David Magney Environmental Consulting

ODYSSEY PROGRAM RIPARIAN HABITAT MITIGATION AND MONITORING PLAN FOR LAS FLORES CREEK, MALIBU, CALIFORNIA

Prepared for:

CALIFORNIA COASTAL COMMISSION

On Behalf of:

ODYSSEY PROGRAM

November 1998

DMEC

Odyssey Program Riparian Habitat Mitigation and Monitoring Plan for the Las Flores Creek Malibu, California

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SECTION 1. PROJECT DESCRIPTION AND SETTING

1.1 PROJECT LOCATION

The Odyssey Program facilities (project site) are located in the floodplain of Las Flores Creek, at the base of the Santa Monica Mountains, in Malibu, California. The Odyssey Program facilities are located immediately west, and adjacent to, Las Flores Creek. The project site is located approximately 0.6 mile north of the intersection of Las Flores Canyon Road and the Pacific Coast Highway (State Route [SR] 1), at the northern edge of the City of Malibu, Los Angeles County. The site is part of the former Topanga Malibu Sequit Mexican land grant, at geographic coordinates of 34°02'43"N latitude and 118°38'18"W longitude (Figure 1 - Project Site Location Map). The Odyssey Program site is at an elevation of approximately 125 feet above sea level.

Odyssey Program engaged in construction work to restore two fire-damaged buildings and landscaping at the site. During construction of the play area, two mature, but fire-damaged California Sycamore (*Platanus racemosa*) trees were removed in July 1998; however, these two trees were removed without authorization from the California Coastal Commission (CCC).

1.2 PROJECT PURPOSE

The CCC has conditioned Odyssey Program, under CCC Coastal Development Permit No. 98009, to mitigate for the loss of the two mature California Sycamore trees as part of the Odyssey Program's coastal development permit. The conditions require Odyssey Program to restore and enhance riparian habitat along a portion of Las Flores Creek commensurate with the ecological and economic value of the two removed California Sycamore trees.

David Magney Environmental Consulting (DMEC) was contracted by Odyssey Program to:

- provide an independent habitat assessment;
- evaluate the replacement value of the two California Sycamore trees previously removed; and
- develop a mitigation and monitoring plan for submittal to the CCC.

The purpose of this mitigation and monitoring plan is to describe the actions the Odyssey Program will implement to mitigate for the removal of the two California Sycamore trees from the Las Flores Canyon Environmental Sensitive Habitat Area (ESHA), and provide a monitoring program for ensuring plan compliance.

Figure 1. Project Site Location Map

1.3 PHYSICAL SETTING

Las Flores Canyon/Creek is located approximately 8 miles west-northwest of the City of Santa Monica, California, with the mouth of the creek located in the City of Malibu. The creek drains a portion of the southern flank of the Santa Monica Mountains from the western portion of Los Angeles County. The Las Flores Creek segment at the project site is about ½ mile north of SR 1 in Malibu. It averages 50 feet in width (measured from bank to bank), and is approximately 10 feet in depth from full bank to the top of the substrate at the thalweg (low point in flow line).

SURFACE FLOW AND SUBSTRATE

This creek system can generate high energy flows during peak winter months in excess of 3,223 cubic feet per second (cfs) for a 50-year flood event (up to 8,264 cfs when the watershed has been substantially burned). The strike of the creek basin is towards the west, and then to the east at the lower end of the site. The substrate consists of exposed bedrock and a mixed grain size aggregate ranging from clay to small boulders. The majority of the particle sizes are somewhere in the middle of the range.

MORPHOLOGY

As a result of past land filling and encroachments in Las Flores Canyon, and the periodic high-energy flood flow, the fluvial geomorphology of this creek system has been greatly altered from prehistoric conditions. Instream facilities at the project site, such as the floodwall, changed the channel dynamics, which include sedimentation and scour rates. Currently, the active channel is incised with the flow meandering towards the west bank at the upper end of the site, and to the east at the lower end of the site. Surface water flow velocities are unknown; however, they are expected to reach has high as 10 feet per second.

1.4 BIOLOGICAL SETTING

This section describes the biological resources, which include vegetation and habitats and fauna, present at the Odyssey Program project site portion of the Las Flores Creek.

VEGETATION AND HABITAT TYPES

The Odyssey Program project site occurs within historical riparian wetlands, categorized as both Riverine and Palustrine (wetland) Systems, according to the U.S. Fish and Wildlife Service (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States* (Corwardin et al. 1979).

The following wetland/riparian plant communities/habitat types (classes) comprise the vegetation of Las Flores Creek at the project site:

- Riverine Aquatic Bed;
- Riverine Unconsolidated Bottom;
- Palustrine Broad-leaved Deciduous Scrub/Shrub Wetland (Southern Willow Shrub); and
- Palustrine Broad-leaved Deciduous Forested Wetland (Willow Riparian Forest) (Cowardin et al. 1979).

The predominant vegetation type is riparian (palustrine broad-leaved winter-deciduous scrub-shrub wetland), which includes Southern Willow Scrub and Willow Riparian Woodland. The partially developed floodplain area (Las Flores Canyon ESHA) is dominated by Sycamore-Willow and Coastal Live Oak Riparian Woodlands (Palustrine broad-leaved winter-deciduous forested wetland). A list of plant species that are either documented as occurring in, or expected to occur in association with, the Las Flores Creek riparian or instream habitat, is presented in Table 1 - Plant Species of the Las Flores Creek at Odyssey Program. Every habitat type listed is considered a sensitive plant community by the California Department of Fish and Game (CDFG) (Holland 1986) and tracked in CDFG's Natural Diversity Data Base (NDDB) (1998).

FAUNA

Palustrine and Riverine habitats provide numerous important wildlife resources. The structure of the riparian community, in addition to the high plant species diversity and richness, provides habitat necessary for foraging, nesting, and cover for numerous species. In addition, streams and rivers such as the Las Flores Creek are important sources of water for numerous upland wildlife species.

Riparian zones along rivers are often used as migration corridors by various species of wildlife including small and large mammals, birds, and reptiles. These migration corridors often connect habitat patches, and they allow for physical and genetic exchange between animal populations. Wildlife can use riparian zones for cover while traveling across otherwise open areas.

Numerous species of wildlife are known to occur within the Las Flores Creek, and frequent the Palustrine and Riverine System habitats on a seasonal basis, or to regularly use resources provided by the creek. Table 2, Wildlife Species of the Odyssey Program Area, contains a list of animal species that are known to be associated with the Las Flores Creek in the area of Odyssey Program.

1.5 RESTORATION PERMITTING REQUIREMENTS

This restoration plan will be implemented and permitted by the CCC, as a Coastal Development Permit condition, as mitigation for the loss of two California Sycamore trees from within the Las Flores Canyon ESHA. Additional permits are required to modify waters of the United States and waters of the State of California.

Table 1. Plant Species of the Las Flores Creek at Odyssey Program

Botanical Name	Common Name	Habit	Wetland Indicator Status	Family
Alnus rhombifolia	White Alder	T	OBL	Betulaceae
*Arundo donax**	Giant Reed	PG	FACW	Poaceae
Azolla filiculoides	Mosquito Fern	AF	OBL	Azollaceae
Baccharis pilularis	Coyote Brush	S	(FACU)	Asteraceae
Baccharis salicifolia	Mulefat	S	FACW	Asteraceae
*Hirschfeldia incana**	Summer Mustard	PH	(FACU)	Brassicaceae
Lemna minor	Duck Weed	AH	OBL	Lemnaceae
Lepidospartum squamatum	Scalebroom	S	(FACW)	Asteraceae
*Melilotus alba**	White Sweetclover	AH	FACU+	Fabaceae
*Melilotus indica**	Sourclover	AH	FAC	Fabaceae
*Nicotiana glauca**	Tree Tobacco	S	FAC	Solanaceae
Platanus racemosa	California Sycamore	T	FACW	Platanaceae
Populus balsamifera ssp. *trichocarpa*	Black Cottonwood	T	FACW	Salicaceae
Populus fremontii	Fremont Cottonwood	T	FACW	Salicaceae
*Ricinus communis**	Castor Bean	S	FACU	Euphorbiaceae
Salix exigua	Narrowleaf Willow	S	OBL	Salicaceae
Salix laevigata	Red Willow	T	FACW	Salicaceae
Salix lasiolepis	Arroyo Willow	T	FACW	Salicaceae
Salix lucida ssp. *lasiandra*	Yellow Willow	T	OBL	Salicaceae
Typha domingensis	Narrowleaf Cattail	PH	OBL	Typhaceae

Notes:

Scientific names follow Hickman (1993). An asterisk "*" indicates nonnative taxa that have become naturalized. Common names follow Abrams and Ferris (1960), DeGarmo (1980), and Niehaus and Ripper (1976).

Habit definitions:

AF = annual fern or fern ally.
AH = annual herb.
PG = perennial grass.
PH = perennial herb.
S = shrub.
T = tree.

