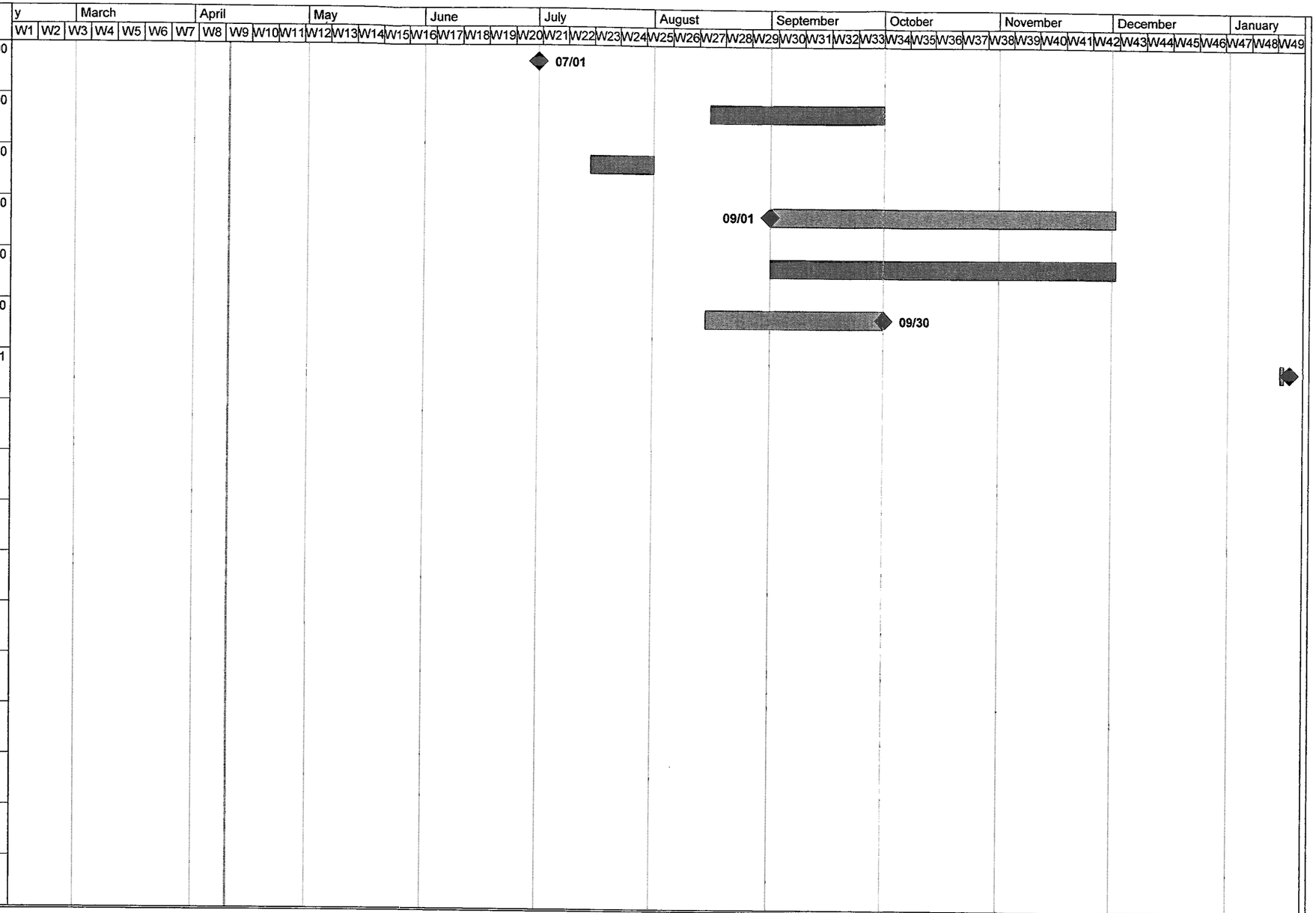
3.8.3 U.S. Army Corps of Engineers Permitting

There is no fee associated with the processing of a Corps permit.

3.8.3.1 Nationwide Permit

It is likely the MMP programs can go forward without the need for a nationwide permit from the Corps because the project won't necessarily result in any fill. The consultant shall coordinate with the Corps to determine if a nationwide permit is necessary On March 9, 2000 the Corps modified their nationwide permit program to take effect on June 5, 2000 If a nationwide permit is necessary, then the new nationwide permit program should allow this project to proceed by nationwide permit (i.e., nationwide permit number 27 - Stream and Wetland Restoration Activities) with notification. The notification process is described below

Task Name	Start	Finish
Los Angeles Public Works Department (LAPWD) Authorization to Proceed	Sat 07/01/00	Sat 07/01/00
Preparation of California Department of Fish & Game (CDFG) 1601 Permit Applications	Wed 08/16/00	Sat 09/30/00
Informal Consultation Meeting with Corps and USFWS	Sat 07/15/00	Mon 07/31/00
Nationwide Permit Program Corps 404 Permit Preparation (if required)	Fri 09/01/00	Fri 12/01/00
Preparation of Draft Water Resources Board 401 (if required)	Fri 09/01/00	Fri 12/01/00
Preparation of Draft Biological Assessment/Submittal of Draft Biological Assessment to US Fish & Wildlife Service (if required)	Tue 08/15/00	Sat 09/30/00
Corps and USFWS Draft Biological Assessment Review/Issuance of USFWS Draft Biological Opinion (if required)	Mon 01/15/01	Mon 01/15/01



Project: Big Tujunga
Date: Mon 04/10/00

Task | Milestone | Milestone Driven Task | Task Driven Milestone

Chambers Group

BIG TUJUNGA WASH MITIGATION BANK PERMITTING SCHEDULE
Figure 3-14

3.8.3.2 Pre-construction Notification Process

Some NWPs require that the Corps approve each use of the NWP on a case-by-case basis. The process of obtaining this approval is called a pre-construction notification (PCN). Obtaining authorization through the PCN process is not automatic. Notification to the Corps must include: (1) the permittee's name, address, and telephone number; (2) location of the project; (3) description of the project, its purpose, its impacts, and information about other Corps authorizations needed[1], and (4) a delineation of special aquatic sites (if required by the NWP). The Corps has 45 days to obtain input from USFWS, EPA, and CDFG to complete its review of the notification. If the Corps determines that a nationwide permit is necessary, then the Consultant shall prepare the notification and secure the nationwide permit from the Corps.

3.8.4 Water Quality Certification

If it becomes necessary to obtain a nationwide permit from the Corps, then the Consultant shall obtain a water quality certification or waiver If a nationwide permit is not necessary, then the Consultant shall not obtain a waiver or certification. Condition number 9 of the Corps' NWP program states that a 401 water quality certification must be obtained or waived in order to utilize a NWP The Water Board is likely to scrutinize the proposed project to make certain that the proposed activities do not result in pollution (including excessive sedimentation) to Big Tujunga Wash. For this reason, all information regarding LADPW's National Pollutant Discharge Elimination System (NPDES) permit would be required. Some of the information contained within the NPDES permit would be incorporated into the 401 water quality certification (or waiver) application.

Section 402(p) of the 1987 amendment to the Clean Water Act requires that this project be authorized by a NPDES permit. The primary objectives of the NPDES General Construction Activities Storm Water Permit for the Big Tujunga project are to: (1) reduce excessive erosion potential, (2) minimize excessive sedimentation, (3) prevent other materials used at the construction sites from causing offsite contamination, (4) eliminate non-storm water discharges from the construction sites, (5) install appropriate measures to reduce impacts on waterways from the completed project, and provide a commitment that these measures will be maintained, and (6) establish maintenance commitments on post-construction sites. A Storm Water Pollution Prevention Plan and Monitoring Program will be developed to identify specific pollution prevention measures that will eliminate or control potential point and non-point pollution sources on the site during and following the project's construction phase. These elements of the NPDES permit and Storm Water Pollution Prevention Plan will assist in the preparation of the 401 water quality certification (or waiver).

An application fee of $1,000.00 per acre is required for a certification of water quality (or $500.00 is required if water quality certification is waived). The processing time for the Water Board is usually 60 days after receiving a complete application. If the Water Board has not replied within 60 days after receiving a complete application, then the Corps has the authority to consider certification for water quality to be waived.

3.8.5 CDFG Streambed Alteration Agreement

Unlike the Corps, CDFG regulates not only the discharge of dredged or fill material, but all activities that alter streams and lakes and their associated habitat. CDFG has no abbreviated permitting process comparable to the Corps nationwide permits. A CDFG 1601 streambed alteration agreement is required for all activities resulting in impacts on streambeds and their associated riparian habitats. A streambed alteration agreement would require an application fee of $1,191.00 and would take approximately 44 days to obtain after submitting a complete application to the CDFG (unless extended by mutual agreement

[1] Many Corps districts (including the Los Angeles District) have issued written policy clarifying that their intent is to receive a small version of an environmental assessment with each notification.

between the CDFG and the applicant) The Consultant shall prepare and submit an application for the Streambed Alteration Agreement. In addition, the Consultant shall coordinate with the CDFG regarding any additional information required to secure the Agreement.

3.9 MITIGATION BANKING AGREEMENT

The LADPW purchased the 207-acres Big Tujunga Wash site for the purpose of establishing a means of mitigating for impacts of other LADPW projects. The Corps and the RWQCB each allotted credits to the LADPW for the existing habitats on the site. The allotment of credits (157.6 credits from the Corps and 154 from the RWQCB) was contingent upon the implementation of a number of enhancement measures. The MMP provides the details and implementation strategies for each of the enhancement measures required by the agencies.

The CDFG had indicated their support for the acquisition of the site and the establishment of a conservation bank due to the extreme significance of the onsite biological resources and need for protection and management of the resources. The CDFG recognizes that the Bank would emphasize the preservation, enhancement, and management of onsite resources to compensate for impacts associated with various types of projects undertaken by the LADPW The CDFG has not yet made a decision on the number of credits they will designate for the Mitigation Bank until the management plan was completed. This MMP fulfills the CDFG's requirements for a management plan for the Bank.

In order to establish a method of keeping track of credits used in the bank, the LADPW must enter into a Banking Agreement with the CDFG. This agreement will establish the mechanism for determining available credits and a system for tracking use of these credits. In addition, the agreement will include all of the rules for using the bank as mitigation for other LADPW projects. In the CDFG comments recently submitted in response to the Draft MMP, the CDFG states that a number of restoration and enhancement measures are described in the Draft Plan as potentially optional, based upon receipt of additional credits. The CDFG states they are willing to accept full credit on an acre-for-acre basis for all habitat acreage within the Bank, except the area off Cottonwood Avenue that was mapped as disturbed or non-native grassland. They also state that the Cottonwood Avenue area would need to be restored as proposed in the Draft Plan in order to serve as mitigation, and they would accept full credit on an acre-for-acre basis for the areas mapped as disturbed or non-native grassland once they are successfully restored.

The LADPW shall be responsible for negotiating the terms and conditions of the banking agreement with the CDFG. In addition, the LADPW, in conjunction with the CDFG, shall establish the record keeping in regards to tracking the credits used in the bank. The LADPW, in conjunction with the CDFG, shall also be responsible for modifying the banking agreement if or when any of the optional measures are implemented.

SECTION 4.0 - QUALITY ASSURANCE/QUALITY CONTROL PLAN

4.1 INTRODUCTION

The Quality Assurance/Quality Control (QA/QC) Plan is a critical component of the MMP because it provides the checks and balances for addressing problems as they arise. In addition, it provides an avenue for determining if the Consultants who are implementing the various programs are performing up to the expected standards. The following sections describe important aspects of the QA/QC Plan

4.2 QUALIFIED CONSULTANT TEAM

The most important aspect of the QA/QC Plan concerns the hiring of a qualified consultant team who has experience in implementing the measures required in the MMP Because this will be a high profile project with the agencies and the local communities, it will be heavily scrutinized In addition, it will be subject to legal ramifications if the project violates the endangered species acts. The team shall include individuals or companies from the following disciplines: Environmental/Biological Consulting, Landscape Architecture, and Landscape Contractor The hiring of a qualified consultant team shall be the responsibility of the LADPW

4.3 SPECIFIC SCOPES OF WORK

In order to establish all of the details and schedules for implementation of each enhancement task at the Big Tujunga Wash Mitigation Bank site, the Consultant Team needs to work closely with LADPW to prepare very specific scopes of work for each of the programs. The MMP has provided an extensive amount of detail regarding how to accomplish the implementation and monitoring of the programs. Consequently, the Consultant team will have a good framework to start with for costing and determining the minute details of implementation. During this time, the Consultant Team will be able to identify details that LADPW must decide upon prior to implementation. This process will help to narrow the scopes of work for each program and to ensure that out-of-scope tasks are not performed until they are authorized by the LADPW The identification of specific scopes of work is the responsibility of the LADPW and the Consultant Team.

4.4 CONTRACT CONTINGENCIES FOR NON-PERFORMANCE

In case of non-performance by the Consultant Team or members of the Consultant Team, all contracts between the LADPW and the Consultant Team and between the Prime Consultant and its subcontractors shall contain a clause stating that the contract can be terminated for non-performance Performance bonds for implementation and completion of the construction measures (e.g., prescribed eradication activities, trap construction/placement/maintenance, installation and contracted maintenance of revegetation) will also be required of the Prime Consultant. These measures will protect both the LADPW and the Prime Consultant if the Prime Consultant or a Subcontractor is terminated during the course of the 5-year project The incorporation of this measure is the responsibility of both the LADPW and the Prime Consultant.

4.5 FREQUENT COMMUNICATION

One of the easiest methods of ensuring QA/QC and ultimately the success of the programs is to conduct frequent communication between the LADPW and the Consultant Team and between the Prime Consultant and its Subcontractors. The Prime Consultant should assign a Project Manager who is experienced in managing complex projects and who understands the goals and objectives of the LADPW as far as the Mitigation Bank is concerned In addition, the Prime Consultant's Project Manager should have extensive experience in managing subcontractors and complex budgets. Communication should

also be one of the strong points of the Consultant's Project Manager, not only because they have to keep the LADPW apprised of the status of the overall program, but also because they will have to be a "Goodwill Ambassador" for the LADPW and the Mitigation Bank. The local communities and the equestrian groups have a vested interest in the Mitigation Bank site and thus, there may be certain issues that arise where the Project Manager must meet with these groups to inform them about the status of the project and the paramount use of the Mitigation Bank site.

The establishment of an public and agency advisory committee for the Mitigation Bank raises unique opportunities where the LADPW, the agencies and the public can monitor the status of the project and provide recommendations or suggestions for further enhancing the Bank. In addition, the equestrians and the local communities have expressed interest in partnering to take care of the site Thus, with all of these opportunities to interact with the public, the Project Manager must be adept at listening, understanding, and communicating with the public.

An even more important aspect of communication is the coordination with the USFWS regarding Endangered Species Act issues. If the Santa Ana sucker is listed as threatened by the USFWS, then the Project Manager must be very experienced in conducting Informal Consultation and Conferencing with the USFWS. In addition, the Project Manager must be experienced with the Section 7 process and should have an established relationship with the USFWS in case a Section 7 process must be initiated Communication and good relations are very important throughout the Section 7 process.

4.6 PROGRAM CHECKLISTS

Program checklists that are specifically designed to identify all of the tasks that must be completed during the implementation and monitoring of each of the programs have been developed and are included in this section of the MMP as attachments. These checklists are designed to ensure all aspects of each methodology are implemented correctly The checklists are easy to follow and should be reproduced prior to each year's implementation, maintenance, and monitoring tasks. The checklists shall be included as part of the reporting process (in the implementation and success monitoring reports) to show that the tasks were completed. Completing and implementing the tasks on the checklists is the responsibility of the Consultant.

4.7 SUCCESS CRITERIA

A critical component of the QA/QC Plan is the establishment of the success criteria that were described in Sections 2 and 8 The quality of the programs can be partially assessed by whether or not the success criteria have been achieved at the end of each year If the success criteria are not achieved, then during the preparation of the annual reports, the programs and the performance of the Consultant Team shall be evaluated. If the success criteria are not met due to unforeseen circumstances, then the LADPW and the Consultant Team shall meet and develop a strategy for dealing with the circumstances. In addition, if necessary, contingency measures shall be implemented to correct problems associated with the unforeseen circumstances.

4.8 CONTINGENCY MEASURES

Section 8 includes an extensive list of contingency measures that shall be implemented if various problems arise in each of the enhancement programs. These measures were designed to identify problems early on so mid-course corrections can be made These contingency measures shall be implemented by the Consultant Team if problems arise during the implementation and monitoring phases of the project. The contingency measures provide a valuable tool for QA/QC because problems can be corrected before they become overwhelming. The implementation of the contingency measures is the responsibility of the Consultant Team in coordination with the LADPW

4.9 REPORTING

A comprehensive reporting program has been developed to ensure frequent review of the status and success of the enhancement programs. Frequent maintenance and monitoring reports are required to ensure that regular maintenance of the revegetation and enhancement plantings is conducted. In addition, these reports will identify problems early on so they can be addressed as quickly as possible Construction activities upstream of the Big Tujunga Wash Mitigation Bank (proposed golf course) and onsite (non-native species eradication program) requires the inclusion of a water quality monitoring program. The water quality monitoring program includes quarterly sampling and reports for the purpose of quickly identifying water quality issues that may adversely affect the sensitive fishes on the site These reports will be submitted directly to the agencies so problems can be quickly identified and consultation can occur for the purpose of identifying adequate resolutions to the problems. The annual reports (implementation report and annual performance monitoring reports) will summarize all of the enhancement programs and evaluate the success of the programs. These reports will provide the documentation the agencies require to determine the adequacy of the enhancement project or help these agencies identify offsite sources of water quality problems affecting the site The QA/QC Plan includes an internal technical review of each report prior to submittal to the LADPW and the agencies. The Consultant Team will be responsible for preparing the reports, although it has been suggested that an Independent Consultant conduct the water quality monitoring program.

BIG TUJUNGA WASH MITIGATION BANK

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.

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

BROWN-HEADED COWBIRD TRAPPING MONITORING CHECKLIST

The following checklist and tailored data sheets can serve as the data sheets for field procedures and data collection. Always carry copy of permit. Monitoring shall occur on a daily basis beginning March 15 and ending July 15.

- ❑ Monitors should carry to traps as needed:
  1. notebook/datasheet
  2. net
  3. carrying cage
  4. scissors
  5. water
  6. seed
  7. zip ties (for repairs)
  8. key for lock
  9. bird field guide
  10. plastic trash bag
  11. snake guards
  12. data sheets
- ❑ check that water containers are full and that there is enough seed and other supplies in vehicle.
- ❑ visit every operating trap.
- ❑ for each trap count and record all birds caught etc. on data sheets and in palmtop.
- ❑ notify or arrange with another trapper if there are scheduling conflicts.
- ❑ check for snakes or any other hazards before entering trap.
- ❑ release all non-cowbirds (if unsure leave in trap and ask someone about identification)
- ❑ clip one wing of all new cowbirds caught (only clip cowbirds, if unsure do not clip!)
- ❑ remove all excess cowbirds to carrying cage (> 2m/3f cowbirds/trap).
- ❑ remove all dead birds, bury or bag for later disposal.
- ❑ check that each trap has birdseed, water, clean water dish, and enough perches.
- ❑ check for any holes, gaps in trap, or any vandalism and make repairs when possible.
- ❑ lock trap door when finished.
- ❑ transfer excess cowbirds to traps that need them as decoys, if all traps have 2m/3f, transfer excess cowbirds to holding trap or destroy birds at end of day
- ❑ Destroying cowbirds (carbon monoxide poisoning):
  1. only destroy excess cowbirds after all traps have 2m/3f
  2. be absolutely sure they are cowbirds, if unsure do not destroy!
  3. destroy birds in secluded location
  4. place excess birds in one of the carrying cages
  5. place cage with birds in large trash bag
  6. using zip ties, attach hose to bag with birds and to vehicle tailpipe (with vehicle turned off)
  7. once hose is secure, turn on vehicle and let it run for a few (5) minutes or until their is no more noise or commotion from caged birds inside the trash bag
  8. turn off vehicle and remove hose and cage
  9. remove dead birds from cage, count and record sex and number destroyed, place in freezer bag, label bag (date, contents, numbers, sex)
  10. freezer bag with birds goes in freezer in a designated location
- ❑ End of trapping day:
  1. all data sheets are filled out
  2. vehicle has full water containers and enough seed for the next days trapping
  3. that inside of vehicle is cleaned, trash thrown away, equipment and supplies properly stowed
  4. if vehicle needs it and time permits, take vehicle to carwash
  5. completed data sheets go in appropriate binders
  6. replace used data sheets with blank data sheets
  7. if necessary, leave notes concerning any problem or information for next days trapper
  8. recharge phone if needed, leave car keys with daily notebook
  9. fax a copy of the trapping datasheet to the field project manager

BROWN-HEADED COWBIRD TRAPPING MAINTENANCE CHECKLIST

- ❑ Check traps to ensure that each has:
  1. perching and shade above trap
  2. no holes or gaps that allow birds to escape
  3. lock on trap door
  4. sign on trap with general information
  5. seed dish with seeds
  6. water guzzler with clean water
  7. 10 perches inside trap, above the level of the trap entrance slot
  8. artificial shade if there is none naturally
  9. 2 male and 3 female wing-clipped cowbirds as decoys
  10 all or part of trap floor covered with dirt
  11 trap floor clear of excessive plant growth
- ❑ "Dangerous" animal in trap

  If a hawk or falcon:
  1 do not enter trap
  2. open trap door
  3. from outside of trap, flush bird out of trap
  4. remove any dead birds from trap
  5. set trap up for regular operation
  6. if injured leave alone and notify Fish and Game

  If a rattlesnake:
  1 do not enter trap
  2. open trap door
  3 leave trap w/door open
  4. check trap later that day if possible
  5 let next trapper know about rattlesnake

BIG TUJUNGA WASH MITIGATION BANK

TRAILS ENHANCEMENT PROGRAM CHECKLIST

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

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 as-need basis.
- ❑ Remove overgrowing vegetation from trail paths on as-need basis.
- ❑ Trim low overhanging branches to minimum of 10-feet above ground level on as-need basis.
- ❑ Document any flooding and erosion problems. If unsafe trail conditions occur, temporarily close the trails and notify LADPW Do not re-open trails until the problem has been resolved.
- ❑ Remove any obstructions from the paths on as-need 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-need 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-need basis.
- ❑ Document any differences in the path of trails if they seem altered or new paths "appear " Use field maps, photographs, and descriptive text to identify the location and notify LADPW Restrict these areas from further use through use of signs and barriers.
- ❑ Ensure that reclaimed trails are no longer in use. Modify barriers and signs as needed to prevent the use of reclaimed trails.
- ❑ Remove barriers and restrictive signs from reclaimed trails once area is deemed successful by Restoration Specialist.

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.
- ❑ 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).
- ❑ 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 bated 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.
- ❑ 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.

BIG TUJUNGA WASH MITIGATION BANK

EXOTIC WILDLIFE MAINTENANCE AND MONITORNG 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 a series of both experimental and control stations 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.

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 2 to 3 weeks 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 ERADICATION

- ❑ 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.
- ❑ Conduct quarterly inspections for a minimum of 5 years.
- ❑ 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.

BIG TUJUNGA WASH MITIGATION BANK

COMMUNITY AWARENESS AND INVOLVEMENT PROGRAM CHECKLIST

- ❑ Initiate formation of CAC in July 2000.
- ❑ Prepare letter and send to agencies and key community organizations inviting them to join CAC (late July 2000)
- ❑ Establish CAC and meet formally to discuss plans (mid August 2000)
  - Identify CAC Chairperson
  - Establish communications protocols amongst CAC members
  - Schedule future meeting date(s)
- ❑ Prepare initial newsletter and mail to stakeholders September 2000
- ❑ Prepare fact sheets and post in kiosk, distribute to CAC members (Fall, 2000)
- ❑ Identify community meetings, events, fairs, trail rides where public information materials can be distributed. This can be accomplished by working closely with CAC members, elected officials offices, homeowner and business groups in the area.
- ❑ Work with project landscape architects and technical consultants to establish appropriate signage and kiosks on site. Signs shall be bilingual English/Spanish. Post public information materials and community updates (in kiosks within 1 week of preparation).
- ❑ Contact local schools.
- ❑ Attend onsite meeting with local school personnel
- ❑ Prepare newsletters for distribution in September 2000: March, June, and September 2001
- ❑ Prepare newsletters for distribution in March and September of years 2002-2005
- ❑ Hold quarterly CAC meetings in years 2000-2003
- ❑ Hold bi-annual CAC meeting in years 2004-2005 (March and September)
- ❑ Contact elected officials and agency personnel bi-annually to offer updates on the project (2000-2005)

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.

BIG TUJUNGA WASH MITIGATION BANK

OPTIONAL 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.

BIG TUJUNGA WASH MITIGATION BANK

OPTIONAL EXOTIC WILDLIFE SPECIES ERADICATION PROGRAM CHECKLIST
Note: This checklist applies to all 3 Options for pond reconfiguration

- ❑ Consult with USFWS regarding need for Section 7 Consultation
- ❑ If Section 7 is required, ensure Section 7 Consultation has occurred and obtain a memorandum of understanding.
- ❑ Send request letters to USFWS and CDFG for authorization (obtain verbal authorization to begin process)
- ❑ Receive authorization letters from USFWS and CDFG
- ❑ Purchase all supplies/equipment.
- ❑ For 3 days prior to construction, sample (via gill-netting, seining, and use of baited traps) and remove exotics.
- ❑ During dewatering, gill-netting, trapping, and some seining should occur on a continuous basis in the pond.
- ❑ During dewatering, trapping and seining should occur on a continuous basis in Haines Canyon Creek.

Gill Netting
Ponds -- Prior to and during dewatering

- ❑ After removal of water hyacinth, set nets of varying sizes near habitat features (cattail banks, willow overhangs) and in open water
- ❑ Set two nets across the outflow to minimize downstream movement (into Haines Canyon Creek) of individuals displaced by dewatering activities.
- ❑ Check nets hourly or bi-hourly
- ❑ Remove any native or other species captured.

Seining
Prior to and during dewatering

- ❑ Conduct 3-4 days of seining during dewatering efforts.
- ❑ Conduct 4-5 days of seining per quarterly sampling period.

Ponds

- ❑ As dewatering takes place, use larger seines to remove exotic species.

Haines Canyon Creek

- ❑ Use smaller seines to remove exotic species downstream.
- ❑ Erect block seines across the width of the stream at the upstream and downstream end of a given section (usually 10-12 m 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, and release the native fishes.
- ❑ Conduct during post-construction monitoring efforts.

Electroshocking
Optional in Haines Canyon Creek (prior to and during dewatering and in post-construction monitoring efforts)

- ❑ Use electroshocker (under a mass of tree roots or under boulders) in conjunction with seining.
- ❑ Retrieve fish and tally the capture on data sheets.

Baited Traps - Haines Canyon Creek and ponds (prior to and during dewatering)

- ❑ Bait traps with a fish carcass or punctured can of sardines in oil.
- ❑ Use baited traps of varying sizes and configurations.
- ❑ Submerge in area to be worked
- ❑ Check on a regular basis and remove captured animals.
- ❑ In Haines Canyon Creek, set small minnow traps for capturing crayfish and small sunfish in shallow streams in a variety of locations.
- ❑ In ponds, set large traps for capturing bullhead, sunfish, carp, and crayfish in deeper water in a variety of locations.
- ❑ For 3 days, sample to remove exotics prior to construction
- ❑ Conduct post-construction monitoring efforts in Haines Canyon Creek.

Shooting and Gigging of Bullfrogs(Optional, used only if other control methods prove to be ineffective)

- ❑ Perform gigging at night from a boat with the use of a headlamp.
- ❑ Shoot the bullfrogs at night with a small-caliber weapon or a small-bore shotgun
- ❑ Electroshock post-metamorphic frogs.

BIG TUJUNGA WASH MITIGATION BANK

EXOTIC WILDLIFE MAINTENANCE AND MONITORNG CHECKLIST FOR OPTIONAL PROGRAMS

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 quarterly basis for Options 1, 2, or 3
- ❑ Sample repeatedly at a series of both experimental and control stations 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.

SECTION 5.0 - MAINTENANCE AND PERFORMANCE MONITORING PLAN

5.1 MONITORING IMPLEMENTATION OF HABITAT RESTORATION AND ENHANCEMENT

The implementation monitoring program is designed to ensure that impacts to environmentally sensitive habitat areas are avoided or minimized. The general construction guidelines described in Section 2.0 and Section 3.0 are designed to protect biological resources from direct and indirect construction-related impacts to ensure successful retention of biological values. Direct impacts include erosion, drainage alteration, and soil compaction; indirect impacts include sedimentation to downstream resources and noise. Implementation monitoring will also ensure the successful installation and establishment of the restoration plantings.

Implementation monitoring will be the responsibility of the Prime Consultant The implementation monitor shall be a biologist/restoration ecologist or specialist familiar with the biology and ecology of southern California plant communities and have experience in horticultural practices commonly used for habitat restoration and revegetation. The monitor will be responsible for monitoring the site during installation procedures. The restoration monitor will be present at all preconstruction meetings and shall be onsite during all construction-related activities. The monitor will be responsible for managing implementation of all resource enhancement and restoration plans and shall also manage all resource specialists required for project implementation.

Prior to commencement of grading or any construction-related vegetation removal, the monitor will stake, fence, flag, and sign sensitive habitats or habitat features approved for protection. The monitor shall prepare a daily construction monitoring report outlining observed activities and indicating compliance with approved performance standards. The daily report will also contain recommendations concerning remedial actions needed to correct any identified deficiencies. A sample of the daily report form is included as Figure 5-1

The implementation schedule for enhancement of the riparian area is as follows:

- Giant reed and other noxious weed removal (October-November);
- realigning trails in the riparian zone (October-November); and
- planting of cuttings and container stock (November-December).

The implementation schedule for the optional oak/sycamore planting is as follows:

- Site preparation, including erosion and weed control;
- installation of temporary irrigation system;
- container plantings of sapling oaks and sycamores, and other container grown plants, and
- hydroseeding.

The schedule for implementation of the enhancement and optional revegetation planting is included in the Implementation and Monitoring Schedule (Figure 3-1)

5.1.1 Responsible Parties

The consultant hired to implement the MMP will be responsible for monitoring during the installation of the enhancement and revegetation programs, and will report to the LADPW The contact person is.

Ms. Patricia Wood
Water Resources Division
Los Angeles County Department of Public Works
900 S Fremont Avenue
Alhambra, California 91803-1331
(626) 458-6131

DAILY IMPLEMENTATION MONITORING REPORT

Project. **BIG TUJUNGA WASH MITIGATION BANK**
Location
Project No

Date Time in. Time out

Monitor Working day

DESCRIPTION OF WORK ACTIVITY OBSERVED

By _____ Page ____ of ____

Figure 5-1

5.2 MAINTENANCE MONITORING

Maintenance of the site shall be the responsibility of the Consultant Team and will be performed with the knowledge and oversight of the native Restoration Specialist. The native Restoration Specialist shall be responsible for overseeing maintenance of the site and preparing maintenance reports. The Restoration Specialist shall be a professional (e.g., biologist, landscape architect, horticulturist) knowledgeable of the physical requirements of native vegetation and experienced in installation and maintenance of native habitats.

5.2.1 Irrigation

The riparian enhancement program may not require supplemental irrigation. If supplemental irrigation is required, the landscape contractor shall be responsible for irrigating the mitigation plantings.

5.2.2 Fencing

The Consultant or Consultant Team shall be responsible for installation and maintenance of the fence on the south side of the Tujunga Ponds. Additionally, protective measures such as tree tubes and placement of cages or screens around individual plants shall be used in areas subject to trampling, herbivory, or other threats as determined by the Restoration Specialist. All protective devices shall be maintained through completion of the monitoring period or until removal is authorized by the Restoration Specialist. LADPW will maintain the perimeter fencing around the outside of the Mitigation Bank Site.

5.2.3 Vandalism

The landscape contractor shall note any instance of vandalism and report occurrences to the Restoration Specialist within 24 hours. Recommendations for the replacement of damaged plants and their protection shall be developed by the Restoration Specialist and reported to the LADPW. The Consultant or Consultant Team shall be responsible for plantings replacement due to vandalism during the five-year MMP

5.2.4 Weed Control

Weeds shall be controlled in the revegetation and restoration areas by the landscape contractor for a minimum of 5 years or until native plantings are well enough established to prevent detrimental competition of invasive species with the mitigation plantings for water, nutrients, light, and space. All weeds shall be removed using hand devices, such as mechanical weed whips. In cases where mechanical removal is ineffective, the approved herbicides utilizing the appropriate methodologies shall be applied

Target non-native species include, but are not limited to, the following:

Scientific Name	Common Name
Arundo donax	giant reed
Brassica nigra	black mustard
Bromus diandrus	ripgut grass
Bromus madritensis ssp. *rubens*	red brome
Cirsium vulgare	bull thistle
Cortaderia selloana	pampas grass
Cyperus involucratus	umbrella sedge
Eichhornia crossipes	water hyacinth

Scientific Name	Common Name
Eucalyptus sp.	eucalyptus
Foeniculum vulgare	sweet fennel
Myoporum laetum	myoporum
Nicotiana glauca	tree tobacco
Pennisetum setaceum	fountain grass
Ricinus communis	castor bean
Schinus molle	Peruvian pepper tree
Schinus terebenthifolius	Brazilian pepper tree
Silybum marianum	milk thistle
Spartium junceum	Spanish broom
Tamarix ramosissima	tamarisk
Washingtonia robusta	Mexican fan palm
Xanthium strumarium	cocklebur

5.2.5 Replacement Plantings and Seeding

Significant loss of container plant material or cuttings shall require plant replacement by the Consultant Team. Replacement will depend on the overall coverage of plants and the relative frequency of the species in comparison to the performance criteria set forth in Section 3.0

All replanting shall be conducted from October through December of each year, as necessary

5.2.6 Trash Removal

Following rain events, trash and debris may enter the site from storm drains. Visitors may also deposit trash. Following initial removal of the trash during site preparation, additional trash and debris in the restoration areas shall be removed by the Consultant Team during maintenance and monitoring inspections. Removal of trash around the ponds and along established trails shall be the responsibility of volunteer sponsors.

5.2.7 Trail Monitoring

Site maintenance and monitoring surveys by the Consultant shall include inspection of all trails. Trash and debris shall be removed during these surveys as well as by equestrians or pedestrians who are assisting with policing the site. Trash shall be removed by hand and placed in the onsite trash receptacles. The monitor shall note the locations of overhanging branches. Vegetative obstructions on established trails will be trimmed to an approximately 10-foot clearance by the Consultant Team. All posted signs, kiosks, trash receptacles, portable toilets, trail barriers, and trail fencing shall be assessed during the site inspections to verify that they are present in good repair and working order as well as to ensure their effectiveness. If negative impacts to native plant and wildlife species are noted along the recreational trails, then it may be necessary to modify the trails closure plan. It is the responsibility of the landscape contractor to take the necessary corrective actions as recommended by the Project Biologist should there be a problem with any of these items. The monitor shall replenish the supply of brochures that are distributed from the kiosk according to the schedule in the Public Awareness Program

In addition, the monitor is responsible for closure of the reclaimed trails. The reclaimed trails shall be surveyed monthly by the Project Biologist to ensure that these areas are no longer utilized as trails. If evidence of foot and/or horse traffic is observed, it is the responsibility of the landscape contractor to reinforce restrictions and barriers to these areas as recommended by the Project Biologist. Any evidence of trespassing on closed trails shall be documented in the success monitoring reports.

5.2.8 Responsible Parties

The prime consultant hired by LADPW to implement Phase II of the MMP will be responsible for maintenance of the mitigation site until the success criteria are met.

5.2.9 Schedule of Maintenance Inspections

The Restoration Specialist will be responsible for inspecting the mitigation sites on a regular basis and, if necessary, providing recommendations to the landscape contractor for changes in the maintenance program. At minimum, the following schedule of maintenance inspections for all plantings and mitigation areas shall be observed:

- monthly inspections during the first year after planting (which includes the 120-day establishment period),
- quarterly inspections during the second year following planting, and
- semiannual inspections after the second year through the 5th year or until performance standards have been met.

The schedule for implementation of the enhancement and optional revegetation planting is included in the Implementation and Monitoring Schedule (Figure 3-1)

5.2.10 Maintenance Reports

Monthly maintenance reports will be submitted to LADPW by the restoration specialist within 5 days of the site visit. Enhancement and revegetation maintenance activities will be summarized and included in the Final Implementation Report. This report will include success monitoring and detailed descriptions of what was completed for each of the programs. During the second year, quarterly reports shall be prepared and submitted to LADPW within 1 month of completing the quarterly inspections. Similarly, semiannual reports shall be submitted to LADPW within 1 month of completing the semiannual inspections.

5.3 PERFORMANCE MONITORING

5.3.1 As-Built Conditions

The first step in the monitoring phase of the program will be to perform an "As-Built Assessment" documenting the actual project conditions on the site immediately upon completion of the installation. This assessment will be performed by the Restoration Specialist and will check the site for compliance with the mitigation plan's technical design criteria, the Corps and Water Board pursuant to Section 404 and 401 of the Clean Water Act and CDFG pursuant to Section 1601 of the California Fish and Game Code permit conditions, and project objectives. Data pertaining to the following factors shall be collected by the Restoration Specialist and compared with the detailed mitigation construction documents:

- site location,
- site topography and morphometry;
- hydrology (flow patterns, drainage area, water depth),
- substrate (soil source, texture),
- water quality;
- plant condition, coverage, and species composition. and
- irrigation system.

Any differences found between the original design and the as-built conditions will be fully assessed and documented by the Restoration Specialist through field maps, photographs, and descriptive text. It is

expected that some modifications of the original plan will be deliberate and some will be due to unforeseen site conditions that became evident during construction. Any deliberate changes in the plan affecting regulatory compliance or cost shall be justified to, and accepted in writing by, the Restoration Specialist and the landscape contractor before the as-built conditions are approved. In addition, any deliberate changes in the plan shall be justified to and approved by the LADPW before implementation Recommendations for corrective measures shall also be made by the Restoration Specialist at the conclusion of the as-built assessment.

A report of the "As-Built Conditions" shall be submitted to LADPW within 6 weeks of LADPW acceptance of site preparation and planting as completed, describing as built status of the mitigation project If grading, planting and erosion control measures are not completed within six weeks of each other, separate reports for each activity will be submitted.

5.3.2 Performance Criteria

Section 3.0 indicates the performance criteria to be met for the enhancement plantings in the riparian areas. Section 9.0 indicates the success criteria for the optional oak/sycamore woodland and the Tujunga Ponds areas. Performance monitoring will document the growth rates, coverage, and other general "success" attributes of the planted areas. The Restoration Specialist shall be responsible for performance monitoring of the mitigation areas.

Use of habitat by wildlife within the created and enhanced riparian areas shall be monitored by the Restoration Specialist. Sections 3.0 and 9.0 provide the performance criteria to be met for wildlife

The Restoration Specialist shall prepare an annual report for submittal to the LADPW Performance and maintenance monitoring shall continue for 5 years after planting. Monitoring reports shall present an overview of the revegetation effort and specifically address monitoring methods, plant survival, percent cover, height of tree and shrub species, and number of each species replanted. Photos from designated photo stations shall also be included.

5.3.3 Functional Analysis Monitoring Methods

Riparian Habitat

A modified version of the hydrogeomorphic (HGM) approach will be used for the functional assessment of the riparian habitat. 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 Nine evaluation variables were used for the functional assessment of riparian habitat.

Riparian Habitat
- Cover (COV)
- Structural Diversity (STD)
- Contiguity (CON)
- Urban Encroachment (URB)
- Percent Exotic Vegetation (EXO)

Hydrologic
- Hydrologic Regime (REG)
- Characteristics of Floodprone area (FPA)
- Micro and Macrotopographic Complexity (TOP)

Biogeochemical
- Available Organic Carbon (CARB)

In addition to these variables, which evaluate wetlands function, three additional variables were added which address wildlife values. Although it is implicit in HGM that if the functions are high, the values will be present, for the purpose of comparison with baseline values it was considered desirable to directly evaluate wildlife values. The wildlife evaluation variables are·

Wildlife Values

Rareness (RAR)
Wildlife Species Richness (RIC)
Presence of Habitat Specialists (SPE)

The definitions and scores for each of these evaluation variables is presented in Table 5-1

Table 5-1
Riparian Habitat and Hydrogeomorphic Functional Analysis Variables

Value	Variables
	Riparian Habitat-Structural Diversity
0.0	Site permanently converted to land use which will not be able to support native riparian vegetation, such as housing, agriculture, or concrete channel.
0.2	No existing riparian vegetation (e.g. covered with annual grasses and scrub, bare ground).
0.4	Vegetated areas of the site contain sparse, scattered, patchy, or remnant riparian vegetation which is immature and/or lacks structural (vertical) diversity, and may have exotic plants interspersed in riparian areas.
0.6	The patches of riparian vegetation on the site contain riparian trees and/or saplings (i.e. perennial dicots), but contain no, or poorly developed shrub understory.
0.8	The patches of riparian vegetation on the site contain riparian trees and saplings, plus a well developed native shrub understory.
1 0	The patches of riparian vegetation on the site are structurally diverse. They contain riparian trees, saplings, and seedlings, as well as developed native shrub understory.
	Riparian Habitat - Cover
0.0	Site permanently converted to land use not able to support native riparian vegetation, such as housing, agriculture, or concrete channel.
0.2	No existing riparian vegetation (e.g. covered with annual grasses and scrub, bare ground).
0.4	Patches of monotypic riparian vegetation covering up to 50 % of the site, interspersed among grasses, exotic plants, or bare ground.
0.6	Patches of diverse riparian vegetation covering up to 30 % of the site, interspersed among grasses, exotic plants, or bare ground; AND/OR greater than 50 % of the site covered with monotypic patch(es) of riparian vegetation, interspersed among grasses, exotic plants, or bare ground.
0.8	Diverse riparian vegetation covering between 30 % and 75 % of the site, e.g. strips or islands of riparian habitat interspersed in open space.
1 0	Diverse riparian vegetation (e.g. at least 3 different genera of riparian vegetation present) covering between 75 % and 100 % of the site.
	Contiguity of Habitat
0.0	Habitat on site is completely isolated from similar habitat and surrounded by permanent barriers to wildlife movement (e.g. houses).
0.4	Habitat on site is completely isolated from similar habitat by dirt roads or other open space, but there are no permanent barriers to wildlife movement

Value	Variables
0.5	Habitat is partially continuous with similar habitat upstream or downstream of the site, but large open spaces or areas frequented by humans may inhibit wildlife movement.
0.8	Habitat is continuous with similar habitat either upstream or downstream of the site.
1.0	Habitat is continuous with similar habitat upstream and downstream of the site.
	Urban Encroachment
0.0	Habitat is completely isolated from similar habitat due to urban development.
0.2	Habitat has one side contiguous with similar habitat, with remaining sides surrounded by urban development.
0.4	Habitat has two adjacent sides with similar habitat, other remaining sides surrounded by urban development.
0.6	Habitat has two opposite sides with similar habitat, other remaining sides surrounded by urban development.
0.8	Habitat has one side open to urban development.
1.0	Habitat completely surrounded by similar habitat with no evidence of urban development.
	Percent of Exotic Invasive Species/Vegetation
0.0	Site is covered by pure stands of exotic invasive vegetation
0.2	Site is covered by more than 75 % exotic invasive vegetation
0.4	Site is covered by 51 - 75% exotic invasive vegetation
0.6	Site is covered by 26 - 50% exotic invasive vegetation
0.8	Site is covered by 10 - 25% exotic invasive vegetation
1.0	Site is covered by less than 10% of exotic invasive vegetation
	Hydrologic Regime of Riparian Zone
0.0	No regular supply of water to the site. Site not associated with any water source, surface drainage, impoundment, or groundwater discharge.
0.2	Water supply to the site is solely from artificial irrigation (e.g. sprinklers, drip irrigation). No natural surface drainage, natural impoundment, groundwater discharge or other natural hydrologic regime.
0.5	Site sustained by natural source of water, but is not associated with a stream, river, or other concentrated flow conduit. For example, the site is sustained by groundwater, or urban runoff. There is no evidence of riparian processes, such as overbank flow or scour or deposition.
0.7	Site is within or adjacent to an impoundment on a natural water course which is subject to fluctuations in flow or hydroperiod.
1.0	Site is within or adjacent to a stream, river, or other concentrated flow conduit which provides the primary source of water to the site. The site contains some evidence of riparian processes such as overback flow or scour or deposition.
	Characteristics of Flood-prone Area
0.0	Channel is contained in a concrete-lined channel, culvert, etc
0.2	Channel has an earthen bottom; however it is structurally confined (e.g. riprap or concrete sideslopes).
0.4	Channel has an earthen bottom and earthen side slopes: however, it is incised or confined such that the flood prone area would be subject to overbank flow only during extreme flow events (e.g. greater than a 50 year flood event).
0.6	Channel has an earthen bottom and earthen side slopes and is mildly incised or confined such that the flood prone area would be subject to periodic overbank flow (i.e. during a ten year flood event).

Value	Variables
0.8	Site is part of a flood plain which provides an opportunity for overbank flow during moderate flow events (i.e. during a two to ten year flood event).
1.0	Site is a natural channel with little to no evidence of incision or confinement.
	Micro and Macro Topographic Complexity
0.0	Channel is contained in a concrete-lined channel, culvert etc., which has no natural micro or macro topographic features.
0.2	Flood prone area is characterized by a homogenous, flat earthen surface with little to no micro and macro topographic features.
0.6	Flood prone area contains micro and/or macro topographic features such as ponds, hummocks, bars, rills, large boulders, but is predominantly homogeneous or flat surface.
1 0	Flood prone area is characterized by micro and macro topographic complexity such as pits, ponds, hummocks, rills, large boulders, etc.
	Available Organic Carbon
0.0	Site is contained in a concrete-lined channel that contains no detritus.
0.2	Site is contained in a concrete-lined channel that contains some detritus.
0.4	Site contains less than 5% relative cover of debris, leaf litter or detritus in channel.
0.6	Site contains between 5% and 25% relative cover with debris, leaf litter or detritus.
0.8	Site contains between 26% and 60% relative cover with debris, leaf litter or detritus.
1.0	Site contains over 60% relative cover with debris, leaf litter or detritus.
	Rareness - Listed and sensitive species
0.0	No listed or sensitive species observed or known to occur on site, no suitable habitat.
0.2	No listed or sensitive species observed or known to occur on site; limited suitable habitat exists.
0.4	No listed or sensitive species observed or known to occur on site. Suitable habitat present on the site.
0.6	Listed threatened or endangered species and/or sensitive species reported on the site in the past but not observed during the 1997 surveys. Suitable habitat still present on the site.
1.0	One or more sensitive or listed endangered or threatened species observed on the site during the 1997 surveys. Suitable habitat present on the site.
	Terrestrial Wildlife (Vertebrate) Species Richness
0.0	Less than 10 species of wildlife detected during the surveys.
0.2	Between 11 and 30 species of wildlife detected during the surveys.
0.5	Between 31 and 50 species of wildlife detected during the surveys.
0.7	Between 51 and 60 species of wildlife detected during the surveys.
1.0	Over 60 species of wildlife detected during the surveys.
	Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife)
0.0	No habitat specialists observed on the site.
0.2	1 to 5 habitat specialists observed on the site.
0.6	5 to 10 habitat specialists observed on the site
1.0	Greater than 10 habitat specialists observed on the site.

Aquatic Habitat

For the aquatic habitat model, most of the evaluation variables were taken from the California Department of Fish and Game Stream Assessment Procedures (CDFG 1996). The aquatic habitat model developed for this project does not use the entire Stream Assessment Procedure but utilizes habitat parameters from the CDFG considered most applicable for the Big Tujunga Wash aquatic habitats. Those habitat parameters are In-stream Cover (INS), Epifaunal Substrate (EPI), Sediment Deposition (SED), Bank Vegetative Protection (BVP) and Bank Stability (BST). In addition, Vegetative Roughness (RUF) from the HGM model was used for the aquatic habitat assessment because it applies to the channel only. Finally, a variable was added for exotic aquatic vertebrates (EAV) because non-native fishes and bullfrogs were considered to have a large impact on native species in the Big Tujunga Wash aquatic system. Predatory exotic vertebrates such as largemouth bass and bullfrogs directly affect native populations by predation. Non-predatory exotic vertebrates can also impact native species by competition. For example, the introduced red shiner is thought to have the potential to competitively exclude arroyo chub (Moyle et al 1995). The definitions for scores for all of the aquatic habitat evaluation variables are shown in Table 5-2.

Table 5-2
Aquatic Functional Analysis Variables

Value	Variables
	In-stream Cover
0.0	Less than 10% mix of stable habitat; lack of habitat is obvious.
0.2	11% to 30% mix of stable habitat; habitat availability less than desirable.
0.6	31% to 50% mix of stable habitat; adequate habitat for maintenance of wildlife populations.
1.0	Greater than 50% mix of snags, submerged logs, undercut banks or other stable habitat.
	Vegetation Roughness (Channel Only)
0.0	Channel is contained in a concrete-lined channel with little to no support of vegetation.
0.2	Site can support grasses, forbs, and other herbaceous plants.
0.4	Channel supports less than 5% cover of herbaceous or other vegetation.
0 6	Channel supports between 5% and 25% relative cover of any type of vegetation.
0.8	Channel supports 26% to 60% relative cover of any type of vegetation.
1.0	Channel supports greater than 61% relative cover of any type of vegetation.
	Epifaunal Substrate
0.0	Riffles or runs virtually nonexistent; large boulders and bedrock prevalent; cobbles lacking.
0 3	Run area may be lacking; riffle not as wide as stream and its length is less than 2 times the stream width; gravel or large boulders and bedrock prevalent, some cobble present.
0.7	Riffle is as wide as stream but length is less than two times width; abundance of cobble; boulders and gravel common.
1.0	Well-developed riffle is as wide as stream and length extends two times the width of stream; abundance of cobble.
	Sediment Deposition
0 0	Heavy deposits of fine material, increased bar development, more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
0.3	Moderate deposition of new gravel, coarse sand on old and new bars 31% to 50% of the bottom affected; sediment deposits at obstruction, constriction, and bends; moderate deposition of pools prevalent.

Value	Variables
0.7	Some new increase in bar formation mostly from coarse gravel; 5% to 30% of the bottom affected; slight deposition in pools.
1 0	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.
	Bank Vegetative Protection
0.0	Less than 50% of the streambank surfaces covered by vegetation, disruption of streambank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height, bare soil common.
0.3	50% to 70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.
0.6	71% to 90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.
1 0	More than 90% of the streambank surfaces covered by native vegetation, including trees understory shrubs or nonwoody macrophytes; vegetative disruption, through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.
	Bank Stability
0.0	Unstable; many eroded areas; "Raw" areas frequent along straight sections and bends; obvious bank sloughing; 60 to 100% of bank has erosional scars.
0.3	Moderately unstable; up to 60% of banks in reach have areas of erosion, high erosion potential during floods;
0.7	Moderately stable; infrequent, small areas of erosion mostly healed over.
1 0	Banks stable/ no evidence of erosion or bank failure; little potential for future problems.
	Exotic Aquatic Vertebrates
0.0	Predatory aquatic exotic vertebrates (largemouth bass, bullfrogs) almost entirely dominant, native aquatic vertebrates almost entirely absent.
0.2	Predatory exotic aquatic vertebrates dominant, few native aquatic vertebrates present.
0.6	Exotic aquatic vertebrates about equal in abundance to native aquatic vertebrates.
0.8	Exotic aquatic vertebrates present but aquatic vertebrate fauna dominated by natives.
1.0	No exotic aquatic vertebrates observed, fauna entirely native.

5.3.3.1 Functional Analysis Data Sampling Methodology

Riparian Habitat

Four of the habitat and hydrologic evaluation variables apply to the site as a whole and do not require the collection of additional field data. These criteria are Contiguity (CON), Urban Encroachment (URB), Cover (COV), and Characteristics of the Floodprone Area (FPA) These criteria are scored based on the overall characteristics of the Big Tujunga Wash Mitigation Bank Site. In addition, the three evaluation variables developed to represent wildlife values, Rareness (RAR), Wildlife Species Richness (RIC) and Presence of Habitat Specialists (SPE), was based on wildlife species list for the area (Chambers Group 1998) The evaluation criteria that need additional field sampling are Structural Diversity (STD), Percent Exotic Vegetation (EXO), Micro and Macro Topographic Complexity (TOP), and Available Organic Carbon (CAR)

Structural Diversity and Percent Exotic Vegetation will be scored primarily from measurements made using the point-centered quarter method (Mueller-Dombois and Ellenberg 1974) In this method of vegetation sampling, the distance to the mid-point of the nearest tree and the nearest shrub from the sampling point is measured in four directions (one in each of the four quarters established at the sampling point through a cross formed by two perpendicular lines through the point). This method yields quantitative data for number of species, density of each species and of shrubs and trees (vegetation layers). These data can then be used to derive scores for STD and EXO. In addition, at each point a transect will be done to determine the density of topographic features. For the purpose of this analysis, a topographic feature is defined as a feature (boulder, pit, hummock etc.) that is greater than one foot in height size The transect will be either the distance to the farthest tree or shrub measured by the point-centered quarter method or a 10 meter (32.7 ft) transect through the point, whichever is greater Because a tape measure will be laid out to measure the distance to the nearest tree or shrub in each quarter, this measurement will be used as the transect line when it is long enough to measure density of features. However, in dense riparian brush, this distance may be very short In that instance, a separate 10-meter (32.7 ft) transect to count topographic features will be conducted. Finally, at each sampling point a 1-square meter (10.8 sq ft) quadrat will be established for seedling and sapling counts (part of score for STD and EXO) and to measure cover of debris, leaf litter, and detritus (CARB).

A stratified random sampling scheme will be used to avoid biased data collection. The Big Tujunga Wash site will be divided into a grid of 300 by 300 ft squares. This grid will be drawn by hand on an acetate overlay placed over an aerial photograph of the Big Tujunga Wash site. Each square is numbered, and using a random numbers table, ten squares will be selected in the willow riparian habitat along Haines Canyon Creek and three squares will be selected in the Tujunga Ponds area. Within each square two sampling points will be selected. The first point will be selected by walking into the approximate center of the predetermined square, and then randomly selecting a compass direction and number of paces. The investigators will then walk the selected number of paces in the selected compass direction. That point will become the center of the point-centered quarter measurements, the topographic features transect, and the one-meter square quadrat. The second point in the square will be determined by walking a random number of steps in a random compass direction from the first point. Using this sampling scheme, 26 meter-square quadrats, 26 transects, and 104 trees and 104 shrubs in the riparian and pond subareas of Big Tujunga Wash will be conducted or counted. If water is released into the Big Tujunga Wash on a regular basis, an additional 10 squares will be selected within this habitat and a separate functional analysis performed to evaluate changes in the wash habitat.

Two classifications of vegetation (trees and shrubs) will be included in the point-centered quadrat measurements in the riparian habitat. The distance to the closest tree, defined as a woody plant of average to tall height originating from a single base, will be measured in each quadrat. Giant wild reed will be included in the definition of a tree because its physical structure more closely resembles a tree than a member of the grass family to which the species actually belongs. The distance to the nearest shrub, defined as a plant of small to medium height with a woody base, will also be measured for each quadrant. Young individuals of the genus *Salix* will be considered a shrub if its growth pattern is multi-branched at the base and the individual has not attained a height over 2 meters.

The functional analysis of riparian and aquatic habitats on the site will be accessed during the annual performance monitoring visits. The Project Biologist will be responsible for collecting and analyzing the data. Documentation will be provided in the form of standardized data sheets. An example of the Functional Analysis Data Sheet for the riparian habitat at the Big Tujunga Wash Mitigation Bank site may be found in Figure 5-2 The Functional Analysis will be included as a section of the annual performance report submitted to the LADPW

Aquatic Habitat

For aquatic habitat, the score for the exotic aquatic vertebrate variable (EAV) will be derived from a fish sampling conducted by the consultant hired to implement Phase II of the MMP The other aquatic habitat evaluation variables (INS, EPI, SED, BVP, BST, and RUF) will be measured in the field by the biologist(s) conducting performance monitoring.

BIG TUJUNGA WASH MITIGATION BANK
Functional Analysis Data Sheet – Riparian Habitat

Date _____ Field Crew _____

Sample Plot No _____ Location _____

Point-Quarter Data:

¼	Tree species	Ht. Cat.[1]	Distance (m)	Cover[2] (m)	Shrub species	Distance (m)	Cover[2] (m)
1							
2							
3							
4							

[1]Height Categories: 1 = <2m, 2 = 2-4m, 3 = >4m
[2]Diameter

Square-Meter Quadrat Data:

% Cover debris / leaf litter, etc:_____ % Cover annual grasses _____

No of seedlings/saplings: _____

Topographic Complexity Transect Data:

No of topographic features > 1 foot tall _____ Transect Length._____(m)

Comments:

Figure 5-2

Stream segments in which the aquatic habitat variables will be measured will be selected using a stratified random method to prevent bias. Haines Canyon Creek will be divided into 200-foot numbered segments. Five sampling segments will be selected using a random numbers table. If water is released into the Big Tujunga Wash so that perennial flow is reestablished, an additional five segments will be selected within the Wash and a functional analysis performed to evaluate changes in the aquatic habitat of the Wash. Within each segment, Instream Cover (INS), Epifaunal Substrate (EPI), sediment deposition (SED), Bank Vegetative Protection (BVP), and Bank Stability (BST) will be quantified for a distance of 50 feet upstream and 50 feet downstream of the stream crossing point. Vegetation Roughness (RUF) in the channel will be measured by estimating vegetative cover in three 1-square meter (10.8 sq ft) quadrats; one near the north bank, one in the center of the channel, and one near the south bank.

In-stream cover will be determined by estimating the percentage of stable substrate (longs, snags, boulders, undercut banks, etc.) 50 feet upstream and 50 feet downstream from the sample point. Vegetation roughness will be determined by measuring the percentage of vegetation within the channel in 1 square meter (10.8 sq ft) quadrats across the stream channel. The score for Epifaunal Substrate will be determined by counting the number of riffles, pools and runs 50 feet upstream and 50 feet downstream of the sampling point, measuring the length and width of riffles relative to the width of the stream, and estimating the percentage of bottom covered by rubble Sediment deposition will be measured by estimating the percentage of the bottom that was covered by sediment and by counting the number of sand bars 50 feet upstream and 50 feet downstream from the sampling point. Bank Vegetative Protection will be measured by determining the percentage of each bank covered by vegetation 50 feet upstream and 50 feet downstream of the sampling point and by estimating the percentage of the vegetation on each bank that showed evidence of disruption. Finally, Bank Stability will be determined by estimating the percentage of each bank 50 feet upstream and 50 feet downstream from the sampling point that was eroded. The score for exotic aquatic vertebrates will be determined from the fish sampling done by the consultant hired to implement Phase II of the MMP

The functional analysis of riparian and aquatic habitats on the site will be accessed during the annual performance monitoring visits. The Project Biologist will be responsible for collecting and analyzing the data. Documentation will be provided in the form of standardized data sheets. An example of the Functional Analysis Data Sheet for the aquatic habitat at the Big Tujunga Wash Mitigation Bank site may be found in Figure 5-3. The Functional Analysis will be included as a section in the annual report submitted to the LADPW

5.3.4 Revegetation and Enhancement Performance Monitoring Methods

Monitoring of the enhancement and revegetation programs will be performed by the Restoration Specialist. The Restoration Specialist shall be a plant ecologist, native landscape horticulturist, or other professional qualified to assess the performance of the habitat establishment efforts and recommend corrective measures, if needed.

Performance monitoring of vegetation within the revegetation areas will generally include (1) estimation of total percent cover by desired and weedy (undesired) species for all mitigation areas through visual reconnaissance, and (2) detailed analysis of growth, cover, height and viability through a minimum of 5-percent sampling of each plant palette within the mitigation areas using point transect methods.

The field sampling procedures to be utilized will be based on the protocol established by the California Native Plant Society (Sawyer and Keeler-Wolf 1995) Fifty-meter-long (164.0 ft) point-transect lines will be established in the areas to be sampled. At each 0.5 meter (1.6 ft) interval along the transect, a point will be projected vertically into the vegetation using a fiberglass rod. Each species intercepted on the rod will be recorded and classified according to vegetation layer Three layers will be identified including a ground layer for vegetation less than 0.5 (1.6 ft) meter in height, a shrub layer for vegetation 0 5 meter to 2 meter (1.6 ft to 6.6 ft) in height, and a tree layer for vegetation over 2 meters (6.6 ft) Coverage of individual species will be determined by dividing the number of hits for a species by the total number of hits for the layer To avoid bias, transect lines will be established based on compass headings.

BIG TUJUNGA WASH MITIGATION BANK
Functional Analysis Data Sheet – Aquatic Habitat

Date. _____ Field Crew: _____

Reach. _____ Station._____Comments:_____

Cover - % Stable Habitat:

Upstream	Downstream

Roughness - % Plant Cover

North Bank	Center	South Bank

Epifaunal Substrate:

Criteria	Upstream	Downstream
Riffles and runs present		
% cobble bottom		
Riffle length		
Riffle width		
Stream width		

Sediment Deposition:

Criteria	Upstream	Downstream
% bottom affected by sedimentation		
# of pools		
# of bars		

Vegetation Protection:

Criteria	Upstream No.	Upstream So.	Downstream No.	Downstream So.
% of streambank covered by vegetation				
Evidence of disruption				

Bank Stability:

Criteria	Upstream No.	Upstream So.	Downstream No.	Downstream So.
% erosion				

Figure 5-3

Plant vigor, recruitment, and patterns of growth within enhanced and reference riparian sites will be noted and documented along with the quantitative performance criteria described in Section 3.0 Aggregations of individual plants or species into stands or zones can provide important information relating to (1) gradients in physical parameters within the site, or (2) interactions with neighboring species (including wildlife). Photographic records will be kept of all mitigation areas for purposes of comparing earlier and later stages of plant establishment and growth. Set photo location points will be utilized for each survey for consistency in photographic comparisons. Documentation will be provided in the form of standardized data sheets, descriptive text, maps, and photographs. An example of the standardized field data sheet for the point transect method may be found in Figure 5-4.

Health of planted trees will be assessed on an annual basis near the end of the wet season (i.e., mid-spring). All trees within the sampled quadrants that shall be established by the Landscape Contractor will be measured and assessed as to their current height, change in height, crown cover, seed production, and overall health and appearance Seven general health categories to be used during tree monitoring are described below

- **Live** - tree is apparently in good condition; leaves are green; no symptoms of wilting, die back, or chlorotic leaf appearance.
- **Stressed** - tree appears to be in a generally poor condition; chlorotic leaves, wilting, and leaf drop.
- **Tip Die-Back** - main stem is in good condition, but apical portions are in very poor condition, wilting and die-back symptoms.
- **Basal Sprouts** - main stem is dead, but new growth from stem base or root stock
- **Not Found** - saplings may not be found during a particular sampling period. Saplings not found during two successive sampling periods will be counted as dead.
- **Apparently Dead** - general appearance of stem is dry and brittle; no live wood observed; no observable green foliage.
- **Dead** - normally applied to trees classified as "apparently dead" during the preceding sampling period or in cases where a previous observation indicated that the specimen was in such poor condition that survival was unlikely

5.3.5 Wildlife Monitoring Surveys

As discussed in Section 3, the use by wildlife of the site will constitute evidence that the revegetation site is proceeding and providing good habitat values. The table in Section 3.1.2 lists the target wildlife species deemed to be good indicators of habitat development. The annual reports shall include the records of those target wildlife species observed on the site The following are considerations relating to habitat function that will be used in assessing wildlife usage of the site:

- evidence of use of the site for reproduction through direct observations of native amphibian larvae, breeding tree frogs, presence of territorial males during breeding season, nests, litters, or young of the year; and
- evidence of food chain support through direct (e.g., documented observation of heron eating gopher or frog, white-tailed kite taking vole, rabbit-browsed rushes, caterpillar-eaten herbs) and indirect (e.g., scat, owl pellets, presence of appropriate or target species within created habitat) observations.

CALIFORNIA NATIVE PLANT SOCIETY
CALIFORNIA PLANT COMMUNITIES FIELD DATA FORM
See code list for italicized fields
Rev. 95/05/19

Temporary plot/transect number:	FOR OFFICE USE ONLY
	Permanent number:
Date:_____/_____/_____ DD MMM YY	Community name: Community number: Occ. no..
County:	Source code:
USGS Quad 7.5'/15' *(circle one)*	Quad code: Quad name: Map index no.:
CNPS Chapter: (or other affiliation)	Update: Yes No

Landowner:
Contact Person:
Address:
City: Zip: Phone:
Observers:

Elevation (ft.):_____ Slope (°):____ Aspect (°):____ Topography: *Macro*____ *Micro*____

Legal: MERIDIAN_____ TWP_____ RNG_____ SEC_____ 1/4_____ 1/16_____

LAT _____ LONG _____ UTMN _____ UTME _____ UTM Zone _____

Community type: _____ *Dominant vegetation form* _____
Wetland or Upland

If Community Type = W (see Artificial Keys to Cowardin Systems and Names)

Cowardin System _____ Subsystem _____ Class _____

Distance to water (m): Vertical _____ Horizontal _____ Channel form (if riverine) _____
Straight, Meandering, Braided

Vegetation Description

Dominant layer _____ Plant community _____
Ground, Shrub, Tree

Patch size (acres): _____ Community size (acres) _____

Adjacent series:	

Trend code _____
1. Increasing 2. Stable 3. Decreasing
4. Fluctuating 5. Unknown

Impact codes ____ ____ ____ ____ ____ ____ ____ ____
(list codes in order, with most significant first)

Intensity ____ ____ ____ ____ ____ ____ ____ ____
1. Light 2. Moderate 3. Heavy (List beneath each impact code)

Layer Height (nearest decimeter - 0.1 m): Ground _____ Shrub _____ Tree _____

Structure: Ground____ Shrub ____ Tree ____ **Phenology:** Ground ____ Shrub ____ Tree ____
1. Continuous 2. Intermittent 3. Open Early, Peak, Late

Transect Length (m) _____ Transect Direction (°) _____

Sampling Interval (m): Ground _____ Shrub _____ Tree _____ Bare _____

Figure 5-4

CALIFORNIA NATIVE PLANT SOCIETY
CALIFORNIA PLANT COMMUNITIES FIELD DATA FORM (PART 2)
Page _____ of _____

G = Ground
S = Shrub
T = Tree

W = Within plot, no hits
X = Outside plots

Layer	Bare, Rock, Litter, Moss/Lichen, Sky or Plant name	Hits	Tally	%

- Annual least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and arroyo southwestern toad (*Bufo microscaphus californicus*) surveys will be performed in suitable habitat for these species (i.e., the southern arroyo willow riparian woodland and sycamore alluvial woodland) to determine presence/absence, including number of individuals, and map locations (if applicable) and to evaluate the success of revegetation. The surveys will conducted according to the U.S. Fish and Wildlife Service (USFWS) approved protocol as discussed below:

5.3.5.1 Least Bell's Vireo Surveys

Eight focused surveys will be conducted annually by wildlife biologists that are familiar with the songs, calls, and visual identification of the bird in all riparian areas and any other potential vireo habitats. These surveys will be conducted according to the USFWS protocol for surveying for this species. Surveys will be performed at 10 day intervals during the period from April 10 to July 31 No more than 50 hectares of suitable riparian habitat will be surveyed per biologist per day All surveys will be conducted between dawn and 11:00 a.m. and will not be conducted during periods of excessive or abnormal cold, heat, wind, rain, or other inclement weather conditions. The surveyors will conduct the surveys by walking the perimeter of 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, will be recorded on standardized data sheets (Figure 5-5) In addition to the least Bell's vireos, any detection of the parasitic brown-headed cowbird (*Molothrus ater*), the federally-listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*), or the state-listed endangered yellow-billed cuckoo (*Coccyzus americanus*) will also be recorded.

5.3.5.2 Southwestern Willow Flycatcher Surveys

For the southwestern willow flycatcher, a minimum of three focused surveys will be performed annually in riparian willow woodland habitat by a biologist permitted by USFWS Survey protocol will include the use of "pishing" and tape recordings in order to elicit responses. The tape will be played for 15-30 seconds followed by a quiet period of 1-2 minutes to listen for a response This procedure will be repeated every 20-30 meters throughout the survey site. Surveys for this species must be conducted between May 15th and July 10th with a minimum of one survey conducted during each of the three time frames: May 15th-31st, June 1st-21st, and June 22nd-July 10th Successive surveys must be at least 5 days apart. Surveys should begin at dawn and end between 9:00 a.m. and 10:00 a.m. depending on the temperature, wind. background noise and other environmental factors. Permitted surveyors will use the approved willow flycatcher survey and detection forms (Figure 5-6) and follow reporting procedures according to protocol.

5.3.5.3 Arroyo Southwestern Toad Surveys

Surveys shall be conducted annually by a qualified biologist familiar with the habits, appearance, and vocalizations of the arroyo southwestern toad. Areas within one kilometer (1 km) of arroyo toad sites of suitable habitat shall be presumed to have arroyo toads Surveys shall cease immediately upon determination that arroyo toad eggs, larvae, juveniles, or adults are present in the survey area. Surveys shall follow the 1999 USFWS Survey Protocol Guidelines for the arroyo toad. The protocol states that at least six (6) surveys must be conducted during the breeding season, which generally occurs from March 15 through July 1, with at least seven (7) days between surveys and with at least one survey per month during April, May, and June. Surveys shall include both daytime and nighttime components conducted within the same 24-hour period (except when arroyo toads have been detected in the survey area).

Daytime surveys shall be conducted by walking slowly along stream margins and in adjacent riparian habitat, visually searching for (but not disturbing) eggs, larvae, and juveniles. If necessary, surveyors may walk within the stream, taking care not to disturb or create silt deposits within breeding pools.

