

FIRE PROTECTION PLAN
for the
MALIBU PARKS PUBLIC ACCESS
ENHANCEMENT PLAN – PUBLIC WORKS PLAN
Modified Redesign Plan
Malibu/Santa Monica Mountains, California

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EXECUTIVE SUMMARY

This fire protection plan (FPP) has been prepared for the Malibu Parks Public Access Enhancement Plan-Public Works Plan (the Plan), Modified Redesign Plan. This FPP has been prepared in response to Draft Environmental Impact Report (DEIR) comments from agencies and the public regarding the FPP prepared for the Proposed Project. This FPP includes a number of significant revisions resulting in acceptable and improved fire safety.

The Plan includes a comprehensive set of policies and development standards, and identifies specific actions and improvements intended to enhance public access and recreation opportunities for specific park properties and recreation areas within the City of Malibu and Los Angeles County, California. Specific Park properties that are the focus of this FPP are (1) Ramirez Canyon Park, (2) Escondido Canyon Park and Latigo Trailhead, (3) Corral Canyon Park, and (4) the Santa Monica Mountains Conservancy-owned Malibu Bluffs (Bluffs). The Plan is intended to enhance public access and recreation opportunities by developing an interconnected system of trails, parks, open space, and habitats and by identifying and completing recreational facility and program improvements for the park properties. Such improvements include new parking, camping areas, day-use, and trailhead improvements to support existing recreational demand and to facilitate an increased level of accessibility for visitors with disabilities. The project also includes improvements to certain access roads within the project area, where necessary for ingress, egress, and/or to facilitate emergency response, at the discretion of the fire authority having jurisdiction.

The Plan includes requirements for preparation and implementation of a Fire Protection and Emergency Relocation Plan that includes site-specific risk assessments for each park property included in the Plan area. Additional restrictive policies have been outlined in the Plan and within this FPP to further reduce the fire risk associated with the proposed improvements. This FPP satisfies the Plan requirements by providing details regarding the site-specific policies and implementation measures that will govern these park properties within the City of Malibu and unincorporated Los Angeles County concerning fire protection. Further, the FPP outlines a "systems approach" to fire prevention, protection, suppression, and emergency relocation to ensure proposed park improvements and uses will reduce potential risks associated with fire hazard. Important concepts and features included in this approach include pre-planning, funded ongoing fuel modification, structural protection, water supply, access (ingress/egress), optional fire shelters at some Park facilities, and emergency response, amongst others. Furthermore, it is anticipated that this FPP will be complementary to the Community Wildfire Protection Plan (CWPP) that is being prepared for the Santa Monica Mountains by the National Park Service

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(and others) on a neighboring parcel. Both plans utilize similar risk analysis procedures, prioritization concepts, and fuel reduction/fire protection practices.

Because this project is not a "traditional" urban development, which would include residential and/or commercial structures, typical fire and building codes are not applicable to all aspects of the proposed site improvements. This FPP provides measures for fire protection based on the proposed site uses, occupancies, and park area settings. This FPP provides requirements that meet the 2007 California Building and Fire Codes, and where applicable, the Los Angeles County Fire Code, which adopts with modification the California code. Cal Fire (California Department of Forestry and Fire Protection) provides fire suppression and prevention for all land designated as state responsibility area (SRA). Cal Fire fulfills that responsibility via contract in several counties, including Los Angeles County. The Los Angeles County Fire Department (LACoFD) provides fire prevention/suppression and emergency services within the City of Malibu and the surrounding unincorporated areas of Los Angeles County under contract with Cal Fire.

This FPP identifies the fire risk associated with the project's proposed park improvements and land uses and outlines requirements for fuel modification, park facility upgrades/retrofits, implementation and maintenance of fire protection features, and offers relocation planning for the subject Park properties' visitors and staff, amongst other pertinent fire protection components. Where the project does not strictly conform to the code, this FPP proposes modifications that are in conformance with the intent and purpose of the code, resulting in substantial conformance.

