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MEMORANDUM

To: Troy White, Dudek
From: Michael Sweesy, Dudek
Subject: Malibu Parks Public Access Enhancement Plan – Biological Concept Mitigation/Restoration Plan
Date: July 26, 2010
Attachment(s): Figures 1–7B

PROGRAM BACKGROUND

This memorandum provides the framework for a habitat restoration program for the Malibu Parks Public Access Enhancement Plan. Pursuant to Section 30605 of the California Coastal Act (Coastal Act), the Malibu Parks Public Access Enhancement Plan—Public Works Plan (the Plan) has been developed to serve as the facilities plan for lands subject to the Malibu Parks Public Access Enhancement Plan Overlay, as defined by Section 3.4.2 of the certified City of Malibu Local Coastal Program (LCP). The Plan also addresses facilities planning for specific park and recreation areas located within lands adjacent to the Malibu Parks Public Access Enhancement Plan Overlay in unincorporated Los Angeles County (County). These areas are collectively referred to as the "Plan area" (see Figure 1 for a regional map). The Plan is being pursued as a joint effort between the Santa Monica Mountains Conservancy (SMMC) and the Mountains Recreation and Conservation Authority (MRCA).

The Plan would enhance public access and recreation opportunities by completing the following tasks:

- By developing an interconnected system of trails, parks, open space, and habitats
- By improving alternative methods of transportation between parklands
- By identifying and completing recreational facility and program improvements for the park properties to support existing recreational demand and to facilitate an increased level of accessibility for visitors with diverse backgrounds, interests, ages, and abilities.

A full description of the proposed project is included in the SMMC/MRCA *Final Environmental Impact Report (FEIR) for the Malibu Parks Public Access Enhancement Pl[illegible] Public Works Plan* (2010).

Exhibit 18
SMMC/MRCA PWP
Biological Concept
Mitigation/Restoration Plan
(Dudek, July 2010)

The public access enhancement tasks include new camp facilities, trails, appurtenant structures, and camp amenities. Fire buffers around the park improvements are a required element of the project design to ensure public safety.

In addition, Ramirez Canyon Park, donated to the SMMC in 1994, will be restored with the intention of enhancing degraded stream habitats and addressing flood and erosion hazards in a channelized portion of Ramirez Canyon. The proposed streambed and riparian habitat restoration would restore, create, and enhance segments of Ramirez Canyon Creek that sustained historic impacts associated with creek bank and channel modifications from a previous property owner. Additional enhancement area would also provide educational displays associated with restoration efforts of the proposed creek restoration program.

PROPOSED PROJECT IMPACTS

A variety of upland and wetland vegetation communities will be impacted as a result of Plan implementation, including impacts associated with restoration in Ramirez Canyon Creek. Upland vegetation communities that could be impacted include various alliances and associations of coastal scrub and chaparral, and purple needlegrass grasslands, a native grasslands community. Wetlands and riparian habitat impacts include southern willow scrub and western sycamore-coast live oak.

Table 1 summarizes proposed impacts of the Plan (modified redesign project alternative) and mitigation as required in the FEIR.

Table 1
Summary of Proposed Mitigation for Direct Sensitive Habitat Impacts

Vegetation Community	Total Impacts[1] (Acres)	Mitigation Ratio	Acreage
Coastal Scrub and Chaparral			
Coastal Scrub (including disturbed forms)	10.84	3:1	32.52
Chaparral (including disturbed forms)	8.4	3:1	25.2
Subtotal	*19.24*	—	*57.72*[2]
Native Grasslands			
Native Grassland (including disturbed forms)	0.40	3:1	1.20
Riparian, Wetlands and Streams			
Southern Willow Scrub	0.34	3:1	1.02
Western Sycamore – Coast Live Oak	1.93	3:1	5.79
Subtotal	*2.27*	—	*6.81*

Table 1 (Continued)

Vegetation Community	Total Impacts[1] (Acres)	Mitigation Ratio	Acreage
Historic Impacts (after 1977) and Associated Creek Restoration Impacts to Riparian, Wetlands, and Streams			
Riparian Habitat Impacts from Historic Impacts	0.18	3:1	0.54
Open Channel/Open Water (temporary) (Creek Restoration)	0.17	1:1	0.17
Open Channel/Open Water (permanent) (Creek Restoration)	0.11	3:1	0.33
Subtotal	*0.46*	—	*1.04*
Total[2]	22.78[3]	—	66.77[2]

[1] Impacts are direct and permanent except where noted as temporary for open water/open channel.
[2] Does not total due to rounding.
[3]This number excludes impacts to broad leafed upland tree dominated habitats (i.e., coast live woodland associations and California walnut woodland) because mitigation associated with these sensitive native communities would occur on a tree-by-tree basis at a 10:1 ratio per the impacts described in the tree section herein.

HISTORIC IMPACTS IN RAMIREZ CANYON CREEK

A majority of the Ramirez Canyon Park historic impacts have occurred since 1953, which began with the construction of the first residence. All residential structures and associated infrastructure were developed on the property prior to 1977; thus, most of Ramirez Canyon Park impacts occurred prior to the enactment of the Coastal Act and the establishment of the California Coastal Commission (CCC) in 1977. After 1977, additional site grading associated with landscaping and the garden was completed, including the construction of cobble walkways and bridges, and further modification of the creek with rock walls and gabion structures occurred. Although the SMMC did not acquire Ramirez Canyon Park until 1994, the historic impacts detailed in Table 1 will be mitigated, as described in this restoration plan and as required by the Malibu LCP and the Coastal Act. Development in Ramirez Canyon Creek after the establishment of the CCC in 1977 totaled approximately 0.18 acre of historic impacts to southern willow scrub. Therefore, mitigation at a 3:1 mitigation-to-impact ratio is required.

Overview of Restoration in Ramirez Canyon Creek

Per CCC guidance, the SMMC will implement a stream restoration and enhancement project within Ramirez Canyon Park through completion of the following tasks:

- Restoration of riparian habitat and wetlands at and across the creek from the existing tennis court through removal of artificial creek wall linings and slope grading
- Removal of non-native plants and revegetation in the creek with native riparian species

- Long-term maintenance of restored vegetation communities
- Removal of one pedestrian bridge
- Extraction of unstable exposed gabions and gunite in creek bottoms to restore soft channel bottom
- Installation of pervious boulder berms throughout the creek to control stream degradation
- Restoration of temporary impact areas from boulder berm construction to pre-impact channel contours
- Implementation of corresponding best management practices (BMPs).

The stream restoration and enhancement project will result in approximately 0.11 acre of permanent impacts to open channel/open water and 0.17 acre of temporary impacts to open channel/open water habitat (see Table 1). These temporary and permanent impacts to open channel/open water, which are potentially jurisdictional[1], at Ramirez Canyon will be mitigated either on site or at King Gillette Ranch (see Table 2). Permanent impacts to open channel/open water will be mitigated through 1:1 creation and 2:1 enhancement (totaling 3:1 mitigation). Temporary impacts to open channel/open water will be mitigated at a 1:1 ratio in Ramirez Canyon Creek. Additional creation for historic and proposed permanent impacts to Ramirez Canyon will be located at King Gillette Ranch (see Figure 2).

OVERVIEW OF PROPOSED RESTORATION

Table 2 presents the location of each mitigation site and shows where the mitigation requirements, defined in Table 1, will be achieved for the proposed project impacts, including creek restoration and the historic creek impacts. The restoration program incorporates performance criteria that are designed to indicate when habitat functions and services have been created on each mitigation site to fully mitigate impacts.

The mitigation program will establish a myriad of native upland and wetland vegetation communities as well as jurisdictional wetlands/waters (Table 2). All impacts occur within the

[1] These are under the joint jurisdiction of the CCC and the California Department of Fish and Game (CDFG). The U.S. Army Corps of Engineers (ACOE) and Regional Water Quality Control Board (RWQCB) may take jurisdiction over those portions of the wetlands/waters occurring below the ordinary high water mark of a stream channel.

Coastal Zone and are under the jurisdiction of the CCC; therefore, mitigation must be located within the Coastal Zone. The mitigation program outlined herein achieves this requirement.

Uplands mitigation will be achieved at selected sites through appropriate weed control, soil preparation, and seed and/or plant installation with and without temporary supplemental irrigation, as available. Wetlands and riparian habitats mitigation will involve a combination of riparian creation and enhancement to fully mitigate project impacts.

Habitat restoration will be conducted at five sites: Malibu Bluffs, Corral Canyon, Tuna/Las Flores Canyon, King Gillette Ranch, and Ramirez Canyon Park (Figure 2). The proposed mitigation will be implemented to achieve the required mitigation for the proposed project and for historic impacts in Ramirez Canyon Creek. This restoration plan addresses the existing conditions and restoration implementation strategies, and the rationale for success. The restoration program incorporates performance criteria that are designed to indicate when habitat functions and services have been created at each mitigation site to fully mitigate Plan impacts (modified redesign project alternative) as well as historic Ramirez Canyon Creek impacts.

