

**MITIGATION PLAN AND MONITORING
PROGRAM FOR THE
MALIBU JEWISH CENTER &
SYNAGOGUE
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA**



Prepared for:

CITY OF MALIBU

On Behalf of:

DAVID LAWRENCE GRAY ARCHITECTS

April 2016, Updated September 2017

DMEC Mission Statement:

*To provide quality environmental consulting services, with integrity,
that protect and enhance the human and natural environment.*

**Mitigation Plan and Monitoring Program for
the Malibu Jewish Center & Synagogue
24855 Pacific Coast Highway Malibu
California**

Prepared for:

City of Malibu

Planning Department
23815 Stuart Ranch Road
Malibu, California 90265
Contact: David Crawford
310/456-2489 ext. 277

On behalf of:

David Lawrence Gray Architects

527 West 7th Street, Suite 1001
Los Angeles, California 90014
Contact: Mark Meyer
213/243-5707

Prepared by:

David Magney Environmental Consulting

P.O. Box 1539
Cedar Ridge, California 95924-1539
Contact: David L. Magney
530/273-1799

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SECTION 1. INTRODUCTION

PROJECT LOCATION

The project site is located in the City of Malibu in western Los Angeles City (Figure 1, General Project Site Location). The Malibu Jewish Center & Synagogue (project site) is located at 24855 Pacific Coast Highway (PCH), Malibu, Los Angeles City, California (AIN 4458-032-027). The project site is east of Corral Canyon Road, and between PCH and Puerco Canyon Creek, as shown on Figure 1. The site is in the Malibu Beach Quadrangle (USGS 7.5-minute Series) at the approximate geographic coordinates of 34.034°N latitude and 118.717°W longitude, located in the Topanga Malibu Sequit Mexican Land Grant, at the logical location of SW¼ NE¼ Section 1 T3S R18W, San Bernardino Base Line, as illustrated in Figure 1.

The Malibu Jewish Center & Synagogue is partially in the Puerco Canyon watershed at an elevation of approximately 160 feet (50 meters) above mean sea level. The parcel is wedge-shaped trending east-west, as illustrated in Figure 1 and Figure 2, Aerial Photograph of the Malibu Jewish Center Property. The project site, and all of Puerco Canyon, is within the Coastal Zone. The project site and the proposed facilities are illustrated in Figure 2.

BACKGROUND

David Magney Environmental Consulting (DMEC) was contracted to conduct this biological resources assessment and impacts analysis for the subject property and proposed project at the request of Mark Meyer of David Lawrence Gray Architects, project architect. The project site and grading plans were prepared by David Lawrence Gray Architects, of Los Angeles, California. DMEC completed the biological assessment in 2014 and updated in 2017 (DMEC 2017a) as well as a tree assessment and protection plan (DMEC 2017b).

PROJECT PURPOSE

The proposed project involves the demolition of existing structures and construction of a new two-story school with basement garage and chapel facility. The parcel is approximately 4.63 acres in size (Los Angeles County parcel data indicates an area of 202,078 square feet). The total footprint of the structures to be built is approximately 0.48 acre. The school building footprint is almost entirely within the footprint of the existing structures, and the chapel footprint is entirely within a previously graded/disturbed area at the location of an unbuilt, but previously permitted (2006) building.

Figure 1 – General Location Map

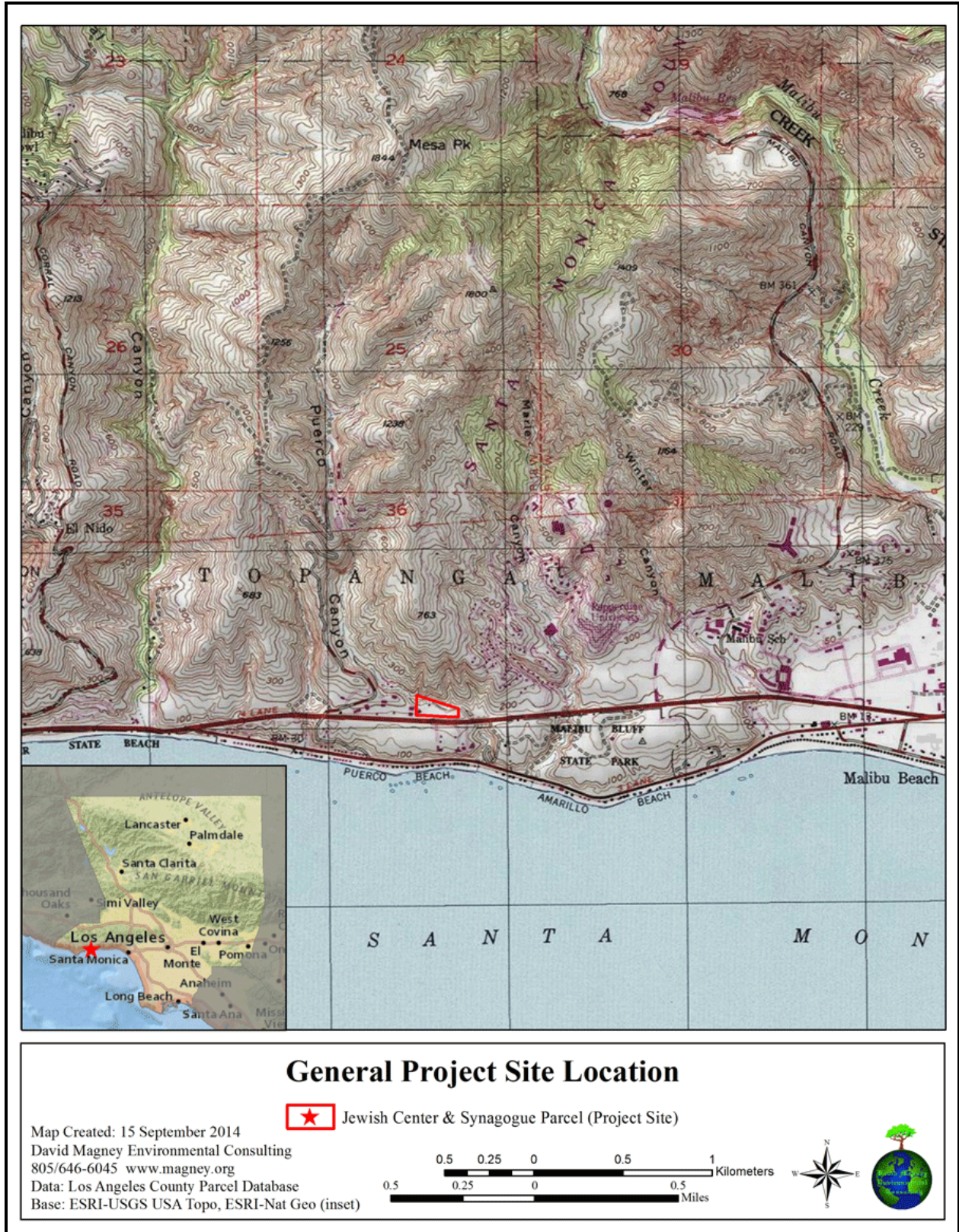


Figure 2 – Aerial Photograph of the Malibu Jewish Center Property





PHYSICAL CONDITION

The project site is located at the base of the Malibu foothills, approximately 1,000 feet north of the Pacific Ocean. The project parcel is adjacent to the PCH and situated on the north side of the highway. Puerco Canyon and Puerco Canyon Creek run south and bend eastward just north of the project site, entering the parcel on the northwest corner and exiting on the east end, and passing through the northern section of the parcel. Puerco Canyon Creek bends southward again just east of the project site before passing under the PCH and into the Pacific Ocean.

The project site sits atop the ridge just south of Puerco Canyon Creek, with most of the developed area draining southward towards PCH and the remainder draining into Puerco Canyon. The proposed project footprint is situated directly atop the ridge, in a largely artificially flattened area due to development. Just to the north of the proposed project footprint, a north facing slope of varied steepness and dominated by mixed Oak Woodland drops approximately 20 vertical feet to the creek bottom, which is dominated by riparian vegetation, both native and non-native. North of the creek bottom a north-facing slope that is dominated by Coastal Sage Scrub rises again.