The Santa Monica Mountains Conservancy and the Mountains Recreation Conservation Authority (Conservancy/MRCA) have been proactive with regard to the existing conditions at the subject Plan area properties by implementing a variety of appropriate fire prevention and protection measures, including an internal Fire Emergency Pre-Plan (available for review at Conservancy-owned Ramirez Canyon Park). The Pre-Plan will be augmented by this FPP, and has been a valuable planning tool forming the basis of the MRCA's fire fighting personnel emergency response training to date. This FPP complements and enhances the existing Pre-Plan by requiring a redundant system of improved infrastructure including water availability, capacity and delivery, park-specific fire fighting apparatus and personnel, improved fire department access, monitored defensible space, maintained fuel modification and landscaping, strict parkland use restrictions and monitoring, and optional contingency fire shelters at some Park facilities. The result will be a high level of fire awareness on these properties, and mandated, ongoing fire prevention and safety.

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This FPP provides detailed analysis of the proposed Plan area and park-specific project sites, the Plan's potential risk for wildfire, and its impact on the fire response capabilities. It also provides requirements, recommendations, and measures to reduce the risk and impacts to acceptable levels.

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1.0 INTRODUCTION

This fire protection plan (FPP) has been prepared for the Malibu Parks Public Access Enhancement Plan-Public Works Plan (the Plan), Modified Redesign Project Alternative and identifies the wildfire risk associated with modified, proposed park improvements and uses. It also outlines strategies for reducing risk by specifying requirements for access and egress, structural protections and fire resistance, defensible space, vegetation management, emergency relocation and temporary on-site sheltering, and park access control, among other pertinent criteria for fire protection associated with the recreational nature of proposed site improvements. This FPP has been revised from the original Draft Environmental Impact Report FPP based on the revised project named the Modified Redesign Plan. All proposed improvements at Escondido Canyon Park, with the exception of trails, have been removed from the project under this alternative. Alternative proposed design and scope of improvements at the other park facilities would occur with the Modified Redesign Alternative.

The purpose of this plan is to generate and memorialize the fire safety requirements of the Fire Authority Having Jurisdiction (FAHJ), namely, Cal Fire via the Office of the State Fire Marshal on State Responsibility Area lands and, where applicable, Los Angeles County Fire Department (LACoFD) which is responsible for fire suppression within the City of Malibu and surrounding unincorporated County areas. Overarching requirements and recommendations are detailed in this “Master” FPP, while Park-specific requirements and recommendations are presented in the focused FPPs included in Appendices A through D.

1.1 Fire Protection Plan Summary

Improvements provided by the Plan include the enhancement or creation of park facilities and trails intended to improve public access to Santa Monica Mountains Conservancy and Mountains Recreation Conservation Authority (Conservancy/MRCA) parklands and trail corridors (the Plan area) in the City of Malibu and the Santa Monica Mountains coastal area (Figure 1). The project is located within what is designated by Cal Fire, LACoFD, and the City of Malibu to be a Very High Fire Hazard Severity Zone, due to the type of vegetation, fire history, climate, and steep topography that comprise large portions of the area. Based on available fire history data, numerous wildfires have burned into the region, including several in the Plan area, and it is expected that wind-driven wildland fire will continue to be a threat throughout the Santa Monica Mountains National Recreation Area and Plan area. The most likely severe wildland fire threat expected for the region would be from an offshore, local foehn wind, such as the Santa Ana or northerly wind-driven wildland fire originating to the north of the Parks and burning/spotting into the Plan area from adjacent properties.

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This FPP will guide the design, construction, and management of project-related improvements in compliance with applicable fire codes. When properly implemented and managed, the requirements and recommendations detailed herein are designed to result in fire hazard risk reduction. To that end, preparation of this FPP reflects completion of the following tasks:

- On-site risk assessment
- Fire history analysis
- Fire behavior modeling
- Review of project site and use plans
- Review and incorporation of State and County Fire and Building Codes, as applicable
- Generation of requirements and alternatives for reducing fire risk.

1.2 Intent

The intent of this FPP is to provide management requirements for reducing wildland fire risk associated with the project. The fire protection system detailed in this FPP includes a redundant layering of prevention, protection, suppression and pre-planning methods and measures proven to reduce fire risk. The combined fire protection system designed for this project includes fuel reduction/treatment, enhancement and maintenance of ingress/egress routes, park and trail access control, options for emergency relocation and contingency on-site sheltering areas, and prohibition of open flames in all Park areas, amongst others. The system significantly reduces the fire risk associated with the Plan and the project area.