Table 2
Summary of Proposed Mitigation Program

Vegetation Community	Total Mitigation Requirement	Malibu Bluffs (Acres)	Corral Canyon (Acres)	Tuna / Las Flores Canyon (Acres)	King Gillette Ranch (Acres)	Ramirez Canyon Park
Coastal Scrub and Chaparral						
Coastal Scrub	32.52	18.42	8.89	5.21	—	—
Chaparral	25.20	—	—	25.20	—	—
Subtotal	57.72	18.42	*8.89*	30.41	—	—
Native Grassland						
Native Grassland	1.20	—	1.20	—	—	—
Riparian, Wetlands and Streams						
Southern Willow Scrub	1.02	—	—	—	1.02	—
Western Sycamore – Coast Live Oak	5.79	—	—	—	5.79	—
Subtotal	*6.81*	—	—	—	*6.81*	—
Historic Impacts (after 1977) and Associated Creek Restoration Impacts to Riparian, Wetlands, and Streams						
Riparian Habitat Impacts from Historic Impacts	0.54	—	—	—	0.37	0.17
Open Channel/Open Water (permanent) (Creek Restoration)	0.33	—	—	—	0.34	—

Table 2 (Continued)

Vegetation Community	Total Mitigation Requirement	Malibu Bluffs (Acres)	Corral Canyon (Acres)	Tuna / Las Flores Canyon (Acres)	King Gillette Ranch (Acres)	Ramirez Canyon Park
Open Channel/Open Water (temporary) (Creek Restoration)	0.17	—	—	—	—	0.18
Subtotal	*1.04*	—	—	—	*0.71*	*0.35*
Total	66.77	18.42	10.09	30.41	7.52	0.35

[1] Does not total due to rounding.

Mitigation graphics in this document depict all mitigation areas that are suitable to establish the vegetation community indicated on each mitigation site figure. There is no intention to over-mitigate, only to demonstrate adequate mitigation acreage is available based on the modified redesign project alternative impact acreage and mitigation ratios. Actual mitigation areas and acreage by vegetation community will be defined in project specific mitigation plans that are described in this habitat restoration plan.

PROJECT SCHEDULE

The project Environmental Impact Report (EIR) analyzes project-wide impacts and mitigation for California Environmental Quality Act (CEQA) compliance. However, project implementation is more likely to occur through smaller discrete projects that are implemented over multiple years. Channel improvements and mitigation in Ramirez Canyon will be implemented prior to or concurrent with the first phase of facilities development contained in the Plan. Implementation of this mitigation program will align with the construction schedule of the Plan. As individual park projects are brought forward, a corresponding mitigation plan will be prepared in support of project-specific resource agency permit applications. These site-specific conceptual plans will be consistent with this framework mitigation program, but will be prepared in a format consistent with resource agency format requirements and additional details of project implementation, monitoring, and maintenance.

MITIGATION GOALS

Mitigation is typically proportional to the resource being impacted. In cases where high-quality habitat is impacted, mitigation must replace the ecological function through the establishment of similar high-quality habitat. Similarly, when disturbed habitats are impacted, mitigation is required to replace their functions and values to the degree they are present.

This mitigation program intends to replace all impacted vegetation with high-functioning vegetation communities. However, mitigation for disturbed habitat impacts has been designated in areas that are more challenged and, therefore, may result in habitat that is not as high-functioning as other mitigation areas. For example, the Corral Canyon mitigation site has a significant infestation of Geraldton carnation weed (*Euphorbia terracina*), an invasive and persistent exotic species. Given the tenacity of this species and the extent of the population in the region, it is likely that complete eradication of the species from the area is not possible. However, the mitigation program proposes to aggressively pre-treat the population before site installation of native species and throughout the 5-year maintenance and monitoring to reduce the population to the greatest extent practicable.

To demonstrate that appropriate mitigation will occur that fully mitigates project impacts, the following mitigation goals are established for each mitigation area and will be achieved by the end of the monitoring period.

Malibu Bluffs

The coastal scrub to be restored at Malibu Bluffs will be fully functioning habitat. The established habitat will provide high native cover that is sufficient to resist future non-native invasion. Non-native species will have low representation within the restored native coastal habitat. The habitat will be highly diverse with representative species of coastal scrub from the local area, including coastal scrub and laurel sumac (*Malosma laurina*) vegetation associations with ashy leaf buckwheat (*Eriogonum cinereum*), purple sage (*Salvia leucophylla*), black sage (*Salvia mellifera*), and California encelia (*Encelia californica*). Performance criteria are provided in Tables 3 and 4.

Corral Canyon

The existing coastal scrub at Corral Canyon is different than the coastal scrub found at Malibu Bluffs. Corral Canyon coastal scrub vegetation will be highly diverse; however, the habitat will be dominated and/or have a significant representation of purple sage. Purple sage vegetation associations with coyotebrush (*Baccharis pilularis*), California sagebrush (*Artemisia californica),* and ashy leaf buckwheat will provide the majority of native cover. In addition to coastal scrub vegetation, native purple needlegrass (*Nassella pulchra*) grasslands will be restored and enhanced on this site. Native grassland species, especially purple needlegrass, will be a component of the coastal scrub as well as the dominant species within native grassland areas. The native grasslands will intergrade into the surrounding coastal scrub habitat.

Tuna/Las Flores Canyon

The mitigation goal at the Tuna/Las Flores Canyon site is to create chaparral vegetation associations that are compatible with adjacent habitat without irrigation. Mitigation at this site will knit together existing chaparral habitat to enhance habitat continuity, reduce non-native vegetation within the disturbed site, and stabilize soils to reduce erosion.

King Gillette Ranch

A wetlands and riparian habitat complex, including western sycamore-coast live oak, is planned for restoration at King Gillette Ranch. Wetlands and riparian habitat will be created along an existing creek through grading to widen the creek at an existing sharp bend and along an upland stretch that sustains non-native grasses. Self-sustaining southern willow scrub will be established at this creation site and enhanced along a selected adjacent existing creek section that does not presently support native wetlands habitat. Western sycamore-coast live oak woodlands will be established in a grove adjacent to the creek creation and enhancement areas. The intent of this arrangement is to create a complex of mutually supportive vegetation communities that result in long-term vegetation stability within this mitigation site.

Ramirez Canyon Park

Riparian vegetation establishment, open channel/open water creation and enhancement, and replacement of non-native and ornamental trees with coast live oak (*Quercus agrifolia*) and Southern California black walnut (*Juglans californica*) trees is planned for restoration at Ramirez Canyon Park. Riparian vegetation will be created in existing developed and/or ornamental upland areas through the demolition of cobblestone retaining walls adjacent to the creek, a tennis court facility adjacent to the retaining wall, and a grass pathway. Subsequent slope grading to widen the creek and create overbank flow will enable the creation of wetlands and riparian habitat in these areas. Creek enhancement efforts will include the removal of non-native plants and the removal of old gabion structures and impervious gunite surfaces to restore the soft channel bottom. All temporary impacts from boulder berm will be mitigated through grading disturbed areas to match pre-construction contours.

Replacement of non-native and ornamental trees with native trees will also occur within the restoration areas and on selected slopes in the Ramirez Canyon Park property as mitigation for tree impacts associated with Plan implementation. Details of the native tree mitigation are discussed in the Appendix F of the FEIR, *Malibu Parks Public Access Enhancement Native Tree Protection Plan* (Dudek 2010a).

The revegetation of wetlands and riparian habitat will include planting container plants and cuttings of local willow species (*Salix* spp.), western sycamore (*Platanus racemosa*), California rose (*Rosa californica*), western white clematis (*Clematis ligusticifolia*), mugwort (*Artemisia douglasiana*), toyon (*Heteromeles arbutifolia*), and mulefat (*Baccharis salicifolia*), among other species that occur in Ramirez Canyon Creek. Adjacent to the creek revegetation area, Southern California black walnut and coast live oak trees will also be established, creating a transitional area between the riparian and upland vegetation.

PERFORMANCE CRITERIA

Site-specific performance criteria are established to create a timetable of habitat development that is consistent with the normal progress of each habitat type to an eventual self-sustaining state. These criteria not only serve as the measure of success at the end of the monitoring period, but also provide milestone habitat development objectives that trigger maintenance actions if criteria are not achieved. This monitoring and adaptive feedback process enhances the likelihood for successful habitat restoration. Performance criteria do not necessarily lead to mature habitat as this process can often exceed the 5-year monitoring period. However, appropriate interim and final performance criteria will lead to mature habitat after the end of the 5-year monitoring period. No performance criteria are proposed for open channel/open water mitigation areas because once it has been established, the area will function as open channel/open water.

Table 3 provides interim annual and final performance criteria for each mitigation site. Vegetation cover is expressed as percent absolute cover for native and non-native vegetation. For native cover, the percentages listed shall be the minimum attained to be considered successful, and for non-native cover, the percentages listed shall not be exceeded.