The soils of the project site consist of Calcic Argixerolls (in the creek bottom and north of the creek) and Danville-Urban Land Complex (atop the ridge at and south of the proposed project footprint, NRCS 2014). Calcic Argixerolls are well drained soils with high runoff potential derived from weathered calcareous sandstone. Danville-Urban Land Complex is a complex of urban uses with well drained soils with high runoff potential, derived from metavolcanics and/or sedimentary rock.

The project site exists within a Fire Hazard Severity Zone ranked “Very High”, by CalFire (2014). According to the U.S. Forest Service dataset Fire Return Interval Departure (USFS 2012), the project site burned in 1985, 1993, and 1995 in the Piuma, Old Topanga, and Calabasas fires, respectively. During the 2007 Corral Fire the project site remained unburned, approximately 1 mile east of the fire’s east most extent. DMEC believes that the dense stand of Giant Reed (*Arundo donax*) present in the creek bottom onsite contributes significantly to fire fuel load and hazard potential.

SECTION 2. BIOLOGICAL RESOURCES

This section discusses the general site characteristics, including the property flora, fauna, and habitats, based on DMEC's 2014 Biological Resources Assessment (DMEC 2017a).

FLORA

A total of thirty-eight (38) vascular plant species were observed onsite. Of these, twenty-four (24, or 61%) of the vascular plants are native species and fourteen (14, or 39%) are nonnative or exotic species, excluding landscape ornamentals. The proportions of native and nonnative taxa onsite are dissimilar to the 75% native: 25% nonnative for other regions of California and for the entire flora of California (Baldwin et al. 2012).

Two (2) special-status species were observed: Southern California Black Walnut (*Juglans californica*, CNPS list 4.2) and Plummer's Baccharis (*Baccharis plummerae* ssp. *plummerae*, CNPS list 4.3). Southern California Black Walnut is also tracked by the CNDDDB as a sensitive habitat when occurring in woodlands. The 38 vascular plants that were observed are listed in the biological resources assessment report (DMEC 2017a).

FAUNA

A total of sixteen (16) vertebrate wildlife species were observed onsite, including one (1) reptile, ten (10) birds, and five (5) mammals. Twelve (12) invertebrate species were found, including one (1) mollusk and eleven (11) insects, some of which are unidentified. The twenty-eight (28) total species observed are listed in the biological resources assessment report (DMEC 2017a).

HABITATS

A total of five (5) habitat and land cover types were identified on the Malibu Jewish Center & Synagogue parcel and adjacent areas, which are listed below in Table 1, Existing Habitats and Land Cover on the Project Site and Expected Impacts. Table 1 provides the area in acres for each habitat and land cover and the acreage of each habitat that is considered ESHA under CCC guidelines.

In addition, the estimated acreage of expected project impacts on the site, within ESHA on the site, and off of the project site (no ESHA is expected to be impacted offsite) is listed. Each habitat and land cover type is described below.

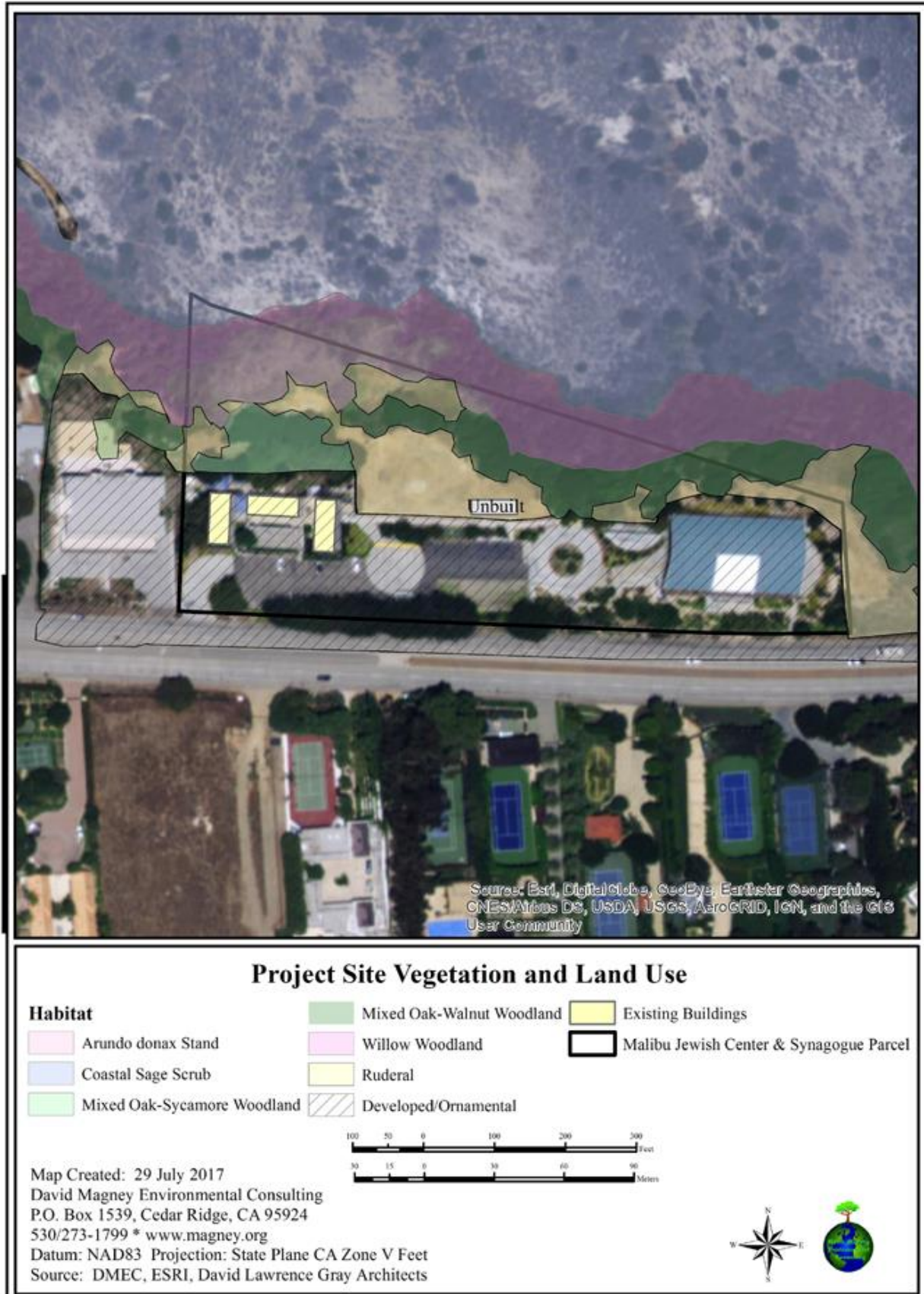
Table 1 – Existing Habitats and Land Cover on the Project Site and Expected Impacts

Existing Habitats and Land Cover Observed	Total Onsite Acres	Onsite ESHA Acres	Construction Impact Acres	ESHA Impact Acres	ESHA Buffer Impact Acres	Fuel Modification Impact Acres ¹	Total Impact Acres
Arundo Stand	0.35	0.35	0	0	0	0.05	0.05
Ruderal Grassland	0.76	0.11	0.13	0	0.13	0.46	0.59
Coastal Sage Scrub	0.03	0.03	0	0	0	0	0
Oak-Walnut Woodland	0.43	0.43	0	0	0	0.19	0.19
Oak-Sycamore Woodland	0.23	0	0	0	0	0.22	0.22
Willow Thicket	0.29	0.29	0	0	0	0.03	0.03
Developed Areas	2.54	0	0.30	0	0.3	0.94	1.24
Acreage Totals	4.64	1.21	0.43	0	0.16	1.9	2.32

The natural vegetation and land cover types present onsite were mapped and are illustrated below in Figure 3, Vegetation Communities and Land Cover of the Project Site.

¹ In addition to/beyond construction footprint.