Project Name _____ Project # _____ Survey Type _____
Location _____
Surveyor _____ Date _____ Time (Start) _____ (End) _____
General Habitat Description of Area _____
_____
Weather (Cloud cover; Estimated wind speed) _____
Temp (Start) _____ (End) _____

Time	Wildlife Species	Sign*	Microhabitat	Behavior/Comments

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name_____ Was site surveyed in previous year? Yes No
If yes, what site name was used? _____

County _____ State_____ USGS Quad Name _____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? ☐ *Yes* ☐ *No*
Site Coordinates: Start: N_____ E_____ UTM
Stop: N_____ E_____ UTM Zone _____
Elevation _____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
1 _____ _____	Date start stop total hrs ____							
2 _____ _____	Date Start Stop total hrs ____							
3 _____ _____	Date Start Stop total hrs ____							
_____ _____	Date start stop total hrs ____							
_____ _____	Date start stop total hrs ____							

Overall Site Summary (Total only resident WIFLs) Total survey hrs_____	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? Yes No If yes, report color combination(s) in the comments section on back of form

Name of Reporting Individual _____ Date Report Completed _____

Submit the original of this form. Retain a copy for your records.

Figure 5-6

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual _____ Phone # _____

Affiliation _____ Email _____

Site Name_____
Did you verify that this site name is consistent with that used in previous years? Yes No (circle one)

Management Authority for Survey Area (circle one): Federal Municipal/County State Tribal Private

Name of Management Entity or Owner (e.g., Tonto National Forest) _____

Length of area surveyed: _____ (specify units, e.g., miles = mi, kilometers = km, meters = m)

Did you survey the same general area during each visit to this site this year? Yes / No If no, summarize in comments below

If site was surveyed last year, did you survey the same general area this year? Yes / No If no, summarize in comments below

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

- ☐ Native broadleaf plants (entirely or almost entirely, includes high-elevation willow)
- ☐ Mixed native and exotic plants (mostly native)
- ☐ Mixed native and exotic plants (mostly exotic)
- ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: _____

Average height of canopy: _____ __ (specify units)

Was surface water or saturated soil present at or adjacent to site? Yes No (circle one)
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? Yes No (circle one)
If yes, describe in comments section below.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):_____

_____

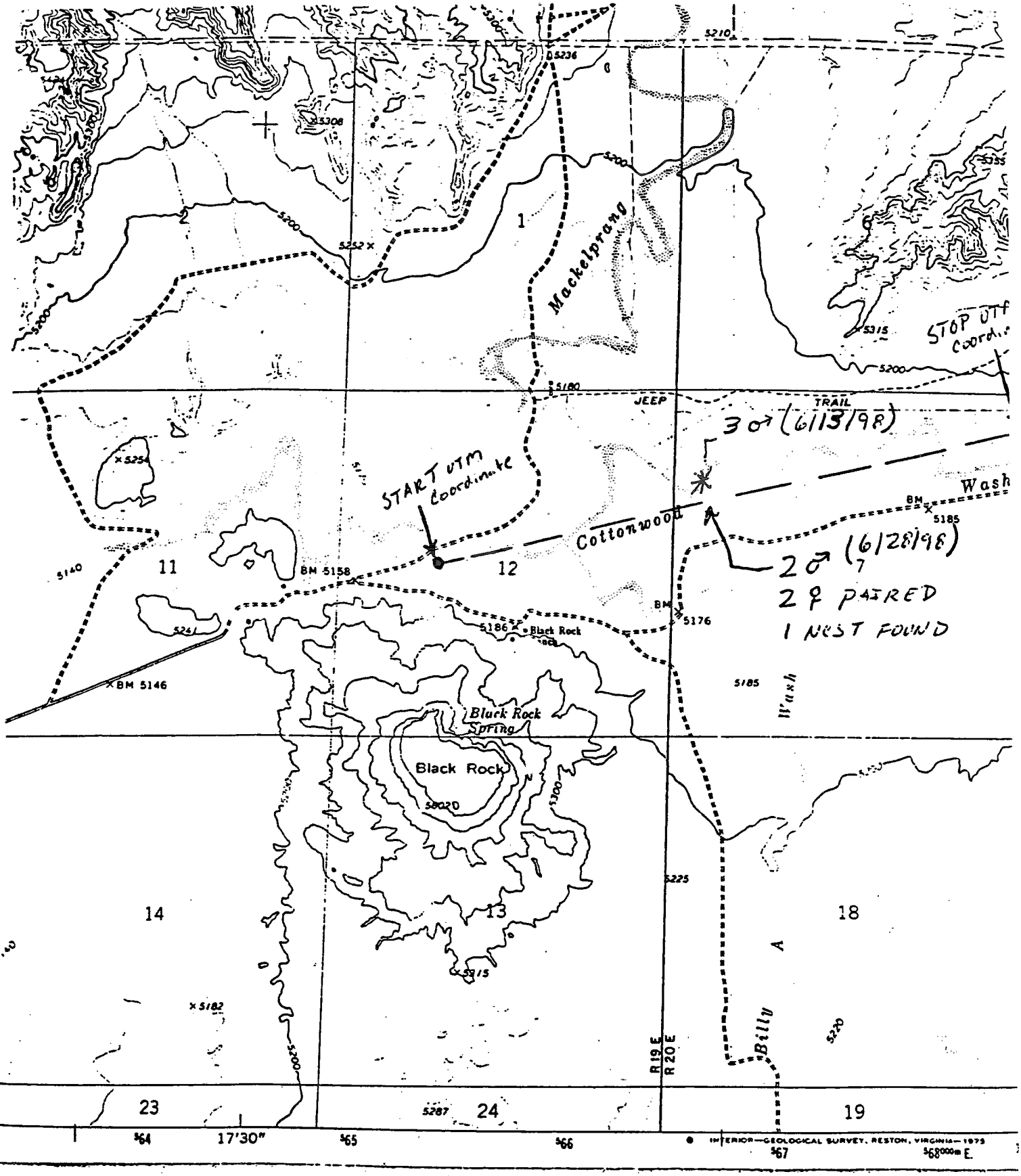
_____

_____

_____

_____

_____



QUAD = ROTTEN BANANAS BUTTE, AZ.

Site name = COTTONWOOD WASH

— — — = SURVEY ROUTE

EXAMPLE MAP

W/ LOCATIONS #'s & DATE

Figure 5-6

Daytime surveys shall include an assessment and mapping of a) arroyo toad habitat suitability. and b) the presence of arroyo toad eggs, larvae, or juveniles. Nighttime surveys (assuming eggs, larvae, and/or juveniles have not been detected) shall be conducted by walking slowly and carefully on stream banks. Surveyors should stop periodically and remain still and silent for approximately 15 minutes at appropriate sites to wait for arroyo toads to begin calling. Nighttime surveys must be conducted between one hour after dusk and midnight, when air temperature at dusk is 55 degrees Fahrenheit or greater Surveys should not be conducted during nights when a full or near-full moon is illuminating the survey area or during adverse weather conditions such as rain, high winds, or flood flows.

Extreme weather conditions can cause variations in the breeding season; these conditions should be fully considered when developing a schedule of surveys. If uncertainty exists as to whether environmental conditions are suitable, contact the appropriate USFWS field office for further information. Extreme caution must be used to avoid crushing arroyo toads that are burrowed into sand-bars and banks or lodged in depressions in the substrate (sand, gravel, soil). Arroyo toads will use trails and roads up to several hundred meters from breeding sites while foraging; therefore, caution must be taken to not disturb, injure, or kill arroyo toads when using these roads and trails.

Surveyors shall use the approved arroyo toad survey and detection protocol and follow reporting procedures according to protocol.

5.3.6 Water Quality Monitoring

In order to address both upstream and downstream water quality issues at the Big Tujunga Wash site, a water-quality monitoring program will be implemented. The monitoring program will specifically address 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 Red Tail Golf Course and Equestrian Project.

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 LADPW personnel shall establish baseline water quality conditions prior to the implementation of the MMP programs. The LADPW personnel shall conduct the baseline water quality sampling in accordance with accepted protocols and the analyses will be conducted by a certified water quality laboratory The water quality program at Big Tujunga Wash shall include 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

Water quality monitoring sites will be permanently established with a Global Positioning System (GPS) at various locations along Haines Canyon Creek and Big Tujunga Wash Three monitoring sites shall be located along Haines Canyon Creek. One site shall be located at the inflow to the Tujunga Ponds, a second site shall be located at the outflow of the Tujunga Ponds; and the third site shall be located in Haines Canyon Creek, just before it exits the Mitigation Bank. A water quality monitoring station shall also be established in Big Tujunga Wash and sampling will be performed if flowing water is present during the quarterly sampling visits.

- a summary of the condition of trails, kiosks, and other physical property on the site;
- copies of all monitoring photographs;
- maps identifying monitoring areas, transects, planting zones, and so forth as appropriate;
- results of the protocol least Bell's vireo, southwestern willow flycatcher, and arroyo southwestern toad surveys;
- summary of the annual water quality report;
- results of the brown-headed cowbird trapping and removal program, and
- discussion and recommendations.

SECTION 6.0 - OUTLINE OF FINAL IMPLEMENTATION REPORT

This section of the MMP includes an outline for the Final Implementation Report. The actual time when this report should be prepared is dependent upon when each of the programs is implemented. The outline included in this section assumes that each of the programs will be implemented in the first year of the enhancement project. This assumption may be unrealistic because the implementation of the programs may be dependent upon available funding, seasonal requirements, and/or agency approvals. It may be safe to assume that the Final Implementation Report is really the first annual report documenting the portion of each program that was implemented in the first year of the project. If all of the programs are not implemented in the first year, then the implementation occurring in the subsequent years can be documented in the Annual Performance Monitoring Reports, which are described in Section 7.0.

The contents of the Final Implementation Report will include detailed descriptions of what was completed for each of the programs, including; exotic plant and wildlife species eradication, native habitat restoration, brown-headed cowbird trapping, trails system establishment and restriction of equestrian use, water quality monitoring, and public outreach. One of the most important components of this report is the "As Built" plan for the native habitat restoration program. This plan documents exactly what was planted in the native habitat restoration areas and where the various plant species were planted.

The first step in implementation will be to contract the water quality consultant/hydrologist and the biological consulting team selected to complete Phase II of the MMP The biological consulting team will consist of the Environmental Consultant, a landscape architect subcontractor, and a landscape installation subcontractor The Environmental Consultant will continue the process of securing the needed agency permits for the project. A summary schedule of the implementation tasks is shown in Figure 3-1

Implementation of several project tasks may begin prior to issuance of the agency permits. The tasks that may be initiated immediately include contracting for the installation of portable toilet and trash receptacles on the site, and kiosk and cowbird trap construction. The environmental consultant will be responsible for initiating these tasks. The Environmental Consultant is also responsible for initiating and overseeing the preparation of all construction drawings, including irrigation and planting plans. Baseline water quality testing and monitoring may also be initiated prior to agency permitting. The water quality consultant/hydrologist will be responsible for initiating the water quality testing program.

Subsequent tasks in the MMP require that the agency permits be in place prior to implementation. Brown-headed cowbird trapping, and baseline monitoring for sensitive species (i.e., least Bell's vireo and arroyo southwestern toad) must be implemented according to established protocol determined by USFWS. Strict adherence to the established survey dates is essential. Sensitive species surveys will begin in March and continue through August. Site preparation for the optional oak-sycamore revegetation is scheduled to begin in early summer with weed abatement procedures. Site preparation for the riparian enhancement plan is scheduled to begin in late summer

BIG TUJUNGA WASH MITIGATION BANK
6.1 OUTLINE OF FINAL IMPLEMENTATION REPORT

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1.2 SITE DESCRIPTION
1.3 SITE LOCATION
1.4 MITIGATION PLAN

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BIG TUJUNGA WASH MITIGATION BANK
6.2 SAMPLE MONTHLY SITE INSPECTION LETTER REPORT

Date 2000
(Project #)

Los Angeles County Department of Public Works
Address
City

Subject: Big Tujunga Wash Mitigation Site

Dear

The purpose of this letter is to report the findings of our latest site visit. This monthly letter report will consist of a synopsis of each aspect of the Big Tujunga Wash Mitigation Bank Master Plan. Monthly inspections are required during the first year after the Habitat restoration and Enhancement Program has been initiated. Topics to be covered are:

- Results and ongoing success of the Exotic Fish, Crayfish, and Bullfrog Removal Program from Haines Canyon Creek and the Tujunga Ponds area.
- The Habitat Restoration and Enhancement Program, which includes the plan to eliminate giant reed and tamarisk form the existing riparian habitat and conducting enhancement planting throughout the riparian zones. This will also include the Revegetation Plan, which outlines the specifications for the creation of coast live oak-California sycamore woodland
- The program for the control of the brown-headed cowbird including, location and success of trapping.
- Explain how the Trails System Program is going. Are the newly constructed trails being used and have the retired trails been effectively closed off
- Report on the Public Education Program, which involves the community in the maintenance and upkeep of the project site
- Report on any wildlife seen during the visit, including observations, tracks, scat, and auditory identifications.
- Provide, if necessary, recommendations to the landscape contractor for changes in the maintenance program, and recommendations for any of the other programs that are being monitored.

Sincerely,

BIG TUJUNGA WASH MITIGATION BANK
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BIG TUJUNGA WASH MITIGATION BANK
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BIG TUJUNGA WASH MITIGATION BANK
6.5 OUTLINE OF ARROYO SOUTHWESTERN TOAD ANNUAL MONITORING REPORT

EXECUTIVE SUMMARY

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1 1 PURPOSE OF ANNUAL REPORT
1.2 MITIGATION PLAN
1 3 BACKGROUND ON THE ARROYO SOUTHWESTERN TOAD
1 4 SITE LOCATION
1.5 SITE DESCRIPTION

SECTION 2.0 - EXISTING CONDITIONS

2.1 VEGETATION
2.2 WILDLIFE SPECIES

SECTION 3.0 - METHODOLOGY

3 1 SURVEY DATES AND TIMES
3.2 DESCRIPTION OF METHODS
3.3 LOCATIONS

SECTION 4.0 - RESULTS

4 1 DOCUMENTING PRESENCE/ABSENCE
4.2 DETERMINING THE NUMBER OF TERRITORIES AND PAIRS
4.3 DOCUMENTING PRESENCE OF COWBIRDS

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BIG TUJUNGA WASH MITIGATION BANK
6.6 OUTLINE OF BROWN-HEADED COWBIRD ANNUAL MONITORING REPORT

The report should discuss the conditions of each trap location upon completion of trap placement and set up. The locations of the 4 traps should be documented on the as-built map of the site conditions. Any difference between the identified trap locations and actual trap placement should be discussed and documented through maps and descriptive text. The report should discuss the initial decoy ratios and any efforts being made to obtain enough decoys to maintain the preferred 2:3 ratio. No changes in the original plan are expected however, any modifications not previously approved by the County should be justified and accepted in writing.

EXECUTIVE SUMMARY

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1 1 BROWN-HEADED COWBIRD TRAPPING AND REMOVAL PROGRAM

1.2 BACKGROUND ON THE BROWN-HEADED COWBIRD

1.3 CALIFORNIA GNATCATCHER

1 4 SITE DESCRIPTIONS

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5 1 PROCEDURAL RECOMMENDATIONS
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3-3 Year 3 Seasonal Variation in Male, Female, and Juvenile Cowbird Captures

3-4 Year 2 Seasonal Variation in Male, Female, and Juvenile Cowbird Captures

3-5 Year 1 Seasonal Variation in Male, Female, and Juvenile Cowbird Captures

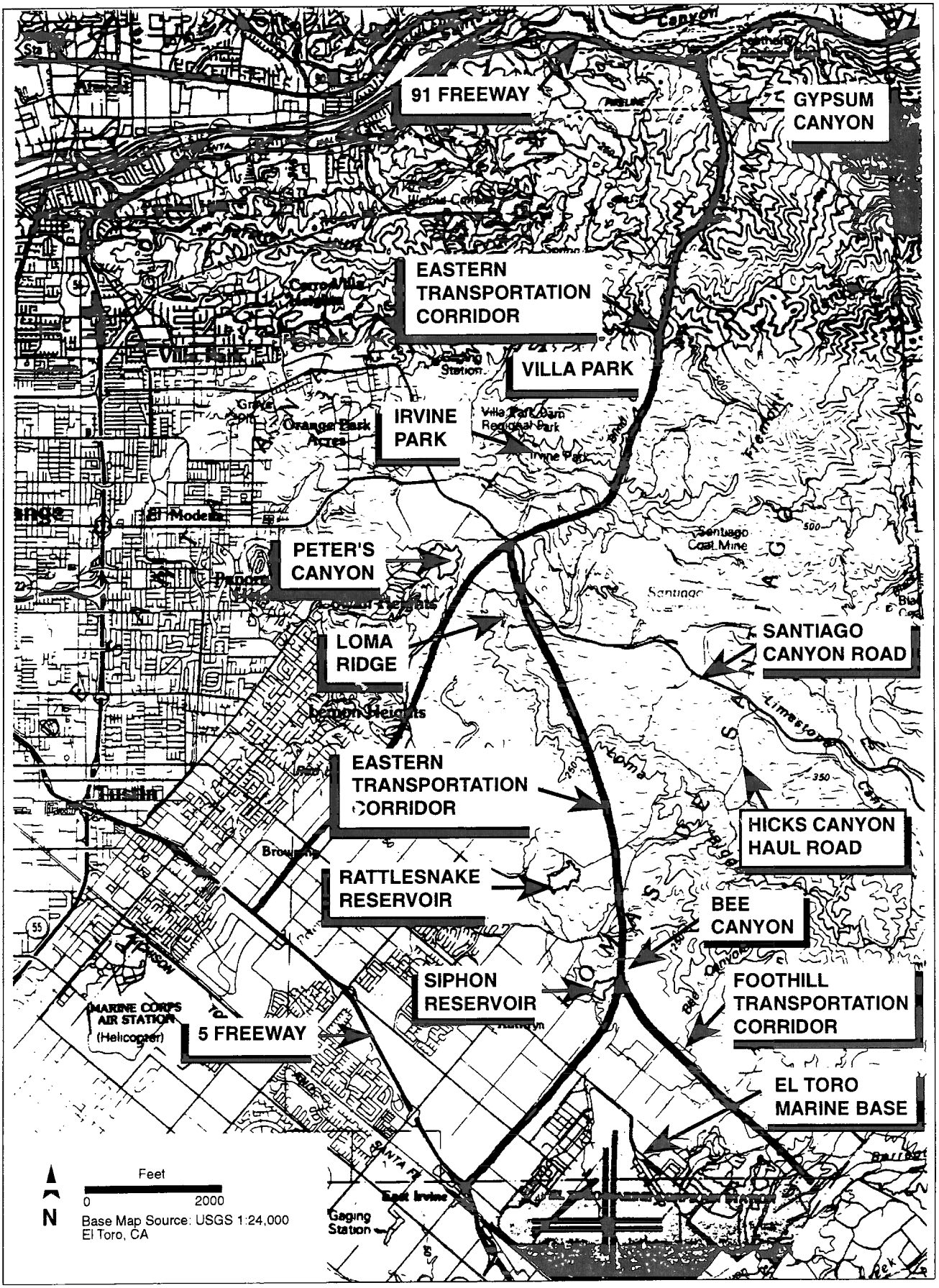
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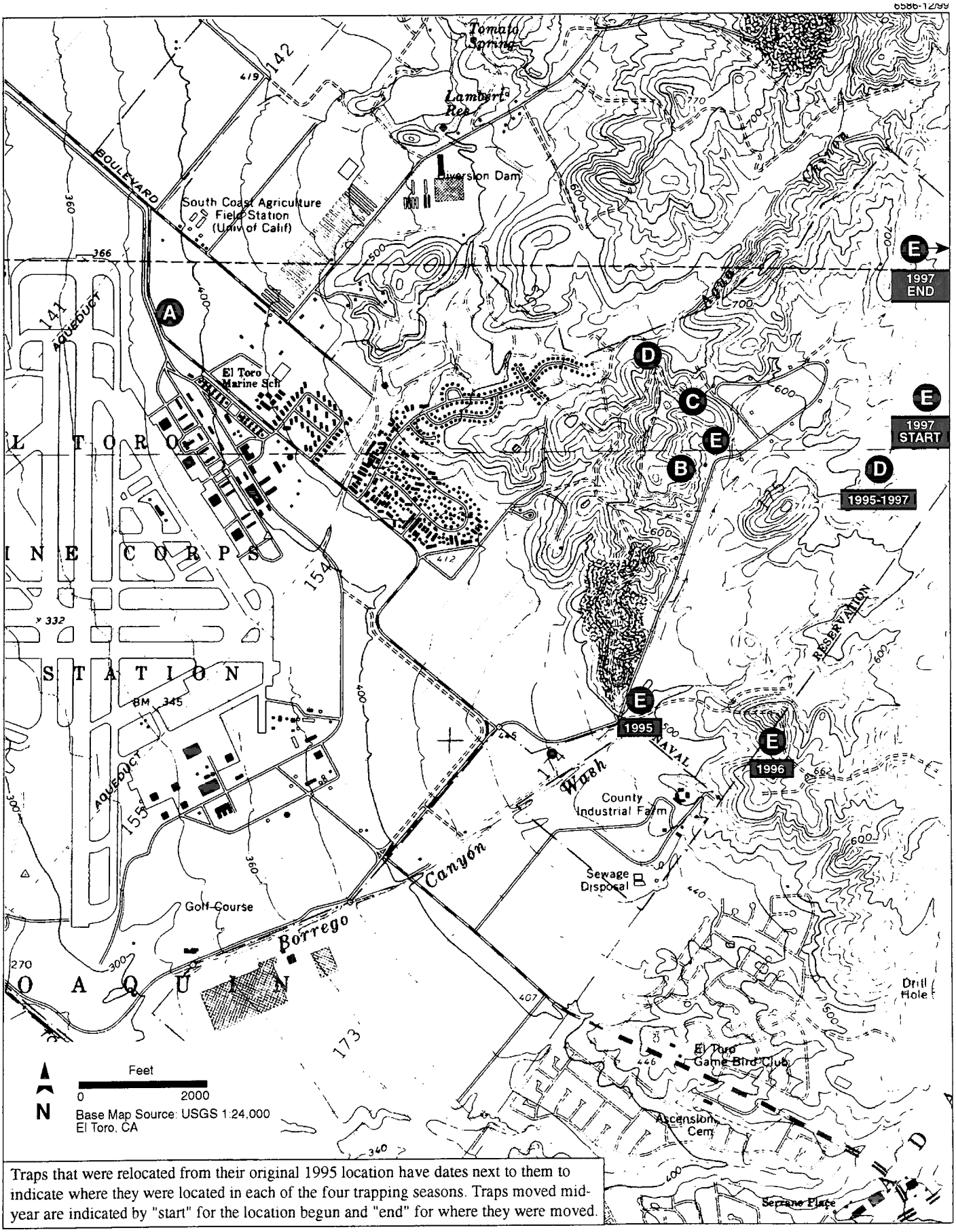


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EASTERN TRANSPORTATION CORRIDOR SHOWING LOCATIONS OF COWBIRD TRAPPING SITES

Figure 1-1

Example



Traps that were relocated from their original 1995 location have dates next to them to indicate where they were located in each of the four trapping seasons. Traps moved mid-year are indicated by "start" for the location begun and "end" for where they were moved.

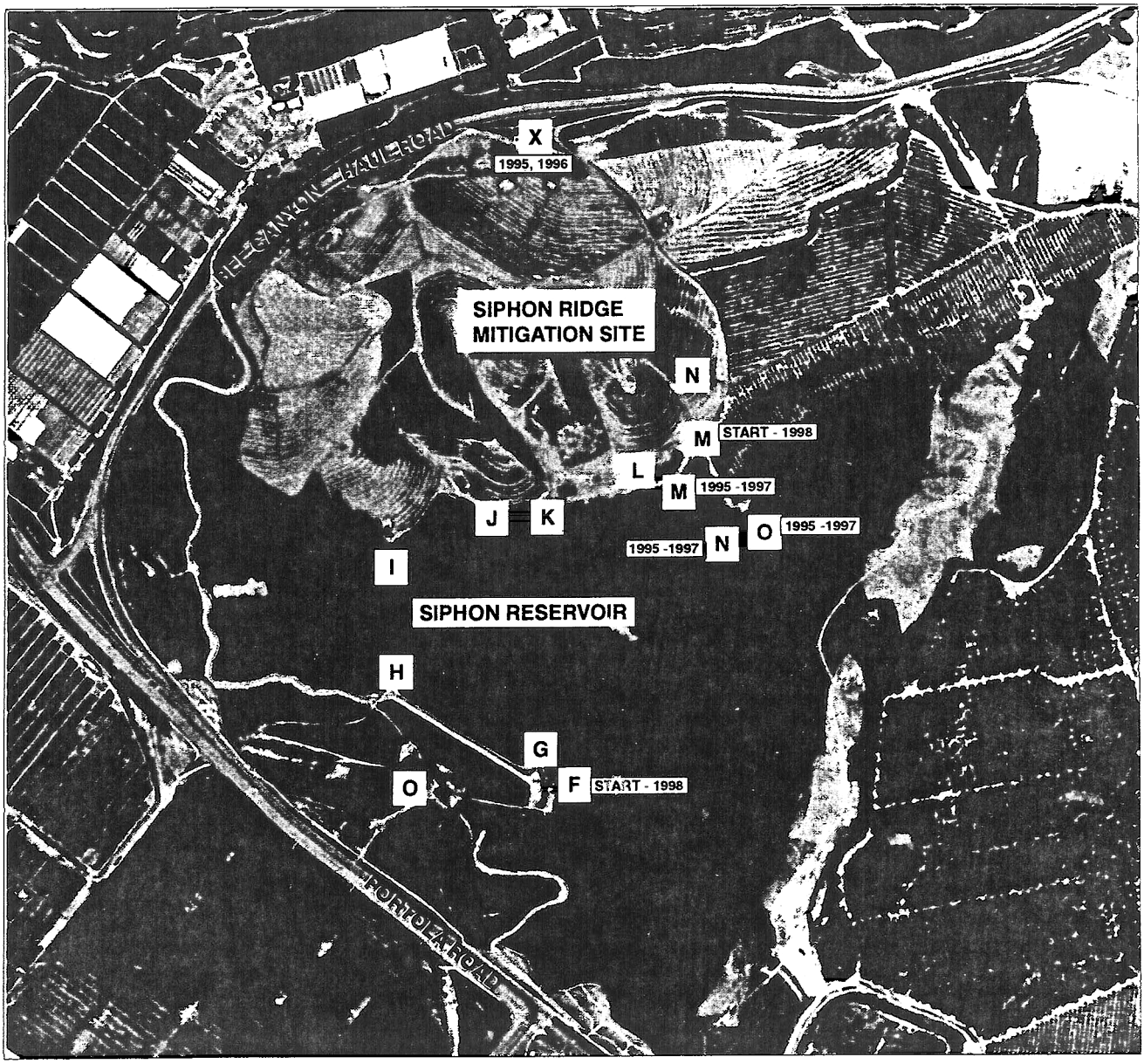
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TRAP DESIGNATION AND LOCATION OF COWBIRD TRAPS AT EL TORO MARINE BASE

Figure 1-2

Example

6586-12/99



Traps that were relocated from their original 1995 location have dates next to them to indicate where they were located in each of the four trapping seasons. Traps moved mid-year are indicated by "start" for the location begun and "end" for where they were moved.

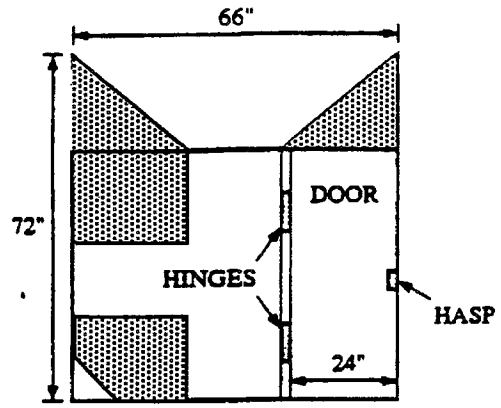
Not to Scale

N Source: Chambers Group, Inc.

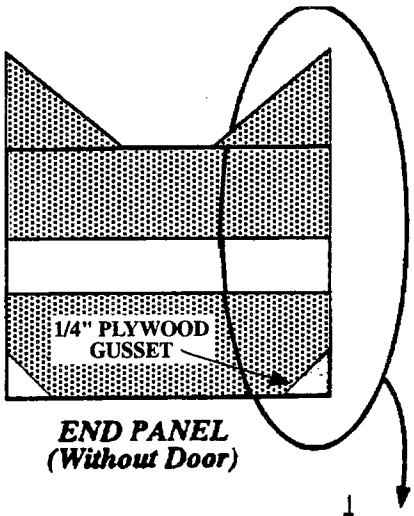
Chambers Group

TRAP DESIGNATION AND LOCATIONS OF THE COWBIRD TRAPS AT SIPHON RESERVOIR
Figure 1-3

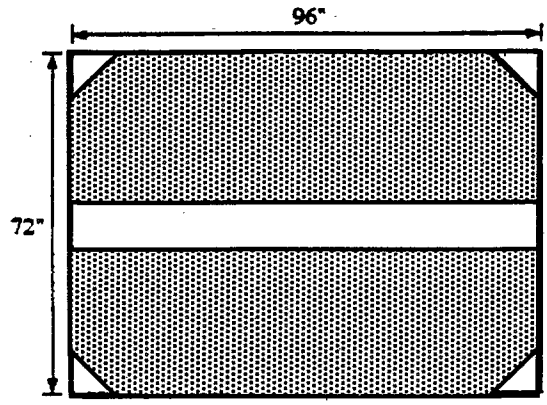
Example



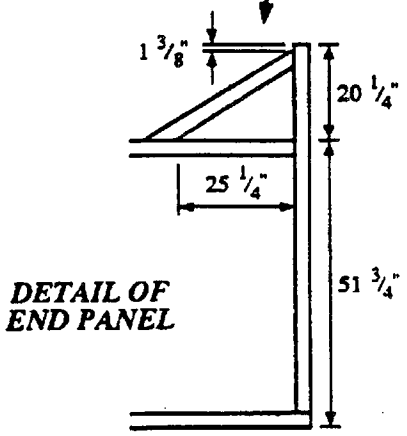
END PANEL (With Door)



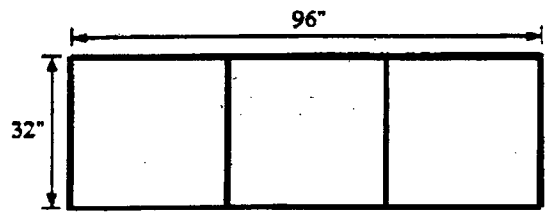
END PANEL (Without Door)



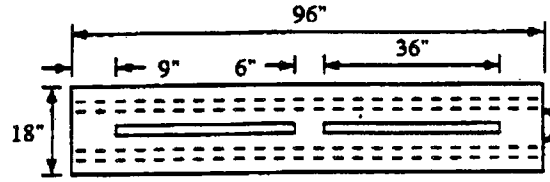
SIDE PANEL (2)



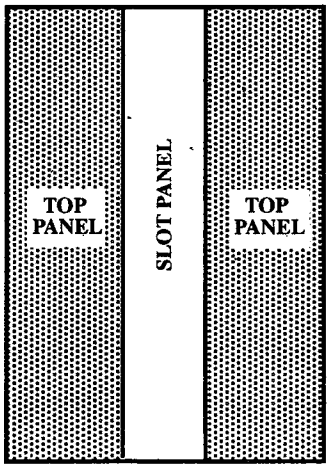
DETAIL OF END PANEL



TOP PANEL (2)



SLOT PANEL



TRAP (Top View)

Shows mesh retrofit areas

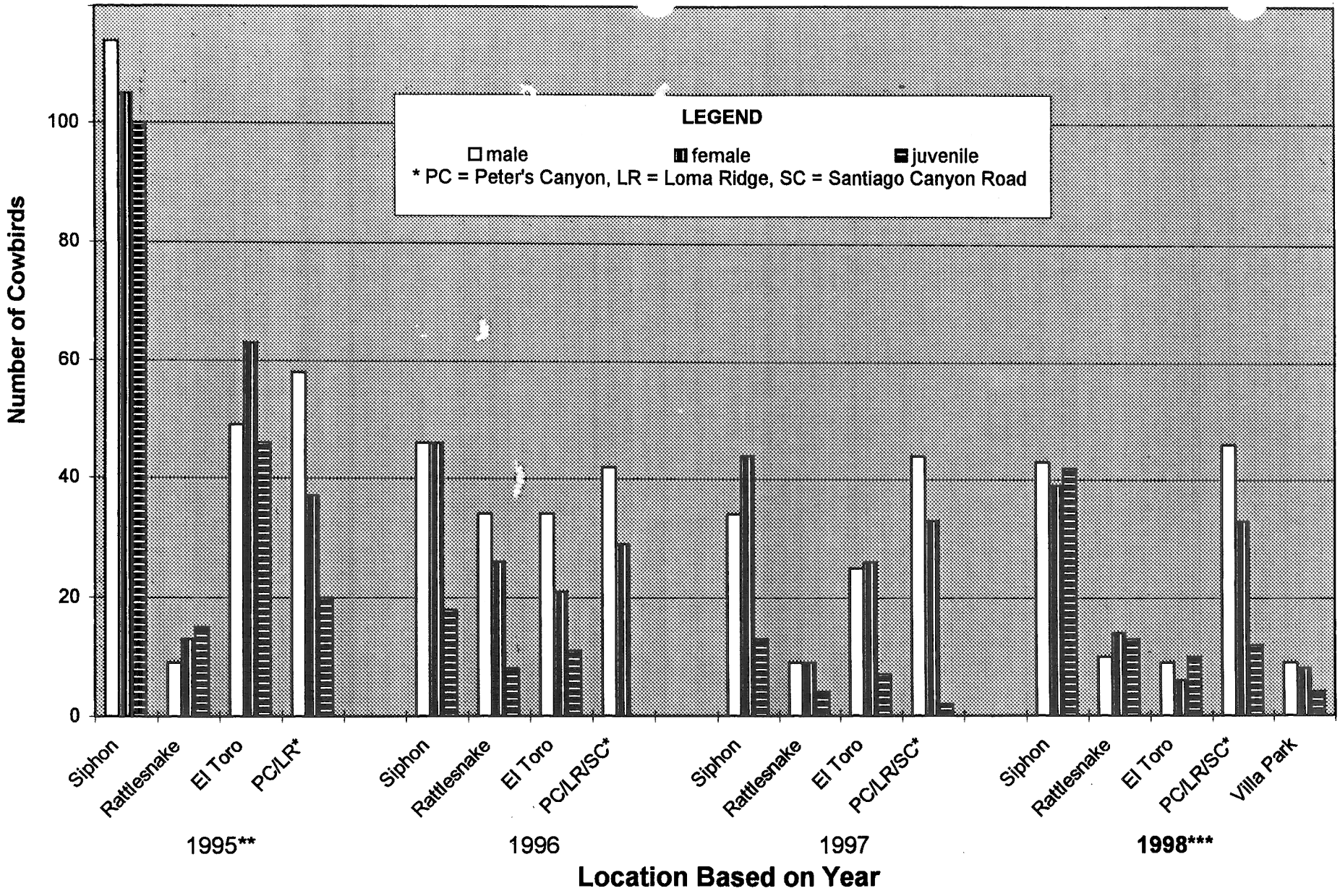
All panels (except slot panel) consist of wood frames and 1" steel mesh. This mesh is ideal: smaller birds (e.g., song sparrows) can come and go at will through mesh. Most frames are made with 2 X 2's; top panel can be made with 1 X 2's. Top slot is usually 1/4" or 3/8" plywood. Holes should be drilled so that connecting pieces are bolted in two places. Floors with mesh are recommended.

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COWBIRD TRAP SPECIFICATIONS
Figure 2-1

Example

Example



**In 1995 traps were placed at Rattlesnake Reservoir midway through the season.

***In 1998 traps were placed at Villa Park midway through the season.

Figure 3-1
NUMBER OF MALE, FEMALE, AND JUVENILE COWBIRDS CAUGHT AT EACH TRAPPING LOCATION DURING 1995, 1996, 1997, AND 1998 TRAPPING SEASONS

Example

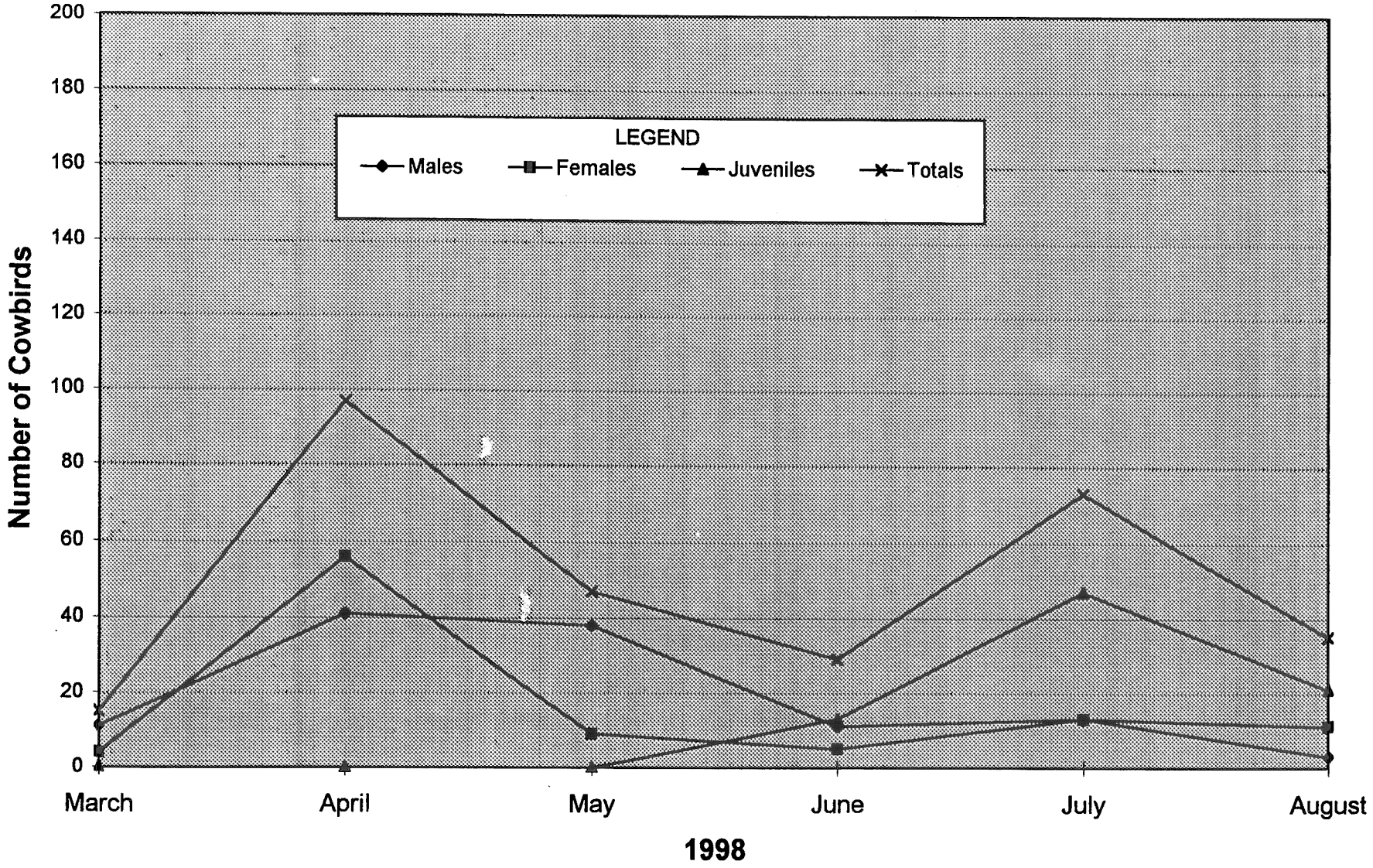


Figure 3-2
SEASONAL VARIATION IN MALE, FEMALE, AND JUVENILE COWBIRD CAPTURES

Example

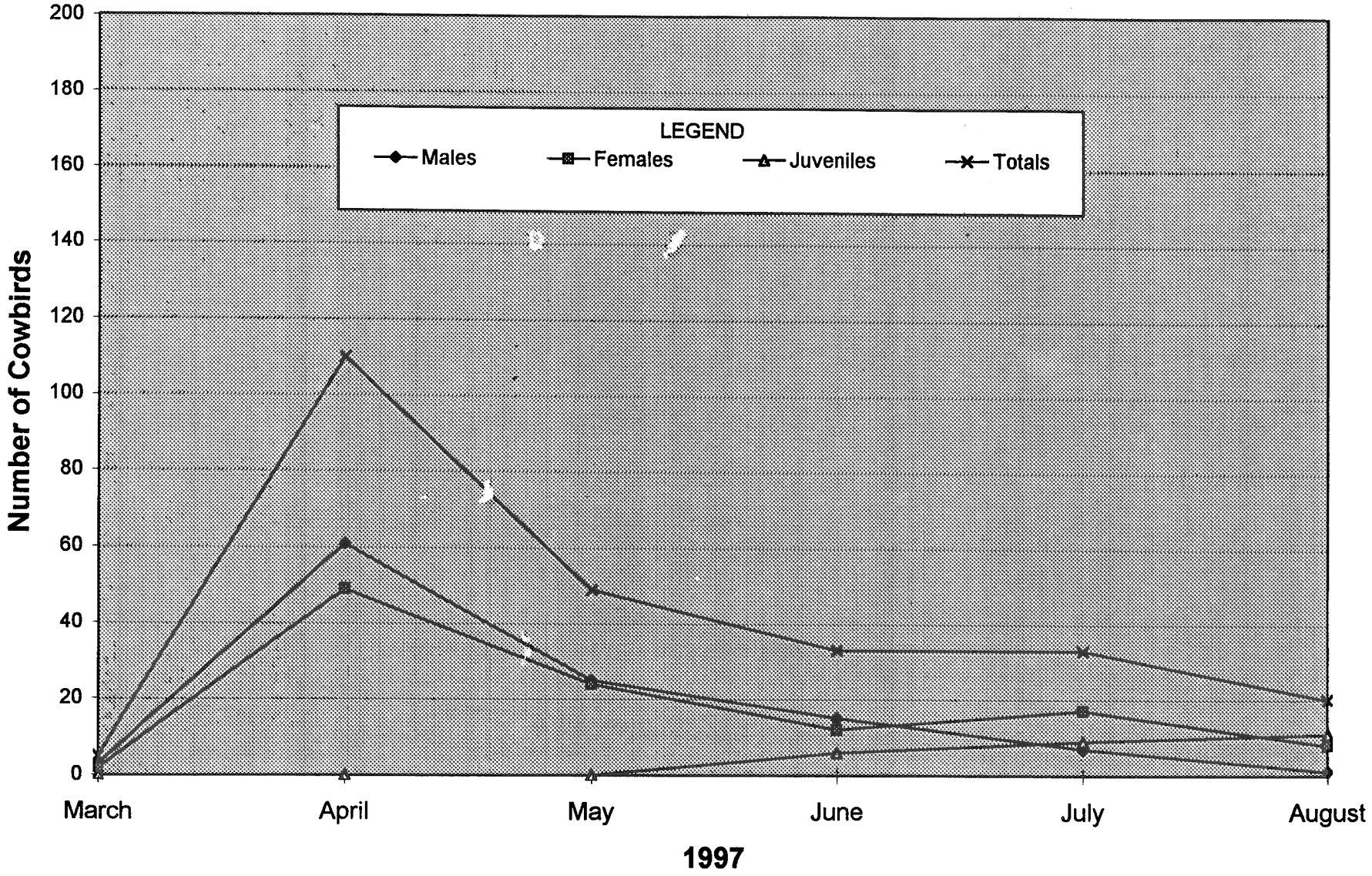


Figure 3-3
SEASONAL VARIATION IN MALE, FEMALE, AND JUVENILE COWBIRD CAPTURES

Example

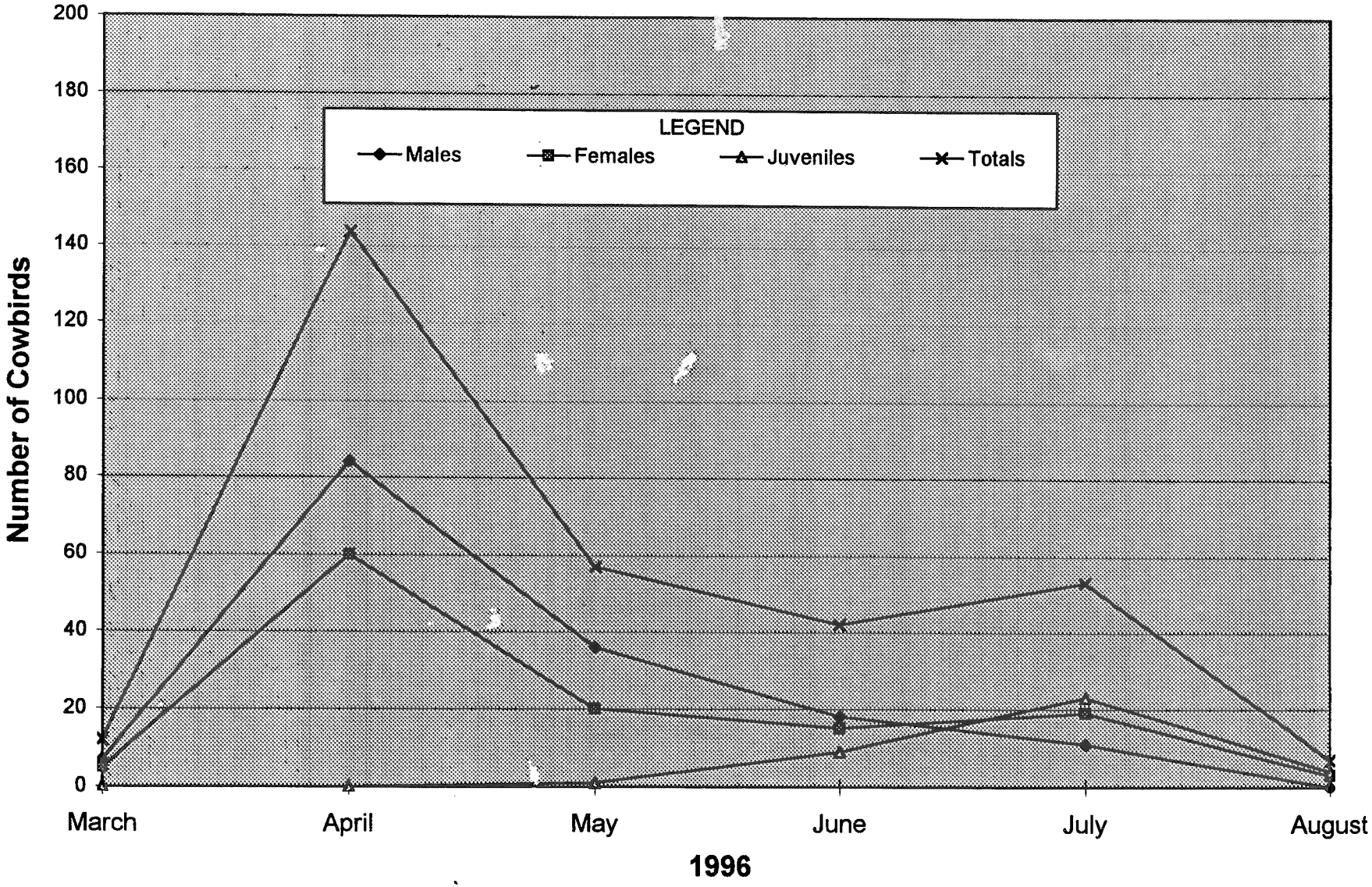


Figure 3-4
SEASONAL VARIATION IN MALE, FEMALE, AND JUVENILE COWBIRD CAPTURES

Example

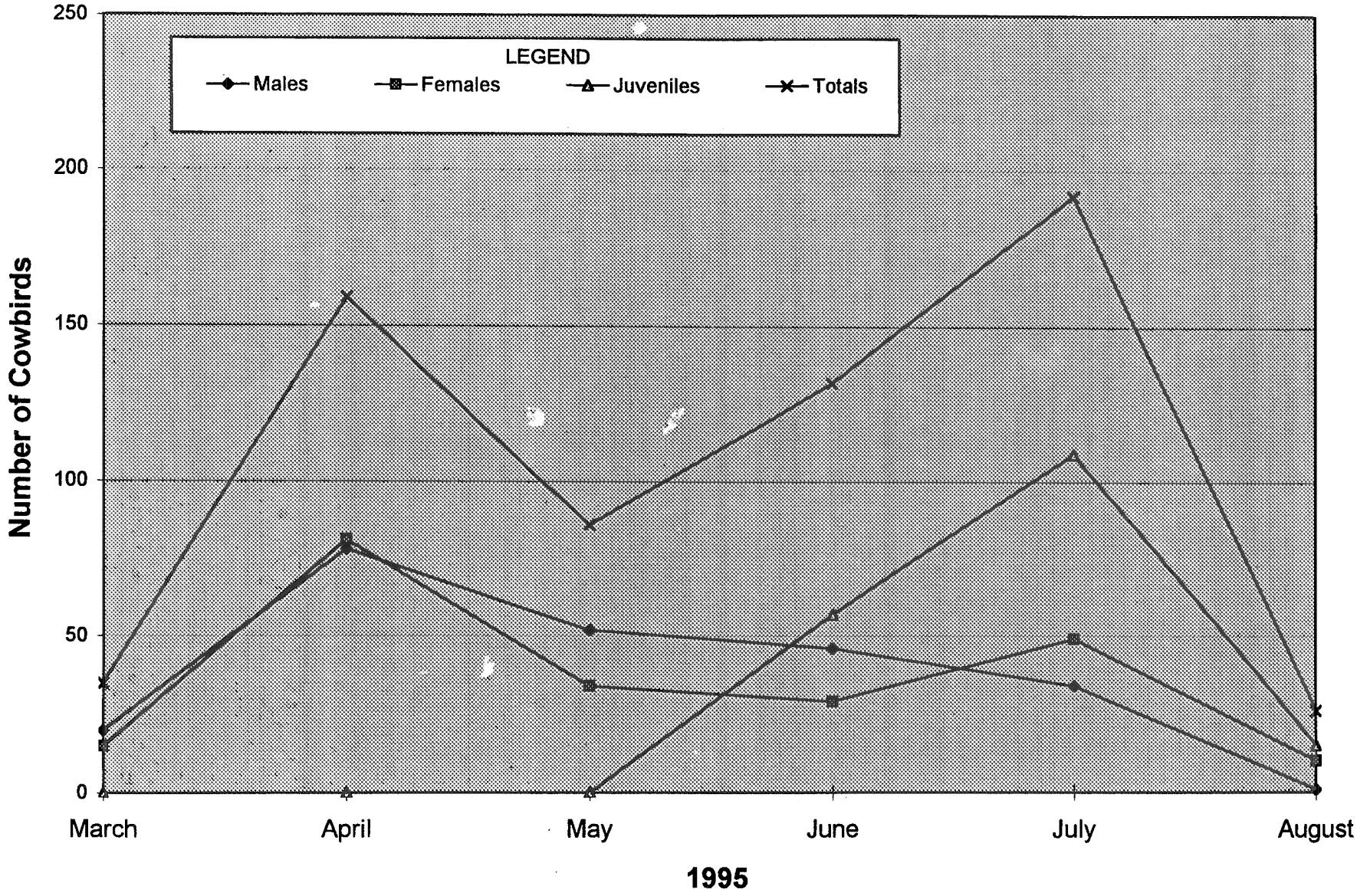


Figure 3-5
SEASONAL VARIATION IN MALE, FEMALE, AND JUVENILE COWBIRD CAPTURES

Table 3-1

Numbers of Cowbirds Trapped and Total Trapping Efficiency at Each Trapping Location, Siphon Reservoir, El Toro Marine Corps Air Base, Rattlesnake Reservoir, Villa Park and Peter's Canyon/Loma Ridge/Santiago Canyon Road for 1995, 1996, 1997, and 1998

	Male Cowbirds Trapped				Female Cowbirds Trapped				Juvenile Cowbirds Trapped				Total Cowbirds Trapped				Total Trapped (trap/day)			
Location*	95	96	97	98	95	96	97	98	95	96	97	98	95	96	97	98	95	96	97	98
SR	114	46	34	43	105	46	44	37	100	18	13	42	319	110	91	122	0.155	0.088	0.059	0.088
ET	49	34	25	9	63	21	26	6	46	11	7	10	158	66	58	25	0.495	0.087	0.075	0.032
RR	9	34	9	10	13	26	9	14	15	8	4	13	37	68	22	37	0.226	0.109	0.029	0.048
PC/LR/SCR	58	42	44	46	37	29	33	33	20	0	2	12	115	71	79	91	0.172	0.087	0.103	0.118
VP				9				8				4				21				0.132

* SR = Siphon Reservoir, ET = El Toro Marine Corps Air Base, RR = Rattlesnake Reservoir, PC = Peter's Canyon, LR = Loma Ridge, SCR = Santiago Canyon Road, and VP = Villa Park.

Table 3-2

Number of Male, Female, Juvenile, and Total Cowbirds Captured in Each Trap for 1995, 1996 , 1997, and 1998

Trap Placement Location	No. of Male Cowbirds Trapped				No. of Female Cowbirds Trapped				No. nf Juvenile Cowbirds Trapped				Total No. of Cowbirds Trapped			
	1995	1996	1997	1998	1995	1996	1997	1998	1995	1996	1997	1998	1995	1996	1997	1998
A (ET)	35	6	11	2	41	5	14	2	24	1	1	4	100	12	26	8
B (ET)	5	6	6	2	9	3	4	1	12	1	1	0	26	10	14	3
C (ET)	3	7	2	3	8	5	1	1	4	3	0	2	15	15	3	6
D* (ET)	5	6	3	2	3	3	1	1	5	4	1	3	13	13	5	6
E* (ET)	2	9	3	0	2	5	6	1	1	2	1	1	5	16	10	2
F* (VP)	23	2	3	8	8	1	3	4	2	0	0	2	33	3	6	14
G (SR)	14	18	3	9	5	14	2	12	10	4	1	5	29	36	6	26
H (SR)	1	0	4	0	4	2	6	0	1	0	6	4	6	2	16	4
I (SR)	2	1	1	1	0	3	2	2	4	0	3	5	6	4	6	8
J (SR)	7	4	6	4	9	5	8	7	23	0	1	9	39	9	15	20
K (SR)	16	9	2	11	24	9	13	3	17	11	1	9	57	29	16	23
L (SR)	20	4	4	3	26	2	4	4	32	1	0	6	78	7	8	13
M* (VP)	9	3	5	5	10	3	5	7	6	0	1	2	25	6	11	14
N* (SR)	3	4	1	5	1	3	0	2	0	0	0	4	4	7	1	11
O* (SR)	9	1	5	6	5	4	1	4	2	2	0	0	16	7	6	10
P (RR)	5	13	3	0	7	11	1	2	8	1	1	6	20	25	5	8
Q* (RR)	5	1	1	2	10	1	1	3	2	0	3	2	17	2	5	7
R* (LR)	9	4	4	2	3	3	5	1	4	0	0	1	16	7	9	4
S* (RR)	3	18	2	6	2	12	2	8	2	3	0	4	7	33	3	18
T* (RR)	5	2	0	0	4	2	0	0	3	4	0	0	12	8	0	0
U* (PC)	11	4	10	21	9	0	12	8	7	0	0	6	27	4	22	35
V (PC)	23	26	13	7	14	20	8	11	6	0	0	3	43	46	21	21
W (LR)	7	2	0	4	4	1	1	3	2	0	0	1	13	3	1	8
X* (IP)	0	3	8	1	3	1	7	3	3	0	2	0	6	4	17	4
Y* (HC)	8	3	13	13	7	4	5	8	1	0	0	2	16	7	18	23
TOTAL				117				98				81				296

* Indicates trap locations that have changed during the last three trapping seasons. See Figures 1-2, 1-3, 1-4, 1-5, and 1-6 for individual trap location and placement.
ET = El Toro, SR = Siphon Reservoir, VP = Vila Park, RR = Rattlesnake Reservoir, LR = Loma Ridge, PC = Peter's Canyon, IP = Irvine Park, HC = Hicks Canyon

Example

Table 3-3
Number of Nontarget Bird Species Captured in Each Trap

Species	Trap 1		Trap 2		Trap 3		Trap 4		Trap 5		Trap 6		Trap 7		Trap 8		Trap 9		Trap 10		Trap 11		Trap 12		Trap 13	
	C*	D**	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
CATO	88	5	121	4	87	2	12	0	164	2	167	1	140	3	385	4	172	1	181	0	24	0	134	1	349	1
HOFI	53	0	4	0	328	4	57	3	306	0	63	3	1146	10	2	0	3	0	47	2	173	6	0	0	507	3
SCJA	0	0	0	0	0	0	0	0	0	0	12	0	5	0	0	0	0	0	28	0	214	3	0	0	1	0
WCSP	695	2	169	0	89	1	0	0	11	0	58	5	1	0	243	0	2	0	30	2	1	0	70	0	36	0
SPTO	151	3	0	0	5	0	0	0	178	1	6	1	1	0	46	0	2	0	6	1	52	0	0	0	128	0
RWBL	0	0	0	0	106	2	0	0	2	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	5	0
SOSP	4	0	0	0	220	4	0	0	173	0	362	0	4	0	0	0	0	0	88	0	0	0	0	0	79	1
LASP	0	0	0	0	3	0	4	1	0	0	5	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0
CGDO	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EUST	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
NOMO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
CATH	0	0	2	0	1	0	0	0	0	0	2	0	0	0	0	0	2	0	11	0	0	0	3	0	7	1
Whydah	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOSP	0	0	0	0	3	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
RCSP	1	0	1	0	0	0	0	0	0	0	0	0	0	0	83	0	0	0	1	0	0	0	0	0	0	0
Parakeet	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YBCH	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOOR	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAWR	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
GCSP	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	370	0	0	0	0	0	0	0	0	0
MODO	0	0	0	0	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BHGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BUSH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
LISP	0	0	0	0	1	0	0	0	0	0	8	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
CAQU	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
DEJU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BLPH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals for each trap	**1003**	**10**	**298**	**4**	**846**	**13**	**121**	**4**	**881**	**3**	**685**	**10**	**1301**	**13**	**760**	**4**	**553**	**1**	**397**	**5**	**468**	**9**	**208**	**1**	**1115**	**6**

* = number of birds captured

** = number of birds found dead

CATO = California towhee
HOFI = House finch
SCJA = Scrub-jay
WCSP = White-crowned sparrow
SPTO = Spotted towhee
RWBL = Red-winged blackbird
SOSP = Song sparrow
LASP = Lark sparrow
CGDO = Common ground-dove
EUST = European starling
NOMO = Northern mockingbird
CATH = California thrasher
HOSP = House sparrow
RCSP = Rufous-crowned sparrow
YBCH = Yellow-breasted chat
HOOR = Hooded oriole
CAWR = Cactus wren
GCSP = Golden-crowned sparrow
MODO = Mourning dove
BHGB = Black-headed grosbeak
BUSH = Bushtit
LISP = Lincoln's sparrow
CAQU = California quail
DEJU = Dark-eyed junco
BLPH = Black phoebe

Example

Table 3-3 (Continued)
Number of Nontarget Bird Species Captured in Each Trap

Species	Trap 14		Trap 15		Trap 16		Trap 17		Trap 18		Trap 19		Trap 20		Trap 21		Trap 22		Trap 23		Trap 24		Trap 25		Total	Total
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
CATO	580	3	606	2	142	0	206	0	229	4	133	0	123	1	22	1	381	1	247	1	85	1	147	1	4925	39
HOFI	0	0	60	1	33	0	1181	4	6	0	500	3	274	0	2	0	0	0	7	0	249	0	114	1	5115	40
SCJA	1	0	10	0	0	0	0	0	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	279	3
WCSP	113	1	19	1	66	0	38	1	8	0	1	0	187	0	8	0	13	0	2	0	39	0	77	3	1976	16
SPTO	4	0	4	0	309	2	44	0	27	0	62	0	10	0	0	0	0	0	2	0	78	2	2	0	1117	10
RWBL	0	0	0	0	16	0	10	0	4	0	5	0	0	0	0	0	0	0	32	2	0	0	0	0	184	4
SOSP	0	0	58	0	377	0	82	1	1	0	167	0	87	1	4	0	0	0	0	0	43	0	0	0	1749	7
LASP	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	19	1
CGDO	0	0	0	0	3	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	1
EUST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	13	0
NOMO	2	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
CATH	3	0	3	0	0	0	1	0	1	0	2	1	19	0	2	0	0	0	0	0	0	0	0	0	59	2
Whydah	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
HOSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0
RCSP	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	0
Parakeet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
YBCH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
HOOR	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0
CAWR	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
GCSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	373	0
MODO	0	0	0	0	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	14	0
BHGB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0
BUSH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
LISP	0	0	0	0	0	0	4	0	0	0	6	0	1	0	0	0	0	0	0	0	1	0	0	0	24	0
CAQU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0
DEJU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
BLPH	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Totals for each trap	**703**	**4**	**761**	**4**	**947**	**2**	**1569**	**6**	**286**	**6**	**882**	**4**	**702**	**2**	**44**	**1**	**397**	**1**	**293**	**3**	**495**	**3**	**342**	**5**	**16057**	**124**

CATO = California towhee
HOFI = House finch
SCJA = Scrub-jay
WCSP = White-crowned sparrow
SPTO = Spotted towhee
RWBL = Red-winged blackbird
SOSP = Song sparrow
LASP = Lark sparrow
CGDO = Common ground-dove
EUST = European starling
NOMO = Northern mockingbird
CATH = California thrasher
HOSP = House sparrow
RCSP = Rufous-crowned sparrow
YBCH = Yellow-breasted chat
HOOR = Hooded oriole
CAWR = Cactus wren
GCSP = Golden-crowned sparrow
MODO = Mourning dove
BHGB = Black-headed grosbeak
BUSH = Bushtit
LISP = Lincoln's sparrow
CAQU = California quail
DEJU = Dark-eyed junco
BLPH = Black phoebe

Example

APPENDIX A

BROWN-HEADED COWBIRD TRAPPING PROGRAM AND PROTOCOL

BROWN-HEADED COWBIRD TRAPPING PROTOCOL[1]

TRAP PLACEMENT

Goal: To place traps in areas naturally preferred or visited by cowbirds, yet close to target host habitat so that the cowbirds removed are those impacting the target hosts.

Fulfill as many of the following criteria as possible by locating traps:

1. In a natural geographic funnel -- river/valley-canyon mouth, river/valley-canyon confluence, ridge line saddle. *Cowbirds usually travel in defined corridors/flight paths between roosting, foraging, and breeding areas.*

2. Near or within a cowbird roosting area (survey at dusk to locate). *Cowbirds usually roost with other blackbirds in wetlands.*

3. Near or within a cowbird foraging area -- stable, dairy, stockyard, agricultural field, golf course. *Cowbirds may commute 5 miles or more between breeding and foraging areas.*

4. Near or within a cowbird breeding area (survey your study area to observe the habitat with the most cowbirds present). *Cowbirds prefer riparian habitat with its high host density over all others.*

5. Near or within the target host habitat (at edge or in clearing). *Cowbirds prefer traps in open areas, not dense brush.*

6. Where visible from above (cowbird's eye view). *Cowbirds are attracted visually to the traps by the motion of live decoys and non-target birds.*

7. Under a cowbird perch -- telephone wire, snag, tree, fence. *Cowbirds prefer to inspect the trap from a nearby perch before close approach.*

8. Where accessible by vehicle (facilitates economical and quality daily servicing).

9. Out of public sight and in a low activity area (if possible).

[1] *Preferred Citation*:

Griffith Wildlife Biology (GWB) 1994. Brown-headed Cowbird Trapping Protocol. Unpublished document prepared by Jane C. Griffith and John T. Griffith, Griffith Wildlife Biology, Calumet, Michigan.

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TRAP ACTIVATION

Goal: To create an oasis of comfort (perches, shade), abundant food, clean water, and loud social-sexual interaction (among happy live decoys) which free cowbirds will find irresistible.

1. Level the trap site if necessary with pick and shovel so that the floor panel lies flat (otherwise the assembled trap will have gaps).

2. Bolt all panels together tightly with a socket wrench (so that vandals cannot easily disassemble the trap).

3. Cover the front half of the mesh floor with native material (sand, dirt) (to create a cowbird foraging pad onto which bait seed will be poured daily through the capture slot above).

4. Insert 1 m long, 1-1.5 cm diameter smooth perches (Arundo donax works best) into three trap corners at chest height (except above door) and 1 at knee height in a back corner for wing-clipped female decoy cowbirds and subordinate cowbirds/non-target species. Collect all perches prior to the day of trap activation.

5. Place a 1 gallon water guzzler on the rear floor in the middle (such placement precludes fouling of water by seed or perched birds). Make certain the water outlet hole in the guzzler faces down hill (else all the water will drain out).

6. Attach green nylon mesh to the west-facing side panel of the trap if the site does not offer afternoon shade (keep this in mind when orienting trap floor during Step 1).

7 Staple an easily replaced informative notice on the trap door (to include information about the trap owner, project administrator, project permit, project purpose, and trap operator, including phone number).

8. Label the trap with a number.

9 Add bait seed. For the first week of trapping, add 1 scoop outside the trap on a bare dirt area visible from above, and 1 scoop onto the foraging pad through the capture slot (allowing about 1/4 to remain on the slot board). Continue baiting both outside and inside only foraging area traps. At non-foraging sites, add 1 scoop per day (regardless of the amount inside -- the decoys and non-target birds need *fresh* seed daily) to each trap through the capture slot (allowing a sprinkling of seed -- enough to attract but not satisfy -- to remain on the slot board). Important: do not use wild bird mix containing sunflower seed (which only attracts non-target species).

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10. Add the live decoys (2 males and 3 wing-clipped females). While building to the preferred ratio, never place more than 2 male decoys per trap. Build as follows (male:female ratio): 1:0 or 0:1 (spread available decoys so there is at least 1 bird, male or female, per trap), 1:1, 1:2 (you may use 2:1 if you have extra males), 2:2, 2:3.

11. Lock the trap with a heavy lock. Key all locks alike.

12. Leave the trap door locked open or the slot board off if daily servicing of the assembled trap will not begin immediately. DO NOT LEAVE LOCKED TRAPS UNATTENDED FOR MORE THAN 24 HOURS. *Assembled, locked, unattended traps can kill animals that enter by dehydration or starvation. It is especially important to lock open or remove the slot board of assembled traps around the start and end of trapping, when assembled traps may be in the field and not serviced daily.*

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TRAP DAILY SERVICING

Goal: To release any non-target species captured, add fresh bait seed and water, maintain the 2M:3F live decoy ratio, and maintain the shade, perches, sign, and general trap integrity.

1. Add 1 scoop of bait seed through the capture slot.

2. Release all non-target birds immediately. Most are less hardy than cowbirds and can die in hand if not immediately released (mortality should be <2%). If there are many more non-target birds than cowbirds in a trap, capture and hold the cowbirds, then open the trap door and flush out the non-target birds.

3. Wing-clip the right wing of any newly-captured female cowbirds.

4. Remove or add newly captured or spare decoy cowbirds (carried with the trap technician daily) as necessary to maintain the 2:3 decoy ratio. Substitute any newly captured cowbirds as "fresh" live decoys.

5. To preclude accidental release of captured cowbirds or spare decoy cowbirds, DO NOT TRANSFER COWBIRDS INTO OR OUT OF THE SMALL HOLDING CAGE UNLESS YOU ARE INSIDE THE TRAP.

6. Fill the water guzzler if it is less than half full. Scrub out the tank and rim of each guzzler weekly.

7 If decoys are missing, carefully inspect the trap for vandalism (some vandals clip a very small hole in the mesh that only close inspection reveals) or evidence that the missing bird died or was preyed upon (blood or feathers on the mesh, carcass). Beware of king snakes and rattlesnakes too thick to escape the trap.

8. Repair any damage from vandals immediately.

9 Verify that the perches, shade, and sign are in place. Repair-replace as needed.

10. When leaving the trap site, verify that the trap is locked and that you have the capture net with keys, seed scoop, and any tools and materials used for repairs.

11. Record all captures, activities, and comment on the daily data sheet.

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TRAP DISASSEMBLY AND STORAGE

Goal: To have all traps in good repair and ready for placement and activation the following year.

1. Disassemble the traps. DO NOT pound on the threaded end of the carriage bolts with metal implements (it will make them unusable); use a rubber mallet or the wooden handle of a hammer to drive the bolts from the frames.

2. Collect all salvageable perches; bind and store in bundles of 100.

3. Separate the bolts from the nuts and washers. Apply a light spray of lubricant to the bolts. Store in a dry building or a sealed container.

4. String all the slot board straps together with baling wire.

5. Lubricate all locks with graphite.

6. Remove all staples left from shade or sign application from panels. Well-attached shade cloth can remain for use the following year.

7. Remove all vegetation from panel mesh, especially the floor.

8. Inspect all panels as they are disassembled. Make notes on any required repairs. Keep panels in need of repair separate.

9. Stack like panels in neat stacks (prevents warping) in the storage area. If outdoors, use 2x4 spacers to provide air circulation. Cover with canvas tarps if not indoors or under shelter (overpass) outdoors. Do not use plastic tarps, which cause condensation and subsequent wood rot.

10. Make all necessary repairs to the damaged panels separated during disassembly, then place on the proper stack.

11. Compile a list of the number and type of panels stored.

12. Scrub clean all salvageable water guzzlers. Remove all algal growth from the rim and tank and dry completely. Store the rims stacked together in firm boxes or 5 gallon plastic buckets. Store tanks in firm boxes or plastic bags. Store out of direct sunlight in an area safe from compaction.

TRAP OPERATION DATES

Topical Trapping

Goal: To minimize the number of parasitism days (the number of days a host population is exposed to each female cowbird) in targeted habitat. Standard Southern California trapping period for riparian hosts: March 15 - July 15.

Start Date

1. Determine the date of cowbird dispersal from winter flocks into targeted host habitat. *In San Diego and Orange Counties, this usually occurs during the third week of March.*

2. Determine the date of earliest egg-laying by the target host. *For least Bell's vireos, this is the first week of April.*

3. Place and activate all traps, with at least 1 male decoy cowbird, at the start of the cowbird dispersal period (for coastal Southern California: March 15) OR about 2 weeks prior to the first egg-laying by the target host (for vireos: March 15).