Wetland Indicator Status (Reed 1988) definitions:

OBL = obligate wetland species, occurs almost always in wetlands (>99% probability).
FACW = facultative wetland species, usually found in wetlands (67-99% probability).
FAC = facultative species, equally likely to occur in wetlands or nonwetlands (34-67% probability).
FACU = facultative upland species, usually occur in nonwetlands (67-99% probability).
Parentheses around an indicator status indicates the wetland status as suggested by David L. Magney based on extensive field observations

Table 2. Wildlife Species of the Odyssey Program Area

Scientific Name	Common Name	Habitat	Evidence
Cottus asper	Prickly Sculpin	Riverine Aquatic Bed	Possible
Gasterosteus aculeatus microcephalus	Partially Armored Threespine Stickleback	Riverine Aquatic Bed	Possible
Pimephales promelas	Fathead Minnow	Riverine Aquatic Bed	Expected
Oncorhynchus mykiss	Rainbow Trout	Riverine Aquatic Bed	Possible
Gila orcutti	Arroyo Chub	Riverine Aquatic Bed	Possible
Lepomis cyanellus	Green Sunfish	Riverine Aquatic Bed	Possible
Ictalurus punctatus	Channel Catfish	Riverine Aquatic Bed	Possible
Carassius auratus	Carp	Riverine Aquatic Bed	Possible
Lampetra tridentata	Pacific Lamprey	Riverine Aquatic Bed	Possible
Bufo boreas halophilus	California Toad	Riverine Aquatic Bed, Palustrine	Expected
Pseudacris regilla	Pacific Chorus Frog	Riverine Aquatic Bed, Palustrine	Observed
Batrachoseps nigriventris	Black-bellied Slender Salamander	Riverine Aquatic Bed, Palustrine	Expected
Rana catesbiana	Bullfrog	Riverine Aquatic Bed, Palustrine	Observed
Elgaria multicarinatus	San Diego Alligator Lizard	Palustrine	Expected
Lampropeltis getulus californiae	California Kingsnake	Palustrine	Expected
Sceloporous occidentalis	Western Fence Lizard	Palustrine	Observed
Uta stansburiana elegans	Side-blotched Lizard	Palustrine	Observed
Pituophis melanoleucus annectens	San Diego Gopher Snake	Palustrine	Expected
Buteo lineatus	Red-shouldered Hawk	Palustrine	Expected
Accipter cooperi	Cooper's Hawk	Palustrine	Expected
Ardea herodias	Great Blue Heron	Riverine Aquatic Bed, Palustrine	Observed
Falco sparverius	American Kestrel	Palustrine	Observed
Colaptes cafer	Northern Flicker	Palustrine	Expected
Picioides pubescens	Downy Woodpecker	Palustrine	Expected
Picioides villosus	Hairy Woodpecker	Palustrine	Expected
Nycticorax nycticorax	Black-crowned Night Heron	Riverine Aquatic Bed, Palustrine	Expected
Ceryle alcyon	Belted Kingfisher	Riverine Aquatic Bed, Palustrine	Expected
Casmerodius albus	Great Egret	Riverine Aquatic Bed, Palustrine	Expected
Calypte anna	Anna's Hummingbird	Palustrine	Observed
Sayornis nigricans	Black Phoebe	Palustrine	Observed
Carduelis tristis	American Goldfinch	Palustrine	Observed
Psaltriparus minimus	Common Bushtit	Palustrine	Expected
Empidonax difficilis	Western Flycatcher	Palustrine	Expected
Mustela frenata	Long-tailed Weasel	Palustrine	Expected

Scientific Name	Common Name	Habitat	Evidence
Mephitis mephitis	Striped Skunk	Palustrine	Expected
Procyon lotor	Raccoon	Riverine Aquatic Bed, Palustrine	Observed
Microtus californicus	California Vole	Palustrine	Expected
Didelphis virginiana	Virginia Opossum	Palustrine	Expected
Thomomys bottae	Botta's Pocket Gopher	Palustrine	Observed
Odocoileus hemionus	Black-tailed Deer	Palustrine	Expected
Canis latrans	Coyote	Palustrine	Observed
Lynx rufus	Bobcat	Palustrine	Expected
Felis concolor	Mountain Lion	Palustrine	Expected
Vulpus cinereoargenteus	Gray Fox	Palustrine	Expected

Notes: Scientific nomenclature follows the AOI (1989) for birds, Burt and Grossenheider (1976) for mammals, Jennings (1983) and Stebbins (1976) for amphibians and reptiles, and Moyle (1976) for fishes. Habitat types follow the USFWS wetlands classification system (Cowardin et al. 1979).

Waters of the U.S., including wetlands, are regulated by the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act. The CDFG regulates waters of the State pursuant to Section 1600 *et seq.* of the California Fish and Game Code.

Fill and discharge of dredged material into waters of the U.S. are regulated through the Corps' permit process, which includes both individual permits and use of general (nationwide) permits. Riparian restoration projects on small areas, such as recommended in this plan, may be conducted under Nationwide Permit 27, which has already been issued as a type of General Permit by the Corps. However, to use Nationwide Permit 27, Odyssey Program must provide the Corps with a "notice of intent", including a description of proposed restoration activities. If the Corps does not respond within 30 days, use of Nationwide Permit 27 is authorized for the described project.

Before the Corps' permit is valid, the applicant must receive a water quality certification, or waiver, from the Los Angeles Regional Water Quality Control Board (RWQCB), pursuant to Section 401 of the Clean Water Act. The applicant must submit an application and description of proposed activities, which this plan suffices, as well as an application fee of $1,000/acre of wetlands affected, or fraction thereof. The RWQCB must act within 60 days of receiving a complete application package. The RWQCB must also comply with the California Environmental Quality Act (CEQA) as part of its permit process. Therefore, the applicant must provide the RWQCB with documentation from the City of Malibu that CEQA was complied with, or that the project was exempted or categorically excluded from CEQA review. CEQA compliance is required for many discretionary permitting actions. Administerial approvals do not trigger CEQA.

Any actions that would modify the wetland/riparian habitats within waters of the State require the applicant to enter into an agreement with CDFG (referred to as a Streambed Alteration Agreement), pursuant to Section 1601 for private parties. The applicant must submit an application to CDFG and include a project description, which this plan qualifies. CDFG requires a permit application fee to complete the application and agreement. CDFG must provide the Streambed Alteration Agreement within 60 days of receiving a completed application and fee.

SECTION 2. METHODS AND IMPACT ASSESSMENT RESULTS

2.1 METHODS

This section provides a description of the methods used to inventory and assess the biological resources of the Odyssey Program project site, and to assess the impacts associated with removing the two mature California Sycamore trees.

LITERATURE REVIEW

As part of this wetland mitigation and monitoring report, a literature review of published and unpublished sources was performed to determine which biological resources are known, or have the potential, to occur in the vicinity of the Las Flores Creek study area, particularly in areas located adjacent to the existing project facilities.

SURVEYS AND EVALUATION METHODS

DMEC conducted field surveys of the Odyssey Program project site to characterize the biological resources present onsite and evaluate the monetary and ecological value of the two mature California Sycamore trees that were cut down during the summer of 1998. Field surveys were conducted on 3 and 19 August 1998. Nomenclature follows Hickman (1993) for vascular plants, the American Ornithologist's Union (AOI) (1989) for bird taxonomy and common names, Jennings (1983) and Stebbins (1972) for amphibians and reptiles, Moyle (1976) for fishes, and Burt and Grossenheider (1976) for mammal taxonomy.

DMEC subcontracted with Paul A. Rogers of Poly Associates, Inc. to conduct an evaluation of the two California Sycamore trees. Rogers, a Consulting Arborist, Member No. 231 of the American Society of Consulting Arborists, prepared appraisals of the two trees. Mr. Rogers evaluated the trees according to guidelines provided by *The International Society of Arboriculture*. A copy of Mr. Rogers' report and evaluations are included as Appendix A – California Sycamore Tree Appraisal Report.

2.2 IMPACT ASSESSMENT/EVALUATION

DMEC determined that the removal of the two mature California Sycamore trees at the Odyssey Program project site adversely affected the biological resources of the Las Flores Canyon ESHA. The two trees cut down measured 18 inches diameter at breast height (dbh) and 24 inches dbh. Both trees were severely damaged in the wildfire of 1995; however, they resprouted substantially

by summer 1998. The tree appraisal determined that the basic replacement cost for each tree is $1,805, or $37/square inch. This base replacement cost was adjusted for each tree's trunk area (compared to the trunk area of a replacement tree), a "Species" rating of 50%, to determine the "Basic Value". The Basic Value of each tree was then adjusted for condition and location to determine the "Appraised Value" of each tree.