1.3 Applicable Codes/Existing Regulations

This FPP demonstrates project compliance with California Code of Regulations (CCR) Title 24, Part 9 (California Fire Code), and CCR Title 14 (State Responsibility Area) Fire Safe Regulations. As applicable, this FPP also demonstrates that the proposed project site will comply with Chapter 7A of the 2007 California Building Code (CBC) and Title 32, Fire Code, of the Los Angeles County Code, as amended and in effect on January 1, 2008, adopting the California Fire Code, 2007 Edition, as required for new structures. This code has also been adopted by the City of Malibu and is hereafter referred to as the Fire Code.

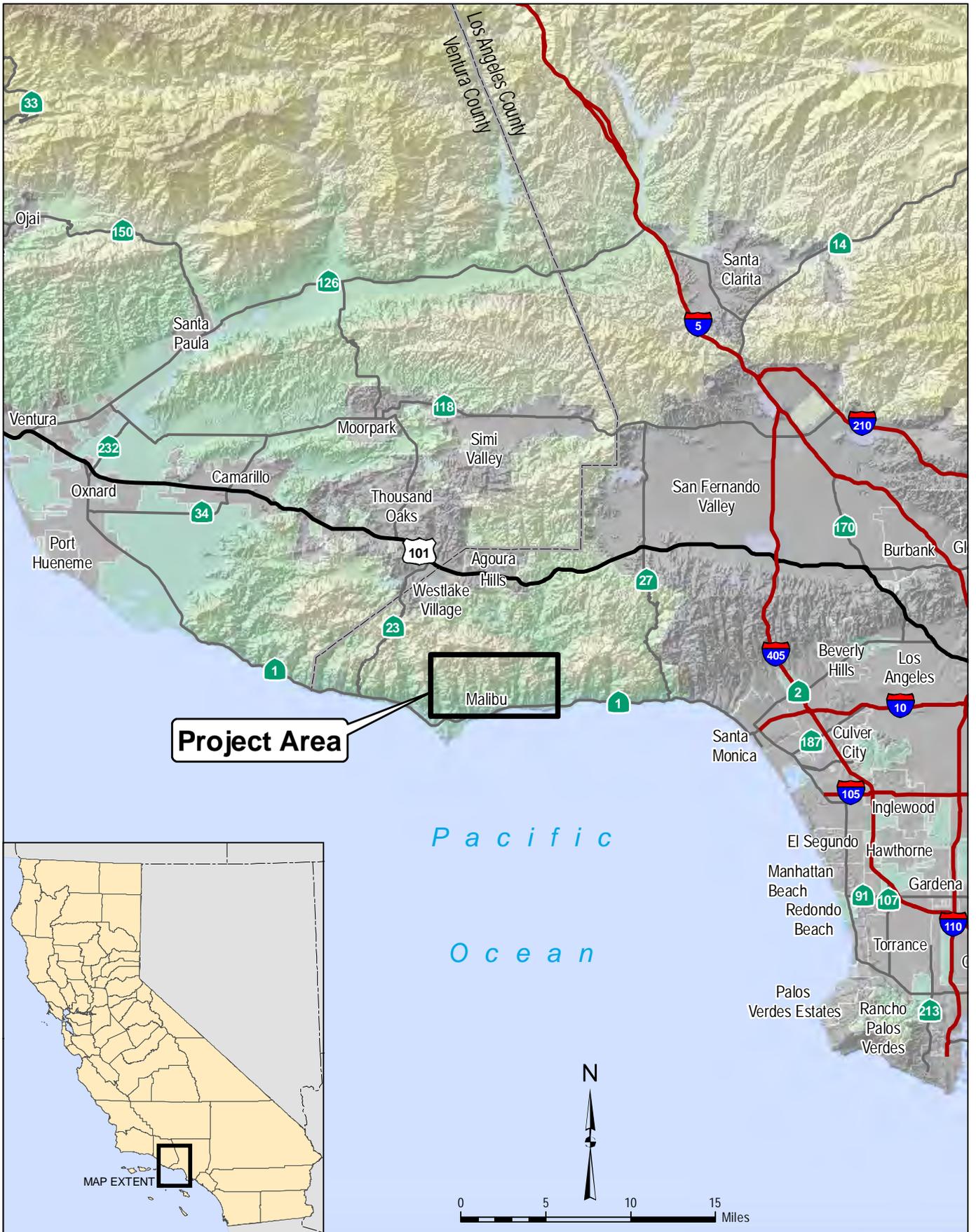
Consistent with Fire Department practices for new development in the Plan area and throughout California, proposed park improvements and uses must be developed and maintained in compliance with applicable Fire and Building Code requirements. To ensure compliance with