Table 3
Mitigation Program Performance Criteria

Mitigation Site	Habitat Type	Year 1 (%)	Year 2 (%)	Year 3 (%)	Year 4 (%)	Year 5 (%)
Malibu Bluffs	Coastal scrub	15	30	50	65	75
	Perennial exotic cover	5	5	5	5	5
Corral Canyon	Coastal scrub	15	25	40	50	65
	Perennial exotic cover	30	20	10	10	10
	Native Grasslands	10	20	35	45	55
	Perennial exotic cover	30	20	10	10	10
Tuna/Las Flores Canyon	Chaparral	15	25	40	50	65
	Perennial exotic cover	5	5	5	5	5
King Gillette Ranch	Southern willow scrub	20	35	50	65	75
	Western sycamore-coast live oak	15	25	35	55	65

Table 3 (Continued)

Mitigation Site	Habitat Type	Year 1 (%)	Year 2 (%)	Year 3 (%)	Year 4 (%)	Year 5 (%)
	woodland					
	Perennial exotic cover	5	5	5	5	5
Ramirez Canyon Park	Riparian vegetation	20	30	40	50	60
	Perennial exotic cover	5	5	5	5	5

Non-native cover thresholds apply only to perennial or biennial invasive exotic species. Annual exotic species (mainly European grasses) will be controlled to the greatest extent practicable, but a specific performance standard cannot be specified because of the highly efficient reproductive capabilities and wide distribution of these species. While the presence of these species is not desirable on a mitigation site, this type of non-native vegetation is not a short-term or long-term threat to the overall habitat persistence. The best management approach for annual species control in the short term is establishment of native shrub cover that can suppress annual seed germination through shading, allelopathy, and resource competition. Over the long term, established native vegetation will build up an in-situ seed bank that can overwhelm the annual seed bank. This important shift promotes native recruitment over non-native recruitment when localized disturbance removes the shrub cover. In these instances, if the native seed bank is of sufficient volume and diversity, the habitat can recruit new seedlings within the opening and self-heal the shrub canopy, overcoming the threat of a dominant emergent non-native annual population.

In addition to native cover criteria, habitat types with vertical structure must meet the tree height criteria listed in Table 4. The criteria are intended to provide an indicator of canopy potential as habitat continues to develop and mature. Achievement of these criteria indicates that canopy species are present and vigorous, with a growth rate that will result in appropriate vertical stratification over time.

Table 4
Tree Height Performance Criteria

Species Name	Tree Height Performance Criteria (feet)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Western sycamore	—	4	6	7	8
Coast live oak	—	2	3	4	5
Arroyo willow (*Salix lasiolepis*)	—	4	6	8	10

EXISTING CONDITIONS

Existing conditions provide the basis for determining the appropriate habitat that can be supported by the mitigation sites and inform the restoration implementation process that will lead to successful establishment of functional, self-sustaining habitat. The preparation of this habitat mitigation program involved the evaluation of 10 separate potential mitigation sites for uplands and wetlands mitigation. These sites were assessed and evaluated for appropriateness for the intended mitigation acreage and target habitat types. Selection criteria included soil type, hydrology, historic vegetation, non-native vegetation and native habitat adjacency, land use, site accessibility, and water source availability.

Through the mitigation site selection, this mitigation program attempts to consolidate uplands and wetlands/riparian habitat mitigation types on the sites that present the best opportunity to successfully establish the target habitat types in perpetuity. This consolidation results in larger, more focused mitigation projects with less edge effects that might otherwise compromise mitigation results on smaller sites. The ecological benefits of these larger sites is greater than providing mitigation through smaller, geographically dispersed sites that have greater edge effects and, therefore, a more uncertain future when in-perpetuity management is considered.

A more detailed description of the biological resources found on the Malibu Bluffs and Corral Canyon mitigation sites can be found in Section 5.4 and Appendix H-1 of the FEIR, *Biological Resources Technical Report for the Malibu Parks Public Access Enhancement Plan* (Dudek 2010b).

Malibu Bluffs Mitigation Site

The Malibu Bluffs mitigation site consists of gently to moderately sloping coastal terraces. These terrace areas have been disturbed by past land use and presently support non-native grasslands. The site is roughly bisected by a localized drainage that supports some wetlands vegetation and side slopes of undisturbed coastal scrub vegetation. Soils on site are deep, well-drained, clay loam with clay subsoil. These soils have a high water-holding capacity that is well suited to support coastal scrub vegetation communities.

The coastal terraces are planned for public park improvements, including campsites, trails, and support facilities. However, a significant portion of the site is available for coastal scrub restoration. Restoration areas do not encroach upon trail and proposed park improvement fire buffers. Soils in this area are appropriate for coastal scrub habitats and adjacent undisturbed areas provide evidence of greater past coastal scrub cover on the coastal terraces. Undisturbed

coastal scrub in this area includes California sagebrush-ashy leaf buckwheat, California sagebrush-black sage, laurel sumac-black sage, and laurel sumac-California sagebrush. A water supply will be available from adjacent park facilities. Site access will be via existing unpaved roads and the future park trail system.

Corral Canyon Mitigation Site

The Corral Canyon mitigation site also occupies gently sloping coastal terraces that begin to rise up to high ridgelines. New campsites and trails are planned for the area. However, a significant portion of the site is available for coastal scrub and grassland restoration. Restoration areas are planned to surround the new park facilities but avoid overlapping the trail and park improvement fire buffers. Soils are conducive to support native bunchgrass grasslands as evidenced by three existing patches of purple needlegrass grasslands. Coastal scrub in this area is typified by purple sage as the dominant shrub species. A population of Geraldton carnation weed is present on site and will be a major challenge to successful habitat restoration. Water supply will be available from adjacent park facilities. Site access will be via existing unpaved roads and the future park trail system. The eastern portion of the mitigation area will be accessible via an old road bed that crosses an existing local drainage that separates the west and east portions of the mitigation site.

An existing cultural resource site is present within the mitigation area that requires protection from mitigation activities. Within the resource site, no excavations greater than 6 inches will be allowed. This may preclude the installation of container plants. However, the area is relatively small and isolated when compared to the overall mitigation site acreage. With an emphasis on seed to establish the majority of vegetation, these restrictions are not considered an impediment to successful habitat restoration. A qualified archaeologist shall be consulted during the final construction design and prior to all construction.

Tuna/Las Flores Canyon Mitigation Site

The Tuna/Las Flores Canyon mitigation site is situated on a ridge top that was cleared as a temporary firebreak sometime prior to 1989 and more recently in 2007. The firebreak is approximately 120 feet wide on a gently sloping ridgeline. The steep slopes flanking the ridgeline are east- and west-facing with some northern exposures. These slopes support mature chaparral vegetation and some isolated coast live oak. Chaparral species adjacent to the mitigation area include chamise (*Adenostoma fasciculatum*), greenbark ceanothus (*Ceanothus spinosus*), laurel sumac, and scrub oak (*Quercus berberidifolia*). South-facing slopes support a matrix of coastal scrub habitat and chaparral.

There is a strong desire to re-establish this disturbed area to a native habitat condition and there are no plans to maintain the fuel break. Although the site is beginning to show signs of natural recruitment and resprouting from few surviving root crowns, the area is generally disturbed and lacking the former chaparral vegetation. The unpaved Big Rock Mountainway traverses the length of this site and provides ready access for equipment and maintenance activities. A hiking trail is planned to follow the Hurst Tank Mountainway and along the Big Rock Mountainway to the Big Rock Lateral until it descends the ridgeline to Las Flores Canyon. These unpaved roads will be maintained through the mitigation site to provide maintenance and through access for park rangers and other management personnel. The nearest paved access is Tuna Canyon Road.

King Gillette Ranch Mitigation Site

The wetlands and riparian habitats, including western sycamore-coast live oak woodland, planned for the King Gillette Ranch mitigation site are associated with an existing drainage that supports patchy willow scrub vegetation and non-native grasses. Adjacent existing pastureland and valley bottoms support isolated valley oak (*Quercus lobata*) and coast live oak groves, respectively. Understory vegetation is typically non-native grasses. The soils on this site are deep Botella Loam soils that are appropriate for woodlands vegetation communities. There is no land use conflict with the mitigation project because the pastureland will be abandoned, and a 100-foot buffer is required between all developed areas and mitigation areas.

Ramirez Canyon Park Mitigation Site

After the Ramirez Canyon Park was donated to the SMMC, activities were limited to maintenance of the structures and landscaping of the grounds adjacent to the creek. Ramirez Canyon Park sustains several historic residences and appurtenant structures, infrastructure, and ornamental landscaping. Site grading associated with the historic residential development and landscaping, including the construction of cobble walkways and bridges, and modification of the creek with rock walls and gabion structures, has altered the native riparian communities along Ramirez Canyon Creek and limited the opportunities for native recruitment.

Of the native riparian species found along the creek within Ramirez Canyon Park, western sycamore, white alder (*Alnus rhombifolia*), arroyo willow, and red willow (*Salix laevigata*) are observed. Understory within the riparian corridor where mature native trees are present is limited to a mix of native vines such as California grape (*Vitis californica*) and blackberry (*Rubus ursinus*), and non-native vines such as English ivy (*Hedera helix*) and common periwinkle (*Vinca minor*). Southern California black walnut, coast live oak, and California laurel (*Umbellularium californica*) characterize the native portions of the transitional upland slopes.

The average width of Ramirez Canyon Creek is 5 feet. The creek bed material is uniformly cobbly due to the velocity of flow in the channel. The width of the riparian canopy varies from 60 to 80 feet along the 1,600 linear feet of creek channel located within the property.

RESTORATION APPROACH AND IMPLEMENTATION STRATEGIES

Restoration approaches and implementation strategies have been developed in response to site-specific conditions at each mitigation site. This section provides a brief overview of the approach to achieve target vegetation types and interim annual and final performance criteria.

All mitigation sites shall be revegetated with indigenous plant species of local (Santa Monica Mountains) genetic stock. No plant species listed as problematic and/or invasive by the California Native Plant Society (CNPS) (found online at http://www.cnps.org/), the California Invasive Plant Council (formerly the California Exotic Pest Plant Council) (found online at http://www.cal-ipc.org/), or the State of California shall be employed or allowed to naturalize or persist on the site. No plant species listed as a "noxious weed" by the State of California or the federal government shall be used within the property. A qualified biologist and/or habitat restoration specialist familiar with those plants that are native or endemic to this region of California shall review all plant palettes.