The two California Sycamore trees that were removed from the Odyssey Program site are evaluated at:

Tree:	18-inch dbh Tree	24-inch dbh Tree
Basic Price:	$8,857	$16,183
Species Rating:	50% = $4,428	50% = $8,091
Basic Value:	$6,233	$9,896
Condition:	35% = $2,181	30% = $2,968
Location:	50% = $1,090	47% = $1,394
Appraised Value (rounded):	$1,100	$1,400

The combined appraised value of the two California Sycamore trees removed is $2,500. The ecological "value" is less tangible and rarely reduced to a dollar value.

The ecological functions provided by riparian trees such as the California Sycamore is determined according to how they "fit" into to ecological food web. Trees such as those removed provide habitat for a suite of invertebrates, small mammals, and birds by providing foraging and nesting habitat. The trees removed were not of sufficient size to support large cavity-nesting birds and mammals, including Barn Owl, Great-horned Owl, and Raccoon. However, dead limbs and trunks of smaller trees, such as those removed, provide nesting habitat for smaller cavity-nesting birds such as woodpeckers.

Since other California Sycamore trees are present nearby, some of which are significantly larger, the ecological loss of the two trees is not significant. However, their loss does contribute to a cumulative loss of riparian trees in the Las Flores Canyon ESHA; therefore, replacement onsite is warranted.

2.3 CONCLUSIONS

The riparian habitat existing at the Odyssey Program site has been previously degraded from historical conditions. The removal of the two relatively small California Sycamore trees that were fire-damaged in 1995 further contributes to the cumulative lowering of the habitat functions originally present in Las Flores Canyon. Although the loss of these two trees, from an ecological standpoint, is less than significant, the two removed trees did provide habitat to a number of riparian-dependant birds and wildlife species currently using Las Flores Canyon. The trees were

recovering from the 1995 wildfire and would have likely provided habitat, on an increasing basis as they grew larger, for as long as they were left standing, whether or not they were alive or dead. Therefore, DMEC recommends mitigation to be implemented that replaces the California Sycamore trees and their ecological functions. The CCC has also conditioned the project with replacing the two trees at a 10:1 ratio.

Replacement mitigation is preferably conducted onsite, as opposed to at another location. A suitable mitigation area is present onsite, on the west bank of Las Flores Creek, and is recommended for mitigation planting. The details of the mitigation planting are provided below in Section 3. DMEC recommends enhancing the riparian/wetland vegetation of an approximate 3,000-sq. ft. (0.07 acre) portion of Las Flores Creek adjacent to the Odyssey Program facilities.

A mitigation-monitoring plan is also recommended to monitor the success, or failure, of the mitigation planting, and is described in Section 4. The monitoring will provide a systematic and regular method of assessing mitigation success. The mitigation monitoring plan is designed such that timely corrective action can be implemented if part or all of the mitigation planting fails, to meet mitigation requirements.

DMEC also suggests, but does not believe should be a mitigation requirement, that nest and bat boxes be installed at several locations onsite to replace nesting habitat that may have been provided by the two California Sycamore trees. Bird nesting boxes and bat boxes also provide educational opportunities for the students of Odyssey Program.

SECTION 3. MITIGATION FOR TEMPORARY LOSSES OF RIPARIAN HABITAT

Odyssey Program proposes to provide mitigation in the vicinity of the Odyssey Program facilities to compensate for the two California Sycamore trees removed during landscaping work performed on those facilities. A conceptual design and description of the mitigation plan are provided in the following subsections and Section 4.

3.1 MITIGATION GOALS

The revegetation/restoration goals of this plan are to be in compliance with CCC Coastal Development Permit No. 98009. Specific goals for the project are described separately below.

The goals for the Riparian Habitat enhancement are as follows:

- Provide a 10:1 replacement ratio for California Sycamore trees removed (20 trees planted for the two trees removed);
- Create/enhance approximately 0.07 acre of riparian habitat within the bed and banks of the project site's section of the Las Flores Creek to mitigate for disturbance and permanent loss of riparian habitat in the Las Flores Canyon ESHA;
- Remove nonnative (invasive exotic) plants from work areas and mitigation sites onsite;
- Monitor for compliance with CCC requirements and regulations;
- Provide directives for future removal of any nonnative (invasive exotic) vegetation at the project site;
- Provide a Maintenance and Monitoring Program with directives promoting ecosystem viability at the project site and compliance with CCC requirements; and
- Provide a general timeline for restoration activities.

3.2 ENHANCING/CREATING RIVERINE AND RIPARIAN HABITATS

The Las Flores Creek is a dynamic environment and is subject to dramatic change. Nevertheless, it supports a diverse wildlife resource and can be enhanced to improve wildlife habitat for species of concern that are dependent upon the unique characteristics of this site. Human activities will continue to directly or indirectly affect Las Flores Creek; however, the purpose of mitigating and enhancing sensitive habitat is to preserve and expand existing habitat values, especially for species facing critically scarce habitat in the region. The means for achieving this

enhancement include restoring habitats by improving water quality, eliminating or controlling nonnative species, and installing native plants.

Since no net loss of wetland acreage resulted from project implementation, the primary goal of the mitigation effort is to compensate for the temporary loss of habitat functions. The riverine and riparian habitats will be enhanced and created onsite by enhancing a total of 0.07-acre of riparian habitat. The area proposed for restoration and mitigation is delineated on Figure L1.1 - Landscape Planting Plan (Oversized). Restoration mitigation will primarily be accomplished by implementing three measures:

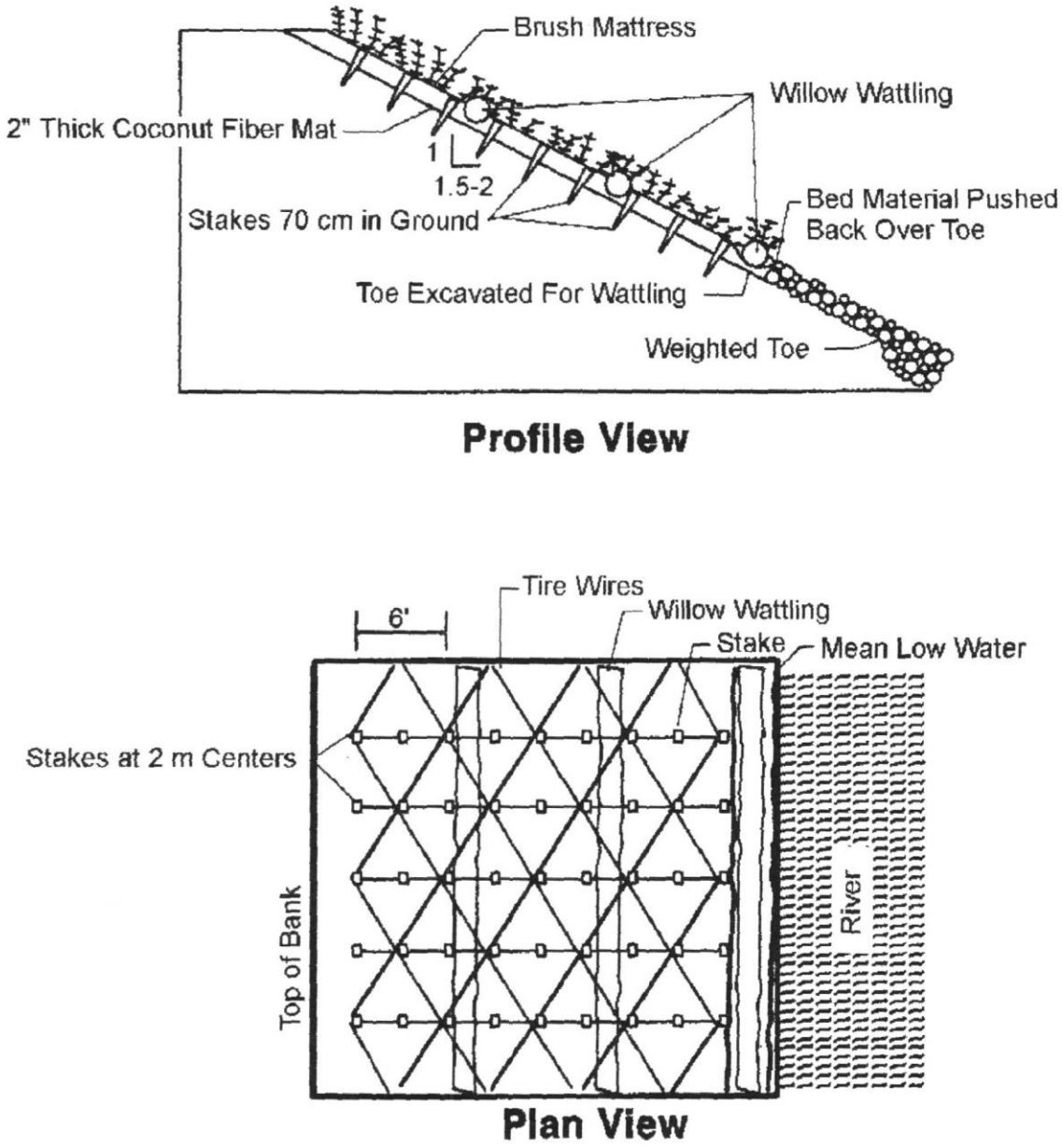
- planting native riparian and wetland species that are indigenous to the region;
- replacing the two California Sycamore trees removed during project construction; and
- enhancing adjacent wetland habitats through removal of invasive exotic species along beds, banks, and channels of the Las Flores Creek.