Example: San Diego County

March 15: Traps placed and activated.
March 15-21 (Week 1): All equipment/logistical/procedural/administrative kinks are worked out, cowbirds disperse into breeding habitat, first cowbirds captured. *There is a lag period of 3-7 days between trap activation and cowbird captures while cowbirds present in the target habitat become accustomed to the traps.*
March 22-28 (Week 2): Most/all female cowbirds present in the target habitat are removed prior to/coincident with the first host egg-laying.
March 22 - July 15 (Weeks 3-18): Cowbirds are removed as they continue to disperse into the habitat, limiting parasitism days to <3 per female cowbird (too short to locate and parasitize host nests).

Note: It is likely that nearly the same number of adult cowbirds could be removed from targeted habitat by trapping only in May. However, the number of parasitism days and actual parasitism events would not be greatly reduced. Similarly, a greater number of cowbirds could be removed by trapping only at cowbird foraging areas, again without the desired effect of reducing/ eliminating parasitism of the target host.

End Date

1. Determine the duration of the target host nesting period. Operate cowbird traps until all/most of the nests are past the egg stage (2 weeks past last nest-initiation). *Least Bell's vireos initiate nests as late as early July (trap through July 15), though most are done by mid-June (trap through June 30).*

2. If nest-monitoring of target hosts is not performed, some measure of the efficacy of the cowbird control effort can be gained by trapping through July. *Juvenile cowbirds, like juveniles of all avian species, are more easily captured than adults. We believe the number of juvenile cowbirds captured in host habitat is an accurate indicator of the success or failure of the cowbird control program. Determining the success of cowbird control in this manner precludes having to perform expensive and invasive host nest-monitoring.*

3. If the trapping period must be shortened for any reason, do not start later than April 1 or end sooner than June 30.

Note: Topical trapping has been performed at several sites for a decade or more. The number of cowbirds captured each year has remained relatively constant. We believe topical trapping, while effective in reducing/eliminating parasitism in targeted habitat or of targeted hosts, has not had a significant effect upon the regional cowbird population.

Winter Trapping, Foraging Area Trapping, Roost Trapping

Goal: To reduce the local/regional cowbird population for broad general benefit.

1. Locate/identify major foraging sites (dairies, stables, agricultural areas) and roosts.

2. Operate multiple traps at these locations during periods of greatest concentration (fall-winter) or year-round.

3. Captured cowbirds can be banded and released, saved for use as decoys, or euthanized.

Note: Limited winter banding and release of cowbirds in Southern California has shown that cowbirds that winter locally (banded and released in winter) breed locally (recaptured during the host nesting season in host breeding habitat traps). We believe that intensive winter/foraging area/roost trapping would have broad benefit to local host species by actual reduction of the local/regional cowbird population.

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NON-TARGET SPECIES

Southern California Species Captured

SSHA	Sharp-shinned hawk	rarely
COHA	Cooper's hawk	sometimes
CAQU	California quail	sometimes
MODO	**Mourning dove**	**often**
CGDO	Common ground dove	sometimes
BLPH	Black phoebe	sometimes
ATFL	Ash-throated flycatcher	rarely
CAKI	Cassin's kingbird	rarely
SCJA	Scrub jay	sometimes
NOMO	Northern mockingbird	sometimes
CATH	**California thrasher**	**often**
LOSH	Loggerhead shrike	sometimes
EUST	European starling	sometimes (non-native)
YBCH	Yellow-breasted chat	rarely
NOCA	Northern cardinal	rarely
BHGR	Black-headed grosbeak	sometimes
RSTO	**Rufous-sided towhee**	**often**
CATO	**California towhee**	**very often**
LASP	**Lark sparrow**	**often**
SOSP	**Song sparrow**	**often (can fly through 1" mesh)**
GCSP	Golden-crowned sparrow	rarely (first few weeks)
WCSP	**White-crowned sparrow**	**often (first few weeks)**
RWBL	**Red-winged blackbird**	**very often**
TRBL	Tricolored blackbird	sometimes
WEME	Western meadowlark	rarely
YHBL	Yellow-headed blackbird	rarely
BRBL	Brewer's blackbird	sometimes
GTGR	Great-tailed grackle	rarely
BRCO	Bronzed cowbird	rarely
HOOR	Hooded Oriole	rarely
NOOR	Northern Oriole	rarely
HOFI	**House finch**	**very often**
HOSP	**House sparrow**	**often (non-native)**

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BIG TUJUNGA WASH MITIGATION BANK
6.7 OUTLINE OF ANNUAL WATER QUALITY MONITORING REPORT

EXECUTIVE SUMMARY

SECTION 1.0 - INTRODUCTION

1 1 PURPOSE OF THE WATER QUALITY ANNUAL REPORT
1.2 SITE DESCRIPTION
(Figures 1 And 2)
1.3 MITIGATION PLAN

SECTION 2.0 - METHODOLGY

2.1 SAMPLING METHODOLOGY
DATE OF IMPLEMENTATION
METHODOLOGY USED IN PONDS
METHODOLOGY USED IN STREAM/HAINES CANYON CREEK
SAMPLING POINT
(Appendix A & B)
(Figure 3)

SECTION 3.0 - RESULTS

Possible Sampling Categories:

- Average depth
- Average width
- Estimated velocity
- Estimated flow
- Estimated depth of erosion/accretion
- Gravel embeddedness
- Mean sediment size
- Turbidity
- pH
- TSS
- Temperature
- DO
- TKN
- Nitrate levels

(Appendix C & D)
(Table 1)

SECTION 4.0 - MONITORING AND MAINTENANCE

CURRENT STATUS
PROBLEMS/CORRECTIVE ACTIONS

SECTION 5.0 - DISCUSSION

WATER QUALITY ANALYSIS
RESULTS

SECTION 6.0 - REFERENCES

Appendix A – Data Sheets
Appendix B – Site Photographs
Appendix C – Water Quality Monitoring Quarterly Letter Reports
Appendix D – Laboratory Analysis of Water Samples

LIST OF FIGURES

Figure

Figure 1 – Project Location
Figure 2 – Vicinity Map
Figure 3 – Sampling locations

LIST OF TABLES

Table

1 Measurements at monitoring stations

BIG TUJUNGA WASH MITIGATION BANK
6.8 SAMPLE QUARTERLY WATER QUALITY MONITORING LETTER REPORT

Date 2000
(Project #)

Los Angeles County Department of Public Works
Address
City

Subject: Quarterly Water Quality Monitoring Letter Report for the Big Tujunga Wash Mitigation Site

Dear

The purpose of this letter is to report the findings of our latest site visit. This quarterly letter report will consist of an analysis of each water quality sampling for the Big Tujunga Wash Mitigation Bank. Quarterly inspections are required during the first five years after the Habitat restoration and Enhancement Program has been initiated. Table 1 presents the results of the various water sampling categories.

(Insert Table 1)

The report shall discuss:

- The first quarterly letter report shall state the results and discuss upcoming water quality samplings/maintenance schedules
- Quarterly letter reports thereafter, shall compare that quarter's results with previous samplings as well as with the baseline water quality sampling results.
- An analysis of what these numbers mean and how it affects the local plant and wildlife shall be included.
- Any problems encountered in the numbers shall be reported as well as the corrective actions undertaken and future possible solutions shall also be mentioned.
- Report on any wildlife seen during the visit, including observations, tracks, scat, and auditory identifications.
- Provide, if necessary, recommendations to the landscape contractor for changes in the maintenance program, and recommendations for any of the other programs that are being monitored.

Sincerely,

SECTION 7.0 - OUTLINE OF ANNUAL PERFORMANCE MONITORING REPORT

Performance monitoring begins during the second year of the restoration and enhancement project at the Big Tujunga Wash Mitigation Bank site. Some of the tasks may not have been implemented during the first year, due to potential delays related to funding or agency review, and thus, the implementation of those tasks will be included in the first annual performance monitoring report. The purpose of the annual performance monitoring reports is to provide documentation of the work done during the year and to summarize the success of each of the programs. The success of the various programs is based on the success criteria described in Sections 2.0 and 8.0. It will be the Consultant's responsibility to prepare a draft of the annual performance monitoring report for review by the LADPW Following LADPW's review, the Consultant will prepare the Final annual performance monitoring report and submit it to the LADPW, Corps, CDFG, RWQCB, and USFWS.

7.1 ANNUAL PERFORMANCE MONITORING REPORT

This section of the MMP contains an outline for the Annual Performance Monitoring Report. For each of the enhancement programs, the report shall include sections describing the status of the program, methods used for implementation or monitoring, results of the implementation or monitoring, problems encountered during the year, and recommended remedial actions, if applicable. The performance monitoring report will specifically state whether any or all of the programs have achieved the success criteria. If the success criteria have not been met, then the report shall provide a discussion of the anticipated time frame for meeting the criteria and any alternative measures that may achieve the success criteria at an earlier date.

7.2 QUARTERLY AND BIANNUAL MAINTENANCE MONITORING REPORTS

This section of the MMP also includes the outlines for the quarterly and biannual maintenance monitoring report for the revegetation and enhancement. Control of weeds and exotic plants is critical to the success of this revegetation and enhancement programs so the Landscape Contractor and Restoration Specialist will conduct quarterly visits during the second year and biannual visits through fifth year of the 5-year duration of the programs. These reports will specifically document the results of the maintenance monitoring, the actions taken, and recommendations for additional weed/exotic plant control measures.

7.3 SEPARATE FOCUSED SURVEY REPORTS

As shown in Section 6.0 (Outline of the Final Implementation Report), several of the programs require separate reports addressing the focused surveys for listed species of wildlife. These separate reports must be submitted to the resource agencies as required by the Consultant's endangered species permits. These reports (cowbird, least Bell's vireo, southwestern willow flycatcher, arroyo southwestern toad, and Santa Ana Sucker [if listed as threatened]) must be prepared during the second through fifth years of the enhancement programs. A draft of each of these reports shall be prepared and submitted to LADPW for comment and then the final reports shall be submitted to the Corps, CDFG, RWQCB, and USFWS). The outlines of the separate reports are included as part of Section 6.0 and will not be repeated here to eliminate redundancy

7.4 SUMMARY OF ANNUAL PERFORMANCE MONITORING

The time period for the annual performance monitoring is assumed to start in the second year of the enhancement project and extend through the fifth year Focused surveys for listed species, brown-headed cowbird trapping, and native fishes/exotic wildlife programs shall be conducted each year during the spring and summer seasons. These sampling seasons typically start in March and end in August. The annual performance monitoring of the restoration and revegetation efforts shall be conducted every year in early September The results of the performance monitoring shall determine whether additional plantings are necessary to remediate problems with the restoration efforts. If so, then the plantings shall occur in the October/November timeframe. Water quality monitoring will continue on a quarterly basis through the performance monitoring period and maintenance monitoring will occur quarterly during the second year and biannually for years three through five. The annual performance monitoring report will be submitted to the LADPW in March of years two through five.

SAMPLE OUTLINE OF ANNUAL PERFORMANCE MONITORING REPORT

EXECUTIVE SUMMARY

SECTION 1.0 - INTRODUCTION

1 1 Purpose of the Annual Report
1.2 Site Description
1.3 Site Location
(Figures 1 and 2)
1.4 Mitigation Plan

SECTION 2.0 - NATIVE HABITAT RESTORATION PROGRAM

2.1 Introduction
- Purpose/Goals
- Location(s)
- Vegetation Description

(Figure 3)

2.2 Methodology/Date of Implementation
- Restoration
- Functional Analysis
- Revegetation Areas
- Enhancement/Reclamation Trails

(reference Appendix A)

2.3 Project Monitoring Status

Seeding and Planting in Revegetation Areas
Maintenance, Monitoring, and Reports
Quarterly or Semi-Annual Monitoring Results
Restoration Monitoring
Revegetation Areas
Enhancement/Reclamation Trails
Wildlife Monitoring
- Least Bell's vireo survey results (Reference Appendix B)
- Southwestern willow flycatcher survey results (Reference Appendix C)
- Arroyo southwestern toad survey results (Reference Appendix D)

2.4 Results

Predisturbance Data and Sample Size Adequacy
Discussion of Sample Adequacy
Height Requirement
Cover and Density
Survival Rates
Functional Analysis

2.5 Site Evaluation and Recommendations

Overall Site Conditions
Maintenance Recommendations and Remedial Actions
(Tables 1-7)
(reference Appendix E)

SECTION 3.0 -EXOTIC PLANT REMOVAL PROGRAM

3.1 Introduction
- Purpose/Goals
- Location(s)

(Figure 4)

3.2 Methodology/Date of Implementation
- Giant reed
- Tamarisk
- Water Hyacinth

3.3 Status/Results
- Quarterly or Semi-Annual Monitoring Results and Schedule
- Quarterly or Semi-Annual Maintenance Results and Schedule
- Problems/Corrective Actions

SECTION 4.0 - EXOTIC WILDLIFE REMOVAL PROGRAM

4.1 Introduction
- Purpose/Goals
- Location(s)

4.2 Methodology/Date of Implementation
- Non-native fish species
- Crayfish
- Bullfrog Removal

4.3 Status/Results
- Monthly Monitoring Results and Schedule
- Monthly Maintenance Results and Schedule
- Problems/Corrective Actions

SECTION 5.0 - BROWN-HEADED COWBIRD PROGRAM

5.1 Introduction
- Purpose/Goals
- Location(s)

(Figure 5)

5.2 Methodology

5.3 Summary of Results
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BIG TUJUNGA WASH MITIGATION BANK
QUARTERLY MONITORING REPORT
FOR
(3-month period, 200_)

Prepared for:

LOS ANGELES DEPARTMENT OF PUBLIC WORKS
Street
City

Prepared by:

ENVIRONMENTAL, INC.
Street
City

Month 2000

BIG TUJUNGA WASH MITIGATION SITE
QUARTERLY MONITORING REPORT FOR (appropriate quarter)

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BIG TUJUNGA WASH MITIGATION BANK
BIANNUAL MONITORING
FOR (6-month period, 200_)

Prepared for:

LOS ANGELES DEPARTMENT OF PUBLIC WORKS
Street
City

Prepared by:

Environmental, INC.
Street
City

Month 200_

BIG TUJUNGA WASH MITIGATION SITE
BIANNUAL MONITORING REPORT FOR (appropriate 6-Month Period)

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SECTION 8.0 - SUCCESS CRITERIA AND CONTINGENCY MEASURES

This section of the MMP provides a description of the success criteria for each of the various programs. The success criteria will be used to determine the short- and long-term success of the programs. These criteria, which have been tailored to fit the Big Tujunga Wash Mitigation Bank site, are based on the most practical and applicable success criteria that are typically required by the agencies (Corps, CDFG, and RWQCB). In addition, this section of the MMP also includes contingency measures that have been designed to identify remedial actions or mid-course corrections that may be necessary to implement if problems arise that threaten the success of the various programs. In some cases, the contingency measures may be designed to improve the enhancement of the site for the purpose of achieving the success criteria prior to the anticipated schedule.

8.1 INTRODUCTION

The overall success of the MMP will depend on several outside factors. From acts of nature, to acts of vandalism, there are many potential situations that could ultimately jeopardize the progress of the MMP This section of the MMP provides a comprehensive set of strategies that are aimed to address certain impeding events. Of course, not all situations or circumstances can be predicted or hypothesized. However, those that are likely to occur during the life of the project are addressed. Implementation of the proposed strategies and courses of action is contingent upon certain emergency circumstances as well as findings of routine inspections. Scheduled inspections will be conducted on a monthly, semi-annual, and annual basis. More frequent visits are allowed as required for unanticipated problems. Contingency planning is designed to facilitate expedient and effective actions when faced with situations that impede restoration success.

Funding of the contingency measures is ultimately the responsibility of the LADPW until which time they turn the Mitigation Bank over to some caretaker agency. All of these measures are contingent upon the development of abnormal conditions or circumstances. The Consultant hired to implement the MMP shall not be financially responsible for reparations resulting from circumstances unanticipated in this MMP including but not restricted to acts of God and acts or delays of governmental or regulatory bodies.

The Consultant needs to ensure that structures installed on the site are designed to withstand floods because the site is in a floodplain. The LADPW's hydrologic standard is runoff from a 50-year frequency rainfall. Therefore, the Consultant shall be responsible for obtaining the necessary design information, for properly designing the structures, and for installing the structures.

The appropriate permits for corrective actions shall be obtained from all applicable governing bodies. The initial permit process for the MMP shall include sections that discuss remedial, scheduled, and emergency actions at times when the target criteria has not been adequately met. This will ensure that time will not be lost when contingency measures are to be implemented.

8.2 MASTER CONTINGENCY MEASURE

The Big Tujunga Wash Mitigation Bank site is located in a floodplain that is subject to periodic flooding events. In the event of a major flood event that washes out the revegetation, enhancement plantings, or trails, then the condition of the site needs to be assessed as soon as the area is safe and the threat of subsequent flooding has passed. Assessment of the site shall consist of a letter report, prepared by the Consultant that documents the condition of the Mitigation Bank site. This assessment shall include the condition of the trails, restoration areas, Tujunga Ponds, kiosks, signage, trash receptacles, portable restrooms, cowbird traps, and exotic wildlife infestation. The LADPW shall enter into consultation with the agencies (Corps, CDFG, RWQCB, and USFWS) to discuss the condition of the site and the responsibilities of the LADPW following the flood. The floodplain vegetation is naturally adapted to flood events and shall recover on its own barring infestations of exotic plant species. Following this type of

flooding event, an active weed and exotic plant species control program shall be implemented (described in Section 3.0). If the exotics and the weeds are controlled then there may not be a need for replanting of riparian habitat. Repairing the condition of trails, cowbird traps, kiosks, signage, trash receptacles, and portable restrooms shall be discussed with the agencies and the decisions made about the continuation of these programs shall be implemented.

8.3 FUNCTIONAL ANALYSIS OF THE MITIGATION BANK SITE

The performance standards for the riparian and aquatic habitats in Haines Canyon Creek are based on the functional analysis performed on the existing habitat. Target functional values for the enhanced riparian and aquatic habitats are based on an analysis of the probable effects of the restoration effort on the existing system. Aquatic functional capacity value is gained by removal of exotic fish and amphibian species from the aquatic habitat, revegetation of the streambank surfaces, and the reduction of erosion along the creek by restricting equestrians to established trails. The total gain in aquatic functional capacity is 0.62 units per acre. Enhancement of the existing riparian habitats include the removal of exotic plant species (giant reed and tamarisk) and protection of native bird species through a cowbird trapping program. The total gain in riparian functional capacity is 0.08 units per acre. The pre- and post-restoration functional units are summarized in Table 8-1

Table 8-1
Target Functional Analysis Variable
Values for Haines Canyon Creek Riparian and Aquatic Habitats

Variable	Functional Units Existing	Functional Units Target
RIPARIAN HABITAT		
Structural Diversity (STD)	0.7	0.9
Riparian Habitat - Cover (COV)	1.0	1.0
Contiguity of Habitat (CON)	1.0	1.0
Urban Encroachment (URB)	0.6	0.6
Percent of Exotic Invasive Species/Vegetation (EXO)	0.8	1.0
Hydrologic Regime of Riparian Zone (REG)	1.0	1.0
Characteristics of Flood-prone Area (FPA)	0.8	0.8
Micro and Macro Topographic Complexity (TOP)	0.8	0.8
Available Organic Carbon (CAR)	1.0	1.0
Rareness - Listed and Sensitive Species (RAR)	1.0	1.0
Terrestrial Wildlife (Vertebrate) Species Richness (RIC)	0.7	0.8
Presence of Habitat Specialists (Terrestrial Vertebrate Wildlife) (SPE)	0.6	0.8
AQUATIC HABITAT		
In-stream Cover (INS)	0.6	0.8
Vegetation Roughness (Channel Only) (RUF)	0.6	1.0
Epifaunal Substrate (EPI)	0.6	0.6
Sediment Deposition (SED)	0.3	0.5
Bank Vegetative Protection (BVP)	0.6	0.8
Bank Stability (BST)	0.7	0.8
Exotic Aquatic Vertebrates (EAV)	0.2	1.0

The determination of success will be made after the success monitoring is completed each year A functional analysis will be conducted and the data from all of the various programs will be reviewed. The individual functional values for each of the variables will give an indication of whether or not the value of

the variables are increasing, decreasing, or staying the same. In the event that one or more variables are decreasing or staying the same, then the overall enhancement program will be reviewed to determine what programs need to be improved. The following sections describe specific contingency measures for each of the programs.

8.4 HABITAT ENHANCEMENT AND REVEGETATION PROGRAM

In the event of a clear and obvious hindrance to the success of the habitat enhancement and revegetation program, an immediate corrective course of action must be undertaken. Flooding events and extreme weather conditions pose a threat to the restoration program. The specific success criteria and contingency measures designed to identify when corrections need to be made in this program are discussed below.

Performance standards for the enhancement planting program are as follows:

- at the end of 3 years, the saplings will reach a height of 3 feet, and canopy cover will be approximately 15 percent;
- after 3 years, 75 percent of the original plantings will survive; and
- after 5 years, 75 percent of the original plantings will survive, and overall cover will be approximately 75 percent or greater

  Note: These performance standards would also apply to the optional oak/sycamore woodland restoration.

There are several factors that may have a direct effect on the germination and growth success of the new plantings. A remedial course of action shall be implemented if, and when, the findings resulting from scheduled inspections conclude that the success of the plantings has not met the established target criteria. Inspections will examine plant survival, percent cover, height of tree and shrub species, and number of species to be replace. All areas, including reclaimed trails, will be monitored and subjected to the established success criteria and contingency measures. All protective devices shall be maintained through completion of the monitoring period or until removal is authorized by the Restoration Specialist. All reseeding and replanting shall be conducted from October through December of each year, as necessary.

- If vandalism or trespassing proves to inhibit successful plant growth, then a fence shall be erected around problem areas. The landscape contractor shall be responsible for installation and maintenance of the perimeter fence. Signage describing the reasons for prohibiting access into these areas shall be reevaluated. Possible improvement in the effectiveness of signs may be achieved by relocating signs to more strategic locations or by introducing additional signs that increase public exposure.
- Additional, protective measures such as tree tubes and placement of cages or screens around individual plants shall be used in areas subject to trampling, herbivory, or other threats as determined by the Restoration Specialist.
- Any plantings displaying signs of stress, tip dieback, or have developed basal sprouts and show no evidence of improvement between subsequent inspections shall be replaced. Prior to replanting, soil compaction and soil chemical analyses shall be completed in the problem areas to identify any site-specific characteristics that may require specialized procedures. If indicated by the soil analyses, the revegetation contractor and the Project Biologist shall develop specific site preparation.
- Saplings may not be found during a particular sampling period Saplings not found during two successive sampling periods shall be counted as dead. These shall be replaced with new plantings.

- Significant loss of container plant material shall require plant replacement. Replacement shall depend on the overall coverage of seedling plants and the relative frequency of the species in the area.

- If mortality occurs for reasons including, but not limited to, those stated within this document, additional plants shall be installed. This shall be accomplished at a one-to-one ratio. For sapling (5-gallon) revegetation, all saplings that die shall be replaced at the first suitable growing season to achieve a level equivalent to 75 percent survival of the original plantings.

- Prior to delivery, the root system of the container plants shall be inspected by the revegetation contractor to ensure that roots are straight and well established. Plants with coiled roots shall not be accepted. Following implementation, the monitor shall determine whether the plants are developing an adequate root system. It the vegetation standards are not met by the respective years, and if the monitor determines that the plants have inadequate root structures, the monitor shall make recommendations to remedy the situation (e.g., replacement of plants, soil treatments).

- It is expected that natural reproduction of a variety of seeded and planted species will be evident by the third year after planting. If the monitor notices any areas that are deficient in the recruitment of native species, appropriate remedial actions shall be taken to remedy the situation.

8.4.1 Supplemental Watering

In the event the Restoration Specialist notes that plantings need supplemental watering, the landscape contractor shall determine the appropriate method of providing supplemental water If necessary, a temporary watering system may have to be constructed so that all portions of the revegetated areas obtain a sufficient amount of water In the case that this coverage is not being achieved, immediate remedial action shall ensue

- The landscape contractor shall be responsible for irrigating the mitigation plantings, and for ensuring the proper functioning of all components of the temporary irrigation system (if one is installed) throughout the establishment period.

- It is the responsibility of the Restoration Specialist to determine when artificial watering is no longer required.

- If plantings are receiving too much or too little irrigation, the Restoration Specialist shall immediately notify the Landscape Contractor and they will agree on the necessary adjustments in the irrigation rates.

8.4.2 Weed Control

The associated ground disturbance resulting from clearing or ripping of soils within the project site will facilitate the dispersal and germination of invasive plant species. Invasive plant species can have profound effects on restoration by out-competing native vegetation, especially in the early stages of growth.

- All weeds appearing within the revegetation areas shall be removed for at least 2 years or until plantings are well established to prevent detrimental competition between the nonnative, invasive species with the revegetation plantings for water, nutrients, light, and space. It is the responsibility of the Restoration Specialist to decide the level of detrimental competition and when weed removal is no longer required.

- Control of invasive grasses shall rely on hand removal methods. If the extent of the invasive plant influx is too great for hand removal, herbicides may be used. However, all herbicides must be wetland approved by the Environmental Protection Agency (e.g., Rodeo ®).

- Overuse of herbicides can cause chemical damage (e.g., sagebrush healthy but understory appears scarce or burned). If this is evident, lessen the amount of herbicide usage or rely on hand removal methods only.

- If native plants become damaged or removed during weeding or maintenance activities (e.g., overuse of power equipment such as "weed eaters") then hand removal methods shall be considered. This allows for greater control over which plants were removed and would be ultimately less damaging to native species. Additional training of landscape maintenance personnel shall be performed by the Project Biologist to prevent further disturbance of native plantings. This education shall, at a minimum, concentrate on the identification of native species found in the revegetation area and differentiating these species from common weeds.

8.4.3 Exotic Plant Eradication

Giant reed and tamarisk shall be removed from presently occupied areas. This vegetation will be removed by hand and subjected to herbicides. Past results have indicated that this method is highly effective. However, there remains the chance of exotic reestablishment. If the success criteria for removal are not attained at the specified time, then the removal program must be reinstated. This shall continue until the final criteria have been satisfied.

- It is the responsibility of the Landscape Contractor to successfully implement the Exotic Vegetation Removal Program. All stands of tamarisk and giant reed that were not removed as a result of the first eradication effort must be targeted and removed. Only accepted removal practices shall be implemented.

- If stands of exotic plant species appear in other areas of the site, these shall be addressed immediately.

- It is possible that exotic species can originate from offsite locations. Seeds can be swept downstream and germinate within the project area. The Contractor is not responsible for the removal of exotic species that are not present within the project area at the time of contract.

- In order to minimize the reinfestation of giant reed and tamarisk on the site, the LADPW shall consult with the Corps, CDFG, U.S. Forest Service and RWQCB and encourage them to establish an exotic plant species removal program upstream of the 210 Freeway bridge. This program could consist of requiring exotic plant species removal for projects in the vicinity that require permits from these agencies.

8.4.4 Erosion Control

Areas undergoing revegetation will be subjected to soil disturbances. During construction, if topsoil is to be segregated and stored for future reestablishment then erosion control devices such as sediment fencing will contain the disrupted soil to prevent sediment runoff.

- Drainage and sedimentation control devices shall be routinely cleaned, maintained, and repaired prior to and during the rainy season. All repairs to these systems shall be immediately executed to minimize erosion problems.

- The repeated failure of erosion control devices must be addressed by reevaluating erosion problems and considering additional or alternative methods (e.g., reinforced silt fencing or biodegradable mesh).

8.4.5 Maintenance

Maintenance of the site will be the responsibility of the landscape contractor and shall be performed with the knowledge and oversight of the native Restoration Specialist. In the case that maintenance of the site is not being adequately achieved, immediate remedial action shall result and a new landscape contractor will be hired.

8.5 BROWN-HEADED COWBIRD TRAPPING PROGRAM

A successful cowbird trapping program is determined by evidence of successful breeding by riparian dependent birds such as the southwestern willow flycatcher, least Bell's vireo, and yellow warbler The overall goal of the trapping program is to remove those cowbirds impacting the target hosts while decreasing non-target capture and mortality Therefore, the following success criteria are designed to maximize cowbird capture and decrease non-target capture and mortality.

8.5.1 Cowbird Capture Ratios

Big Tujunga Wash has already been surveyed and trap locations have already been determined however, if a specific trap has a low capture ratio, the following contingency measures shall be implemented:

- Check to make sure that each trap is situated in an accessible location, visible from above, and also fulfills one or more of the following additional criteria: placed in an area of high cowbird concentration, under a cowbird perching site, or along an observed cowbird daily migration path.

- In addition to the maintenance of the trap, time shall be taken to observe the surrounding area to monitor the behavior of birds and identify other cowbird activity to determine whether better trap locations exist.

- If another cowbird migration path or area of high cowbird concentration is identified, contact USFWS and consider moving the trap to an appropriate location. Be sure to map any changes made to trap locations. The map shall be on a 1 inch:24,000 feet USGS map or an aerial photograph at a scale of 1 inch=300 feet.

8.5.2 Cowbird Decoy Ratios

The live decoys shall be placed in the traps at a ratio of 2 males to 3 wing-clipped females. While building or maintaining the 2:3 preferred ratio, the following contingency measures shall be implemented:

- The ratio can vary between any combination of the following (male to female): 1:0, 0:1, 1:1, 1:2, 2:1, 2:2, or 2:3. Make sure there is at least one decoy per trap but never place more than 2 male decoys per trap.

- Unless an abundance of decoys are available for the trapping season, obtaining decoys shall be a continual process throughout the trapping season. This ensures that the proper ratio can always be maintained even if cowbird mortality, predation, and/or escape occurs.

8.5.3 Capture Mortality

It is important to create an attractive and comfortable environment for both the cowbirds and non-targets birds and keep capture mortality to a minimum. Additionally, non-target mortality shall be less than 2 percent. The following contingency measures shall be implemented to help decrease the overall capture mortality:

- Provide enough appropriately placed perches to eliminate the pecking and sometimes death associated with overcrowding. Each trap shall have at least 10 perches. This number can vary depending upon the number of captures in any given trap.

- Provide enough shading on the trap to avoid heat exhaustion.

- To reduce predation problems, traps can be retrofitted or constructed with ¼-inch wire mesh at the base and tops of the side, front, and back panels, and along the entire length of the top panels. Retrofitting can begin at the time of trap assembly and shall be implemented on an as-needed basis throughout the trapping season.

- Weed grasses in the traps shall be removed to ensure the safety of the birds, as well as the trappers from predators, especially rattlesnakes.

- Capture mortality can also be caused by larger non-target species (e.g., raptors or scrub jays) either entering the trap or preying upon captures through the top slot. If this trend continues and there are no significant gaps in the panels, the top slot can be reduced from 1⅝ inches to 1⅜ inches. The top slot size shall be small enough to prevent larger non-target species from entering without deterring cowbirds. USFWS and CDFG shall be contacted if the top slot size needs to be adjusted.

- If a certain trap is subject to a significant amount of continual predation, contact USFWS and request for temporary trap closure. If significant predation continues after the trap is re-opened, contact USFWS and request for a permanent trap closure.

8.5.4 Vandalism

The potential for a high incidence of vandalism exists at Big Tujunga Wash because it is a publicly owned area with a lot of foot traffic through the wash. Consequently, the following contingency measures shall be implemented:

- Although the trap locations are already identified, they can be slightly adjusted during initial trap placement. Adjustments include moving the trap closer to a tree or shrub or angling the trap to be more discrete, especially if a trail is nearby.

- Always inspect all damage and repair immediately. Be sure to record all damage in the data sheets.

- If vandalism is a continual problem, look into relocating the trap to a more discrete site, and contact USFWS.

8.5.5 Flooding Contingency

It is possible that heavy rains during the trapping season could flood the traps. If any of the traps are at risk of being flooded, the following contingency measures shall be implemented:

- Move the trap to an appropriate upland location away from the watercourse.

- If the trap cannot be moved, then transfer the decoys to another trap, while maintaining the appropriate decoy ratio, and remove the guzzler and feed pan. Flush out all non-target captures and lock the trap door open in order to prevent captures in a flooded trap.

- After the flood, thoroughly inspect the trap for any damage (e.g., warped panels or mesh) and repair immediately.

- When the trap is safe and all repairs have been made, return the decoys, guzzler, and feed pan and begin protocol trap monitoring.

8.6 FORMAL TRAILS ESTABLISHMENT PROGRAM

The overall goal of the trail system is to allow for existing recreational activity while minimizing affects to the habitat quality at the Big Tujunga site. Essential to this process is the effort of returning unnecessary trails to their natural condition for the overall improvement of habitat quality. In addition, the integrity of the habitats is contingent upon proper use of the trails that remain open. Therefore, the following success criteria and contingency measures are designed to maximize the success of the trail reclamation program.

8.6.1 Unsafe Trail Conditions

Low hanging branches and surrounding shrubs shall be trimmed regularly to the appropriate clearance height (10 feet) and width (8 feet). Shrubs and saplings that become established on the trail paths shall be removed by hand.

If trails become flooded or washed out and are impassible, barricades and signs shall be placed at the start and end of the trail and the trail shall be closed until waters reside. If erosion problems along the trail cause unsafe trail conditions for pedestrians and equestrians, the trail shall be closed until the problem is resolved. Erosion problems shall be resolved in a safe and timely manner and preventative erosion control measures shall be installed in problem areas.

If trails become obstructed by a fallen tree, landslide, or other object the problem shall be resolved at the time of detection. If the obstruction is too large to remove by hand mechanical devices may be used to clear the path. Natural debris (trees, rocks) shall be removed from the site or placed within similar habitat outside the path of the trail. Foreign objects shall be permanently removed from the site or placed in the proper trash receptacle.

8.6.2 Vandalism

In the event that posted signs are removed, defaced, or destroyed by vandals, the signs shall be fixed or replaced as soon as the problem is detected. If chain link fencing, temporary barricades, or other protective barriers have been pushed aside, destroyed, or removed, these shall be replaced the same day of detection or as soon as possible. In the event that any vandalism is noted, the Consultant shall immediately notify LADPW to determine the corrective course of action.

8.6.3 Improper Trail Use

For the safety of the public and the environment, the trails shall be limited to pedestrian and equestrian traffic. No bikes, mopeds, off-road vehicles, automobiles, or unauthorized machinery shall be allowed use of the trails. Restrictive signs shall be posted at the start of the trails. Detection of improper use of the trails shall result in the additional placement of posted signs in the problem areas. If continued improper use is detected, strategically placed fencing shall be constructed that will allow the passage of only pedestrians and equestrians. If all precautions are ignored, the problem shall be reported to the local legal and regulatory authorities.

8.6.4 Sensitive Habitat

Several aspects of the project design are aimed to minimize inadvertent impacts on all restoration areas resulting from human activity (e.g., horseback riding) within the recreational area. Signs shall be strategically situated throughout the enhancement area. These signs shall clearly state areas that are off-limits due to the presence of fragile habitat (e.g., streams, ponds, and areas of rehabilitation). Signs shall be posted at 50-foot intervals advising people of areas undergoing native plant rehabilitation.

Additional out-of-bounds markers along the perimeter of the revegetated areas may be necessary. If hiking and riding activities repeatedly extend into these fragile areas, then the use of supplemental deterrence devices shall be considered. A discreet single-strand wire fence barrier could be installed. This would likely reduce intentional or inadvertent impacts on revegetation areas as a result of human recreational activity.

Existing trails that currently impact stream or fragile riparian habitat shall be permanently closed. Scheduled inspections will assess the success of trail closure and if the newly created trails are being used. If there is noticeable damage to fragile habitat, then remedial actions shall be implemented immediately.

- Install additional signs along closed areas or relocate existing signs to increase exposure and effectiveness.

- Place railroad ties at the head of closed trails to create barriers for access. If railroad ties are not totally effective, then a fence shall be erected.

8.7 EXOTIC WILDLIFE ERADICATION PROGRAM

The Exotic Fish, Crayfish, and Bullfrog Removal Program shall continue within Haines Canyon Creek and Tujunga Ponds area until all means of removal have been exhausted or until the species are completely eradicated. Following the removal program, the estimated population of each exotic species shall be calculated and documented. This data shall serve as the base information to which future sampling efforts and population estimations can be compared. In each of the four years following initial removal of exotics, less than 5 percent of the densities of exotic fishes and less than 10 percent of the densities of crayfish and bullfrogs than the baseline populations established will constitute success of the program. If the findings of scheduled inspections conclude that the eradication of exotic species has not met the targeted criteria for each site, then further remedial actions shall be implemented.

- In the event that any of the above mentioned exotic wildlife species are detected during the scheduled inspections after the removal program has been completed, additional eradication efforts shall be implemented.

- If the Corps implements the planned water conservation program at Hansen Dam, then the threat of exotic wildlife species moving upstream into the Mitigation Bank site would be a concern. In order to alleviate this potential problem, the LADPW shall consult with the Corps and USFWS regarding the construction of a drop structure downstream of the Mitigation Bank site. This will restrict the upstream movement of exotic fishes.

8.8 WATER QUALITY MONITORING

The Water Quality Monitoring 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 monitoring program will specifically address water quality issues, such as pesticide/fertilizer percolation or run-off and subsequent groundwater contamination that may occur due to upstream development. The water quality monitoring program at Big Tujunga Wash shall complement the monitoring that is a requirement of the

upstream Red Tail Golf Course and Equestrian Project. The success of the program will be determined by either the maintenance of a stable condition or by an improvement from the baseline water quality data. The success will be measured by analyzing the water quality parameters. The following contingency measures shall be implemented in order to properly monitor water quality

8.8.1 Discrepancies from Baseline Data - Elevated Nitrogen and Organophosphate Levels

Monitoring for elevated levels of nitrogen and organophosphates will help determine whether nitrate-laden irrigation water or pesticide run-off from upstream developments is affecting the Big Tujunga Wash Mitigation Bank. Water quality parameters described in Section 5 will determine if unhealthful conditions exist for the aquatic wildlife species.

- Monitoring of other notable discrepancies between the water quality and the baseline water quality established in the beginning of MMP implementation shall be brought to the attention of the LADPW, CDFG, RWQCB, USFWS, and the consultant within 7 days of receiving the water quality analysis.

- If the agencies have concerns over the changes in the water quality, then a qualified hydrologist in conjunction with a native fish specialist shall develop and implement a program for remediating the water quality changes. This program shall include consultation with the USFWS and potential legal recourse if the source of the unhealthful water quality can be identified.

SECTION 9.0 - OPTIONAL ENHANCEMENT ALTERNATIVES

The enhancement report prepared by Chambers Group in 1998 provided a general description of enhancement measures that could be implemented to improve the Big Tujunga Wash Mitigation site. The resource agencies (Corps, CDFG, and RWQCB) allotted mitigation credits to LADPW for the alluvial scrub, riparian woodland, and jurisdictional waters on the site if the enhancement measures were implemented. The agencies allotted the following mitigation credits to LADPW: Corps – 157.6, CDFG – not designated, and RWQCB - 154. Implementation of the basic measures in the Chambers Group report are included in the previous sections of this MMP

During the preparation of the MMP, a number of additional enhancement measures were identified that will further improve the habitats on the site and may improve the site for the various user groups. In addition, some of these measures may increase the number of mitigation credits available on the site. The actual number of additional credits allotted by the agencies if these additional measures are implemented is subject to the discretion of the agencies. This section of the document describes the additional enhancement measures that were developed during the course of the MMP preparation. Briefly, these measures include creating a coast live oak – sycamore woodland with a coastal sage scrub understory on the uplands at Cottonwood, eliminating the concrete at the Cottonwood area and replacing it with additional oak/sycamore woodland/coastal sage scrub habitat, reconfiguring the Tujunga Ponds to eliminate the ponds and create stream habitat, and providing a regular patrol of the site to discourage vandalism.

9.1 CREATION OF COAST LIVE OAK - SYCAMORE WOODLAND WITH COASTAL SAGE SCRUB UNDERSTORY

Creating a coast live oak-sycamore woodland with a coastal sage scrub understory community was not included as part of the enhancement measures put forth 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 a non-native grassland to a native plant community. The existing oaks and sycamores in this area provide a good indication that the uplands can support a native plant community Consequently, an optional enhancement measure was developed to address the revegetation of the upland areas. Creating 11 7 acres of oak/sycamore/coastal sage scrub habitat should be considered a valuable addition to the Mitigation Bank for both ecological and aesthetic values. During preparation of the MMP, both the Corps and CDFG were consulted regarding the possibility of obtaining additional credits in the Mitigation Bank for the revegetation of the upland with this habitat. Both agencies expressed favorable opinions and stated that they would give consideration to allotting additional mitigation credits. The Corps suggested drafting a letter to them which documents the request for additional mitigation credits. Subsequently, the Corps would consult with CDFG and RWQCB regarding the allotment of additional credits. If LADPW decides to proceed with this optional measure, then consultation with the resource agencies regarding the additional credits should be implemented in a timely manner

Revegetation is intended to create a plant community where none currently exists. The goal of the revegetation plan will be to create a coast live oak–sycamore woodland with an undifferentiated coastal sage scrub understory in the revegetation areas on the site now occupied by non-native grasslands. Approximately 11 7 acres of habitat will be created on a 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 will be planted primarily as a coastal sage scrub community with occasional sycamores. A mixed sycamore-oak woodland will be established on the remaining 6.9 acres. The composition of these revegetation areas 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 revegetation are will also provide an additional buffer between the urban areas and the riparian zone. The revegetation plan consists of various tasks designed to prepare the areas prior to

planting and to install container plant and seed materials. Figures 9-1A and 9-1B show the conceptual planting plan for the woodland and scrub communities. Figure 9-1C shows the conceptual layout for the temporary irrigation system.

The reader should note that the portion of the upland area that is covered with the concrete pad from the old asphalt plant is not included as part of the upland revegetation area. Removal of the concrete pad and subsequent disturbance of the underlying soils may be problematic, and the underlying soils may not be suitable to support a native plant community. If LADPW elects to remove the concrete pad, then soils testing of the underlying material can be completed to determine if the soils are suitable. If the soils are deemed suitable, then a modification of the habitat restoration and enhancement portion of the MMP can provide the details to accomplish the revegetation of that area.

The implementation of this optional enhancement measure is at the discretion of the LADPW and the decision should be based upon costs associated with the revegetation effort and value obtained from establishment of this community in the Mitigation Bank. 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.

9.1.1 Site Preparation

The site selected for the woodland-coastal sage scrub planting was based on several considerations, including existing trees, potential for future native wildlife use, and aesthetic value. Guidelines for the protection of trees to be conserved in place during construction are described below. In addition, measures for protecting existing topsoil and for implementing pre-planting weed control are also described.

Tree Protection Program

Trees, particularly oaks, are sensitive to environmental changes that alter the availability of water and nutrients. During construction-related activities, the most common type of damage sustained by trees are root injury from soil cuts, fills, compaction, and trenching, and excessive branch removal due to contact with construction equipment. The purpose of these guidelines is to ensure that construction-related impacts do not adversely affect oaks or any other trees intended for preservation.

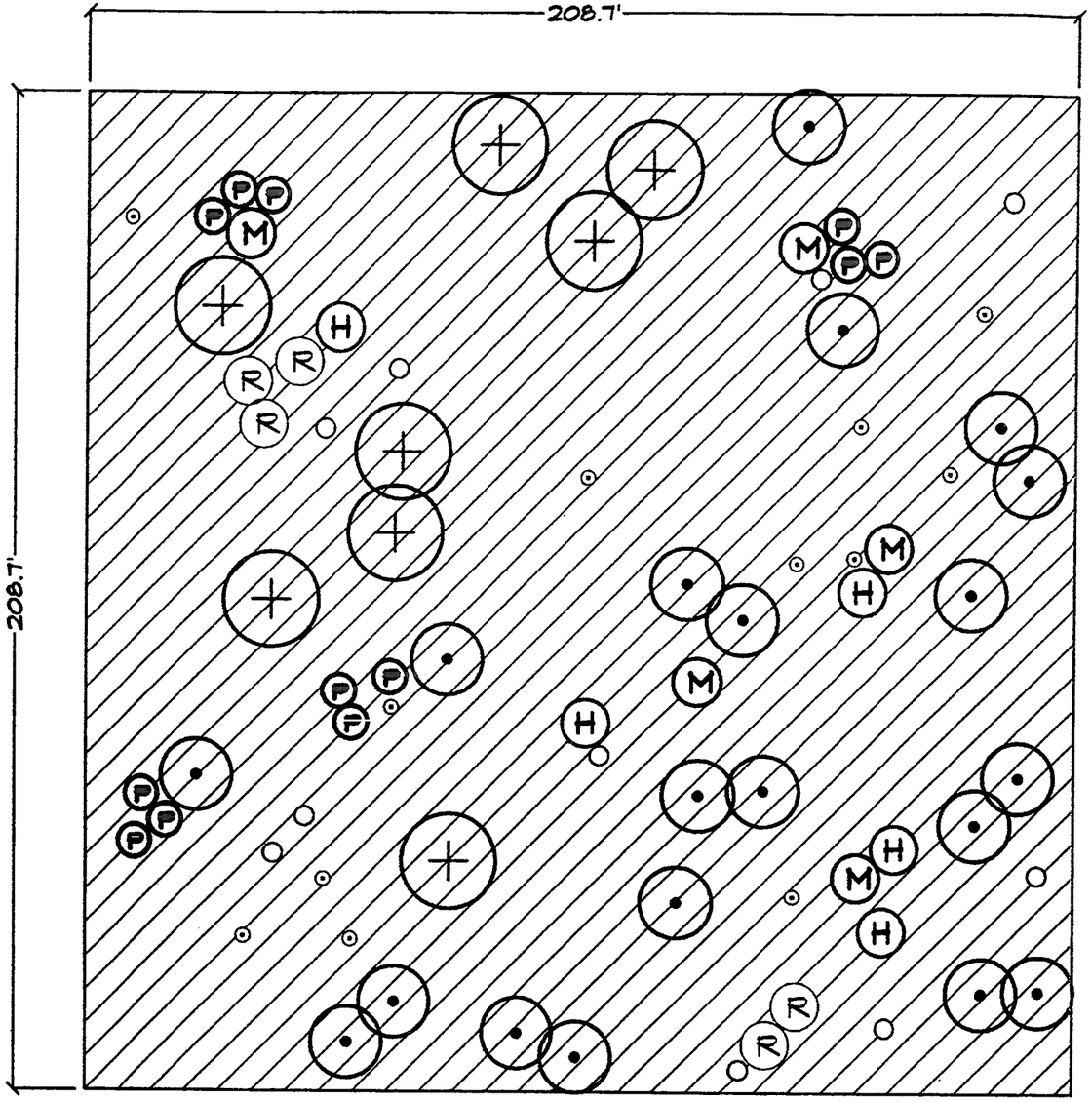
- Areas to be protected will be identified by the Restoration Specialist and isolated with construction fencing prior to construction.

- Vehicles will not be allowed to operate within the dripline of any tree to be preserved.

Protection of Topsoil

Topsoil provides a desirable growing medium with greater water and nutrient holding capacity, and contains beneficial microorganisms that underlying subsoils cannot provide. These characteristics greatly contribute to quick establishment of high-quality, long-lived restoration plantings. The rebuilding of soil structure is an important process in natural plant succession and the establishment of self-sufficient communities.

Topsoil in the revegetation area shall be protected by restricting vehicles to established routes. Where prior soil compaction has occurred due to vehicle access, topsoil shall be disced to a depth of 12 inches to alleviate compaction. This only applies to the areas previously used for parking, facilities, or trails on the upland area. All plant container holes shall be augured to facilitate deep root growth and successful establishment of the plant. The finished topsoil surface shall be left in as rough of condition as possible.



SCALE: 1"=30'
SITE AREA = APPROX. 1 ACRE

NOTE:
SEE FIGURE 3-4A FOR COMPLETE TREE SPECIES LAYOUT AND LOCATION OF BERBERIS NEVINII (1 GROUP OF 3 INDIVIDUALS)

LEGEND			DENSITY/AC.
○	ARTEMISIA CALIFORNICA	SAGEBRUSH	10
⊙	ERIOGONUM FASCICULATUM	BUCKWHEAT	10
H	HETEROMELES ARBUTIFOLIA	TOYON	5
M	MALOSMA LAURINA	LAUREL SUMAC	5
P	PAEONIA CALIFORNICA	PEONY	10
R	RIBES SPECIOSUM	CURRANT	5
+	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	10
•	QUERCUS AGRIFOLIA	COAST LIVE OAK	20
▨	HYDROSEED		

MIXED COASTAL SAGE SCRUB UNDERSTORY SEED MIX

SCIENTIFIC NAME	COMMON NAME	% OF SPECIES IN MIX	POUNDS OF SEED PER ACRE (a)
Artemisia californica	California sagebrush	20	1.0
Croton californicus	California croton	5	2.0
Dichelostemma pulchella	blue dicks	5	1.5
Encelia farinosa	brittlebush	5	1.5
Eriogonum fasciculatum	California buckwheat	15	5.5
Eriophyllum confertiflorum	golden yarrow	10	0.5
Gilia capitata	gilia	5	1.5
Gnaphalium californicum	California everlasting	5	2.0
Isocoma menziesii	goldenbush	5	0.5
Lotus scoparius	deerweed	10	0.5
Nassella lepida	shaperral needlegrass	5	1.5
Nassella pulchra	purple needlegrass	5	1.5
Phacelia distans	blue phacelia	5	1.5
Scrophularia californica	California figwort	5	2.0

(a) Final specifications for the seed mix will be developed after tests for purity and seed germination for each species.

BIG TUJUNGA WASH
FORMA

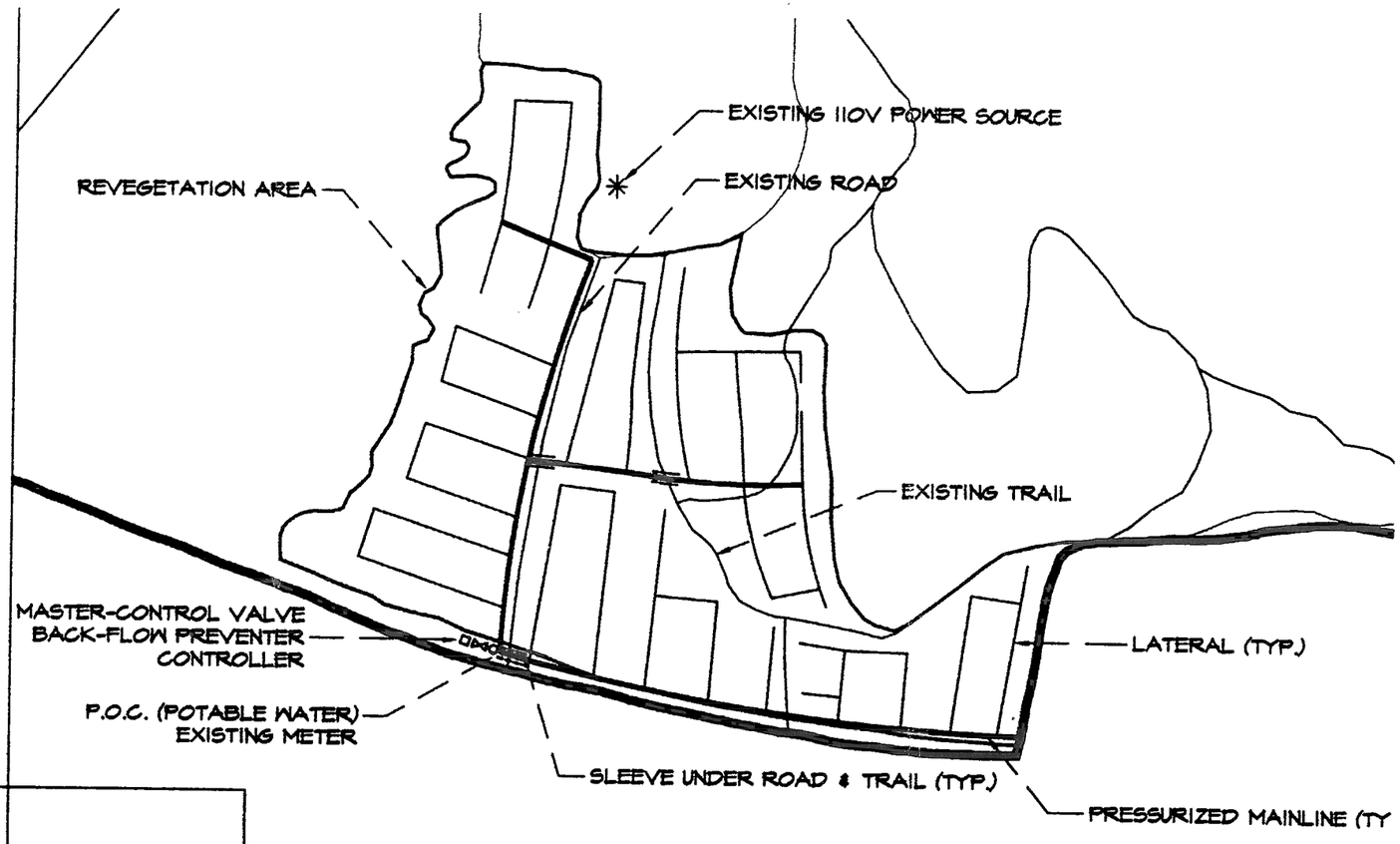
TYPICAL LAYOUT MODEL

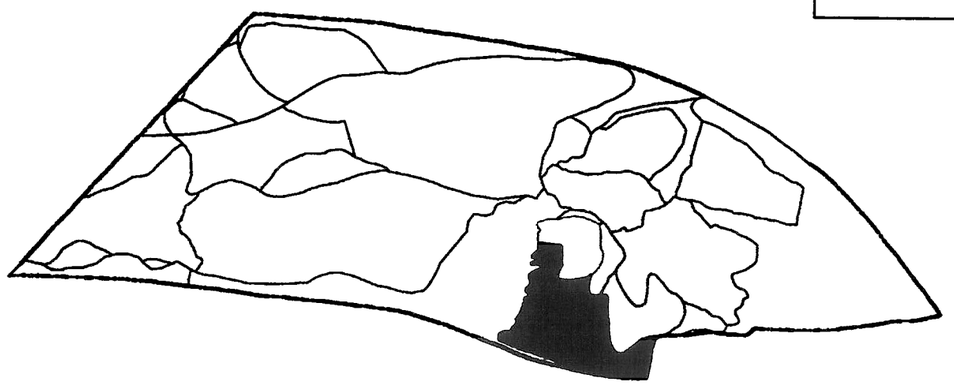
OPTIONAL COAST LIVE OAK - SYCAMORE - COASTAL SAGE SCRUB REVEGETATION AREA

Figure 9-1B

NOTE

ALL CONTAINER PLANTS TO BE IRRIGATED BY A TEMPORARY, AUTOMATIC, ABOVE GROUND DRIP IRRIGATION SYSTEM.





KEY MAP - NTS

BIG TUJUNGA WASH
FORMA

CONCEPTUAL IRRIGATION PLAN

Figure 9-1C

Pre-Planting Weed Control

Weed farming method of removal shall be used in the revegetation site where problem invasive weeds are established. Weed farming includes a cycle of irrigation, weed germination, and weed removal to be repeated up to 12 times or more as a means of removing the weed seed bank in existing soils. Mechanical clearing, mowing, and non-residual herbicides (Rodeo® and Roundup®) may also be used to remove weed and exotic species. The weed farming methods are described below.

1 Construction fencing shall be installed around trees and other areas to be preserved at the direction of the Restoration Specialist. Silt fencing shall be installed at the boundary of the revegetation site adjacent to riparian zones. The Restoration Specialist will determine the locations of the silt fencing.

2. The site shall be cleared of weeds by mechanical mowing. Cut vegetation shall be removed from the site and disposed of at an appropriate offsite location.

3. The revegetation area shall be irrigated three times per week for a two week period using a water truck or temporary irrigation system. Soils should be saturated to a depth of at least 3 inches during each irrigation.

4. Germinated weeds shall be mowed and removed at the end of the first two-week irrigation cycle.

5. The cycle of irrigation and weed removal as described in items 3 and 4 shall be repeated 3 times, including the initial cycle. The Restoration Specialist shall determine if further treatment is required to remove the weed seed bank.

At the time of planting, the Landscape Contractor and the Restoration Specialist shall determine whether undesirable vegetation has become established in any of the restoration planting areas and whether eradication is necessary Wherever feasible, pre-planting weed control shall use mechanical methods such as removal by hand or string trimmers. If effective weed control cannot be attained through mechanical means, appropriate systemic non-residual herbicides may be applied under the supervision of the Restoration Specialist. Pre-planting weed abatement shall begin at least ten (10) days prior to the start of planting work.

Installation of Temporary Irrigation

Because the goal of revegetation is to create a self-sustaining site, no permanent irrigation system will be maintained in the native plant communities at the revegetation site. Supplemental irrigation will be necessary, however, during the first two dry seasons.

Water should be provided only to container shrubs and trees. Overhead irrigation is not recommended for oak trees. Overhead irrigation encourages weed growth and discourages the growth of beneficial soil organisms. The frequency of supplemental irrigation will be determined by the Restoration Specialist in consultation with the Landscape Contractor The frequency of irrigation will be reduced during the second year to infrequent deep watering. The native plants and trees will adapt to site conditions after establishment and will survive on rainfall as a source of moisture.

A temporary drip irrigation system designed to deliver water consistently to all plants requiring irrigation shall be installed prior to planting. Prior to installation of the system, the Landscape Contractor in consultation with the Restoration Specialist will determine the locations for the specified container plants and mark each location in the field with colored pin flags. The drip system shall be designed and installed to deliver water to the marked plant locations. The irrigation system shall be fully operational and areas to be planted shall be thoroughly watered prior to planting. The conceptual irrigation layout is shown on Figure 9-1C.

Irrigation water shall be applied as often and in sufficient amounts, as conditions require, to keep the container plants healthy and growing. During the establishment and maintenance periods, the Restoration Specialist shall monitor soil moisture conditions to ensure sufficient water is delivered to the container plants. The temporary irrigation system shall be removed when the Restoration Specialist determines the revegetation plantings are established and self-sustaining.

9.1.2 Plant Materials

The plant materials for the revegetation plan were developed from plant species lists compiled during the previous biological surveys at the site were conducted by Chambers Group. Botanical survey information compiled for the Tujunga Ranger District of the Angeles National Forest was also reviewed (Boyd, et al. 1993).

Container Plant Materials

Installation of container plants provides the following four important functions in revegetation:

- allows established plants that are past the vulnerable sapling stage to be introduced onsite,
- provides the means to introduce species that do not establish well from seed and are best propagated from cuttings,
- provides diversity of age structure and thus speeds natural regeneration, and
- provides an efficient method to introduce beneficial soil fungi (mycorrhizae) onsite.

Mycorrhizae can be reintroduced onsite by providing inoculated host plants. This reinvasion is often very slow (Miller 1985). Container plants that have been inoculated with mycorrhizae shall be used as the prime method for spreading these beneficial fungi. In addition to spreading the mycorrhizae onsite, inoculation of container-grown plants may increase transplant success, growth, and reproductive success.

Container plants shall be purchased from a supplier experienced in the propagation of native plant species. Prior to delivery, the root systems of the plants shall be inspected by the Restoration Specialist to ensure that roots are straight and well established. Plants with coiled roots (rootbound) shall not be accepted

Materials to be planted at the woodland revegetation site will include sapling (1-gallon) oaks and sycamores, and other 1-gallon container-grown shrub species. The trees and shrubs shall be obtained from local native plant nurseries.

The following specifications shall be included in the commercial collector/supplier's growing contract for the plantings:

- All plants shall be hardened to frost/drought.
- All plant species that would normally host mycorrhizal fungi shall be inoculated.
- Plants shall not be grown with excessive fertilization.
- Five gallon plants and larger shall have been grown in containers for a minimum of six months and a maximum of two years. Plant root systems must fill the containers, but not be root-bound at time of delivery.

- Plant materials shall be properly labeled as to genus, species, subspecies, and source.
- Trees shall be tagged with metal forestry tags stating the species and size at time of delivery to facilitate tracking of growth during the monitoring phase.
- Plant materials shall be provided in quantities and sizes specified.
- Plants shall be ready for planting during specified planting period.
- No plants showing signs of serious pest infestation or disease shall be accepted.
- All plant substitutions shall require written approval from the Restoration Specialist.
- Plants shall not be subjected to breakage or desiccation during transport. Any broken or desiccated plants shall be rejected.
- Plant materials shall be approved by the Restoration Specialist prior to delivery.
- Upon delivery to the mitigation sites, plants shall be stored in a shaded location, evenly spaced, and upright. All materials shall be protected from adverse weather, vandalism, or other conditions that may be detrimental to the product.

Container plants of shrub species shall be installed in conjunction with the trees to create a diverse woodland-coastal sage scrub habitat. Table 9-1 shows the container plant palette for the revegetation area. The size of the container plants ranges from 1 gallon to 5 gallons to maximize structural diversity.

Seed Collection and Supply

Rather than collecting seeds for the sage scrub mixes in the areas adjacent to the revegetation sites, seeds collected from southern California counties shall be supplied by a qualified commercial seed collector/supplier with experience in native seed collections. Wherever possible, the supplie shall provide seeds collected from populations in the immediate area. The seed supply should not include seeds from San Diego County as plants from this area likely would be adapted to drier conditions than those in Los Angeles County. Seeds shall be cleaned by the seed supplier to a commercially acceptable grade, tested, and labeled with the species name, weight, purity and germination rate. Seeds shall be stored in a cool, dry environment until delivery for hydroseeding.

Because availability of seed may be limited, flexibility in species selection and application rates will be necessary. Actual amounts of seed necessary for the revegetation plan will ultimately be determined by the purity and germination rates of the available seed. Seed shall not contain more than 0.5 percent weed seed by volume. Seed types shall be as specified in the seed palette and shall be applied at the rates indicated. Seeds will be received by the Landscape Contractor in separate containers specifying species, quantity, purity, and germination. The Landscape Contractor shall provide the Restoration Specialist with each seed bag label used in the installation. Seed suppliers shall be experienced in native plant seed propagation and collection, and shall be approved by the Restoration Specialist. Mycorrhizae shall be incorporated into the seed mix at a rate of 60 liters per acre. Mycorrhizae shall be supplied by a native plant grower experienced in the propagation of native plants and beneficial fungi. Table 9-2 lists the coastal sage scrub understory seed palette for the revegetation area.

Table 9-1
Container Plant Palette for
Coast Live Oak-Sycamore-Coastal Sage Scrub Revegetation Area

Scientific Name	Common Name	Container Size	Density	Distribution	Minimum spacing (distance on center*)
Artemisia californica	California sagebrush	1 gal	10/acre	Scattered	-
Berberis nevinii	Nevin's Barberry	1 gal*	3**	Group	**
Ceanothus leucodermis	chaparral white throne	1 gal	3/acre	Scattered	-
Eriogonum fasciculatum	California buckwheat	1 gal	10/acre	Scattered	-
Heteromeles arbutifolia	toyon	1 gal	5/acre	Scattered	-
Malosma laurina	laurel sumac	1 gal	5/acre	Scattered	-
Opuntia littoralis	prickly pear cactus	1 gal	5/acre	Groups: 3	7
Platanus racemosa	California sycamore	5 gal	5/acre	Scattered	-
*Quercus agrifolia****	coast live oak	1 gal	30/acre	Scattered	-
Ribes speciosum	fuchsia-flowering currant	1 gal	5/acre	Groups: 3	10
			80/acre		-

*Distance (on-center) between plants of the same species; only applicable to species planted in groups.
**Specimen planting of sensitive species (if available) to be planted in single group of 3 individuals.
***Restricted to woodland section.

Table 9-2
Mixed Coastal Sage Scrub Understory Seed Mix

Scientific Name	Common Name	Percentage of species in mix	Pounds of Seed per Acre[1]
Artemisia californica	California sagebrush	20	1.0
Dichelostemma pulchella	blue dicks	5	0.5
Encelia farinosa	brittlebush	5	1.5
Eriogonum fasciculatum	California buckwheat	15	5.5
Eriophyllum confertiflorum	golden yarrow	10	0.5
Gilia capitata	gilia	5	0.5
Gnaphalium californicum	California everlasting	5	2.0
Isocoma menziesii	goldenbush	5	0.5
Lotus scoparius	deerweed	7	0.5
Nassella lepida	chaparral needlegrass	3	0.5
Nassella pulchra	purple needlegrass	5	1.5
Phacelia distans	blue phacelia	3	0.5
Salvia apiana	white sage	4	0.5
Salvia meleifera	black sage	3	0.5
Scrophularia californica	California figwort	5	3.0

[1] Final specifications for the seed mix will be developed after tests for purity and seed germination for each species.

9.1.3 Container Planting Methods

Container trees and shrubs shall be planted at an approximate density of 80 stems per acre. Plantings will be distributed in a natural pattern, with some trees grouped together and others spread farther apart. No oak plantings will be planted closer than 10 feet on center. Figure 3-5 shows a diagram of a typical container plant installation.

Container shrub species shall be planted in the period between October through January and prior to seeding of the site. No pruning of plant materials shall be allowed unless specified by the Restoration Specialist. The roots of the container stock shall be protected from drying during planting. All planting holes shall be augured to 2 to 3 feet in diameter and 5 to 7 feet deep. Prior to planting, the augured holes shall be filled with water, backfilled with native soil, and refilled with water to create a moisture reserve in the soil.

Containers shall be gently cut or slid away from the rootball. Plants shall be placed in the premoistened holes with the root crown 1 to 2 inches above the surrounding soil. Backfill of native soil shall be gently tamped in around the rootball.

A small berm shall be constructed around the perimeter of the plant, effectively forming a watering basin. In level areas, excavated material shall be used to form a berm, creating an 18- to 24-inch diameter watering basin around the plant. The basin shall be filled with water, allowed to drain, and filled again.

No plantings will be staked unless staking is considered necessary by the Restoration Specialist at the time of planting. Any staking shall be done with a single 2-inch diameter by 8-foot wood post, with loose ties holding the trunk to the post. The ties will be loose enough to allow the plant to flex without snapping or bending over excessively. Figure 3-6 shows a typical staked tree planting.

Sapling oaks are a tempting food source for many animals. To protect the tender saplings from herbivory, protective cages shall be placed around the oak saplings at the time of planting. The cages shall be buried to a minimum depth of 6 inches below ground level. This depth helps to discourage burrowing animals that may cause damage. The cages shall extend at least 20 inches above ground level to deter rodents, insects, and browsing animals.

9.1.4 Seeding Methods

The seed mix shall be planted between October and January using hydroseed/hydromulch methods. Hydroseeding/hydromulching shall take place after the container plants have been installed to avoid disturbing the seeds. Container plants shall either be covered or avoided during hydroseeding to prevent potential damage.

Hydroseeding shall consist of a hydraulic application of a slurry mixture containing water, organic soil stabilizer, cellulose wood fiber, mycorrhizae, and seed. Fertilizer shall not be added to the mix because native plants have low nutrient requirements, and fertilizer application favors the establishment of non-native weedy species.

Hydroseed mulch shall be manufactured from 100 percent virgin wood fiber and shall not contain growth or germination inhibitors. When mixed with water, the mulch shall remain in uniform suspension and when blended with the seed and other approved additives, form a homogeneous slurry. A non-phytotoxic wetting agent shall be added to the slurry mixture. A water-soluble, non-toxic green dye shall be added in sufficient quantity to clearly delineate the seeded areas after application. The following materials shall be applied in a one-step hydroseed/hydromulch operation:

- virgin cellulose wood fiber· 2,000 pounds per acre;
- organic soil stabilizer· 160 pounds per acre;

- mycorrhizae: 60 liters per acre, and
- seed mix as shown on Table 9-2.

9.1.5 Maintenance During the Establishment Period

The plant establishment period will begin when the installation work has been accepted as complete by LADPW. The plant establishment period will be a minimum of 120 days. During the establishment period, the Landscape Contractor shall furnish sufficient personnel and equipment to perform landscape maintenance of all planted areas. Maintenance visits shall be conducted at a minimum of twice monthly during the establishment period. Depending on site conditions, additional maintenance visits may be necessary and, if so, the need for them shall be determined by the Landscape Contractor and the Restoration Specialist. The required maintenance items shall include, but are not limited to, the following items:

- Maintenance of erosion control devices and installation of additional erosion control devices where necessary as indicated by the Restoration Specialist,
- Maintenance of perimeter fencing,
- Weed eradication in planted areas and along trails,
- Maintenance of the irrigation system,
- Maintenance of herbivory control devices,
- Trash removal, and;
- Replacement of dead or diseased plant materials as directed by the Restoration Specialist.

The Restoration Specialist shall inspect the site monthly during the establishment period and submit a written report to the LADPW and the Landscape Contractor with specific recommendations to correct any deficiencies. At the end of 120 days, the revegetation site will enter the first maintenance and monitoring period. Maintenance activities and schedules during the maintenance period are described in Section 5.0.

9.1.6 Uplands at the Old Asphalt Plant

The remains of the old asphalt plant that previously existed on the upland portion of the site, consists primarily of degraded concrete and other debris associated with the asphalt operation. The presence of the degraded concrete is problematic because it would have to be removed prior to any enhancement or revegetation of the area. In addition, it would be expensive and labor intensive to remove the old concrete. Concerns about the potential presence of hazardous materials under the concrete raises the question about whether the concrete should be removed. This option is not investigated in detail in this MMP because the LADPW would have to make this decision. A previous hazardous materials study was conducted prior to the purchase of the site by the LADPW. This study should be reviewed by LADPW to determine the ramifications of removing the concrete.

If the LADPW decides that removing the concrete is a viable enhancement measure, then one option for this portion of the site would be to revegetate it with additional coast live oak – sycamore woodland – coastal sage scrub habitat. Soil samples would have to be analyzed to determine if the underlying soils could support native plant communities. An additional 3.6 acres of habitat could be created if the concrete is removed. If the assumption is made that the allotment ratio for additional credits for this habitat would be the same as for the Cottonwood area, then an additional 3.6 credits could be achieved. Preparation of this portion of the uplands, prior to planting and seeding, may be somewhat more costly than the remainder of the upland area due to the potential need for soil amendments. If the soils underlying the concrete are lacking in nutrients or organic matter, then soil amendments may be necessary to support the revegetation of native habitats.