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applicable Fire and Building Codes, the proposed Local Coastal Program Amendment includes an implementation measure which specifies that, where it is infeasible to strictly meet standard Building and Fire Code requirements for fire protection due to physical site or resource constraints, modifications may be granted for the park improvements and uses pursuant to this FPP. Such modifications are in accordance with Section 702A of Chapter 7A of the 2007 California Building Code and Section 4702.1 of the 2007 California Fire Code, and adopted by reference in Title 32, The Los Angeles County Fire Code. Once an FPP is submitted, the Agency Having Jurisdiction then determines whether modifications are granted based on measures provided to minimize potential for loss from wildfire exposure. Accordingly, this FPP includes design, construction, maintenance, and operation requirements for the park improvements and uses in compliance with applicable fire codes and, where necessary, fire protection enhancement requirements or alternative materials and methods to provide functional equivalency for any non-code complying park improvement element. The final FPP would be reviewed and approved by the California Coastal Commission, consistent with the LCPA.

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Project Area

Pacific
Ocean

MAP EXTENT

0 5 10 15 Miles

FIGURE 1
Regional Map

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1.4 Project Description

The Modified Redesign Alternative Plan has been developed to serve as the facilities plan for specific park and recreation areas located within the City of Malibu and unincorporated Los Angeles County, collectively referred to as the "Plan area" (Figure 2). The Plan focuses on a coastal area located in the Malibu and Santa Monica Mountains on the southern California coastline, starting on the west at the east edge of Kanan Dume Road at the westernmost portion to the Malibu Bluffs Conservancy Property (Malibu Bluffs) at the easternmost portion, south to Pacific Coast Highway and to the shoreline at Corral Canyon Park and Malibu Bluffs and, at its northernmost point, beyond the City of Malibu/Unincorporated Los Angeles County Boundary to the Santa Monica Mountains "ridgeline" in Malibu Creek State Park.

The Plan includes a comprehensive set of policies and development standards, and identifies specific actions and park improvements, intended to enhance public access and recreation opportunities for specific park properties and recreation areas within the City of Malibu and Los Angeles County. The Plan will enhance public access and recreation opportunities by developing an interconnected system of trails, parks, open space and habitats; by improving alternative methods of transportation between parklands; and by identifying and completing recreational facility and program improvements for the park properties, including new parking, camping at some park facilities, day-use, and trailhead improvements to support existing recreational demand and to facilitate an increased level of accessibility for visitors with disabilities. The project also includes improvements along certain access roads within the project area, where necessary for ingress/egress, to meet standards, and at the discretion of the FAHJ. The following sections summarize the components of the Plan area. A more detailed project description is provided in the Modified Redesign Alternative EIR Section Project Description (Appendix MRA-1).