Riparian vegetation will be planted in a 3,000-sq. ft. area along Las Flores Creek (see Figure L1.1). Vegetative propagules for the mitigation planting will be obtained from existing onsite wetland/riparian vegetation, and will be propagated onsite or at an appropriate nursery for replanting.

The mitigation site will be planted primarily with a combination of site-collected seed and vegetative material to maintain the local genetic integrity of habitat in the area. In the initial years of establishment, emphasis will be placed on control of invasive exotic plants in the mitigation area, and on monitoring success of the new plantings. Invasive exotic control will continue until the new vegetation has matured (for up to 5 years) to reduce the risk of invasive exotics becoming dominant in the mitigation areas. The enhanced riparian plantings will improve the site's function as wildlife habitat, and as they become established, will provide forage for a wide variety of riparian-dependent animals.

A portion of the planting area may need to be protected from erosion. DMEC recommends using bioengineering techniques in combination with the plantings. Several treatments are available, with one suggested for use onsite, depending on specific site conditions and the general level of protection from flood scour desired. The bioengineering techniques suggested include coir blankets (Figure 2 - Coir Blanket and Wattling Detail) with wattling or pole plantings.

Figure 2. Coir Blanket and Wattling Detail



3.3 ESTIMATED COST

The cost to complete all aspects of this wetland habitat mitigation effort, including construction and post-construction monitoring, is included in the estimate. Costs to implement the proposed mitigation/habitat restoration, as described in this plan, ranges from $8,000 to $12,000, excluding major grading (which is not proposed). Planting-phase monitoring is estimated to cost between $2,000 and $4,000, including preparing as-built planting plans. Post-planting phase monitoring, for the required five-year period after planting, is estimated at between $20,000 and $28,000. The total cost estimate for mitigation implementation and monitoring ranges from $30,000 to $44,000.

3.4 TARGET FUNCTIONS

Wetlands disturbed or eliminated by the project will be replaced in-kind and in areas located adjacent to or within the project site. Loss of wetlands will be replaced by creating Riverine riparian habitat dominated by a diverse assemblage of appropriate native species. The mitigation objective is to have no net loss of riparian wetland extent or function ("value") resulting from implementation of the proposed project.

Wetland habitats created will be designed to maximize wildlife habitat values through incorporating features that increase cover, foraging, breeding, and nesting opportunities for a wide variety of aquatic and terrestrial wildlife. Wildlife habitats associated with wetland communities of the project sites are expected to be restored as vegetation of the mitigation site becomes established. The primary target functions of wetland habitats to be restored or enhanced include the following:

- Provide suitable foraging and cover habitats for semi-aquatic species;
- Provide suitable foraging habitats for terrestrial wildlife that frequent or inhabit wetlands of the project site;
- Provide suitable breeding and nesting habitats for bird species, that currently inhabit or frequent riparian communities of the project site, or for birds that would be expected to breed in riparian habitats associated with perennial seeps and springs;
- Maintain surface water quality within Palustrine habitats to reflect pre-project conditions or better;
- Maintain suitable food sources, consisting of aquatic invertebrates, for native aquatic and terrestrial fauna associated with the existing springs; and
- Maintain self-sustaining riparian wetland habitats consisting of diverse assemblages of native plant species.

These target functions can be restored and maintained through implementation of the following measures:

- Create additional wetland riparian habitat onsite;
- Plant additional areas with local native species;
- Control invasive exotic plant species;
- Allow natural habitat succession; and
- Increase plant species richness and diversity by planting additional wetland riparian plant species growing in the vicinity of the project site.

3.5 PROPOSED MITIGATION AREA

Impacts to riparian resources will be mitigated onsite. The mitigation will occur onsite within the banks of Las Flores Creek by planting a variety of locally indigenous wetland riparian plants. The resulting mitigation will enhance the existing sparse riparian vegetation of the creek present at the Odyssey Program project site. The proposed planting area is illustrated on Figure L1.1 and consists of one discrete site, and landscaping elsewhere onsite. The landscaping includes extensive use of native plants. A recommended plant palette is provided in Table 3 - Mitigation Area Plant Palette, and includes recommended planting densities, as appropriate.

Table 3. Mitigation Area Plant Palette

Botanical Name	Common Name	Planting Rates
Baccharis salicifolia	Mulefat	40 pole cuttings or 5 20'-long wattles of 15 cuttings each
Juglans californica ssp. *californica*	Southern California Black Walnut	5 1-gallon containers
Platanus racemosa	California Sycamore	5 1-gallon containers
Rubus ursinus	Pacific Blackberry	20 rooted cuttings
Salix exigua	Narrowleaf Willow	20 pole cuttings or 4 20'-long wattle of 15 cuttings each
Salix lasiolepis	Arroyo Willow	20 pole cuttings or 5 20'-long wattles 15 cuttings each
Sambucus mexicana	Blue Elderberry	5 1-gallon containers

Many of these plants can be obtained from Las Flores Creek as cuttings, which is the recommended method. Others can be obtained from native plant nurseries, such as Matilija Nursery (805/523-8604), Tree of Life Nursery (714/728-0685), and Mariposa Horticultural

Enterprises (626/960-0196). The parent material should originate from the Santa Monica Mountains area, not from other floristic provinces.

The pole cuttings should be planted vertically as illustrated in Figure 3, Example Pole Cutting Detail, or planted horizontally in wattles (bundles of pole cuttings lashed together and partially buried parallel to the streamflow).

Mitigation will occur in the location of the Odyssey Program facilities until a total mitigation an approximate 0.07-acre area of riparian habitat has been enhanced from existing conditions. The total area used for mitigation (within the seven planting areas) is approximately 0.07 acre, plus the landscape plantings on the grounds of the Odyssey Program schoolyard.

3.6 MITIGATION IMPLEMENTATION PLAN

This section describes what the wetland mitigation plan includes and how, where, and when it will be implemented to mitigate for impacts to two California Sycamore trees. For mitigation, a total of approximately 20 California Sycamore trees and 0.07 acre along Las Flores Creek will be planted with native riparian and wetland plants as described above.

IMPLEMENTATION SCHEDULE

Planting Plan

The intent of the mitigation plan is to enhance existing riparian wetland habitat along Las Flores Creek adjacent to the Odyssey Program site. The general approach for the wetland creation/enhancement at the Odyssey Program mitigation site includes:

- Removing existing nonnative, exotic plants from the work area;
- Installing natural retaining devices (e.g. coir blankets), if necessary;
- Collecting cuttings and propagating wetland/riparian plants;
- Collecting seeds, if necessary;
- Installing a temporary irrigation system;
- Planting with native plant material and seeds;
- Monitoring the work of the planting contractor; and
- Monitoring the mitigation plantings for a 5-year period.

Mitigation planting activities will not commence until the final grading and contouring activities at the mitigation area are completed, which involves little grading and installation of any needed erosion control devices (e.g. coir blankets). Planting activities should take place between the first wetting rains, and before the last spring rains (generally between October and April), unless otherwise directed. A general implementation schedule is described below and is graphically presented in Table 4, Mitigation Implementation Schedule.

Table 4. Mitigation Implementation Schedule

Task/Item	Weeks (Starting January 1999)											
	1	2	3	4	5	6	7	8	9	10	11	12
Submit bid request(s)												
Select contractor(s)												
Execute contract(s)												
Conduct start-up meeting(s)												
Remove invasive plants												
Grade planting site												
Install retaining devices												
Collect cuttings												
Collect seeds												
Plant cuttings												
Plant seeds												
Install irrigation												
Monitor grading contractor												
Monitor planting contractor												

This schedule may be modified as necessary to properly implement all aspects of this riparian mitigation plan.

SITE PREPARATION

Specific procedures are required to prepare the project site for mitigation planting. Some items identified below are intended to meet specific permit conditions, while others are necessary or recommended to implement the restoration and enhancement plan to facilitate successful restoration.

Plantings will occur in native riverbed soils (gravels, cobbles, and sand) found onsite. No adjustment to soil texture is expected to be necessary, or recommended, other than the mulch addition.

Delineate Work Area

All work areas will be demarcated with flags or stakes prior to construction activities. All contractors, subcontractors, and equipment operators shall be instructed to remain within the flagged boundaries. Vegetation and soils shall not be disturbed outside of the flagged

boundaries. All debris, such as wood debris, nonnative gravel, cured or uncured concrete, nonnative rocks, rebar, flagging, and excess soil will be removed from the mitigation site prior to restoration activities described in this mitigation plan. One or more pickup trucks will likely be used, as well as possibly one backhoe.