Figure 3 – Vegetation Communities and Land Cover of the Project Site



SECTION 3. IMPACT ASSESSMENT

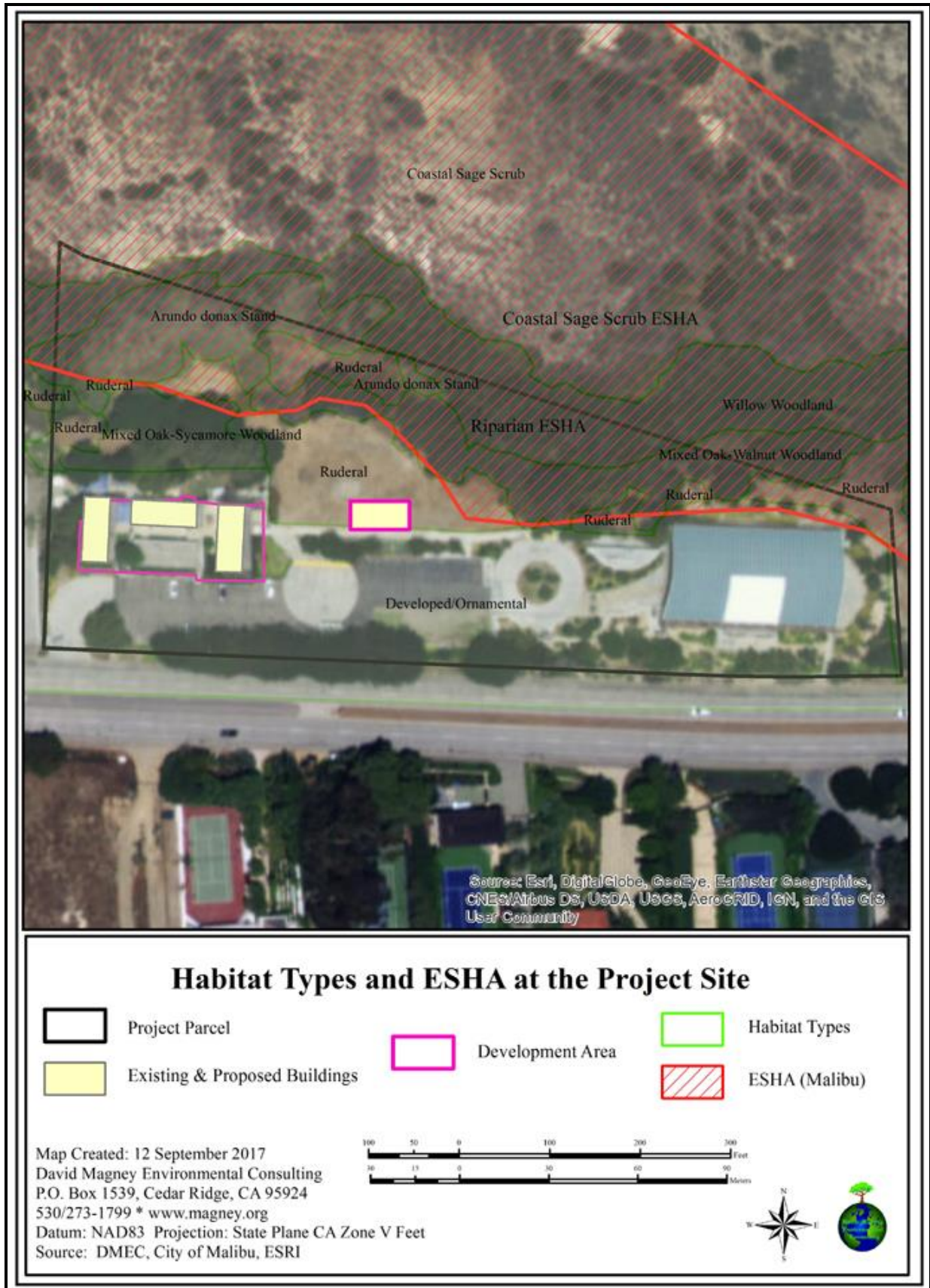
REGULATORY REQUIREMENTS

DMEC was retained by David Lawrence Gray Architects to provide the Malibu Jewish Center a revegetation plan and monitoring program for the impacted areas in order to provide full mitigation of encroachments into ESHA buffer zones. DMEC has prepared this mitigation plan to guide the physical restoration of the currently degraded areas of the ESHA onsite to compensate for expected impacts that encroachment into the ESHA habitat as a result of building within the setback zones and fuel modification activities, as shown on Figure 4, Map of Malibu Jewish Center Property Affected Habitats.

To mitigate for the expected decrease in habitat functions in the ESHA, the Malibu Jewish Center & Synagogue will improve habitat conditions onsite within the designated ESHA. A dense stand of *Arundo donax* is proposed to be removed and replaced with riparian trees and shrubs. Native trees will be planted in and adjacent to the ESHA and landscaping to mitigate the loss of mature *Platanus racemosa* and *Quercus agrifolia* trees at the building site.

The ESHA restoration plantings will generally follow the landscape plans developed by Steven A. Ormenyi & Associates, L-104 dated 22 April 2016 and provided on Figure 5, Habitat Restoration Plans, below; however, please refer to the original landscape plan sheet for implementation.

Figure 4 – Malibu Jewish Center Property Affected Habitats



SECTION 4. REVEGETATION PLAN

This section discusses the general objectives and approach of the revegetation of the property, the possibilities of constraints to revegetation, and revegetation specifications, sequence, and schedule.

OBJECTIVES

The objective of this mitigation plan is to enhance habitat conditions of Puerto Creek onsite to offset expected reductions in habitat functions as a result of encroachment into development setback zones on the south side of the ESHA. This will be accomplished by removing the invasive exotic *Arundo donax* and replacing it with native shrubs and trees indigenous to the area.

Invasive exotic plant species will be eradicated and controlled and native plants planted and encouraged in the treatment area, as detailed in Landscape Plan L-104.

CONSTRAINTS

Native scrub revegetation has been successfully accomplished in Southern California; however, due to natural stresses and other potentially unfavorable conditions, care must be taken in site preparation and planting for a successful revegetation effort in a reasonable amount of time. Design specifications and success criteria should be flexible to allow the natural and physical processes to operate on the property landscape. Prolonged drought or fire must always be considered as a constraint possibility for onsite restoration. Although most of the plant species present onsite are adapted to a Mediterranean climate with relatively low levels of precipitation, the possibility of prolonged drought exists and may occur after restoration planting implementation, which could lead to decreased ground water availability to the intolerable restoration plantings.

REVEGETATION SPECIFICATIONS, SEQUENCE, AND SCHEDULE

The restoration of native riparian and woodland habitats will be implemented to restore the plant communities and functional wildlife habitat back to the impacted areas on the Malibu Jewish Center property. The primary requirements for riparian vegetation establishment are bare, mineral- and mycorrhizal-rich, penetrable soil surfaces with access to groundwater late in the first growing season (late fall to early winter). Seeds and container plants used for the regeneration of riparian communities are dependent upon their tolerance of, and adaptation to, harsh environmental conditions (e.g. drought, fire, and wind erosion).

All impacted areas will be weeded of all invasive plant species currently colonizing the disturbed areas of the site. Appropriate areas may also need to be properly aerated and prepared with mulch where necessary. It is typically recommended that any available duff material be salvaged from the impacted areas and utilized in preparing the restoration areas for planting. This will

allow a portion of the pre-existing native and local seed bank, and other existing propagules and mycorrhizae, to be salvaged and replenished onsite.

As a backup to natural succession and regrowth, supplemental planting is recommended when natural revegetation fails. Periodic monitoring of the regrowth will determine which areas, if any, may require remedial restoration actions. These sites will be identified, mapped, and flagged. Then each revegetation site will be prepared as described below.