Topsoil will be salvaged and placed onto disturbed graded areas within the development areas where topsoil has been removed. Use of topsoil placement shall be determined during final design and preparation of construction plans. Criteria for topsoil salvage and reuse will consider the ability of the receiving site to accommodate topsoil without the potential to erode once placed, e.g., sloped areas over 2:1 slope gradient will not be considered as suitable candidates to receive topsoil. If topsoil is salvaged, exposed stockpiles of soil and other erosive materials shall be covered during the rainy season, as required in the DEIR MM HYD-1.1.

Where practicable, temporary irrigation will be used to support native vegetation establishment. The Malibu Bluffs, Corral Canyon, King Gillette Ranch, and Ramirez Canyon Park mitigation areas are expected to be installed with temporary irrigation systems. The irrigation system will be turned off no less than 2 years before the end of the 5-year maintenance and monitoring period to demonstrate the self-sustaining capacity of the established native vegetation community.

The irrigation system design will include a master valve to protect against mainline breaks and consequent water loss and potential erosion. The irrigation system will use spray and/or drip irrigation, as suitable for seed and container plants. Low-head drainage and potential erosion will

be avoided and minimized using in-line check valves. Irrigation heads will be selected for low-precipitation rates of application to avoid and minimize runoff. Pressurized mainline pipes will be buried under proposed pedestrian pathways to protect the pipes from damage.

Irrigation system operations will mimic normal rainfall seasonality. The system will be operated to supplement natural rain events; essentially to guarantee appropriate moisture levels and temporal distribution throughout normal rainfall months. Irrigation systems will not be operated during hot summer months unless absolutely necessary to reduce mortality of container plants during years 1 and 2. This will allow developing vegetation to adopt a normal growth-dormancy cycle.

A weed eradication program will be implemented one growing season (6–12 months) prior to installation of native seed and container plants in all mitigation areas with proposed irrigation that are currently dominated with non-native annuals. A grow-and-kill weed eradication program will be implemented where spray irrigation is installed to reduce the weed seed bank that is present in the soil. The procedure will include alternating periods of irrigation to stimulate weed seed germination and chemical treatment to kill emerging weed seedlings. This process will be repeated until weed seed germination is reduced to a level that is deemed acceptable by the habitat restoration specialist. Appropriate herbicides will be selected by a pest control advisor based on the weed species to be controlled.

Malibu Bluffs Mitigation Site

Restoration of the Malibu Bluffs mitigation site involves the conversion of non-native grasslands to various associations of coastal scrub (see Figure 3). Mitigation areas are located around proposed campsites and trails. The mitigation areas are located outside of the designated trail and new park facilities fire buffers. However, restoration treatments and vegetation establishment will extend up to the edge of designated trails even though no mitigation credit will be allowed. This approach will reduce the area where weeds can persist and established coastal scrub vegetation will define the trail edges, keeping park users on authorized trail facilities.

Mitigation site access restrictions may be required due to the close proximity of mitigation areas to campsites and trails. Signs shall be posted indicating that the area is undergoing habitat restoration and requesting that people and dogs stay out of the area. No permanent fence is proposed to be installed during or after the 5-year vegetation establishment period. Temporary fencing consisting of a single strand of yellow nylon rope attached to T-bar posts will be used to demarcate the mitigation site boundary where campsites and trails are in close proximity. Permanent fencing may be installed as a management action in areas where unauthorized entry

and habitat degradation is observed. This post-occupancy approach will provide a better indication of actual public use of the site than anticipating such activity and will limit fence installation to only those areas of greatest need.

Soil preparation will include thatch clearing to expose mineral soils, incorporation of any needed soil amendments, and cross-ripping to prepare the soil for planting.

Several composite soil samples shall be collected from the mitigation areas and sent to a soil testing laboratory for agricultural suitability testing. Test results will determine the need for any pre-planting and post-planting amendments and/or fertilizer.

The flatter portions of the site and trails/roads to be abandoned will be cross-ripped to a depth of at least 6 inches in two directions to loosen compacted soil, incorporate any recommended soil amendments and/or fertilizers, and prepare the surface for seeding. Slopes steeper than 3:1 shall not be ripped. Mycorrhizal inoculants are not expected to be necessary because they are expected to be present. Native perennial grasses such as needlegrass (*Nassella* sp.), and some shrubs such as lemonadeberry (*Rhus integrifolia*) are obligate mycotrophs and require mycorrhizae to become established. Most coastal scrub species, however, are either non-mycorrhizal, such as sticky monkeyflower (*Mimulus aurantiacus*) and black sage, or facultative mycotrophs, such as California sagebrush, coyotebrush, California buckwheat (*Eriogonum fasciculatum*), and deerweed (*Lotus scoparius*).

To the extent practical, existing native volunteer plants will be preserved during soil preparation. Prior to cross-ripping, amendments and pre-plant fertilizer will be spread on the surface to be incorporated, including 20 pounds of agricultural gypsum per 1,000 square feet and 15 pounds of 6-20-20-XB fertilizer per 1,000 square feet. Soil test results may modify the pre-plant fertilizer and/or amendment type and application rate. The area will then be cross-ripped to a depth of at least 6 inches to loosen compacted soil and incorporate the amendments.

Restoration areas will be spray irrigated where it is deemed necessary to support habitat development. Irrigation may be used as a contingency measure that would be installed a year after initial seed installation. This will allow for the initial expression of habitat establishment under a natural rainfall regime. Areas where seed does not germinate due to lack of moisture would be candidate areas for irrigation and re-seeding. Vegetation introduction will be achieved mainly through the application of a native seed mix (see Table 5). Species that are not available in seed or that do not perform well from seed will be introduced with container plant installations (see Table 6). Species installed from nursery containers include coastal prickly-pear (*Opuntia littoralis*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), and laurel sumac.

Table 5
Malibu Bluffs - Coastal Scrub Plant Palette

Botanical Name	Common Name	Hydroseed Mixture	
		% Purity / % Germination	Pounds Per Acre
Artemisia californica	California sagebrush	15/50	4
Bromus carinatus	California brome	95/80	2
Encelia californica	California encelia	40/60	4
Eriogonum cinereum	Ashy leaf buckwheat	50/10	3
Eriophyllum confertifolium	Golden yarrow	98/75	0.5
Eschscholzia californica	California poppy	98/80	1
Gnaphalium bicolor	California everlasting	5/40	0.5
Hazardia squarrosus var. *grindelioides*	Saw-tooth goldenbush	15/20	3
Lasthenia californica	Goldfields	70/50	0.5
Leymus condensatus	Giant wildrye	80/80	1
Lotus scoparius var. *scoparius*	Deerweed	95/80	3
Lupine bicolor	Miniature lupine	98/85	3
L. hirsutissimus	Stinging lupine	90/80	1
Melica imperfecta	Coast range melic	90/60	3
Nassella pulchra *	Purple needlegrass	90/80	6
Phacelia parryi	Parry's phacelia	95/70	2
Salvia leucophylla	Purple sage	80/40	3
Salvia mellifera	Black sage	70/50	3
Sisyrinchium bellum	Blue-eyed grass	95/75	1
		Total	44.5

* Deawned seed only.

Table 6
Coastal Scrub Container Plant Palette, All Areas (27.97 Acres)[1]

Botanical Name	Common Name	Percent Composition (Estimated)	Quantity (Estimated)	Container Size (gallon)	Average Spacing (feet)
Yucca whipplei	Our lord's candle	1	997	1	4
Leymus condensatus	Giant wild rye	2	886	1	6
Malosma laurina	Laurel sumac	10	1,108	1	12
Mirabilis laevis var. *crassifolia*	Wishbone bush	2	1,995	1	4 f
Opuntia littoralis	Coastal prickly-pear	3	2,992	1	4
Rhus integrifolia	Lemonadeberry	2	222	1	12
		Total	8,200	1	—

[1] Final plant quantities and percent composition will be determined for each site, or portion thereof that is being restored as each park facility is implemented. Final conceptual mitigation packages may vary to address site-specific vegetation composition.

Corral Canyon Mitigation Site

Corral Canyon restoration will establish coastal scrub and purple needlegrass grasslands on coastal terraces located immediately above the Pacific Coast Highway (see Figure 4). Due to the presence of a substantial infestation of Geraldton carnation weed, the proposed habitat restoration project will begin with a 12-month weed eradication program to reduce the non-native seed bank prior to introduction of a native seed mix and container plants. To maximize the benefit of this process, the entire mitigation area is recommended to be irrigated with a spray system. This will allow for continual grow-and-kill cycles that stimulate non-native seed germination and follow-up with chemical treatment.

Temporary irrigation will be used to support native plant establishment. The system will be a combination of spray and drip irrigation, as suitable for seed and container trees.

During this initial period, site preparation work as described previously for Malibu Bluffs will be implemented at Corral Canyon. Site access to the eastern restoration area will be via an old road bed that crosses the drainage separating the west and east terrace areas.

Vegetation to be established on site via native seed mixes includes coastal scrub associations with purple sage as the dominant species and purple needlegrass grasslands (see Table 7). Container plants from Table 6 will also be installed on this site to increase species diversity within the mitigation site.