Invasive Exotic Plant Removal and Control

All invasive exotic plants will be removed by hand from the planting areas within 1 week of planting. Invasive exotic plant species targeted for regular removal include several shrub and herb species that grow within the Odyssey Program project area (which includes the creek bed area along the Odyssey Program property). A list of the target invasive exotic plants that will be eradicated and controlled is presented below in Table 5, Target Invasive Exotic Plant Species.

Table 5. Target Invasive Exotic Plant Species

Botanical Name	Common Name
Arundo donax	Giant Reed
Brassica spp.	Wild Mustard
Foeniculum vulgare	Sweet Fennel
Nicotiana glauca	Tree Tobacco
Raphanus sativus	Wild Radish
Ricinus communis	Castor Bean
Tamarix spp.	Tamarisk or Saltcedar

All invasive exotic nonnative plants shall be removed from the work areas and shall be disposed of in a manner that prevents their re-establishment. Removal shall be done at least twice annually during the spring/summer season, and as needed through the term of monitoring period. Whenever possible, invasive exotic plants shall be removed by hand rather than by chemical means. Where surface water is present, and control of invasive exotic plants is required within the streambed or bank with herbicides, the Contractor shall hire a licensed pesticide applicator to apply only those herbicides, such as glyphosate (e.g., Rodeo), that are approved for aquatic use. If surfactants are required, they shall be restricted to non-ionic chemicals, such as Agri-Dex, that are approved for aquatic use.

Mulch

Mulch on planting areas will be of sterile rice straw or chipped material (excluding material from invasive exotic plants). The salvaged topsoil replaced on planting areas will be amended with

straw mulch, or composted or chipped material, at a 1:5 ratio (one part mulch to five parts topsoil). Straw mulch will be incorporated into the topsoil, or anchored with wood fiber and an organic binder if applied on top of soil. Additionally, mulch will be applied at a minimum of 3 inches deep and 2 feet in diameter at each container-planting site. All mulch (chipped or rice straw bales) shall be free of noxious weed seed, mold, and deleterious materials. Owner will furnish evidence that clearance has been obtained from County Agricultural Commission if straw is obtained from outside Los Angeles County.

Collection, Propagation, and Salvage Operations

Plant material for the revegetation shall be derived from cuttings materials obtained from plants salvaged from disturbed areas and/or native plantings in the Las Flores Creek/Canyon area. Seeds shall be obtained from selected native trees and shrubs occurring onsite or locally within the same watershed. Any replacement tree/shrub stock that cannot be grown from cuttings or seeds shall be obtained from an approved native plant nursery and shall not be inoculated to prevent heart rot. The contractor shall provide a list of all materials that must be obtained from other than onsite sources.

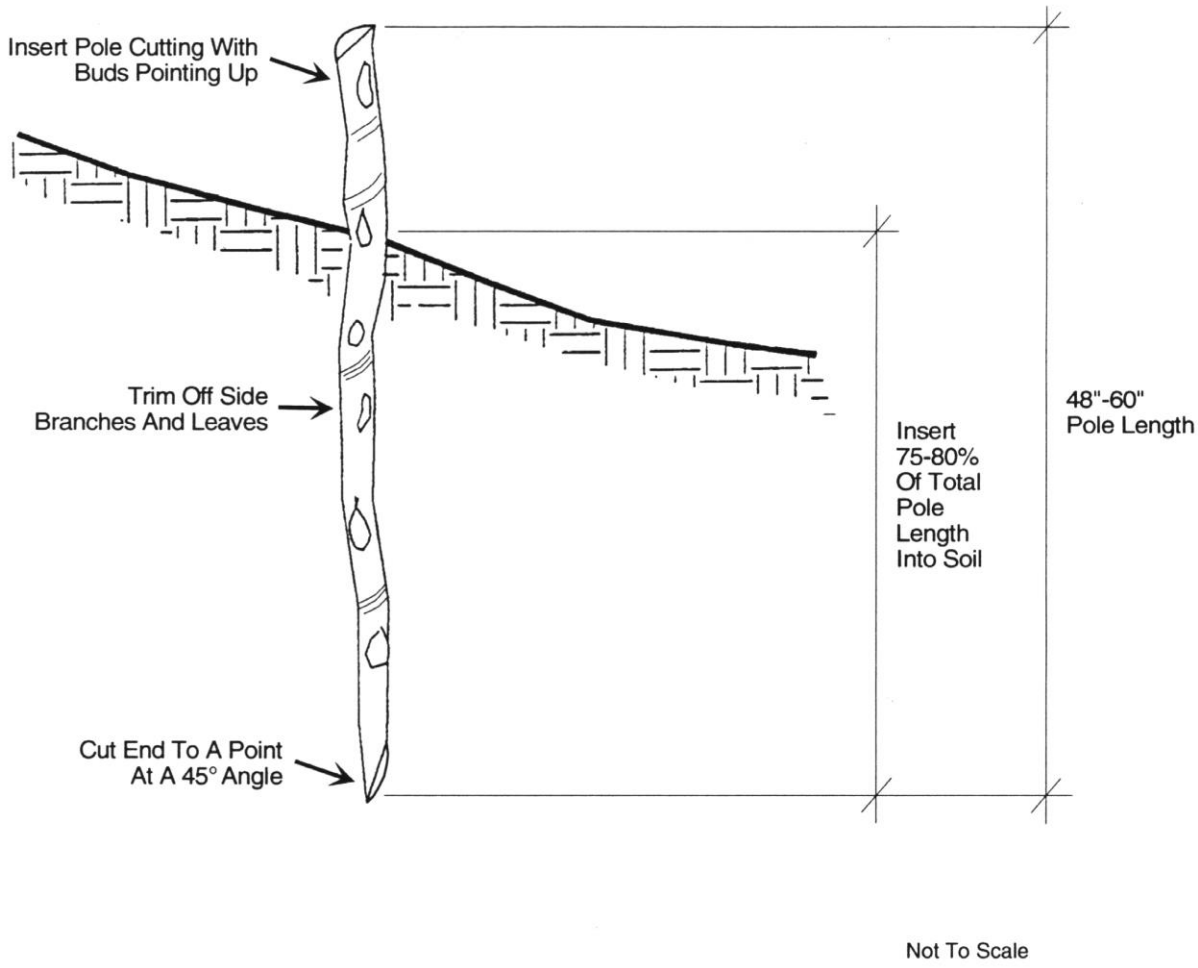
Pole cuttings should be made in the following manner (see Figure 3). *Salix lasiolepis* (Arroyo Willow), *Salix exigua* (Narrowleaf Willow), *Baccharis salicifolia* (Mulefat), and *Populus fremontii* (Fremont Cottonwood) pole cuttings shall be cut from mother plant stock with a diameter not less than ½" and a length of 36" to 60". Pole cuttings shall be stored with angled tips in water until planting in soil takes place. Pole cuttings shall be planted within 48 hours of collection.

Plant Salvage Plan

Prior to site preparation operations, and under the direction of a qualified and approved (by the CCC and Corps) restoration specialist, selected existing native plants shall be salvaged and removed from the mitigation area. These plants shall be collected, stored, and grown at a qualified nursery facility experienced with growing California native plants (e.g. Matilija Nursery--805/523-8604, Ventura College Horticulture Department, Donald Rodrigues--805/654-6400, Tree of Life Nursery--714/728-0685, and Mariposa Horticultural Enterprises--626/960-0196).

The salvage operations shall gather either entire plants or cuttings, as appropriate, to be used in replanting at the designated mitigation area. Salvaged plants shall be planted in appropriately sized containers and cared for until replanting in the mitigation areas can occur, scheduled for February 1999. Cuttings, such as for pole cuttings, can be stored, without leaves, in cold storage until planted onsite, or in containers for later onsite planting if cuttings are taken prior to planting time.

Figure 3. Example Pole Planting Detail



EXAMPLE POLE PLANTING

Cuttings obtained for propagation shall be treated according to standard nursery practices and grown to at least 1-gallon-size containers for planting at the mitigation areas in February/March 1999. All container plantings shall be labeled with scientific name, date collected and transplanted, and location from which stock was obtained. No container plants shall be accepted for mitigation planting without proper labels.

Note: extensive salvage is not expected to be needed for this project, since the site selected for riparian/wetland enhancement is already sparsely vegetated.