Another optional enhancement measure for this portion of the site would be to leave the area unvegetated and improve it as a parking area for vehicles during organized and permitted uses of the

site. Improvements may consist of removing the concrete (see concerns stated above), grading the area flat, and spreading a layer of decomposed granite. This would allow for an improved area for parking of vehicles and horse trailers. The benefit of this substrate is that the decomposed granite drains well and typically does not result in muddy areas after a rainfall. The practicality of this optional measure will depend upon whether the LADPW decides to remove the concrete from this area. A parking area could still be established if the concrete is not removed, but the portion of the area where the concrete currently exists would have to be avoided by vehicles and horses, for safety purposes. If LADPW considers this optional enhancement measure, then the details of how this measure would be implemented will be worked out at a later date.

9.2 EXOTIC WILDLIFE ERADICATION PROGRAM - AQUATIC HABITAT MODIFICATION OPTIONS

During the investigation of the infestations of exotic wildlife at the Mitigation Bank, a number of options were developed that would not only make eradication of these species more successful but would also create additional habitat for sensitive, proposed, and listed species of native fishes. These options were briefly discussed in Section 3. This section provides a more detailed description of what would be necessary to implement Options 1 through 4. Option 4, which includes keeping the Tujunga Ponds in their current configuration, is the option selected by LADPW and covered in the MMP

9.2.1 Habitat Modification Options

The following options were developed during the extensive studies conducted prior to the preparation of the MMP These are only presented as potentially viable options but the ultimate decision of whether or not to implement any of these options is at the discretion of the LADPW and the resource agencies. Further studies would be required before Options 1, 2, or 3 could be implemented.

9.2.2 Option 1: Elimination of Ponds, Creation of New Stream Channel

The presence of the two ponds onsite negatively affects sensitive native species in two ways. First, the ponds currently represent unsuitable or marginal habitat for all native fishes and other vertebrates. Second, they hold populations of exotic species that are known or likely to prey on natives, either in the ponds or through dispersal downstream into Haines Canyon Creek (and also to Big Tujunga Creek via Haines Canyon Creek), or to have other negative impacts. Thus, the least costly solution to this problem is to eliminate the ponds and construct a new stream channel which is aquatic habitat more suitable for use by native species.

9.2.2.1 Procedure

Maintenance of Flow

Flow would need to be maintained into the current channel of Haines Canyon Creek somewhere in the vicinity of its origin (at the outflow of the west pond). Flow into the east pond (and then to the west pond) is at least in part maintained by large pipes which drain a spring/seep (?) under the location of the I-210 freeway to the north. Connection of pipes to these outfalls should be feasible; however a cofferdam might be required to affect a connection. It is likely that pumping would also be required, however there may be a sufficient gradient between the inflow source and the termination of the pipes such that only a single high capacity pump would be required at the source. The flow should be directed along the north shore of the existing ponds to the west end of the west pond, where they would parallel the west shore until they reach the area of the current outflow/stream source. At the terminus of the pipes, they should empty into one or more large sediment traps designed to filter out fines in the form of silt. Such traps might be constructed as large wireframe "baskets" containing a mixture of clean sand and gravel; the size and content would depend upon the flow rate and level of suspended fines in the output. If placed in the

stream channel they could also serve as a significant barrier to downstream movement of exotics as pond levels fall. Additional hydrologic and engineering studies would need to be conducted in order to compare the net loss and gain of waters of the United States and riparian habitat of each alternative.

Dewatering

Because at least a portion of the flow in the system (via the ponds) may be maintained by ground water upwelling (Hamilton 1997), there are at least two other considerations involved in removal of the ponds. First, water from the ponds must be pumped out to a point where there is sufficient space for it to percolate back into the substrate without producing siltation downstream. The most likely location for this is the existing dry channel of Haines Canyon Creek on the south side of the project site. Minimally, there appears to be approximately 150 m (492.1 ft) of wash channel which could serve as a gross filter before any flow returns on the surface (?) to the active channel. This would require active pumping from the current inflow point. Pipes from the west pond should be tied to the pipes from the east pond; however if draining to another outfall is necessary for the west ponds pumping to the existing channel of Big Tujunga Creek should be possible through a "notch" just south of the I-210 freeway However, the lift involved might well require larger pumps. Dewatering should continue until all surface water is removed from both ponds, and the substrate is capable of receiving fill material. Gill-netting and active seining should occur in the ponds concurrent with dewatering. This serves two purposes: 1) it minimizes downstream escape of exotics and 2) it may allow some salvage of "game" fish (bass) for relocation to other nearby (disturbed) sites such as Hansen Reservoir. We recommend against use of this latter practice.

The second consideration is to avoid siltation during the dewatering process at a time when it would impact survivorship of eggs and/or larvae of native fishes. This should be considered a light of timing of dewatering (outside the spawning period) and the use of barrier filters (wire mesh/gravel/sand/carpet) across the outflow of the west pond.

Elimination of Ponds/Fill

The objective is to fill both ponds to a point where they are at or near the grade level of the surrounding habitat, and thus suitable for (re)construction/excavation of a stream habitat. This will require the use of heavy equipment (dozer, track hoe and dump trucks) and construction of at least one haul road. This will also by default require removal of at least some native vegetation. However, careful location of entry and exit points could minimize loss of larger trees.

Assuming that the surface area of the east pond is approximately 3,700 m^2 (39,081 ft^2) with an average depth of 3.5 m (11.5 feet), the estimated volume of the pond approximates 450,00 ft^3 (16,650 yd^3). Assuming an estimated 30 to 40 yd^3 of material per dump truck, it would require an estimated minimum of 426 to 555 loads to fill the pond to existing grade. Assuming the west pond has slightly more same surface area (4400 m^2) and the same depth, the calculated volume is approximately 19,800 yd^3 The number of truck loads that would be required to fill this area would be 495 to 660. Thus, an estimated minimum of 36,500 yd^3 of fill material (approximately 920 to 1,215 truck loads) would be required. The need to compact the fill material to provide a firm base for construction traffic and to minimize post-construction subsidence might increase the amount required; consultation with a soil scientist or civil engineer is recommended in this regard. The fill material, for a variety of reasons relating to re-establishment of native vegetation and the need to minimize sediment input to the stream, should structurally/functionally approximate the existing substrate/soil type (riverwash /sand, gravel, cobble) and be as "clean" (low silt/fines content) as practical. A primary goal of the fill and compaction is to minimize (in this option) the potential for subsidence and creation of ponded water habitats of any size in the period following fill and stream reconstruction.

(Re)construction of Stream Course

The new stream channel would be excavated in the fill area, and run from the approximate location of the inflow structure to the approximate location of the current outflow To maximize the extent of the area useable by native species, the stream course needs to be as long as possible in a given area given the

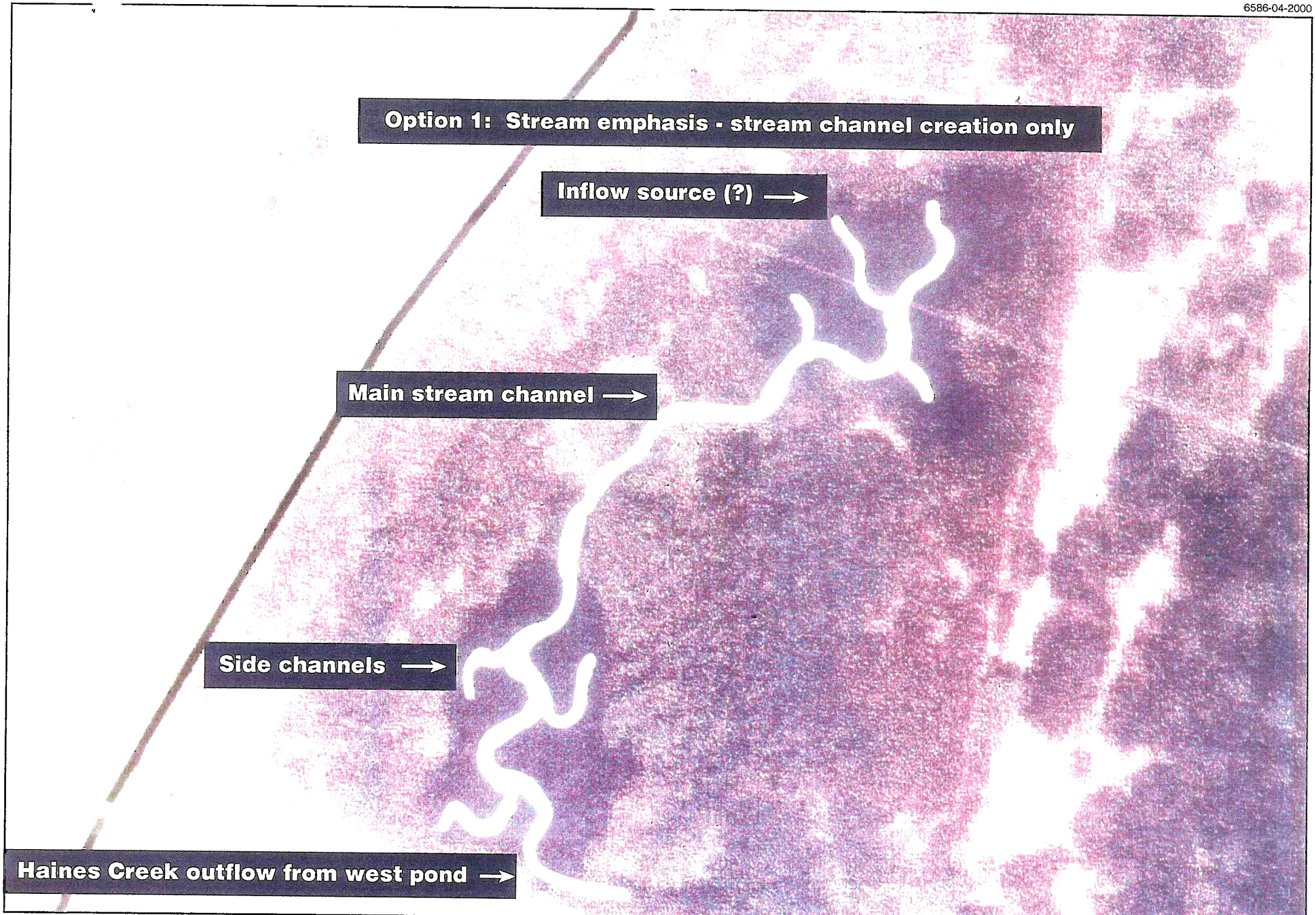
practical and physical limitations imposed by hydrologic constraints and cost-effectiveness. Ideally, the stream should be essentially serpentine/meandering in layout and is shown in Figure 9-2. An estimate of the total length of the "new" stream channel is 200 to 250 m (650 to 812 feet). The new stream channel should follow the existing stream channel that connects the ponds to minimize disturbance of native vegetation and to utilize existing terrain/drainage contours.

Limited flow data is apparently available for Haines Canyon Creek onsite (Chambers Group 1997); estimate of mean flow on 10 May 1997 was 30 m^3/sec (n = 6, range 18.9 to 56.7 m^3/sec.). The "new" stream channel should be designed to carry average spring flows. A general objective is to construct/recreate a stream channel that mimics to the greatest extent practical the gross physical and microhabitat conditions present in downstream areas of the drainage. Existing data (Chambers Group 1998a) indicates a mean stream width of 5.6 m (n = 7, range 4.5 to 9.0 m) exclusive of pools. Mean depth (exclusive of pools) was 26 cm (n = 7, range 18.7 to 42.2 cm). Thus, the new stream channel should be approximately 5 to 6+ m wide and average 20+ cm deep in most areas, with depths of up to 1 m. The level at which the stream is established needs to be careful considered in relation to the grade of the surrounding area; plans should accommodate potential loss or escape from the constructed channel through natural processes. Structural heterogeneity in the streambed is an important consideration; there should be riffle, glide and pool areas. Depending upon the amount of drop between the inflow and outflow points, the feasibility of "fine-tuning" of microhabitat conditions may be variable. Regardless, this practice needs to be applied with caution for at least two reasons. First, small pools appear to be favored microhabitat for arroyo chub but also constitute suitable sites for the maintenance and (re)establishment of exotics such as bass and green sunfish. Thus, the number or areal proportion of these microsites should be varied along the length of the channel in different sections. This would also allow for collection of important data during post-construction monitoring of microhabitat use by all native species. Second, if we assume that water flow will remain relatively constant in this system due to the nature of the outfall, loss or degradation of these habitats may occur over time due to natural sedimentation and the lack of periodic scouring flows.

Substrate conditions need to be varied along the stream length to mimic naturally occurring conditions downstream. This means that while the majority of the channel should be a sand/gravel/cobble mix, there should also be stretches of essentially homogenous substrate/microhabitat. Tentatively, we suggest three basic types: solid sand, solid cobble and solid bedrock. This practice serves two functions. First, while there appears to be significant anecdotal evidence on the microhabitat characteristics preferred by various native species (i.e., chubs in pools, suckers and dace in riffle areas), these are not well-established empirically. Thus, this practice provides a range of "options" or "choices" for re-established or re-invading fishes. Second, as noted above, a priori quantification of stream channel structure will allow for monitoring of changes in the structure of the microhabitat and associated changes in its use by native fishes. This will provide potentially valuable management data for other sites. For a diagrammatic depiction of a heterogenous stream section, refer to Figure 9-3.

Excavation of the stream channel and structuring of the microhabitat should proceed in a direction from the vicinity of the inflow (east pond) to the outfall (west pond) for several reasons. First, it allows for periodic grade checking to maintain calculated levels of fall for a given section. Second, it allows for modification of the location and/or structure of the channel should unexpected complications arise (i.e., development of localized subsidence). Third, it allows for one-pass/one-way construction and revegetation to occur without potential conflicts.

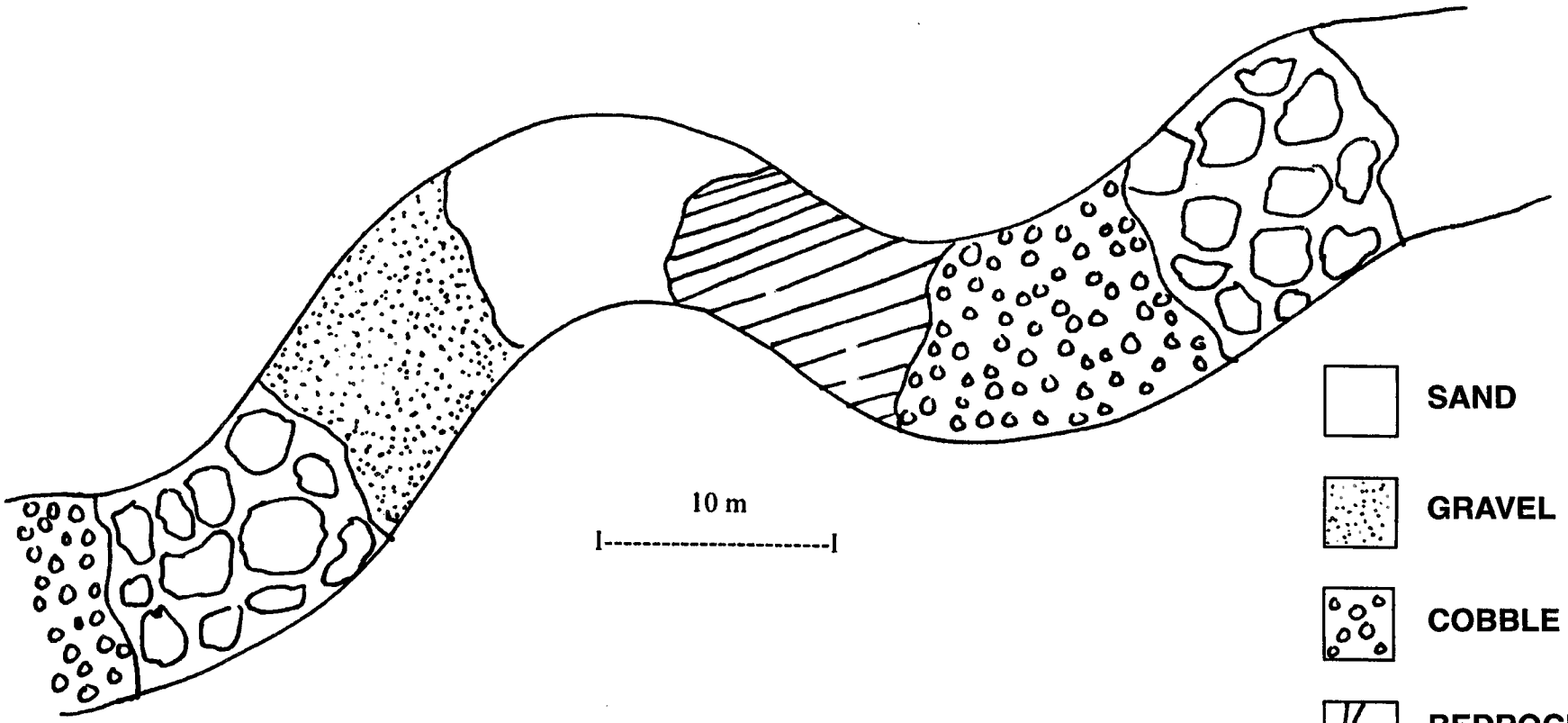
Revegetation of the stream banks should proceed as construction works away (downstream) of the created channel. The extent and timing of this practice are critical for a variety of reasons. Replanting of native vegetation in the form of willows (*Salix* spp.), white alder (*Alnus rhombifolia*), cottonwoods (*Populus* spp.) and shrubs (*Baccharis salicifolia*). Planting within and adjacent to the new stream channel proper may require diversion of enough flow to maintain mesic/hydrophytic species such as sedges (*Cyperus* spp., *Carex* spp.) and brooklime (*Veronica* sp.). Use of exotics (such as watercress - *Rorippa nasturtium aquaticum*) or some fast-growing natives (cattails - *Typha* spp.) is not recommended. Replanting should



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OPTION 1: STREAM CHANNEL CREATION
Figure 9-2

Option 1: "New" stream channel with heterogenuous substrate



Note: Diagrammatic only; Not to scale

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DIAGRAMMATIC REPRESENTATION OF HETEROGENOUS STREAM CHANNEL
Figure 9-3

be timed to utilize cuttings/seedlings at a time when they are dormant and/or most likely to be successfully established. Plantings should also be sufficiently dense to minimize erosion/runoff into the stream course. Some short-term erosion control measures may be required.

9.2.2.2 Maintenance of Flows in Big Tujunga Creek

Existing data (Hamilton 1997) and repeated observations of the site indicate that Big Tujunga Creek frequently dries completely along the majority of its length below Big Tujunga dam. This results in the loss of significant numbers of native fishes, particularly Santa Ana sucker and Santa Ana speckled dace. It also decreases the amount of riparian vegetation, particularly tree species, that are able to become established and maintain themselves. Establishment of a fringe of riparian vegetation has some advantages for native fishes through stabilization of the stream bank, reduction of erosion, shading of the water and a decrease in average temperature, and input of organic debris in the form of leaves and woody debris.

Although maintenance of perennial flow in Big Tujunga Creek is not a viable alternative at this time, perennial flow could form an important part of any mitigation proposal for the site. The maintenance of flow, coupled with control of exotics, is likely to provide potentially significant benefits to native fish populations and other species, as well as increasing the amount of riparian habitat created and thus able to be utilized for mitigation credits. The level of flow required should be based upon worst-cases conditions (drought) such that during these periods, sufficient water exists within the streambed to maintain numerous refuge sites (deep pools) along the length of the system, even if they are not connected by surface flow. In most years, however, sufficient flow needs to be maintained between Big Tujunga dam and Hansen dam such that the stream channel maintains an average depth of 10 to 20 cm (4 to 8 in) and allows for the formation and maintenance of pools. Periodic scouring may facilitate local re-establishment of arroyo toads, and maintenance of some areas of stream channel with relatively little canopy cover might benefit this species if appropriate breeding pool structure is present.

9.2.2.3 Advantages of Option 1

Each of the options has various advantages and disadvantages. These are listed and discussed below, but should not necessarily be considered to be ranked or arranged in order of merit. As previously noted, this list should not be considered exhaustive nor necessarily exclusive.

- Maximization of habitat for native fishes. Construction of a serpentine stream channel in the pond area will potentially produce up to 200 to 250 m (650 to 820 ft) of habitat available for use by native fishes. Maintenance of water flow in Big Tujunga Creek could provide several kilometers of habitat.

- Elimination/reduction of ponded water habitats for exotics. Elimination of the ponds will reduce habitat for several species of predaceous fishes (largemouth bass, green sunfish) and other species as well (bullfrogs, red swamp crayfish). This will in turn reduce emigration of these species into Haines Canyon Creek and Big Tujunga Creek. We estimate the reduction in slackwater habitats to approximate 99 percent; in areal extent this is estimated to be 0.72 ha (1.8 acres)

- Elimination/reduction for incentive for re-establishment of exotics. A corollary of the advantage noted above, the absence of slackwater areas will also decrease the overall suitability of the habitat for exotic species invading from offsite. The lack of ponds will also minimize the potential for deliberate re-establishment from human sources (fishermen) of bass and sunfish.

- Elimination/reduction of water hyacinth control. Water hyacinth is an essentially slack-water/low-flow habitat species. Removal of the ponds eliminates most if not all of its habitat, and reduces the chance of reinfestation. If reinfestation occurs, access to the stream and the amount of habitat affected will facilitate removal and thus minimize expenditures for control.

- Increase in available habitat for least Bell's vireo. By direct replanting and naturally occurring succession, areas of the pond which are filled in should be recolonized by native riparian vegetation. Over time, these sites could become available for use by least Bell's vireo. We estimate the potential habitat that might be re-established as southern willow scrub/riparian forest in the pond area to approximate 0.6 to 0.7 ha (1.5 to 1 7 acres) The creation of riparian habitat in the wash at Big Tujunga might also be considerable, although no approximate determination of extent is practical at this time. This habitat might in turn be used as mitigation credit for other projects.

- Decreased maintenance requirements (as opposed to other options). The construction of the stream channel involves extensive use of heavy equipment but requires only the construction of a relatively simple channel. Other options require the construction/excavation of ponds and of water control structures. These will, by their nature, require maintenance

- Decreased cost. While there is likely to be significant overlap in equipment and related costs involved in any of these proposed options, this plan essentially represents a baseline condition. All other options obligately incorporate this plan, and expand upon it. As a result, these would involve additional planning, design/engineering, earthwork, and maintenance costs.

9.2.2.4 Disadvantages of Option 1

- Feasibility/stability. The three basic constraints on this project are physical, biological and financial. The practicality/physical limitations of diverting the existing flow, filling the ponds and re-establishing stream flow in a created channel have not been assessed in this document. Consultation with a hydrologist is strongly recommended. Biologically, we do not know if fishes will naturally re-occupy the created habitat, or will become successfully established there if reintroduced. There are more reasons to indicate that establishment of native fish populations would be successful than the converse, however there are no guarantees in this respect. The long-term stability of the system in terms of maintaining the flow and the location of the created stream channel may also be subject to change. Again, this topic/consideration needs evaluation by a qualified hydrologist.

- Habitat for native species. This option may create but minimize some potential habitat for other target native species, specifically the California red-legged frog and southwestern pond turtle. Both of the species historically and currently exist in stream habitats. However, both also occur in ponded/slackwater areas. Re-establishment of these species onsite would be constrained by and depend upon a number of other variables; however elimination of exotics would probably have the greatest significance for the potential success of any re-introduction effort.

- Increases potential habitat for other exotic plant species, specifically giant reed. Fill deposited in the area of the former ponds has a high potential to provide habitat for giant reed, castor bean, pampas grass and other exotics. Minimization of the potential for re-establishment of these or other species can be facilitated by careful selection of fill material, aggressive monitoring and control of exotics post-construction, extensive re-planting of native vegetation in areas of disturbed soil, and control of exotics in surrounding areas (addressed by another portion of the overall mitigation/management plan for the site).

9.2.3 Option 2: Elimination of Ponds, Creation of New Stream Channel with Instream Ponds

This option is structurally and functionally similar to Option 1 in that it requires fill of the existing ponds and excavation of a stream channel. It differs primarily in that some ponded water habitat would be retained by construction of ponds in the stream channel.

9.2.3.1 Procedure

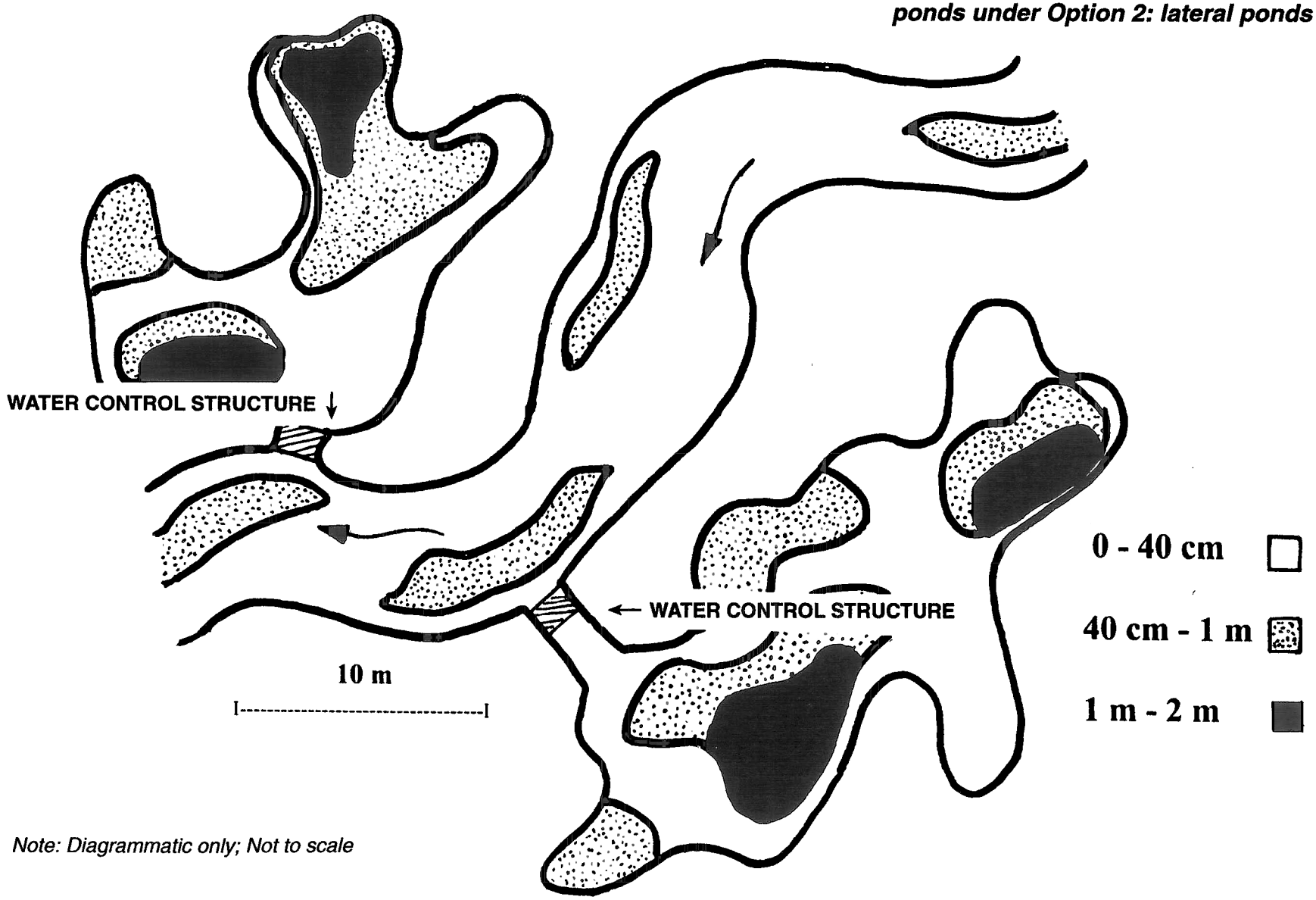
Construction

As detailed in Option 1, dewatering of the existing ponds, importing and compaction of fill material, and excavation of the stream channel would proceed. However, slackwater water habitats (ponds) would be excavated within the stream channel. These ponds would have their greatest length parallel to the stream, and would be constructed such that a water control structure in the form of a box culvert, weir or similar structure was present where the stream flows into and out of the pond. These culverts should be constructed so that a heavy-gauge wire-mesh "gate" could be lowered into place. While the "gates" would normally be open so that passage between the stream and pond is possible, during sampling or control efforts for exotics the "gate" would be lowered into place (on both ends) to preclude escape of species being sampled or controlled.

The ponds are designed primarily to create habitat for two species of native vertebrates, southwestern pond turtles and California red-legged frogs. As such, the ponds need to be constructed with sufficient habitat heterogeneity that they will favor the maintenance of one or both species. In practice, this means that the ponds should mimic the structure of naturally occurring ponds in which the species occur

The ponds would be 20 to 30 m (65 to 100 ft) in length and 8 to 15 m (25 to 50 ft) in width. Shoreline contours should maximize the edge/area ratio, such that the ponds are irregular in shape. The ponds should be constructed so that the depth is variable, from extensive areas which are shallow (25 to 100 in) that allow the establishment of emergent vegetation in the form of cattails (*Typha* sp.), bulrush/tules (*Scirpus* sp.) and sedges (*Cyperus* sp., *Carex* sp.). As the first species is aggressive and quickly fills available shallow-water areas, there also need to be significant areas of the pond that are deep enough to preclude invasion by these species during periods of decreased water levels or over the course of several years. As such, portions of the pond need to be 1 ft to 3+ft deep, and at least some portions need to be 3 to 6 ft deep. There is no published quantification of the relative proportions of these depths in naturally occurring ponds, however we suggest (based upon many years of field experience in this respect) that a ratio of 40:40:20 (4 to 16 in:16 in-3.3 ft:3.3-6.6 ft) would be an appropriate starting point. Figure 9-4 shows the diagrammatic representation of the pond structure. In the case of the 3 to 6 ft areas, these deep "holes" provide potential refugia for both species. For the California red-legged frog a cold-water (=deep) microsite would be required for deposition and successful development of eggs. The eggs of California red-legged frogs have the lowest critical thermal maximum of any North American ranid frog (Jennings and Hayes 1994), and as such a thermally sheltered microhabitat (preferably more than one) would need to be provided in each pond. These would be areas located on the south side of the pond and shaded by extensive plantings of cattails, willows or alders to produce shade. These "holes" should be at least 3 ft deep and possibly up to 6 ft. Southwestern pond turtles can and do bask on emergent vegetation, however it would be appropriate to provide some other emergent basking sites in the form of logs and/or boulders.

Construction of the ponds would only be a partial requirement for habitat modification for southwestern pond turtles. The nesting habits and habitat of this species are relatively well understood (see Holland 1994). As suitable nesting habitat is currently likely to be very limited onsite, it would be necessary to import several thousand cubic yards of additional fill material to create nesting habitat. This material should be composed primarily of a heavy soil elements, with a substantial silt/clay fraction - essentially upland soils. Nesting areas should be minimally several thousand square yards in extent, oriented so that there is sun on the southerly face for several hours each day, and with varying relief. Additionally, under natural conditions these areas have little vegetative cover, usually grasses and forbs. As succession on the project site would probably quickly cover these sites with shrubs and/or trees, some maintenance would be necessary. This essentially means that the sparse cover in the nesting area would have to be burned on a regular basis - perhaps every other year. Another consideration is that multiple nesting areas (a minimum of three) would be required to minimize the chances for catastrophic loss of reproductive output at a single site (such as by raccoon predation). Also, the nesting areas need



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DIAGRAMMATIC REPRESENTATION OF POND STRUCTURE
Figure 9-4

to be developed at some distance away from the watercourse. The relatively small size of the areas previously occupied by the existing ponds may seriously constrain the size and placement of these created habitats. Figure 9-5 shows Option 2 - Pond Emphasis.

9.2.3.2 Advantages of Option 2

1 This option provides some increase in habitat for native fishes through the presence of the stream. However, there is unlikely to be as much stream habitat available as in Option 1 We do not know if native fish species will utilize the pond areas in the absence of exotics. Our suspicion is that arroyo chub and unarmored threespine stickleback may occupy these sites, but that they are unlikely to support Santa Ana sucker or Santa Ana speckled dace.

2. This option, in the form of ponded-water habitat, may provide some potential habitat for southwestern pond turtles and possibly California red-legged frogs. While both these species historically did and currently do occur in stream habitats, the peculiarities of this site (in the form of continuous human presence and disturbance) indicates a better chance of survival onsite in a slackwater habitat (ponds). This is primarily due to their decreased vulnerability to collection in an area where there are deep-water refuge sites, surrounded by emergent vegetation.

3. As with Option 1, there will be some increase in potential habitat for least Bell's vireo. However, due to the need to create ponds and nesting areas for southwestern pond turtles, it would be substantially less than under Option 1, probably by at least 50 percent and perhaps by as much as 75 percent.

4. The creation of ponds does increase the habitat heterogeneity of the site and create additional habitat for other native species. In particular, the ponds would be expected to attract waterfowl and other bird species such as herons and egrets. While these species will use stream habitats, they tend to be more common (or at least conspicuous) in pond areas.

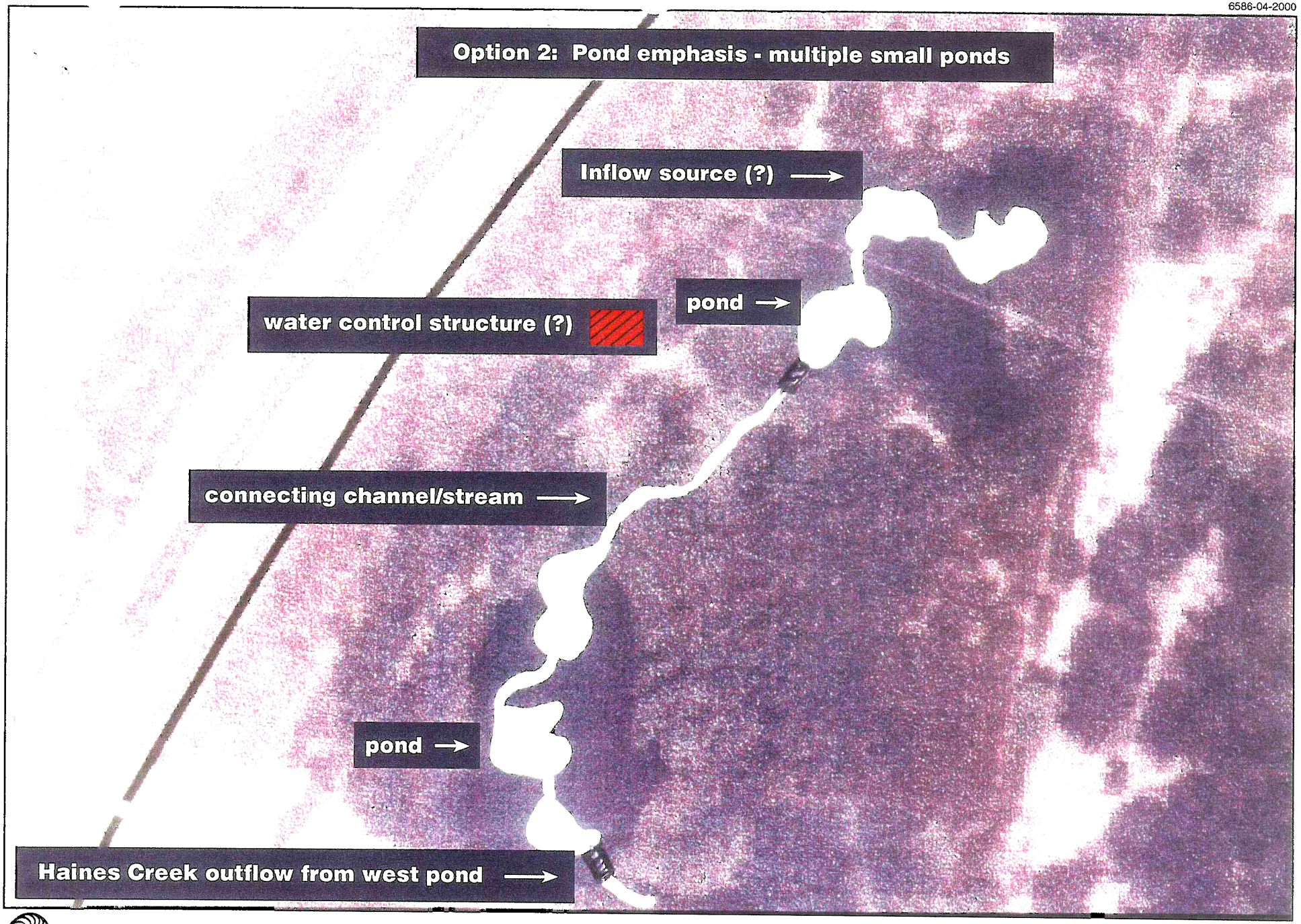
5. The use of the culverts and "gates" as water control structures may facilitate isolation of parts of the system for maintenance and removal of exotics.

9.2.3.3 Disadvantages of Option 2

1 As discussed above, the presence of any ponded areas increases in habitat for exotic species. Additionally, the presence of ponds also increases the potential for reintroduction of exotics by fishermen or other parties. In particular, the ponds would encourage the presence of bullfrogs which might move overland into the area. Also, the presence of ponds provides habitat for water hyacinth. Given the speed with which this species can colonize and essentially cover an open water habitat, monitoring would have to be fairly frequent (every 2 to 3 weeks) and removal would entail additional management/maintenance costs. The presence of cattails, while a native species, would also produce a long-term monitoring and maintenance requirement to maintain sufficient open-water habitat in the ponds.

2. The in-stream ponds may constitute an "attractive nuisance" in the form of swimming, fishing or other perceived recreational opportunities. This in turn may increase potential safety and liability concerns for the property owners/managers. The presence of water control structures and other features may also increase the potential for vandalism onsite.

3. The need to excavate ponds and install water control structures, as well as to import and prepare several thousand cubic yards of additional fill to create nesting habitat for southwestern pond turtles will significantly increase both initial construction and long-term management and maintenance costs.



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OPTION 2: POND EMPHASIS
Figure 9-5

4. The presence of ponds and the turtle nesting areas may significantly decrease habitat availability (in the long term) for least Bell's vireo. As noted above, this might entail a 50 to 75 percent reduction in the amount of potential riparian or riparian scrub habitat within the area occupied by the existing ponds relative to Option 1, which would maximize potential vireo habitat.

5. Importation of upland soils for fill material for southwestern pond turtle nesting sites might also establish new weed species onsite, which would in turn require additional control and management efforts.

9.2.4 Option 3: Elimination of Ponds, Creation of New Stream Channel with Lateral Ponds

The construction of a new stream channel, as in Options 1 and 2, would also be required under this option. The procedures and constraints previously discussed would also apply here. This plan differs from Option 2 in that the ponds would be constructed laterally to the stream channel, and would be smaller and more numerous (ideally, 8 to 10 small ponds). These would be irregular in shape to maximize edge/area ratios, and variable in size and depth. The range of sizes would be from maximally 15 to 20 m (50 to 65 feet) in length by 5 to 10 m (18 to 33 feet) in width. Smaller ponds would be a minimum of 5 to 8 m (18 to 28 feet) in length and 3 to 6 m (10 to 20 feet) in width. As in Option 2, depth would be variable. However, given the limited area of each pond and the need for some open-water habitat to remain during dry periods or periods of decreased flow, the depth ratio of 10 to 40 cm:40 cm-1 m:1-2 m (4 to 16 in:16 in-3.3 ft:3.3-6.6 ft) would need to be adjusted, such that it approximates 35:35:30. Each pond would be connected to the nearest pond by means of a small channel/stream, and also to the stream by means of another small channel/stream. Each channel/stream would be equipped with a box-culvert/weir arrangement at the outflow from the pond, such that the gate could be lowered into place to isolate each individual pond to sample or to remove exotics. To facilitate drainage to the stream channel, each pond would be "perched" slightly above the level of the stream channel. For a diagrammatic cross-sectional representation, see Figure 9-6.

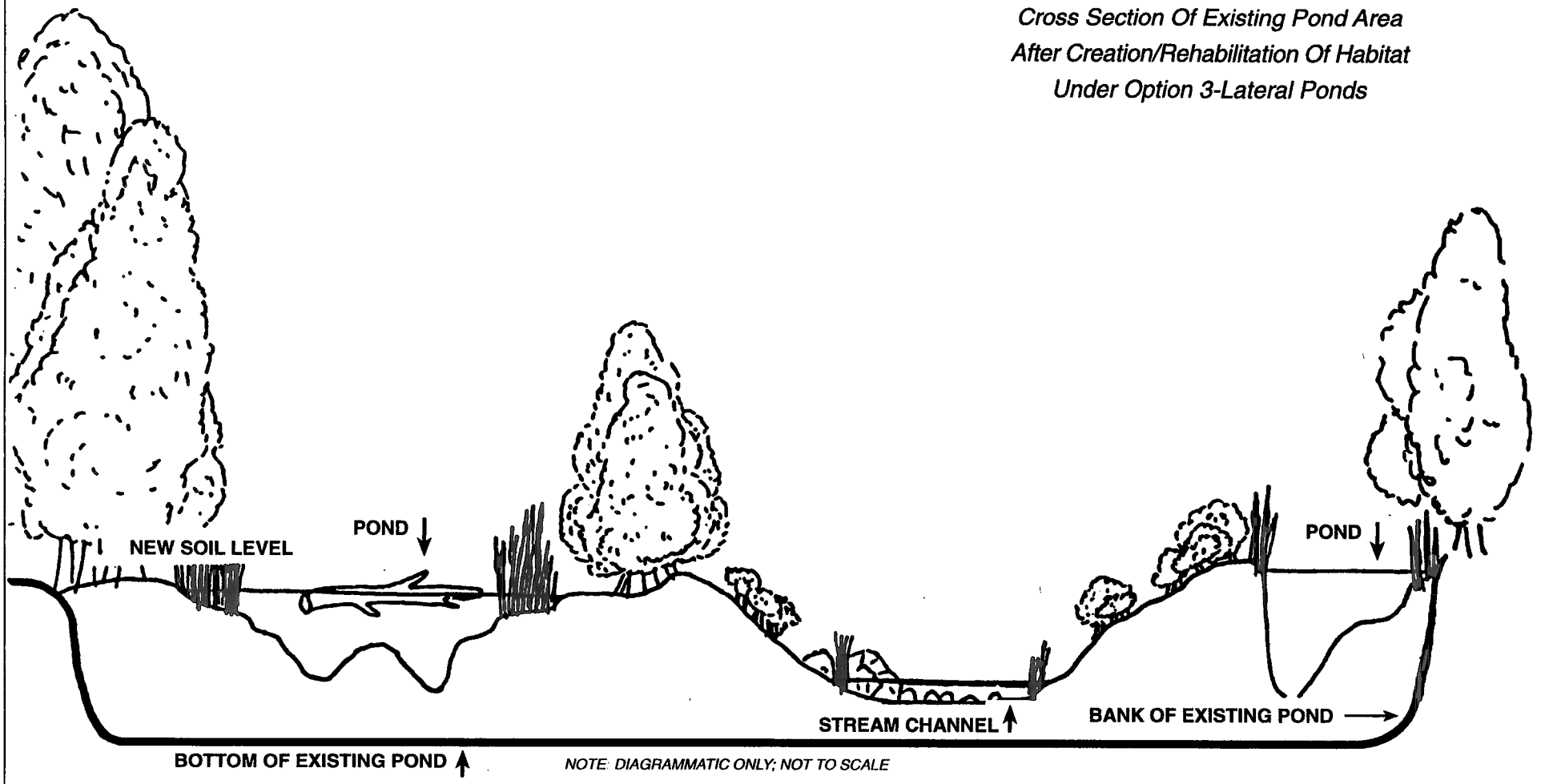
As with Option 2, the goal is to provide habitat for California red-legged frogs and southwestern pond turtles, and as such construction of nesting areas via the importation of fill would also be necessary. To the greatest extent possible, these areas need to be somewhat separate from the ponds. Given the limited amount of space available (due to the lateral placement of the ponds), this would likely reduce their extent and certainly restrict the amount of riparian vegetation that could or would be allowed to become re-established in the area formerly occupied by the existing ponds. Figure 9-7 shows Option 3 - Mixed Mode.

9.2.4.1 Advantages of Option 3

1 Most if not all of the advantages of Option 2 listed would apply to this option, specifically:

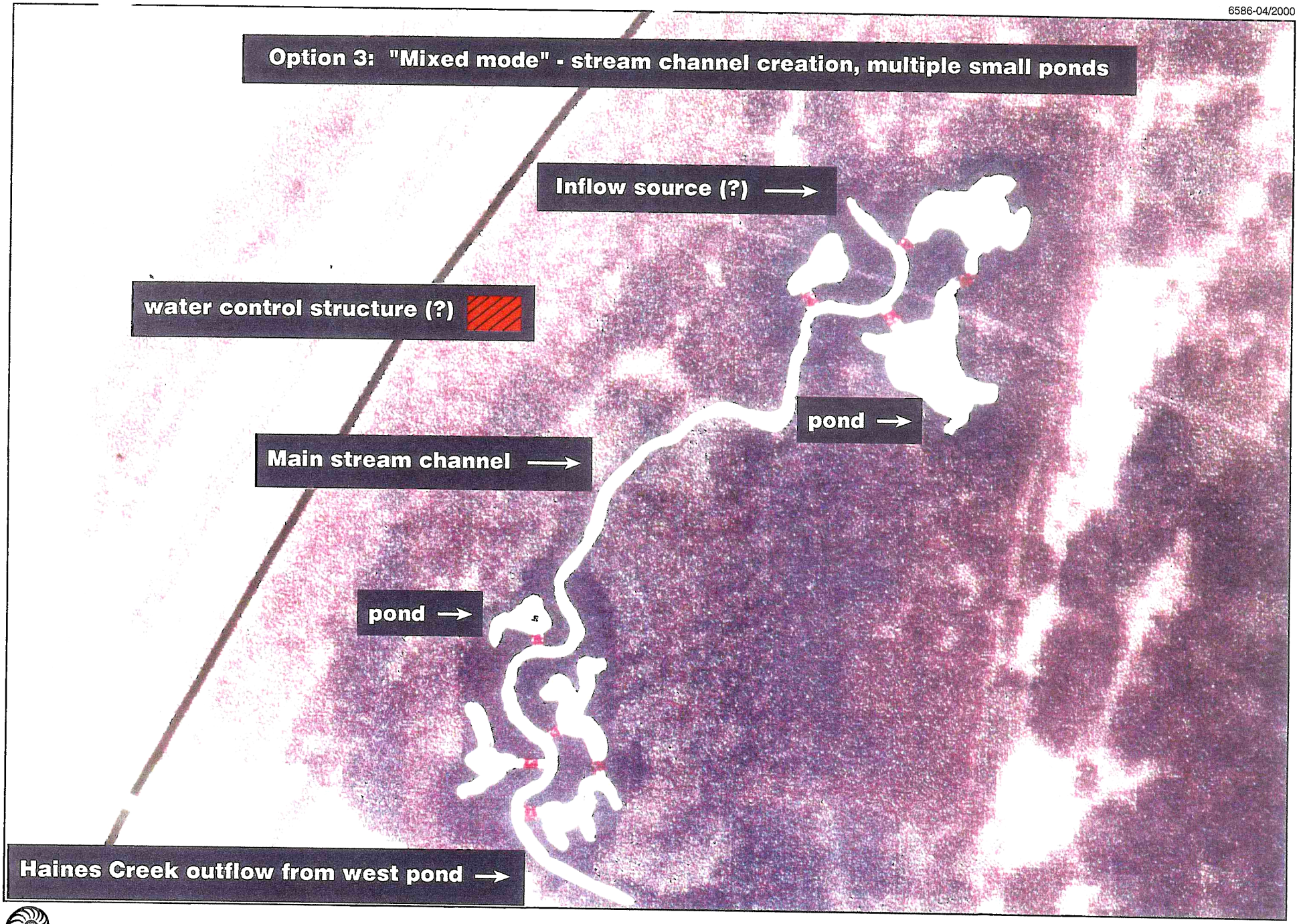
- some increase in habitat for native fishes
- increased habitat for southwestern pond turtles and California red-legged frogs
- some increase in habitat for least Bell's vireo
- increase in habitat heterogeneity
- facilitation of control of exotics under some circumstances

2. This option maximizes habitat heterogeneity, and may thus increase the range of management options and flexibility



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DIAGRAMMATIC REPRESENTATION CROSS SECTION OF POND AND STREAM AREA
Figure 9-6



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OPTION 3: MIXED MODE
Figure 9-7

9.2.4.2 Disadvantages of Option 3

1 Most of the disadvantages of Option 2 would also apply to this option; specifically:

- increased habitat for exotics, increased potential for re-infestation
- increased potential for "attractive nuisance" problems
- generally increased construction costs would be exacerbated by the need to create or excavate multiple ponds, and to have multiple water-control structures installed
- increased costs for management, especially periodic maintenance on smaller ponds to eliminate/restrict growth of cattails
- importation of fill material for nesting areas would also increase costs and decrease potential habitat for least Bell's vireo

2. Additionally, construction of several small multiple ponds would entail a significant increase in monitoring efforts over time. This in turn would increase management costs.

3. If monitoring does not detect an infestation of an exotic species until such time as the species has spread through most or all of the system, eradication or control costs will be consequently increased with a multiple small-pond situation.

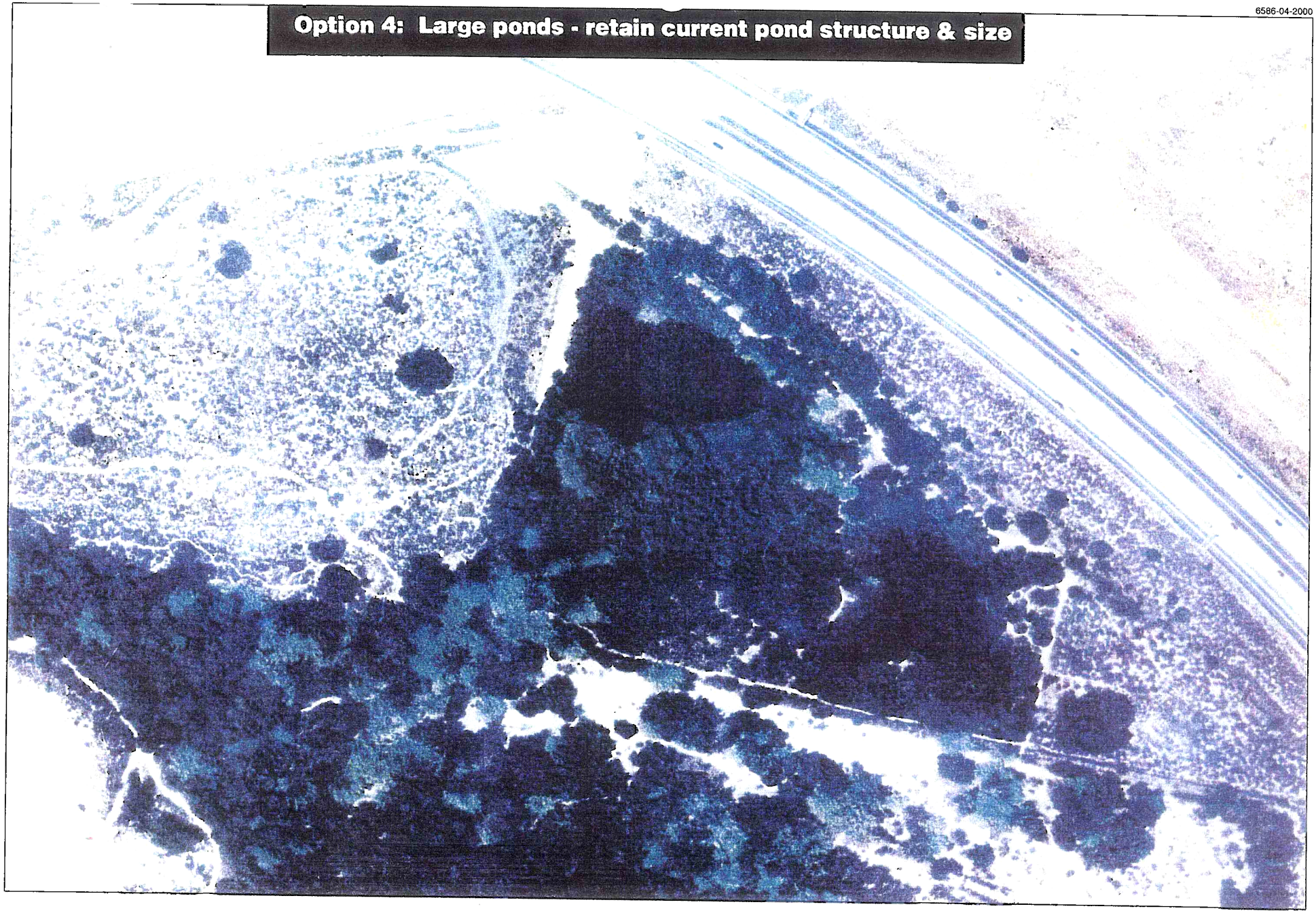
9.2.5 Option 4: Retention of Current Pond Structure

This option envisions retention of the current pond structure with no habitat alteration but involving direct control of exotic species. If restoration/rehabilitation of the site for sensitive native aquatic vertebrate and other species is a primary goal of this project, then there are essentially no biological benefits to retention of the current pond structure, and significant detriments. There may be economic benefits in the narrow and short-term sense; however, exotics control would be required onsite for the foreseeable future. At present, the ponds constitute good to excellent habitat for exotic fishes, frogs, invertebrates and plants, and will continue to do so in the absence of any habitat alteration (removal) in spite of any control effort for exotics. Given the size and nature of the ponds, control efforts for exotics are essentially guaranteed to be long-term and intensive. Movement of fishes (bass, green sunfish, black bullhead) into the system is virtually guaranteed during periods when fish move upstream from Hansen Reservoir Similar expectations exist for bullfrogs and crayfish. The likelihood of re-establishment of exotics is essentially certain; the scale and scope of negative impacts from this process which will affect native species are related to local environmental conditions and the intensity of control efforts. For example, during a drought centrarchid fishes (bass, sunfish) would be expected to be displaced upstream from Haines Canyon Creek and thus increase the relative and total impact on native fishes through the creation of a "source" population of exotics. As population sizes of native species decline during a drought, impacts from exotics may be proportionately greater Monitoring and control efforts would likely have to occur on a monthly basis (as opposed to quarterly with other options). Control efforts would be also be constrained by the highly probable re-infestation of the site by water hyacinth. Observations indicate that this plant achieved 85 to 90 percent coverage of the east pond in a period between May 17 and November 28, 1999. As such, periodic removal of hyacinth from both ponds would be required before any control efforts (use of gill nets, baited traps) could proceed. This in turn would significantly increase management and maintenance costs. Figure 9-8 shows Option 4.

9.2.5.1 Advantages of Option 4

1 Short-term costs are minimized, as no construction-related habitat alteration would occur

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OPTION 4 : RETENTION OF CURRENT POND STRUCTURE
Figure 9-8

9.2.5.2 Disadvantages of Option 4

1 Long-term costs are maximized due to the need for recurrent control efforts for all species of exotics. This includes mechanical removal of water hyacinth, gill netting, trapping and other control methods for fishes, bullfrogs and crayfish.

2. Regulatory agencies would be unlikely to allocate any additional mitigation credits for a significant portion of the pond as there are no tangible benefits to native species through retention of the current pond structure, and significant negative impacts on native species will remain.

3. The presence of any ponded areas increases habitat for exotic species. Additionally, the presence of ponds also increases the potential for reintroduction of exotics by fishermen or other parties. In particular, the ponds would encourage the presence of bullfrogs which might move overland into the area. Also, the presence of ponds provides habitat for water hyacinth. Given the speed with which this species can colonize and essentially cover an open water habitat, monitoring would have to be fairly frequent (every 2 to 3 weeks) and removal would entail additional management/maintenance costs. The presence of cattails, while a native species, would also produce a long-term monitoring and maintenance requirement to maintain sufficient open-water habitat in the ponds.

4. The ponds may constitute an "attractive nuisance" in the form of swimming, fishing or other perceived recreational opportunities. This in turn may increase potential safety and liability concerns for the property owners/managers.

9.2.6 Plan Recommendations

Because mitigation bank Options 1 through 3 depict plans to modify the Tujunga Ponds, the resource agencies would scrutinize these plans and would likely make recommendations and include permit conditions to ensure that their concerns are met. Nevertheless, no great difficulty is anticipated in obtaining any of the required permits and the resource agencies would likely view this project favorably

The option adopted will depend upon a number of factors, including practicality, degree of positive effects of target native species, and cost. We have herein developed a series of options reflecting our understanding of the situation and overall goals of the project, and influenced by our experiences with both the native and exotic species involved, and the nature and extent of the habitat on the site.

However, it is our professional opinion that the greatest benefit in relation to (1) the relative local status of the species involved, (2) the practicality of the habitat creation/restoration effort, and (3) the likely costs associated with construction and management is likely to be derived from the implementation of Option 1 This includes maintenance of minimum water flows in Big Tujunga Creek. Options 2 and 3 offer increased potential benefits for both southwestern pond turtles and California red-legged frogs; however there are potentially significant risks associated with these options due largely to the retention of ponded/slackwater habitats in the area. Other factors, particularly the possibility that sufficient "donor" stock for any red-legged frog reintroduction is not likely to be available for several years (at best) have influenced our opinion in this matter In our opinion, there is nothing to recommend the retention of the ponds in their current state, and several significant factors that weigh heavily against this option.

One overall goal of this project is to restore/increase native habitat for fishes. This should include species long-absent from the site and the Los Angeles River drainage. In particular, restoration and restocking efforts should obligately include the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). Source/donor populations are likely to be the fish currently resident in the upper portion of the Santa Clara River It is our opinion that the creation of stream habitat under Option 1, coupled with a rigorous program to remove and control exotics, has significant potential to allow the reintroduction and successful establishment of this taxon on the site. Given the status of this species, this effort should be afforded a very high priority in the overall plan. Any such plan will require a Section 7 consultation (if a

federal nexus is established via a discharge of dredge or fill material) or a Habitat Conservation Plan via Section 10 (if a federal nexus is not established) of the federal Endangered Species Act. Impacts to this species and other Species of Special Concern will also require consultation through the CDFG.

The site may serve as a relocation site for southwestern pond turtles; as previously noted the species normally exists in stream habitats. However, we are concerned that given the degree of human use of this site and the nature and extent of the habitat, translocated animals remain very vulnerable to (illegal) collection and removal. Some of this might be mitigated by public education and local patrol efforts.

9.2.7 Cautions and Disclaimers

This portion of the project is essentially an experiment in applied conservation biology. There are apparently no published accounts of any similar attempts to construct/reconstruct habitat for sensitive native aquatic vertebrates in the Los Angeles basin or other areas. Thorough searches of literature have been made and the situation at Tujunga Wash involved a unique suite of species that are not duplicated outside of southern California. As such, there are no guidelines nor other information upon which to draw to facilitate the implementation of this project, nor to avoid pitfalls which are certain to arise.

There are potentially significant physical, biological and fiscal constraints on this project. In our opinion, the most immediate concern is the practicality from a hydrologic standpoint of (1) diverting flow from the existing inflow structures and (2) potential problems with groundwater sources onsite and concomitant concerns about their potential impact on the success of the construction phase of the project. This report does not and cannot accurately nor completely assess the potential influence of these factors on the feasibility of the project. Consultation with and assessment by hydrologists and engineers is required in this respect.

The biological concerns are also significant. We do not know if we can successfully create/recreate habitat for native fishes and other species. We do not know with certainty if we can eradicate or effectively control exotic species onsite. The number of potential factors that can affect either of these situations is very large and essentially uncontrollable. However, there may be reasons to be optimistic about the chances for success in both areas. Given the intermittent and physical structure of the habitat of native fishes, it seems likely that we can successfully mimic this in a "created" stream. Additionally, the ecology and high biotic potential of these species may allow for relatively rapid immigration and establishment in the "new" stream. Several factors may facilitate control of exotic species, the most important of which is elimination or restriction of suitable habitat. Elimination of the ponds will be the single largest contributor to the probable success of this effort. The limited extent and nature of the habitat downstream may facilitate effective control efforts; however it is unlikely that exotics will ever be eliminated from the site. This is due to the presence of a massive source population downstream in Hansen Reservoir, and the influence of Big Tujunga dam. However, control of exotics may well be effective even if complete eradication is not possible. Removal of the majority of larger bass or sunfish within drainage may confer benefits on native species through increased survivorship, even if some exotics are still present.

The opportunity exists in this situation to engage in a unique effort which, in our professional opinion, is likely provide significant benefits to a variety of native wildlife species in both the short- and long-term. Such an effort may be difficult to implement, and perhaps costly, but is more promising and less risky than many other potential mitigation measures.

9.3 PERMITTING FOR OPTIONAL POND CONFIGURATIONS

If LADPW decides to pursue the pond reconfiguration strategies, then more extensive permitting would be required. The basic 404, 401, and 1601 permits are discussed in Section 3. If an individual 404 permit is required by the Corps and/or if a Section 7 Consultation (USFWS) or 2081 (CDFG) process is required

then time and effort would be required to secure these permits. The following sections describe the more extensive effort required for these permits.

9.3.1 Individual Permit

If the Corps decides that the proposed project cannot be authorized by NWP number 27 then an individual permit would be required. The Los Angeles District of the Corps proposed the inclusion of a condition to the new NWPs that would require an individual permit for all projects that impact more than 1,000 linear feet of intermittent streambed. If this condition is included in the new NWP program then the Big Tujunga project may either require (1) an individual permit or (2) a design that impacts less than 1,000 linear feet of streambed. If this condition is not included in the new NWP program then it is expected that (based upon the proposed mitigation plans for the Big Tujunga Wash and our personal communications with Aaron Allen of the Corps) this project would be permitted by NWP

The average processing time for an individual Section 404 permit in the Los Angeles District Corps generally ranges between 120 days and one year The Corps has 30 days to determine an applications completeness and another 45 days to obtain input from USFWS, EPA, and CDFG to complete its review of the notification, totaling 75 days.

9.3.2 Federal Endangered Species Act

If the LADPW decides to reconfigure the Tujunga Ponds, then, through the Corps' 404 permitting process, a Section 7 Consultation will hae to be initiated. Pursuant to Section 7 of the Federal Endangered Species Act (ESA) of 1973 (as amended), federal agencies have a substantive duty through consultation with the USFWS to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of endangered or threatened species or species proposed for listing. If the enhancement of the Big Tujunga Wash Mitigation Bank site requires a federal permit (such as a 404 permit), then the permit provides a federal nexus under Section 7 of the ESA. Because the Big Tujunga Wash Mitigation Bank site supports the Santa Ana Sucker, a species proposed for listing, and potentially supports other listed species (least Bell's vireo and southwestern willow flycatcher) the Corps will have to initiate consultation with the USFWS under Section 7 of the ESA. The informal consultation process begins prior to the Formal Consultation process and is characterized by a number of informal meetings with the USFWS staff. The purpose of these meetings is to discuss the project and the measures that may be implemented to ensure the protection of the listed or proposed species.

During the informal consultation process, a Biological Assessment shall be prepared that provides information identifying the presence of listed or proposed species that may be present in the project area. In addition, the direct and indirect affects of the project on the listed or proposed species is evaluated in the Biological Assessment. The format of the Biological Assessment must follow the guidelines set forth by the USFWS. Upon completion of the Draft Biological Assessment, it shall be submitted to the Corps so that the Formal Consultation process can be initiated. The Corps will submit a letter to the USFWS with the Draft Biological Assessment requesting a Section 7 Consultation. The USFWS has 90 calendar days to review the Draft Biological Assessment and to submit a Draft Biological Opinion on the project. The Draft Biological Opinion contains the USFWS's determination of whether the action taken together with cumulative effects is likely to jeopardize the continued existence of the listed or proposed species. In addition, the USFWS will include reasonable and prudent alternatives in the Draft Biological Opinion.

After receipt of the Draft Biological Opinion, the LADPW will have 30 days to comment and modifications shall be made for the purpose of negotiating the Final Biological Opinion. The comments on the Draft Biological Opinion shall be submitted to the Corps and the USFWS within the 30-day comment period. After receipt of the comments, the USFWS has 45 days to issue a Final Biological Opinion. The Final Biological Opinion may be a jeopardy decision if they determine the project will jeopardize the future existence of the listed or proposed species, a No Jeopardy if they determine the project will not jeopardize the species, or a Jeopardy with reasonable and prudent alternatives. The duration of the

Section 7 process from the time the Draft Biological Assessment is submitted to the Corps until the time the Final Biological Opinion is received is 135 days.

If the enhancement of the Big Tujunga Wash Mitigation Bank site does not require a federal permit, then a federal nexus would not be established, and consultation pursuant to Section 10 (a) of the federal ESA would be required. Section 10 consultations are reserved for non-federal lead agencies (e.g., state, local, or private) and results in an incidental take permit with an approved Habitat Conservation Plan (HCP). The duration of the Section 10 process from the time the HCP is submitted until the time the HCP is approved varies from project to project and depends upon the size, complexity, and impacts of the project.

9.3.3 California Endangered Species Act

The California Endangered Species Act (CESA) mandates that state agencies not approve projects that would jeopardize the continued existence of endangered or threatened species. For projects in which there are any federally listed species (as is the case with the Big T project) the CDFG must consult with the USFWS and obtain their Biological Opinion. For species which are both federally and state listed, CESA directs that CDFG adopt the federal Biological Opinion as its written finding (as is the case with the proposed project). CESA further mandates that CDFG issue a written finding within 90 calendar days from the date they receive the Biological Opinion as to whether the proposed project would jeopardize an endangered or threatened species listed under CESA.

9.4 REGULAR PATROLLING OF THE MITIGATION BANK

The 1998 Enhancement Document did not include implementing a regular security patrol of the Mitigation Bank site. This measure was suggested in a letter to LADPW from CDFG on September 29, 1998. The CDFG letter stated that "site security and patrolling will be important issues to address to ensure that wildlife are provided maximum habitat benefits." Site security and patrolling can be accomplished by either contracting with a private security firm or entering into a partnership with the local residents and equestrian groups to assist in patrolling the site. No decisions have yet been made on the method of patrolling the site and who the personnel would be to implement the patrolling. LADPW is actively working on a strategy for implementing the patrolling. It will include identifying personnel, coordinating with local law enforcement regarding authority, establishing a training program, and establishing enforcement/reporting procedures.

The purpose of patrolling the site would be to control the authorized traffic and curtail unauthorized traffic on the site, curtail camping activity, curtail the vandalism of brown-headed cowbird traps and restoration/revegetation areas, encourage the use of existing trails, and enhance the safety of the site's user groups. If a private security firm were contracted to patrol the site, it would be difficult and labor intensive for them to effectively patrol the entire site without vehicular access to the site. Thus, it may be more effective for the LADPW to enter into a partnership agreement with the local equestrian groups that includes regular patrolling of the site. The equestrian groups could designate a Site Custodian or have various members patrol the site each day of the week to look for vandals and campers. In addition, they could look for damage to cowbird traps, fences, signs, and restoration/revegetation areas and they could report the damage directly to the Restoration Specialist, Project Biologist, and the LADPW Manager Because the equestrians use the site on a daily basis, and because they can access all portions of the site, they will constitute the most effective patrolling mechanism on the site. A list of contact names could be provided to the patrolling groups that would include the Restoration Specialist, Project Biologist, LADPW Project Manager, and local law enforcement agencies. The outcome of the patrolling strategy will be discussed with CDFG when it is completed.

Site security will be enhanced by replacing the fence along the south side of the Tujunga Ponds, which was described in Section 3. Access to the ponds will remain open at the northwest corner where the access road enters the area off of Foothill Boulevard. If site security remains a problem, even after the implementation of the equestrian patrol, then the LADPW should consider eliminating access to the pond areas.

9.5 ENTRANCE TO THE MITIGATION BANK SITE AT MARYBELL AVENUE

Based on comments from the public who attended the community meeting in November, an optional enhancement measure was developed to respond to their concerns regarding an entrance to the site at Marybell Avenue. This is purely a public safety issue because Wentworth is a very busy street with little or no shoulder on the north side that can be used by equestrians. Thus, the equestrians have to ride along the south side of Wentworth prior to crossing over to the Mitigation site at Wheatland or east of Marybell Avenue. The crossing east of Marybell Avenue is rather unsafe for equestrians because it is somewhat of a blind curve.

To help reduce the hazards to equestrians when crossing Wentworth, an entrance to the Mitigation Bank site at Marybell Avenue is an option. If this option is implemented, then the LADPW may be able to utilize their field staff to create an entrance in the chain link fence that looks similar to the entrance at Wheatland. The gap in the fence should be wide enough for equestrians to enter and large boulders should be placed in front of the entrance to restrict the passage of motorcycles and other motorized vehicles. The boulders should be placed in such a manner as to allow horses to pass between them.

LADPW will consider this option but the potential impacts of an entrance in this location may have an effect on the success of the optional upland restoration, if LADPW decides to go forward with that measure.

SECTION 10.0 - REFERENCES

Avila, V and P Frye
1978 Feeding behavior of the African clawed frog (*Xenopus laevis* Daudin): (Amphibia, Anura, Pipidae): effect of prey type. J. Herpetol. 12: 391-396.

Bell, M.A. and T.R. Haglund
1978 Selective predation of threespine sticklebacks (Gasterosteus aculeatus) by garter snakes. Evolution 32: 304-319.

Bell, M.A.
1982 Melanism in a high elevation population of Gasterosteus aculeatus. Copeia: 829-835.

Bellemin, J.M. and G.R. Stewart
1977 Diagnostic characters and color convergence of the garter snakes Thamnophis elegans and Thamnophis couchii atratus along the central California coast. Bull. So. Calif. Acad. Sci. 76 73-84.

Black, J.H.
1974 Bullfrog eating a bird. Herpetol. Rev 5: 104.

Blair, W.F
1957 Changes in vertebrate populations under conditions of drought. Cold Harbor Symp. Quant. Biol. 22: 273-275.

Blair, W.F
1957 Structure of the call and relationships of Bufo microscaphus Cope. Copeia: 208-212.