Table 7
Coastal Scrub Plant Palette, Sites Inland of Pacific Coast Highway[1]

Botanical Name	Common Name	Hydroseed Mixture	
		% Purity / % Germination	Pounds Per Acre
Artemisia californica	California sagebrush	15/50	6
Bromus carinatus	California brome	95/80	2
Encelia californica	California encelia	40/60	3
Eriogonum cinereum	Ashy leaf buckwheat	50/10	2
Eriogonum fasciculatum var. *foliolosum*	California buckwheat	50/20	3
Eriophyllum confertifolium	Golden yarrow	98/75	0.5
Eschscholzia californica	California poppy	98/80	1
Gnaphalium bicolor	California everlasting	5/40	0.5
Isocoma menziesii ssp. *menziesii*	White flowered goldenbush	40/30	3
Lasthenia californica	Goldfields	70/50	0.5
Leymus condensatus	Giant wildrye	80/80	2

Table 7 (Continued)

Botanical Name	Common Name	Hydroseed Mixture	
		% Purity / % Germination	Pounds Per Acre
Lotus scoparius var. *scoparius*	Deerweed	95/80	3
Lupine bicolor	Miniature lupine	98/85	3
L. hirsutissimus	Stinging lupine	90/80	1
Melica imperfecta	Coast range melic	90/60	3
Mimulus aurantiacus	Coast monkey flower	2/60	1
Nassella pulchra [2]	Purple needlegrass	90/80	6
Phacelia parryi	Parry's phacelia	95/70	2
Salvia leucophylla	Purple sage	80/40	3
Salvia mellifera	Black sage	70/50	2
Sisyrinchium bellum	Blue-eyed grass	95/75	1
		Total	48.5

[1] Final seed application rates will be determined for each site, or portion thereof that is being restored as each park facility is implemented. Final conceptual mitigation packages may vary to address site-specific vegetation composition.
[2] Deawned seed only.

Native grasslands will be enhanced and created through the application of a native seed mix (see Table 8). In addition, liners of purple needlegrass shall be installed in both the existing grasslands and grassland creation site to increase bunchgrass density. The density of these container plantings shall be determined in the final conceptual mitigation plan.

Table 8
Native Bunchgrass Grasslands Plant Palette

Botanical Name	Common Name	Hydroseed Mixture	
		% Purity / % Germination	Pounds Per Acre
Achillea millefolium	Yarrow	98/85	0.5
Artemisia californica	California sagebrush	15/50	1
Bromus carinatus	California brome	95/80	4
Eriogonum cinereum	Ashy leaf buckwheat	50/10	1
Gnaphalium californicum	California everlasting	5/40	0.5
Hazardia squarrosus var. *grindelioides*	Saw-tooth goldenbush	15/20	1
Lasthenia californica	Goldfields	70/50	0.5
Leymus condensatus	Giant wildrye	80/80	1
Lotus scoparius	Deerweed	90/60	3
Lupine bicolor	Miniature lupine	98/85	3
Lupinus succulentus	Arroyo lupine	98/85	2
Malacothamnus fasciculatus	Chaparral bushmallow	15/60	1

Table 8 (Continued)

Botanical Name	Common Name	Hydroseed Mixture	
		% Purity / % Germination	Pounds Per Acre
Malosma laurina	Laurel sumac	98/70	1
Melica californica	California melic	90/60	3
Nassella lepida *	Foothill needlegrass	70/60	2
*Nassella pulchra**	Purple needlegrass	90/80	6
Phacelia parryi	Parry's phacelia	95/70	2
Salvia leucophylla	Purple sage	80/40	1
Sisyrinchium bellum	Blue-eyed grass	95/75	2
		Total	35.5

* Deawned seed only.

Similar to the Malibu Bluffs site, site access restrictions may be required due to the close proximity of mitigation areas to camp sites and trails. Signs shall be posted indicating that the area is undergoing habitat restoration and requesting that people and dogs please stay out of the area. No permanent fence is proposed for installation during the 5-year vegetation establishment period. Temporary fencing consisting of a single strand of yellow nylon rope attached to T-bar posts will be used to demarcate the mitigation site boundary where campsites and trails are in close proximity. Permanent fencing may be installed as a management action in areas where unauthorized entry and habitat degradation is observed. This post-occupancy approach will provide a better indication of actual public use of the site than anticipating such activity and will limit fence installation to only those areas of greatest need.

Tuna/Las Flores Canyon Mitigation Site

This ridgeline restoration site is surrounded by existing mature chaparral vegetation. The site will be restored to chaparral vegetation while maintaining the Big Rock Mountainway and Big Rock Lateral access roads (see Figure 5). Chaparral is a difficult vegetation community to establish because of the thick seed coat that is typical of chaparral species. This fire adaptation requires fire scarification of seeds prior to widespread germination to ensure appropriate site conditions are present that favor seedling establishment. In addition, container plants of chaparral species are extremely sensitive to moisture, especially from irrigation, leading to high plant mortality. These factors make chaparral one of the most difficult vegetation communities to restore.

Given these constraints, the most common approach to chaparral restoration is to establish a native seral vegetation community that will give way to chaparral species over time, leading to chaparral vegetation that is considered the climax community where it is dominant. Coastal scrub

is planned to be established as the placeholder for chaparral in this case. Table 9 provides the plant palette for establishing coastal scrub and chaparral species.

Table 9
Chaparral Plant Palette

Botanical Name	Common Name	Hydroseed mixture	
		% Purity / % Germination	Pounds Per Acre
Achillea millefolium	Yarrow	98/85	0.5
Adenostoma fasciculatum	Chamise	50/20	2
Artemisia californica	California sagebrush	15/50	3
Bromus carinatus	California brome	95/80	4
Ceanothus spinosus	Greenbark ceanothus	98/70	2
Cercocarpus betuliodes var. *betuloides*	Birch-leaf mountain-mahogany	50/70	2
Encelia californica	California encelia	40/60	3
Eriogonum fasciculatum var. *foliolosum*	California buckwheat	50/20	3
Eriophyllum confertifolium	Golden yarrow	30/70	0.5
Eschscholzia californica	California poppy	98/80	1
Gnaphalium californicum	California everlasting	5/40	0.5
Isocoma menziesii ssp. *menziesii*	White flowered goldenbush	40/30	3
Leymus condensatus	Giant wild rye	80/80	2
Lotus scoparius	Deerweed	95/80	5
Lupine bicolor	Miniature lupine	98/85	3
L. hirsutissimus	Stinging lupine	90/80	1
Malacothamnus fasciculatus	Chaparral bushmallow	15/60	2
Malosma laurina	Laurel sumac	98/70	1
Melica californica	California melic	90/60	3
Mimulus aurantiacus	Coast monkey flower	2/60	1
*Nassella lepida**	Foothill needlegrass	90/60	6
*Nassella pulchra**	Purple needlegrass	90/80	6
Phacelia grandiflora	Large-flowered phacelia	98/80	2
Rhus ovata	Sugar bush	90/60	4
Salvia leucophylla	Purple sage	80/40	3
Salvia mellifera	Black sage	70/50	3
		Total	66.5

* Deawned seed only.

In addition to hydroseeding the chaparral revegetation area, 2 acres will be planted with locally collected acorns from coast live oak and scrub oak. Planting pits 1 foot deep and 1 foot in

diameter will be excavated to loosen the soil and amended with one cup of agricultural gypsum. Three viable acorns will be placed in each planting pit approximately 1 to 2 inches deep, along with one Agriform 21-gram 20-10-5 planting tablet or one Best Pak 20-10-5 planting packet, or approved equal, placed approximately 6 inches deep. A wire-planting cage 18 inches in diameter and 3 feet tall will be anchored to the ground around each planting pit at the time of planting to help limit herbivory. Oaks will be clustered near areas were oaks are already growing in the adjacent habitat at the rate of 15 coast live oak planting pits per acre and 200 scrub oaks per acre.

King Gillette Ranch Mitigation Site

Implementation of southern willow scrub and western sycamore-coast live oak woodlands is intended to complement existing vegetation communities that are present on lands adjacent to the mitigation site. The configuration of habitat types is also intended to act as a vegetation complex of mutually supportive vegetation.

Wetlands creation will be achieved through grading an area of existing pastureland to the flow line of the adjacent creek (see Figure 6). At the flow line elevation, this area will receive creek flows that can establish and support southern willow scrub habitat. A section of existing creek immediately downstream of the creation area will be enhanced by the removal of non-native grass thatch and establishment of south willow scrub species.

Soil preparation will include thatch clearing to expose mineral soils, incorporation of any needed soil amendments, and cross-ripping to prepare the soil for planting. A grow-and-kill weed eradication program will be implemented where spray irrigation is installed to reduce the weed seed bank that is present in the soil.

Several composite soil samples shall be collected from the mitigation areas and sent to a soil-testing laboratory for agricultural suitability testing. Test results will determine the need for any pre-planting and post-planting amendments and/or fertilizer.

Temporary irrigation will be used to support native understory and tree canopy establishment. The system will be a combination of spray and drip irrigation, as suitable for seed and container trees.

The planting plan for this site includes southern willow scrub to be located in the channel bottom (see Table 10). The western sycamore-coast live oak plant palette (see Table 11) will be located on the transition slope and pasture land. Sycamore will be located closer to the creek while oaks will be located in the old pasture area. Coast live oak and western sycamore trees shall be

installed in wire mesh cages to protect their root system from gophers and other burrowing animals. Aboveground cages might also be required to protect these trees from deer browse.