PLANTING

Divisions will be kept moist and planted, within 2 hours of collection, in moist soil. Willows and Mulefat will be planted directly in the planting areas within several hours of taking cuttings from trees and shrubs growing in the area of the project site. Willow cuttings, 60-inches long, will be planted in vertical holes at least 36 inches deep, immediately backfilled with native soil, and thoroughly irrigated, as illustrated in Figure 4 - Example Container Planting with Plant Protection Detail. Willow cuttings grow fast and are expected to reduce erosion during the period of nursery propagation of other species to be planted. Container stock will be planted as follows:

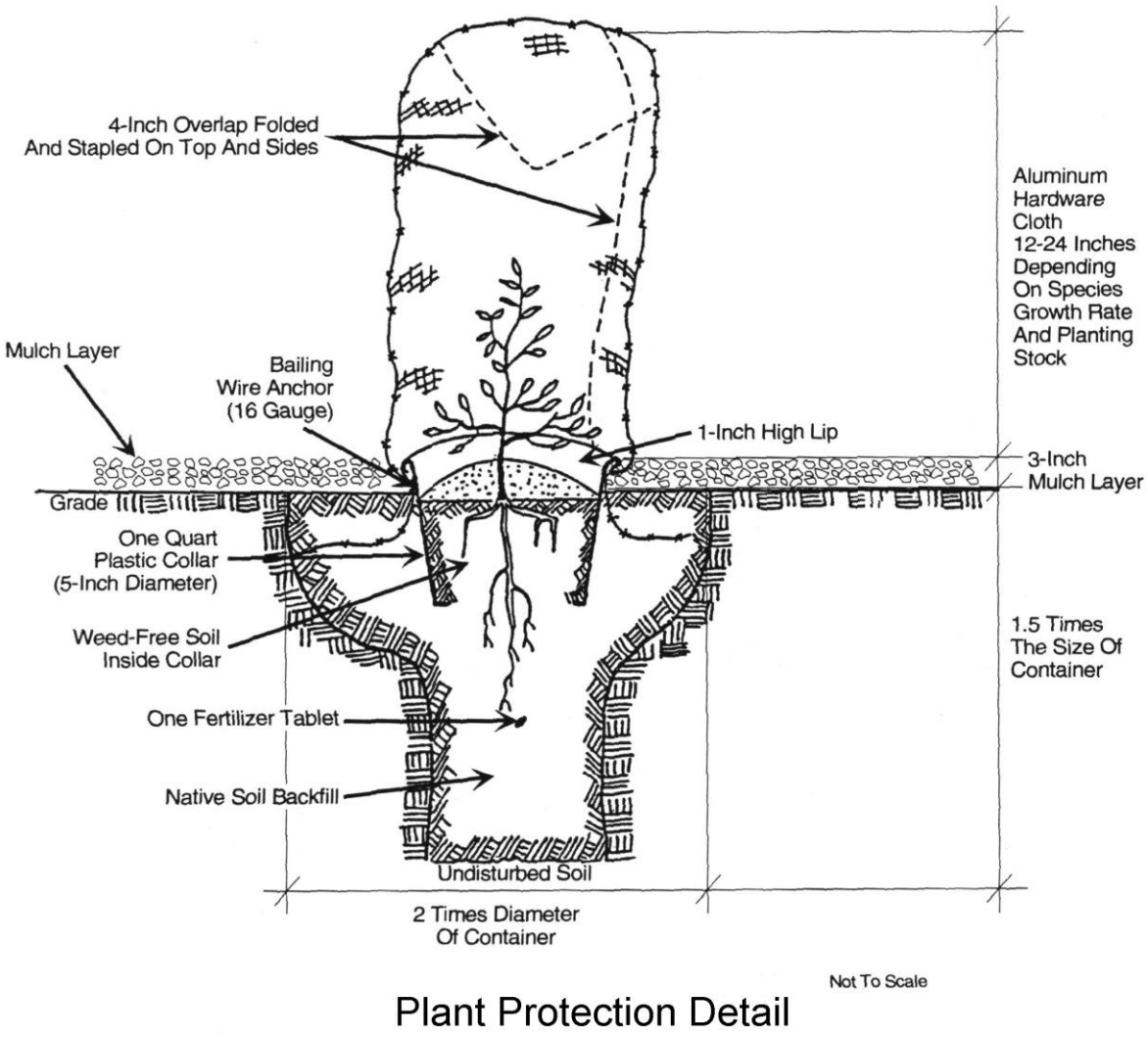
- Excavate a hole 2 times the diameter and 1.5 times the height of the container;
- Remove roots and rocks from the hole;
- Place slow release fertilizer tablet in the hole;
- Trim excess roots to obtain approximately equal root and shoot mass;
- Place root ball in hole and cover with native soil;
- Place organic mulch 3 inches deep on top of soil around plant;
- Install a root collar and basket of aluminum screen (as needed to prevent herbivory); and
- Irrigate immediately to saturate surrounding soil.

Root collars and screen baskets should be installed on those plants (including *Populus fremontii, Platanus racemosa,* and *Sambucus mexicana*) expected to be browsed by deer, rabbits, or rodents (Figure 4). Additional irrigation may be necessary depending on soil moisture and timing of expected rainfall at the time of planting.

IRRIGATION PLAN

A temporary irrigation system will be installed only where necessary, for a period of 2 years or until plant establishment is achieved. Supplemental irrigation will not be necessary for willow saplings and other riparian tree species planted directly in the wet zone of the created channels. Irrigation is recommended for installation when natural moisture conditions are inadequate to insure survival of plantings. Irrigation should be provided regularly (every other day, except when raining) to plantings during the first 3 months following planting.

Figure 4. Example Container Planting with Plant Protection Detail



Additional irrigation may be required during summer drought periods within the first 2 years. Irrigation should be phased out during the fall/winter of the second year unless unusually severe dry conditions threaten plant survival. All plantings must survive and grow for a least 3 years without supplemental water for revegetation/restoration to comply with recommended success criteria. Upland areas will require supplemental irrigation. The temporary irrigation system shall be maintained for a period of 24 months (2 years) from the date the planting and irrigation is accepted from the installation contractor.

All temporary irrigation shall be above ground. Water shall be provided by Odyssey Program from onsite sources. All piping shall be white PVC and all flex tubing shall be black. The temporary irrigation system shall be a combination of drip (to cuttings and/or container plantings) and low-precipitation overhead impact spray (for mulched and/or seeded areas), as appropriate.

Watering Schedule

At the onset of planting, watering shall be performed three times per day at 3 to 4 times per week for the first two weeks. Gradually, over a period of 6 months to one year, watering will be decreased, until heavy natural rainfall is has occurred, or forecasted. At the end of the 24-month period, temporary irrigation will be discontinued.

Watering will not be necessary during the winter season if normal precipitation occurs regularly. However, if rainfall does not occur more frequently than at three-week intervals during the first winter and spring, supplemental water shall be applied in the mitigation areas.

MITIGATION MAINTENANCE

Maintenance of the mitigation areas is essential to achieve mitigation objectives and performance criteria. Many of the corrective actions triggered by non-attainment of the performance criteria involve maintenance, but routine maintenance should also be conducted even if not required to attain those criteria.

The mitigation areas should be maintained in good ecological condition, and shall be protected in perpetuity for the natural values of the Riverine and riparian habitats. Included maintenance measures are weed control, trash removal, and erosion control. In addition, as part of maintenance activities, woody debris that is naturally deposited within the mitigation area should be retained onsite wherever possible to enhance habitat values for wildlife.

Maintenance visits, for the establishment of the vegetation, are critical for successful habitat establishment. Two visits per year, one in spring and one in the fall, are considered sufficient; however, maintenance should be conducted more frequently during the first year, and is recommended to occur on a monthly basis for the first six months. The irrigation system should also be checked monthly, particularly during the dry season (June through October).

Protection measures are designed to safeguard the mitigation area so that uses considered incompatible with long-term preservation of the wetland/riparian species are prohibited. These include meeting with Odyssey Program staff and contract crews to discuss the mitigation efforts and areas to avoid, providing physical protection of existing wetlands during construction, fencing or marking the entire mitigation area, and posting educational signs describing the sensitive resources. Mitigation maintenance and protection measures shall be accomplished by Odyssey Program and a landscape contractor familiar with both native plant materials according to the techniques described in the following sections. Odyssey Program staff and/or the landscape contractor assigned to implement this plan must be approved (as qualified and experienced with native wetland restoration and maintenance) by the CCC and Corps.

Maintenance Activities

Plantings will be maintained weekly for the first 3 months after planting, and quarterly thereafter. The installation contractor shall guarantee the plantings for a period of 90 days from acceptance. Another approved landscape maintenance contractor may conduct the remaining maintenance for the balance of the 5-year compliance period.

The maintenance period will be 5 years from the date of completion of mitigation planting. Maintenance will include irrigation, weeding, repair/replacement of plant protection kits and irrigation components, and replacing dead or dying plants. Irrigation will be conducted only to supplement existing natural water supplied by creek surface flows and shallow groundwater. Weeding will include removal of all nonnative plants from the planting areas and may include minor trimming of native plants to increase light and reduce physical contact with neighboring plants. The following maintenance measures shall be conducted on a regular basis:

- **Weed Control**. Planted areas shall be weeded to encourage the success of planted native plant material and to discourage nonnative ruderal or weedy species from establishing populations at the mitigation site, and reduce plant competition. A minimum area of 1-square-meter around each new planting (excluding pole cuttings and wattles) shall be kept weed free. This process shall be done by hand wherever possible.
- **Irrigation Monitoring.** Irrigation components will be monitored on a regular basis to verify that equipment is in working order. An onsite monitor will be present during irrigation schedules to inspect for leaks, accurate coverage, and troubleshooting. Replacement or repair of broken irrigation components will be completed as necessary. All site visits will be documented.
- **Plant Protection Kits.** Plant protection kits shall be repaired when necessary. Plant screens shall be removed before the screens obstruct plant growth. The mulched area shall be maintained weed-free.