Once the restoration site is appropriately prepared, the restoration site can then be planted/seeded with a combination of only native indigenous (species with local provenance) seeds or container-grown plants to maintain the local genetic integrity of the restored scrub ecosystems. DMEC recommends that the impacted areas be planted and revegetated by hand sowing at varying densities, with suitable plant species. Specifically, an appropriate seed mix, consisting of native and indigenous scrub and perennial species, should be obtained and sown on properly prepared sites. Approximately 20 pounds of pure live seed per acre including only native indigenous mixed riparian species is recommended (see the Plant Palette subsection below for a list of species). Affected areas will also receive erosion-control treatments, using bioengineering techniques and materials (coir blankets). These treatments will provide greater erosion protection than planting alone.

The following revegetation methods are recommended for implementing the revegetation effort:

- **Natural succession** with control of nonnative species and implementation of erosion control practices. In areas where natural revegetation does not occur satisfactorily, the following methods will be implemented;
- **Hand sowing** where the terrain is suitable, for species that sprout easily from seed, and if native indigenous seed supply is adequate; and
- **Container plantings** for species that will establish better from saplings and where hand sowing is not suitable.

In the initial years of vegetation establishment, emphasis will be placed on control of invasive plants in the restoration site and monitoring natural successional processes. For areas requiring manual revegetation, emphasis will be placed on success monitoring of new plantings. Control of invasive and exotic plants is important to ensure decreased competition levels for the new plantings. The maintenance and control efforts will continue until the new vegetation has matured (for up to five years). Such efforts shall be monitored by restoration biologists to ensure that the success criteria thresholds and City requirements are being met.

Specifically, the approaches recommended for revegetating the Malibu Jewish Center property restoration areas include, but are not necessarily limited to, the following:

- **Collecting propagules:**
 - Collecting seeds that are of native species locally indigenous to the property (or at least to the Santa Monica Mountains), and have habitat requirements consistent with the existing habitat;
 - Preparing and treating collected seeds for successful germination; and
 - Purchasing seeds of native shrubs, grasses, and herbs to supplement existing seed sources.
- **Preparing the affected areas for planting:**
 - Removing existing non-native, invasive plant species from the restoration sites;

- Removal or processing, such as by mulching, of excessive vegetative debris from the original brush removal activities in order to expose or create a suitable medium for planting; and
- Stabilizing planting areas using bioengineering erosion control devices (coir blankets) to retain the integrity of the soil during the initial establishment of the plantings.
- ***Planting implementation:***
 - Implementing one or more appropriate planting methods to specific areas of the restoration sites;
 - Planting the collected seeds from the plant species existing at the restoration sites by hand sowing or propagating and planting container plantings; and
 - Facilitating natural succession of riparian habitat by controlling invasive plant species and implementing erosion control practices.
- ***Monitoring the revegetation site to ensure the success of the restoration effort:***
 - Monitoring the work of the restoration contractors during project implementation;
 - Mapping as-built conditions after restoration implementation;
 - Establishing permanent transects and photo-documentation stations to last the duration of the required monitoring period;
 - Providing recommendations for supplemental irrigation and replacement planting; and
 - Monitoring revegetation plantings and restoration site until success thresholds are achieved.

Plant Palette

The predominant native plant species to be planted onsite are listed in Table 2, Revegetation Plant Palette for the Malibu Jewish Center Property. Table 2 lists the twenty-one (21) dominant and associate plant species that are important contributors to establishing functional riparian habitat. Certainly additional, or different, plant species have become, and have the potential of becoming, established since the property flora, which may be captured in any replaced duff material and may naturally succeed into the restoration site. However, many of these species may not become reestablished onsite due to poor seed preparation or poor seed viability. To ensure that the impacted chaparral is revegetated to the pre-clearing condition, DMEC recommends planting the species in Table 2 to promote the establishment of functional riparian to meet revegetation success criteria.

Approximately half of the plantings will consist of planting container-grown plants or pole cuttings (*Baccharis salicifolia* and *Salix lasiolepis*), with seed sowing used to supplement the plantings. The seeds of the project site species listed in Table 2 should be collected and planted onsite at approximately 20 pounds of pure live seed per acre. This seed source will be the primary focus to facilitate the revegetation effort. Supplemental seed purchasing and/or container planting purchasing may be required to meet the needs of this restoration effort. Plant materials from offsite sources should only be used if they can be obtained from a nearby indigenous or semi-indigenous source within the Santa Monica Mountains. All seed stock should be checked by a qualified biologist to ensure the source is at least from the Santa Monica Mountains.

Table 2 – Revegetation Plant Palette for the Malibu Jewish Center Property Impact Areas

Scientific Name	Common Name	Habit
<i>Arctostaphylos glauca</i>	Bigberry Manzanita	Shrub
<i>Artemisia douglasiana</i>	Mugwort	Perennial
<i>Baccharis plummerae</i> ssp. <i>plummerae</i>	Plummer’s Baccharis	Shrub
<i>Baccharis salicifolia</i>	Mulefat	Shrub
<i>Ceanothus spinosus</i>	Greenbark Ceanothus	Shrub
<i>Diplacus [Mimulus] longiflorus</i>	Sticky Bush Monkeyflower	Shrub
<i>Elymus condensatus</i>	Giant Wildrye	Perennial
<i>Encelia californica</i>	California Bush Sunflower	Shrub
<i>Eriophyllum confertiflorum</i> ssp. <i>confertiflorum</i>	Golden Yarrow	Perennial/Subshrub
<i>Frangula californica</i>	California Coffeeberry	Shrub
<i>Heteromeles arbutifolia</i>	Toyon	Shrub
<i>Juglans californica</i>	So. Calif. Black Walnut	Shrub/Tree
<i>Malacothamnus fasciculatus</i> var. <i>fasciculatus</i>	Chaparral Bushmallow	Shrub
<i>Rhamnus ilicifolia</i>	Hollyleaf Redberry	Shrub
<i>Rhus integrifolia</i>	Lemonadeberry	Shrub
<i>Ribes malvaceum</i> var. <i>malvaceum</i>	Chaparral Currant	Shrub
<i>Ribes speciosum</i>	Fuchsia-flowered Gooseberry	Shrub
<i>Rubus ursinus</i>	Pacific Blackberry	Vine
<i>Salix lasiolepis</i> var. <i>lasiolepis</i>	Arroyo Willow	Tree
<i>Salvia mellifera</i>	Black Sage	Shrub
<i>Sambucus nigra</i> ssp. <i>caerulea</i>	Blue Elderberry	Shrub

Activities Prior To Revegetation Implementation

The activities expected prior to the implementation of the revegetation plan include: finalizing a specific planting plan, selecting a qualified landscape contractor, physically delineating planting and enhancement sites, detailing operations for collecting seed, preparing, storing, and propagating seed collected onsite for planting. These activities are discussed in the following paragraphs.

The timing for the restoration planting will depend upon obtaining the necessary permits and approvals from the City.

Grading and Planting Plan

No grading or re-contouring is recommended for this revegetation effort; therefore, no grading plan is necessary for the revegetation project.

Once this restoration and monitoring plan is approved, final planting specifications will be completed prior to implementation, with the formal planting plan (L-104) followed as specified.

Contracting

The Malibu Jewish Center will need to solicit and select a qualified landscape contractor that is experienced with upland scrub restoration and that is approved by City to implement this restoration plan. Either the landscape contractor or a subcontractor will need to be retained for seed collection, or purchase if necessary. If container plantings are utilized it will be necessary to arrange for the growing of the plants from onsite or nearby local seed sources if appropriate locally indigenous plants are not available for purchase. Cleaned and prepared seeds or other plant materials need to be available at the optimal time for planting.

Delineate Planting Areas

All planting areas need to be demarcated with flags or stakes prior to restoration activities. Delineating and marking the planting areas prior to revegetating portions of the property is important to avoid any impacts to additional areas of the property and to designate exactly what areas need to be prepared for revegetation and subsequently planted. All contractors, subcontractors, and equipment operators shall be instructed to remain within or outside the flagged boundaries, as appropriate. Existing, intact vegetation and soils shall not be disturbed outside of the flagged boundaries. Delineating planting areas also protects the plantings from disturbance after the restoration project has been implemented.