Table 10
Southern Willow Scrub Plant Palette

Botanical Name	Common Name	Percent Composition (Estimated)	Quantity (Estimated)	Container Size (gallon)	Average Spacing (feet)
Canopy and Understory Container Plants					
Baccharis salicifolia	Mulefat	20	16	1	8
Muhlenbergia rigens	Deergrass	10	65	1	4
Rubus ursinus	California blackberry	10	29	1	6
Salix lasiolepis	Arroyo willow	40	73	1	10
		Total	183	1	—
Hydroseed mixture		% Purity / % Germination		Pounds Per Acre	
Ambrosia psylostachya	Western ragweed	20/30		1	
Amsinckia menziesii	Common fiddleneck	40/60		0.5	
Artemisia douglasiana	Mugwort	15/50		2	
Hazardia squarrosus var. *grindelioides*	Saw-tooth goldenbush	15/20		3	
Lupine bicolor	Miniature lupine	98/85		3	
		Total		9.5	

Table 11
Western Sycamore – Coast Live Oak Woodland Plant Palette

Botanical Name	Common Name	Percent Composition (Estimated)	Quantity (Estimated)	Container Size (gallon)	Average Spacing (feet)
Container Plants					
Baccharis salicifolia	Mulefat	10	174	1	8
Heteromeles arbutifolia	Toyon	5	87	1	8
Platanus racemosa	Western sycamore	30	139	5	20
Quercus agrifolia var. *agrifolia*	Coast live oak	20	53	5	25
Sambucus nigra ssp. *canadensis*	Blue elderberry	5	22	1	16
		Total	283	1	—
			192	5	
Hydroseed mixture		% Purity / % Germination		Pounds Per Acre	
Artemisia douglasiana	Mugwort	10/50		2	
Baccharis pilularis	Coyotebrush	2/40		4	
Bromus carinatus	California brome	95/80		5	

Table 11 (Continued)

Botanical Name	Common Name	Percent Composition (Estimated)	Quantity (Estimated)	Container Size (gallon)	Average Spacing (feet)
Galium angustifolium	Narrow-leaved bedstraw	80/30		0.5	
Gnaphalium californicum	California everlasting	10/25		0.5	
Hazardia squarrosus var. *grindelioides*	Saw-tooth goldenbush	15/20		3	
Muhlenbergia rigens	Deergrass	80/70		1	
*Nassella lepida**	Foothill needlegrass	90/60		2	
Nassella pulchra *	Purple needlegrass	70/60		6	
Phacelia cicutaria	Caterpillar phacelia	95/80		2	
			Total	26	

* Deawned seed only.

Ramirez Canyon Park Mitigation Site

Mitigation will be achieved through the excavation of a tennis court and rock retaining wall, excavation of an upland grass pathway across the creek from the tennis court, and grading of both these areas to an elevation slightly above the flow line of the adjacent creek (see Figures 7A and 7B). At these flow-line elevations, the area will receive creek flows that can establish and support southern willow scrub habitat. Once grading is complete, southern willow scrub vegetation is proposed that complements existing vegetation communities that are present on lands adjacent to the mitigation site. Mitigation in this particular area will create a larger area for surface flows to slow down, allowing the natural hydrology and sediment deposition to resume.

Temporary irrigation will be used to support native understory and tree canopy establishment. The system will be a combination of spray and drip irrigation, as suitable for seed and container trees.

With the installation of gabions and hard structures along the creek, stream flow rates increased due to the loss of infiltration into the surrounding areas, loss of sediment along the creek bank, and loss of dissipation by vegetation growing along the creek channel (LSA 2002). Upstream from the creation areas, removal of gabions and associated structures from Ramirez Canyon Creek, and the replacement of those structures with boulder berms will facilitate passive restoration of the creek. Passive restoration (i.e., simply reducing or eliminating sources of degradation and allowing recovery time) is expected to occur with the removal of hard structures and replacement with softer, more natural boulder berm structures. Boulder berms are proposed to slow down stream flow and create rock-riffle-pool complexes within the channel, which

should assist with passive restoration by facilitating sediment deposition and subsequent native recruitment of southern willow scrub vegetation. Passive restoration is expected to be localized throughout the length of Ramirez Canyon Park.

Temporary impacts to Ramirez Canyon Creek associated with the removal of the gabion structures and placement of boulder berms is proposed to occur at the location of each structure (see Figures 7A and 7B). Temporary impacts will be mitigated at a 1:1 mitigation-to-impact ratio on site by re-establishing pre-construction stream morphology to the greatest extent practical.

Several sections of existing creek immediately downstream of the creation areas will be enhanced by the removal of canary palms (*Phoenix canariensis*) and establishment of southern willow scrub species. The canary palms that are present range in size from several feet tall to 8 to 10 feet tall with a canopy cover of 8 feet in diameter. Palms on the creek bank to be removed will be replaced with appropriate southern willow scrub species using local willow cuttings.

The planting plan for this site includes southern willow scrub vegetation to be located on the created benches and banks (see Table 12). Coast live oak and black walnut trees will also be planted on the slopes to provide transitional upland habitat. Coast live oak and black walnut trees shall be installed in wire mesh cages to protect their root system from gophers and other burrowing animals. Aboveground cages might also be required to protect these trees from deer browse. The *Malibu Parks Public Access Enhancement Native Tree Protection Plan* (Dudek 2010a), included as Appendix F to the FEIR, further details the specifications for coast live oak and black walnut tree plantings and the mitigation requirements that such tree planting will satisfy.

Table 12
Riparian Vegetation Plant Palette

Botanical Name	Common Name	Percent Composition (Estimated)	Quantity (Estimated)	Container Size (gallon)	Average Spacing (feet)
Canopy and Understory Container Plants					
Baccharis salicifolia	Mulefat	10	12	1	8
Clematis ligusticifolia	Western white clematis	5	24	I	4
Heteromeles arbutifolia	Toyon	5	6	1	8
Platanus racemosa	Western sycamore	2	4	5	20
Pluchea sericea	Arrowweed	1	6	1	4
Rosa californica	California rose	2	10	1	6
Salix exigua	Sandbar willow	10	12	1	8
Salix laevigata	Red willow	20	24	1	8

Table 12 (Continued)

Botanical Name	Common Name	Percent Composition (Estimated)	Quantity (Estimated)	Container Size (gallon)	Average Spacing (feet)
Salix lasiolepis	Arroyo willow	20	24	1	10
Sambucus mexicanus	Mexican elderberry	3	5	1	10
Umbellularia californica	California laurel	2	5	1	10
		Total	—	1	—
Hydroseed mixture		% Purity / % Germination		Pounds Per Acre	
Ambrosia psilostachya	Western ragweed	20/30		1	
Artemisia douglasiana	Mugwort	15/50		2	
Leymuscondensatus	Giant wild rye	70/80		2	
Leymus triticoides	Creeping wild rye	95/80		3	
Lupine bicolor	Miniature lupine	98/85		3	
			Total	11	

MAINTENANCE AND MONITORING PROGRAM

A 5-year maintenance and monitoring program will be implemented on all mitigation sites to ensure successful implementation of the habitat mitigation program. A landscape maintenance contractor with experience in habitat restoration shall be hired to provide maintenance services at the project sites throughout the 5-year maintenance period. Maintenance shall consist of controlling weeds and other pests, irrigation system operation and repairs and/or hand watering (if used), trash removal, erosion control, access control, remedial planting and seeding, and other measures.

The habitat restoration specialist shall visit the project site on the same schedule as the landscape maintenance contractor to inspect the contractor's work and determine the need for any additional remedial measures, using an adaptive management approach. Adaptive management will be implemented in the event of unforeseen or unpredictable circumstances. Adaptive management will include the utilization of regular qualitative assessments and rapid quantitative assessment data gathered in the field prior to and during the mitigation effort to assess the health and vigor of vegetation communities within the mitigation areas. Achieving the key goals of mitigation completion and establishment of self-sustaining native vegetation communities will be the focus of all adaptive management decisions.

The habitat restoration specialist shall be responsible for implementing the biological monitoring program in accordance with the final approved habitat restoration plan(s) and any permit

conditions specified by the resource agencies. Monitoring shall be both qualitative and quantitative in nature. Photo-documentation shall be used to help document site development and permanent photo viewpoints shall be established to document vegetation development over time. The habitat restoration specialist shall document and measure habitat development each year and prepare annual reports presenting the results and recommending remedial measures, as needed, to address any deficiencies noted.

Once the mitigation area has completed its 5-year maintenance and monitoring period, and if the ultimate performance criteria have been achieved, the resource agencies will be notified that the mitigation has been successfully completed, request a site visit, and ask for final project sign-off. Should the project not meet its success criteria, the maintenance and monitoring period shall be extended and/or other mitigation measures negotiated to fulfill the mitigation requirements.

CONTINGENCY MEASURES

Initiating Procedures for Contingency Measures

If performance criteria are not met for all or any portion of the mitigation projects, remedial action may be recommended to rectify the conditions. If the ultimate performance criteria are not met, the project biologist and MRCA shall prepare an analysis of the cause(s) of failure within the appropriate annual report and, if determined necessary by the project biologist, propose remedial action for agency approval. If the mitigation site has not met the performance criteria by the end of the 5-year maintenance and monitoring period, MRCA maintenance and monitoring obligations will continue until contingency measures are negotiated and implemented to bring the mitigation site into compliance with the established standards or until applicable regulatory agencies grant final mitigation project acceptance.