- **Trash Removal.** All trash shall be removed in all mitigation areas on a regular basis, particularly following significant windstorm events.

Maintenance Schedule

Maintenance of all habitat restoration plantings, and control of invasive exotics, shall be conducted according to the following schedule; however, the specific timing of maintenance activities may be dependent on monitoring or other conditions that may require deviation from the schedule. All mitigation areas shall be maintained weed-free, at least quarterly for the first 2 years, and semiannually for the remaining 3 years of maintenance/monitoring.

All plantings in each mitigation area shall be maintained weekly for the first 3 months following installation, quarterly for the first year, and at least semiannually during the 5-year monitoring period. Additionally, the irrigation system shall be maintained on a routine basis during the summer season during the first 2 years following installation.

Maintaining Control of Invasive Exotics in the Mitigation Area

Odyssey Program shall control invasive exotics in the mitigation area for a period of 5 years. Initially, invasive exotic plants will be eradicated, which will occur between February and April 1999. Invasive exotic plants will be controlled in the restoration and mitigation areas quarterly for 5 years from the date of the initial eradication effort. Assuming the invasive exotics are eradicated by March 1999, maintenance control will be conducted once every 3 months.

SECTION 4. MITIGATION MONITORING PLAN

This section describes the specifics of how and when mitigation monitoring will be conducted at the Odyssey Program site.

4.1 SITE ACCESS

Access to the mitigation work sites shall be via Las Flores Canyon Road and the Odyssey Program's lower (southern) playground. Equipment staging, storage, and fueling shall take place outside of the jurisdictional waters of the U.S., in a designated upland location, which will likely occur in the upper (northern) student "drop-off" area. All equipment that may enter onsite waters of the U.S., including wetlands, shall be checked daily for petroleum or fluid leaks or spills. Leaks or spills shall be cleaned immediately.

Contractor and crewmembers shall receive pre-construction training that will include: identification of site boundaries, identification of construction boundaries, and contingency plans to be followed if special-status species (which include listed and non-listed rare, threatened, and endangered plants and wildlife) are found onsite during construction activities.

Monitoring will be conducted semiannually for the first 2 years in conjunction with maintenance, and annually for the remaining 3 years, or until mitigation criteria are met. Monitoring will be conducted by the Biological Monitor, a person experienced in native habitat restoration approved by the CCC. The following tasks will be completed during each monitoring visit at the mitigation areas:

- Establish photodocumentation stations and take photographs;
- Record the number of surviving plants for each species;
- Record total percent cover of native plant species;
- Identify and record all plant species in the planting area; and,
- Determine maintenance requirements.

An annual monitoring report will be prepared and will include the following information:

- Photographs taken, percent cover, and survival data collected;
- Discussion of revegetation success in terms of survival, percent cover, and amount of reproduction and colonization by native species;
- Discussion of plant replacement actions;
- Discussion of maintenance actions; and
- Proposed maintenance for the following year.

4.2 GENERAL SITE DISTURBANCE ISSUES AT PROJECT SITE

Sensitive resources are known to occur in the Las Flores Canyon ESHA, specifically aquatic and wetland/riparian resources, will need to be considered during installation of the mitigation plantings. Sensitive biological resources may be encountered and need to be avoided or protected. No listed plants or wildlife are reported as occurring within Las Flores Canyon (Natural Diversity Data Base 1998).

SITE DISTURBANCE AT WORK AREAS

All work areas will be demarcated with flags or stakes. All contractors, subcontractors, and equipment operators shall be instructed to remain within the flagged boundary. Vegetation and soils shall not be disturbed outside of the flagged boundary. The total area of disturbance shall not exceed 0.07 acre (3,000 sq. ft.), as described in the project description in Section 1.0.

EXISTING VEGETATION

Native vegetation shall not be removed or intentionally damaged beyond the proposed site preparation area as delineated on Figure L1.1. Native vegetation shall not be removed or intentionally damaged beyond these work areas.

4.3 WILDLIFE FOUND IN WORK AREAS

Several special-status wildlife species are known to occur in the vicinity of the project site. No federally or state listed species are known to occur at the site; however, if a listed species is encountered all work in the immediate vicinity of the find shall halt until inspected by a qualified biologist. The CCC and Corps shall be notified of any federally listed species that may be adversely affected by the project. The CDFG shall be notified of any state-listed species that may be adversely affected by the project.

4.4 SUCCESS CRITERIA

This section describes the general and specific criteria that will be used to determine if the mitigation measures presented in this plan are successful. Criteria are described qualitatively and quantitatively; however, quantitative measurements will be used specifically to determine success. Each aspect of the mitigation plan will be monitored to determine success or failure.

Success will be based on the survival and size of plants after a period of five (5) years, which are summarized in Table 6 - Overall Success Criteria and Thresholds for Plantings. Milestones will be used that should be met for each year.

Table 6. Overall Success Criteria and Thresholds for Plantings

Year After Planting	Percent Cover (Total Cover)	Species Richness (Number of Native Species)	Number Surviving (Percent)
1	20 Percent	5	100
2	50 Percent	5	100
3	75 Percent	7	80
4	80 Percent	7	80
5	90 Percent	9	75

Survival of 75 percent of each species after three (3) years, and at least 90 percent total canopy cover at the mitigation site, will be considered successful after five (5) years. Survival rates of less than 75 percent will require replacing all plants lost of that species.

General height and canopy cover guidelines for plantings of shrubs and trees are listed in Table 7 - Minimum Height and Cover Criteria for Shrub and Tree Plantings. These measurements are intended to be general guidelines for monitoring purposes. Five-year height and canopy cover measurements must be met to satisfy mitigation requirements. However, climatic conditions can cause variation in plant growth from year to year.

Table 7. Minimum Height and Cover Criteria for Shrub and Tree Plantings

Year After Planting	Tree and Shrub Species	Minimum Height	Minimum Canopy Cover (inches in diameter)
1	*Baccharis salicifolia*	12 inches	12 inches
	Juglans californica ssp. *californica*	12 inches	8 inches
	Platanus racemosa	12 inches	12 inches
	Populus fremontii	12 inches	12 inches
	Salix exigua	12 inches	12 inches
	Salix lasiolepis	48 inches	48 inches
	Sambucus mexicana	12 inches	12 inches
2	*Baccharis salicifolia*	24 inches	24 inches
	Juglans californica ssp. *californica*	16 inches	16 inches
	Platanus racemosa	36 inches	36 inches
	Populus fremontii	40 inches	32 inches
	Salix exigua	24 inches	20 inches
	Salix lasiolepis	68 inches	60 inches
	Sambucus mexicana	18 inches	18 inches

Year After Planting	Tree and Shrub Species	Minimum Height	Minimum Canopy Cover (inches in diameter)
3	*Baccharis salicifolia*	36 inches	36 inches
	Juglans californica ssp. *californica*	24 inches	20 inches
	Platanus racemosa	60 inches	40 inches
	Populus fremontii	50 inches	40 inches
	Salix exigua	36 inches	32 inches
	Salix lasiolepis	120 inches	72 inches
	Sambucus mexicana	24 inches	24 inches
4	*Baccharis salicifolia*	48 inches	48 inches
	Juglans californica ssp. *californica*	36 inches	32 inches
	Platanus racemosa	48 inches	44 inches
	Populus fremontii	80 inches	60 inches
	Salix exigua	48 inches	40 inches
	Salix lasiolepis	140 inches	96 inches
	Sambucus mexicana	36 inches	36 inches
5	*Baccharis salicifolia*	60 inches	56 inches
	Juglans californica ssp. *californica*	48 inches	36 inches
	Platanus racemosa	108 inches	54 inches
	Populus fremontii	96 inches	72 inches
	Salix exigua	60 inches	48 inches
	Salix lasiolepis	180 inches	120 inches
	Sambucus mexicana	48 inches	48 inches

RATIONALE FOR EXPECTING SUCCESS

Success of this habitat restoration plan is dependent on a number of environmental and human factors. Restoring or enhancing natural vegetation involves considering existing and future (short-term) environmental conditions at and surrounding the project site. Site preparation and land management activities are important components of the success or failure of a habitat restoration effort. This plan was developed with full expectations of success because:

1. No significant changes to the hydrogeomorphic regime are anticipated;
2. Water levels will remain the same as existing conditions;
3. Recommended plantings consist of locally indigenous plants that are adapted to habitats in and adjacent to onsite wetlands;
4. Plantings will occur in locations with suitable and appropriate hydrologic regimes;
5. Maintenance activities are included to control weeds and replace dead and dying plantings;
6. Supplemental irrigation will be applied to plantings, when drought conditions exist, for at least the first two years following planting;

7. Mitigation plantings are placed in appropriate locations and habitats; and
8. Mitigation monitoring is designed to identify failures and provide appropriate remedial actions.