Seed Collection Operations

The seeds required for the restoration of the scrub habitats onsite shall be obtained from the property or in the nearby vicinity (within the Santa Monica Mountains). Collecting seeds onsite, and in the vicinity of the property, will ensure that the genetic integrity of the area is maintained with the implementation of the revegetation effort. Collecting seeds onsite will ensure that a sufficient range of genetic diversity will be represented in the property, and will maximize germination rates and the development of native plants onsite. All collected and purchased seeds shall be treated and prepared appropriately to ensure seed viability and optimum seed germination.

Seeds should be collected without causing significant damage to any existing living plants. When seeds are collected in the vicinity of the property, care should be taken to ensure that no existing vegetation is damaged and that no special-status species (if found to be present) are impacted. Seeds should also be collected in areas that are already somewhat disturbed in order to prevent impacts to the more pristine portions of the property chaparral habitat. Every effort should be made to collect only mature disease-free seed from healthy and mature individuals within a given population. The seed collections for each species should include seeds from at least fifty different individuals. In addition, all seeds need to be collected when mature and available, and should be stored and properly treated for manual planting at the restoration site. Recommended supplies for seed collecting include medium to large heavy duty clear to white plastic bags as collection receptacles, surgical tape to wrap thumbs and index fingers for protection, and hand clippers.

All seed collected for the restoration effort shall be separated by species, collection location, and time of collection into separate seed lots. A unique seed lot number and an associated seed collection form will identify each seed lot (refer to Appendix B for an example of a seed collection form). The seed collection form shall identify the species, the seed collector(s), as well as the date and location of the seed lot. The form will allow for the documentation of collection site data, such as the plant community classification, site characteristics, and habitat descriptions. Seed processing, storage, and pre-germination techniques shall be described as well. Duplicates of completed seed collection forms should be kept in a separate file in addition to keeping an original form alongside its given seed lot until the seeds have been planted in the restoration site.

Seeds may also be purchased from professional seed collectors; however, the seeds must be native and indigenous to the Santa Monica Mountains. If purchasing seeds is necessary, or if obtaining seeds from another site is necessary, then the contractor shall provide a list of any new materials (plant propagules) that must be purchased/obtained from other sources other than onsite sources prior to planting. Any unacceptable plant material shall be rejected by DMEC restoration specialists (or other qualified restoration specialists contracted by the Malibu Jewish Center) at the contractor's expense.

Seed Storage and Preparation for Propagation

Immediately after a given seed lot has been collected, the process of cleaning, upgrading, and storing the seed should begin. The purpose of this process is to reduce bulk and weight of the seed, improve storage life, increase germination probability, and make establishment and/or nursery propagation (if necessary) more successful and economical (Lippit et al 1994). A professional seed cleaning facility should assist in the cleaning, storage, and pre-germination treatment of seed.

Seed will be stored following appropriate treatments for each species. The lots will be stored no longer than is necessary; however, seed of certain species require pre-germination treatments in order to break seed dormancy. Other species require little or no pre-germination treatments. For those species, field-establishment or propagation in a nursery should take place at the earliest and most appropriate stage of the restoration project.

Activities During Revegetation Implementation

Preparing soils for planting, eradicating and controlling invasive plants, installing erosion control devices, and planting seeds and/or container plants are the primary activities to be conducted during the implementation of the revegetation effort and to facilitate revegetation success.

Site Preparation

Careful attention is required when preparing and treating soil/substrate surfaces when implementing native scrub restoration. Any debris present, such as wood debris, nonnative gravel, cured or uncured concrete, nonnative rocks, rebar, flagging, trash, and excess soil should be removed from the restoration areas. Excessive vegetative debris from the original brush removal activities should be removed to expose the soil surface, or processed, such as by mulching, to enhance soil conditions for planting. These areas should be properly aerated and prepared with mulch as needed. Any available duff material remaining from previous vegetation

clearing should be salvaged from the impacted areas and utilized in preparing the restoration site for planting. This will allow the pre-existing locally native seed bank, and other existing propagules, to be salvaged and replenished onsite.

Invasive Plant Removal and Control

Invasive exotic species are opportunists, and they readily invade open, disturbed sites with nutrient-poor soils. Therefore, invasive plant species need to be removed by hand from the planting areas within one week of planting. Invasive plant species targeted for regular removal include shrub and herb species that were observed on the property. These nonnatives have the potential to become problem species after a significant disturbance, such as the onsite conditions following site preparation and planting.

A list of target invasive exotic plants to be eradicated and controlled onsite is presented in Table 3, Target Invasive Plant Species for Removal. All invasive plants shall be removed from the restoration areas and shall be disposed of in a manner that prevents their re-establishment. Invasive plants shall be removed by hand rather than by chemical means whenever possible.

Removal shall be conducted at least twice annually during spring and summer seasons, and as required over the duration of the monitoring period (until success is achieved). More specifically, DMEC recommends that the Malibu Jewish Center property be maintained free of invasive plant species according to specific plant density thresholds for each targeted invasive plant species. The thresholds are designated to trigger when eradication is necessary for each species. The invasive plant density thresholds are discussed below under Revegetation Maintenance in the Activities After Revegetation Implementation subsection.

Table 3 – Target Invasive Plant Species for Removal

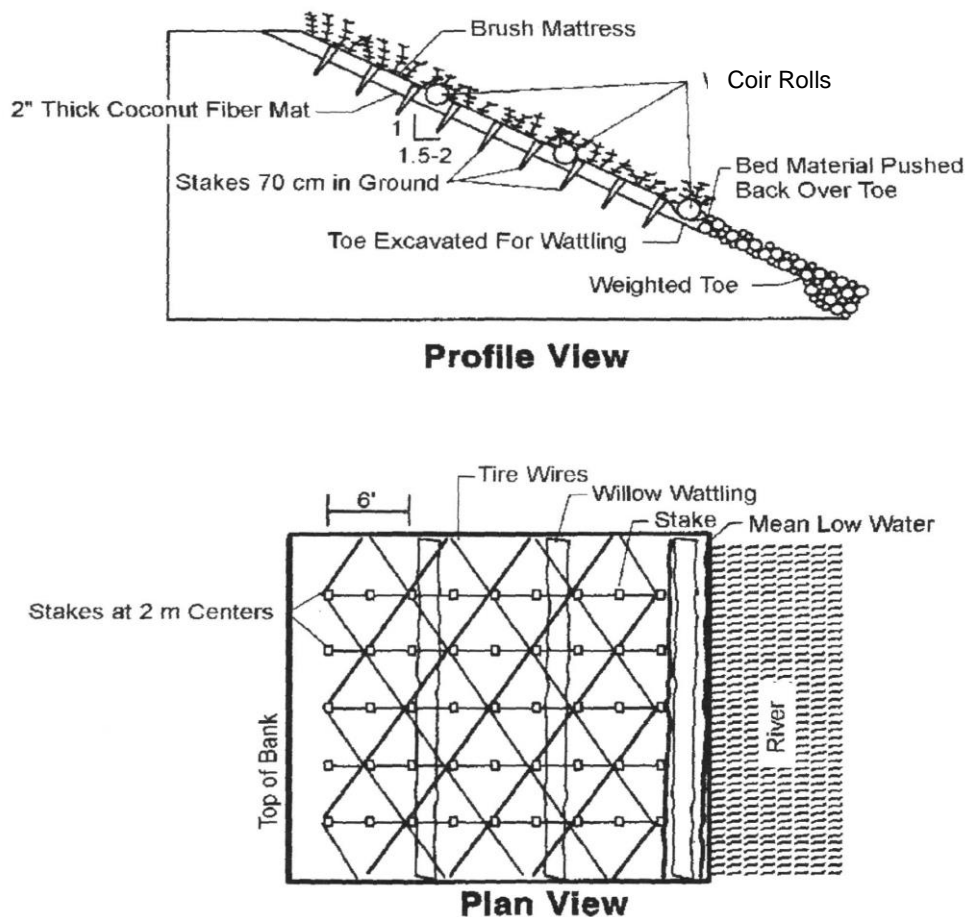
Scientific Name	Common Name	Habit
<i>Arundo donax</i>	Giant Reed	Perennial Grass
<i>Bromus diandrus</i> ssp. <i>diandrus</i>	Ripgut Brome	Annual Grass
<i>Carpobrotus chilensis</i>	Sea Fig	Perennial Herb
<i>Chenopodium album</i>	Lamb’s Quarters	Annual Herb
<i>Cordedera jubata</i>	Pampas Grass	Perennial Grass
<i>Euphorbia terracina</i> var. <i>terracina</i>	False Caper	Perennial Herb
<i>Foeniculum vulgare</i>	Sweet Fennel	Perennial Herb
<i>Hirschfeldia incana</i>	Summer Mustard	Perennial Herb
<i>Myoporum laetum</i>	Lollypop Tree	Shrub
<i>Nicotiana glauca</i>	Tree Tobacco	Tree/Shrub
<i>Pennisetum clandestinum</i>	Kikuyu Grass	Perennial Grass
<i>Ricinus communis</i>	Castor Bean	Shrub
<i>Salsola tragus</i>	Russian Thistle	Annual Herb
<i>Stipa miliacea</i>	Smilo Grass	Perennial Grass