Adaptive Management Plan

An adaptive management plan will be implemented in the event of unforeseen or probable but unpredictable circumstances. Adaptive management is defined, for the purposes of this mitigation project, as a flexible, iterative approach to the long-term management of biological resources directed over time by the results of ongoing monitoring activities and direct observation of environmental stressors that produce adverse results within the mitigation site. Adaptive management will include the use of regular qualitative assessments and rapid qualitative assessment data gathered in the field prior to and during the mitigation project to assess the health and vigor of habitat within the mitigation site. Following an event that causes damage to all or part of the revegetation sites, these data will be used, in part, to drive

management considerations for repair of the damaged areas. Achieving the key goals of mitigation completion and establishment of self-sustaining native vegetation communities will be the focus of all adaptive management decisions. Individual environmental stressors are discussed as follows, along with an anticipated range of management responses to correct any damage that may occur to the mitigation site.

Herbivory

Some grazing and browsing by native mammals is expected to occur within the revegetation areas. The plant palettes for each vegetation community have been designed to tolerate a moderate level of plant browsing. If browse levels should become elevated (i.e., if significant plant mortality and cover reduction occurs) as indicated by qualitative or quantitative monitoring of the mitigation site, remedial measures shall be implemented. Browse guards (e.g., plastic fencing, wire cages) may be installed around the base of trees and young shrub container plants in affected areas to reduce plant mortality. In addition, remedial planting or seeding may be necessary depending upon the stage of the project. If irrigation has not ceased, then remedial plating with container plants may be possible to restore cover. If irrigation has ceased, then remedial seeding using hand tools may be possible within affected areas to help restore cover. Each of these options would require the use of contingency funds to restore affected areas.

Drought

Seasonal drought is a normal annual cycle in Los Angeles County, and all plant palettes have been designed with drought-tolerant plant species that are capable of withstanding seasonal fluctuations in available moisture. However, an extended drought could potentially occur, including low seasonal rainfall and prolonged high temperatures that may negatively affect the mitigation site (e.g., lower native cover, higher plant mortality, increased potential for pest infestations on site). Irrigation will be installed on site to reduce or eliminate the effects of drought on container plants and seedlings during the first 3 years of the mitigation project. Any remedial options that may be necessary after 2 years from the installation date will likely require an additional period of site irrigation to relieve plants from drought stress and/or provide for new seed growth. All irrigation components will be left in place after year 3 in case remedial seeding and/or container planting is required at a later project date. If the irrigation system is required at a later date, it should be used only as necessary (i.e., periodic watering versus regular daily watering).

Fire

This region of the Santa Monica Mountains has experienced periodic wildfires. Vegetation communities native to the area are adapted to this periodic fire regime, with plant species possessing the ability to stump sprout or otherwise regenerate from underground plant material. While fire is a co-evolutionary factor, it also creates the possibility for faster growing, early successional non-natives to out-compete the recovering native species. Also, working within a 5-year time frame for vegetation community establishment, a fire event could set back progress so that the site is not meeting its performance criteria. In the event of fire affecting the revegetation areas, the project biologist will assess the post-fire conditions and provide adaptive management recommendations.

Erosion

If loss of plants occurs from erosion during the 5-year monitoring period, due to either direct rainfall runoff or adjacent stream flow, the condition will be assessed by the project biologist, and recommendations may be made for slope stabilization, additional BMPs, replanting, and/or soil re-contouring if determined by the project biologist as appropriate. Loss due to natural, dynamic stream channel evolution may not be recommended for corrective measures.

COMPLETION OF MITIGATION

Notification of Completion

MRCA shall notify the applicable regulatory agencies upon submitting the annual report for the final year in which the ultimate performance criteria have been met, and/or at the end of the 5-year monitoring period, and shall request confirmation that the project has met performance goals. Early release may be possible if performance standards are met early and the resource agencies agree with the level of establishment within jurisdictional areas. Removal of the irrigation system, erosion control devices, and signage would occur prior to final sign-off.

Regulatory Agency Confirmation

Following receipt of the notification of completion, applicable regulatory agencies may visit the site to confirm the completion of the revegetation effort and issue formal letters of success prior to acceptance.

REFERENCES

Dudek. 2010a. *Malibu Parks Public Access Enhancement Native Tree Protection Plan.* Irvine, California: Prepared for Mountains Recreation and Conservation Authority. January. Appendix F to the FEIR.

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LSA (LSA Associates, Inc.). 2002. Riparian Habitat Evaluation: Ramirez Canyon Park, City of Malibu, California. Riverside, California: LSA Associates, Inc. Prepared for the Santa Monica Mountains Conservancy. August 30.

SMMC/MRCA (Santa Monica Mountains Conservancy/Mountains Recreation and Conservation Authority). 2010. *Final Environmental Impact Report (FEIR) for the Malibu Parks Public Access Enhancement Plan—Public Works Plan.* Prepared by Dudek. July.