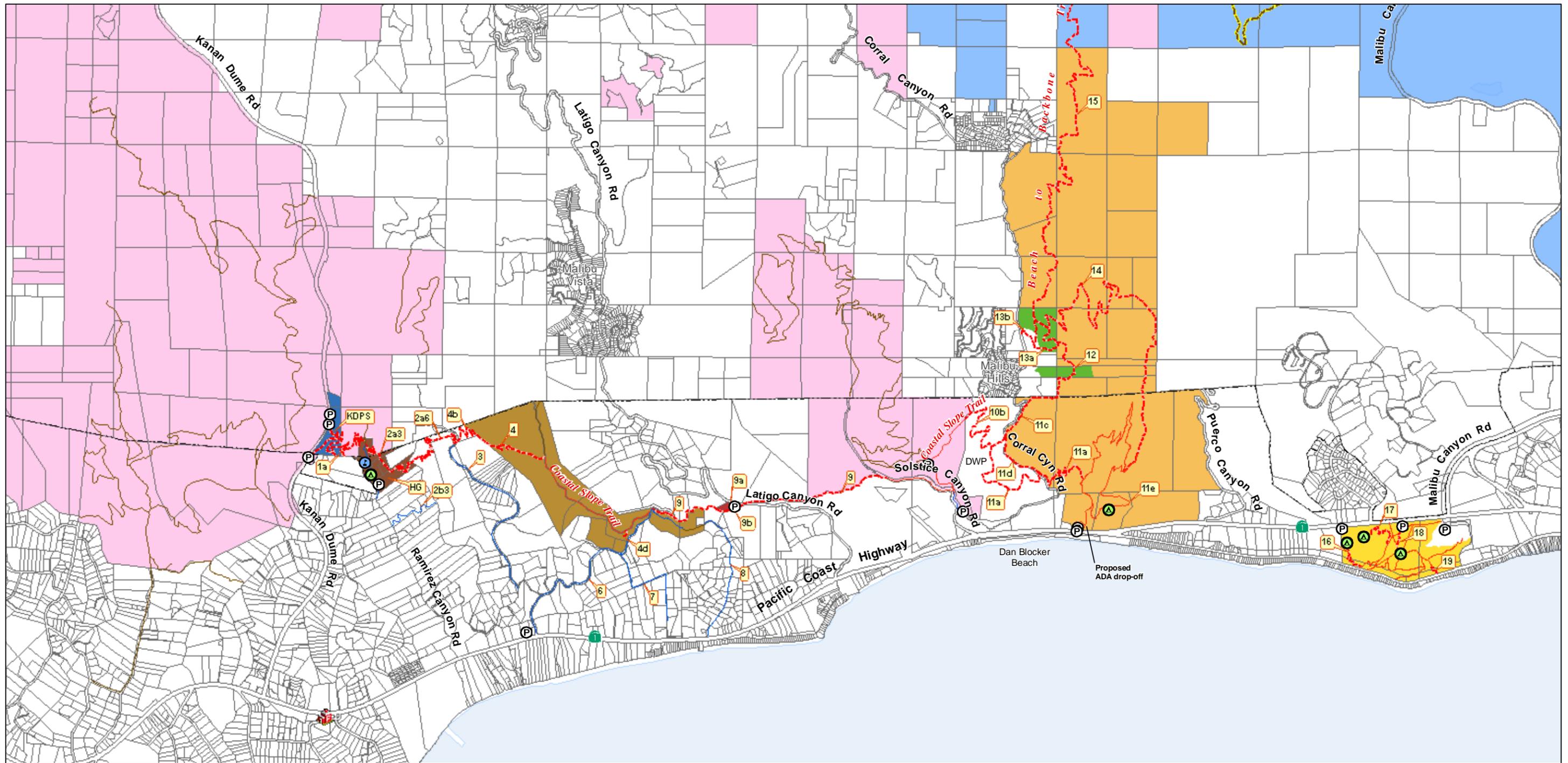
1.4.1 Project Location

The Plan area encompasses the following parks, trails/trailheads, and access roads (Figure 2):

- Ramirez Canyon Park, 5810 Ramirez Canyon Road, City of Malibu and Unincorporated Los Angeles County
- Escondido Canyon Park, 27200 Winding Way, City of Malibu – no improvements, other than to trails, are planned for Escondido Canyon Park under the Modified Redesign Alternative.
- Latigo Trailhead, 5837 Latigo Canyon Road, City of Malibu

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0 500 1,000 2,000 Feet

SOURCE: DigitalGlobe 2008, MRCA 2009

- National Park Service Owned Land
- California State Parks Owned Land
- LA County Owned Land to be Acquired by MRCA
- Other Protected Land
- Malibu City Limits

- Ramirez Canyon Park (SMMC - 21.7 acres)
- Escondido Canyon Park (SMMC/MRCA - 138.4 acres)
- Latigo Trailhead (MRCA - 2.4 acres)
- Corral Canyon Park (SMMC/MRCA - 772.2 acres)
- Malibu Bluffs Conservancy Property (SMMC - 83.7 acres)

Facilities

(see P&S Project Plans)

- Existing Park Administrative Area
- Proposed Camping Area
- Proposed Parking Area
- LA County Fire Stations

Trail Corridors

- Primary Trail (see P&S Project Plans)
- Primary Trail (Existing)
- Connector Trail (Existing)
- Backbone Trail
- Other Existing Trail

This map includes those public parklands, recreation areas and some trail segments subject to the Malibu Parks Public Access Enhancement Plan Overlay, the specific boundaries of which are as described in Section 3.4.2.B of the City of Malibu Local Coastal Program-Local Implementation Plan. Proposed trail alignments are approximate and may vary slightly within public lands/easements due to site constraints. Trail alignments between the beach and Backbone Trail are currently shown through public park property in Corral Canyon. Other alternatives with more spectacular views from ridgelines on private property should be considered during the regulatory process.