Bles, E.J.
1905 The life history of *Xenopus laevis* Daud. Trans. Royal Soc. Edinburgh 41 789-821

Bogert, C.M.
1930 An annotated list of the amphibians and reptiles of Los Angeles County, California. Occas. Papers Calif. Acad. Sci. 16: 3-14.

Bohnsack, K.
1952 Terrestrial hibernation of the bullfrog, Rana catesbeiana Shaw Copeia: 114.

Boyd, Steve, Timothy Ross, Walter Appleby and Orlando Mistretta
1993 A Botanical Assessment of the West End Vegetation Management Unit, Tujunga Ranger *District, Angeles National Forest, California*. Rancho Santa Ana Botanic Garden, unpublished report.

Branning, T
1979 Frog wars. Natl. Wildlife 17: 34-37

Brattstrom, B.H.
1988 Habitat destruction in California with special reference to Clemmys marmorata: A perpesctive (sic) In: DeLisle, H.F., P.R. Brown, B. Kaufman and B.M. McGurty (eds). Proc. Conf Calif Herpetology, SW Herpetologists Society, Spec. Publ. 4.

Brattstrom, B.H. and D. Messer
1988 Current status of the southwestern pond turtle, Clemmys marmorata pallida, in southern California. Final Rept. Calif Dept. of Fish & Game # C-2044

Brittingham, M.C. and S.A. Temple
1983 Have Cowbirds Caused Forest Songbirds to Decline? *BioScience* 33:31-35.

Brooks, G.R., Jr
1964 An analysis of the food habits of the bullfrog, Rana catesbeiana, by body size, sex, month and habitat. Va. J. Sci. 15: 173-186.

Bury, R.B.
1972b Habits and home range of the Pacific pond turtle, Clemmys marmorata in a stream community Ph.D. disser., Univ Calif. Berkeley, California.

Bury, R.B.
1986 Feeding ecology of the turtle, Clemmys marmorata. J Herpetol. 20: 515-521

Bury, R.B. and J. Whelan
1984 Ecology and management of the bullfrog. U.S. Fish and Wildlife Serv Resource Publ. 155. Washington, D.C

Bury, R.B. and R.A. Luckenbach
1976 Introduced amphibians and reptiles in California. Biol. Conser 10: 1-14

CalEPPC
1997 Prescriptions for Applying Herbicide to Tamarisk. CalEPPC News, Spring 1997, V 5:2, pp. 7-10.

Carpenter, H.L. and E.O Morrison
1973 Feeding behavior of the bullfrog, Rana catesbeiana, in northcentral Texas. Bios 44 188-193.

Case, S.M.
1978 Biochemical systematics of members of the genus Rana native to western North America. Syst. Zool. 27· 299-311

Chambers Group, Inc.
1995 *Resource Management Plan for San Joaquin Hills Transportation Corridor* Prepared for Transportation Corridor Authorities, Santa Ana, CA. February 1995

1998a *Draft Biological Resources Assessment and Functional Analysis of a Site in Big Tujunga Wash, Los Angeles County, California.* Prepared for County of Los Angeles Department of Public Works Alhambra, CA. April 1998.

1998b *Draft Enhancement Opportunities at Big Tujunga Wash, Los Angeles County, California.* Prepared for County of Los Angeles Department of Public Works, Alhambra, CA. August 1998.

Chambers Group
1998c *Brown-Headed Cowbird Trapping Program for the Eastern Transportation Corridor* Prepared for CH2M Hill.

Cohen, N.W and W.E. Howard
1958 Bullfrog food and growth at the San Joaquin Experimental Range. Copeia 223-225.

Courtenay, W.R., Jr and C.R. Robins
1975 Exotic organisms: an unsolved, complex problem. BioScience 25 306-313

Cunningham, J.D.
1955 Arboreal habits of certain reptiles and amphibians in southern California. Herpetologica 11 217-220.

Cunningham, J.D.
1959 Reproduction and food of some California snakes. Herpetologica 15: 17-19

Cunningham, J.D.
1961 Observations on the natural history of the California Toad, Bufo californicus Camp. Herpetologica 17 255-260.

Currie, W and E.D Bellis
1969 Home range and movements of the Bullfrog, Rana catesbeiana Shaw, in an Ontario pond. Copeia: 688-692.

Davidson, C.
1996 Frog and toad calls of the Pacific Coast: Vanishing voices. CD from Cornell Laboratory of Ornithology

DeLisle, H., G. Cantu, J. Feldner, P O'Connor, M. Peterson and P Brown
1986 The distribution and present status of the herpetofauna of the Santa Monica Mountains of Los Angeles and Ventura County, California. Southwestern Herpetol. Soc. Spec. Publ. 2: 1-94.

Deuchar, E.
1975 *Xenopus laevis*: The South African clawed frog. John Wiley and Sons, London.

Dixon, J.R.
1967 Amphibians and reptiles of Los Angeles County, California. Los Angeles Co. Museum Sci. Series 23: 1-64.

Durham, L. and G.W Bennett
1963 Age, growth and homing in the bullfrog. J. Wildlife Manage. 27 107-123.

Ehrlich, P., D. Dobkin, and D. Wheye
1988 *The Birder's Handbook.* Simon and Schuster, Inc. New York, NY

Ely, E.
1992 Geographic distribution: Thamnophis hammondii. Herpetol. Rev 23: 124-125.

Emlen, S.T
1968 Territoriality in the bullfrog, Rana catesbeiana. Copeia: 240-243

Ernst, C.H. and R.W Barbour
1989 Turtles of the world. Smithsonian Institution Press, Washington, D.C.

Feder, J.H.
1977 Genetic variation and biochemical systematics in western Bufo. MA Thesis, Univ Calif. Berkeley

Fingal, W and H.W Kaplan
1963 Susceptibility of *Xenopus laevis* to copper sulfate. Copeia:155-156.

Fitch, H.S.
1940 A biogeographical study of the ordinoides artenkreis of garter snakes (genus Thamnophis). Univ Calif. Publ. Zool. 44: 1-150.

Fitch, H.S.
1941 The feeding habits of California garter snakes. Calif. Fish & Game 27· 1-32.

Fitch, H.S.
1949 Study of snake populations in central California. Amer Midl. Nat. 41:513-517

Fitch, H.S.
1984 Thamnophis hammondii. Catalogue of Amer Amph. Rept. 351 1-351.3.

Fritts, T.H. and M. McCoid
1976 Colonization and biology of the African clawed frog (*Xenopus laevis*) in southern Riverside County Unpubl. Rept. Riverside Co. Fish & Game Comm.

Frost, S.W
1935 The food of Rana catesbeiana Shaw Copeia: 15-18.

Frye, P.G
1977 Food initiated behavior of the African clawed frog (*Xenopus laevis* Daudin) MS Thesis, San Diego State Univ., San Diego, California.

Gergus, E.W.A.
1994 Systematics and biogeography of Bufo microscaphus (Anura:Bufonidae), with a preliminary report on americanus group phylogeny MS Thesis, San Diego State Univ., California.

Gibbons, J.W.
1994 Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C

Gibbons, J.W and J. Greene
1994 Reproduction in the slider and other species of turtles. In: Gibbons, J.W 1994. Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C.

Graham, Frank Jr
1998 Bad, Bad Birds. *Audubon* September-October·104-108

Grant, C
1936 Breeding of Psuedemys elegans in California and notes on other captive reptiles. Copeia: 112-113.

Griffith Wildlife Biology (GWB)
1993 *Brown-Headed Cowbird Impacts on South-Western Riparian Bird Communities: Management Options and Opportunities*. Paper from the North American Workshop on the Ecology and Management of Cowbirds, Austin, TX.

1994a *Brown-Headed Cowbird Trapping Protocol*. Unpublished document prepared by Jane C. Griffith and John T Griffith, Griffith Wildlife Biology, Calumet, Michigan.

Grinnell, J. and H.W. Grinnell
1907 Reptiles of Los Angeles County, California. Throop Inst. Bull. 35: 1-64.

Hamilton
1997 Hydrologic Assessment for the Big Tujunga Wash Mitigation Site - Los Angeles County, California. Report to Chambers Group, Irvine, CA.

Harris, J. H.
1991 Effects of Brood Parasitism by Brown-Headed Cowbirds on Willow Flycatcher Nesting Success Along the Kern River, California. *Western Birds* 22:13-26.

Harvey & Stanley Associates, Inc.
1983 *Revegetation Manual.* Prepared for Alameda County Flood Control and Water Conservation District. Hayward, CA. June 1983.

Hayes, M.P and M.R. Jennings
1988 Habitat correlates of distribution of the California red-egged frog (Rana aurora draytonii) and the foothill yellow-legged frog (Rana boylii): Implications for management. In: Szaro, R.C., K.E. Severson and D.R. Patterson (techn. coords.), Proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America. U.S. Dept. Agriculture, Forest Service, Technical Report RM-166.

Hayes, M.P and D.M. Krempels
1986 Vocal sac variation among frogs of the genus Rana from western North America. Copeia: 927-936.

Hayes, M.P and M.M. Miyamoto
1984 Biochemical, behavioral and body size differences between the red-legged frogs, Rana aurora aurora and Rana aurora draytonii. Copeia 1984. 1018-1022.

Hayes, M.P and M.R. Tennant
1986 Diet and feeding behavior of the California red-legged frog, Rana aurora draytonii. SW Nat. 30: 601-605.

Hayes, M.P and J. Warner
1985 Life history notes: Rana catesbeiana, food. Herpetol. Rev 16: 109

Hickman, J.C. (Editor)
1993 *The Jepson Manual: Higher Plants of California.* University of California Press. Berkeley, CA.

Holland, D.C.
1991 A synopsis of the ecology and status of the western pond turtle (Clemmys marmorata) in 1991 Unpubl Rept. to U.S. Fish & Wildlife Service, San Simeon, California.

Holland, D.C.
1992 Level and pattern in morphological variation: A phylogeographic study of the western pond turtle (Clemmys marmorata). Ph.D. dissertation, Univ SW Louisiana, Lafayette, Louisiana.

Holland, D C
1994 Western pond turtle: Habitat and history DOE/BP Rept. #62137-1, Bonneville Power Admin., Portland, Oregon.

Holland, D.C. and R.H. Goodman, Jr
1999a A guide to the amphibians and reptiles of MCB Camp Pendleton. Rept. to AC/S Environmental Security Office, MCB Camp Pendleton, San Diego County, California.

Holland, D. C. and R.H. Goodman, Jr
1999b Sensitive amphibian and reptile species on MCB Camp Pendleton, San Diego County, California, with management recommendations. Rept. to AC/S Environmental Security Office, MCB Camp Pendleton, San Diego County, California.

Holland, R.
1986 *Preliminary Descriptions of the Terrestrial Natural Communities of California.* Nongame Heritage Program, State of California Department of Fish and Game.

Howard, W.E.
1950 Birds as bullfrog food. Copeia: 152.

Jameson, Jr., E.W. and Hans J. Peeters
1988 *California Mammals.* University of California Press, Berkeley, CA.

Jennings, M.R.
1983 An annotated checklist of the amphibians and reptiles of California. Cal. Fish & Game Bull. 69:151-171

Jennings, M.R.
1987 Annotated checklist of the amphibians and reptiles of California, second revised edition. SW Herpetologists Soc., Spec. Publ. 3: 1-48.

Jennings, M.R.
1988a Origin of the population of Rana aurora draytonii on Santa Cruz Island, California. Herpetol. Rev 19: 76.

Jennings, M.R.
1988b Natural history and decline of native ranids in California. In: DeLisle, H.F., P.R. Brown, B. Kaufman and B.M. McGurty (eds). Proc. Conf. Calif. Herpetol. Spec. Publ. Southwestern Herpetologists Society.

Jennings, M.R. and M.P Hayes
1985 Pre-1900 overharvest of the California red-legged frog (Rana aurora draytonii): The inducement for bullfrog (Rana catesbeiana) introduction. Herpetologica 41 94-103.

Jennings, M.R. and M.P Hayes
1989 Final report on the status of the California red-legged frog (Rana aurora draytonii) in the Pescadero Marsh Natural Preserve. Rept. for Calif. Dept. Parks and Recreation, Sacramento, California. Contract # 4-823-9018.

Jennings, M.R. and M.P Hayes
1994 *Amphibian and Reptile Species of Special Concern in California.* California Department of Fish and Game Inland Fisheries Division (Contract Number 8023).

Jennings, M.R. and M.P Hayes
1994 Decline of native ranid frogs in the desert southwest. In: Brown, P.R. and J Wright (eds), Herpetology of the North American Deserts: Proceedings of a symposium. Southwestern Herpetologists Society, Special Publ. 5.

Jennings, M.R. and M.P Hayes
1996 Amphibian and reptile Species of Special Concern in California. Calif. Dept. of Fish and Game Spec. Publ.

Klauber, L.M.
1929 Range extensions in California. Copeia: 15-22.

Klauber, L.M.
1931 A statistical survey of the snakes of the southern border of California. Bull. San Diego Zool. Soc. 8: 1-93.

Kruse, K.C. and M.G. Francis
1977 A predation deterrent in larvae of the bullfrog, Rana catesbeiana. Trans. Amer Fish. Soc. 106: 241-252.

Kupferberg, S.J.
1993 Bullfrogs (Rana catesbeiana) invade a northern California river: A plague or species coexistence? (abstract) Bull. Ecol. Soc. America, Programs and Abstracts supplement to 74: 319-320

Kupferberg, S.J.
1994 Exotic larval bullfrogs (Rana catesbeiana) as prey for native garter snakes: Functional and conservation implications. Herpetol. Rev. 25: 95-97.

Larson, N.M.
1984 Geographic variation in the two-striped garter snake, Thamnophis hammondii. MS Thesis, Calif. State Polytechn. Univ. Pomona, Pomona, California.

Lawson, R. and H.C. Dessauer
1979 Biochemical genetics and systematics of the Thamnophis elegans-couchii-ordinoides complex. Occas. Papers Museum Zool., Louisiana State Univ. 56: 1-24.

Laymon, S.S.
1987 Brown-Headed Cowbirds in California: Historical Perspectives and Management Opportunities in Riparian Habitats. *Western Birds* 18:63-70.

1993 *Brown-Headed Cowbird Impacts on South-Western Riparian Bird Communities: Management Options and Opportunities*. Paper from the North American Workshop on the Ecology and Management of Cowbirds, Austin, TX.

Lenaker, R.
1972 *Xenopus in* Orange County Unpubl. Rept. Calif. State Polytechnic Univ - Pomona.

Lillywhite, H.
1970 Behavioral temperature regulation in the Bullfrog, Rana catesbeiana. Copeia: 158-168

Mahmoud, I.Y. and N. Lavenda
1969 Establishment and eradication of food preferences in red-eared turtles. Copeia: 298-300.

Mahrdt, C.R. and F T Knefler
1972 Pet or pest? The African clawed frog. Environ. SW 446: 2-5.

Mahrdt, C.R. and F T Knefler
1973 The African clawed frog - again. Environ. SW 450: 1-3

McAtee, W.L.
1921 Homing and other habits of the bullfrog. Copeia: 39-40.

McCoid, M.J
1993 Speculations on colonizing success of the African clawed frog *Xenopus laevis* (Pipidae), in California. So. African J. Zool. 28: 59-61

McCoid, M.J. and T.H. Fritts
1980a Notes on the diet of a feral population of *Xenopus laevis* (Pipidae) in southern California. SW Nat. 25: 272-275.

McCoid, M.J. and T.H. Fritts
1980b Observations of feral populations of *Xenopus laevis* (Pipidae) in southern California. Bull. So. Calif. Acad. Sci. 79: 82-86.

McCoid, M.J., G. Pregill and R.M. Sullivan
1993 Possible decline of *Xenopus* populations in southern California. Herpetol. Rev 24:29-30.

McGuire, J.A. and L.L. Grismer
1992 The taxonomy and biogeography of Thamnophis hammondii and T digueti (Reptilia:Squamata:Colubridae) in Baja California, Mexico. Herpetologica 49: 354-365

Miller, L. and A.H. Miller
1936 The northern occurrence of Bufo californicus in California. Copeia: 176.

Moyle, P.B.
1973 Effects of introduced bullfrogs, Rana catesbeiana, on the native frogs of the San Joaquin Valley, California. Copeia: 18-22.

Moyle, P.B.
1976 Inland fishes of California. University of California Press, Berkeley, CA.

Mulla, M.S.
1963 Toxicity of organochloride insecticides to the mosquito fish Gambusia affinis and the bullfrog Rana catesbeiana. Mosquito News 23: 299-303.

Mulla, M.S., L.W. Isaak and H. Axelrod
1963 Field studies on the effects of insecticides on some aquatic wildlife species. J. Econ. Entomol. 56: 184-188.

Munsey, L.
1972 Salinity tolerance of the African clawed frog, *Xenopus laevis*. Copeia: 584-586.

Myers, G.S.
1930 The status of the southern California toad, Bufo californicus Camp. Proc. Biol. Soc. Washington 43: 73-78.

National Geographic Society
1987 *A Field Guide to the Birds of North America*. National Geographic Society, Washington, D.C.

Patten, M.A. and S.J. Myers
1992 Geographic distribution: Bufo microscaphus californicus. Herpetol. Rev 23: 124.

Price, A.H. and B.K. Sullivan
1988 Bufo microscaphus. Catal. Amer Amphib. & Reptiles 415.1-415.3.

Pritchard, P.C.H.
1979 Encyclopedia of turtles. TFH Publ., Neptune, New Jersey

Raney, E.C
1940 Summer movements of the bullfrog, Rana catesbeiana Shaw as determined by the jaw tag method. Amer Midl. Nat. 23: 733-745.

Rathbun, G.B., N. Seipel and D.C. Holland
1992 Nesting behavior and movements of western pond turtles (Clemmys marmorata). SW Nat. 37 319-324.

Rathbun, G.B., M.R. Jennings, T.G. Murphey and N.R. Seipel
1993 Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. Unpubl. Rept., National Ecol. Res. Center, Piedras Blancas Research Station, San Simeon, California.

Ryan, R.A.
1953 Growth rates of some ranids under natural conditions. Copeia: 73-80.

Schoenherr, A.A.
1976 The herpetofauna of the San Gabriel Mountains, Los Angeles County, California. Special Publ. SW Herpetologists Society

Schwalbe, C.R. and P.R. Posen
1988 Preliminary report on effect of bullfrogs on wetland herpetofaunas in southeastern Arizona. In: Szaro, R.C., K.C. Severson and D.R. Patton (tech. coordinators), Proceedings of the symposium on the management of amphibians, reptiles and small mammals in North America. U.S. Dept. Agriculture, Forest Service, Gen.Tech. Rept. RM-120.

Seeliger, L.M.
1945 Variation in the Pacific mud turtle. Copeia: 150-159.

Slevin, J.R.
1928 The amphibians of western North America: an account of the species known to inhabit California, Alaska, British Columbia, Washington, Oregon, Idaho, Utah, Nevada, Arizona, Sonora and Lower California. Occas. Papers Calif. Acad. Sci. 16: 1-152

Sloan, A.J.
1964 Amphibians of San Diego County Occas. Papers San Diego Soc. Nat. Hist. 13: 1-42.

Society for Ecological Restoration (SERCAL)
1992 *Restoration/Revegetation Planning: The Basics.* Proceedings for workshops held November 13, 1992, Sacramento, California. Sponsored by SERCAL, California Chapter

St. Amant, J., F Hoover and G. Stewart
1973 African clawed frog, *Xenopus laevis* (Daudin), established in California. Calif. Fish & Game 59: 151-153.

St. Amant, J.
1975 Exotic visitor becomes permanent resident. Terra., 13. 22-23.

Stallcup, R.
1993 *"Another Silent Spring?"* Pt. Reyes Bird Observatory News, Spring 1993

Stebbins, R.C.
1951 Amphibians of western North America. Univ. Calif. Press, Berkeley, California.

Stebbins, R.C.
1954b Amphibians and reptiles of western North America. McGraw-Hill Book Co., New York, New York.

Stebbins, R.C
1985 *A Field Guide to Western Reptiles and Amphibians*. Hought Mifflin Company, Boston.

Stewart, G.R.
1972 An unusual record of sperm storage in a female garter snake (genus Thamnophis). Herpetology 28: 346-347

Storer, T.I.
1922 The eastern bullfrog in California. Calif. Fish & Game 8: 219-224.

Storer, T.I.
1925 A synopsis of the amphibia of California. Univ Calif. Publ. Zool.. 27 1-342.

Storer, T.I.
1930 Notes on the life-history and ecology of the Pacific fresh-water turtle, Clemmys marmorata. Univ Calif Publ. Zool. 35: 429-441

Sullivan, B.K.
1992 Calling behavior of the southwestern toad (Bufo microscaphus). Herpetologica 48: 383-389.

Sweet, S.S
1991 Ecology and status of the arroyo toad (Bufo microscaphus californicus) on the Los Padres National Forest of southern California, with management recommendations. Report to U.S. Dept. of Agriculture, Forest Service, Los Padres National Forest, Goleta, California.

Sweet, S.S
1993 Second report on the biology and status of the arroyo toad (Bufo microscaphus californicus) on the Los Padres National Forest of southern California. Rept. to U.S. Dept. of Agriculture, Forest Service, Los Padres National Forest, Goleta, California.

Swift, C.C., T.R. Haglund, M. Ruiz and R.N. Fisher
1993 The status and distribution of the freshwater fishes of southern California. Bull. So. Calif Acad. Sci. 92:101-167

Thrall, J
1971 Excavation of pits by juvenile Rana catesbeiana. Copeia: 731-732.

Treanor, R.R.
1975 Management of the bullfrog (Rana catesbeiana) resource in California. Calif Dept. Fish & Game Inland Fisheries Admin. Rept. 75-1

Treanor, R.R. and S.J Nichola
1972 A preliminary study of the commercial and sporting utilization of the bullfrog, R. catesbeiana Shaw in California. Calif. Dept. Fish & Game Inland Fisheries Admin. Rept. 72-4

Twedt, B.
1993 A comparative ecology of Rana aurora Baird and Girard and Rana catesbeiana Shaw at Freshwater Lagoon, Humboldt County, California. MA Thesis, California State Univ Humboldt, Humboldt, California.

Tyler, J.D. and R.D Hoestenbach, Jr
1979 Differences in food habits of bullfrogs (Rana catesbeiana) from pond and stream habitats in southwestern Oklahoma. SW Nat. 24:33-38.

United States Department of Agriculture
1978 *Soil Survey of Orange County and Western Part of Riverside County, California.* Soil Conservation Service and Forest Service. 150 pp+

Unitt, P
1984 *The Birds of San Diego County.* San Diego Society of Natural History, Memoir 13.

U.S. Fish and Wildlife Service (USFWS)
1999 Arroyo southwestern toad (*Bufo microscaphus californicus*) Recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

U.S. Fish and Wildlife Service (USFWS)
1999 Personal communication with Jim Thomas, May 1, 1999

Van Denburgh, J. and J.R. Slevin
1918 The garter-snakes of western North America. Proc. Calif. Acad. Sci. Ser 4, 8: 181-270

von Bloeker, J.C., Jr
1942 Fauna and flora of the El Segundo sand dunes: 13. Amphibians and reptiles of the dunes. Bull. So. Calif. Acad. Sci. 41 29-38.

White, M. and J.A. Kolb
1974 A preliminary study of Thamnophis near Sagehen Creek, California. Copeia: 126-136.

Wiewandt, T.A.
1969 Vocalization, aggressive behavior and territoriality in the Bullfrog, Rana catesbeiana. Copeia: 278-285.

Willet, G.
1933 Revised List of Birds of Southwestern California. *Pacific Coast Avifauna* 27· 1-203.

Wright, A.H. and A.A.
1949 Handbook of frogs and toads of the United States and Canada. Third edition, Comstock Publ. Co., Ithaca, New York.

Wright, A.H. and A.A. Wright
1957 Handbook of snakes of the United States and Canada. Vol. I & II. Comstock Publ Co., Ithaca, New York.

Zacuto, B
1975 The status of the African clawed frog (*Xenopus laevis*) in Agua Dulce and Soledad Canyons. Unpubl. Rept. Calif. Dept. Fish & Game.

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APPENDIX A

PLANT SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH STUDY AREA

Appendix A

PLANT SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH STUDY AREA

Scientific Name	Common Name
GYMNOSPERMS	
CUPRESSACEAE	**CYPRESS FAMILY**
Juniperus californica	California juniper
PINACEAE	**PINE FAMILY**
Pinus coulteri	Coulter pine
ANGIOSPERMS-DICOTS	
ACERACEAE	**MAPLE FAMILY**
Acer macrophyllum	Big-leaf maple
Acer negundo var *californicum*	California box-elder
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**
Malosma laurina	Laurel Sumac
Rhus integrifolia	Lemonadeberry
Rhus ovata	Sugar Bush
*Schinus molle**	Peruvian pepper tree
*Schinus terebinthifolius**	Brazilian pepper tree
Toxicodendron diversilobum	Poison oak
APIACEAE	**CARROT FAMILY**
*Foeniculum vulgare**	Fennel
APOCYNACEAE	**DOGBANE FAMILY**
*Nerium oleander**	Oleander
ASTERACEAE	**SUNFLOWER FAMILY**
*Ageratina adenophora**	Ageratina/Eupatorium
Ambrosia acanthicarpa	Annual Bur Sage
Ambrosia psilostachya	Western ragweed
Artemisia californica	Coastal Sagebrush
Artemisia douglasiana	Mugwort
Baccharis salicifolia	Mulefat
Brickellia californica	California Brickelbush
*Centaurea melitensis**	Tocalote
Chaenactis glabriuscula	Yellow pincushion
Chamomilla suaveolens	Pineapple weed
Chrysopsis villosa	Golden-Aster
Cirsium occidentale	Cobweb thistle
*Cirsium vulgare**	Bull Thistle

Scientific Name	Common Name
*Conyza bonariensis**	Conyza
Conyza canadensis	Horseweed
Encelia farinosa	Incienso/Brittlebush
Eriophyllum confertiflorum	Golden Yarrow
Ericameria pinifolia	Pinebush
Filago californica	California Fluffweed
Gnaphalium bicolor	Bicolored cudweed
Gnaphalium californicum	California Everlasting
Gnaphalium canescens	Felty everlasting
*Gnaphalium luteo-album**	white cudweed
Gnaphalium palustre	Everlasting
Gutierrezia californica	California Matchweed
Gutierrezia sarothrae	Broom Snakeweed/Matchweed
Helianthus annuus	Common Sunflower
Heterotheca grandiflora	Telegraph Weed
Heterotheca sessiliflora	Hairy golden-aster
Isocoma argentea (?)	Goldenbush
*Lactuca serriola**	Prickly Lettuce/ Wild Lettuce
Lepidospartum squamatum	Scalebroom
Lessingia filaginifolia	Cudweed aster
Lesingia glandulifera (?)	NCN
Malacothrix saxatilis	Cliff malacothrix
Senecio flaccidus	Shrubby butterweed
Sonchus asper ssp. *asper**	Prickly sow thistle
*Sonchus oleraceus**	Common Sow-thistle
Stephanomeria exigua	Small wreathplant
Stephanomeria pauciflora	Wire lettuce
Xanthium strumarium	Cocklebur
BETULACEAE	**BIRCH FAMILY**
Alnus rhombifolia	White Alder
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia tessellata	Devil's Lettuce
Cryptantha intermedia	Popcorn Flower
Cryptantha microstachys	Tejon cryptantha
Cryptantha muricata	Cryptantha
Pectocarya sp.	Pectocarya

Scientific Name	Common Name
BRASSICACEAE	**MUSTARD FAMILY**
*Brassica nigra**	Black Mustard
*Hirschfeldia incana**	Short-podded mustard
*Lobularia maritima**	Sweet Alyssum
Rorippa nasturtium-aquaticum	Water Cress
*Sisymbrium irio**	London rocket
*Sisymbrium orientale**	Oriental mustard
CACTACEAE	**CACTUS FAMILY**
Opuntia basilaris var *basilaris*	Beavertail Cactus
Opuntia littoralis	Coastal Prickly Pear
Opuntia parryi	Valley Cholla
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
Sambucus mexicana	Blue Elderberry
CARYOPHYLLACEAE	**PINK FAMILY**
Loeflingia squarrosa	California loeflingia
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
Atriplex canescens	Four-winged saltbush
*Chenopodium ambrosioides**	Mexican tea
*Chenopodium botrys**	Jerusalem Oak
*Salsola tragus**	Russian Thistle/ Tumbleweed
CRASSULACEAE	**STONECROP FAMILY**
Crassula connata	Pygmy-weed
CUCURBITACEAE	**GOURD FAMILY**
Cucurbita foetidissima	Calabazilla
Marah macrocarpus	Wild Cucumber
CUSCUTACEAE	**DODDER FAMILY**
Cuscuta californica	California dodder
ERICACEAE	**HEATH FAMILY**
Arctostaphylos glauca	Bigberry manzanita
EUPHORBIACEAE	**SPURGE FAMILY**
Croton californicus	California croton
*Euphorbia peplus**	Petty spurge
*Ricinus communis**	Castor bean
FABACEAE	**LEGUME FAMILY**
Lotus nevadensis	Sierra Nevada lotus
Lotus scoparius	Deerweed
Lupinus concinnus	Bajada lupine
Lupinus hirsutissimus	Stinging lupine
*Melilotus alba**	White Sweetclover
*Spartium junceum**	Spanish broom

Scientific Name	Common Name
GERANIACEAE	**GERANIUM FAMILY**
*Erodium botrys**	broad-lobed filaree
*Erodium cicutarium**	Red-stemmed filaree
GROSSULARIACEAE	**GOOSEBERRY FAMILY**
Ribes aureum	Golden currant
HYDROPHYLLACEAE	**WATERLEAF FAMILY**
Eriodictyon crassifolium	Thick-leaved yerba santa
Eriodictyon trichocalyx var *trichocalyx*	Yerba santa
Eucrypta chrysanthemifolia	Common eucrypta
Phacelia cicutaria	Phacelia
Phacelia distans	Common Phacelia/ Blue Phacelia
Phacelia grandiflora	Large flowered phacelia
Phacelia minor	Wild canterbury-bell
Phacelia ramosissima	Branching phacelia
LAMIACEAE	**MINT FAMILY**
*Marrubium vulgare**	Horehound
Salvia apiana	White Sage
Salvia columbariae	Chia
Salvia mellifera	Black Sage
LOASACEAE	**LOASA FAMILY**
Mentzelia laevicaulis	Giant blazing Star
MALVACEAE	**MALLOW FAMILY**
Malacothamnus davidsonii	Davidson's bushmallow
Malacothamnus fasciculatus	Mesa bushmallow
MORACEAE	**MULLBERRY FAMILY**
*Ficus carica**	Common fig
*Morus alba**	White mullberry
MYRTACEAE	**MYRTLE FAMILY**
Eucalyptus sp.*	Eucalyptus/ Gum Tree
OLEACEAE	**OLIVE FAMILY**
Fraxinus velutina	Velvet ash
*Olea uhdei**	Mexican ash
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia bistorta	Camissonia
Camissonia hirtella	Small flowered suncup
Camissonia californica	California evening primrose
Camissonia micrantha (?)	Small primrose
Epilobium ciliatum	California cottonweed
Oenothera elata ssp. *hookeri*	Evening Primrose

Scientific Name	Common Name
PAPAVERACEAE	**POPPY FAMILY**
Dendromecon rigida	Bush poppy
Eschscholzia californica	California poppy
PITTOSPORACEAE	**PITTOSPORUM FAMILY**
*Pittosporum undulatum**	Victorian box
PLANTAGINACEAE	**PLANTAIN FAMILY**
*Plantago indica**	India plantain
*Plantago major**	Common plantain
PLATANACEAE	**SYCAMORE FAMILY**
Platanus racemosa	Western sycamore
POLEMONIACEAE	**PHLOX FAMILY**
Eriastrum densifolium	woollystar
Eriastrum sapphirinum	Sapphire Eriastrum
Loeseliastrum schottii	Schott's Loeseliastrum
Navarretia hamata	Hooked navarretia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum sp. *(sterile)*	Wild Buckwheat
Eriogonum fasciculatum var *fasciculatum*	California Buckwheat
Eriogonum fasciculatum var *foliolosum*	California buckwheat
Eriogonum thurberi	Thurber's buckwheat
Lastarriaea coriacea	Lastarriaea
*Polygonum arenastrum**	Common knotweed
Polygonum lapathifolium (?)	Pale smartweed
*Rumex conglomeratus**	Whorled dock
*Rumex crispus**	Curly dock
PRIMULACEAE	**PRIMROSE FAMILY**
*Anagallis arvensis**	Scarlet pimpernel
RHAMNACEAE	**BUCKTHORN FAMILY**
Ceonothus crassifolius	Hoary leaf ceonothus
Ceanothus integerrimus	Buckbrush
Ceanothus leucodermis	Chaparral whitethorn
ROSACEAE	**ROSE FAMILY**
Prunus virginiana	Western chokecherry
RUBIACEAE	**MADDER FAMILY**
Galium angustifolium	Bedstraw
SALICACEAE	**WILLOW FAMILY**
Populus fremontii ssp. *fremontii*	Fremont's cottonwood
Salix exigua	Sandbar willow

Scientific Name	Common Name
Salix gooddingii	Black willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
SCROPHULARIACEAE	**FIGWORT FAMILY**
Mimulus aurantiacus	Orange bush monkey flower
Mimulus cardinalis	Scarlet monkey flower
Mimulus guttatus	Common monkey flower
Mimulus pilosus	Downey monkey flower
Penstemon heterophyllus austraulis	Chaparral penstemon
*Veronica anagallis-aquatica**	Water speedwell
Veronica peregrina ssp. *xalapensis*	Purslane speedwell
SIMAROUBACEAE	**QUASSIA FAMILY**
*Ailanthus altissima**	Tree of heaven
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii	Jimsonweed
*Nicotiana glauca**	Tree tobacco
Solanum douglasii	Douglas' nightshade
TAMARICACEAE	**TAMARISK FAMILY**
*Tamarix ramosissima**	Salt Cedar/ Tamarisk
ULMACEAE	**ELM FAMILY**
*Ulmus parvifolia**	Chinese elm
URTICACEAE	**NETTLE FAMILY**
Urtica dioica ssp. *holosericea*	Giant creek nettle
VERBENACEAE	**VERVAIN FAMILY**
Verbena menthifolia	Mint-leaf vervain/ Verbena
VITACEAE	**GRAPE FAMILY**
*Vitus vinifera.**	Cultivated grape
ANGIOSPERMS (MONOCOTYLEDONS)	
ARECACEAE	**PALM FAMILY**
Washingtonia sp.	Fan palm
CYPERACEAE	**SEDGE FAMILY**
Cyperus eragrostis	Tall cyperus
Cyperus involucratus	Umbrella plant
Eleocharis parishii	Parish's spike-sedge
JUNCACEAE	**RUSH FAMILY**
Juncus oxymeris	Rush
Juncus rugulosus	Wrinkled rush

Scientific Name	Common Name
LEMNACEAE	**DUCKWEED FAMILY**
Lemna sp.	Duckweed
LILIACEAE	**LILY FAMILY**
Yucca whipplei	Our Lord's candle
POACEAE	**GRASS FAMILY**
*Agrostis viridis**	water bentgrass
*Arundo donax**	Giant reed
*Avena barbata**	Slender wild oat
*Avena fatua**	Wild oat
*Bromus diandrus**	Ripgut grass
Bromus madritensis ssp. *rubens**	Red Brome
*Cortaderia jubata**	Pampas grass
*Cortaderia selloana**	Pampas grass
*Echinochloa crus-galli**	Barnyard Grass/ Echinochloa
*Festuca arundinacea**	Tall fescue
*Hordeum murinum**	Glaucous foxtail barley
*Lolium perenne**	Perennial ryegrass
*Pennisetum setaceum**	Fountain grass
*Piptatherum miliaceum**	Smilo grass
*Polypogon monspeliensis**	Annual Beard Grass/Rabbitfoot Grass
*Schismus barbatus**	Mediterranean schismus
Vulpia myuros var *hirsuta**	Foxtail Fescue/ Vulpia
TYPHACEAE	**CATTAIL FAMILY**
Typha domingensis	Slender cattail
Typha latifolia	Broad-leaved cattail
Note: 162 Species observed, 60 nonnative species *** Indicates nonnative species.**	

APPENDIX B

WILDLIFE SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH STUDY AREA

Appendix B

WILDLIFE SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH PROJECT SITE

Scientific Name	Common Name
CLASS AMPHIBIA	**AMPHIBIANS**
BUFONIDAE	**TRUE TOADS**
Bufo boreas	Western toad
RANIDAE	**TRUE FROGS**
*Rana catesbeiana**	bullfrog
CLASS REPTILIA	**REPTILES**
IGUANIDAE	**IGUANIDS**
Phrynosoma coronatum blainvillei	San Diego horned lizard
Sceloporus occidentalis	Western fence lizard
Uta stansburiana	side-blotched lizard
TEIIDAE	**WHIPTAILS AND ALLIES**
Cnemidophorus tigris	Western whiptail
CLASS AVES	**BIRDS**
ANATIDAE	**DUCKS**
Anas platyrhynchos	mallard
Anas strepera	gadwall
ARDEIDAE	**HERONS**
Nycticorax nycticorax	black-crowned night-heron
Butorides striatus	green-backed heron
Ardea herodias	great blue heron
RALLIDAE	**RAILS, GALLINULES AND COOTS**
Fulica americana	American coot
CATHARTIDAE	**VULTURES AND RELATIVES**
Carthartes aura	turkey vulture
ACCIPITRIDAE	**KITES, BUTEOS, ACCIPITERS**
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	red-tailed hawk
CHARADRIIDAE	**PLOVERS**
Charadrius vociferus	killdeer
PHASIANIDAE	**QUAILS AND TURKEYS**
Callipepla californica	California quail
COLUMBIDAE	**PIGEONS AND DOVES**
Columba livia	rock dove
Zenaida macroura	mourning dove
CAPRIMULGIDAE	**GOATSUCKERS**
Chordeiles acutipennis	lesser nighthawk
TROCHILIDAE	**HUMMINGBIRDS**
Archilochus alexandri	black-chinned hummingbird
Calypte costae	Costa's hummingbird
Calypte anna	Anna's hummingbird
PICIDAE	**WOODPECKERS**
Melanerpes formicivorus	acorn woodpecker
Picoides pubescens	downy woodpecker
Picoides nuttallii	Nuttall's woodpecker
Colaptes auratus	Northern Flicker

Scientific Name	Common Name
TYRANNIDAE	**FLYCATCHERS**
Contopus sordidulus	western wood-pewee
Sayornis nigricans	black phoebe
Myiarchus cinerascens	ash-throated flycatcher
Contopus borealis	olive-sided flycatcher
Empidonax difficilis	Pacific-slope flycatcher
Tyrannus verticalis	western kingbird
Tyrannus vociferans	Cassin's kingbird
HIRUNDINIDAE	**SWALLOWS**
Stelgidopteryx serripennis	northern rough-winged swallow
CORVIDAE	**CROWS AND JAYS**
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Aphelocoma coerulescens	scrub jay
AEGITHALIDAE	**LONG-TAILED TITS AND BUSHTITS**
Psaltriparus minimus	bushtit
TROGLODYTIDAE	**WRENS**
Troglodytes aedon	house wren
Thryomanes bewickii	Bewick's wren
MUSCICAPIDAE	**THRUSHES**
Sialia mexicana	western bluebird
Chamaea fasciata	wrentit
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Toxostoma redivivum	California thrasher
Mimus polyglottos	northern mockingbird
PTILOGONATIDAE	**SILKY-FLYCATCHERS**
Phainopepla nitens	phainopepla
LANIIDAE	**SHRIKES**
Lanius ludovicianus	loggerhead shrike
EMBERIZIDAE	**EMBERIZIDS**
Vermivora celata	orange-crowned warbler
Dendroica petechia	yellow warbler
Geothlypis trichas	common yellowthroat
Icterus galbula	northern oriole
Icterus cucullatus	hooded oriole
Icterus bullockii	Bullock's oriole
Melospiza melodia	song sparrow
Pipilo erythrophthalmus	rufous-sided towhee
Pipilo crissalis	California towhee
Pheucticus melanocephalus	black-headed grosbeak
Guiraca caerulea	blue grosbeak
FRINGILLIDAE	**FINCHES**
Carpodacus mexicanus	house finch
Carduelis psaltria	lesser goldfinch
PASSERIDAE	**OLD WORLD SPARROWS**
*Passer domesticus**	house sparrow

Scientific Name	Common Name
CLASS MAMMALIA	MAMMALS
CANIDAE	**DOGS AND FOXES**
Canis latrans	coyote
Canis familiaris	domestic dog
LEPORIDAE	**HARES AND RABBITS**
Lepus californicus	blacktail jackrabbit
Sylvilagus auduboni	desert cottontail
SCIURDAE	**SQUIRRELS**
Spermophilus beecheyi	California ground squirrel
*Indicates non-native species.	

APPENDIX C

AQUATIC SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH PROJECT SITE

Appendix C
AQUATIC SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH PROJECT SITE

Scientific Name	Common Name	Sign
CLASS OSTEICHTHYES	**FISHES**	
POECILIIDAE	**LIVEBEARERS**	
Gambusia affinis	mosquitofish	collected
CENTRARCHIDAE	**SUNFISHES**	
Micropterus salmoides	largemouth bass	observed
CATOSTOMIDAE	**SUCKERS**	
Catostomus santaanae	Santa Ana sucker	observed
CYPRINIDAE	**MINNOWS**	
Gila orcutti	arroyo chub	collected
Rhinichthys osculus	Santa Ana speckled dace	observed
CLASS DECAPODA	**DECAPODS**	
Procambaris charki	non-native crayfish	collected
Pacitasticus sp.	native crayfish	collected

APPENDIX D

BROWN-HEADED COWBIRD TRAPPING PROGRAM PROTOCOL

BROWN-HEADED COWBIRD TRAPPING PROTOCOL[1]

TRAP PLACEMENT

Goal: To place traps in areas naturally preferred or visited by cowbirds, yet close to target host habitat so that the cowbirds removed are those impacting the target hosts.

Fulfill as many of the following criteria as possible by locating traps:

1. In a natural geographic funnel -- river/valley-canyon mouth, river/valley-canyon confluence, ridge line saddle. *Cowbirds usually travel in defined corridors/flight paths between roosting, foraging, and breeding areas.*

2. Near or within a cowbird roosting area (survey at dusk to locate). *Cowbirds usually roost with other blackbirds in wetlands.*

3. Near or within a cowbird foraging area -- stable, dairy, stockyard, agricultural field, golf course. *Cowbirds may commute 5 miles or more between breeding and foraging areas.*

4. Near or within a cowbird breeding area (survey your study area to observe the habitat with the mos. cowbirds present). *Cowbirds prefer riparian habitat with its high host density over all others.*

5. Near or within the target host habitat (at edge or in clearing). *Cowbirds prefer traps in open areas, not dense brush.*

6. Where visible from above (cowbird's eye view). *Cowbirds are attracted visually to the traps by the motion of live decoys and non-target birds.*

7. Under a cowbird perch -- telephone wire, snag, tree, fence. *Cowbirds prefer to inspect the trap from a nearby perch before close approach.*

8. Where accessible by vehicle (facilitates economical and quality daily servicing).

9 Out of public sight and in a low activity area (if possible).

[1] *Preferred Citation*:

Griffith Wildlife Biology (GWB) 1994. Brown-headed Cowbird Trapping Protocol. Unpublished document prepared by Jane C. Griffith and John T. Griffith, Griffith Wildlife Biology, Calumet, Michigan.

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TRAP ACTIVATION

Goal: To create an oasis of comfort (perches, shade), abundant food, clean water, and loud social-sexual interaction (among happy live decoys) which free cowbirds will find irresistible.

1. Level the trap site if necessary with pick and shovel so that the floor panel lies flat (otherwise the assembled trap will have gaps).

2. Bolt all panels together tightly with a socket wrench (so that vandals cannot easily disassemble the trap).

3. Cover the front half of the mesh floor with native material (sand, dirt) (to create a cowbird foraging pad onto which bait seed will be poured daily through the capture slot above).

4 Insert 1 m long, 1-1.5 cm diameter smooth perches (Arundo donax works best) into three trap corners at chest height (except above door) and 1 at knee height in a back corner for wing-clipped female decoy cowbirds and subordinate cowbirds/non-target species. Collect all perches prior to the day of trap activation.

5. Place a 1 gallon water guzzler on the rear floor in the middle (such placement precludes fouling of water by seed or perched birds). Make certain the water outlet hole in the guzzler faces down hill (else all the water will drain out).

6. Attach green nylon mesh to the west-facing side panel of the trap if the site does not offer afternoon shade (keep this in mind when orienting trap floor during Step 1)

7 Staple an easily replaced informative notice on the trap door (to include information about the trap owner, project administrator, project permit, project purpose, and trap operator, including phone number).

8 Label the trap with a number.

9 Add bait seed. For the first week of trapping, add 1 scoop outside the trap on a bare dirt area visible from above, and 1 scoop onto the foraging pad through the capture slot (allowing about 1/4 to remain on the slot board). Continue baiting both outside and inside only foraging area traps. At non-foraging sites, add 1 scoop per day (regardless of the amount inside -- the decoys and non-target birds need *fresh* seed daily) to each trap through the capture slot (allowing a sprinkling of seed -- enough to attract but not satisfy -- to remain on the slot board). Important. do not use wild bird mix containing sunflower seed (which only attracts non-target species).

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10. Add the live decoys (2 males and 3 wing-clipped females). While building to the preferred ratio, never place more than 2 male decoys per trap. Build as follows (male:female ratio): 1:0 or 0:1 (spread available decoys so there is at least 1 bird, male or female, per trap), 1:1, 1:2 (you may use 2:1 if you have extra males), 2:2, 2:3.

11. Lock the trap with a heavy lock. Key all locks alike.

12. Leave the trap door locked open or the slot board off if daily servicing of the assembled trap will not begin immediately. DO NOT LEAVE LOCKED TRAPS UNATTENDED FOR MORE THAN 24 HOURS. *Assembled, locked, unattended traps can kill animals that enter by dehydration or starvation. It is especially important to lock open or remove the slot board of assembled traps around the start and end of trapping, when assembled traps may be in the field and not serviced daily.*

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TRAP DAILY SERVICING

Goal: To release any non-target species captured, add fresh bait seed and water, maintain the 2M:3F live decoy ratio, and maintain the shade, perches, sign, and general trap integrity

1. Add 1 scoop of bait seed through the capture slot.

2. Release all non-target birds immediately. Most are less hardy than cowbirds and can die in hand if not immediately released (mortality should be <2%). If there are many more non-target birds than cowbirds in a trap, capture and hold the cowbirds, then open the trap door and flush out the non-target birds.

3. Wing-clip the right wing of any newly-captured female cowbirds.

4. Remove or add newly captured or spare decoy cowbirds (carried with the trap technician daily) as necessary to maintain the 2:3 decoy ratio. Substitute any newly captured cowbirds as "fresh" live decoys.

5 To preclude accidental release of captured cowbirds or spare decoy cowbirds, DO NOT TRANSFER COWBIRDS INTO OR OUT OF THE SMALL HOLDING CAGE UNLESS YOU ARE INSIDE THE TRAP.

6 Fill the water guzzler if it is less than half full. Scrub out the tank and rim of each guzzler weekly.

7 If decoys are missing, carefully inspect the trap for vandalism (some vandals clip a very small hole in the mesh that only close inspection reveals) or evidence that the missing bird died or was preyed upon (blood or feathers on the mesh, carcass). Beware of king snakes and rattlesnakes too thick to escape the trap.

8 Repair any damage from vandals immediately

9 Verify that the perches, shade, and sign are in place. Repair-replace as needed.

10 When leaving the trap site, verify that the trap is locked and that you have the capture net with keys, seed scoop, and any tools and materials used for repairs.

11 Record all captures, activities, and comment on the daily data sheet.

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TRAP DISASSEMBLY AND STORAGE

Goal: To have all traps in good repair and ready for placement and activation the following year

1. Disassemble the traps. DO NOT pound on the threaded end of the carriage bolts with metal implements (it will make them unusable); use a rubber mallet or the wooden handle of a hammer to drive the bolts from the frames.

2. Collect all salvageable perches; bind and store in bundles of 100.

3. Separate the bolts from the nuts and washers. Apply a light spray of lubricant to the bolts. Store in a dry building or a sealed container.

4. String all the slot board straps together with baling wire.

5. Lubricate all locks with graphite.

6. Remove all staples left from shade or sign application from panels. Well-attached shade cloth can remain for use the following year.

7 Remove all vegetation from panel mesh, especially the floor.

8. Inspect all panels as they are disassembled. Make notes on any required repairs. Keep panels in need of repair separate.

9 Stack like panels in neat stacks (prevents warping) in the storage area. If outdoors, use 2x4 spacers to provide air circulation. Cover with canvas tarps if not indoors or under shelter (overpass) outdoors. Do not use plastic tarps, which cause condensation and subsequent wood rot.

10. Make all necessary repairs to the damaged panels separated during disassembly, then place on the proper stack.

11 Compile a list of the number and type of panels stored.

12. Scrub clean all salvageable water guzzlers. Remove all algal growth from the rim and tank and dry completely. Store the rims stacked together in firm boxes or 5 gallon plastic buckets. Store tanks in firm boxes or plastic bags. Store out of direct sunlight in an area safe from compaction.

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TRAP OPERATION DATES

Topical Trapping

Goal: To minimize the number of parasitism days (the number of days a host population is exposed to each female cowbird) in targeted habitat. Standard Southern California trapping period for riparian hosts: March 15 - July 15.

Start Date

1. Determine the date of cowbird dispersal from winter flocks into targeted host habitat. *In San Diego and Orange Counties, this usually occurs during the third week of March.*

2. Determine the date of earliest egg-laying by the target host. *For least Bell's vireos, this is the first week of April.*

3. Place and activate all traps, with at least 1 male decoy cowbird, at the start of the cowbird dispersal period (for coastal Southern California: March 15) OR about 2 weeks prior to the first egg-laying by the target host (for vireos: March 15).

> Example: San Diego County
>
> *March 15*. Traps placed and activated.
> *March 15-21* (Week 1): All equipment/logistical/procedural/administrative kinks are worked out, cowbirds disperse into breeding habitat, first cowbirds captured. *There is a lag period of 3-7 days between trap activation and cowbird captures while cowbirds present in the target habitat become accustomed to the traps.*
> *March 22-28* (Week 2): Most/all female cowbirds present in the target habitat are removed prior to/coincident with the first host egg-laying.
> *March 22 - July 15* (Weeks 3-18): Cowbirds are removed as they continue to disperse into the habitat, limiting parasitism days to <3 per female cowbird (too short to locate and parasitize host nests).

Note: It is likely that nearly the same number of adult cowbirds could be removed from targeted habitat by trapping only in May. However, the number of parasitism days and actual parasitism events would not be greatly reduced. Similarly, a greater number of cowbirds could be removed by trapping only at cowbird foraging areas, again without the desired effect of reducing/ eliminating parasitism of the target host.

End Date

1. Determine the duration of the target host nesting period. Operate cowbird traps until all/most of the nests are past the egg stage (2 weeks past last nest-initiation). *Least Bell's vireos initiate nests as late as early July (trap through July 15), though most are done by mid-June (trap through June 30).*

2. If nest-monitoring of target hosts is not performed, some measure of the efficacy of the cowbird control effort can be gained by trapping through July. *Juvenile cowbirds, like juveniles of all avian species, are more easily captured than adults. We believe the number of juvenile cowbirds captured in host habitat is an accurate indicator of the success or failure of the cowbird control program. Determining the success of cowbird control in this manner precludes having to perform expensive and invasive host nest-monitoring.*

3. If the trapping period must be shortened for any reason, do not start later than April 1 or end sooner than June 30.

Note: Topical trapping has been performed at several sites for a decade or more. The number of cowbirds captured each year has remained relatively constant. We believe topical trapping, while effective in reducing/eliminating parasitism in targeted habitat or of targeted hosts, has not had a significant effect upon the regional cowbird population.

Winter Trapping, Foraging Area Trapping, Roost Trapping

Goal: To reduce the local/regional cowbird population for broad general benefit.

1 Locate/identify major foraging sites (dairies, stables, agricultural areas) and roosts.

2. Operate multiple traps at these locations during periods of greatest concentration (fall-winter) or year-round.

3 Captured cowbirds can be banded and released, saved for use as decoys, or euthanized.

Note: Limited winter banding and release of cowbirds in Southern California has shown that cowbirds that winter locally (banded and released in winter) breed locally (recaptured during the host nesting season in host breeding habitat traps). We believe that intensive winter/foraging area/roost trapping would have broad benefit to local host species by actual reduction of the local/regional cowbird population.

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NON-TARGET SPECIES

Southern California Species Captured

SSHA	Sharp-shinned hawk	rarely
COHA	Cooper's hawk	sometimes
CAQU	California quail	sometimes
MODO	**Mourning dove**	**often**
CGDO	Common ground dove	sometimes
BLPH	Black phoebe	sometimes
ATFL	Ash-throated flycatcher	rarely
CAKI	Cassin's kingbird	rarely
SCJA	Scrub jay	sometimes
NOMO	Northern mockingbird	sometimes
CATH	**California thrasher**	**often**
LOSH	Loggerhead shrike	sometimes
EUST	European starling	sometimes (non-native)
YBCH	Yellow-breasted chat	rarely
NOCA	Northern cardinal	rarely
BHGR	Black-headed grosbeak	sometimes
RSTO	**Rufous-sided towhee**	**often**
CATO	**California towhee**	**very often**
LASP	**Lark sparrow**	**often**
SOSP	**Song sparrow**	**often** (can fly through 1" mesh)
GCSP	Golden-crowned sparrow	rarely (first few weeks)
WCSP	**White-crowned sparrow**	**often** (first few weeks)
RWBL	**Red-winged blackbird**	**very often**
TRBL	Tricolored blackbird	sometimes
WEME	Western meadowlark	rarely
YHBL	Yellow-headed blackbird	rarely
BRBL	Brewer's blackbird	sometimes
GTGR	Great-tailed grackle	rarely
BRCO	Bronzed cowbird	rarely
HOOR	Hooded Oriole	rarely
NOOR	Northern Oriole	rarely
HOFI	**House finch**	**very often**
HOSP	House sparrow	often (non-native)

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APPENDIX E

BROWN-HEADED COWBIRD
TRAPPING SAMPLE AUTHORIZATION LETTERS

Date

Mr Loren Hays
Fish and Wildlife Service
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

Dear Mr Hays:

Name of consultant is requesting brown-headed cowbird (*Molothrus ater*) trapping permission for the year season of the Los Angeles Department of Public Works' (LADPW) Big Tujunga Wash brown-headed cowbird trapping and removal program located in Los Angeles County, California. This is a length of trapping program year (xxxx through xxxx) cowbird trapping program to benefit the California gnatcatchers (*Polioptila californica*) or other host species. The trapping program's current year season, which follows the Griffith protocol, is scheduled to begin on March 15 and will continue every day until July 15, xxxx. Discuss trap locations. Trap assembly and placement will begin in the first week of March.

A total of four modified Australian crow traps will be used to catch brown-headed cowbirds along the Big Tujunga Wash in xxxx. Each trap will be maintained, serviced, and have excess cowbirds removed on a daily basis throughout the trapping period (March 15 through July 15, 1997). Please see the enclosed Cowbird Trapping and Removal Program Methodology for more detail. Consideration will be taken to not release any captured European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*) trapped during xxxx.

Permission is requested for the following biologists, who will be trained and participating in the brown-headed cowbird program as of date, to operate and maintain the cowbird traps.

List names of trappers

Enclosed is a copy of name of consultant California gnatcatcher permit allowing brown-headed cowbird take and current Scientific Collecting Permit (expiration date) to take unlimited numbers of brown-headed cowbirds using modified Australian crow traps.

If you have any questions or concerns, please call me at phone number.

Sincerely,

Enclosures

Date

Dr. John Gustafson
Department of Fish and Game
1416 Ninth Street
P.O. Box 944209
Sacramento, CA 94244-2090

Dear Dr Gustafson:

Name of consultant is requesting brown-headed cowbird (*Molothrus ater*) trapping permission for the year season of the Los Angeles Department of Public Works' (LADPW) Big Tujunga Wash brown-headed cowbird trapping and removal program located in Los Angeles County, California.

This is a length of trapping program year (xxxx through xxxx) cowbird trapping program to benefit the California gnatcatchers (*Polioptila californica*) or other host species found along Big Tujunga Wash. The trapping program's current year season, which follows the Griffith protocol, is scheduled to begin on March 15 and will continue every day until July 15, xxxx. Discuss trap locations. Trap assembly and placement will begin in the first week of March.

A total of four modified Australian crow traps were used to catch brown-headed cowbirds along the Big Tujunga Wash in year. Discuss results of previous trapping season, if applicable. Consideration will be taken to not release any captured European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*) trapped during year. Name of consultant is in consultation with the local USFWS in Carlsbad in regards to any change in cowbird trapping protocol and any additional permitting required.

Permission is requested for the following biologists, who will be trained and participating in the LADPW's year brown-headed cowbird program as of date, to operate and maintain the cowbird traps.

List names of trappers

Enclosed is a copy of name of consultant California gnatcatcher permit allowing brown-headed cowbird take and current Scientific Collecting Permit (expiration date) to take unlimited numbers of brown-headed cowbirds using modified Australian crow traps.

If you have any questions or concerns, please call me at phone number.

Sincerely,

Enclosures

Los Angeles Department of Public Works

Year Annual Environmental
Brown-headed Cowbird Trapping
and Removal Program
Methodology

Trap Construction - As recommended by the USFWS, modified Australian crow traps will be used to trap the brown-headed cowbirds. The traps will be 4 feet high (with two additional triangular sections, 2 feet high on either side of the top panel), 8 feet long, and 6 feet wide (Figure 1). The panels consist of wood frames covered with 1-inch mesh wire. All traps will be painted dull green and held together with bolts and screws. Signs will be posted on every trap door to inform the public of the nature and relevance of the trapping program. These signs will be clearly written and laminated to maintain legibility with a telephone number to call for further information. Padlocks will be used on the doors to discourage vandalism.

The traps built and used during the year 1 trapping season were reused in year 2 and will be used during the year 3 trapping season. The traps have been disassembled and stored outside under rain proof tarps. They will be reassembled and necessary repairs made before the start of the year 3 trapping season.

Trap Locations - Before the year 1 trapping season each project site was surveyed to determine the most suitable locations for the cowbird traps. Each project site and trap location was surveyed in late February/early March of year to determine if the traps could be placed in the same locations as last year Each trap will be situated in an accessible location, will be visible from above, and also fulfilled one or more of the following additional criteria: placed in an area of high cowbird concentration, under a cowbird perching site, or along an observed cowbird daily migration path.

Trap Maintenance - Because it is unlikely that a trap filled with stressed or dead birds would be inviting to the target birds and because it is desirable to reduce mortality among the generally less hardy nontarget species accidentally captured, every effort will be made to create an attractive and comfortable environment within the traps. Each trap will be leveled, and the mesh floor will be covered with a thin layer of soil or grass to encourage natural foraging behavior among decoy birds. Eight or more horizontal perches will be provided in the trap corners for the decoy birds. If the trap locations do not provide afternoon shade, shade cloth will be stapled to the outside of the west-facing side of the trap. An abundant supply of wild bird seed and a 1-gallon guzzler of water will be kept in each trap. The rim and inside of the guzzler will be cleaned of dirt and algal growth on a daily or as needed bases. The traps will also be inspected daily to determine the structural integrity of each trap.

Trap Monitoring - Traps will be checked daily from March 15 (or earlier if placed in the field before this date) through July 15, 1996, including all weekends and holidays falling within this timeframe. All capture information for each trap will be entered into a data spreadsheet on a palmtop computer The number of cowbirds caught, escaped (or missing), dead, and left in each trap as decoys will be recorded. The number of individual species of nontarget birds will also be recorded. This information will be downloaded at the end of each day into a main file on a desktop PC. A hard copy of the data will be printed out and backup disks will be keep on a daily bases. We will also carry individual daily log sheets for each trap as a backup in the field. In addition, a general synopsis sheet for all traps under operation will be filled out daily A daily summary sheet containing information on daily cowbird captures and on the season totals will be kept.

After entering the trap, all trapped cowbirds will have one wing clipped at the edge of the secondary feathers, thereby removing the primary feathers. Therefore, if a bird escapes, it will only be able to fly in circles, and will be more vulnerable to predation. All birds will be clipped immediately, regardless of whether they will be left in traps, thereby ensuring that any escaped bird will be unable to survive.

Once all of the cowbirds are placed into the holding cage, the nontarget birds will be carefully flushed out of the trap. With the nontarget birds removed, the seed will be replenished and the 1-gallon water guzzlers will be scrubbed out and refilled with clean water as needed. Cowbirds are not attracted to sunflower seeds, therefore wild bird seed without sunflower seeds will be used. Guzzlers will be checked to ensure that the openings will be on the downhill side and that the water will not running out of the tray. Also, the guzzlers and seed will be placed in the middle of the trap, clear of any perches to protect them from bird droppings.

Perches will be adjusted according to the patterns of usage by the birds indicated by the accumulation of droppings on the cage floor. If a cage is exceptionally popular, extra perches will be placed to accommodate the number of birds and eliminate the pecking associated with overcrowding. In general, at least eight perches will be placed in the traps, two in each corner except over the door and one in the middle of each of the long sides of the trap. This will encouraged the birds to perch up high where they will be better protected from predators and can not see the opening of the entry slot at the top of the trap. Also by keeping the perches away from the door, the birds will be discouraged from finding gaps in the doorway or escaping when the door is opened. During the previous trapping seasons it was noticed that the birds did not need a low perch after their wings were clipped because they could climb up the sides of the traps with ease.

Weeds will be removed to ensure the safety of the birds, as well as the trappers from predators, especially rattlesnakes. With all of this accomplished, cowbird decoys of two male and three females will be stocked in each trap as available. Upon leaving the trap, the shading will be adjusted as needed to suit the needs of the birds, taking into consideration the different locations of the sun throughout the day. Also, a detailed inspection will be given to locate and repair any damage from vandalism that could jeopardize bird safety. In addition to the maintenance of the trap, time will be taken to observe the surrounding area to monitor the behavior of birds and determine whether more ideal trap locations exists.

Cowbird Disposal - Excess birds not needed as decoys will be removed from the site and placed in a holding cage. At the end of the trapping day, if there were excess cowbirds, an extremely discrete site will be chosen for disposal. The holding cage will then be quickly placed into a large black trash bag. Using a length of aluminum vent hose, the bag will be closed with wire ties and connected to the tailpipe of an automobile. To ensure maximum efficiency, the car will be run for 5 minutes. The birds will die of carbon monoxide poisoning. This fast (approximately 30 seconds) method was developed by Loren Hays of the USFWS and is the standard method of euthanizing cowbirds. It is considered to be the most humane method for this required task. When completed, the cowbirds will be placed into a clear plastic bag, labeled, dated, and then placed into a freezer specifically designated for the storage of cowbirds. Museums and educational institutions will be contacted and offered any euthanized birds. Any cowbirds not needed by the museums and educational institutions will be buried in a discrete location away from the public and urban areas.

APPENDIX F

TRAIL SURVEY DATA SHEETS

Project Name Big Tujunga Project # 6586 Survey Type Trails Survey

Location Sunland

Surveyor CLM/DEC Date 7-28-99 Time (Start) 08:20 (End) 11:30 am

General Habitat Description of Area Riparian / Alluvial / All. fan sage scrub

Weather (Cloud cover, Estimated wind speed) Clear 1-3 mph

Temp (Start) 75°F (End) 78°F

Time	Wildlife Species	Sign*	Microhabitat	Behavior/Comments
	WTSW			A1-A6 drops off into wash - can walk into Tujunga Wash to next trail.
	AMKE			
	HOFI			
	MODO			A7 dead ends into wash - No way down! Like Oz
	RODO			
	~~Cottontail~~			
	CATH -			
	BLPH			
	ANHU			
	CA whitetail			
	CATO			
	SPTO			
	WREN			
	BEWR			
	gray haunted			
	cabbage white			
	CAQU			
	CORA			
	CA gr. squirrel			
	jack rabbit			
	RSHA			
	acmon?			
	BUSH			
	SCJA			
	horned lizard			
	GBHE			
	NOMO			
				RAN OUT OF MEMORY ON GPS UNIT

General Comments:

53661.4 B.J.T 7/28/99
53807.7 1:20

* O=Observed, T=Tracks, S=Scat, V=Vocalization, B=Burrow, C=Carcass, N=Nest, Fe=Feathers, Fu=Fur

Project Name Big Tujunga Project # _____ Survey Type _____
Location Sunland
Surveyor LLM/DEC Date 7-19-99 Time (Start) 06:45 (End) _____
General Habitat Description of Area _____

Weather (Cloud cover, Estimated wind speed) Clear - 3-8 mph
Temp (Start) 82°F (End) 87°F

Time	Wildlife Species	Sign*	Microhabitat	Behavior/Comments
		TRAIL	A	A1 - Top of Staging Area at Cottonwood down thru willow riparian - across the at fork took Rt trail - past another trail coming in from Rt heading E -> w/in duck pond boundary Lt -> freeway - walked along base of 210
		~~TRAIL~~	B	Starting at A9 -> crossed pond (A10) came up left fork of trail back to A4-A5
		TRAIL	B	R+(E) From A2 - thru rip. (good horse trail) tree down blocking path at B1 - needs to be removed.
		TRAIL	C	Crosses 3 times - (stream) C6 - to left dead ends into stream C6 to rt. (N) dead ends into wash w/ ont. between C6 + C7
	Coyote			
	RATTA			
	CATH			
	SPTO			
	horned lizard			
	LEGO			
	WTSW			
	BLPH			
	CA gr. Sq.			
	AMCO			
	MODO			
	AHFL			
	CORA			

General Comments:

* O=Observed, T=Tracks, S=Scat, V=Vocalization, B=Burrow, C=Carcass, N=Nest, Fe=Feathers, Fu=Fur

APPENDIX G

INFORMATION KIOSK VERBAGE

KIOSK VERBAGE

Goal

To restore, enhance, and preserve the native ecosystem and wildlife habitat at the Big Tujunga Wash Mitigation Bank site to cost-effectively maximize its value as a mitigation bank.

General Information

The Big Tujunga Wash Mitigation Bank site was purchased by the Los Angeles County of Public Works (LADPW) in 1998 with the intention of establishing a mitigation bank. The site is a 207-acre parcel of land located in the City of Sunland. Several equestrian and hiking trails wind throughout the native alluvial scrub, aquatic, and willow riparian habitat that surround the Big Tujunga Wash.

[INSERT ALLUVIAL, RIPARIAN, AND AQUATIC HABITAT PHOTOS]

These plant communities provide suitable habitat for several wildlife species including:

Butterflies

Gray hairstreak
Western tiger swallowtail
Lorquin's admiral
Cabbage white

Amphibians

Western toad
California treefrog
Pacific chorus frog
California slender salamander
Garden slender salamander

Reptiles

Side-blotched lizard
Western fence lizard
California kingsnake
Coachwhip snake
gopher snake

Birds

Rock dove
western scrub jay
American kestrel
California quail
American coot
mourning dove
house finch
white-throated swift
turkey vulture
black phoebe
bushtit
Bewick's wren
lesser goldfinch
American goldfinch
common raven
Anna's hummingbird
red-tailed hawk
ash-throated flycatcher
wrentit
northern mockingbird
European starling
California thrasher
spotted towhee
California towhee

Mammals

Desert cottontail
Brush rabbit
Black-tailed jackrabbit
California ground squirrel
Coyote

[INSERT COYOTE, TIGER SWALLOWTAIL, BRUSH RABBIT, AND HERON PICTURES]

The Big Tujunga Wash Mitigation Bank site also provides or has the potential to provide suitable habitat for a number of endangered, threatened, and sensitive plant and wildlife species including:

Fish

Arroyo chub
Santa Ana sucker

Reptiles

orange-throated whiptail
southwestern pond turtle
San Diego horned lizard

Plants

San Fernando Valley spineflower
Slender-horned spineflower
Davidson's bushmallow
Plummer's mariposa lily
Nevin's barberry

Birds

least Bell's vireo
southwestern willow flycatcher
Cooper's hawk
coastal California gnatcatcher
loggerhead shrike
red-shouldered hawk
red-tailed hawk
sharp-shinned hawk
great blue heron
black-crowned night heron

[INSERT VIREO, GNATCATCHER, HORNED LIZARD, CHUB, SUCKER]

HABITAT RESTORATION AND ENHANCEMENT PLAN

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. In addition to improving existing habitat, the Plan also includes specifications to create approximately 12.0 acres of sycamore-oak woodland in the south portion of the site. The open woodland is designed with a coastal sage scrub understory to encourage use by a wide diversity of wildlife.

A habitat restoration plan has been designed and implemented in order to improve general site conditions for native plant and animal species. The long-term goal of the plan is to provide a site that requires minimal maintenance and is resistant to invasion by non-native plant species. Several trails throughout the site have been closed as part of the restoration plan and will be restored to their natural condition. The habitat restoration plan will aid in revegetation of "reclaimed" trails, disturbed areas, and areas that were formerly dominated by non-native plant species such as the giant reed. The established communities will encourage biotic interactions from the microorganismal to the macroorganismal level, by maintaining nutrients within the organic matter and providing a self-sustaining system.

Giant Reed, Salt Cedar, and Water Hyacinth Removal

Giant reed (*Arundo donax*) - Introduced into the U.S. from Europe for use as erosion control. Since its introduction, giant reed has become one of the most destructive weeds in southern California.

Salt cedar (*Tamarix samosissima*) - A native of Europe introduced into the U.S. as an ornamental plant in the early 1800s. A fierce competitor for water with a prolific reproductive capacity, it has successfully invaded nearly every drainage system in the Southwest including approximately 16,000 acres in California (Lovich et al. 1995).

Water hyacinth (*Eichhornia crassipes*) and duckweed (*Lemna* sp.) - Invasive plants that cover the entire surface of the Tujunga Ponds and limit the amount of sunlight and oxygen that reaches the bottom of the ponds.