Environmental factors beyond the control of DMEC, Odyssey Program, the planting contractor, and the compliance monitors for this project include abnormal weather and flooding events.

PERFORMANCE CRITERIA

This monitoring plan is structured to meet the requirements of CCC and Corps General (Nationwide) Permit No. 27. Monitoring requirements:

1. All new plantings shall have a minimum of 80% survival, by species, after the first year; thereafter,
2. Plantings shall attain 75% absolute area coverage after 3 years;
3. And 90% absolute area coverage after 5 years for the life of the project;
4. Designated photo stations shall be selected for mitigation report requirements;
5. Annual monitoring for a five-year period, semiannually the first two years;
6. Annual mitigation reports shall be submitted to CCC and the Corps by January 1 of each of the five years after planting. Mitigation reports shall include:
   A. A concise overview of the restoration procedures and progress;
   B. Species survival percentages;
   C. Percent cover by species - both trees and shrubs;
   D. Height of tree and shrub species;
   E. The number of plants replaced, by species;
   F. An overview of methods used to assess these parameters; and
   G. Photographs from designated photo stations.

If the survival or coverage requirements have not been met, Odyssey Program is responsible for replacement plantings to achieve the same requirements. If performance criteria are not met after the fifth year, monitoring shall continue for one-year increments until final success criteria are met.

In addition to the monitoring requirements listed above, the following goals are part of the monitoring program:

- A minimum height are required for the following trees:

Years After Planting	Arroyo Willow	Mulefat	Cottonwood	Sycamore
3 years	10 feet	5 feet	7 feet	5 feet
5 years	15 feet	8 feet	12 feet	9 feet

- Replace plantings of dead plant material with new native plant propagules obtained from locally collected plant stock or from an approved native plant nursery;
- Plants are to be conditioned for drought tolerance over a two- to three-year time frame;
- Plant materials shall be self-sustaining after five years; and
- Weeds shall be hand-removed by the stem to a distance of one meter from each mitigation planting.

The maintenance contractor and the Biological Monitor should be familiar with, and retain the Corps, CDFG, RWQCB, other required permits, and this plan on their person while on the project site.

All plantings and monitoring shall be overseen by a specialist familiar with restoration of native plants and approved by the Corps. All plantings/replantings should be done after the first wetting rains, between October and March 1 (or as otherwise directed), to take advantage of winter rains, dormancy, and rooting period to ensure optimum survival of plantings. Chances of survival are diminished during other times of the year. To compensate for decreased survival rates, planting densities would be augmented by 25% to account for the likelihood of increased mortalities. Any restoration plantings shall be completed by 31 March 1999.

4.5 MONITORING METHODS

Monitoring will be conducted semi-annually for the first two years and annually for the following 3 years (for a total 5-year monitoring period), in conjunction with maintenance. A person experienced in wetland/riparian restoration using native plants and approved by the CCC and Corps will conduct monitoring. The following tasks will be completed during each monitoring visit at the mitigation site(s):

- Establish photodocumentation stations and take photographs;
- Record the number of surviving plants for each species;
- Record total percent cover of native plant species;
- Identify and record all plant species in the planting area; and,
- Determine maintenance requirements.

Field monitoring forms suggested for use in monitoring mitigation success and used for recording site photographs are provided in Appendix B – Mitigation Area Field Monitoring Forms. Separate forms shall be used for each mitigation monitoring area and station.

4.6 ANNUAL REPORTS

An annual monitoring report will be prepared for the Odyssey Program riparian habitat restoration, which will include the following information:

- Photographs taken, percent cover, and survival data collected;
- Discussion of the success of planting in terms of survival, percent cover (relative and absolute), heights of trees and shrubs, and amount of reproduction and colonization by native species;
- Discussion of plant replacement actions;
- Discussion of maintenance actions; and
- Proposed maintenance for the following year.

Each annual report shall be submitted to the permitting agencies by the end of the calendar year. Specific remedial actions that are recommended as a result of onsite monitoring should be submitted by the Biological Monitor to Odyssey Program for action within two weeks of the monitoring visit.

4.7 MONITORING SCHEDULE

The proposed monitoring schedule is divided into two parts, mitigation implementation monitoring, and post-planting monitoring.

MITIGATION IMPLEMENTATION MONITORING

A qualified restoration specialist shall monitor activities of the restoration implementation at the mitigation area. Actions requiring monitoring include site preparation, propagule collection and storage, plantings, and design modifications. This phase of monitoring is assumed to occur between January and April 1999.

POST-PLANTING MONITORING

The first post-planting monitoring visit is expected to occur in (or about) June 1999. Post-planting monitoring will occur during June, and is intended to determine success or failure of each aspect of the mitigation plan and permit requirements, as they related to mitigation for loss of the two California Sycamore trees.

Post-planting monitoring shall commence 90 days after completion of the mitigation planting and habitat restoration, which is assumed to be between 15 February and 31 March 1999. A second monitoring event will occur during September 1999 for the first year and a report will be submitted annually to the CCC and Corps by December 31 of each year. The final mitigation monitoring report is anticipated to be due on or before 31 December 2004.

Remedial measures identified during each monitoring event will be submitted to the responsible party (Odyssey Program), within two weeks of the monitoring visit, to facilitate timely action by the maintenance contractor or Odyssey Program.

SECTION 5. ACKNOWLEDGEMENTS

David Magney prepared this report. Mr. Magney managed the project and reviewed and edited the report. Cher Wellonen edited the report. Mr. Paul Rogers, of Poly Associates, conducted the tree evaluations.

Steven Mecham and Luclia Graham of Odyssey Program reviewed a draft of this report and provided information about Odyssey Program and the project site. Joyce S. Sung ASLA, licensed Landscape Architect, prepare the Landscape Planting Plan (Figure L1.1) on behalf of Odyssey Program.

SECTION 6. CITATIONS

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APPENDICIES

APPENDIX A – CALIFORNIA SYCAMORE TREE APPRAISAL REPORT

APPENDIX B – MITIGATION MONITORING FORMS

APPENDIX A. CALIFORIA SYCAMORE TREE APPRAISAL REPORT

APPENDIX B. MITIGATION MONITORING FORMS

MITIGATION AREA FIELD MONITORING FORM

PHOTO DOCUMENTATION FORM

MITIGATION AREA FIELD MONITORING FORM

PROJECT NAME: Odyssey Program, Las Flores Canyon, Malibu, California

COASTAL COMMISSION COASTAL DEVELOPMENT PERMIT NO.: 98009
STREAMBED ALTERATION AGREEMENT NO.: _____
U.S. ARMY CORPS OF ENGINEERS PERMIT NO.: _____

Observation Date: _____ Monitor: _____

PURPOSE OF THIS MONITORING/OBSERVATION: Periodic report to assess plant growth, survival rates, condition of irrigation system (if applicable), and the progress of site mitigation plantings.

GENERAL PROGRESS OF THE MITIGATION PLANTINGS:

_____

_____

_____

_____

OVERALL OBSERVATIONS, CORRECTIVE MEASURES, AND RECOMMENDATIONS:
Plantings:

1. _____
2. _____
3. _____
4. _____

Use separate sheet for additional comments

Irrigation:

1. _____
2. _____
3. _____
4. _____

Use separate sheet for additional comments

IRRIGATION SITE CORRECTIONS AND SPRINKLER-HEAD LOCATION

_____

_____

_____

_____

MITIGATION AREA FIELD MONITORING FORM (continued)

PLANT COVER MEASUREMENTS: Species Count – Year: 1 2 3 4 5 (circle one)

Species	No. Planted	No. Surviv-ing	Plant Height	Plant Width	Total Percent Canopy Cover Estimate	Success Criteria Met (Y/N)	Comments
Baccharis salicifolia Mulefat							
Juglans californica ssp. *californica* Southern California Black Walnut							
Platanus racemosa California Sycamore							
Rubus ursinus Pacific Blackberry							
Salix exigua Narrowleaf Willow							
Salix lasiolepis Arroyo Willow							
Sambucus mexicana Blue Elderberry							

Additional Comments:

PHOTO DOCUMENTATION FORM

PROJECT NAME: Odyssey Program, Las Flores Canyon, Malibu, California

COASTAL COMMISSION COASTAL DEVELOPMENT PERMIT NO.: 98009
STREAMBED ALTERATION AGREEMENT NO.:
U.S. ARMY CORPS OF ENGINEERS PERMIT NO.:

Station Point No.: _____ **Mitigation Area:** _____

Date Photos Taken: _____ **Monitor:** _____

Place first year 3 by 5-inch photograph so that bottom is approximately ½ inch above this sentence. Tape top edges. Write year and station point number on back of photograph. Overlay photographs from successive monitoring dates.