FIGURE 2
Proposed Park and Trail Locations

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- Corral Canyon Park, 25623 Pacific Coast Highway, City of Malibu and Unincorporated Los Angeles County
- Santa Monica Mountains Conservancy-owned Malibu Bluffs, 24250 Pacific Coast Highway, City of Malibu
- Various Trail/Recreation Areas in the City of Malibu and Unincorporated Los Angeles County
- Park access roads, include Delaplane Road, Ramirez Canyon Road, and Via Acero.

The map presented in Figure 2 depicts the extent of the Plan area and identifies the locations of the aforementioned parks, trails/trailheads, and access roads.

These Park properties are currently comprised of open space, natural and exotic vegetation with trails and trailhead facilities being the only notable improvement, except for Ramirez Canyon, which includes a more urbanized landscape with buildings, roadways, infrastructure, and manicured grounds. Land uses for the vicinity around the Parks are as follows:

- Ramirez Canyon Park: Residential, public parkland (National Park Service), private undeveloped land
- Escondido Canyon Park: Residential, private undeveloped land
- Latigo Trailhead: Residential, private undeveloped land
- Corral Canyon Park: Residential, recreational vehicle park and private campground, commercial (fish market and café, public beach), public parkland (National Park Service and California State Parks), Los Angeles City Department of Water and Power undeveloped land, private undeveloped land and public beach
- Santa Monica Mountains Conservancy-owned Malibu Bluffs: Residential, parkland (City-owned Malibu Bluffs Park), Pepperdine University, private undeveloped land, public beach
- Trail Corridors: Residential, public parkland, private undeveloped land, public beach, recreational vehicle park and private campground, commercial (fish market and café), parkland (National Park Service, California State Parks, and City of Malibu), Los Angeles City Department of Water and Power undeveloped land, Pepperdine University.

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1.4.2 Trail Improvements

The Plan will construct major components of an expansive trail system planned for the Malibu coastal area and the larger Santa Monica Mountains National Recreation Area (SMMNRA), thus connecting a number of federal and state-owned parklands in the Plan area including Ramirez Canyon Park, Escondido Canyon Park and Latigo Trailhead, Solstice Canyon Park (not part of this project), Corral Canyon Park, and Malibu Creek State Park. The proposed trail improvements will complete trail connections for the Coastal Slope Trail and its ultimate connection to the Beach to Backbone Trail (in Corral Canyon), which will provide access to and between adjacent urban areas of Los Angeles and Ventura Counties, the larger SMMNRA, and to the shoreline within the City of Malibu (Figure 2). Additional parkland and shoreline access will be provided with the Beach to Bluffs trail improvements proposed at the Santa Monica Mountains Conservancy-owned Malibu Bluffs. . Figure 2 illustrates existing and planned alignments of various feeder trails through the Plan area.

The majority of the new trails are proposed to be 5 feet wide, in some cases they are proposed to be 4 feet wide, and will include periodic widened, passing areas. In Ramirez Canyon Park and Malibu Bluffs Conservancy Property, Pedestrian bridges across drainages will be provided in five locations. In addition, informational signage will be strategically installed along trail corridors, including regulatory, fire safety awareness, “We Tip”, directional, and educational signs.

1.4.3 Park Facility and Camping Improvements

The Plan includes several park facility and camping improvements to enhance public access and recreational opportunities. The specific parking, camping, and support facility improvements are detailed in Appendices A through D, for each particular park property and which generally include one or more of the following: trailhead, parking and camp facilities, day-use picnic areas, and specialized park programs and improvements. The camping program included in the Plan consists of pre- or on-site registration, low-impact and low-cost walk-in camping, and is not designed for car camping. Proposed camping improvements at each park property are designed in accordance with current accessibility guidelines and technical requirements. Ramirez Canyon Park includes two phases according to the Modified Redesign Alternative, components of which include:

Phase 1:

- Ramirez Canyon Road and bridge improvements, if required by the appropriate fire agency

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- Retrofit Ranger/maintenance supervisor residence as on-site shelter
- Ignition resistance improvements to other existing structures, if required
- Retrofit all structures with interior sprinklers
- Fire hydrants
- Usage as described in the Modified Redesign Alternative Project Description, consistent with current use (FEIR -Volume 4, Appendix 3, Sheets 4-8-Phase1)