[INSERT ARUNDO PICTURE]

Exotic Fish, Crayfish, and Bullfrog Removal Plan

Alien/non-indigenous species have been a significant component of the aquatic fauna of California since at least the late 1800's (Moyle 1973). At the Big Tujunga site, several species of exotic fishes are known or are likely to occur in or immediately adjacent to the area, including largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), brown bullhead (*Ameirus nebulosus*), and fathead minnow (*Pimephales promelas*). Alien reptile species include red-eared slider (*Trachemys scripta elegans*), common snapping turtle (*Chelydra serpentina*) and Reeve's turtle (*Chienemys reevsi*). The most common alien amphibian species in this area is the bullfrog (*Rana catesbeiana*), which is a known predator of the California red-legged frog (*Rana aurora*) (Hays and Jennings 1986) a Federal Species of Concern (FSOC). All of these species are known or strongly suspected to have negative impacts on native fauna (Jennings and Hayes 1994), to the extent that the presence of sufficient numbers of some exotics may eliminate or preclude the re-establishment of native species of fishes or amphibians in an area.

[INSERT BULLFROG PHOTO]

Brown-headed Cowbird Trapping and Removal Program

Cowbirds are members of the blackbird family of icterids, which also includes grackles, orioles, meadowlarks, and bobolinks. Brown-headed cowbirds were first documented in California in 1896 at Borrego Springs, San Diego County (Unitt 1984) and were apparently well established by the 1930s (Willet 1933). Male brown-headed cowbirds (*Molothrus ater*) are easily recognized by their iridescent black body plumage and brown heads. Female cowbirds are a uniform, dull-brown color. The brown-headed cowbird is an obligate brood parasitic bird species, meaning this species does not build its own nests or tend for 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*). 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. The brown-headed cowbird removal program is being conducted in conjunction with the U.S. Fish and Wildlife Service. All bird species other than the cowbird are released from the traps on a daily basis. The program will reduce the number of parasitic brown-headed cowbirds in the study area and facilitate the breeding passerines, such as the least Bell's vireo and the California gnatcatcher. Please do not disturb the traps.

[INSERT COWBIRD AND COWBIRD TRAP PHOTOS]

TRAILS

The Bert Bonnett Trail Loop and Dr Au Trail have been named after valued members of the Shadow Hills community who have been generous with their time and knowledge to the residents of Shadow Hills. Doc and Bert have worked together to provide low cost clinics to fellow equestrians for many years.

Bert Bonnett Trail Loop

Bert Bonnett moved to the Shadow Hills community in 1935. After retiring in 1965, Bert more actively raised and trained young horses. Bert, a charter member of Equestrian Trails, Inc., Corral 20, has trained many horses in the community and has always been willing to provide those without a horse with a safe one of his own to ride. Bert has mentored the youth of the community by teaching them his love and care of animals.

The Bert Bonnett Trail Loop is characterized by open land, sparse vegetation, and sandy soils within the floodplain of the Big Tujunga Wash. The sandy, cobble and boulder strewn wash, combined with the absence of shading create desert-like conditions that may challenge the novice hiker Alluvial fan sage scrub, characterized by drought-resistant shrubs such as cacti, yucca, California sagebrush, and California buckwheat, occurs throughout the wash. At first glance this area may appear deserted however, an abundance of wildlife species occurs within the wash, including horned lizards, whiptail lizards, California quails, California thrashers, desert cottontails, black-tailed jackrabbits, coyotes, and a variety of raptor species that utilize the open space for foraging.

Length: 1.52 miles
Estimated Time: 40 minutes
# of Creek Crossings: 2

[INSERT A CLEAR PLASTIC TRAILS BROCHURE HOLDER WITH A LID]

[INSERT ALLUVIAL PHOTO]

Dr Au Trail

Dr Au, a.k.a., "Doc" graduated from Washington State School of Veterinary Medicine and served in WW II. After the war, he settled in Burbank and began his practice. He moved to Shadow Hills in 1963. When Doc retired in 1978, he still had many of the same clients who looked to him for his veterinary help and advise over the years. Doc was always very generous with his time and always quickly responded to the calls of the community. One of his life-long family friends said, "You always felt Doc cared. He knew his families well."

For those who do not want to get their feet wet, this is the only trail that does not have a stream crossing. While on the Dr Au Trail, you will cross through the desert-like conditions of the alluvial fan sage scrub habitat. Alluvial fan sage scrub is characterized by drought-resistant shrubs such as cacti, yucca, California sagebrush, and California buckwheat, and occurs throughout the entire trail. Hardy wildlife species such as ravens, loggerhead shrikes, California quails, California thrashers, desert cottontails, black-tailed jackrabbits, coyotes, lizards, and snakes may be found along this trail.

Length: 0.46 mile
Estimated Time: 10 minutes
# of Water Crossings: None

[INSERT ALLUVIAL PHOTO]

Pond Trail

The Pond Trail consists of a secluded walk through the Tujunga Ponds. The trail is heavily shaded and provides relief from extreme temperatures on hot summer days. Several different kinds of willow trees including arroyo willow, black willow, and red willow comprise the majority of the canopy. The southwestern portion of the trail crosses the edge of a pond and requires getting your feet wet! Wildlife species that may be found within the riparian habitat include the southwestern pond turtle, Lorquin's admiral (butterfly), coastal western whiptail (lizard), black phoebe, ash-throated flycatcher, black-crowned night heron, great blue heron, and red-shouldered hawk.

Length: 0.51 mile
Estimated Time: 10 minutes
# of Water Crossings: 1

[INSERT RIPARIAN PHOTO]

Water Trail

Those that want to experience a lush riparian habitat may opt to hike along the Water Trail. This trail follows closely alongside Haines Creek and crosses it several times as it winds through the willow riparian habitat on the south side of the site. Several different kinds of willow trees including arroyo willow, black willow, and red willow comprise the majority of the canopy. The riparian habitat is characterized by lush, green shrubs and a willow tree canopy that provides shading and habitat for a number of wildlife species including fish, frogs, toads, flycatchers, and vireos. Haines Creek is one of the last remaining habitats for the arroyo chub and Santa Ana sucker

Length: 0.80 miles
Estimated Time: 20 minutes
# of Creek Crossings: 7

[INSERT AQUATIC HABITAT PHOTOS]

CAUTION:

This is a natural wildlife area that may be frequented by coyotes, rattlesnakes, and even mountain lions. Poison oak and stinging nettle, plant species that cause skin irritation, occur throughout the site. For your safety, please do not leave the trails and do not approach the wildlife.

Big Tujunga Wash is subject to flash floods, therefore use caution during or after a major storm event.

[INSERT POISON OAK AND STINGING NETTLE PHOTOS.]

Please:

- Stay on designated trails
- Do not disturb native restoration and sensitive habitat areas
- Do not disturb cowbird traps
- Place trash in covered trash receptacles
- Keep pets on leashes

No:

- Dumping in ponds or streams
- Fishing
- Swimming
- Fireworks or firearms
- Hunting
- Smoking
- Fires

Trail Hours: From Dawn till Dusk

Contact Number: (626) 458-6117
Frank Wu
Los Angeles Department of Public Works

APPENDIX H

TRAIL SIGNAGE

AREA CLOSED

HABITAT RESTORATION IN PROGRESS

BERT BONNETT TRAIL LOOP

Length: 1.52 miles
Estimated Time: 40 minutes
Number of Creek Crossings: 2

NO Dumping, Fishing, Swimming, Fireworks or Firearms, Hunting, Motorized Vehicles or Bicycles

Trails Limited To Foot And Horse Traffic Only

DR. AU TRAIL

Length: 0.46 miles
Estimated Time: 10 minutes
Number of Water Crossings: None

NO Fireworks or Firearms, Hunting, Motorized Vehicles or Bicycles

Trails Limited To Foot And Horse Traffic Only

WATER TRAIL

Length: 0.80 miles
Estimated Time: 20 minutes
Number of Creek Crossings: 7

NO Dumping, Fishing, Swimming, Fireworks or Firearms, Hunting, Motorized Vehicles or Bicycles

Trails Limited To Foot And Horse Traffic Only

POND TRAIL

Length: 0.51 miles
Estimated Time: 10 minutes
Number of Water Crossings: 1

NO Dumping, Fishing, Swimming, Fireworks or Firearms, Hunting, Motorized Vehicles or Bicycles

Trails Limited To Foot And Horse Traffic Only

APPENDIX I

DETAILED SPECIES ACCOUNTS

Species Accounts - Natives

Common name: Santa Ana Sucker **Scientific name:** *Catostomus santaanae*

Legal Status: **Federal** - Proposed Federal **State:** Species of Special Concern

Description: Attains approximately 20 cm (8 inches) standard length (SL), fusiform body shape with inferior mouth. Mouth with broad, papillose upper and lower lips. Color usually mottled greys and browns occasionally with shades of green. Often with three to five distinct lateral blotches; at night or in turbid water may be almost uniformly grey, brownish or silvery Males can show lateral wash of reddish or orange in the breeding season, and have distinct small white protuberances (breeding tubercles) along rays of the anal fin and posteriorly on the lower half of the body

Distinguishing Characteristics and Similar Species: Papillose lips clearly separate it from all other fishes within its native range. In the Santa Clara River it is introduced and occurs with the dusky sucker, *Catostomus fumeiventris*, also introduced. The latter has a much smaller mouth, lacking notches in the lateral margins of the lips, and attains about twice the size of the Santa Ana sucker (Buth and Murphy 1980; Hubbs et al. 1943).

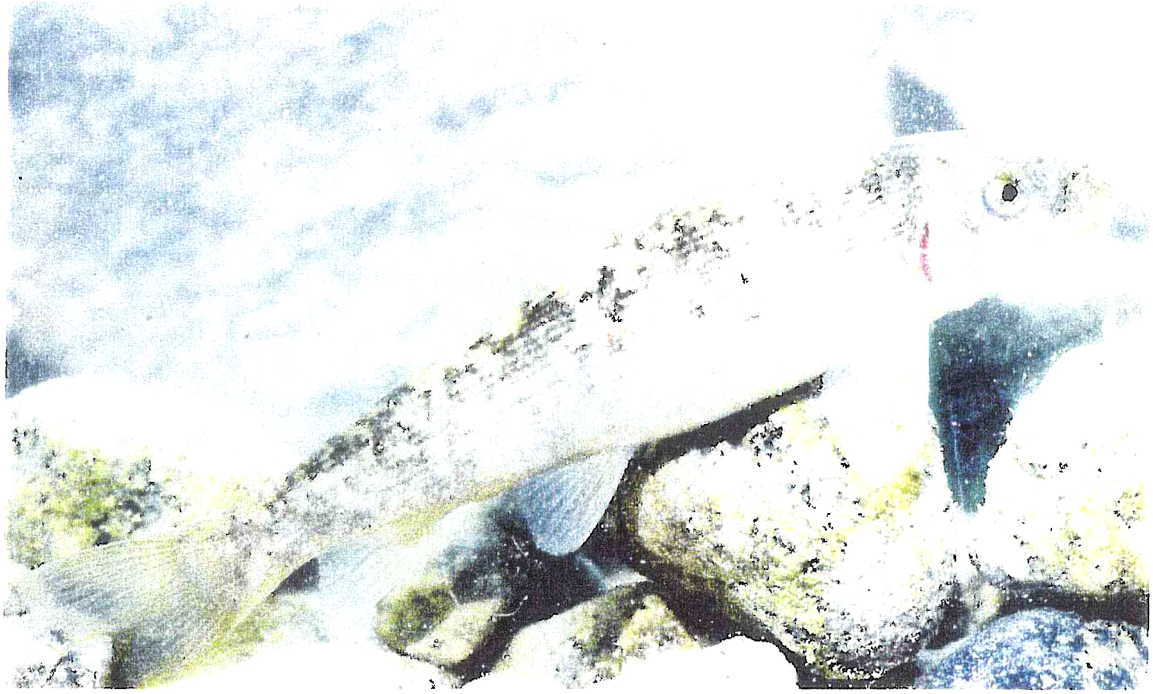
Life History: Native in the Los Angeles, San Gabriel, and Santa Ana River drainages of the Los Angeles Basin, introduced into the Santa Clara River just to the north (Swift et al. 1993). Most abundant in higher gradient rocky and gravelly portions of these streams in foothills and mountains, but remains in the middle Santa Ana River from about Riverside downstream to Yorba Linda. Extirpated in the downstream portions of the Los Angeles and San Gabriel systems. Breeds in cooler waters from about late February to early May, depending on timing and intensity of winter storms. Probably (like other similar suckers) lays eggs in flowing water over gravel or cobble; eggs stick to the gravel and develop in one to two weeks at cool temperatures (approximately 45-60 degrees F). Lives to three or four years (Greenfield et al. 1970) and primarily feeds on algae, diatoms along with some insects and other invertebrates. Young fish inhabit shallow margins of the streams and move into deeper water with growth.

Habitat: Large to moderate sized streams (for southern California) with clear water for growth of algae. Does not seem to live in reservoirs as the larger species such as dusky suckers which are also more omnivorous.

Comments: Recently proposed as federally threatened species by the U S. Fish and Wildlife Service. The only population and the stronghold for the species in the Los Angeles River drainage is the Big Tujunga River from the upper edge of Hanson Dam upstream to just below Tujunga Reservoir The largest populations are concentrated between the Haines Creek ponds and Hansen Dam.

Management Recommendations: Maintain and improve rocky and gravelly permanent and cool stream conditions. The Haines Creek ponds currently supply a very desirable supply of cool water year round and support the population downstream. Remove or reduce introduced predators, particularly largemouth bass, green sunfish, channel catfish, and bullhead catfishes. Prevent introduction of predatory exotic trouts, particularly brown trout, *Salmo trutta*, and other predatory fishes.

Literature Cited and References



Santa Ana sucker *(Catostomus santaanae)*

Common name: Unarmored threespine stickleback **Scientific name:** *Gasterosteus aculeatus williamsoni*

Legal Status: Federal: Endangered, since 1970 **State:** Endangered since 1971

Description: Length up to 10 cm SL, usually 7.5 or less, elongate and well compressed fish with three prominent spines on top of middle of back, and a pair of pelvic spines just behind the opercular opening on the belly below the posterior portion of the pectoral fin, mouth very small, terminal and tail very narrow and spindle-like. Life color mottled brown, olive, or green; breeding males with bright red underside of head and belly and pelvic spine often red also. No rectangular scale-like bony plates dorso-laterally on body behind the head and above pectoral fin in fish over about 2.5 centimeters long (SL).

Distinguishing Characteristics and Similar Species: No other native fish with isolated spines on the body except the other form of unarmored threespine stickleback, the Shay Creek stickleback, and the partially armored three spine stickleback. One of these two forms has 1-6 bony plates on the side of the body, and differs electrophoretically. The Shay Creek stickleback would be very hard to tell from this the unarmored threespine stickleback except with electrophoretic data. No other morphological differences have been worked out and lateral plate counts are critical to identifying specimens without electrophoretic data. The two unarmored forms do not occur together

Life History: Native from the Santa Clara River drainage, in Pacific coastal drainages, south to the Santa Ana River drainage (Swift et al. 1993). Absent from Malibu Creek, but possibly historically present in upper San Juan Creek drainage. The unarmored form now only remains in the upper Santa Clara River, from about the mouth of Piru Creek up to within about half a kilometer of Acton. Males build a globular nest of vegetation on the bottom and court the females who deposit the eggs in the nest. The male guards the eggs until hatching. The young move into very shallow, vegetated water and move into deeper water as they mature. Length frequency data from southern California sticklebacks, including both partially armored and unarmored forms, indicates they usually only live one year (Baskin 1993). Stickleback are microphagus, feeding on very small animals such as amphipods, insect larvae, and annelid worms. They were touted as good at controlling mosquito larvae in the early 1900s (Swift et al. 1993). Much of the biology of the species is summarized in Wotton (198?) and Bell and ?????? (199).

Habitat: Low gradient streams and slower portions of faster streams usually in less 50 centimeters of depth where aquatic and emergent vegetation are abundant and the bottom is mud, sand, or gravel.

Comments: Originally abundant in (but now completely extirpated) the Los Angeles Basin, the Recovery Plan (U S. Fish and Wildlife Service 1985) recommended recovery criteria of establishing two self-sustaining populations in each of the three Los Angeles Basin streams where it originally occurred, namely the Los Angeles, San Gabriel, and Santa Ana River systems. Much of the best former habitat for this subspecies is now under the cement lined channels that criss-cross the Los Angeles Basin. The low gradient one to two kilometers of Haines Creek below the ponds would be ideal habitat for the species if exotic predators were removed.

Management Recommendations: Identify habitat restoration and other management objectives for re-introducing unarmored threespine sticklebacks into the section of Haines Creek in and below the ponds just downstream of the I-210 Freeway Intensively remove largemouth bass, green sunfish, and all catfishes.

Literature Cited and References



Unarmored threespine stickleback *(Gasterosteus aculeatus williamsoni)*

Common name: Arroyo chub **Scientific name:** *Gila orcutti*

Legal Status: Federal: None **Status:** State species of special concern

Description: Up to about 15 centimeters SL, a fusiform fish with a terminal, moderately upturned mouth, only slightly compressed and deeper bodied than most minnows. Color usually relatively uniform greyish, greenish, olive or yellowish with a small black spot in the middle of the base of the tail. Individuals more than 8 or 9 centimeters sometimes with and indistinct lateral row of darker blotches, often forming an indistinct later dark band. Lateral scales indistinct in life about 50-55 in lateral series, pharyngeal teeth 2,5-4,2.

Distinguishing Characteristics and Similar Species: Rounder and deeper bodied than co-occurring minnows and suckers, usually plain colored. Only other native minnow, the speckled dace, has a subterminal mouth, a mottled color pattern and a flattened head rather than rounded as in arroyo chub. Fathead minnows with black checkered outline of lateral scales more elongate (cylindrical) and translucent. First dorsal rays shorter with middle ones the longest in fathead minnows whereas arroyo chubs have the first dorsal rays longest and those more posterior shorter Red shiners more compressed than arroyo chubs and fathead minnows and red shiners also have well defined black scale outlines like fathead minnows. In both fathead minnows and red shiners the mouth is smaller and both of these latter species have 4-4 pharyngeal teeth, lacking the smaller teeth in the outer rows. Red shiners, fathead minnows, and speckled dace only reach about 10 centimeters SL, about half the maximum size of arroyo chubs.

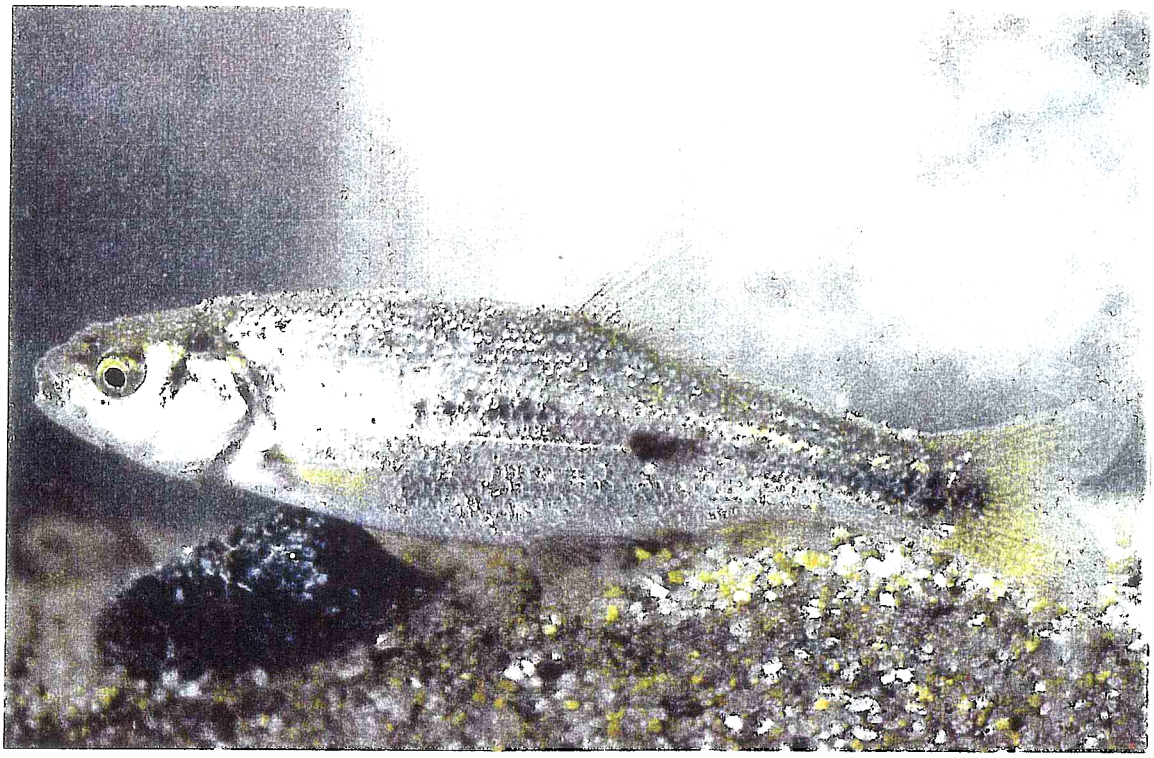
Life History: Native to the Los Angeles Basin streams from Malibu Creek southward to the San Luis Rey drainage including the Lake Elsinore-San Jacinto River drainages; apparently naturally absent from small coastal drainages between San Juan Creek and the Santa Margarita River, now largely on Marine Base Camp Pendleton. Widely introduced both north and south in coastal drainages and even into some Mojave desert streams draining the San Gabriel and San Bernardino Mountains (Swift et al. 1993). Lives to two or three years and attaches eggs to aquatic vegetation in slow to moderate flows at about 60 to 70 degrees F (Tres 1992). Most spawning is from about late March to June, often with a hiatus in summer, and then occasionally with some reproduction again in the fall. Arroyo chubs are omnivorous, feeding on algae and aquatic invertebrates (Greenfield and Greenfield 1972; Greenfield and Deckert 1973). It tolerates warmer and lower gradient water than speckled dace and Santa Ana sucker

Habitat: Reaches greatest abundance in moderate to low gradient streams with gravel and sand substrate and abundant aquatic and marginal emergent vegetation. In higher gradient streams with more prevalent rocks and gravel (and more typical for Santa Ana sucker and Santa Ana speckled dace) arroyo chubs can be abundant in low rainfall years, but will be decimated by high flows in heavy rainfall years. However, low rainfall years also allow exotic predators, particularly largemouth bass, green sunfish, and bullhead catfishes, to be more successful and this can depress arroyo chub populations. Little or no tolerance for standing water

Comments: Arroyo chubs are still abundant in the Big Tujunga River in the vicinity of Haines Creek.

Management Recommendations: Maintain the lower gradient portions of the Haines Creek channel, particularly just below the ponds where gradient is lower than farther downstream. Removal of warm water exotics is probably more important for this native fish species than for any other because its life history takes place at the warmest temperatures and slowest flows of the three native fishes remaining in this area. These propensities make it more likely to be impacted by exotics that thrive under similar habitat features. Many native and introduced populations of arroyo chubs were observed to decline during the drought of the late 1980s when low water levels forced chubs into the same small warm pools with exotic predators, particularly green sunfish.

Literature Cited and References



Arroyo chub *(Gila orcutti)*

Common Name: Arroyo southwestern toad **Scientific Name:** *Bufo californicus*

Legal Status: **Federal** - Endangered **State** - Species of Special Concern[1]

Description A small (to 7.5 cm) very robust-bodied species. Dorsal (ground) color cream to light gray to light greenish-gray, with a sparse network of medium-to-dark brown vermiculations and blotches. No dorsal stripe. Venter cream to whitish-gray, usually without dark specks or spots. Prominent cranial boss (ridge) between eyes. Paratoid glands well developed. Eyes large, pupil round with dark horizontal line through it. Skin pustulose/bumpy Call a bird-like trill, 5-7 seconds in length. Larvae initially black, but become lighter - usually dark brown with gold-gray bands and flecking - as they grow Eyes dorsal. Cryptic in most habitats.

Distinguishing Characteristics and Similar Species : (1) California toad (*Bufo boreas halophilus*) has (a) prominent light-colored dorsal stripe and (b) lacks a prominent cranial boss (ridge) between eyes and (c) larvae remain black throughout life. (2) Western spadefoot toad (*Scaphiopus hammondii*) has (a) eyes with vertical pupils. (3) Larvae of California treefrog (*Hyla cadaverina*) have (a) laterally-placed eyes when viewed dorsally and (b) indistinct head (when viewed laterally).

Life History: Movement to breeding sites typically begins in February-March and extends through July, although on rare occasions this may occur as early as January (pers. obs.). Males arrive prior to females and call from the edge of breeding pools. Females deposit 2,000-10,000 eggs in a long string in shallow water Larvae are unable to swim until they are approximately 2 weeks old (Sweet 1991), and remain closely associated with the egg mass. The larvae are specialized feeders, sifting the interstitial areas of the substrate for algae and microorganisms. Larvae require 65-85 days to metamorphose, and are typically 15-22 mm length at metamorphosis. The juveniles are cryptic, and remain closely associated with the immediate area of the natal pool. By the time the juveniles reach 20-25 mm, they may begin to move away from the poolside microhabitat and become nocturnal. At approximately 30 mm, they may begin to disperse into surrounding riparian vegetation. Juveniles may remain in the immediate vicinity of the watercourse channel until at least October Adults and larger juveniles may move to watercourses early in the year, and are present in upland habitats throughout the year Nocturnal activity is normal, but on rare occasions animals may be observed active during the day Overland movement, both to and from breeding areas and within upland habitats, is often closely tied to rainfall, particularly outside of the breeding season. This species engages in long-distance (> 1 km) movements to and from breeding sites. Feeds on small insects, typically ants and beetles.

Habitat: This species is obligately tied to riparian areas for breeding, and to upland areas for foraging, movement and overwintering sites. Found in coastal sage scrub, chaparral, oak woodland, grassland and riparian areas. The arroyo toad requires a specialized riparian habitat for breeding, usually 2nd-6th order streams where they cross alluvial "bench" areas. Breeding pools are usually in overflow areas along the benches, or in sections of stream where waterflow is reduced. Substrate is typically a mixture of sand, gravel and cobble, often on the downstream side of a large boulder Found up to at least 1.2 km away from the watercourse in upland habitats, on slopes of all aspects.

Comments: It is likely that some of the largest remaining populations of this species occur on MCB Camp Pendleton. The population in the Santa Margarita drainage represents the only one occurring on an undammed system within southern California.

Management Recommendations: This species, because of its habitat requirements and distribution, is susceptible to a wide range of impacts. Generally, important considerations are to (1) avoid impacts to breeding habitat (2) avoid impacts to upland habitat (3) minimize road-kill.

1 - recommended State Endangered (Jennings and Hayes 1996)

Literature Cited and References

Blair, W.F 1957 Structure of the call and relationships of Bufo microscaphus Cope. Copeia. 208-212.

Cunningham, J.D 1961 Observations on the natural history of the California Toad, Bufo californicus Camp. Herpetologica 17 255-260

Feder, J.H. 1977 Genetic variation and biochemical systematics in western Bufo. MA Thesis, Univ Calif. Berkeley

Gergus, E.W.A. 1994 Systematics and biogeography of Bufo microscaphus (Anura.Bufonidae), with a preliminary report on americanus group phylogeny MS Thesis, San Diego State Univ., California.

Klauber, L.M. 1929. Range extensions in California. Copeia. 15-22.

Miller, L. and A.H Miller 1936 The northern occurrence of Bufo californicus in California. Copeia. 176.

Myers, G.S. 1930 The status of the southern California toad, Bufo californicus Camp. Proc. Biol. Soc. Washington 43 73-78

Patten, M.A. and S.J Myers. 1992. Geographic distribution. Bufo microscaphus californicus. Herpetol. Rev 23 124

Price, A.H. and B.K. Sullivan. 1988. Bufo microscaphus. Catal. Amer Amphib. & Reptiles 415 1- 415.3

Stebbins, R.C 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

Sullivan, B.K. 1992. Calling behavior of the southwestern toad (Bufo microscaphus). Herpetologica 48 383-389

Sweet, S.S 1993 Second report on the biology and status of the arroyo toad (Bufo microscaphus californicus) on the Los Padres National Forest of southern California. Rept. to U.S. Dept. of Agriculture, Forest Service, Los Padres National Forest, Goleta, California.

Sweet, S.S 1991 Ecology and status of the arroyo toad (Bufo microscaphus californicus) on the Los Padres National Forest of southern California, with management recommendations. Report to U.S Dept. of Agriculture, Forest Service, Los Padres National Forest, Goleta, California.



Arroyo southwestern toad *(Bufo microscaphus californicus)*

Common Name: Southwestern pond turtle **Scientific Name:** *Clemmys marmorata pallida*

Legal Status: Federal - None **State** - Species of Special Concern[1]

Description : A medium-sized (2-18 cm carapace length) "typical" emydid turtle. Dorsal (ground) color of carapace variable, from light yellowish-tan to greenish olive to dark brown or black. Carapace may lack pattern, or be covered with varying amounts of fine dark brown or black vermiculations or lines. Plastron dull whitish-yellow to yellowish-tan, with dark markings ranging from absent to covering 60%+ of the shell. Certain individuals from ponded habitats may have dark reddish-brown stains (produced by tannins in the water) covering the entire plastron. Ground color of skin light yellow-tan, with varying amounts of dark pigment in the form of vermiculations and speckling on the dorsal, lateral and ventral surface of head, neck and limbs. Tail relatively long - 25-30% of shell length.

Distinguishing Characteristics and Similar Species : This is the only native freshwater turtle on Camp Pendleton and in coastal southern California. However, there are numerous introduced species present in this area. The two most common are the (1) red-eared slider (Trachemys scripta elegans) which usually has (a) bright red stripe along side of head (often absent in old males) (b) head and limbs have bright yellow stripes (c) tail is usually short (10-15% of body length). (2) common snapping turtle (Chelydra serpentina) has (a) reduced plastron (b) long tail (50% or more) of shell length (c) prominent tubercles on side and top of neck and (d) usually three longitudinal keels on carapace.

Life History: This species is active year-round, although levels and extent of activity is reduced in colder months (October-February). Most activity - at least during colder months, is diurnal, but the species is also active diurnally during warmer periods. The western pond is a highly aquatic species obligately tied to upland habitats for nesting, overwintering and movement. Adults have been found in upland habitats at distances of over 1 km from water, and known overwintering areas extend up to 500 m from the watercourse (Holland 1994). Mating occurs year-round, and clutch size ranges from 1-9 in southern California (up to 13 elsewhere in the range) are laid in open areas, usually with compact soils, sparse grasses or other vegetation, and a south-facing exposure. Oviposition occurs from late April-July, and two clutches may be laid in some years. Young are 21-31 mm at hatching, and may reach sexual maturity within 5-8 years at approximately 105-110 mm carapace length. May move overland considerable distances (up to 5 km) between watercourses, although most animals appear to remain within a given watercourse for extended periods of up to several years. Adults may live 40+ years, although average life span is probably significantly less. Species is strongly sexually dimorphic. The species is omnivorous (Bury 1986, Holland 1991), and feeds primarily on small aquatic invertebrates, but may also take some plant material. Also frequently feeds on carrion.

Habitat: Found in a wide variety of fresh and brackish-water habitats, including the fringes of salt marsh. Most common in coastal streams and lagoons, and interior streams. Also occurs in reservoirs, stock ponds, sewage treatment ponds, and intermittently in vernal pools. Overwinters and nests in upland areas of coastal sage scrub, chaparral, oak woodland and grassland.

Comments: This species is nowhere common in southern California, and many populations exhibit signs of declines in recruitment, being composed of > 90% adults.

1-recommended State Endangered (Jennings and Hayes 1996)

Management Recommendations: Primary management recommendations include control of exotic species, avoidance of impacts to nesting and overwintering sites, and minimization of road kill.

Literature Cited and References

Brattstrom, B.H. and D Messer 1988 Current status of the southwestern pond turtle, Clemmys marmorata pallida, in southern California. Final Rept. Calif. Dept. of Fish & Game # C-2044

Brattstrom, B.H. 1988. Habitat destruction in California with special reference to Clemmys marmorata: A perpesctive (sic). In: DeLisle, H.F., P.R. Brown, B Kaufman and B.M. McGurty (eds). Proc. Conf. Calif. Herpetology, SW Herpetologists Society, Spec. Publ. 4

Bury, R.B. 1986 Feeding ecology of the turtle, Clemmys marmorata. J Herpetol. 20: 515-521

Bury, R.B. 1972b. Habits and home range of the Pacific pond turtle, Clemmys marmorata in a stream community Ph.D disser., Univ Calif. Berkeley, California.

Holland, D.C. 1994. Western pond turtle: Habitat and history DOE/BP Rept. #62137-1, Bonneville Power Admin., Portland, Oregon.

Holland, D C. 1992. Level and pattern in morphological variation: A phylogeographic study of the western pond turtle (Clemmys marmorata). Ph.D dissertation, Univ SW Louisiana, Lafayette, Louisiana.

Holland, D.C. 1991. A synopsis of the ecology and status of the western pond turtle (Clemmys marmorata) in 1991 Unpubl Rept. to U.S. Fish & Wildlife Service, San Simeon, California.

Jennings, M.R. and M.P Hayes. 1996. Amphibian and reptile species of special concern in California. Calif. Dept. of Fish & Game Spec. Publ., Sacramento, California.

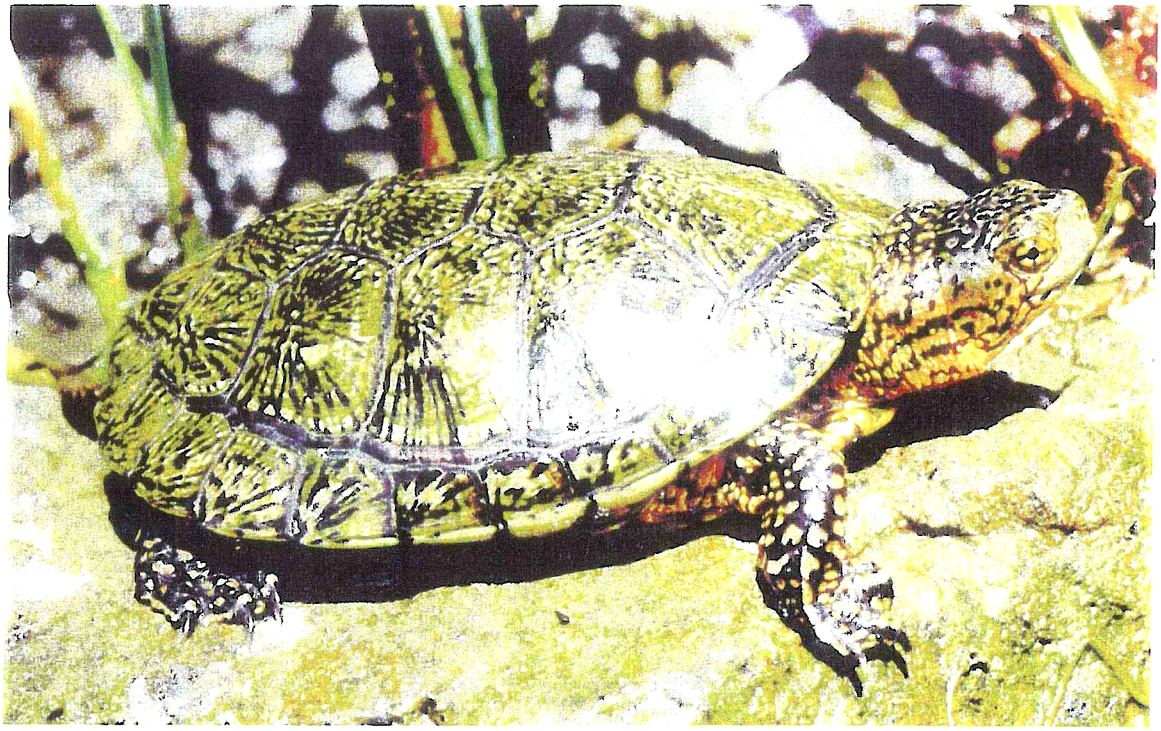
Rathbun, G.B., M.R. Jennings, T G. Murphey and N.R. Seipel. 1993 Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. Unpubl. Rept., National Ecol. Res. Center, Piedras Blancas Research Station, San Simeon, California.

Rathbun, G.B., N Seipel and D C. Holland. 1992. Nesting behavior and movements of western pond turtles (Clemmys marmorata). SW Nat. 37 319-324

Seeliger, L.M. 1945 Variation in the Pacific mud turtle. Copeia. 150-159

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

Storer, T.I. 1930 Notes on the life-history and ecology of the Pacific fresh-water turtle, Clemmys marmorata. Univ Calif. Publ. Zool. 35 429-441



Southwestern pond turtle *(Clemmys marmorata pallida)*

Common Name: California red-legged frog **Scientific Name:** *Rana aurora draytonii*

Legal Status: Federal - Threatened **State** - Species of Special Concern[1]

Description : A medium to large (to 14 cm) robust-bodied frog. Dorsal (ground) color dark brown to reddish-brown. Dorsal markings usually a series of dark spots of small blotches, rarely forming vermiculations or mottling. Prominent dorsolateral folds. Dark bands on legs. Venter white to grayish-white, with moderate to extensive mottling on throat and hind limbs. Reddish suffusions on ventral and dorsal surface of body variable in extent and seasonal. Eyes large, hind feet fully webbed. Larva with snout sharp and narrower eyes when viewed from above. Call low, 4-5 short (< 1 sec) pulses with a low "growl or moan" (Davidson 1996) at end. Typically wuhh-wuhh-wuhh-wuhh-uurrrr

Distinguishing Characteristics and Similar Species : (1) Bullfrog (*Rana catesbeiana*) (a) lacks dorsolateral folds (b) when viewed from above, larva has a more rounded snout, with wider eyes. (2) African clawed frog (*Xenopus laevis*) has (a) no eyelids (b) has small claws on hind toes (c) larva resembles a small translucent catfish.

Life History: This species may be active from February-November in southern California. Adults are primarily nocturnal, but are often active during daylight, especially on overcast days. This species typically breeds early in the year (December-April). First egg masses observed in Riverside County in April. Males are typically present at breeding sites from 2-4 weeks prior to the arrival of the females (Jennings and Hayes 1996). Males call (see above) in small groups, usually 3-7 animals (Jennings and Hayes 1996). Females deposit 2000-6000 eggs in a globular, moderately firm mass about the size of a baseball. Larvae require 4-6 months to achieve metamorphosis, and juvenile frogs typically appear from June-September and are 25-30 mm snout-length. The species reaches sexual maturity in two years (males) and three years (females) (Jennings and Hayes 1985). Juveniles typically feed on invertebrates (Hayes and Tennant 1986), while adults have a relatively broad dietary range, up to and including small mammals such as deer mice (Peromyscus maniculatus). Adults of this species is highly nocturnal, but may be observed on overcast days. However, juveniles (particularly small juveniles) may frequently be observed during the day

Habitat: Requires permanent water - populations in ephemeral streams and ponds are probably not sustainable (Jennings and Hayes 1996). Historically found in lakes, rivers and other aquatic habitats, currently apparently restricted to areas without exotic fishes or bullfrogs, including small ponds, springs, streams, stock tanks and occasionally vernal pools. Typical habitats have a heavy willow or other emergent plant cover (tules, cattails, rushes), usually associated with "plunge pools" greater than 0.7 m deep. Streams typically have little or no current. The presence of undercut banks or overhangs formed by the roots of emergent vegetation seems to be a key microhabitat feature. California red-legged frogs may move considerable distances overland during rainy periods (M. Hayes, N. Scott, pers. comm.) and may spend considerable periods of time during the fall outside the watercourse in riparian vegetation (Rathbun et al. 1993).

Comments: Historically likely to be present in area, essentially extirpated in southern California although a new population was recently discovered in the Casitas Creek area.

Management Recommendations: See report for details. Potential for reintroduction on site may exist.

1 - recommended State Endangered (Jennings and Hayes 1996)

Literature Cited and References

Case, S.M. 1978 Biochemical systematics of members of the genus Rana native to western North America. Syst. Zool. 27 299-311

Davidson, C. 1996 Frog and toad calls of the Pacific Coast. Vanishing voices. CD from Cornell Laboratory of Ornithology

Hayes, M.P and M.R. Jennings. 1988 Habitat correlates of distribution of the California red-egged frog (Rana aurora draytonii) and the foothill yellow-legged frog (Rana boylii) Implications for management. In. Szaro, R.C., K.E. Severson and D.R. Patterson (techn. coords.), Proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America. U.S. Dept. Agriculture, Forest Service, Technical Report RM-166.

Hayes, M.P and D.M. Krempels. 1986 Vocal sac variation among frogs of the genus Rana from western North America. Copeia 927-936.

Hayes, M.P and M.M. Miyamoto. 1984 Biochemical, behavioral and body size differences between the red-legged frogs, Rana aurora aurora and Rana aurora draytonii. Copeia 1984 1018-1022.

Hayes, M.P and M.R. Tennant. 1986 Diet and feeding behavior of the California red-legged frog, Rana aurora draytonii. SW Nat. 30: 601-605

Jennings, M.R. 1988a. Origin of the population of Rana aurora draytonii on Santa Cruz Island, California. Herpetol. Rev 19: 76.

Jennings, M.R. 1988b. Natural history and decline of native ranids in California. In: DeLisle, H.F., P.R. Brown, B. Kaufman and B.M. McGurty (eds). Proc. Conf. Calif. Herpetol. Spec. Publ. Southwestern Herpetologists Society.

Jennings, M.R. 1983 an annotated checklist of the amphibians and reptiles of California. Cal. Fish & Game Bull. 69:151-171

Jennings, M.R. and M.P Hayes. 1996. Amphibian and reptile Species of Special Concern in California. Calif. Dept. of Fish and Game Spec. Publ.

Jennings, M.R. and M.P Hayes. 1994 Decline of native ranid frogs in the desert southwest. In. Brown, P.R. and J. Wright (eds), Herpetology of the North American Deserts: Proceedings of a symposium. Southwestern Herpetologists Society, Special Publ. 5

Jennings, M.R. and M.P Hayes. 1989 Final report on the status of the California red-legged frog (Rana aurora draytonii) in the Pescadero Marsh Natural Preserve. Rept. for Calif. Dept. Parks and Recreation, Sacramento, California. Contract # 4-823-9018.

Jennings, M.R. and M.P Hayes. 1985 Pre-1900 overharvest of the California red-legged frog (Rana aurora draytonii): The inducement for bullfrog (Rana catesbeiana) introduction. Herpetologica 41 94-103

Rathbun, G.B., M.R. Jennings, T G Murphey and N.R. Seipel. 1993 Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. Unpubl. Rept., National Ecol. Res. Center, Piedras Blancas Research Station, San Simeon, California.

Slevin, J.R. 1928 The amphibians of western North America. an account of the species known to inhabit California, Alaska, British Columbia, Washington, Oregon, Idaho, Utah, Nevada, Arizona, Sonora and Lower California. Occas. Papers Calif. Acad. Sci. 16: 1-152.

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston, Massachusetts.

Stebbins, R.C. 1954 Amphibians and reptiles of western North America. McGraw-Hill Book Co., New York, New York.

Stebbins, R.C. 1951. Amphibians of western North America. Univ Calif. Press, Berkeley, California.

Storer, T.I. 1925 A synopsis of the amphibia of California. Univ Calif. Publ. Zool. 27 1-342.

Wright, A.H. and A.A. 1949 Handbook of frogs and toads of the United States and Canada. Third edition, Comstock Publ. Co., Ithaca, New York.

Common Name: Two-striped garter snake **Scientific Name:** *Thamnophis hammondii*

Legal Status: Federal - None **State** - Species of Special Concern[1]

Description A medium-sized (to 1 m) slender-bodied species. Dorsal (ground) color dark green to olive drab, interspersed with black flecks. Often with two light yellow to yellowish- white lateral stripes just above the ventral scales. Stripes often indistinct and occasionally absent Venter gray to grayish-blue to light yellowish-white, often with a salmon suffusion. Head moderate in size, eyes with round pupils. Scales keeled.

Distinguishing Characteristics and Similar Species : (1) Striped racer (Masticophis lateralis) has (a) smooth scales and (b) distinct lateral stripes. (2) Western yellow-bellied racer (Coluber constrictor mormon) (a) lacks lateral stripes and (b) has smooth scales.

Life History: The two-striped garter snake is a highly aquatic species, but may move considerable distances overland and into upland habitats, even where permanent water is lacking. The home range of the species ranges from 80 m2 to over 5000 m 2 (Rathbun et al. 1993), with a mean of 1500 m2. Individuals are occasionally found in shrubs and trees (Cunningham 1955), particularly where they overhang water Snakes may overwinter in small mammal burrows (Rathbun et al. 1993), where they emerge to bask on warm days during the winter The species is normally active from April-October, and may become primarily nocturnal or crepuscular during the summer months. Two-striped garter snakes mate in the fall and bear from 1-25 live young, with neonates first being observed in mid-May in southern California and early July in central California. Young are typically 210-230 mm snout-vent length. Females may store sperm for up to 53 months (Stewart 1972). This species preys primarily on fish, fish eggs and aquatic vertebrates (Grinnell and Grinnell 1907, Klauber 1931, Fitch 1940, von Bloeker 1942, Cunningham 1959, Bell and Haglund 1978, Bell 1982, Rathbun et al. 1993, Jennings and Hayes 1996, pers. obs.) including threespine stickleback (*Gasterosteus aculeatus*), tidewater goby (*Eucyclogobius newberryi*), coast range sculpin (*Cottus aleucticus*), staghorn sculpin (*Leptocottus armatus*), mosquitofish (*Gambusia affinis*), longjaw mudsucker (*Gillichthys mirabilis*), Pacific treefrog (*Hyla regilla*), California treefrog (*Hyla cadaverina*), California red-legged frog (*Rana aurora draytonii*), bullfrog (*Rana catesbeiana*), arroyo southwestern toad (*Bufo californicus*), California toad (*Bufo boreas halophilus*), western spadefoot toad (*Scaphiopus hammondii*) Coast Range newts (*Taricha torosa torosa*). Earthworms (Stebbins 1985) and leeches (pers. obs.) are also eaten, most typically by juvenile snakes.

Habitat: Although highly aquatic, this species may be found far from water Observed in riparian, freshwater marsh, coastal sage scrub, chaparral, oak woodland and grassland habitats. In the latter instance, it is often found in the vicinity of vernal pools. Apparently absent from all but the fringes of salt marsh habitats on Camp Pendleton, although it may occur in these situations elsewhere. Does not require permanent water, although populations in permanent streams seem to be larger than in ephemeral systems (pers. obs.).

Comments: Fairly widespread on in southern California, but only locally common. Most populations may be threatened by the presence of numerous exotic species which co-occur with them, including bullfrogs and centrarchid fishes.

1 - recommended State Threatened (Jennings and Hayes 1996)

Management Recommendations: While this species is relatively widespread in montane areas, lowland populations are severely threatened and susceptible to a variety of impacts and should be managed as a sensitive species.

Literature Cited and References

Bell, M.A. 1982. Melanism in a high elevation population of Gasterosteus aculeatus. Copeia. 829-835

Bell, M.A. and T.R. Haglund. 1978 Selective predation of threespine sticklebacks (Gasterosteus aculeatus) by garter snakes. Evolution 32. 304-319

Bellemin, J.M. and G.R. Stewart. 1977 Diagnostic characters and color convergence of the garter snakes Thamnophis elegans and Thamnophis couchii atratus along the central California coast. Bull. So. Calif. Acad. Sci. 76 73-84

Cunningham, J.D. 1959 Reproduction and food of some California snakes. Herpetologica 15 17-19

Cunningham, J.D 1955 Arboreal habits of certain reptiles and amphibians in southern California. Herpetologica 11 217-220

DeLisle, H., G. Cantu, J Feldner, P O'Connor, M. Peterson and P. Brown. 1986. The distribution and present status of the herpetofauna of the Santa Monica Mountains of Los Angeles and Ventura County, California. Southwestern Herpetol. Soc. Spec. Publ. 2 1-94

Dixon, J.R. 1967 Amphibians and reptiles of Los Angeles County, California. Los Angeles Co. Museum Sci. Series 23 1-64

Ely, E. 1992. Geographic distribution: Thamnophis hammondii. Herpetol. Rev 23 124-125

Fitch, H.S. 1984 Thamnophis hammondii. Catalogue of Amer Amph. Rept. 351 1-351.3

Fitch, H.S. 1941 The feeding habits of California garter snakes. Calif. Fish & Game 27 1-32.

Fitch, H.S. 1940. A biogeographical study of the ordinoides artenkreis of garter snakes (genus Thamnophis). Univ Calif. Publ. Zool. 44 1-150.

Grinnell, J and H W Grinnell. 1907 Reptiles of Los Angeles County, California. Throop Inst Bull. 35 1-64

Jennings, M.R. and M.P Hayes. 1996. Amphibian and reptile Species of Special Concern in California. Calif. Dept. of Fish and Game Spec. Publ.

Klauber, L.M. 1931 A statistical survey of the snakes of the southern border of California. Bull. San Diego Zool. Soc. 8 1-93

Larson, N.M. 1984 Geographic variation in the two-striped garter snake, Thamnophis hammondii. MS Thesis, Calif. State Polytechn. Univ Pomona, Pomona, California.

Lawson, R. and H.C. Dessauer 1979 Biochemical genetics and systematics of the Thamnophis elegans-couchii-ordinoides complex. Occas. Papers Museum Zool. , Louisiana State Univ 56. 1-24

McGuire, J.A. and L.L. Grismer 1992. The taxonomy and biogeography of Thamnophis hammondii and T digueti (Reptilia.Squamata:Colubridae) in Baja California, Mexico. Herpetologica 49· 354-365

Rathbun, G.B., M.R. Jennings, T G Murphey and N.R. Seipel. 1993 Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. Unpubl. Rept., National Ecol. Res. Center, Piedras Blancas Research Station, San Simeon, California.

Schoenherr, A.A. 1976. The herpetofauna of the San Gabriel Mountains, Los Angeles County, California. Special Publ. SW Herpetologists Society

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

Stebbins, R.C. 1954b. Amphibians and reptiles of western North America. McGraw-Hill Book Co., New York, New York.

Stewart, G.R. 1972. An unusual record of sperm storage in a female garter snake (genus Thamnophis). Herpetology 28 346-347

Van Denburgh, J and J.R. Slevin. 1918 The garter-snakes of western North America. Proc. Calif. Acad. Sci. Ser 4, 8. 181-270

von Bloeker, J C., Jr 1942. Fauna and flora of the El Segundo sand dunes: 13 Amphibians and reptiles of the dunes. Bull. So. Calif. Acad. Sci. 41 29-38.

Wright, A.H. and A.A. Wright. 1957 Handbook of snakes of the United States and Canada. Vol. I & II. Comstock Publ Co., Ithaca, New York.

Common Name: South Coast garter snake **Scientific Name:** *Thamnophis sirtalis* ssp nov

Legal Status: **Federal** - None **State** - Species of Special Concern[1]

Description : A medium-sized (to 1 1 m) medium-bodied species. Dorsal (ground) color black, one prominent yellowish dorsal stripe and two yellowish lateral stripes. Small reddish bars between lateral and dorsal stripes. Venter blue-gray to grayish-white, unmarked or with very small black flecks. Head with light green-gray markings on labials, scales keeled.

Distinguishing Characteristics and Similar Species : (1) Coastal patch-nosed snake (*Salvadora hexalepis virgultea*) has (a) enlarged rostral scale (b) orange-white dorsal stripe and (c) lacks small reddish bars between dorsal and lateral stripes. (2) Striped phase of California kingsnake (*Lampropeltis getulus californiae*) lacks (a) small reddish bars between dorsal and lateral stripes and (b) dorsal and lateral stripes are white or whitish-yellow

Life History· The red-sided (common) garter snake (*Thamnophis sirtalis*) has one of the widest ranges of any snake in North America, with 14 currently recognized subspecies occurring from Alaska to Mexico. The life history of this snake, although well-studied elsewhere, is very poorly known in southern California. It was historically known from only 24 sites in this area (Jennings and Hayes 1996). The activity period extends from March-October, although some individuals may emerge during warm days in the winter (Ruthling 1915). The species was historically at least locally common (Grinnell and Grinnell 1907, Bogert 1930, von Bloecker 1942). Like all garter snakes, the red-sided garter is viviparous (live-bearing). Clutch size in this taxon (subspecies) is 12-20, which are born in August (Cunningham 1959). In California, other subspecies of this snake are known to feed on a wide range of prey, including insects, fishes, amphibians and small mammals (Fitch 1941, 1949, Cunningham 1959, White and Kolb 1974). It is assumed that the diet of the South Coast garter is similar

Habitat: Fresh-water marsh and adjacent upland habitats. Currently the historic localities on Camp Pendleton are dominated by tules (*Scirpus*), cattail (*Typha*) occasional willows (*Salix*) as well as giant reed (*Arundo donax*).

Comments: This snake is an as-yet (late 1999) undescribed form (subspecies) of the red-sided (common) garter snake (*Thamnophis sirtalis*) (Jennings and Hayes 1996). There is a single record for lower San Mateo Creek on Camp Pendleton, and two others for the lower Santa Margarita River Three other records exist from the San Luis Rey drainage - one near Bonsall, one near Whelan Lake, and another near Monserate. The species may still occur in either the San Mateo and San Luis Rey drainages as apparently suitable habitat remains (pers. obs). However, it has not been found in these areas with limited search effort. It may require considerable search effort to find this species (Klauber 1929, Sweet in Jennings and Hayes 1996).

Management Recommendations: Jennings and Hayes (1996) estimate that 75% of the known historical sites for this taxon have been eliminated, and only six sites remain. Given the extremely limited distribution and current status of this snake, any populations discovered should be treated as though the species was federally listed, and appropriate management and protection efforts taken.

1 - recommended State Endangered (Jennings and Hayes 1996).

Literature Cited and References

Bogert, C.M. 1930 An annotated list of the amphibians and reptiles of Los Angeles County, California. Occas. Papers Calif. Acad. Sci. 16 3-14

Cunningham, J.D 1959 Reproduction and food of some California snakes. Herpetologica 15 17-19

Fitch, H.S. 1949 Study of snake populations in central California. Amer Midl. Nat. 41 513-517

Fitch, H.S. 1941 Feeding habits of California garter snakes. Calif. Fish and Game 27 1-32.

Grinnell, J and H.W Grinnell. 1907 Reptiles of Los Angeles County, California. Throop Inst. Bull. 35 1-64.

Jennings, M.R. and M.P Hayes. 1996. Amphibian and reptile Species of Special Concern in California. Calif. Dept. of Fish and Game Spec. Publ.

von Bloeker, J C., Jr 1942. Fauna and flora of the El Segundo sand dunes: 13 Amphibians and reptiles of the dunes. Bull. So. Calif. Acad. Sci. 41 29-38.

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

White, M. and J.A. Kolb. 1974. A preliminary study of Thamnophis near Sagehen Creek, California. Copeia. 126-136.

SPECIES ACCOUNTS - EXOTICS

Common name: Red shiner **Scientific name:** *Cyprinella lutrensis*

Legal Status: Federal: None **State:** None

Description: A small compressed minnow reaching 4 cm SL, moderately compressed with distinct vertically oriented diamond shaped scale pocket on the sides. Often a reddish cast to live specimens and breeding or territorial males with bright red fins and tail and with steely blue gray cast to the body Females remain as non breeding individuals. In preserved specimens the combination of 9 anal rays with 4-4 pharyngeal teeth is distinctive, particularly for minnows from southern California.

Distinguishing Characteristics and Similar Species: The diamond-shaped lateral scales and reddish tinge are the best field characters is non-breeding fish, and the anal ray-pharyngeal tooth combination noted above is the best for specimens. The abdomen and ventral belly are white or silvery where as this area is often dusky or with darker blotches in fathead minnows. The arroyo chub lacks definition of the scales and the scales are smaller in indistinct in the chub.

Life History: Like the fathead minnow, the red shiner are introduced from the Mississippi Valley and Texas. Also like the fathead minnow, the red shiner breeds at warmer temperatures than our native minnows and suckers. The colorful male stakes out a territory near a log or a rock with distinct crevices. He entices the females to come and lay eggs in the crevice or other cavity where the male fertilizes them. The male will defend the area against some egg predators like other minnows. Red shiners are usually seen feeding in midwater of slow pools and feel primarily on small animal matter The species is probably annual in southern California. It feeds in schools in mid-water of slow flows. This species was also brought in for bait in the Colorado River and became established in the wild in the 1950s. It did not arrive in coastal drainages until much later, as well as in the San Joaquin Valley, until the 1980s. In coastal drainages of southern California, it is known in Big Tujunga River, Los Angeles County, and San Juan, San Diego, and Aliso creeks, Orange County

Habitat: Slow moving water from small streams to large rivers, including those much larger than those in southern California, that get warm in summer Red shiners are found almost throughout the Big Tujunga River from Hansen Dam upstream to Tujunga Reservoir

Comments: This fish becomes abundant and is a serious threat to become permanently established in many other places in southern California. Little evidence it is having an impact on native fishes, but it seems to dominate large pools in the Big Tujunga with the arroyo chubs being relegated (forced into or restricted to?) to the flowing riffles and runs exclusively The red shiner in known to actively compete for space and food with native minnows in Nevada and Arizona (??????????????).

Management Recommendations: Like fathead minnows and mosquitofish, red shiners are severely decimated by strong winters, and control efforts should be concentrated in early spring. Efforts should be made to prevent unauthorized introductions, perhaps extending to not allowing their use for bait in the Los Angeles Basin.

Literature Cited and References



Red shiner *(cyprinella lutrensis)*

Common name: Mosquitofish **Scientific name:** *Gambusia affinis*

Legal Status: Federal: None **State:** None

Description: Small fish, 5 centimeters or less standard length with an upturned mouth and distinctly blackened lines in diamond shapes outlining the scales along the sides. Rounded caudal (tail) fin and single rounded dorsal fin considerably behind the anal fin. Males only about half the size of the females, and males have anal fin prolonged into a long narrow tube, the intromittent organ to transfer sperm to the female. Body elongate except pregnant females that have very expanded abdominal areas until the young are born. Both sexes grey to silvery often with bluish reflections.

Distinguishing Characteristics and Similar Species: Only other small, live-bearing fish in coastal southern California is the sailfin molly that is much darker in color with longitudinal stripes and a long, often colorful dorsal fins extending half or more the length of the dorsal body surface. At small sizes (less than 15 millimeters) young California killifish are similar, but have the dorsal fin ahead rather than behind the anal fin. Killifish are only within one or two kilometers of the coast in southern California drainages.

Life History: Females can carry sperm and fertilize successive broods without mating again and they give birth to living young only after temperatures reach or exceed 20 degrees centigrade. Mosquitofish tolerate very little current and typically occupy stream margins and standing pools usually near the surface unless disturbed. Then they may retreat to deeper water or into vegetative cover In cool weather they often are concentrated in shallow standing water warmed by the sun. Mosquitofish feed on a wide variety of small invertebrates, but also have been documented to feed on larval and juvenile fishes of many species, as well as cannibalistically on their own young. Thus they have been directly and indirectly implicated in the decline or extirpation of several species of fishes and amphibians.

Habitat: Native to the western half of the eastern United States and almost ubiquitous at the margins of rivers, marshes, ponds, and lakes. Two closely related subspecies are known and one or both may occur in California, including southern California (Swift et al. 1993, Dill and Cordone 1998). Most collections of mosquitofish from southern California have been the western mosquitofish, *Gambusia affinis affinis*.

Comments: This species is one of the most serious predators on native fishes in standing waters, particularly stickleback and arroyo chubs. Since mosquitofish inhabit the shallows where the larvae and small juveniles of most fish species start their life, mosquitofish are major predators on these early stages.

Management Recommendations: Introduction of this species should be curtailed and replacement by sticklebacks should be considered if mosquito control is an issue. Like many exotics, strong winter flows decimate populations considerably and early spring eradication should be the most effective. Systems managed for cooler water, less than 20 degrees C., will not

be conducive to reproduction by mosquitofish and sticklebacks will be much better for mosquito control in such cases. Haines Creek should be a good natural experiment for this since it is naturally quite cool. This coolness may explain the lack of mosquitofish at this site.

Literature Cited and References



Mosquitofish *(Gambusia affinis)*

Common name: Green sunfish **Scientific name:** *Lepomis cyanellus*

Legal Status: Federal: None **State:** Game fish

Description: Small, deep bodied sunfish with a large mouth and dark greenish to brown coloration dorsally and a black blotch at the base of the last 3 to 5 dorsal and anal fin rays. Maxillary bone extending backward to beyond a vertical through the anterior margin of the eye. Often considerable yellow color to dorsal and caudal fins. Spines in dorsal, anal, and pelvic fins. Body thicker, less compressed, or chunkier than other sunfishes, but less so than largemouth bass. Gill rakers long, reaching anteriorly to beyond the bases of 2nd or 3rd raker ahead of it on the lower part of the anteriormost gill arch.

Distinguishing Characteristics and Similar Species: Only largemouthed sunfish in coastal southern California. Others like bluegill and redear sunfishes the maxillary bone rarely reaches posteriorly to a vertical through the anterior margin of the eye. These latter two also are more compressed, deeper bodied, and have longer pectoral fins. When depressed upward on the body the pectoral fins extend beyond the upper margin of the body in these two and not in the green sunfish.

Life History: By far the most common and established sunfish in the streams and rivers of southern California, arriving in California near the turn of the century (Dill and Cordone 1998) Native to the middle Mississippi Valley and the plains states and Texas into northern Mexico. The male guards the eggs and young in a depression in sand or gravel in slower moving or standing waters adjacent to streams and rivers, usually when water temperatures approach 70 degrees F Often does well in rocky or boulder situations or other areas where lots of cover and obstructions exist in streams (Minckley 1973). Fish live up to three or four years and possibly more. Green sunfish are carnivores eating crustaceans and fishes, and have been well documented to prey on the young and juveniles of many native southwestern freshwater fishes.

Habitat: Small streams and ponds, apparently doing best in the absence of other sunfishes or basses. Requires deep pools or cover in the form of boulders, logs, etc. Southern California streams seem well suited to it since it has become the most widespread and successful of the introduced sunfishes; all the others are much more restricted to reservoirs, ponds, and other artificial impoundments and are usually scarce in stream and river environments where green sunfish predominate. Although native arroyo chubs and sticklebacks seem to coexist with green sunfishes, during late fall or in drought periods, the lower water forces these species in close contact with the sunfishes and local populations of native species become extirpated. Green sunfish can penetrate upstream into waters inhabited by trout and threaten them as well.

Comments: Very high priority for control or elimination since it can adversely affect a wide variety of native species of fishes and amphibians.

Management Recommendations: Make high priority of controlling or eliminating this species from restored natural waterways in southern California. Must make long term commitment since the species is firmly entrenched in most freshwater systems in California. Often heavily decimated

during strong winter storms, so control efforts in early spring before reproduction can commence should be most effective. An alternative used in the Colorado River area is exclusion devices to prevent access to spawning and rearing areas of native fishes.

Literature Cited and References



Green sunfish *(Lepomis cyanellus)*

Common name: Largemouth bass **Scientific name:** *Micropterus salmoides*

Legal Status: Federal: None **State:** Game fish

Description: Large-mouthed elongate bass-like fish with dorsal, anal, and pelvic spines, up to about 60 centimeters long, but usually less than 40. Upturned mouth with lower jaw jutting forward beyond snout and posterior extent of maxillary beyond posterior margin of eye in fish over 10 centimeters. Teeth fine and sandpaper-like. Usually greenish or grayish dorsally and silvery or white ventrally with a strong lateral black blotchy stripe. Stripe more prominent in fish less than 40 centimeters, often indistinct in larger fish. Dorsum can be mottled, fins clear or yellowish. Spinous and soft dorsal fins with very low connection, one quarter or less of the height of the soft dorsal fin.

Distinguishing Characteristics and Similar Species: The large mouth and deep notch in dorsal fin distinguishes the largemouth bass from the other introduced freshwater smallmouthed basses, namely the spotted, small mouth, and redeye basses. These latter have smaller mouths (maxillary bone does not extend posteriorly beyond a vertical through the posterior margin of the eye), are much darker in color, often with longitudinal stripes or lines of spots, and with a much higher connection between the dorsal fins, one third or more of the height of the soft dorsal. In life the small mouthed species are usually much more mottled dorsally or even almost with multiple bands of darker color

Life History: Native to the eastern United States including nearby Canada and Mexico. Widely introduced in the western United States and other parts of the world. Largemouth bass are territorial solitary predators in standing or very slowly moving water, so they are usually found only in ponds, lakes, and oxbow ponds associated with flowing rivers and creeks. They breed early in the year when water temperatures reach about 60 degrees F The male excavates a depression in sandy or gravelly substrate and attracts females to lay eggs in this nest. The male guards the nest until a few days after the young-of-the-year bass begin to leave the nest. The young bass may school for a few weeks but soon disperse and become territorial. If crowded they can become cannibalistic. Largemouth bass live for at least 10 or years and reach a record of almost 23 pounds.

Habitat: Lakes, ponds, reservoirs, and standing or slow moving water associated with streams and rivers. Also commonly encountered in golf course ponds and farm ponds and watering troughs.

Comments: Known to be a serious predator on native species within the habitat it occupies.

Management Recommendations: This species needs to be completely eliminated in areas where native species will be maintained. Its greatest impact is one smaller species living in lower

gradient situations like threespine stickleback and arroyo chubs. Largemouth bass often do not maintain themselves in the higher gradient flows optimal for Santa Ana suckers and speckled dace. However, where these strong flows are interrupted by entering into reservoirs or arising from ponds such as those at Haines Creek, largemouth bass can have strong effects.

Literature Cited and References



Largemouth bass *(Micropterus salmoides)*

Common name: Fathead minnow **Scientific name:** *Pimephales promelas*

Legal Status: Federal: None **State:** None

Description: A small fish, 4 centimeters or less in SL, with a small terminal mouth, well in advance of the eye. Scales diamond shaped and outlined in black, relatively translucent body in life with subtle darkish blotches on abdomen from black peritoneum showing through. Often fish show a distinct narrow black lateral stripe of pigment on the sides of the body and tail, ending in a black spot at the base of the tail. Often the lateral line pores are present only on the anterior part of the body, but this is hard to see in live specimens. The breeding males have a striking black head and tail with a paler body between with the pectoral and dorsal fins strikingly bicolored in black and white. The head has about 8 large breeding tubercles in two bands of four across the snout. Pharyngeal teeth are 4-4

Distinguishing Characteristics and Similar Species: The red shiner is very similar to the fathead minnow in appearance but is more compressed and often has a pinkish hue rather than greyish or bluish of the fathead minnow The red shiner has the scales on the nape the same size as those on the lateral sides of the body and outlined in diamond shaped chevrons. The nape scales in fathead minnows are distinctly smaller and more crowded in arrangement than those on the sides. The red shiner is more compressed rather than cylindrical as is the fathead minnow The red shiner has 9 anal rays whereas the fathead has 7 or occasionally 8 Finally the mouth is larger in the red shiner, reaching backward to a vertical through the front of the eye, rather than falling short of such a vertical as in the fathead minnow

Life History: The fathead minnow lives in slow moving or standing waters near streams as well as in lakes and ponds with no flow It is native to the Mississippi Valley in the eastern United States and was brought west as a bait fish in the 1950s. It can be taken almost anywhere freshwater exists in coastal southern California, bu is absent from some streams, such as the Santa Margarita River It spawns at relatively warm temperatures, 60 degrees F or more, and the male defends a territory under a rock, stick, or log. The female lays the eggs on the underside of the defended feature and the male guards the eggs until hatching. The fathead minnow is primarily herbivorous, having flat crushing pharyngeal teeth (with a count of 4-4) and a long convoluted gut. It also eats some animal matter, and has been documented to eat sucker larvae farther north in Oregon and Idaho. In southern California, most fathead minnows probably live only one year, but this has not been studied locally

Habitat: Almost anywhere that standing or slow moving permanent freshwater exists, often in harsh, changing, or marginal habitats where few other fish species live. As such it is very successful in southern California where a low number of species is the norm. It, mosquitofish, green sunfish and black bullhead are the most common and established exotic freshwater fish species in southern California.

Comments: This species can be very abundant in some localities where warm standing or sluggish water occurs, but there is little evidence it is having an adverse effect in southern California. Like the mosquitofish, it is rare in cooler water habitats that most of the native species

occur Certainly the green sunfish, mosquitofish, and catfishes are of higher priority for control than fathead minnow

Management Recommendations: Maintain cool water conditions that inhibit reproduction by this species. Prevent introductions of this fish into the drainage; prohibit the use of fathead minnows for bait. Study effects of this species on associated native species where appro pirate.

Literature Cited and References



fathead minnow *(Pimephales promelas)*

Common Name: Bullfrog **Scientific Name:** *Rana catesbeiana*

Legal Status: **Federal** - None **State** - Game animal[1]

Description : A large (to 20+ cm) robust-bodied species. Dorsal (ground) color light yellowish-green to dark green, varies with temperature and other factors. Dark brown or black mottling and spots extensive on dorsum, legs with dark bands. Venter white to whitish-yellow, often with extensive dark mottling on limbs and throat. Eyes large, hind feet fully webbed. Larvae large, olive to dark green with dark brown or black mottling, snout rounded in profile when viewed from above. Call distinct, loud (audible at distances of several hundred meters on a still night), deep with a nasal tone, with 1-3 notes. Variously described as "jug-o-rum" or "br-wum" (Stebbins 1985) or a short (1-2 seconds) "brrarwww" Small individuals may give a short alarm call - "eearrrp" when diving in to water

Distinguishing Characteristics and Similar Species : (1) California red-legged frog (Rana aurora draytonii) has (a) prominent dorsolateral folds (b) snout of larva is sharper when viewed from above, and eyes narrower (2) African clawed frog (Xenopus laevis) has (a) no eyelids (b) claws on hind toes (c) larva resembles small translucent catfish.