Erosion Control

Best management practices, with regard to erosion control, will be employed with the revegetation of the impacted areas. In addition, planting areas will be stabilized using a bioengineering technique to retain the integrity of the soil during the initial establishment of the plantings. Several treatments are available, of which rolls are suggested for this restoration plan (Figure 6, General Schematic of Coir Roll and Blanket Detail).

Coir rolls, which create berm-like diversions for water runoff, will be laid down between sections of prepared slope. A row of coir rolls will be laid down every 10 to 20 feet between the sections of treated slope to prevent soil erosion from wind, rain, and trampling, and to protect the newly planted seeds and establishing seedlings. All erosion control devices will be inspected and maintained throughout the restoration effort and the monitoring duration.

Figure 6 – General Schematic of Coir Roll and Blanket Detail



Planting

DMEC recommends hand-sowing seed throughout the revegetation areas onsite, using supplemental randomly spaced container plantings to create a natural planting schematic onsite. Natural succession of native plant species should be encouraged as much as possible, while

nonnative invasive plants should be controlled as much as possible. The following subsections discuss these three revegetation methods in further detail:

HAND SOWING

Collected seeds, and any purchased seeds, of chaparral species predominant onsite, should be hand sown into designated prepared areas of the restoration sites. Any purchased seeds shall be native and indigenous to the vicinity of the property (or at least indigenous to the Santa Monica Mountains), and shall be of the species recommended by DMEC in Table 2 (above). Hand sowing involves using a “belly grinder”, which is a small bucket with a crank-dispenser. This seed dispersal device is strapped onto the front of a person who cranks the device, distributing many seeds over the prepared and moistened soil surface. If the restoration areas are somewhat small, the seed mix can be spread by hand as well. The seeds can be raked into the soil, and are then expected to germinate without further aid. Fine seeds are rarely watered directly, as even the most careful treatment would likely dislodge such seeds.

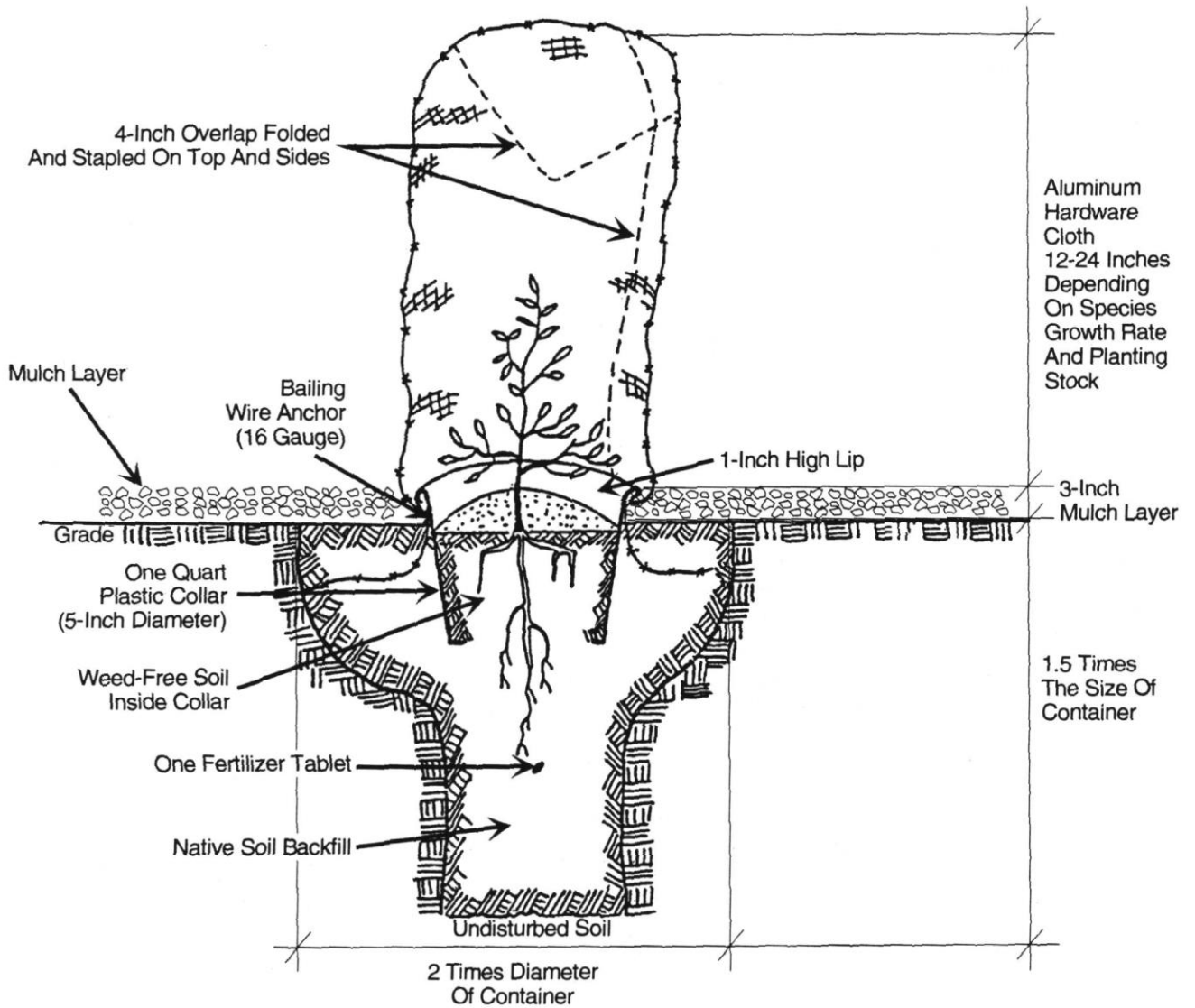
CONTAINER PLANTINGS

Purchased container plantings of native shrub species may be required in areas where hand sowing is not a successful method for reestablishing vegetation onsite. The purchased native container plantings, again, shall be native and indigenous to the vicinity of the property (or at least indigenous to the Santa Monica Mountains), and shall be of the species recommended by DMEC in Table 2 above. Revegetating with container plantings is the best method for upland restoration; however, this method is usually the most expensive. Therefore, this method will only be required in the areas where other means of revegetation do not succeed. Plant protection kits (root collars and screen baskets) will be required for container plantings to ensure their successful establishment and to avoid damage to the plantings due to browsing and foraging by wildlife and illustrated in Figure 7, Example Container Planting with Plant Protection Detail.

NATURAL SUCCESSION

Natural succession is the process through which a disturbed plant community or habitat type gradually reverts to its original state prior to the disturbance. Natural succession is typically slow and typically begins with colonization by invasive plant species that are adapted to disturbance and extreme conditions. Therefore, natural succession in a highly disturbed site requires extensive and constant maintenance and weed control to allow the natural native plant species to establish in a less competitive environment. Natural succession of riparian habitat shall be facilitated in all restoration areas in addition to any other seeding or planting methods used. Natural succession will be the primary revegetation method for areas that will be enhanced (as opposed to replanted).