Phase 2:

- Retrofit “Peach House” as on-site shelter
- Secondary Access – Via Acero Improvements, if required by the appropriate fire agency
- Additional events
- Accessible campsites
- New parking improvements
- Day use areas and restrooms
- Usage as described in the Modified Redesign Alternative Project Description (FEIR – Volume 4, Appendix 3, Sheets 6-8-Phase 2)

In addition, numerous fire safety regulations and improvements will be implemented for all park facilities and camping areas included in the Plan. These include, amongst others:

- Strict prohibition on campfires and open flames at all times
- Park closure to all public use during any Red Flag Warning Day/period as declared for the Santa Monica Mountains area by the National Weather Service, a division of the National Oceanic Atmospheric Administration (NOAA)
- Cook Stations (Hospitality Stations) to provide safe, non-flammable, flameless cooking areas from supplied all weather electric outlet provided at each cook station (discussed in more detail in Section 5.3).
- Signage to provide information relative to park and trail use regulations, potential hazards, park services, and information related to the natural resources of the Santa Monica Mountains and their special nature or role in the local ecosystem

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- Fire protection apparatus will be provided and maintained at all camp facilities and will include, at a minimum:
 - Water storage tank and water delivery system designed, located, and maintained to provide a dependable water supply for fire protection at each proposed camp area at all times to ensure adequate water supply for fire protection of new camp facilities
 - A portable and air-powered quick attack firefighting system to be provided at each camp facility for ready deployment by trained Camp Host, Ranger, or park personnel in the event of a fire
 - Portable self-contained fire extinguisher units to be provided for each cluster or group of campsites.

Additional fire safety improvements are discussed in detail in this FPP and the focused FPPs (Appendices A–D) for each Park site.

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2.0 SITE CHARACTERISTICS

The Plan area consists of four parks (Ramirez Canyon Park, Escondido Canyon Park (only trail improvements), Corral Canyon Park, and the Conservancy-owned Malibu Bluffs), Latigo Trailhead, numerous trail corridors, and several park access roads. The facilities encompassed by the Plan are situated within the Santa Monica Mountains within the City of Malibu and/or within unincorporated portions of Los Angeles County. The facilities within the Plan area vary by topography, vegetative cover, proximity to residential areas, available access, and planned use. The following sections discuss the characteristics of the Plan area at a regional scale (area within approximately 2,500 feet of parks, facilities, or trail segments). Park-specific conditions are evaluated in more detail in the individual focused FPPs included in Appendices A through D. The intent of evaluating conditions at this macro-scale is to better understand the local fire environment, which is not constrained by property boundary delineations.

2.1 Topography

The topography of the Santa Monica Mountains is best described as being dominated by steep hillsides with deeply incised canyons that trend primarily in a north-south direction, terminating at the Pacific Ocean. Relatively flat coastal bluffs are common in the Plan area region along the southern edge of the Santa Monica Mountains adjacent to the Pacific Ocean. Slope gradients in the Plan area region vary from relatively flat, as seen at the Bluffs location, up to gradients exceeding 100% (45 degrees) in steep canyons and along ridgelines. Elevations range from sea level along the Pacific Ocean to 760 feet above mean sea level in the northern-most portion of the Plan area.

The regional topographic conditions and the topographic alignment of each individual Plan area can have considerable effect on wildland fire behavior and on the ability of firefighters to suppress those fires. Slope and canyon alignments within the Plan area are conducive to channeling, deflecting, concentrating, or dispersing winds, and creating extremely erratic wildfire conditions, especially during off-shore, local foehn winds such as the Santa Ana or closely related true-north wind-driven fire events. Local foehn winds such as the Santa Anas impact the area from a northeast direction, driving wildland fire in a southwest direction. This alignment to the local canyons slows the rate of spread due to the topographical wind sheltering in some canyons, as observed during the 2007 Canyon Fire (MRCA 2010).