Life History: The bullfrog is an exotic species, native to the southeastern United States. It was introduced into California in the late 1800's at least in part to maintain the commercial harvest of frog legs. The native red-legged frog (Rana aurora draytonii) had by that point been hunted to the point of commercial extinction (Jennings and Hayes 1985). The bullfrog is primarily active from March-October, but may occasionally be noted during warm days in the winter Overland movement during rain by both juveniles and adults may occur at any time, and frogs have been noted at distances of at least 2 km from permanent watersources. Bullfrogs are active diurnally and nocturnally, with most nocturnal activity occurring during the summer Size at sexual maturity varies geographically, with most females being mature at > 115-120 mm snout-urostyle length. Males mature at about 120 mm. Age at sexual maturity varies slightly, but is usually 2+ years. Males typically begin calling when water temperatures regularly exceed 20o Celsius. Females lay from 1,000 to more than 45,000 eggs, depending upon the size of the female. The first eggs on Camp Pendleton may be deposited by early April. The egg mass is large, often covering 0.5-0.8 m2, and is typically laid in warm, relatively (< 0.5 m) shallow water The mass sinks slightly and becomes indistinct due to the growth of algae on its surface within a few days. Females may deposit more than one clutch per year. Larvae are largely herbivorous, and typically do not metamorphose until their second season. Recent metamorphs usually appear in late June-July, and are usually 35-40 mm. The catholic feeding habits of bullfrogs have been well known for a considerable period of time (see Bury and Whelan 1984 for a review). Briefly, bullfrogs eat most invertebrate and vertebrate species potentially available to them within or adjacent to the aquatic habitat. Items noted in the diet of bullfrogs on Camp Pendleton and elsewhere in California include threespine stickleback (*Gasterosteus aculeatus*), arroyo chub (*Gila orcutti*), Pacific treefrog (*Hyla regilla*), California treefrog (*Hyla cadaverina*), California red-legged frog (*Rana aurora draytonii*), western toad (*Bufo boreas*), arroyo southwestern toad (*Bufo californicus*), Coast Range newt (*Taricha torosa torosa*), California tiger salamander (*Ambystoma californiense*), garter snakes (*Thamnophis* spp.), lizards (*Sceloporus occidentalis, Elgaria multicarinata, Eumeces skiltonianus*), western pond turtle (*Clemmys marmorata*), birds

(various spp.), California vole (*Microtus californicus*) and other mammals.
1 - California fishing license required for take, no season or bag limit - Sec. 5.05

Habitat: Requires fresh water, but may occasionally be found in slightly brackish systems. Because larvae require two seasons to metamorphose, reproductively established only in permanent watercourses. May occur seasonally in vernal pools, moving overland up to 1 mile or more to these areas. Found in aquatic habitats in all areas, including lakes, ponds, reservoirs, canals, sewage treatment ponds, streams, and rivers.

Comments: This introduced species has been found in most major and minor drainages in southern California.

Management Recommendations: .Extirpation of bullfrogs on site may be possible in the short-term, but long-term reinvasion will be a problem. Site-by-site control measures may have positive benefits for several sensitive species.

Literature Cited and References

Black, J.H. 1974 Bullfrog eating a bird. Herpetol. Rev 5 104.

Blair, W.F 1957 Changes in vertebrate populations under conditions of drought. Cold Harbor Symp. Quant. Biol. 22. 273-275

Bohnsack, K. 1952. Terrestrial hibernation of the bullfrog, Rana catesbeiana Shaw Copeia. 114

Brooks, G.R., Jr 1964 An analysis of the food habits of the bullfrog, Rana catesbeiana, by body size, sex, month and habitat. Va. J Sci. 15 173-186

Bury, R.B. and R.A. Luckenbach. 1976. Introduced amphibians and reptiles in California. Biol. Conser 10 1-14

Bury, R.B and J Whelan. 1984 Ecology and management of the bullfrog. U.S Fish and Wildlife Serv Resource Publ. 155 Washington, D.C.

Carpenter, H.L. and E.O. Morrison. 1973 Feeding behavior of the bullfrog, Rana catesbeiana, in northcentral Texas. Bios 44 188-193

Cohen, N.W and W.E. Howard. 1958. Bullfrog food and growth at the San Joaquin Experimental Range. Copeia 223-225

Courtenay, W.R., Jr and C.R. Robins. 1975 Exotic organisms: an unsolved, complex problem. BioScience 25. 306-313

Currie, W and E.D Bellis. 1969 Home range and movements of the Bullfrog, Rana catesbeiana Shaw, in an Ontario pond. Copeia: 688-692.

Durham, L. and G W Bennett. 1963 Age, growth and homing in the bullfrog. J. Wildlife Manage. 27: 107-123.

Emlen, S.T 1968. Territoriality in the bullfrog, Rana catesbeiana. Copeia. 240-243

Frost, S W 1935 The food of Rana catesbeiana Shaw Copeia: 15-18

Hayes, M.P and J Warner 1985 Life history notes: Rana catesbeiana, food. Herpetol. Rev 16 109

Howard, W.E. 1950 Birds as bullfrog food. Copeia. 152.

Jennings, M.R. and M.P Hayes. 1985. Pre-1900 overharvest of the California red-legged frog (Rana aurora draytonii): The inducement for bullfrog (Rana catesbeiana) introduction. Herpetologica 41 94-103.

Kruse, K.C. and M.G Francis. 1977 A predation deterrent in larvae of the bullfrog, Rana catesbeiana. Trans. Amer Fish. Soc. 106. 241-252.

Kupferberg, S.J 1994. Exotic larval bullfrogs (Rana catesbeiana) as prey for native garter snakes: Functional and conservation implications. Herpetol. Rev 25 95-97

Kupferberg, S.J 1993 Bullfrogs (Rana catesbeiana) invade a northern California river: A plague or species coexistence? (abstract) Bull. Ecol. Soc. America, Programs and Abstracts supplement to 74: 319-320

Lillywhite, H. 1970 Behavioral temperature regulation in the Bullfrog, Rana catesbeiana. Copeia: 158-168.

McAtee, W.L. 1921 Homing and other habits of the bullfrog. Copeia. 39-40

Moyle, P.B. 1973 Effects of introduced bullfrogs, Rana catesbeiana, on the native frogs of the San Joaquin Valley, California. Copeia: 18-22.

Mulla, M.S. 1963 Toxicity of organochloride insecticides to the mosquito fish Gambusia affinis and the bullfrog Rana catesbeiana. Mosquito News 23 299-303

Mulla, M.S., L.W Isaak and H. Axelrod. 1963. Field studies on the effects of insecticides on some aquatic wildlife species. J. Econ. Entomol. 56: 184-188.

Raney, E.C. 1940. Summer movements of the bullfrog, Rana catesbeiana Shaw as determined by the jaw tag method. Amer. Midl. Nat. 23. 733-745.

Ryan, R.A. 1953 Growth rates of some ranids under natural conditions. Copeia. 73-80

Schwalbe, C.R. and P.R. Posen. 1988. Preliminary report on effect of bullfrogs on wetland herpetofaunas in southeastern Arizona. In: Szaro, R.C., K.C. Severson and D.R. Patton (tech. coordinators), Proceedings of the symposium on the management of amphibians, reptiles and small mammals in North America. US Dept. Agriculture, Forest Service, Gen.Tech. Rept. RM-120

Sloan, A.J 1964. Amphibians of San Diego County Occas. Papers San Diego Soc. Nat. Hist. 13· 1-42.

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

Storer, T.I. 1925 A synopsis of the amphibia of California. Univ Calif. Publ. Zool. 27 1-342.

Storer, T.I. 1922. The eastern bullfrog in California. Calif. Fish & Game 8 219-224

Thrall, J 1971 Excavation of pits by juvenile Rana catesbeiana. Copeia. 731-732.

Treanor, R.R. 1975 Management of the bullfrog (Rana catesbeiana) resource in California. Calif. Dept. Fish & Game Inland Fisheries Admin. Rept. 75-1

Treanor, R.R. and S.J Nichola. 1972. A preliminary study of the commercial and sporting utilization of the bullfrog, R. catesbeiana Shaw in California. Calif. Dept. Fish & Game Inland Fisheries Admin. Rept. 72-4

Twedt, B 1993 A comparative ecology of Rana aurora Baird and Girard and Rana catesbeiana Shaw at Freshwater Lagoon, Humboldt County, California. MA Thesis, California State Univ Humboldt, Humboldt, California.

Tyler, J.D and R.D Hoestenbach, Jr 1979 Differences in food habits of bullfrogs (Rana catesbeiana) from pond and stream habitats in southwestern Oklahoma. SW Nat. 24· 33-38.

Wiewandt, T.A. 1969 Vocalization, aggressive behavior and territoriality in the Bullfrog, Rana catesbeiana. Copeia. 278-285

Wright, A.H. and A.A. 1949 Handbook of frogs and toads of the United States and Canada. Third edition, Comstock Publ. Co., Ithaca, New York.

Common Name: African clawed frog **Scientific Name:** *Xenopus laevis*

Legal Status. **Federal** - None **State** - None[1]

Description : A medium-sized (to 12.5 cm) medium-bodied species. Dorsal (ground) color light gray to whitish-gray to brownish-green, with darker gray to light brown mottling. Venter whitish, occasionally with small dark flecks or spots. Body flattened, head small. Eyes small & dark, facing forward. Small blacks claws on tips of hind toes. Larva resembles small, translucent catfish. Call "low-pitched, rising and falling two-parted trill, made underwater" (Davidson 1996), audible in air (McCoid 1985).

Distinguishing Characteristics and Similar Species : The presence of claws on the hind toe tips will immediately distinguish this from any other amphibian on Camp Pendleton. (1) Bullfrog (Rana catesbeiana) has (a) no claws (b) eyes are laterally oriented (c) body not dorso-ventrally flattened.

Life History: The African clawed frog is an exotic species, introduced into southern California sometime prior to the 1970's (St. Amant et al. 1973). This species is highly aquatic, but is capable of moving considerable distances overland (Mahrdt and Knefler 1973, R. Fisher pers. comm.). Males call from late March through June (McCoid 1985), and reproduction may begin as early as mid-April. Eggs are deposited as early as April, although larvae have also been observed at this time (McCoid 1985). The larvae resemble small translucent catfish, and may school in midwater. Dispersal during "sheet flow" rainy conditions is conducted primarily by young frogs (McCoid and Fritts 1980b). When they occur in shallow ponds or other watercourses, frogs may burrow into the substrate to escape high water temperatures and aestivate for prolonged periods (McCoid and Fritts 1980b). The diet of this species is known to include both invertebrates and vertebrates, particularly fishes. There is disagreement about the potential impact to native vertebrate species, some authors (Lenaker 1972, St. Amant et al. 1973, St. Amant 1975) consider clawed frogs a serious threat, while McCoid and Fritts (1980a, 1980b) indicate that the potential impacts may be overestimated. However, recent evidence (R. Goodman unpubl. data) indicates that the species may prey on native fishes such as threespine stickleback (*Gasterosteus aculeatus*) and arroyo chub (*Gila orcutti*). The clawed frog has been observed to feed on tidewater gobies (*Eucyclogobius newberryi*) (C Swift pers. comm.). It is thought that clawed frogs, particularly larvae, may be susceptible to predation by introduced centrarchids (McCoid and Fritts 1980b).

Habitat: Found in a variety of freshwater habitats, and may venture into brackish water Observed in major rivers (even when channel is cement), streams, reservoirs, ponds, stock tanks and possibly vernal pools.

Comments: Known to occur downstream in the Los Angeles River drainage. Widespread in surrounding areas - known from Los Angeles, Orange County, Riverside County and several areas in San Diego County.

Management Recommendations: Despite the equivocal evidence concerning predation on native species, eradication of any populations discovered is recommended as a precautionary measure.

1 - possession or importation prohibited by California State Dept. of Agriculture regulations

Literature Cited and References

Avila, V. and P Frye. 1978. Feeding behavior of the African clawed frog (*Xenopus laevis* Daudin): (Amphibia, Anura, Pipidae): effect of prey type. J Herpetol. 12. 391-396.

Bles, E.J 1905 The life history of *Xenopus laevis* Daud. Trans. Royal Soc. Edinburgh 41 789-821

Branning, T 1979 Frog wars. Natl. Wildlife 17 34-37

Davidson, C. 1996 Frog and toad calls of the Pacific Coast. Vanishing voices. CD from Cornell Laboratory of Ornithology

Deuchar, E. 1975 *Xenopus laevis* The South African clawed frog. John Wiley and Sons, London.

Fingal, W and H.W Kaplan. 1963 Susceptibility of *Xenopus laevis* to copper sulfate. Copeia.155-156.

Fritts, T.H. and M. McCoid. 1976. Colonization and biology of the African clawed frog (*Xenopus laevis*) in southern Riverside County Unpubl. Rept. Riverside Co. Fish & Game Comm.

Frye, P G. 1977 Food initiated behavior of the African clawed frog (*Xenopus laevis* Daudin). MS Thesis, San Diego State Univ., San Diego, California.

Lenaker, R. 1972. *Xenopus in* Orange County. Unpubl. Rept. Calif. State Polytechnic Univ - Pomona.

Mahrdt, C.R. and F T Knefler 1973. The African clawed frog - again. Environ. SW 450 1-3

Manrdt, C.R. and F.T. Knefler. 1972. Pet or pest? The African clawed frog. Environ. SW 446: 2-5.

McCoid, M.J 1993 Speculations on colonizing success of the African clawed frog *Xenopus laevis* (Pipidae), in California. So. African J. Zool. 28. 59-61

McCoid, M.J., G. Pregill and R.M. Sullivan. 1993 Possible decline of *Xenopus* populations in southern California. Herpetol. Rev 24:29-30.

McCoid, M.J and T.H. Fritts. 1980a. Notes on the diet of a feral population of *Xenopus laevis* (Pipidae) in southern California. SW Nat. 25 272-275

McCoid, M.J and T.H. Fritts. 1980b. Observations of feral populations of *Xenopus laevis* (Pipidae) in southern California. Bull. So Calif. Acad. Sci. 79· 82-86

Munsey, L. 1972. Salinity tolerance of the African clawed frog, *Xenopus laevis*. Copeia. 584-586.

St. Amant, J 1975 Exotic visitor becomes permanent resident. Terra., 13 22-23

St. Amant, J., F Hoover and G Stewart. 1973 African clawed frog, *Xenopus laevis* (Daudin), established in California. Calif. Fish & Game 59· 151-153

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

Zacuto, B 1975 The status of the African clawed frog (*Xenopus laevis*) in Agua Dulce and Soledad Canyons. Unpubl. Rept. Calif. Dept. Fish & Game.

Common Name: Red-eared slider **Scientific Name:** *Trachemys scripta elegans*

Legal Status: **Federal** - None **State** - None

Description : A moderate to large turtle, adults 140-250+ mm. Skin generally greenish, with prominent yellow striping in the head and limbs, most obvious is smaller and younger specimens Carapace dark greenish, with dark black lines on individual shields. Plastron light yellow, usually with large, dark blotches or ocelli (eye-shaped marks) on shields. Males have elongated front claws, usually apparent when animals reach 110-120 mm carapace length. Females have shorter claws. Tail usually short, 10-15% of shell length. Old male red-eared sliders develop piebald melanism, with the carapace and skin darkening with age. In these individuals, the red "stripe" may be dark gray-black or absent altogether, and the yellow lines on the head and limbs are indistinct or absent.

Distinguishing Characteristics and Similar Species : (1) Southwestern pond turtle (*Clemmys marmorata pallida*) lacks (a) yellow stripes on the head and limbs (b) lacks a bold red "ear" stripe and (c) tail is long, approximately 25-30% of shell length.

Life History: Red-eared sliders are an exotic species, native to the southeastern United States. Individuals have been released into natural habitats in California at least as far back as 1935 (Grant 1936), and are currently known from numerous localities on the west coast (Holland unpubl. data). The slider is a relatively-fast growing species, and males in South Carolina reach sexual maturity at approximately 100-110 mm and an age of 2-5 years, with most mature by 4 years of age (Gibbons and Green 1994). Females reach sexual maturity at 160-200 mm, and at ages of 5-7 years. Clutch size is positively correlated with carapace length, and ranges from 2-25 eggs. Females may deposit more than a single clutch/year The eggs hatch in 65-75 days, and hatchlings are 25-33 mm carapace length. A female was observed nesting on a peninsula at Lake O'Neill in July 1995, and 15 eggs were recovered from the nest. All eggs hatched in mid-September Juvenile turtles are omnivorous, with most of the diet consisting of small invertebrates and carrion. The diet shifts as the animal grows, and adults (under normal circumstances) appear to consume large amounts of aquatic vegetation. However, the species is an opportunistic feeder, and will frequently engage in carnivory Sliders are known to engage in long-distance overland movements, and may thus "turn up" at isolated watercourses.

Habitat: Slow-moving streams, rivers, lakes and ponds. Widely established in reservoirs and other artificial aquatic habitats in southern California. May be observed in many terrestrial habitats during overland movements.

Comments: This species is introduced (non-native), and has been found in a number of drainages in southern California. It is likely that this species already is or will soon become reproductively established in many areas, unless active efforts are made to prevent this from occurring.

Management Recommendations: Because of the possibility of competition with the native western pond turtle, and/or the potential for transmission of disease, efforts should be made to discourage the further introduction or spread of the species. This could be accomplished through

education of the public to avoid deliberate or accidental release of pets into watercourses on the site. Additionally, where turtles are observed they should be removed through trapping.

Literature Cited and References

Bury, R.B. and R.A. Luckenbach. 1976. Introduced amphibians and reptiles in California. Biol. Conser. 10: 1-14.

Ernst, C.H. and R.W. Barbour. 1989. Turtles of the world. Smithsonian Institution Press, Washington, D.C.

Gibbons, J.W. 1994. Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C.

Gibbons, J.W. and J. Greene. 1994. Reproduction in the slider and other species of turtles. In: Gibbons, J.W. 1994. Life history and ecology of the slider turtle. Smithsonian Inst. Press, Washington, D.C.

Grant, C. 1936. Breeding of Psuedemys elegans in California and notes on other captive reptiles. Copeia. 112-113

Jennings, M.R. 1987 Annotated checklist of the amphibians and reptiles of California, second revised edition. SW Herpetologists Soc., Spec. Publ. 3 1-48.

Mahmoud, I.Y and N Lavenda. 1969 Establishment and eradication of food preferences in red-eared turtles. Copeia. 298-300

Pritchard, P C.H. 1979 Encyclopedia of turtles. TFH Publ., Neptune, New Jersey

Stebbins, R.C. 1985 A field guide to western reptiles and amphibians. Houghton Mifflin Press, Boston.

APPENDIX I

PUBLIC OUTREACH DOCUMENTATION

Enhancement, Preservation and Management Program

The enhancement program includes the following components:

➢ Removal of exotic plant and wildlife species

➢ Restoration of the native habitat.

➢ Formal establishment of equestrian and walking trails

- *Realizing that the local community has benefited from the site's many equestrian and walking trails for many years the LADPW believes it is important to continue providing the community with access to the site. At the same time, any public use of the site must be weighed with the goals of the mitigation bank and is contingent upon approval by the resource agencies. As such, use of the site by equestrians and hikers will be limited to established trails in order to maintain the integrity of the mitigation bank.*

➢ Implementation of a public awareness and education program

- *It is important to protect the mitigation bank from degradation following the initial restoration and enhancement efforts. The public awareness and education program will ensure that activities of recreational users at the site are consistent with the preservation of the natural habitat. Program components under consideration include a kiosk, brochures, site maps, and community meetings.*

Habitats and Species on Site

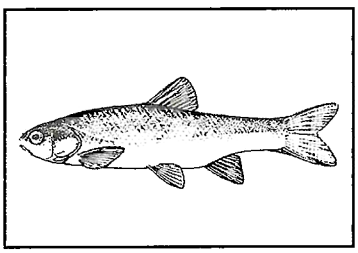
The Big Tujunga Wash site contains valuable habitats that can potentially support a variety of native California wildlife and provide suitable breeding grounds for a number of endangered, threatened, or sensitive plant and wildlife species.

Essentially, the site contains three types of native habitat: **alluvial scrub, aquatic,** and **willow riparian.** A significant portion of the native habitat has been infested with giant reed and, to a lesser extent, salt cedar Similarly, exotic wildlife species such as the bullfrog and largemouth bass thrive at the expense of native species such as arroyo chub and the Santa Ana sucker This project aims to remove exotic species from the site to ensure that native species can flourish without harm.

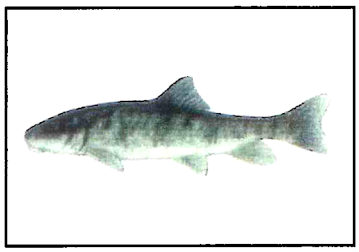
Native species existing, or that have the potential to exist at the site include the following:

- Sensitive species associated with the alluvial habitat:
  - Loggerhead shrike
  - Orange-throated whiptail
  - San Diego horned lizard
  - California gnatcatcher (a federal-listed threatened species)
- Sensitive species associated with the riparian habitat:
  - Willow Flycatcher (federal and state-listed endanered species)
  - Least Bell's vireo
- Sensitive species associated with the aquatic habitat:
  - Southern California arroyo chub/Santa Ana sucker fish
  - Southwestern pond turtle
- The Big Tujunga Wash also provides suitable habitat for a number of raptor (prey birds) species, including:
  - Red-tailed hawk
  - Red-shouldered hawk
  - American kestrel
  - Sharp-shinned hawk
  - Cooper's hawk
- The site provides important recovery habitat for the state-listed endangered plant, the slender-horned spineflower

NATIVE SPECIES



Arroyo Chub[1]



Santa Ana Sucker[1]

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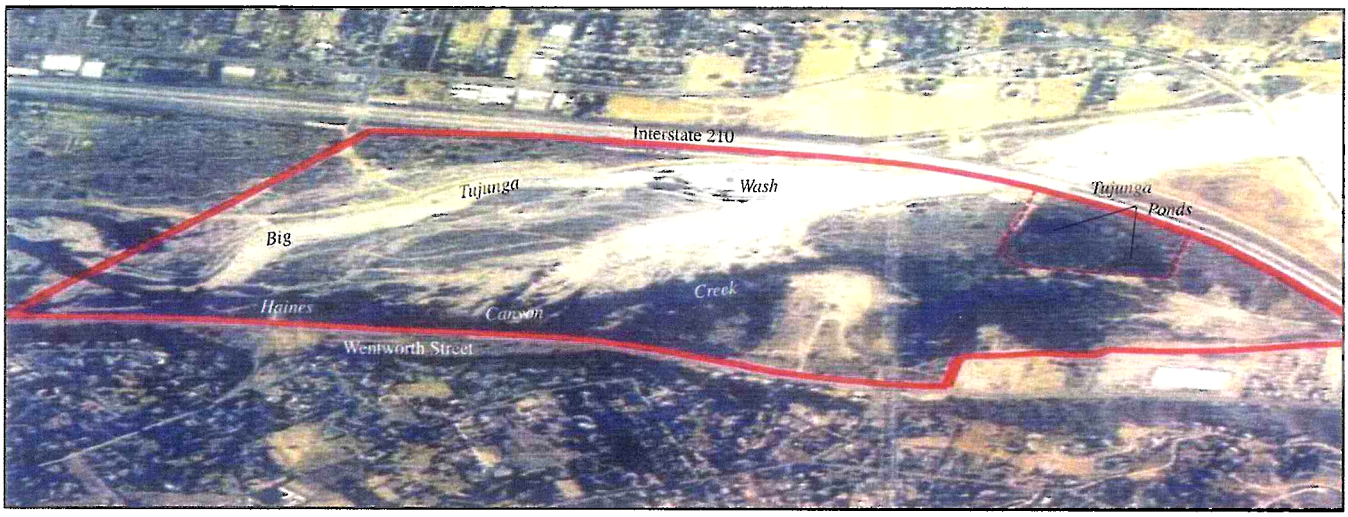
Big Tujunga Wash Mitigation Bank

Mission Statement

Restore, enhance, and preserve the native ecosystem and wildlife habitat at the Big Tujunga Wash site to cost-effectively maximize its value as a mitigation bank

Project Background and Objectives

In 1998, the Los Angeles County Department of Public Works (LADPW) purchased the Big Tujunga Wash site from the Calmat Company (now Vulcan Materials) The site is a 207-acre parcel of land that is bordered on the north by the 210 Freeway and on the south by Wentworth Street.



Historically, the site was used for gravel mining operations. Local residents have also used the numerous trails throughout the site for walking and horseback riding

Prior to the purchase, LADPW reached a tentative agreement with the **resource agencies** to establish a mitigation bank at the Big Tujunga Wash site The mitigation bank will serve to offset unavoidable impacts to habitats as a result of LADPW's current and future flood control projects.

In order for the Big Tujunga Wash site to qualify as a mitigation bank, it must provide suitable habitat for native plant and wildlife species. As such, the LADPW has identified various enhancement measures aimed to restore and preserve the site's valuable native habitat Also included in the enhancement program is the restoration of the adjacent Tujunga Ponds. Currently, the ponds are breeding grounds for many invasive exotic species. Restoration of the ponds to their native habitat is vital to the success of the mitigation bank

The resource agencies have reviewed and approved an enhancement program. At this time, the LADPW is developing a master plan that will outline how to implement the enhancement program and explore long-term maintenance and monitoring solutions. The master plan is scheduled for completion in early 2000

Glossary of Terms

Alluvial Scrub Those species living or growing on sediment deposited by flowing water, as in riverbed or delta.

Aquatic Those species living or growing in, on, or near the water.

Ecosystem An ecologcal community considered together with its environment, functioning as a unit.

Exotic Species Those species not native to the place found. Exotic species are often introduced into a region by human activity. Over time, the exotic species often dominate the region by out-competing the native species for natural resources.

Mitigation Banking The intentional creation, restoration, or enhancement of a wetland to protect a habitat for the purpose of compensation unavoidable [but] necessary losses from specific future development actions *(Fish and Wildlife Service, Biological Report 88(41) (July 1988).*

Native Species Those species living or growing naturally in a given region.

Resource Agencies Jurisdictional State and Federal agencies involved in this project. They include the California Department of Fish and Game, Regional Water Quality Control Board, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service.

Willow Riparian Those species living or growing on the banks of a natural course of water.



Loggerhead Shrike[2]



California Gnatcatcher[2]



Willow Flycatcher[4]



Least Bell's Vireo[2]



San Diego Horned Lizard[3]



Orange Throated Whiptail[3]



Red-Tailed Hawk[4]



Red-Shouldered Hawk[2]



American Kestrel[2]



Sharp-Shinned Hawk[2]



Cooper's Hawk[2]



Southwestern Pond Turtle[5]

Exotic species that will be removed from the site as part of the enhancement program include the following:

- Giant Reed (Arundo donax) - Introduced into the United States from Europe for use as erosion control Since its introduction, giant reed has become one of the most destructive weeds in southern California.

- Salt Cedar (Tamarix samosissima) - A native of Europe introduced into the United States as an ornamental plant in the early 1800s A fierce competitor for water with a prolific reproductive capacity, it has successfully invaded nearly every drainage system in the Southwest including approximately 6,475 hectares (16,000 acres) in California (Lovich et al 1995)

- Water hyacinth and duckweed · These invasive plants cover the entire surface of the Tujunga Ponds, limiting the amount of sunlight and oxygen reaching the bottom of the ponds.

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[2]National Audubon Society. Field Guide to North American Birds, Eastern Region. New York. Knopf, 1994.
[3]Mattison, Chris. Lizards of the World. New York: Facts On File, 1989
[4]Thompson III, Bill. Foreward by John C. Sawhill. Bird Watching For Dummies. Foster City, CA. 1997.
[5]Niering, William A. Wetlands. The Audobon Society Nature Guides. New York: Knopf, 1985.

- Largemouth bass A highly predatory species that can prey on the young of the native fish species such as the arroyo chub and Santa Ana sucker.

- Bullfrog (Rana catesbeiana) · Bullfrog tadpoles have a voracious appetite and are known to prey on native frog and toad tadpoles. An adult bullfrog's diet typically consists of insects, crayfish, other frog and small fish which may include the arroyo chub and Santa Ana sucker.

- Brown-headed cowbird · A non-native bird species that is commonly found in open woodlands, farmlands, and suburbs in the winter. Cowbirds are obligate brood parasites which disperse into riparian habitat during the breeding season. Obligate parasites, such as the brown-headed cowbird, deposit one or more eggs into the nests of host species, often removing or destroying some of the host eggs

  One female cowbird has the potential to lay as many as 40 eggs per season, ultimately parasitizing up to 40 different host nests in one breeding season and significantly reducing the breeding success of host species.

  The cowbird eggs hatch several days ahead of most host species' eggs. The cowbird chicks then push the remaining host eggs out of the nest or simply out-compete the smaller host chicks for food

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We Seek Your Feedback!

You can help us develop a "community-friendly" mitigation bank by providing valuable input and feedback during the planning stages. Specifically, we seek community feedback in these important areas:

- Long-term site management, including community-based patrol and/or maintenance.
- Preferred access points and trails.
- Public awareness and education program such as organized nature walks and school outings
- Other public uses that are consistent with the project mission and do not undermine the integrity of the mitigation bank.

Remember, all proposed activities are contingent upon approval by the resource agencies.

For more information please contact: Frank Wu, Project Manager, Department of Public Works, County of Los Angeles, 900 South Fremont Boulevard, Alhambra, CA 91803; (626) 458-6117: (626) 457-5326 fax; fwu@dpw.co.la.ca.us

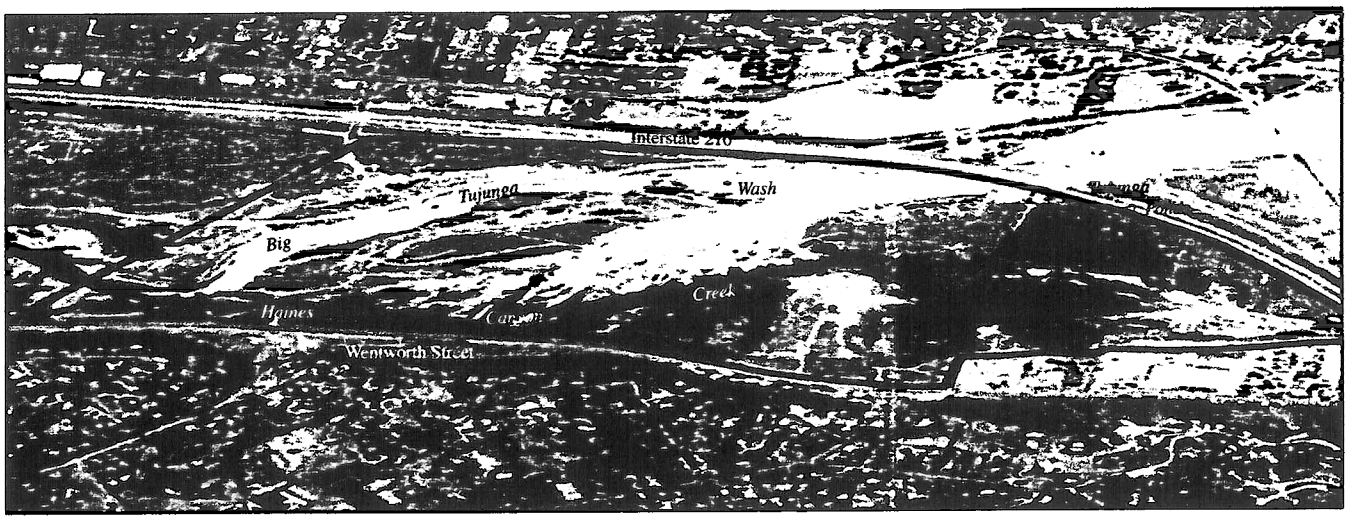
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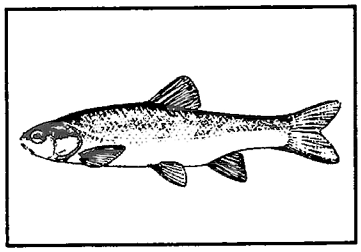
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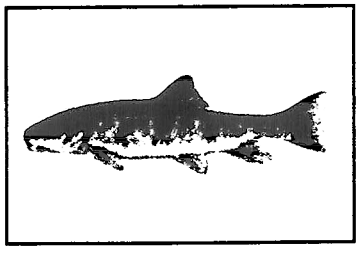
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NATIVE SPECIES



Arroyo Chub[1]

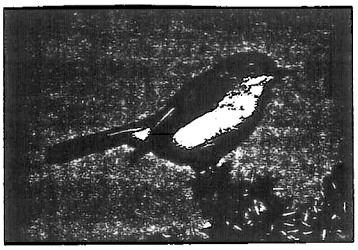


Santa Ana Sucker[1]

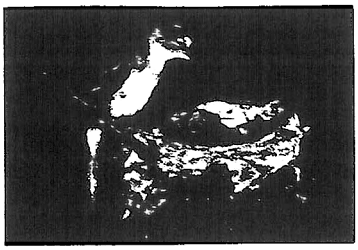
[1] Page, Lawrence M. and Brooks M Burr. Freshwater Fishes. Boston: Houghton Mifflin Company, 1991.



Loggerhead Shrike[2]



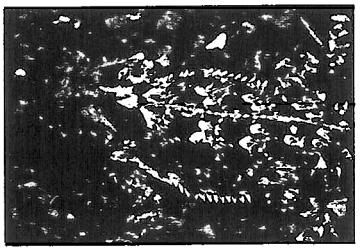
California Gnatcatcher[2]



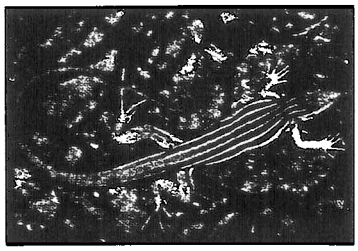
Willow Flycatcher[4]



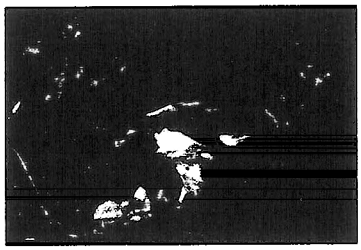
Least Bell's Vireo[2]



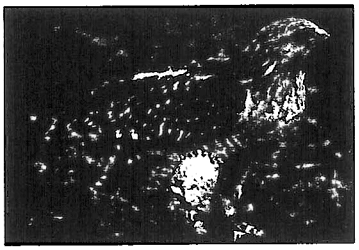
San Diego Horned Lizard[3]



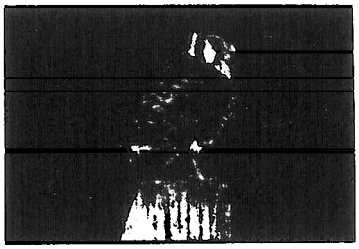
Orange Throated Whiptail[3]



Red-Tailed Hawk[4]



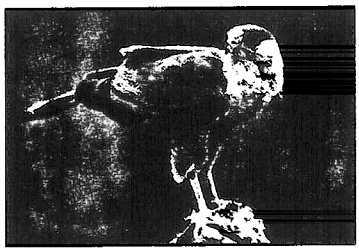
Red-Shouldered Hawk[2]



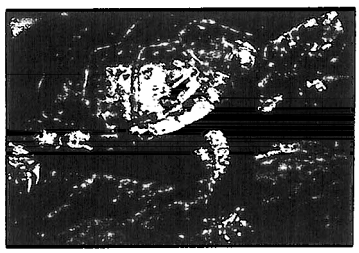
American Kestrel[2]



Sharp-Shinned Hawk[2]



Cooper's Hawk[2]



Southwestern Pond Turtle[5]

Exotic species that will be removed from the site as part of the enhancement program include the following:

- Giant Reed (Arundo donax) - Introduced into the United States from Europe for use as erosion control. Since its introduction, giant reed has become one of the most destructive weeds in southern California.
- Salt Cedar (Tamarix samosissima) - A native of Europe introduced into the United States as an ornamental plant in the early 1800s. A fierce competitor for water with a prolific reproductive capacity, it has successfully invaded nearly every drainage system in the Southwest including approximately 6,475 hectares (16,000 acres) in California (Lovich et al. 1995).
- Water hyacinth and duckweed - These invasive plants cover the entire surface of the Tujunga Ponds, limiting the amount of sunlight and oxygen reaching the bottom of the ponds.

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[2]National Audubon Society. Field Guide to North American Birds, Eastern Region. New York: Knopf, 1994.
[3]Mattison, Chris. Lizards of the World. New York: Facts On File, 1989.
[4]Thompson III, Bill. Foreward by John C. Sawhill. Bird Watching For Dummies. Foster City, CA. 1997
[5]Niering, William A. Wetlands. The Audobon Society Nature Guides. New York: Knopf, 1985.

- Largemouth bass - A highly predatory species that can prey on the young of the native fish species such as the arroyo chub and Santa Ana sucker

- Bullfrog (Rana catesbeiana) - Bullfrog tadpoles have a voracious appetite and are known to prey on native frog and toad tadpoles. An adult bullfrog's diet typically consists of insects, crayfish, other frogs, and small fish which may include the arroyo chub and Santa Ana sucker

- Brown-headed cowbird - A non-native bird species that is commonly found in open woodlands, farmlands, and suburbs in the winter Cowbirds are obligate brood parasites which disperse into riparian habitat during the breeding season. Obligate parasites, such as the brown-headed cowbird, deposit one or more eggs into the nests of host species, often removing or destroying some of the host eggs.

  One female cowbird has the potential to lay as many as 40 eggs per season, ultimately parasitizing up to 40 different host nests in one breeding season and significantly reducing the breeding success of host species.

  The cowbird eggs hatch several days ahead of most host species' eggs. The cowbird chicks then push the remaining host eggs out of the nest or simply out-compete the smaller host chicks for food.

We Seek Your Feedback!

You can help us develop a "community-friendly" mitigation bank by providing valuable input and feedback during the planning stages. Specifically, we seek community feedback in these important areas:

- Long-term site management, including community-based patrol and/or maintenance.
- Preferred access points and trails.
- Public awareness and education program such as organized nature walks and school outings.
- Other public uses that are consistent with the project mission and do not undermine the integrity of the mitigation bank.

Remember, all proposed activities are contingent upon approval by the resource agencies.

For more information please contact: Frank Wu, Project Manager, Department of Public Works, County of Los Angeles, 900 South Fremont Boulevard, Alhambra, CA 91803; (626) 458-6117; (626) 457-5326 fax; fwu@dpw.co.la.ca.us

RECEIVED NOV 3 0 1999

Comments

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7. Do you have any ideas on potential candidate organizations that can become long-term "caretakers" of the site?
8. Which other groups or individuals should we speak to regarding this project?

Dear Lilian De Loza: 11-28-99

Thank you for the informative meeting on 11/17/99 at Lake View Terrace Recreation Center. It was good to meet the team involved to restore and preserve the Big Tujunga Wash Mitigation Bank's valuable native habitat and ~~restoration~~ restore the Tujunga Ponds. It was good to see Frank Wu again. Here are our recommendations:

- Consider the gated entry opposite Marybell Ave which leads to the staging area since there is better visibility of traffic on Wentworth Street.
- Foot Paths for pedestrians and handicap use for viewing the flora and fauna.
- Benches for resting and viewing special points of interest.
- Trash and Recycle Bins at strategic locations for public use.
- Horse Riders to be confined to the horse trails. Have Hitching Posts at intervals where riders can walk to Foot Paths and enjoy the environment along the Foot Paths and then can return to their horse to continue on the horse trails.

Perhaps most of these ideas are already in place. Succes in all your efforts.

One last idea - Docents for guidance and information services similar to Descanso Gardens.

Sincerely, Ivan Cole & Roberta Cole

Ivan E & Roberta C Cole
10040 Wentworth St., Shadow Hills, CA 91040-1246

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name Ivan E & Roberta C Cole Phone/Fax (818) 353-4633

Address 10040 Wentworth St

City/State/Zip Shadow Hills, CA 91040-1246

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

Comments

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1, Have ridden there for over thirty years
2, Press coverage & other community groups meetings
3, Same at # 2
4. Put signs on them about the reason for trapping
5. Yes, happy to do so
, Yes, they do this now to some extent
7. Valley Horse Owners, Lake View Terrace Improvement Assn. - L.V.T. Homeowners Shadow Hills Property Owners Assoc. & S.V.A.P.
8. Some groups as #7

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name TAMA LOCKWOOD Phone/Fax 818-899-5825

Address 11370 RUGGIERO AVE.

City/State/Zip LAKE VIEW TERRACE, CA. 91342

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

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It is critical that it be written into the proposal a steadfast Clause that No matter what happens if the Golf Course does get developed the are guaranteed to be financially ~~developed~~ responsible for the soil brought in and water polation on this mitigation area.

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name Linda Fullerton Phone/Fax 818 246 8877

Address 9800 Craigmitchell 246 8984 FAX

City/State/Zip Shadow Hills 91040

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

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Please create a community advisory committee immediately that would include a representative from the local ETA, from SWAP, and from the Lake View Improvement Association.

Set one time each month to meet with the reps. Allow the organizations to choose their reps.

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name Tristine Reiner Phone/Fax 818 896-2110

Address 10578 Arnwood Rd

City/State/Zip Lake View Terrace, CA 91342

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

Comments

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There must be an advisory committee that would meet on a regular basis That would be impowered to direct the direction this mitigation goes.

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

For Same #

Name Phyllis Hines Phone/Fax (818) 892-7644

Address 11515 Orcas Ave

City/State/Zip Lake View Terrace CA 91342

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

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8. Which other groups or individuals should we speak to regarding this project?

Please request community to form input committee
for all aspects of the project.
Publish criteria for achieving bank and the budget.
Emphasis on diversity, enrichment of native species.
Safeguard the project from the golf course contamination
and by monitoring with independent party and make monitor
reports public.

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name Joanne Westbrook Phone/Fax 951.4495

Address 9401 McBroom St

City/State/Zip Sunland CA 91040

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

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Comments

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1– LOTS - YES 30 YRS

4 EXPLAIN - END OF SPAN - WITH -CARE-

WHY ENCOURAGE MORE USE - YES

6- NOT SURE "PATROL ANSWER-

I broke it, arm - thats why everything is short

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name _____ Phone/Fax 818 353 5534

Address _____

R Ms. Carol Roper
9635 La Canada Way
Sunland, CA 91040

City/State/Zip _____

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

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(1) I live on the ridge above this BTW site. I walk there regularly.

(2) Regular meetings, mailers to community in LVT & Shadow Hills Pacoima Sunland.

(3) As above + Audubon Society. DFG,

(4) Teach about reason for trapping. Make community value the program.

(5) Yes, I ride & drive a buggy w/ my horse.

(6) Yes. Community ~~participation~~ participation.

(7) 4H? Rangers? local biology classes from schools. P.T.O.

(If necessary, please continue your comments on the reverse side of this paper.)

To receive updates and information on The Big Tujunga Wash Mitigation Bank project, please fill out your name and address.

Name SUZANNA WOOD Phone/Fax tel 818-352-7040 fax 352-0240

Address 9626 HILLROSE ST

City/State/Zip SHADOW HILLS, CA 91040-1720

Please mail completed comment forms to: Lilian De Loza, Project Manager, Consensus Planning Group, 444 South Flower Street, Suite 1300, Los Angeles, CA 90071

(8) local people: horse people: audubon society: free people from advisary committee per: Sepulveda Basin Wildlife Area.

Maintenance of kiosks — faded, out-dated info...

Trash - community pick-up works - we need peripheral trash containers to be emptied by County.

Measurable goals - include reduction of trash

* of clinics/school visits.

Toilets!

PUBLIC COMMENTS SUMMARY AND RESPONSES

Comment: A community advisory committee should be formed in which local residents would have the opportunity to provide input.

Response: LADPW is committed to keeping the public involved throughout this project and endorses the idea of forming a community advisory committee (CAC). A CAC made up of representatives from various local organizations would serve to consolidate opinions and ideas, therefore simplifying communications between LADPW and the public. It is up to these local organizations, and any other interested parties, to form the CAC; and do so as soon as possible in order to effectively comment on this report.

The CAC would stay in touch with project planners on a regular basis through its chosen representative. Please note that the formation of the CAC is only to facilitate communication. LADPW intends to hold additional community meetings at critical stages of the project to share information with and obtain input from the public.

Comment: Meetings like the one held on November 17, 1999 in Lake View Terrace should be held at critical points of the project to share information with the community

Response: Noted. LADPW intends to hold additional meetings as the project progresses. The next logical point would be following the completion of the Final Master Mitigation Plan and prior to its implementation. LADPW also intends to distribute annual newsletters as a mean to share information (i.e. water quality data, progress, achievements, outlook, etc.) with the public.

Comment: Consider gated entry opposite Marybell Avenue.

Response: Pedestrian/equestrian access at Marybell is currently under evaluation and is discussed as an optional enhancement alternative in Section 9.5 Entrance to the Mitigation Bank at Marybell Avenue.

Comment: Establish footpaths for pedestrian and handicap use for viewing the flora and fauna. Bench for resting and viewing special points of interest. Trash and recycle bins at strategic locations for public use. Horse riders to be confined to the horse trails. Have hitching posts at intervals where riders can walk to foot paths.

Response: Trails are designed for both equestrian and hiking use. Benches and hitching posts may be added at strategic locations along the trails. Please see Section 3.3 Formal Trails System Program for details.

Comment: Docents for guidance and information services similar to Descanso Gardens.

Response: Docent programs and educational tours are currently under evaluation. Their implementation rests largely on volunteers and participation from local organizations such as SWAP Any such programs would need to be regulated as to avoid impact to sensitive habitats and conflict with existing equestrian use.

Comment: We are concerned about contamination to the mitigation bank site as result of the proposed upstream golf course development.

Response: The implementation program includes regular water quality monitoring following completion of the construction phase. Water quality data will be reported to the resource agencies quarterly. It will be the responsibility of the CDFG, RWQCB, and USFWS to enforce the laws regarding water quality impacts on sensitive species from upstream

development, and take the necessary actions against upstream sources. Please see Section 5.3.6 Water Quality Monitoring for details.

Comment: The upstream golf course developer anticipates hauling soil through the mitigation bank area.

Response: As the new property owner. LADPW will evaluate all proposed activities on the Big Tujunga Wash site and determine its compatibility with mitigation banking objectives. The Department has not authorized the hauling of soil through the site.

Comment: Safeguard the mitigation bank project from the upstream contamination by hiring an independent consultant to conduct water quality monitoring and making the monitoring results public.

Response: Please see Section 5.3.6 Water Quality Monitoring for details. In addition to the Annual Monitoring Report, LADPW intends to publish an annual newsletter summarizing our efforts on this project in less technical terms. The newsletter would include water monitoring results as well as project status and outlook.

Comment: One of the favorite equestrian trails on the site traverses 1,000 feet in the streambed. What will be the fate of this trail?

Response: The newly named "Water Trail" will be modified to minimize impacts to sensitive aquatic species living in the stream. Similarly, many of the existing trails will either be abandoned (or reclaimed) or modified to allow sensitive habitats to flourish. Rest assured that the new, environmentally sensitive trail system will be just as, if not more enjoyable than existing trails. Please see Section 3.3.2.3 Trails Modification and the accompanying Trail Guide for details.

Comment: The proposed water conservation activities at Hansen Dam by the U.S. Army Corps of Engineers and the LADPW could potentially impact the mitigation bank site.

Response: Project planners are monitoring development of the proposed water conservation activities downstream at Hansen Dam and will take appropriate actions to prevent the site from adverse impacts.

Comment: Sufficient funds should be allocated to repair fences on at least a weekly basis. Plan should include sufficient resources to have someone with sufficient authority patrol the area frequently enough to keep the vandals away

Response: LADPW intends to promptly repair all broken fences at the site. Similarly, trash bins will be emptied regularly. The issue of site patrol is currently under evaluation and is discussed as an optional enhancement alternative in Section 9.4 Regular Patrolling of the Mitigation Bank.

Comment: Remove papyrus and 'composite family' plant near the ponds. Suggest planting Nevin's Barberry on site.

Response: Noted. Please see Exhibit 2-A.

Comment: Would like to see some mechanism by which the site's long term maintenance is assured.

Response: Following the initial construction effort, LADPW will conduct five years of performance monitoring or until success criteria have been met. Please see Section 2.0 Project Goals and Success Criteria and Section 8.0 Success Criteria and Contingency Measures for

details. LADPW intends to transfer maintenance reponsibilities beyond five years to a 'long-term caretaker' such as a nature conservancy or a local non-profit organization.

Comment: Take into consideration the proposed improvements at Big Tujunga Dam. Would it be feasible to maintain a continuous flow in the creek to provide better habitat for the Santa Ana Sucker once the improvement work is complete?

Response: Storage capacity in the restored reservoir will remain limited, therefore LADPW can not guarantee a continuous flow year-round.

Comment: The long-term monitoring plan should include money for water quality control monitoring, policing, docent programs, annual biological surveys, and trails maintenance. There should be a specific budget and it must be funded.

Response: LADPW will form a budget and hire a consultant to ensure implementation of the MMP once it has been approved by the resource agencies. Some items such as policing, docent programs, and trail maintenance may rely heavily on volunteer efforts.

Comment: All persons who attended the November 17, 1999 meeting should be sent copies of the master plan automatically.

Response: The master plan will be available at local libraries and will be sent to local organizations identified in the report.

APPENDIX J

AGENCY AND PUBLIC COMMENTS AND RESPONSES ON THE DRAFT MMP

RESPONSE TO AGENCY COMMENTS ON THE DRAFT MASTER PLAN

California Department of Fish and Game Letter

1 A section has been included in the document reflecting the need and the process for establishing a formal banking agreement between LADPW and CDFG

2. A discussion has been included in the document to reflect the fact that the MMP only addresses the first 5 years of implementation, maintenance, and monitoring at the site. The LADPW will address the long-term maintenance, monitoring, and care-taking of the site in a separate document.

3 See previous response.

4 LADPW will coordinate with CDFG regarding an agent that may be available and qualified to hold the conservation easement and/or take over the long-term management of the Bank.

5 A monitoring program has been developed to determine if public use of the site negatively affects the site's biological resources. The results of the monitoring will be documented in regular maintenance and monitoring reports and remedial actions will be taken to correct or eliminate negative impacts.

6. Additional trail closures have been included in the Final MMP Additional trail closures are shown on figure 3-12.

7 The trails section has been revised with a discussion of allowable and non-allowable uses.

8. Noted. LADPW will determine the feasibility of implementing some of the optional measures and then they will coordinate with CDFG regarding additional mitigation credits.

9 The Tujunga Ponds will be included in the management of the site. Although, at this time, the LADPW will keep the pond configuration as it currently exists and will attempt to eradicate the exotic wildlife in the ponds through extensive eradication programs.

10 Noted. See previous response.

11 Noted. The Citizen Advisory Committee will include agency personnel as well as individuals representing local stakeholder groups.

12. The goal statement in Section 2.6 has been expanded to reflect the CDFG's comment.

13 Table 1-3 has been corrected to reflect the comment.

14 Noted. The word "created" has been removed from the text in Section 2.4

15 The text in Section 2.8 1 1 has been corrected to reflect the comment.

16. The text in Section 2.11 has been modified to reflect this comment.

17 The public awareness program will provide regular newsletters and fact sheets to the public that describe each of the MMP programs. In addition, a monitoring program will document the successes and problems resulting from public use. The results of the monitoring will be disclosed to the public and remedial action will be undertaken to solve any problems that arise.

18. Flood control and fuel modification activities have been removed from the text in Section 3.2.4.2, they are not part of the planned programs. The coast live oaks have been changed from 5 gallon size to 1 gallon size and the planting density has been increased. Table 3-2 has been revised to reflect the additional chaparral species suggested by CDFG. The augering for trees has been changed to reflect CDFG's suggestion.

19 Noted.

20 Comments noted and Section 3.3.3 1 changed to reflect CDFG suggestions.

21 Noted. The text reflects the fact that individual tamarisk and giant reed plants that are not shown on figure 3-7a will be removed.

22. Noted. Three additional traps have been added at stable areas offsite. Cowbird trapping beyond the 5 year duration of the MMP will be addressed by LADPW in subsequent documentation.

23 The table of target wildlife species has been modified to reflect CDFG suggestions.

24 Performance standards have been modified to reflect CDFG recommendations.

25 Performance standards have been modified to reflect CDFG recommendations.

26. Performance standards have been modified to reflect CDFG recommendations.

27 Noted. Text changed to reflect CDFG suggestions.

28 Text changed in Section 2.12 to reflect CDFG comment.

29 Noted. The 5-year duration of the MMP addresses monitoring and repeated removal of exotic wildlife from the Tujunga Ponds. Long-term monitoring and removal will be the subject of subsequent documentation by the LADPW

30 Noted.

31 Noted. Section number has been corrected.

32. Non-native wildlife species in Appendix B have been noted in the table.

33 Four additional trails have been closed. The Dr Au trail will remain open for now but monitoring of human impacts may justify closure if the public does not remain on the established trails. Closure of this trail will be further addressed in the monitoring reports. The access points will be modified so that motorcycles cannot access the site. Limiting access on the proposed Bert Bonnett trail from downstream areas is not because the trail is in the floodplain of the Big Tujunga Wash. Thus, monitoring of impacts from vehicles will be conducted to determine if remedial actions are necessary to correct problems associated with this trail. The LADPW does not have any established plans for allowing additional large-scale organized recreational rides on the site. The use of the Cottonwood Area for organized activities would require a permit from LADPW and the compatibility of the proposed use would be evaluated to determine if it fits with the goals of the Mitigation Bank.

34 The goal statement has been changed in the brochure and "no smoking" and "no fires" have been added to the disallowed uses at the site.

35 Noted. The perimeter fence will be repaired and access will only be allowed at established access points. The existing fence around the Tujunga Ponds will be repaired as part of the MMP

36. Noted

37 Noted

38. Noted.

39 Noted. Pond reconfiguration Option #3 would be investigated in more detail prior to implementing this option. If LADPW decides to investigate reconfiguring the ponds, then a feasibility study would be conducted and the use of gill netting and seining would be described in more detail.

40 See response to comment number 28.

41 Noted.

42. Noted. See response to comment number 39

43 Noted.

44 The water quality monitoring program has been expanded to include testing for specific pesticides.

45 If the LADPW decides to investigate reconfiguring the ponds, then a detailed feasibility study will include a hydrology and engineering study and it will address the origin of the flow and how to manage stream flow within the pond area.

46. Noted.

47 Noted. The educational program will not be focused toward large groups of individuals, rather it will be limited to smaller, more manageable groups. In addition, the Consultants will meet with the school personnel on the site to show them the allowable use areas and the off limits areas.

48. LADPW will address long-term funding and management of the site in subsequent negotiations with CDFG

49 LADPW will be addressing the feasibility of using volunteers to assist with site patrols. If volunteers are used, then they would require appropriate training and local law enforcement agencies would be contacted to determine authority of volunteers.

United States Army Corps of Engineers Letter

1 Noted. The algorithm has been modified to reflect the comment.

2. The text has been changed to reflect this comment.

3 If the LADPW decides to implement one of the pond reconfiguration options, then the need for a Section 7 Consultation or Section 10(a) Incidental Take Permit from the USFWS will be determined through coordination with the Corps and the USFWS. At this point, the Final MMP does not include any reconfiguration of the ponds, rather control of exotic wildlife species will be undertaken.

4 Noted. The section describing the Nationwide Permit Program has been updated.

5 Noted. A discussion has been added regarding the potential for a 10(a) permit.

6. Noted.

7 Noted.

8 At this time, the LADPW is not proposing to reconfigure the Tujunga Ponds. If the LADPW decides to go forward with reconfiguring the ponds, then a detailed feasibility study will be conducted. At that time, the potential gain/loss of waters of the United States and riparian habitat would be determined.

9 The increase in flow from Tujunga Dam has been eliminated as an option because the reservoir does not contain enough volume of water to provide continual flow

10 Noted. See response to comment number 8.

United States Fish and Wildlife Service

1 At this time, the LADPW is not proposing to reconfigure the Tujunga Ponds. If the LADPW decides to go forward with reconfiguring the ponds, then a detailed feasibility study will be conducted. The compensation for the loss of original mitigation value would be determined during the preparation of the feasibility study

2. Noted. These species have been added to the plant palettes.

3 Noted. The potential establishment of a population of yellow-legged frog at the site would be considered in the long-term maintenance and monitoring of the site, after a decision is made whether or not to reconfigure the Tujunga Ponds. If the exotic wildlife can be controlled, then introduction of yellow-legged frogs may be feasible.

4 The wetland area on the south side of the site is included in the mapped riparian habitat. This area is already vegetated with riparian habitat and does not really lend itself to further enhancement.

5 The preferred herbicide for use in riparian areas and adjacent to aquatic habitats is Rodeo. This herbicide has been approved for use in these situations by the Environmental Protection Agency Rodeo is the form of Roundup that is approved for aquatic use because it lacks the surfactant that has detrimental effects on larval amphibians and fishes.

6 Noted. Monitoring for listed species of birds during the breeding season will be conducted on an annual basis for the duration of the MMP If and when these species are documented on the site, then increases in the population sizes will be one measure of success.

7 Monitoring for listed species of birds during the breeding season will be conducted and during this monitoring, the biologists will note nest locations (if easily observed) that occur near active trails. If disturbance of the nesting birds becomes an issue, then the biologist will have the option to temporarily close trails until the birds have completed their nesting cycles.

8 The protocols may not be able to achieve complete eradication of the exotic wildlife species from the site. Thus, the only option may be to just continue with the accepted protocols to attempt to keep exotic wildlife populations under control.

9 The LADPW will negotiate an agreement with a qualified and accepted care-taking agency to ensure the continued management and maintenance of the site.

10 Noted.

11 Noted.

12 The plant palette has been adjusted to reflect USFWS' comment.

13 The layout of the oak/sycamore woodland with the coastal sage scrub understory has been modified to reflect a more open coastal sage scrub community The trees have been grouped to reflect areas of woodland habitat.

14 Figure 3-5 has been modified to reflect the comment.

15 The size of the cages around saplings has been modified.

16 At this time, the ponds will not be reconfigured so the habitat enhancement around the ponds will occur

17 Noted.

18 Noted. The text has been modified to reflect the more frequent inspections following treatment of water hyacinth with herbicides.

19 Noted. The design of the traps has been changed to reflect the comment.

20 Sentence clarified to reflect the comment.

21 Sentence clarified to reflect the comment.

22. Noted. Cedar shingles will not be used on the kiosks.

23 The modification of the Water Trail includes approximately seven crossings, some of which were already present prior to the modification. The crossings are actually preferable to the equestrians walking down the center of the stream. In order to reduce the number of crossings to 4 it would require the removal of a substantial amount of willow riparian habitat or the equestrians would have to be allowed to walk through portions of the stream lengthwise. Regular monitoring of the trails use should determine whether the use of seven stream crossings is detrimental to the wildlife on the site and in the stream.

24 Noted. Lead shot will not be used to shoot bullfrogs.

25 At this time, the LADPW is not proposing to reconfigure the Tujunga Ponds. If the LADPW decides to go forward with reconfiguring the ponds, then a detailed feasibility study will be conducted. This study would include a detailed literature review to determine if other similar projects have been successful.

26. Noted.

27 Hyacinth is covered in its own section in the document.

28 The original functional analysis was conducted on the Big Tujunga Wash Mitigation Bank site as part of a 1998 study of the site and the San Gabriel River channel (Chambers Group 1998). The functional analysis approach was modified to reflect the fact that a separate reference site was not utilized in the analysis. The method used in the original functional analysis at the Big Tujunga Wash site was approved by the Corps prior to its use.

29 The LADPW will conduct the baseline water quality sampling prior to initiation of the MMP programs. The samples will be collected using accepted protocols. The analyses will be conducted by a certified water quality laboratory

30 At this time, the LADPW is not proposing to reconfigure the Tujunga Ponds. If the LADPW decides to go forward with reconfiguring the ponds, then a detailed feasibility study will be conducted and the most suitable method for dewatering the ponds would be determined.

31 The LADPW will negotiate an agreement with a qualified and accepted care-taking agency to ensure the continued management and maintenance of the site.

32. A discussion has been included in the document to reflect the fact that the MMP only addresses the first 5 years of implementation, maintenance, and monitoring at the site. The LADPW will address the long-term maintenance, monitoring, and care-taking of the site in a separate document. Long-term management of the exotic wildlife species will be a primary consideration in the subsequent documentation for long-term management.

33 Three additional cowbird traps have been added at stable locations within 7 kilometers of the riparian habitat at the Big Tujunga Wash Mitigation Bank site. The locations will be identified by qualified cowbird experts.

34 At this time, the LADPW is not proposing to reconfigure the Tujunga Ponds. If the LADPW decides to go forward with reconfiguring the ponds, then a detailed feasibility study will be conducted.

35 The option addressing an increase in flow from Tujunga Dam has been eliminated because the reservoir does not contain enough water volume to provide adequate flows down the Big Tujunga Wash.

36 If the optional restoration of the oak/sycamore woodland is undertaken, then the irrigation system will be removed after the initial 5-year management period. The irrigation system will consist primarily of a drip system that will be easily removed. Any temporary pipes that were installed will be carefully removed so as not to disturb any plantings.

37 Eliminating access from the downstream areas would be very difficult because the trails are located in the wash where it would be impractical to erect fences. The monitoring of the site will include documenting human impacts on and off the trails. If vehicle access is a continual problem, then the Consultant and LADPW will develop some contingency measures to control this problem.

United States Fish and Wildlife Service – Additional comments per letter dated February 29, 2000

38 LADPW will address the mitigation banking instrument in a separate document. A discussion has been included in the document to reflect the fact that the MMP only addresses the first 5 years of implementation, maintenance, and monitoring at the site. The LADPW will address the long-term maintenance, monitoring, and care-taking of the site in a separate document. Long-term management of the exotic wildlife species will be a primary consideration in the subsequent documentation for long-term management.

39 Organochlorines have been added to the initial baseline and yearly monitoring efforts of the water quality monitoring program.

40 The text has been changed to reflect this comment.

RESPONSE TO PUBLIC COMMENTS ON THE DRAFT MASTER PLAN

1 **Plan should address the site's maintenance and monitoring after the initial five-year effort. A funding source such as an endowment fund should be established that provides funding in perpetuity for continued maintenance and monitoring of the site. A conservation easement needs to be established to permanently protect the property.**

Public Works will enter into a Formal Banking Agreement with the resource agencies following finalization of the Plan. The Formal Banking Agreement is the appropriate vehicle to address the issues of maintenance and monitoring after the initial implementation program, potential funding sources, and conservation easement.

2. **Cost associated with enhancement measures is not discussed in the Plan. It is important for the residents to know when and if funds will be available to implement the enhancement measures and/or optional measures so that residents understand how long the project will be under construction in the area.**

Public Works is currently preparing to initiate the consultant selection process for the implementation of the Plan. The selection process will identify the cost of the Plan's measures. Funds will be encumbered once a consultant is under contract. Public Works will keep the community appraised of the project schedule through newsletters and community meetings.

3. **Project implementation should be phased to accommodate recreational users. Consider utilizing local newsletters in addition to the annual project newsletter as means to communicate with the community.**

Recommendation is noted. Project planners will make every effort to limit impact to recreational users during construction. However, due to the seasonal nature of most of the individual measures, priority must be given to timely completion of the work within the proper season. Local newsletters will be utilized to facilitate communication with the community

4 **Recommend adding a multi-use/equestrian trail as indicated on the Shadow Hills Community Plan along the north side of Wentworth Street, south of Haines Canyon Creek, to minimize traffic through the creek area.**

The proposed trail is located within City of Los Angeles' right-of-way Public Works believes that such a trail would need to be installed by the City

5 **The citizens patrol and residents whose homes overlook the area should be given contact numbers to report incidents or maintenance needs.**

Recommendation is noted. In addition to those provided in this Plan, contact information for future project personnel will be provided in newsletters.

6. **Suggest burning labels into small wood plaques that, if vandalized, are biodegradable. Or, as an alternative, place and remove signs before and after docent tours.**

   Placing and removing the signs before and after docent tours represent the more viable option.

7 **Preference for the Figure 13 kiosk design over Figure 14. Overhang may need to be extended to protect literature from rain.**

   Noted.

8. **Recommend that plant fencing be at least 4 feet in height.**

   Noted.

9 **Suggest contacting the Wildlife Waystation and the Shadow Hills local Wild Bird Rescue regarding recycling.**

   Noted.

10 **Suggest that most trails be left as single-track in width, except for those used for school tours.**

   Noted.

11 **Suggest replacing all existing fencing with new ones. Exterior property lines should be fenced with heavier gauge fencing to prevent vandalism.**

   Noted.

12. **Use of retenone is not appropriate for this area.**

   Retenone will not be used for this project.

13 **Two important trails are not shown on the trail map (Figure 3-12).**

   The trail system described in this Plan has been developed with input from the local equestrian groups and has been approved by the regulatory agencies. It is necessary to close some of the more intrusive existing trails to ensure a thriving ecological and biological community

14 **Preference for Tujunga Ponds enhancement alternative No. 4, followed by No. 2.**

   Noted. The draft Plan alternative No. 4 is actually the basic action and has been renamed in the final Plan to reflect it. Public Works intends to proceed with the basic action (exotics removal and riparian revegetation) at this time. Public Works may conduct a feasibility study for transforming the ponds into a stream habitat in the future.

15 **Recommend that a step-over be installed at the Marybell entrance.**

Noted. Equestrian access at Marybell Avenue has been included in the Plan as an option.

16 **Suggest using the existing northwest entrance to the ponds area for visitor (school children) parking. Suggest using Cottonwood as the main entrance with vehicle parking for hikers and general viewing by students.**

Vehicle parking at the site will require a permit from Public Works to keep site disturbance to a minimum. At this time, Public Works has not designated a permanent parking lot onsite, though both areas will be considered.

17 **Support the live oak and sycamore, sage scrub revegetation plan to create additional natural habitat. Salvaged concrete can be used for streambed protection.**

Noted. However, streambed protection measures must comply with State and Federal environmental protection laws.

18 **Recommend placing trash receptacles at both sides of the Tujunga Wash at Wheatland and at the Marybell entrance.**

Trash receptacles will be placed in five strategic locations (including on both ends of Wheatland Avenue and at Marybell Avenue) to facilitate site cleanliness. Existing trash cans will be replaced with improved receptacles.

19 **The water quality monitoring program should include testing for pesticides. Sufficient funding needs to be in place to provide for the ongoing and in perpetuity testing on the water quality and review by independent testing labs.**

Public Works has added Pesticide Diazonone to the list of constituents to be tested. Funding issues for maintenance and monitoring activities beyond the five-year restoration program is outside of the scope of the Plan. These issues will be addressed in the Banking Agreement.

20 **Trails should be named after Carol Roper and Anson Burlingame.**

Public Works encourages the local communities to come up with a consensus on trail names.

21 **Add Pierce College in Woodland Hills to the list of potential labor sources for the Cowbird Trapping Program.**

Noted.

FAX

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
900 South Fremont Avenue Alhambra, CA 91803-1331

Date: February 22, 2000

To:	Mari Schroeder Chambers Group, Inc.	**Fax No:** **Tel:**	(949) 261-8950 (949) 261-5414
From:	Frank Wu Hydraulic / Water Conservation Division	**Fax No:** **Tel:**	(626) 457-5326 (626) 458-6117
Subject:	**Big Tujunga Wash Mitigation Bank Project Comments on the Draft MMP**	**Total Pages:**	32

Mari,

Following are the comments we have received so far on the draft MMP:

- DFG (13 pages)
- Corps (2 pages)
- USFWS (6 pages)
- Public (10 pages)

Additionally, please move the Implementation Plan section to the beginning of the report, making it more prominent. Also, Option 4 is the 'default' alternative for enhancement of the ponds. In other words, Option 4 is not really an option – it is a part of the implementation plan. Please modify the section showing only 3 options to reflect this.

Please call if you have any questions. Thank you.

FAX TRANSMITTAL

for State of California
Department of Fish and Game



South Coast Region

To: Frank Wu
L.A. County - Public Works

@ Fax No.: (626) 457 5326

Date: 2-10 Time: 1:30

From: Sarah Leslie *for* Chuck Raysbrook
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-2702
(858) 467-4239 - FAX

# of pages sent **including** transmittal sheet 14 ***Please call me immediately at (858) 467-2702 if you do not receive all pages.***

Comments:

Big Tujunga letter + attachment

STATE OF CALIFORNIA-THE RESOURCES AGENCY GRAY DAVIS, Governor
DEPARTMENT OF FISH AND GAME
South Coast Region
8 Viewridge Avenue
San Diego, California 92123
(858) 467-4201
FAX (858) 467-4239

February 7, 2000

Mr. Harry W. Stone
Director of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91803-1331

Dear Mr. Stone:

Big Tujunga Wash Mitigation Bank
Draft Master Mitigation Plan, Los Angeles County

The Department of Fish and Game (Department) has reviewed the draft Master Mitigation Plan (Plan) which provides guidelines for enhancement of biological resource values at the proposed Big Tujunga Wash Mitigation Bank (Bank). The 207-acre site is located near the community of Sunland, just south of the 210 freeway. The draft Plan represents a commendable effort on the part of the Public Works Department to identify enhancement strategies aimed at controlling exotic plant and animal species populations that compete with and displace native species. By improving conditions for native fish and wildlife resources, the overall habitat values at this site will be enhanced, thereby helping offset impacts to biological resources from various public work's projects.

Background: The site is wholly located within a state-designated Significant Natural Area (LAX-018) and the biological resources found here are of local, regional and state-wide significance. The area supports several rare habitat types, including Riversidean Alluvial Fan Sage Scrub and Southern Arroyo Willow Woodland. Areas of perennial and intermittent stream flow on Haines Canyon Creek and Big Tujunga Wash support a suite of rare native fishes, including the federally Proposed Threatened Santa Ana sucker. State and federally listed Endangered least Bell's vireo and southwestern willow flycatcher are known to use the riparian habitat here. Numerous wildlife California Species of Special Concern occur in the aquatic, alluvial and riparian habitats onsite. Local hikers and equestrians have extensively used the site for recreation in the past.

The Department has previously indicated our support for acquisition and establishment of a conservation bank here due to the extreme significance of the onsite biological resources and need for protection and management of these resources (see our previous comments dated September 29, 1998). As proposed, the Bank would emphasize the preservation, enhancement and management of onsite resources to compensate for impacts associated with various types of projects undertaken by the Los Angeles County Public Works Department. Creation of wetlands to offset loss of wetlands elsewhere, is not a component of the proposed Bank.