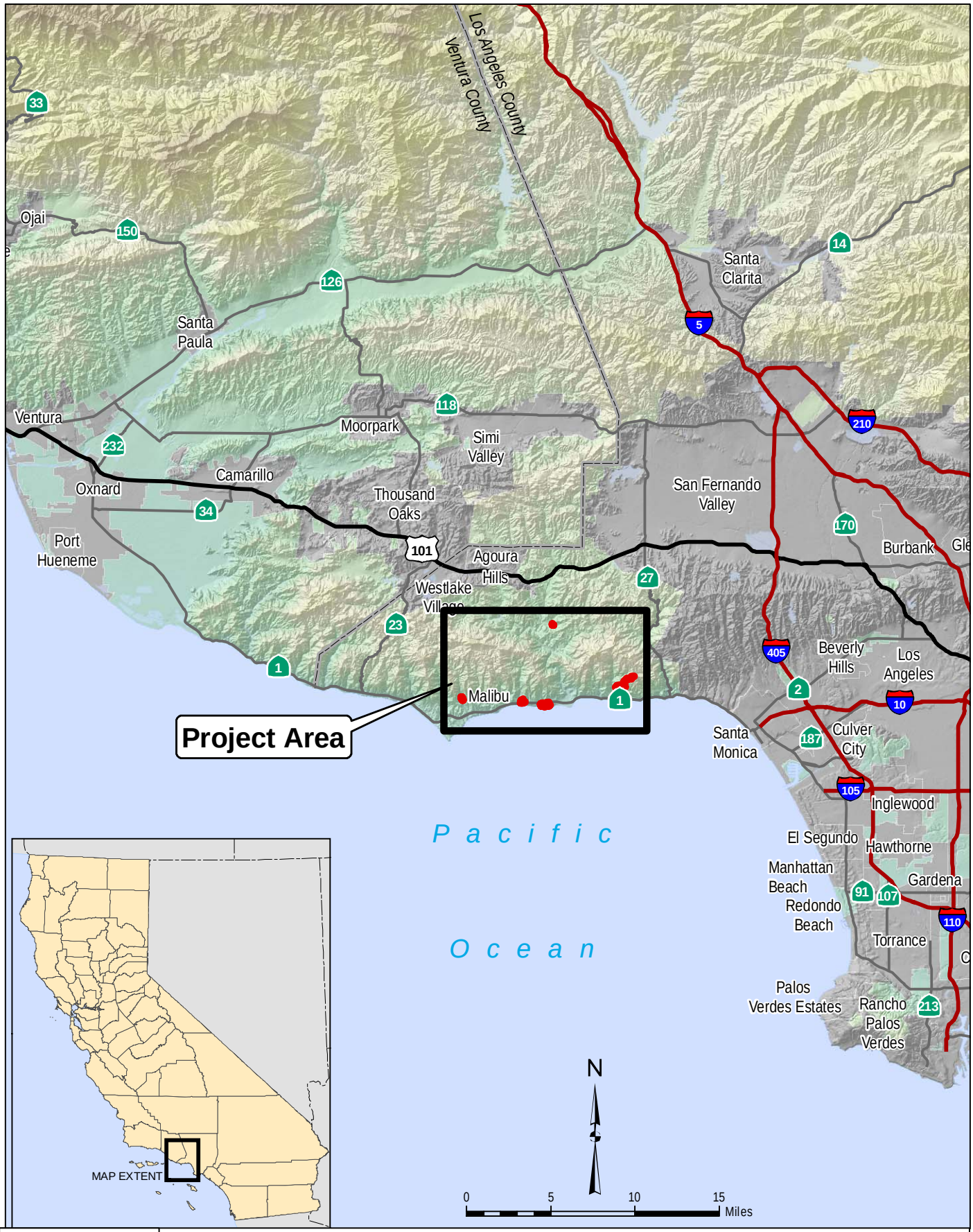

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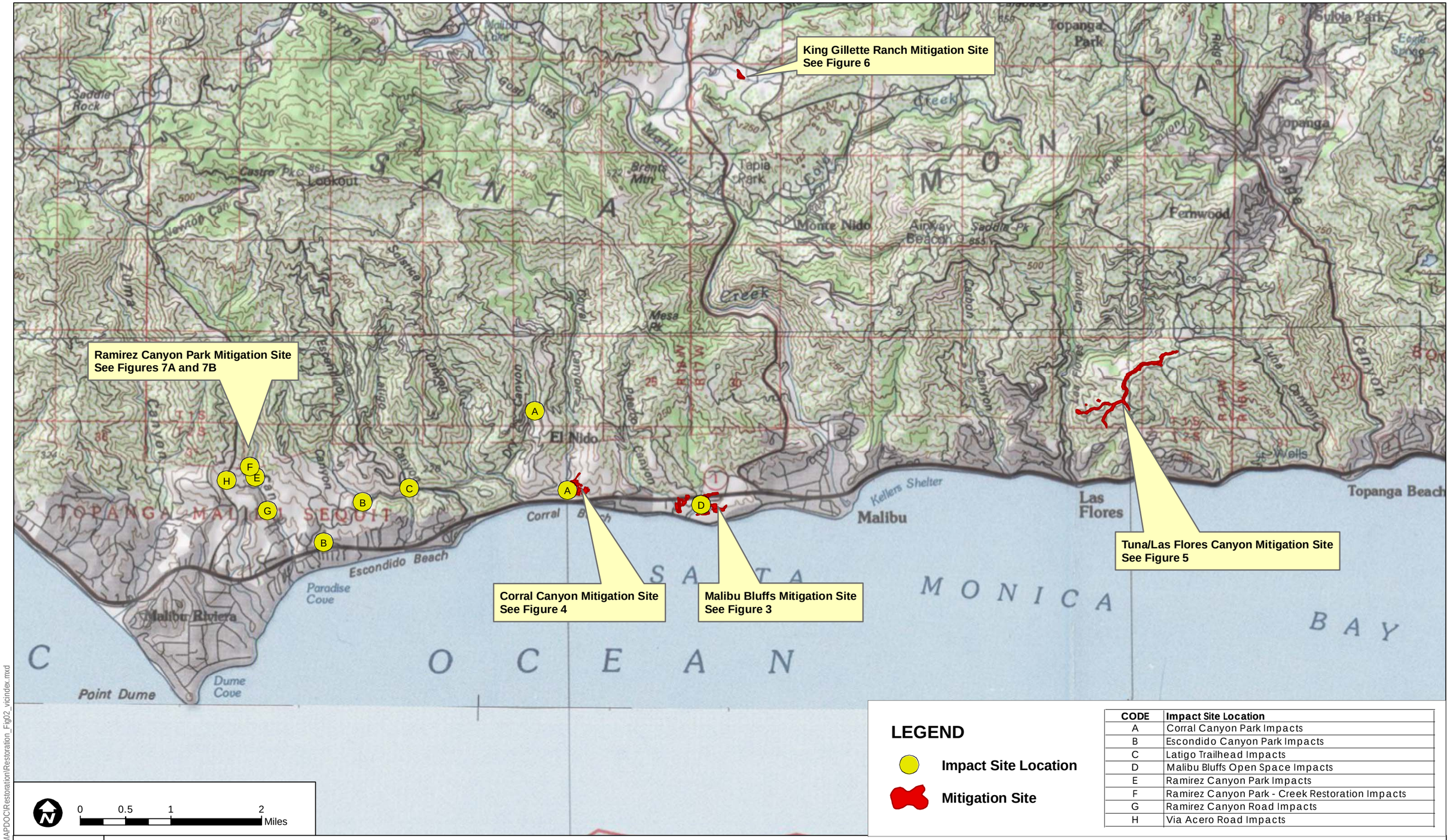
FIGURE 1

Regional Map

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

Z:\Projects\4835001\MAPDOC\Restoration\Restoration_Fig01_Regional.mxd



LEGEND

- Impact Site Location
- Mitigation Site

CODE	Impact Site Location
A	Corral Canyon Park Impacts
B	Escondido Canyon Park Impacts
C	Latigo Trailhead Impacts
D	Malibu Bluffs Open Space Impacts
E	Ramirez Canyon Park Impacts
F	Ramirez Canyon Park - Creek Restoration Impacts
G	Ramirez Canyon Road Impacts
H	Via Acero Road Impacts

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SOURCE: USGS, MRCA

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FIGURE 2

Vicinity and Index Map

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

Z:\Projects\j4835011\MAPDOC\Restoration\Restoration_Fig02_vicindex.mxd

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AERIAL SOURCE: DIGITALGLOBE, MARCH 2007

FIGURE 3

Malibu Bluffs Coastal Scrub Mitigation Site

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

Z:\Projects\4835011\MAPDOC\Restoration\Restoration Area_.mxd

Old Road Bed
Access for Construction,
Maintenance & Monitoring

Legend

Impact Facilities

Mitigation Areas

Coastal Scrub

Native Grassland

0 90 180 Feet

AERIAL SOURCE: DIGITALGLOBE, MARCH 2007

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FIGURE 4

Corral Canyon Coastal Scrub/Native Grassland Mitigation Site

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

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AERIAL SOURCE: DIGITALGLOBE, MARCH 2007

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FIGURE 5

Tuna/Las Flores Canyon Chaparral Mitigation Site

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

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AERIAL SOURCE: DIGITALGLOBE, MARCH 2007

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FIGURE 6

King Gillette Ranch Wetlands and Sycamore/Oak Woodland Mitigation Site

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

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AERIAL SOURCE: DIGITALGLOBE, MARCH 2007

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FIGURE 7A

Ramirez Canyon Park Restoration Mitigation Site

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

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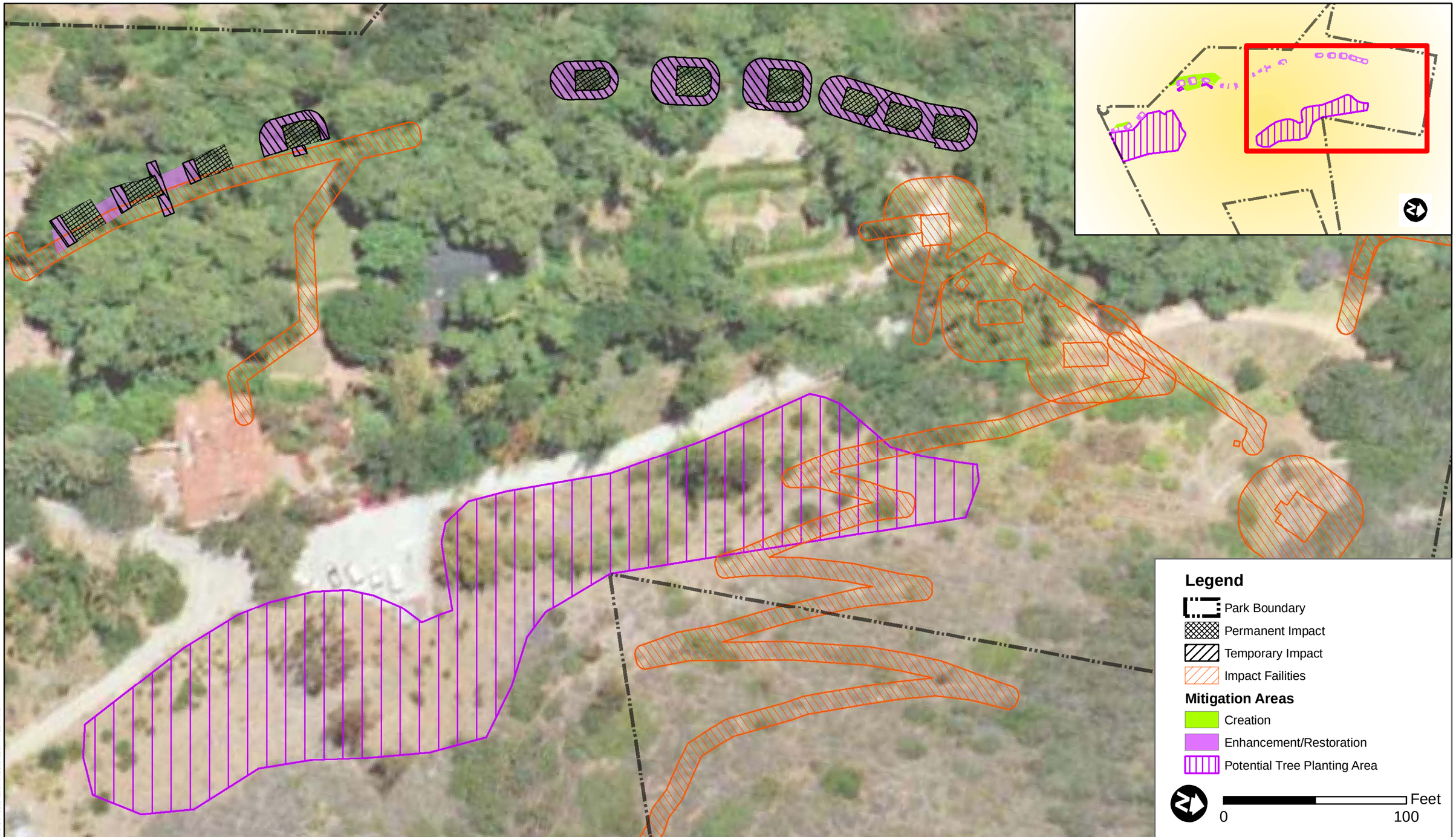

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AERIAL SOURCE: DIGITALGLOBE, MARCH 2007

4835-01
JULY 2010

FIGURE 7B

Ramirez Canyon Park Restoration Mitigation Site

Malibu Parks Public Access Enhancement Plan - Biological Concept Mitigation/Restoration Plan

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