Figure 7 – Example Container Planting with Plant Protection Detail



Plant Protection Detail

Timing of Planting

Planting of seeds and any container plants needs to be conducted at times when environmental conditions are optimal for seed germination and plant establishment. Soil moisture needs to be adequate to allow seedlings and transplants to become established and be sustained through periods of hot, dry conditions. Generally, the optimum time for seeding and planting is just prior to the first fall rains.

Activities After Revegetation Implementation

Post-implementation activities include maintaining the revegetation site to ensure criteria are met for restoration success and evaluating newly established plantings for restoration monitoring. These activities are discussed in more detail in the following subsections.

Revegetation Maintenance

Maintenance of the restoration sites is essential to achieve restoration objectives and performance criteria success. Included maintenance measures are weed control and eradication, trash removal, replanting, erosion control, and protection measures as necessary. The restoration site shall be maintained in good ecological condition, and shall be protected for the duration of the compliance-monitoring period.

Protection measures are designed to safeguard the revegetation areas once they have been established. These protection measures may include:

- Meeting with property owner and contractors to discuss revegetation efforts and identify which areas are to be protected;
- Providing physical protection of existing undisturbed habitats during implementation;
- Fencing or marking the entire restoration area; and
- Posting signs stating that the restoration areas are not to be disturbed.

Ultimately the applicant/property owner is responsible for ensuring that all requirements are met for revegetation compliance; therefore, restoration maintenance and protection measures shall be accomplished by the property owner and a -approved landscape contractor familiar with both native plant materials and techniques described in the following subsections. If native plants are mistaken for non-native plants, and native plants are accidentally removed from the restoration site, the success of the revegetation effort is threatened since success criteria are based on native plant species richness and ground cover by native plant species. The property owner's landscape contractor, assigned to implement this plan, must be approved by the as qualified and experienced with native upland restoration and maintenance.

The maintenance period will be a minimum of five (5) years from the completion date of the restoration planting (or permit approval). If success criteria are not met at the end of five years, the can be expected to offer recommendations and requirements for additional restoration measures. The primary maintenance task is weeding, while additional important maintenance activities to be performed include installing, maintaining, and removing plant protection kits (see Figure 6 above), repair and/or replacement of any faulty erosion control devices, trash removal, replacing dead plants, and reseeding unsuccessful portions of the restoration area.

INVASIVE PLANT SPECIES CONTROL

Initially, invasive exotic plants will be eradicated to prepare for the planting implementation, which will reduce plant competition. Weeding is necessary to encourage the success of planted native species and to discourage nonnative ruderal or weedy species from establishing competitive populations at the restoration site. Weeding will include removal of all non-native plants from the planting areas and may include minor trimming of native plants to increase light and reduce physical contact with neighboring plants, but only if necessary. This process shall be performed by hand wherever possible. Weeding shall only be conducted by persons able to

identify native plants and their seedlings, and able to avoid removal of naturally colonizing native plants at the property. See Table 3 above for the list of invasive exotic plants known to occur onsite.

MAINTENANCE SCHEDULE

Maintenance visits, for the establishment of the vegetation, are critical for successful habitat establishment. Maintenance of all habitat restoration plantings shall include:

- Controlling invasive exotics;
- Repairing plant protection kits (if used);
- Repairing and/or replacing any faulty erosion control devices (if installed);
- Removing trash;
- Replacing dead plants and reseedling.

These tasks shall be conducted according to the following schedule; however, the specific timing of maintenance activities may be dependent upon monitoring or other conditions that may require deviation from the schedule.

Seeds and germinating seedlings will be maintained frequently (as required) for the first few months following planting, especially to control invasive plant species. General maintenance should be conducted on a monthly basis for the first six (6) months with a final maintenance visit during month twelve. Maintenance should then be conducted quarterly for the second year during the establishment of the new seedlings and to monitor irrigation levels. Thereafter, two visits per year, one in spring and one in fall, are considered sufficient for the remaining monitoring duration (the final three years). Monitoring shall be conducted for at least five (5) years; however, if success criteria are not met at the end of five years, then monitoring will continue until success is achieved.

Revegetation Success Monitoring

After planting completion, and when the new seedlings can be identified, species locations and plant numbers will be evaluated and will serve as the baseline from which to monitor the establishment and development of the plantings, the general success of the restoration, and the overall revegetation efforts. All plantings shall be monitored at least annually for a minimum of five years. Monitoring shall be conducted for two purposes: (1) to ensure minimum success criteria are met annually and by the end of the monitoring period; and (2) to determine if interim corrective measures or maintenance is required to ensure successful recovery of the chaparral habitat. Annual monitoring reports will be prepared and submitted to . A detailed monitoring program is provided in Section 5 below.

SECTION 5. REVEGETATION MONITORING PROGRAM

Monitoring on a regular basis is necessary to ensure that the site is revegetation according to plan. At least five (5) years of monitoring will be required to ensure the establishment and progress of the revegetation effort, although the time it takes to successfully revegetate may exceed five years. If success is not achieved in five (5) years, the City will likely provide requirements for additional restoration and monitoring.

The following subsections provide the general monitoring approach, monitoring parameters, project standards, and rationale for expecting success.

GENERAL MONITORING APPROACH

The purpose of the restoration planting is to restore the onsite ecosystem functions that were present prior to the disturbance, more specifically, to restore natural chaparral and scrub vegetation in the impacted areas. The intent of this monitoring plan is to provide a reasonable and measurable mechanism to determine that these restoration objectives are met during the monitoring period.

If monitoring indicates that restoration is not progressing toward the stated objectives, an analysis of project conditions shall be conducted to determine if contingency measures need to be implemented. Natural ecosystems are subject to natural perturbations that may affect the restoration efforts substantially. The impacts of natural physical and biological processes on restoration progress will need to be determined and recommendations made that consider these factors.

MONITORING PARAMETERS AND PROJECT STANDARDS

This subsection suggests general recommendations for monitoring parameters and project standards based upon the project purposes and the nature of the property. The focus of the monitoring portion of the overall project is on the restoration of plant and wildlife habitat on the Malibu Jewish Center property.

The monitoring protocol outlined below is focused on the biological attributes and processes of the restored ecosystem. Monitoring parameters and project standards are described qualitatively and quantitatively; however, quantitative measurements will be used to monitor success throughout the five-year period.

Control Sites

Compliance with City requirements will be based on the restoration of the property impact areas back to at least natural conditions (or even into a more enhanced ecosystem). Instead of using artificial plant growth and cover success thresholds, DMEC recommends measuring the restoration effort against similar, adjacent, undisturbed, functioning habitats adjacent to the restoration site. Therefore, it is proposed that monitoring compare restoration site conditions with control site conditions each year of the five-year program. Determining the success of the

natural and planted colonization process onsite, when compared to natural control site conditions, is a more valid and fair method of measuring restoration of natural vegetation than using a planting plan with a preset planting number and preset plant species to be planted, with potentially unreasonable success criteria.

A City-approved Qualified Biologist shall determine ecological conditions in similar adjacent habitats to be used as control sites for comparison with the conditions within the restoration site. At least twenty (20) control sites shall be established that are representative of the chaparral and scrub types onsite prior to revegetation implementation and outside of any development areas, and with representative terrain and aspect. The control sites shall consist of areas that have not been disturbed significantly by human activities and are not likely to be disturbed in the foreseeable future.

Revegetation Success Criteria

This section provides performance standards for the revegetation effort, and develops remedial measures for unforeseen problems. The restoration success criteria discussed in the following subsections include:

- (1) The thresholds that will be compared to the results of the control site surveys, such as species richness and percent cover; and
- (2) Additional success criteria that may provide supplemental and useful information for achieving revegetation success, such as the actual growth and survival rate of individual plantings.