The Public Works Department has an outstanding mitigation obligation for previous and ongoing channel maintenance activities associated with the 100 Channels Clearing Project pursuant to Streambed Alteration Agreement 5-328-97. This agreement requires that 62.7 acres of compensation habitat be permanently preserved and managed. Once the Bank is established, 62.7 acres of credit from this bank would serve to meet this obligation. Other projects potentially utilizing credits in this Bank have yet to be proposed.

* * * * *

Due to the complexity of the draft Plan, the Department's comments are organized into two sections: a general summary of major issues is included here, and our specific, more detailed comments follow in an attachment.

General Comments

Establishment of the Bank:

As we previously indicated in our September 29, 1998 letter, the Department will require that a formal Banking Agreement be developed following the policies and procedures of The Resources Agency. This has yet to occur. Formal establishment of the bank will also require permanent protection through a Conservation Easement in favor of the Department or our approved agent. The Enhancement Plan prepared here needs to be augmented to include a more detailed management plan which addresses long term management and monitoring of the site. A funding mechanism is also needed, such as a permanent, non-wasting endowment, in order to ensure the programs are funded and effective.

Long-Term Management and Monitoring:

2 The draft Plan under review here focuses on development of an intensive enhancement and monitoring program that would occur generally over a five-year period. As currently written, the Plan lacks a long-term ongoing management and monitoring component. It is our understanding that the Bank is to serve as a permanent mitigation site for projects that have either permanent or ongoing impacts to fish and wildlife resources, therefore, management and monitoring of the preserve area needs to be in perpetuity.

3 The draft Plan needs to develop a specific section describing long term management and monitoring of the site to ensure that the values at the site are preserved and maintained in a condition which maximizes biological resource values. We recommend the intensive five-year program described in the draft Plan be augmented with periodic follow-up management and monitoring. At a minimum, the management plan should address activities such as fencing repair, replacement of signage, periodic exotic species control and trash cleanup, allowable and non-allowable uses, patrolling/site security and coordination with adjacent landowners/managers. Provisions for permitting non-intrusive, non-manipulative scientific study need to be included. The monitoring program should be sufficiently intensive to ensure that the enhancement and

management measures are effective in improving conditions for fish and wildlife and that habitats are reasonably protected from adverse impacts of public use. Rather than include detailed comments here of what should be included in the management plan, the Department recommends the County develop an outline for this section that we can review and discuss further.

4 It is also critical that we resolve what agent(s) may be available and qualified to hold the conservation easement and/or take over long-term management of the Bank.

Public Use of the Site:

5 Public use of preserves and conservation banks must be carefully addressed to ensure that the level of use and types of activities do not reduce the biological resource values for which the bank/preserve was established. The draft Plan proposes to maintain an extensive system of formal and informal hiking and equestrian trails. The Department recognizes that the public has been using the Big Tujunga Wash for many years and considers it an important recreational area. However, the purpose of the Conservation Bank is to provide for permanent preservation and management of scarce biological resources that were lost or impacted elsewhere. The frequent presence of humans, horses and pets can have a variety of adverse affects on native vegetation and wildlife. Therefore, recreational uses must be limited to a level which does not impair the habitat values for which the Bank was established.

6 Currently the site is riddled with trails used by hikers, bicyclists, and equestrians. The draft Plan proposes to close only six trails, while maintaining four formal trails and 16 informal trails. Further trail closures should be addressed to ensure that core habitat blocks are free of human intrusion.

7 The Plan needs to develop a more detailed section that describes allowable and non-allowable uses and how any restrictions would be enforced.

Potential Available Mitigation Credits:

8 Available credits and a system for tracking use of these credits is best addressed in the banking agreement, to be developed. However, a number of restoration and enhancement measures are described in the draft Plan as potentially optional, based upon receipt of additional credits. The Department is willing to accept full credit on an acre-for-acre basis for all habitat acreage within the bank, except the area off Cottonwood Avenue mapped as disturbed or non-native grassland. The Cottonwood Avenue area would need to be restored as proposed in the draft Plan in order to serve as mitigation, and we would accept full credit on an acre-for-acre basis for areas mapped as disturbed or non-native grassland once they are successfully restored.

Tujunga Ponds:

9 As recognized in the draft Plan, the currently unmanaged Tujunga Ponds, owned by the Los Angeles County Department of Parks and Recreation, represent an inholding that serves as an ongoing source of exotic aquatic and wetland species which will degrade the habitat values in the

bank unless the area is incorporated into the management and enhancement plan. The Tujunga Ponds are a good example of a well-intentioned mitigation effort which now provides only minimal benefits to native plants and animals due to a lack of funding and management. The Department supports efforts to include enhancement and management efforts for the Tujunga Ponds as part of the overall program being developed here.

10 The draft Plan examines a number of proposals aimed at reconfiguring the ponds to increase their suitability for rare, native aquatic and riparian species. The Department supports Option 1, which proposes to reconfigure the ponds into a stream-based system. We are willing to discuss additional mitigation credits for reconfiguration of the ponds, if further study indicates this is feasible.

Coordination and Technical Assistance:

11 There could be benefits to creating a Technical Advisory Committee for the purposes of providing periodic input as ongoing biological issues arise. This group should consist of qualified experts and agency representatives with experience in conservation and management of aquatic, riparian and alluvial scrub habitats and associated species. Involvement of adjacent land owners and managers of wash habitat would also be beneficial in coordinating activities and enhancing security.

* * * * *

Additional specific comments follow in the attachment. The Department appreciates this opportunity to comment. We recommend meeting directly in the near future to discuss these comments further. Ms. Mary Meyer of our staff will contact you to set this up. She can be reached at (805)640-8019.

Sincerely,

C. F. Raysbrook
Regional Manager

Attachment
cc: Mr. Ken Berg
U.S. Fish and Wildlife, Carlsbad

Ms. Caitlin Bean
CDFG, Habitat Conservation Planning Branch, Sacramento

MMeyer:mm/sl
Chron file
hstone 02-07

bc: Morgan Wehtje
Mary Meyer
Maurice Cardenas
Scott Harris
Leslie MacNair

ATTACHMENT

CDFG Specific Comments on the Big Tujunga Wash Mitigation Bank Draft Master Mitigation Plan

Page 2-3, Section 2.6, Long Term Goal

12 **Comment:** The goal statement may be appropriate for the enhancement plan, but an overarching goal statement needs to be developed which incorporates the concepts that the site is intended to provide for permanent preservation, management and enhancement of biological resources for the benefit of the state's fish and wildlife resources, and serves to provide compensation for loss of similar resources elsewhere in the Los Angeles Basin.

Table 1-3

13 Department staff have observed San Diego Horned Lizard on the upper fan of Tujunga Wash within two miles of the bank site - we recommend the Table be corrected to indicate that suitable habitat for this species occurs onsite.

Page 2-2, Section 2.4 indicates that 60 acres of southern arroyo willow woodland would be created and enhanced.

14 **Comment:** This should be revised to indicate 60 acres will be enhanced.

Page 2-5, Section 2.8.1.1

15 **Comment:** Replacement plantings should be monitored for a full five years from the time they are installed.

Page 2-7, Section 2.11

16 **Comment:** Language should be added indicating recreational activity will be allowed only where it is compatible with maximizing wildlife use of the Bank. If monitoring of recreational use shows there are problems, it may be necessary to further modify allowable activities.

Page 2-8, Section 2.13

17 **Comment:** The public outreach program is a component of public use of the proposed Bank. While success criteria per se would not apply, monitoring public use would tell us whether activities are consistent with the management guidelines, and whether further public outreach or modifications are needed to deal with adverse impacts of public use on biological resources.

Page 3-6, Section 3.2.4.2

18 **Comment:** The need for this section is unclear...are flood control and fuel modification activities expected to occur at the site?

Page 3-10, Section 3.3.2, Coast Live Oak Restoration

Comment: The Department is pleased that soil mycorrhizal organisms are proposed for the restoration area, as this should significantly improve growth rates.

Comment: We recommend that you use smaller sized coast live oak material - preferrably one gallon liners which have a free tap root. The planting density should then be increased. Any containerized plant which normally has a tap root is likely to survive better using younger material with a free tap root.

Comment on Table 3-2: Suggest you add some alluvial chaparral species like *Prunus ilicifolia, Rhamnus* crocea, and *Ceanothus leucodermis* to the mix. *Berberis nevinii* is a state-listed endangered plant species. We would support efforts to establish a population of this species onsite for recovery purposes, but would need further discussions as to whether material can be obtained for this purpose from local genetic stock.

Comment: Augering for trees such as oaks and sycamores should be deeper than 2-3 feet if possible to increase rooting depth.

Page 3-21, Irrigation: an establishment period of 120 days may be too short, particularly if we
19 get below-normal rainfall during the second growing season. We recommend irrigation for the first two dry seasons, with infrequent deep waterings the second year.

Page 3-22, Section 3.3.3.1, Exotic Plant Species Removal

Comment: This section describes a number of exotic plant species which would be
20 controlled onsite, but control techniques are described for only Arundo, Tamarix and Water Hyacinth.

Comment: The Plan needs to recognize that horses will provide an ongoing source of weed seeds in their manure - horse trails should be periodically examined and weeds in these areas appropriately controlled.

Comment: Giant Reed - We recommend that giant reed be cut, stems removed to a disposal area, and the base allowed to resprout to about two to three feet in height, then treated with Rodeo as described. You need to ensure that giant reed stems are preferably chipped to prevent sprouting

Figure 3-7a shows areas where invasives would be removed and habitat restored.

Comment: The draft Plan should indicate that individual giant reed and tamarix plants
21 that are not mappable are none-the-less removed. Revegetation of these dispersed areas is probably not necessary.

Page 3-28, Section 3.4, Brown Headed Cowbirds

22 **Comment:** Because cowbirds are most effectively trapped in areas where they are congregating and foraging, it may be appropriate to investigate placing traps offsite in nearby equestrian areas. Cowbird trapping efforts should be coordinated with other parties in Tujunga Wash who are planning to undertake similar efforts in order to maximize effectiveness of the program.

Cowbird trapping should take place in perpetuity on an as-needed basis following achievement of eradication goals and subsequent monitoring. The continued presence of horses and horse trails will continue to provide ideal feeding habitat and access into riparian areas and therefore will continue to promote nest parasitism of sensitive bird species, thus limiting the value of the mitigation bank over time.

Page 2-1, Target Wildlife Species lists common and sensitive species which will be used as progress indicators of revegetation success.

23 **Comment:** The following indicators should be included in the revegetation success list:

1. Add Yellow-breasted chat, Yellow warbler, Blue grossbeak, Coopers hawk and Downy woodpecker to the bird list. The majority of these species have been documented during the breeding season behind Hanson Dam.

2. Add two-lined garter snake to reptile list

3. Add Bobcat and consider adding Mule deer to Mammal list.

Table 2-3. Page 2-5, Target for Coast Live Oak - Sycamore Woodland describes performance standards for Coast Live Oak-Sycamore Woodland plantings as 80%, 75%, and 70% for survival after the first, third and fifth year respectively.

24 **Comment:** The Department requires that all planting shall have a minimum of 80% survival the first year and 100% survival after five years.

Page 2-6, Target for Arroyo Willow Riparian indicates that Arroyo Willow Riparian plantings shall have the same performance standards as those for the Oak, Sycamore, Cottonwood plantings.

25 **Comment:** The Department requires that all planting shall have a minimum of 80% survival the first year and 100% survival after five years.

Page 2-6, Performance Standards for Oak, Sycamore, and Cottonwood Trees indicates that at the end of three years, saplings planted from five gallon containers shall have attained a height of three feet.

26 **Comment:** Please provide reference to justify these performance standards as Sycamore and Cottonwoods are considered rapid growers and Live oaks are considered moderated growers. The Department requires a minimum height of 9, 13, 15 feet after 3 years of

growth for Coast Live Oaks, Sycamores and Cottonwoods respectively. Minimum height for Coast Live Oak should reduced if one gallon material is used. Performance standards should ensure that there is no die back in the primary growth leader for trees. Die back often indicates the tree has been stressed and it will not perform well.

Page 3-6, Debris Removal indicates that garbage and noxious weeds will be removed from the mitigation bank site.

27 **Comment:** Garbage, debris and noxious weeds should be removed on an as-needed basis in perpetuity as debris and weeds will continue to be brought into the area from recreational use and from developed sources further up the drainage. Cleanup following large scale flooding events should be included.

Trash receptacles should be the type that wildlife cannot get into.

Page 2-7, Exotic Wildlife Eradication Program provides performance standards for removal of exotic species.

28 **Comment:** The Plan should provide a discussion regarding abandoned and/or feral dogs and their potential to adversely effect restoration goals, particularly for mammalian target species such as mule deer and small mammals. A control program may be necessary to address these impacts.

Page 3-48 describes how the Plan will address the methodologies for eradication of non-native amphibians and fishes and various habitat modification options which include maintaining native species habitat ponds within the mitigation bank.

29 **Comment:** The persistence of existing ponds or the creation of ponds in addition to existing and enhanced riparian habitat will continue to provide a reservoir and/or habitat for exotic aquatic plant and animal species establishment which would continue to adversely effect the continued function of the mitigation bank. For this reason it is important that periodic monitoring for exotic species followed by eradication measures as deemed appropriate continue in perpetuity.

Page 3-49 of the Introduction, second paragraph, mentions reptile and amphibian species which are restricted in range to the area or region of southern California. The third paragraph goes on to describe forces which have resulted in the reduction of these species and the regulatory status of selected species.

30 **Comment:** The selected species mentioned in paragraph three, for example: California red-legged frog; California horned lizard; and two-striped garter snake, should be the same as those species described in paragraph two for consistency.

Page 3-24, Enhancement Site Preparation:

31 **Comment:** Reference to **Section 3.1.4.3** under **Erosion Control and Bank Stabilization**, should read **3.2.4.3.**

Page B-1, Appendix B lists wildlife species observed within the Big Tujunga Wash Project Site.

32 **Comment:** To be consistent with the Plant Species List in Appendix A, any non-native animal species observed should be added to the list of observed species, including feral dog.

Page 3-43, Section 3.5, Formal Trail System

33 **Comment:** As we indicated in our general comments, we recommend additional trail closures to further reduce human intrusion into core habitat blocks. Of the four formal trails, we recommend that the Dr. Au Trail be eliminated to reduce impacts to this core block of alluvial habitat. Most of the informal trails should be eliminated unless they are needed to provide a connection to the remaining three formal trails.

Comment: Pedestrian and equestrian access points should be designed to ensure that motorcycles cannot access them. Placement of boulders is generally not sufficient to prevent motorcycle access. Boulders combined with a raised bar that can be crossed by pedestrians and horses may be more appropriate.

Comment: We noted in our field visit that vehicle tracks were evident on the road-like segment of the proposed Bert Bonnett Trail. We also noted that this trail is very wide. We recommend that measures be taken to restrict vehicular access at this and any other location where this may be a problem. Efforts to narrow this trail would also be appropriate in order to encourage regrowth of alluvial scrub.

Comment: We noted that the draft Plan does not propose parking or staging areas for equestrian and hikers. The Department would support this, because we are concerned that by providing more amenities and staging areas, increased levels of public use will occur requiring more oversight and management while reducing wildlife habitat values. We also noted on page 3-48 that a new trail was recently constructed for the October 1999 Antonovich Trail Ride. This brings up the issue of use of the mitigation bank site for large scale organized recreational events. The Department feels this type of intensive public use is incompatible with the goals of conserving wildlife habitat.

Trail Brochure

34 **Comment:** The Goal Statement should be consistent with the overall goal of the bank. This goal statement is different from the one you've included in the Plan. The general information statement should indicate that these "plant communities onsite provide suitable habitat for <u>many</u> species of wildlife..."

Restrictions: should indicate **No Smoking** and **No Fires.** The public generally doesn't know what sensitive habitats are...the entire site supports sensitive habitats. This section should indicate that no disturbance, removal or collection of plants, animals or other natural features, is allowed.

Page 3-45, Section 3.5.5.3.1, Trails Modifications

35 **Comment:** This was the only section reviewed which discusses the condition of protective fencing at the site. The Plan needs to include a review of the entire perimeter fencing and its condition to ensure that access is controlled and limited to designated entrance points. If the Tujunga Ponds are incorporated in the Bank's management Plan, and if they are reconfigured as per Option 1, fencing off this area would appear to be unnecessary.

Aquatic Species

Page 2-7, Section 2.12 The eradication of exotics includes the option of "..setting of traps for crayfish."

36 **Comment:** Need to describe potential mortality to non-target species to include arroyo southwestern toad and other species of concern. There needs to be discussion on the potential of crayfish to successfully reproduce in flowing stream habitat as opposed to slack water habitat.

Page 3-50, Section 3.6.3 First paragraph states "The second segment is Haines Canyon Creek, a first order stream (originates from a seep or a spring) that originates from the outflow of the west pond..."

37 **Comment:** Haines Canyon Creek is at minimum a second order stream whose origin is approximately seven miles (stream measurement) east of the ponds. More precisely, Haines Canyon Creek becomes intermittent as it approaches the 210 Freeway and not, as implied, two separate streams.

Page 3-51, Section 3.6.4.2 The third paragraph states "The possible status of native, non-migratory fish in this and other drainages has probably been confused beyond any hope of resolution by repeated introductions of hatchery fish into local streams." Further on page 3-52, last paragraph of section 3.6.4.2 it states that the trout in Big Tujunga and lower Haines Canyon Creek "undoubtably represent planted fish either moving upstream from Hansen Reservoir or downstream from Big Tujunga Reservoir."

38 **Comment:** Analysis of mitochondrial DNA (mtDNA), within the last few years, has been developed to address steelhead / rainbow trout lineage. Application of mtDNA analysis on trout streams in southern California have revealed that even with the previous stocking of hatchery trout, and where migration of adult steelhead is absent, wild native stocks prevail. While it is expected that migration of adult steelhead into the Big Tujunga drainage has most likely ceased within the past 50 years or so, it is highly probable that a self-sustaining population of native trout exist within the upper reaches. This population of native trout should continue to produce smolt which under certain conditions make it to the ocean.

Trout in the Big Tujunga drainage have substantial potential of being of historic native stock. The burden of proof needs to be placed on determining through genetic analysis if the Big Tujunga Creek native trout are now extirpated.

Page 3-55, Section 3.6.6 Under proactive options, #3 the removal of exotics from dewatering of the ponds will require "gill-netting and seining" and that gill netting could also be utilized in the removal of exotics in Haines Canyon Creek.

39 **Comment:** This option needs further discussion on potential impacts to aquatic species of concern as well as T&E species.

Page 3-59, Section 3.6.8.4

40 **Comment:** Trapping of exotics in this section carries the same concerns as found in section 2.12, page 2-7.

Page 3-60, Section 3.6.9

41 **Comment:** Relocation of State listed species will require consultation with the Department of Fish and Game.

Page 4-1, Eradication Program Checklist

42 **Comment:** Please refer to the Department's concerns elsewhere in this letter over the use of gill nets.

Page 4-12

43 **Comment:** The "remove and dispose of exotic species" item will require Department of Fish and Game authorization.

Page 8-9, Section 8.8, Water Quality Monitoring

44 **Comment:** The Department supports the concept of water quality monitoring. It is important that this program complement water quality monitoring that is a requirement of the upstream Red Tail Golf and Equestrian Project. Monitoring of levels of key pesticides and herbicides may be appropriate. However, we cannot provide specific comments on water quality monitoring at this time until we have seen Red Tail's proposed baseline water quality monitoring plan.

Page 9-3, Section 9.2.1.1

45 **Comment:** The discussion on the origin of flow and options on how to manage stream flow within the pond area is based on extremely vague information. A cursory investigation on the source of the pond water, at minimum, needs to be completed prior to proposing alternatives on managing / directing future stream flow within the pond area.

Pg 3-61, Section 3.7, Community Awareness Program

46 **Comment:** The Department supports efforts to involve the community in ongoing issues related to the Bank. The Department's ability to participate in such groups is often limited

due to staffing, and we cannot participate in committees that involve voting - the Department's authority as the state Trustee Agency for fish and wildlife precludes us from participating in committees in other than an advisory role.

There could be benefits to creating a Technical Advisory Committee for the purposes of providing periodic input as ongoing biological issues arise. This group should consist of qualified experts and agency representatives with experience in conservation and management of riparian and alluvial scrub habitats and associated species, and familiarity with purposes for which the Bank was established. Involvement of adjacent land owners and managers of wash habitat would also be beneficial in coordinating activities and enhancing security.

Page 3-64, School Programs

47 **Comment:** The Department supports efforts to provide educational opportunities at the Bank site. However, encouraging large numbers of visitors to the area needs to be balanced with the need to protect core habitat blocks for wildlife. The Plan should identify a specific area/trail which would serve as an interpretive trail for educational programs. We recommend a short loop trail staged from the Cottonwood area that provides access to both riparian and alluvial scrub habitats for interpretive programs.

Section 8.0, Success Criteria and Contingency Measures

48 **Comment:** This section needs to be strengthened to address long term success of various programs. Funding of contingency measures is the responsibility of LADPW and needs to be addressed through establishment of a permanent ongoing funding mechanism. Any subsequent "caretaker" agency would need funding to carry on the necessary programs.

Section 9.4, Patrolling

49 **Comment:** Local equestrians/volunteers can provide important assistance in patrolling the site, but cannot solely be relied upon for this important activity.



LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS

FACSIMILIE TRANSMITTAL HEADER SHEET

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FROM: Aaron Allen

REMARKS: Comments on Big Tujunga Mitigation Plan

2 Pages to Follow

CESPL-CO-R February 2, 2000

MEMORANDUM FOR THE RECORD
SUBJECT: DRAFT MASTER MITIGATION PLAN – BIG TUJUNGA SITE

Reference is made to the Draft Master Mitigation Plan for the Big Tujunga Wash Mitigation Area dated December of 1999. Overall, I would like to commend both Chambers Group and LADPW for providing an organized and in-depth mitigation plan for the above site. The following are my comments on the above document.

1 Page 2-4 – At present, the algorithm used to determine the functional units for riparian habitat is a little unclear. Specifically, without additional parentheses it is unclear which variables are multipliers and which are additive. Please make it clear that EXO and REG are the two multipliers in the first algorithm.

2 Page 3-10 – In the first paragraph of Section 3.3.2, please add a few sentences that outline the spatial relationship between the proposed oak/sycamore habitat and waters of the United States. Please provide a more specific description of how this habitat will improve the physical and biological functions in and adjacent to waters of the United States.

3 Page 3-60 – In the third paragraph of the Plan Recommendation Section, please indicate that this plan would include a Section 404 permit that may require the Corps to complete a Section 7 Consultation with the Service. A Section 7 Consultation is only done when there is a federal action (e.g. a 404 permit); however, if LADPW is completing activities that do not result in a discharge of fill material, a 10(a) permit may be required by the Service to comply with the Endangered Species Act.

4 Page 3-70 – Please update the section (3.8.3.1) on the Nationwide Permit Program. Many changes, including additional General Conditions, have been proposed since the July 21, 1999 publication in the Federal Register. Furthermore, there are several Regional Conditions proposed by the Los Angeles District that could affect this project. I would recommend that you wait until February 14, 2000 when the final version of the Nationwide Permits will be published in the Federal Register and then update this section.

5 Page 3-71 – In Section 3.8.6 (ESA), please include a discussion of ESA compliance for the proposed project if discharges of fill material are not required (e.g. a 10(a) permit). Although it is unlikely that a 10(a) Permit would be required, this section should include at least a short paragraph on 10(a) permits.

Page 3-72 – The total amount of time for a Section 7 Consultation is 135 days (90 days to formulate a Draft Opinion and an additional 45 days for the USFWS to deliver the Final Biological Opinion).

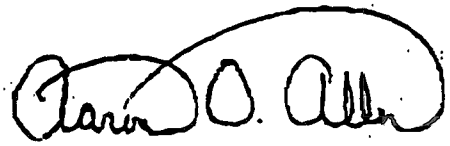
CESPL-CO-R 1145b

7 Page 4-16 – U.S. Army Corps of Engineers (Contact Resource Agencies).

8 Page 9-3 – In Section 9.2.1.1 (Procedure), this section needs to provide additional information concerning the projected amount of waters of the United States and adjacent riparian habitat each alternative would provide. How do the three alternatives compare in terms of net loss/gain of waters of the United States and riparian habitat? At present, this section provides adequate information concerning what type of habitat would be provided and which species would benefit; however, it needs to provide additional information on the overall gain in both acreage and in physical and biological functions. Perhaps the same functional assessment methodology that is used earlier in the document could be applied to the three alternatives to augment the amount of available data.

9 Page 9-7 – Please indicate in Section 9.2.1.2 (Maintenance of Flows) whether LADPW considers increasing flow from Big Tujunga Dam a viable enhancement alternative. Furthermore, please include estimates of how much water would be required from the reservoir to meet the desired flow conditions in the mitigation area. If this enhancement plan were implemented, how would LADPW deal with variable water supply from Big Tujunga Reservoir. During drought years, could LADPW provide any additional water to the mitigation site and, if so, how much would the releases vary from year to year.

10 Section 9.0 – Substantial information is still required to evaluate the three alternatives for the Big Tujunga ponds. It appears that this component of the mitigation plan will significantly affect the success of many of the proposed enhancement activities. Additional hydrologic and engineering information is required to assess how downstream habitat would be affected by the three alternatives and which of the alternatives would have the best chance for success. I would recommend that LADPW pursue additional hydrologic and engineering information immediately to facilitate a timely solution to the above problems.



Aaron O. Allen, Ph.D.
Senior Project Manager

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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FACSIMILE TRANSMITTAL FORM

Date Sent: 2/15/00 Time Sent: PST: 10:00

Number of pages including this transmittal sheet 7 [ ]

TO: Frank Wu Fax No.: 626-457-5326

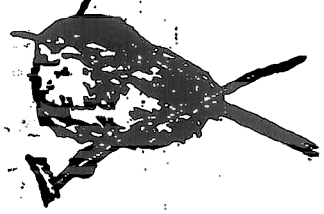
FROM: Jenny Brubeck Fax No.: (760) 431-9618 Phone No.: (760) 431-9440

SUBJECT: Preliminary FWS comments on Big Tujunga Wash Mitigation Bank

COMMENTS: Sorry these are late, Frank. Our system went down yesterday and I couldn't print. This is a draft document. Formal letter to follow. -Jenny

→ Please, call if you have problems receiving this fax. Thanks!

[Revised 2/11/98]



California Gnatcatcher

Preliminary Comments on the Big Tujunga Wash Mitigation Bank Draft Master Mitigation Plan. These comments have not undergone internal review. This is a draft document and is intended as a "heads-up" for comments that will follow in a formal letter.

Page 1-2

1

Under **PROJECT LOCATION**, the second paragraph states that the Big Tujunga Ponds were created as part of the mitigation required by construction of the 210 Freeway. Currently, the pond habitat is seriously degraded; however, if the ponds are eliminated per the optional enhancement proposals, how will the loss of the original mitigation value be compensated? Is there any record of the type of habitat that was destroyed/degraded that prompted the original mitigation?

Page 1-7

2

Under **Sensitive Plants**, the discussion states that the site harbors suitable habitat for Nevin's barberry (*Berberis nevinii*), San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), slender-horned spineflower (*Dodecahema leptocerus*) and several plant species of state concern. We recommend that restoration plans include attempts to establish/reestablish these species in appropriate habitats on the site.

Page 1-10

3

Under **Sensitive Wildlife**, the report doesn't mention the mountain yellow-legged frog (*Rana mucosa*). This species was recently proposed for listing as endangered by the Fish and Wildlife Service. Only about 100 individuals are known to exist in and around the San Gabriel Mountains. We recommend the MMP consider the potential for establishing a population of the mountain yellow-legged frog on the mitigation site if appropriate habitat exists or can be restored on the site.

Page 1-12

4

Under **Wetlands and Other Waters of the United States**, the MMP states that a large wetland area was delineated on the south side of the site in an abandoned gravel pit. The location of the pit should be designated on a map. If there is potential to enhance this site, enhancement plans should be included in the MMP. Perhaps additional mitigation credits could be awarded for such enhancement.

Page 2-6

5

Under **Non-Native Species**, the MMP states that in areas where mechanical weed removal is ineffective, an 'appropriate' herbicide will be used. Please identify the appropriate compound and discuss why it is considered more desirable than other herbicides.

Page 2-7

6

Under **BREEDING OF SENSITIVE/LISTED BIRDS**, the MMP states "It would be difficult to say what number of breeding pairs constitutes success so presence of successfully breeding pairs is the most logical way to determine whether or not the enhancement is a success." It may be possible to use a habitat-based method when evaluating success. For example, if you know the territory size and life requirements of the species and the amount and quality of available habitat, a comparison of the expected number of occupied territories with the observed number of occupied territories would give you some measure of success.

Page 2-7
7

Under **TRAILS CLOSURE AND RESTORATION**, the MMP states "the overall goal of the trail system is to allow for recreational activity while minimizing impacts on the habitat quality..." We believe impacts of equestrian activity on nesting birds also should be evaluated in determining where and when trails should be open. For example, does the approach of horses and riders cause nesting birds to flush from their nests temporarily? If riders stop in the vicinity of a nest, does their presence inhibit feeding of young? Could this disturbance impact nesting success? For these reasons, it may become necessary to limit the number of people and horses using certain trails during the nesting season for sensitive species. The MMP should discuss this possibility and include it in ongoing discussions with the interested public.

Page 2-7
8

Under **EXOTIC WILDLIFE ERADICATION**, the discussion is not clear. It appears that the goals are to limit the densities of exotics on the site to less than 5% of the baseline densities of exotic fish and less than 10% of the baseline densities of bullfrogs and crayfish. If the goals are not met, the control protocol should be modified to achieve the original goal, not, as the Plan states, to keep these populations less than the original baseline populations.

Page 3-5
9

Under Responsible Parties, the MMP states that the LADPW will be responsible for determining the future ongoing activities following the initial 5-year management period. We strongly recommend that a nondiminishing endowment be established to ensure continued management and maintenance of this important site.

Fig. 3-4A
10

Shows *Berberis nevinii* planted adjacent to the intersection of three trails on the upland site. This species is native to alluvial fan scrub and should be planted in the wash area where it would have a better chance of survival. Additionally, sensitive species should not be planted near the intersection of trails where equestrians and pedestrians taking short cuts around corners would trample them.

Page 3-17
11

Under Seed Collection and Supply, the MMP states that seeds will not be collected from areas adjacent to the revegetation sites, but will be collected from southern California counties. The seed supply should not include seeds from San Diego County as plants from this area likely would be adapted to drier conditions than those in existing in Los Angeles County.

Table 3-2
12

Although California peony (*Paeonia californica*) is an attractive flower, it contributes little to habitat quality. We suggest elimination of this species from the proposed plant pallete and/or the inclusion of Mexican elder (*Sambucus mexicana*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and prickly pear cactus (*Opuntia litoralis*) in its stead. These species are important components of coastal sage scrub and should be included in any revegetation plan for coastal sage scrub habitat.

Page 3-10
13

Under Coast Live Oak-California Sycamore-Coastal Sage Scrub Revegetation Plan (Optional Enhancement Measure), the MMP proposes establishing an oak-sycamore woodland with a coastal sage scrub understory, in part for the purpose of acquiring additional mitigation credits. Coastal sage scrub habitat generally is an open habitat with little overstory. Many plant species adapted to sage scrub habitat require full sun for growth. We question whether a sage scrub plant community could survive over time under shaded conditions. We also question whether typical coastal sage scrub wildlife species such as the coastal California gnatcatcher would use woodland habitat. We recommend establishment of woodland habitat on upland sites and coastal sage scrub habitats at lower elevations between the woodland and riparian habitats. The two habitat types could overlap along the zone of contact, but for optional growth and survival, they should not be intermixed.

Figure 3-5
14

This figure should depict the root crown to be 1-2 inches above the surface of the soil. The current depiction would encourage planters to bury the root crown too deeply in the soil, a condition that could lead to reduced survival.

Page 3-21
15

The MMP suggests that protective cages placed around oak saplings should be buried to at least 4 inches below ground and should extend at least 12 inches above ground to deter rodents, insects, and browsers. We suggest these limits be extended to at least 6 inches below ground and at least 20 inches above ground; even small rabbits can reach well above 12 inches.

Page 3-22
16

Under Riparian Habitat Enhancement Plan - MMP states that 20 acres of habitat around the Tujunga Ponds will be enhanced. However, a decision has yet to be made regarding the optional recontouring of the area to remove standing water. If this area is to be modified, habitat enhancement should not occur until modifications are complete.

Page 3-22
17

Under Giant Reed Eradication Technique, the MMP discusses treating herbicides with dye. The MMP should stipulate that any dye used should be non-toxic to wildlife.

Page 3-24
18

Under Water Hyacinth Eradication Technique - the MMP states that inspections of treated plants shall be conducted at 3 and 7 weeks after application of herbicide, and that dead biomass shall be removed from the water during each inspection to prevent oxygen depletion of the pond water due to decomposition of the treated plants. We agree that oxygen depletion of the pond water would undesirable and may lead to adverse impacts to the fish community, including the proposed threatened Santa Ana sucker, downstream of the ponds in Haines Canyon Creek. We recommend inspections be done once weekly unless and until such time as the plant biomass in the pond area is reduced to a level such that decomposition is unlikely to cause oxygen depletion.

Page 3-33 19 — The MMP states that wire mesh will be placed around portions of the outside of the cowbird traps if predation within the traps becomes a problem. We recommend that wire mesh to prevent predator access to traps be installed prior to initiation of cowbird trapping.

Page 3-39 20 — The first paragraph on this page contains a confusing statement about consulting with the USFWS about which non-target bird species to dispatch and which to keep in the traps throughout the season. No non-target species should be left in traps; the only species that may be euthanized legally are those that are not native to the United States, such as the house sparrow, starling and rock dove, and that are not listed as threatened or endangered by the USFWS.

Page 3-42 21 — The last sentence under Non-target Captures directs cowbird trapping report preparers to "state that (captured sensitive species) were released unharmed." We assume you intend this statement to be used only in cases when it is true; however, the reader may interpret it to mean that sensitive species always should be reported as being released unharmed, even if they died in traps. Please clarify.

Figure 3-13 22 — Given the frequency of fire in southern California, we suggest that signs and kiosks on the site be constructed of fire-proof materials; the cedar shingle roofs recommended in the MMP likely would burn readily.

Page 3-48 23 — The first paragraph on this page indicates that seven short crossings have been created along the Water Trail to replace the section of previously existing trail that utilized 1000 feet of streambed in Haines Canyon Creek. Although the crossings are preferable to having horses wade down the stream, seven crossings seems excessive. We recommend that the number of crossings be reduced to a maximum of four within the subject 1000-foot reach of the stream.

Page 3-59 24 — Under Shooting and Gigging, there is discussion of using small, lead pellets for killing frogs. Lead shot can present a serious danger of lead poisoning for some wildlife species. The Service generally discourages the use of lead shot. We recommend the use of steel shot if it is available.

Page 3-60 25 — Under Cautions and Disclaimers, the MMP describes the optional proposal to eliminate the Tujunga Ponds and attempt to establish additional stream habitat on site as "essentially an experiment" because "there are no published accounts of similar attempts ...in the Los Angeles basin." However, there may be accounts of similar attempts in other areas, and these accounts could prove highly useful should any of the optional proposals to eliminate the ponds be initiated. We recommend a literature search be conducted to locate any existing, relevant information on construction of aquatic habitats if such a search has not been performed.

Page 4-60 — Under Monitoring Checklist, the MMP should state how often all monitoring efforts should be accomplished. This instruction has not been provided for three
26 of the items on the checklist.

Page 5-3 — The list of non-native species which will be targeted for weed control does not include water hyacinth. Is this an oversight or do you consider hyacinth covered
27 in its own section?

Page 5-6 — Under Functional Analysis Monitoring Methods, The hydrogeomorphic approach used for the functional assessment requires a reference standard site with the
28 highest level of function. How was this site determined? Is there a written standard or is it necessary to identify an existing site for comparison? If the reference site actually exists, please identify it and explain why it was chosen as the reference standard.

Page 5-24 — Under Water Quality Monitoring, the MMP states that water quality sampling shall be done on a quarterly basis. We recommend that water quality sampling be
29 done immediately after and/or during heavy rainfall events in addition to the proposed quarterly sampling to determine if contaminants are flushed downstream during runoff from upstream sources such as the proposed Red Tail Golf Course.

Page 9-3 — Under Dewatering, the MMP states that there are at least two considerations regarding removal of the ponds that are associated with the fact that flow in
30 Haines Canyon Creek may be maintained by groundwater. However, the section discusses only one consideration (i.e., the pumping of water). Please clarify this apparent discrepancy.

Following are additional comments that we feel are important to the success of the project.

31 ➤ The Big Tujunga Wash Mitigation Bank should be protected in perpetuity by a deed restriction that prohibits development and protects the area from uses that could result in degradation of the biological, hydrological, physical, and/or chemical attributes of the site.

32 ➤ Management by the consultants will continue for 5 years or until the habitat reaches success standards for restoration. It is extremely important to provide for continued management of the property beyond the initial five year period. We recommend the establishment of a nondiminishing endowment to ensure management of the site in perpetuity. Exotics, especially bullfrogs, bass, and invasive plants likely will require monitoring and removal for the life of the project. Failure to address these concerns could result in degradation and deterioration of the habitat value established under the initial restoration and management phase of the project.

33 ➤ With the agreement of the stable owners, we recommend that cowbird traps be placed at equestrian centers located within 7 kilometers (i.e., the maximum distance traveled by

cowbirds from feeding sites to nesting sites) of the mitigation bank site. Equestrians using these facilities could learn to operate the traps; in this way they could contribute to controlling the impact of cowbirds which their activities inadvertently encourage. The trap sites should be determined by cowbird experts who have surveyed the area.

34 ➤ We recommend implementation of Optional Enhancement Alternative No. 1 at the Big Tujunga Pond site. We are concerned about the ability of the MMP to meet desired goals without eliminating the ponds which are sinks for alien species. To this end, a hydrological study is essential. The source of the water in the ponds is not known with certainty, and it must be determined that maintenance of flows in Haines Canyon Creek is possible during and after grading activities intended to eliminate the ponds and establish stream habitat on the site. Maintenance of instream flow would be critical in sustaining sensitive fish populations in the creek Additionally, the potential for runoff or contaminated ground water from the proposed Red Tail Golf Course to contaminate the mitigation bank should be included in the hydrological study.

35 ➤ We agree that it would be highly desirable to maintain instream flows in Big Tujunga Wash; however, discussions with County personnel during a site visit on January 11, 2000, indicate that this may not be possible given the amount of releases reasonably expected to occur from Big Tujunga Dam and the sandy substrate within the wash. We do believe that sufficient releases from the dam might be accomplished to maintain pools within the wash that would function as refugia for native fish species during the dry season and thus increase the benefit to sensitive species of the mitigation site. We also recommend that intermittent scouring flows be released during times of heavy rains when the capacity of the reservoir is likely to be exceeded; scouring flows would help maintain alluvial fan sage scrub habitat on the project site.

36 ➤ With regard to irrigation, will the irrigation system be removed after the initial 5-year management period? If so, what mitigation measures will be employed to avoid, minimize, and compensate for negative impacts to habitat on the site that may result from the removal process?

37 ➤ During the site visit to the Big Tujunga Wash, we observed vehicle tracks in several places in the wash area. The vehicle access point to the mitigation bank site should be located and vehicle access to this sensitive habitat should be eliminated.

WILLIAM E. EICK
ATTORNEY AT LAW
2604 FOOTHILL BOULEVARD, SUITE C
LA CRESCENTA, CALIFORNIA 91214

TELEPHONE: (818) 248-0050 FACSIMILE: (818) 248-2473

January 31, 2000

Los Angeles Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803

Attn: Frank Wu

Re: *Chambers Group Master Plan for Tujunga Wash Mitigation Bank*

Dear Mr. Wu:

This letter represents my comments to the proposed Master Plan document proposed by the Chambers Group and the County of Los Angeles. My comments are as follows:

1. There needs to be a permanent conservation of this property. Nowhere in the draft did I see the existence of a conservation easement which would permanently protect the property. I am mindful of what happened with the Tujunga Ponds when it was turned over to the County of Los Angeles Department of Recreation and Parks and how because of budgetary constraints the ponds fell into disrepair. At some point in time the county even attempted to give away the Tujunga Ponds to any governmental agency that would take it. In this regard I believe that a permanent conservation easement should be recorded over the entire property so as to protect it from future budgetary constraints including later efforts to deed the property to others. I believe this is perhaps one of the most critical points which needs to be addressed.

2. The draft report seems to rely heavily on volunteers. While people in the Shadow Hills Community and the Small Wilderness Area Preservation and others have in the past volunteered and likely intend to continue to volunteer to maintain the area, there is no guarantee or certainty that this effort will in fact continue. I believe that any proposal should provide for funding assuming that there are no volunteers to provide maintenance. That way if there are volunteers, so much the better. The draft proposal tends to focus on what will

happen over the next five (5) years. This is a long term mitigation bank inasmuch as the property needs to be preserved in perpetuity. There must be an ongoing permanent commitment to the funding of maintenance and mitigation measures. I believe that as part of this proposal there should be an annuity or a bond placed which would provide for this ongoing maintenance increase by a rate of inflation. I would suggest that a minimum of thirty thousand dollars ($30,000.00) per year increase by the cost of living would be an appropriate starting point for maintenance. It is not sufficient to provide for only a five year plan.

3. In reviewing the water quality testing it appears that most of the testing will be done on fertilizers and nitrogen type products. I believe that testing also needs to focus on pesticides. The leaching of pesticides from the proposed golf course is, in my mind, almost inevitable and could have severe adverse impacts on the property. Sufficient funding needs to be in place to provide for the ongoing and in perpetuity testing on the water quality and review by independent testing labs.

4. With all due respect to Dr. Au and Bert Bonnett, I would suggest that the trails be named after Carol Roper, who has voluntarily cleaned up this area weekly for years and also Anson Burlingame who for over twenty years has actively supported the preservation of the Tujunga Wash. Both of these persons are Shadow Hills residents and are most deserving.

Very truly yours,

Bill Eick

William E. Eick,
Attorney at Law

WEE/kw

cc: California Department of Fish and Game
U.S. Fish and Wildlife Service

SHPOAWu.1

From Ivan E. & Roberta C. Cole
10040 Wentworth St.
Shadow Hills, CA 91040-1246
(818) 353-4633
Dated: January 25, 2000

Frank Wu
Project Director
Los Angeles County Department of Public Works
Hydraulic/Water Conservation Division
900 South Fremont Avenue
Alhambra, CA 91803-1331

Dear Frank Wu:

It was good to talk with you and share our views on the draft Master Mitigation Plan. Thank yo for giving us the opportunity to review the Big Tujunga Wash Mitigation Bank Draft Master Mitigation Plan at the Sunland-Tujunga Library. The presentation and contents of the prepared draft is excellent. The methodology is well depicted along with the figures, tables and references. Understanding was enhanced by bringing out advantages and disadvantages with potential options.

Suggestions which may be considered:

- Cowbird Trapping Program -Potential Labor Sources 3.4.2.5. Add Pierce College in Woodland Hills. It is recognized as a horticultural/ and agricultural community college.
- Kiosk Fig 3-13 & 3-14 Overhang may need to be extended to protect literature from the rain.
- Wildlife Species -Birds
  Egrets and cranes occasionally fly over the ponds.
  Owls come out at night during the Fall and Winter.
- Consider Cottonwood as the Main Entrance with vehicle parking spaces for hikers and general viewing by students. Trust that this area will not be used as a staging area for horses since this would have a negative impact on the residences. There is a large staging area near Hanson Dam.

For your awareness, there is a "Worm Farm" operation which moved to 9635 Wentworth St. about two months ago. This land is adjacent to the Big Tujunga Wash Mitigation Bank. Trucks have been hauling in materials such as compost matter and soils of unknown origin. The volume of materials, its content of pesticides and insecticides is questionable. Now with the rains, what pollution is flowing into the Mitigation bank? More recently, it looks like soil is being processed.

Success in your endeavors.

Sincerely,
I.E.C
R.C.C.

January 31, 2000

Los Angeles County Department of Public Works
Hydraulic/Water Conservation Division
900 South Fremont Avenue
Alhambra, CA 91803-1331
Attn: Frank Wu

Dear Mr. Wu:

The attached comments were compiled by a group of Shadow Hills residents in response to the published draft of the Master Mitigation Plan for the Big Tujunga Wash Mitigation Bank provided by your office. We are pleased to have the County of Los Angeles Department of Public Works perform a restoration of such scope in a recreational locale that is enjoyed and treasured by most area residents.

Our intent is to provide a perspective that reflects our knowledge and experience within the area. We hope that they constructively help to refine the plan and at the same time target specific areas of concern.

If you have questions concerning the content of this memo, please contact Andrea Gutman at 818-353-5974. We ask that a final draft of the Mitigation Plan be sent to Carol Roper, 9635 La Canada Way, Shadow Hills, CA 91040.

Sincerely,

Shadow Hills Residents:

Andrea Gutman
James Gutman
Jacqy Gamble
Carol Roper
Chris Arlington
Kathy Delson

Cc:

Mary Myer, Californian Department of Fish and Game
Chris Wilkinson, U.S. Fish and Wildlife Service

10910 WALNUT DR. • SHADOW HILLS, CA • 91040
PHONE: 818-352-9440 • FAX: 818-352-2114 • EMAIL:
dkdelson@mediaone.net

General Comments:

We consider the following issues to be fundamental to the overall Mitigation Plan:

- Of primary concern to local residents is that the plan documents a course of action for a 5-year period with only general reference to maintenance afterwards. As an ecologically sensitive area, it is essential that maintenance continues, and is specifically provided for, after the County has met its obligations for mitigation points. An additional section to the plan should be added that outlines plans for maintenance and monitoring after the 5-year period. This is especially important since a golf course that will use pesticides/herbicides is planned for construction upstream from the site.

- If the property is to be given to another government agency such as the Santa Monica Conservancy, a funding source such as an endowment should be established that provides funding in perpetuity for continued maintenance and monitoring of the site. Minimum maintenance standards should also be defined. Note that volunteers within the community will gladly provide some level of upkeep and are willing to participate in equestrian-based patrols of the area, but it is unrealistic to place the burden of total maintenance and monitoring requirements on volunteers. Such a plan is essential as illustrated by the degrading of the Tujunga Ponds due to the absence of an active management plan by Los Angeles County Department of Recreation and Parks.

- The plan does not provide cost analysis for basic enhancements and for optional enhancement alternatives nor is there reference to budget information regarding the project. It is assumed that LADPW will allocate funds to implement the basic measures required to satisfy the mitigation points allotted from the Army Corps of Engineers, CDFG, and RWQCB. However, it is important to know when or if funds will be forthcoming for any of the optional enhancements so that residents understand how long the project or projects will be under construction in the area. E.g., 1 year for the basic enhancements; multiple, consecutive months/years for additional enhancements.

- Since this is a prime recreation area, it would be appreciated if the project were structured such that only a few sections of the site are closed at any given time. To facilitate communication with the community regarding specific closures and planned public meetings to review the finalized plan, consider continual use of local newsletters in addition to publishing an annual newsletter yourselves. Publication deadlines for the Shadow Hills Property Owners Association are the 4th day of alternate months, starting in February. Contact person is Carol Roper at 818-353-5534.

Plan Specific Comments

Section/Figure	Issue	Comments
Sec. 2.7.1.2; 3.5, 8.6	Formal trails system	All trails must be *dedicated* trails, established in perpetuity in the City of Los Angeles. What does *formal* signify in your plan? Because of future planned equestrian home development along Wentworth, we recommend adding a multi-use/equestrian trail as indicated on the Shadow Hills Community Plan along the north side of Wentworth St., south of the Haines Canyon Creek, to minimize traffic through the creek area itself. Traffic now forced to use only the creek could use the Wentworth trail as an alternative route, particularly important when trails are unstable because of flow conditions. This trail would require only the reinforcement of a short span of bank on the south side of the creek (portion east of the South Wheatland entrance.)
Sec. 3.6.6; 9.4	Vandalism of facilities	The citizens patrol and residents whose homes overlook the area should be given contact numbers to report incidents or maintenance needs. To reduce vandalism, consider the following suggestions: • Secure public restroom facilities so they cannot be dislodged and surround with native shrubs to discourage graffiti. All construction must be low cost, unobtrusive, and easily reparable. • Use native materials such as logs to provide seating for observation and education purposes.
Fig. 3-11	Signage	Nametags on plants are targets for vandals. Suggest burning labels into small wood plaques that, if vandalized, are biodegradable. Another alternative is a docent program that places signs before and removes them after tours.
Fig. 3-13	Kiosk	Preference for Fig. 13 sketch over Fig. 14 (although very attractive) because of graffiti concerns. Brochures should only be available for specific tour groups, otherwise will become trash.

Section/Figure	Issue	Comments
Sec. 5.2.2	Fencing of new plants	Cages to protect new plantings are not visually obvious enough. Request that fencing be at least 4 feet in height so equestrians and hikers can easily see them. Recommend using construction fencing (or orange snow fencing) as an alternative. Use of a "discrete single strand wire fencing" to protect plantings (unless highly visible wide-strand) is not advisable because of safety issues.
Sec.3.3, 3.6,8.7	Re-cycling of plants and animals	Suggest contacting Marteen Collette at Wildlife Waystation to see if they can use plants and animals that are to be eradicated. Also, please contact Diane Waters at Shadow Hills local Wild Bird Rescue. She can use live/dead cowbirds for feeding rescued raptors. Diane may also have a source who can use bull frogs. Diane can be contacted at 818-353-9414.
Sec. 8.6.1	Trail width	We ask that most trails are left single-track in width as opposed to 8 ft. widths. Perhaps only the "recreational trails" need to be wider to accommodate school children while others are left single track.
Sec. 3.5.3.1	Fencing	Request that all old existing fencing be removed. If existing ponds are removed, there will be little need to fence off the area since the ponds are the main attraction to the area. Where exterior property line fencing is constructed, we support using heavier gauge fencing to keep wildlife off Wentworth St. and pedestrians from entering at unintended points.
Sec. 3.6.8	Exotics control	The use of rotenone as an eradicator is not an appropriate solution to rid exotic fish species from the waters in our area.
Fig. 3 - 12	Trails Map	2 important trails are not shown on the trails map (Fig. 3-12). One of the trails is even visible in your aerial photos. Please see attached where the 2 trails are indicated by dotted lines.
Sec. 3.6.9	Choice of Options 1 - 4	Most residents who attended the Nov. 17 meeting did not understand that the closure of the Tujunga Ponds was a major possibility. Given a choice, most residents would prefer that our existing ponds be enhanced. However, in that our goal is also to enhance and protect native and endangered species, we support option 2, streambed enhancement with inline ponds, as the next best option. Areas where the giant reed is removed will create natural pond areas along the stream and if shaped correctly, should not become stagnant. There should be a net balance or gain of established riparian and wetland habitat.

Section/Figure	Issue	Comments
Sec. 9.5	Entrance to the mitigation bank	The Marybell entrance would be better served if a step-over is installed when the fence opening is cut through so that a horse can step over, but motorcycles cannot be lifted over. An example is at the top of the Hansen Dam off Osborne.
Sec. 3.7.4.2	Educational program parking	Parking for visitors (school children) is not defined. Suggest using the existing northwest entrance to the ponds area: through the yellow gate on Foothill. Even if existing ponds do not remain, this is still the best alternative. Please place trash receptacles at this site also.
Sec. 3.3.2	Cottonwood area	We support the live oak and sycamore, sage scrub revegetation plan to create additional natural habitat. If concrete is removed from this area, it could be salvaged and placed at the north end of the Cottonwood plateau for streambed protection.
Sec. 3.5.3	Trash pick up along trails	Please place trash receptacles at both sides of the Tujunga Wash at Wheatland. Also at the Marybell entrance.

main comment here is the preservation of the ponds (Option 4).

From Mrs. Tama Lockwood
11370 Ruggiero Ave.
Lake View Terrace, CA 91342
Dated: January 28, 2000

The Master Mitigation Plan is certainly most thorough and comprehensive. The four options are presented fairly -pros and cons.

Any of the options will require diligent maintenance, some more than others. My first choice is option 4. If that option, after overall considerations is definitely not viable, my second choice would be option 3, encompassing parts of 3 and 4.

No matter which option (3 or 4) is implemented, the presence of exotic species of wildlife might eventually return to somewhat the same status as exists today, though hopefully to a much lesser degree.

I can appreciate the need to eliminate the ~~son~~ cow bird, as odious as the process is, as well as the campaign against the non-~~nature~~ native fish, etc.

The water hyacinth problem is obviously extensive and should have been more thoroughly handled when removal was attempted years ago. Not a single plant can be left or eventually it will take over again. Complete eradication is essential in order to preserve any type of water area. Arundo will also sprout again from a single root joint - similar to bermuda grass. (The Army Corps "planted" Arundo, Eastor bean and tobacco in many areas where it had never occurred before, by having the dredging contractor dump unsaleable material in various areas in the Hansen Dam Basin.) Tamarix must be very infrequent, as it certainly is not very apparent.

The elimination of the ponds (option 1,2 &3), filling in the two ponds would seem to be extremely disruptive and destructive -even for the surrounding areas. What becomes of the native species of plants, fish, birds, etc. during this procedure? Each of the three options would seem to be equally severe. Also, streams naturally change their course many times after heavy rain run-off.

I accept the need to realign some parts of equestrian/hiking trails, as is being done on the last 50 yards or so of the water trail east of Wheatland Ave.

We have a wonderful resource and it would be advantageous, in my opinion, to keep as much as possible in the natural state. The ponds community is quite well established and it would seem to me to be worth trying to conserve it as it is and improve it at the same time ie. option 4.

Thank you for your consideration.

Sincerely,
T.L.

member of:
Valley Horse Onvers Assn.
San Fernando Valley Audubon Society
Hansen Dam Advisory Committee
Lake View Terrace Improvement Assn.
Lake View Terrace Home owners Assn.
Equestrian Trails, Inc. Corrals 12 & 20
Los Angeles Co. Office of Public Safety, Mounted Patrol

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United States Department of the Interior
Fish and Wildlife Service
Ecological Services
Carlsbad Fish and Wildlife Office
2730 Loker Avenue West
Carlsbad, California 92008

FEB 2 9 2000

Harry W. Stone
Director of Public Works
County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

Re: Big Tujunga Wash Mitigation Bank Draft Master Mitigation Plan

Dear Mr. Stone:

As requested in your letter dated December 30, 1999, we have reviewed the Draft Master Mitigation Plan (MMP) for the Big Tujunga Wash Mitigation Bank. The 207-acre mitigation site is located immediately downstream of Foothill Boulevard in the City of Los Angeles' Sunland area. It was purchased by the Department of Public Works in 1998 to offset environmental impacts of past, current, and future water conservation and flood control projects.

The Big Tujunga Wash Mitigation Bank is located within a designated Los Angeles County Significant Ecological Area. The site is also a state-designated Significant Natural Area, indicating that the biological resources it supports are significant on a local, regional, and statewide basis. The site contains several very rare and sensitive plant communities, including Riversidean alluvial fan sage scrub, southern arroyo willow riparian woodland, and coastal sage scrub, as well as perennial and intermittent stream habitats. These habitats sustain an array of sensitive plant and animal species including the federally proposed threatened Santa Ana sucker and potentially could (and perhaps do) support a number of state and/or federally listed species such as the endangered southwestern willow flycatcher (*Epidonax traillii extimus*), endangered least Bell's vireo (*Vireo bellii pusillus*), endangered arroyo southwestern toad (*Bufo microscaphus californicus*), threatened coastal California gnatcatcher (*Polioptila californica californica*), and threatened California red-legged frog (*Rana aurora draytoni*).

The draft MMP is obviously the result of a substantial and arduous effort on the part of the Department of Public Works and its consultant to provide for the preservation and enhancement of the exceptionally valuable biotic communities, including state and federally listed species associated with the Big Tujunga Wash. We strongly support protection of the Big Tujunga Wash and commend you and your staff for your determination to conserve these important resources.

We have enclosed general and specific comments on the Draft MMP that address long-term protection, restoration/enhancement management, and monitoring issues associated

with the mitigation bank (enclosure). If you have questions regarding our comments or require additional information, please contact Virginia Brubeck of my staff at 760/431-9440.

Sincerely,

Karen A. Evanfor

Jim A. Bartel
Assistant Field Supervisor

enclosure

1-6-00-NFTA-213

cc: Mary Meyer (CDFG, Ojai)
Mrogan Wehtje (CDFG, Camarillo)

Enclosure

Big Tujunga Wash Mitigation Bank
Draft Master Mitigation Plan

General Comments

1. A mitigation banking instrument should be prepared by the Department of Public Works that addresses 1) bank goals and objectives, 2) current and future ownership of bank
38 lands, 3) methods for determining credits and debits, 4) accounting procedures, 5) reporting protocols and monitoring plan, 5) financial assurances, and 6) provisions for long-term management.

In particular, the Big Tujunga Wash Mitigation Bank should be protected in perpetuity by a deed restriction that prohibits development and protects the area from uses that could result in degradation of the biological, hydrological, physical, and/or chemical attributes of the site. Additionally, it is critical to provide for continued management of the property beyond the initial five year period. We recommend the establishment of a non-wasting endowment to ensure management of the site in perpetuity. Exotics, especially bullfrogs, bass, and invasive plants likely will require monitoring and removal for the life of the project. Failure to address these concerns could result in degradation and deterioration of the habitat value established under the initial restoration and management phase of the project.

2. With the agreement of the stable owners, we recommend that cowbird traps be placed at equestrian centers located within 7 kilometers (i.e., the maximum distance traveled by cowbirds from feeding sites to nesting sites) of the mitigation bank site. Equestrians using these facilities could learn to operate the traps; in this way, they could contribute to controlling the impact of cowbirds, which their activities inadvertently encourage. The trap sites should be determined by cowbird experts who have surveyed the area.

3. We recommend implementation of Optional Enhancement Alternative No. 1 at the Big Tujunga Pond site. We are concerned about the ability of the MMP to meet desired goals without eliminating the ponds, which are sinks for alien species. At the very least, elimination of the ponds would decrease the need for future control of exotics. To this end, a hydrological study is essential. The source of the water in the ponds is not known with certainty, and it must be determined that maintenance of flows in Haines Canyon Creek is possible during and after grading activities intended to eliminate the ponds and establish stream habitat on the site. Maintenance of instream flow would be critical in sustaining sensitive fish populations in the creek. Additionally, the potential for runoff or contamination of ground water from upstream sources such as the proposed Red Tail Golf Course to impact the mitigation site should be included in the hydrological study.

4. We agree that it would be highly desirable to maintain instream flows in Big Tujunga Wash; however, discussions with County personnel during a site visit on January 11,

2000, indicate that this may not be possible given the amount of releases that could reasonably be expected to occur from Big Tujunga Dam and the sandy nature of the substrate within the wash. We do believe that sufficient releases from the dam might be accomplished to maintain pools within the wash between Big Tujunga Dam and Hansen Dam that would function as refugia for native fish and larval amphibians during the dry season and thus increase the benefit to sensitive species of the mitigation site. We also recommend that intermittent scouring flows be released during times of heavy rains when the capacity of the reservoir is likely to be exceeded; scouring flows would help maintain alluvial fan sage scrub habitat on the project site.

5 With regard to irrigation, the MMP does not state whether the irrigation system will be removed after the initial 5-year management period. If removal of the system is necessary, what mitigation measures will be employed to avoid, minimize, and compensate for negative impacts to habitat on the site that may result from the removal process?

6. During the site visit to the Big Tujunga Wash, we observed vehicle tracks in several places in the wash area. The vehicle access point to the mitigation bank site should be located and vehicle access to this sensitive habitat should be eliminated.

Specific Comments

Page 1-2 **PROJECT LOCATION.** The second paragraph states that the Big Tujunga Ponds were created as part of the mitigation required by construction of the 210 Freeway. Currently, the pond habitat is seriously degraded; however, if the ponds are eliminated per the optional enhancement proposals, how will the loss of the original mitigation value be compensated? Is there any record of the type of habitat that was destroyed/degraded that prompted the original mitigation?

Page 1-7 **Sensitive Plants.** The discussion states that the site harbors suitable habitat for Nevin's barberry (*Berberis nevinii*), San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), slender-horned spineflower (*Dodecahema leptocerus*) and several plant species of state concern. We recommend that restoration plans include attempts to establish/reestablish these species in appropriate habitats on the site.

Page 1-10 **Sensitive Wildlife.** The report doesn't mention the mountain yellow-legged frog (*Rana mucosa*). This species was recently proposed for listing as endangered by the Fish and Wildlife Service. Only about 100 individuals are known to exist in and around the San Gabriel Mountains. We recommend the MMP consider the potential for establishing a population of the mountain yellow-legged frog on the mitigation site if appropriate habitat exists or can be restored on the site.

Page 1-12 **Wetlands and Other Waters of the United States.** The MMP states that a large wetland area was delineated on the south side of the site in an abandoned gravel

pit. The location of the pit should be designated on a map. If there is potential to enhance this site, enhancement plans should be included in the MMP. Perhaps additional mitigation credits could be awarded for such enhancement.

Page 2-6 **Non-Native Species.** The MMP states that in areas where mechanical weed removal is ineffective, an 'appropriate' herbicide will be used. Please identify the appropriate compound and discuss why it is considered more desirable than other herbicides.

Page 2-7 **BREEDING OF SENSITIVE/LISTED BIRDS.** The MMP states "It would be difficult to say what number of breeding pairs constitutes success so presence of successfully breeding pairs is the most logical way to determine whether or not the enhancement is a success." It may be possible to use a habitat-based method when evaluating success. For example, if you know the territory size and life requirements of the species and the amount and quality of available habitat, a comparison of the expected number of occupied territories with the observed number of occupied territories would give you some measure of success.

Page 2-7 **TRAILS CLOSURE AND RESTORATION.** The MMP states "the overall goal of the trail system is to allow for recreational activity while minimizing impacts on the habitat quality..." We believe impacts of equestrian activity on nesting birds also should be evaluated in determining where and when trails should be open. For example, does the approach of horses and riders cause nesting birds to flush from their nests temporarily? If riders stop in the vicinity of a nest, does their presence inhibit feeding of young? Could this disturbance impact nesting success? For these reasons, it may become necessary to limit the number of people and horses using certain trails during the nesting season for sensitive species. The MMP should discuss this possibility and include it in ongoing ~~discussions with the interested public.~~

Page 2-7 **EXOTIC WILDLIFE ERADICATION.** The discussion is not clear. It appears that the goals are to limit the densities of ~~exotics~~ on the site to less than 5% of the baseline densities of exotic fish and less than 10% of the baseline densities of bullfrogs and crayfish. If the goals are not met, the control protocol should be modified to achieve the original goal, not, as the Plan states, to keep these populations less than the original baseline populations.

Page 3-5 **Responsible Parties.** The MMP states that the LADPW will be responsible for determining the future ongoing activities following the initial 5-year management period. We strongly recommend that a non-wasting endowment be established to ensure continued management and maintenance of this important site.

Page 3-10 **Coast Live Oak-California Sycamore-Coastal Sage Scrub Revegetation Plan (Optional Enhancement Measure).** The MMP proposes establishing an oak-

sycamore woodland with a coastal sage scrub understory, in part for the purpose of acquiring additional mitigation credits. Coastal sage scrub habitat generally is an open habitat with little overstory. Many plant species adapted to sage scrub habitat require full sun for growth. We question whether a sage scrub plant community could survive over time under shaded conditions. We also question whether typical coastal sage scrub wildlife species such as the coastal California gnatcatcher would use woodland habitat. We recommend establishment of woodland habitat on upland sites and coastal sage scrub habitats at lower elevations between the woodland and riparian habitats. The two habitat types could overlap along the zone of contact, but for optional growth and survival, they should not be intermixed.

Fig. 3-4A This figure shows *Berberis nevinii* planted adjacent to the intersection of three trails on the upland site. This species is native to alluvial fan scrub and should be planted in the wash area where it would have a better chance of survival. Additionally, sensitive species should not be planted near the intersection of trails where equestrians and pedestrians taking short cuts around corners would trample them.

Table 3-2 Although California peony (*Paeonia californica*) is an attractive flower, it contributes little to habitat quality. We suggest elimination of this species from the proposed plant pallette and/or the inclusion of Mexican elder (*Sambucus mexicana*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and prickly pear cactus (*Opuntia littoralis*) in its stead. These species are important components of coastal sage scrub and should be included in any revegetation plan for coastal sage scrub habitat.

Page 3-17 Seed Collection and Supply. The MMP states that seeds will not be collected from areas adjacent to the revegetation sites but will be collected from southern California counties. The seed supply should not include seeds from San Diego County as plants from this area likely would be adapted to drier conditions than those in existing in Los Angeles County.

Figure 3-5 **CONTAINER PLANT INSTALLATION DETAIL.** This figure should depict the root crown to be 1-2 inches **above** the surface of the soil. The current depiction would encourage planters to bury the root crown too deeply in the soil, a condition that could lead to reduced survival.

Page 3-21 **Container Planting Methods**. The MMP suggests that protective cages placed around oak saplings should be buried to at least 4 inches below ground and should extend at least 12 inches above ground to deter rodents, insects, and browsers. We suggest these limits be extended to at least 6 inches below ground and at least 20 inches above ground; even small rabbits can reach well above 12 inches.

Page 3-22 **Riparian Habitat Enhancement Plan**. The MMP states that 20 acres of habitat around the Tujunga Ponds will be enhanced. However, a decision has yet to be made regarding the optional recontouring of the area to remove standing water. If this area is to be modified, habitat enhancement should not occur until modifications are complete.

Page 3-22 **Giant Reed Eradication Technique**. The MMP discusses treating herbicides with dye. The MMP should stipulate that any dye used should be non-toxic to wildlife.

Page 3-24 Water Hyacinth Eradication Technique. The MMP states that inspections of treated plants shall be conducted at 3 and 7 weeks after application of herbicide and that dead biomass shall be removed from the water during each inspection to prevent oxygen depletion of the pond water due to decomposition of the treated plants. We agree that oxygen depletion of the pond water would be undesirable and may lead to adverse impacts to the fish community, including the proposed threatened Santa Ana sucker, downstream of the ponds in Haines Canyon Creek. We recommend inspections be done once weekly unless and until such time as the plant biomass in the pond area is reduced to a level such that decomposition is unlikely to cause oxygen depletion.

Page 3-33 **Trap Materials/Supplies** (first paragraph). The MMP states that wire mesh will be placed around portions of the outside of the cowbird traps if predation within the traps becomes a problem. We recommend that wire mesh to prevent predator access to traps be installed prior to initiation of cowbird trapping.

Page 3-39 **Trap Monitoring**. The first paragraph on this page contains a confusing statement about consulting with the USFWS about which non-target bird species to dispatch and which to keep in the traps throughout the season. No non-target species should be left in traps; the only species that may be euthanized legally are those that are not native to the United States, such as the house sparrow, starling and rock dove, and that are not listed as threatened or endangered by the USFWS.

Page 3-42 Non-target Captures. The last sentence directs cowbird trapping report preparers to "state that (captured sensitive species) were released unharmed." We assume you intend this statement to be used only in cases when it is true; however, the reader may interpret it to mean that sensitive species always should be reported as being released unharmed, even if they died in traps. Please clarify.

Figure 3-13 Given the frequency of fire in southern California, we suggest that signs and kiosks on the site be constructed of fire-proof materials; the cedar shingle roofs recommended in the MMP likely would burn readily.

Page 3-48 **Trail Modifications**. The first paragraph on this page indicates that seven short crossings have been created along the Water Trail to replace the section of

previously existing trail that utilized 1000 feet of streambed in Haines Canyon Creek. Although the crossings are preferable to having horses wade down the stream, seven crossings seems excessive. We recommend that the number of crossings be reduced to a maximum of three within the subject 1000-foot reach of the stream.

Page 3-59 **Shooting and Gigging.** This section discusses the use of small, lead pellets for killing frogs. Lead shot can present a serious danger of lead poisoning for some wildlife species. The Fish and Wildlife Service generally discourages the use of lead shot. We recommend the use of steel shot if it is available.

Page 3-60 **Cautions and Disclaimers.** The MMP describes the optional proposal to eliminate the Tujunga Ponds and attempt to establish additional stream habitat on site as "essentially an experiment" because "there are no published accounts of similar attempts ...in the Los Angeles basin." However, there may be accounts of similar attempts in other areas, and these accounts could prove highly useful should any of the optional proposals to eliminate the ponds be initiated. We recommend a literature search be conducted to locate any existing, relevant information on construction of aquatic habitats if such a search has not been performed.

Page 4-10 **Trail Monitoring Checklist.** The MMP should state how often all monitoring efforts should be accomplished. This instruction has not been provided for three of the items on the checklist.

Page 5-3 **Weed Control.** The list of non-native species that will be targeted for weed control does not include water hyacinth. Is this an oversight or do you consider hyacinth covered in its own section?

Page 5-6 **Functional Analysis Monitoring Methods.** The hydrogeomorphic approach used for the functional assessment requires a reference standard site with the highest level of function. Please identify the reference site and how it was chosen as the reference standard.

Page 5-24 **Water Quality Monitoring.** The MMP states that water quality sampling shall be done on a quarterly basis. We recommend that water quality sampling be done
39 immediately after and/or during heavy rainfall events in addition to the proposed quarterly sampling to determine if contaminants are flushed downstream during runoff from upstream sources such as the proposed Red Tail Golf Course.

Additionally, organochlorines were not included in the list of water quality parameters to be monitored. Although the use of most organochlorine pesticides has been outlawed, elevated organochlorine levels occasionally are documented in stream sediments. We recommend that organochlorines be included in the initial baseline monitoring effort and yearly thereafter as a precautionary measure.

Page 9-3 Dewatering. The MMP states that there are at least two considerations regarding removal of the ponds that are associated with the fact that flow in Haines Canyon ~~Creek may be maintained~~ by groundwater. However, the section discusses only one consideration (i.e., the pumping of water). Please clarify this apparent discrepancy.

B-1 **Appendix B. WILDLIFE SPECIES OBSERVED WITHIN THE BIG TUJUNGA WASH PROJECT SITE.** Please add gadwall (*Anas strepera*) and
40 American coot (*Fulica americana*), both of which were observed at the Tujunga Ponds during the January 11th site visit.