Revegetation Success Criteria Based on Control Sites

Ecological data will be sampled from at least twenty (20) control sites adjacent to the restoration areas. The characteristics surveyed at each control site will include total percent cover by native species, percent cover by native shrub species, plant species richness, shrub species richness, and shrub density. Control site surveys will be conducted at the same time that restoration monitoring will be conducted. (See Appendix C for an example of the Restoration Control Sites Field Monitoring Forms.)

After the control sites are established and surveyed, the restoration areas will be surveyed for the same characteristics surveyed for the control sites. Once the species richness, diversity, density, and cover is determined at the restoration site via transect surveys, the restoration site shall be required to meet minimum overall success thresholds (percentages of success compared to the control sites), which are summarized in Table 4, Overall Success Criteria and Thresholds for Plantings. Milestones will be used that must be met for each year of monitoring. Five years of thresholds are provided in Table 4; however, the monitoring duration may extend past five years if success is not achieved by the end of the fifth year.

Each year, percent cover, species richness, and plant density will be determined and the results will help illustrate the general success or failure of the revegetation effort for that year. If the results are less than the thresholds listed in Table 4 for a particular year, then the revegetation effort within the following year will require remediation to ensure that the revegetation site is comparable in habitat function to the adjacent control sites for the next monitoring survey.

The revegetation effort shall ultimately achieve at least 90% native canopy cover, 80% native shrub cover, 90 percent plant species richness, 100% native shrub species richness, and 80%



shrub density of that which was found for the control sites by the end of the fifth year for the restoration effort to be considered successful. If these thresholds are not met after five years, any requirements for additional remediation and monitoring will be determined by City.

Table 4 – Overall Success Criteria and Thresholds for Plantings Compared to Control Sites

Year After Seeding	Percent Total Native Cover Compared to Control Sites	Percent Native Cover Compared to Control Sites	Plant Species Richness Compared to Control Sites ²	Native Shrub Species Richness Compared to Control Sites	Density of Plants Compared to Control Sites
1	20%	10%	25%	30%	10%
2	30%	30%	40%	50%	20%
3	50%	40%	60%	70%	40%
4	70%	60%	80%	80%	60%
5	90%	80%	90%	100%	80%

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 requires consideration of existing and future (short-term) environmental conditions at, and surrounding, the property. Site preparation and maintenance activities are important components of success or failure of a habitat restoration effort. This plan is developed with full expectation of success since:

- The original topsoil was not highly disturbed by the vegetation removal or the introduction of foreign materials or propagules.
- Recommended plantings consist of seeds and container-grown plants from locally indigenous native plants that have habitat requirements consistent with the existing habitat and are adapted to onsite conditions.
- Non-native plant removal and control and erosion control measures will be implemented.
- A portion of this revegetation effort is to rely on natural plant recruitment onsite.
- Maintenance activities are included to protect the restoration site, control weeds, and replace any dead plantings by reseeding or replanting.
- Restoration monitoring identifies deficiencies and provides appropriate remedial maintenance actions.

Environmental factors beyond the control of the plan preparers, the property owner, planting contractor, and compliance monitors for this project include abnormal weather and wildfire. The thresholds of success for each restoration planting area will be compared directly with natural conditions in similar habitats adjacent to each restoration site (control sites). If natural environmental events such as fire, extended drought, or episodic precipitation do occur, conditions in the control sites will likely indicate any changes resulting from such events.

² Plant species richness and diversity thresholds will be established for vascular plants that are observed at the corresponding habitat type control sites.



If the natural dynamics of weather and other environmental disturbances causes significant changes in the natural vegetation of the control sites, the success criteria for the restoration plantings will be modified accordingly to reflect these natural changes, since the success criteria measurements are a percentage of the control sites. Nevertheless, the restoration site will be required to meet the success threshold criteria.

SECTION 6. ACKNOWLEDGEMENTS

This restoration plan and monitoring program was written by David Magney. Mr. Magney and Evan Lashly conducted the biological survey onsite. Mr. Magney and Vickie Peters prepared the figures for this report.

Mark Meyer of David Lawrence Gray Architects provided information about the proposed project. Steven Ormenyi, Landscape Architect, provided detailed landscape plans in support of this report.

David Crawford, Biologist with the City of Malibu, provided guidance on assessment and documentation needs.

SECTION 7. CITATIONS

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APPENDICES

**APPENDIX A.
SITE PHOTOGRAPHS**

**APPENDIX B.
SEED COLLECTION FORM**

**APPENDIX C.
RESTORATION MONITORING FORMS**



APPENDIX A.
MALIBU JEWISH CENTER PROPERTY PHOTOGRAPHS

SITE PHOTOGRAPHS



Left: View northwest of mitigation area along Puerco Canyon. *Arundo donax* dominates a significant portion of the ESHA riparian habitat. Right: View northward of *Arundo donax* dominating Puerco Canyon Creek. This area to be cleared of invasive exotic plants and planted with native riparian species.



Left: Riparian ESHA onsite dominated by native species. Right: View northward of riparian ESHA from near proposed mikvah building site.



APPENDIX B. SEED COLLECTION FORM



SEED COLLECTION FORM

SEED LOT #: _____

INCLUDE THIS FORM WITH EVERY SEED LOT

PROCESSING INFORMATION

SCIENTIFIC NAME: _____

COMMON NAME: _____

STATUS: _____

COLLECTOR'S NAME: _____

WATERSHED: _____

SUBWATERSHED: _____

GPS LOCATION N: _____ W: _____

LEGAL (T,R,S,S1/4): _____

CREEK OR SITE NAME: _____

AREA RELOCATION DIRECTIONS: _____

ATTACH QUAD OR ROAD MAP TO THE BACK OF SHEET MARKING COLLECTION SITE

VOUCHER INCLUDED: _____ ID VERIFIED: _____

SOIL SAMPLE INCLUDED: _____ ID OF SOIL TYPE: _____

ELEVATION: _____ PERCENT SLOPE: _____ ASPECT: _____

VEGETATION SERIES: _____

ASSOCIATE SPECIES: _____

HABITAT CLASSIFICATION/DESCRIPTION: _____

DATE AND TIME OF COLLECTION: _____

TIME SPENT COLLECTING: _____

PROCESSING INFORMATION

TEMPORARY STORAGE METHOD: _____

START DATE OF PROCESSING: _____

WEIGHT UNPROCESSED: _____ PROCESSED WEIGHT: _____

PROCESSING METHOD: _____

PROCESSING TIME: _____

PURITY: _____ PLS &(METHOD): _____ / _____

MOISTURE CONTENT: _____ SEED/LB: _____ E./N. Weeds(Y/N): _____

PRETREATMENT DESCRIPTION: _____

COMMENTS (MAKE ADDITIONAL NOTES ON BACK IF NEEDED):

**APPENDIX C.
RESTORATION MONITORING FORMS:**

**Restoration Area Field Monitoring Form
(Control Sites)**

**Restoration Area Field Monitoring Form
(General Comments)**

**Restoration Area Field Monitoring Form
(Percent Cover, Shrub Density, Species Richness)**



RESTORATION AREA FIELD MONITORING FORM (Control Sites)

PROJECT NAME: Malibu Jewish Center Property Revegetation, Santa Monica Mountains, Malibu

Observation Date: _____ Monitor: _____

Control Site Number	Total % Cover (for tree, shrub, & herbaceous layers)	Plant Species Richness (no. of species)	Plant Species Diversity (1, 2, or 3 plant forms)
1			
2			
3			

Additional Comments/Observations:



**RESTORATION AREA FIELD MONITORING FORM
(General Comments)**

PROJECT NAME: Malibu Jewish Center Property Revegetation, Santa Monica Mountains, Malibu

CITY OF MALIBU PROJECT NO.: _____

Observation Date: _____ Monitor(s): _____

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

GENERAL PROGRESS OF THE RESTORATION PLANTINGS:

OBSERVATIONS, CORRECTIVE MEASURES, AND RECOMMENDATIONS:

Plantings:

Irrigation:

PHOTOGRAPHIC DATA

Photo No(s).: _____ View: _____

Notes: _____