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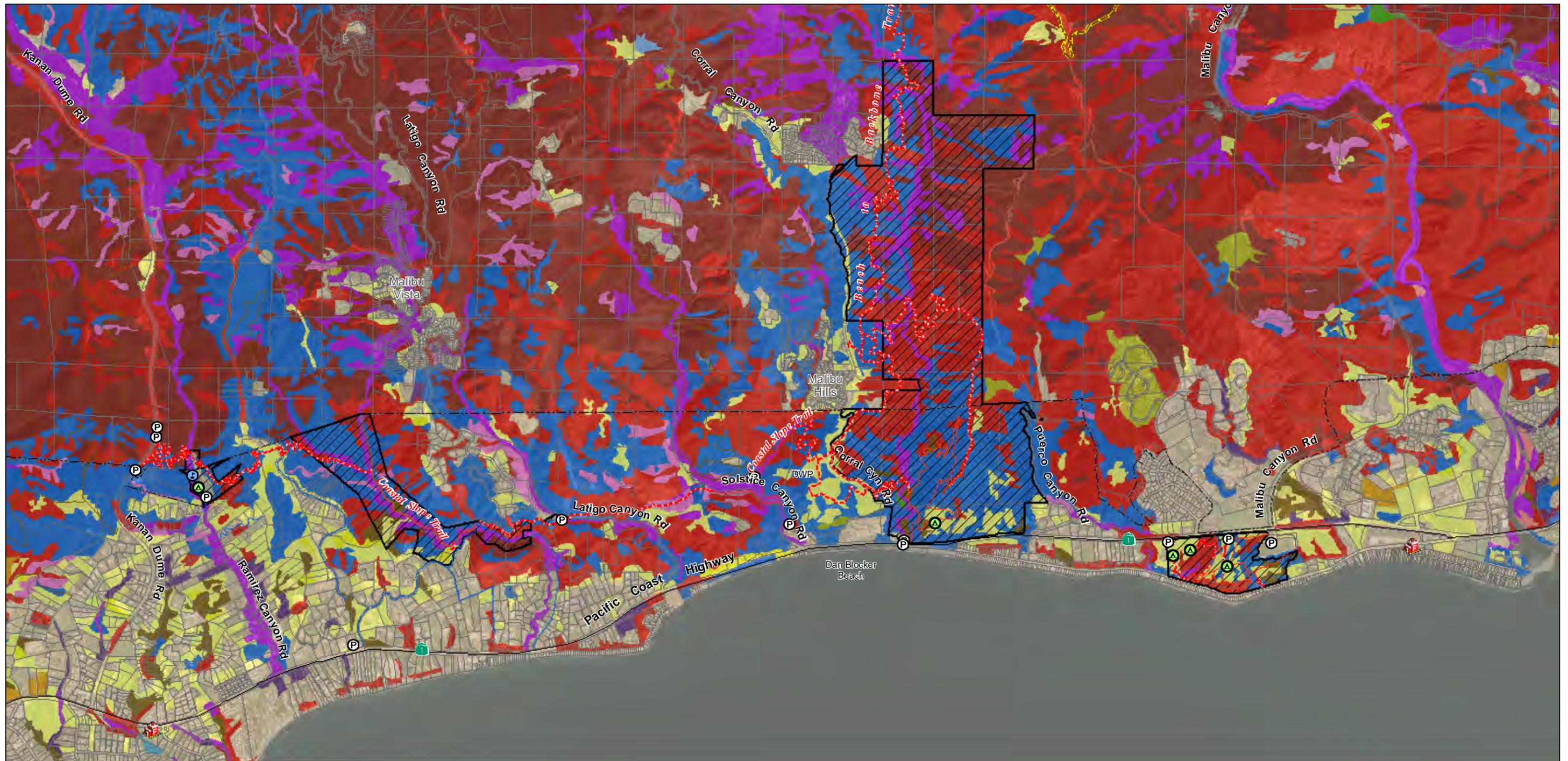
2.2 Climate

The climate in the Plan area region is typified by warm, dry summers and wetter winters. Precipitation in the Malibu area typically occurs between November and March and averages approximately 13 inches per year. The prevailing wind is an onshore flow with fall winds (Santa Ana Winds) from the north and northeast that may gust to 70 miles per hour (mph) or higher and have a humidity level near zero. The climate in the vicinity of the Plan area has a large influence on fire risk, as drying vegetation during the summer months becomes fuel available to advancing flames should an ignition be realized.

Localized weather patterns may vary throughout the Plan area as humidity levels and plant moisture content near the coast can be higher than inland, mountainous locations due to the influence of the Pacific Ocean. Fluctuations in wind patterns and direction may also be observed throughout the Plan area due to topographic influences.

2.3 Vegetation and Fuels

In addition to weather and topography, vegetation (or fuel) plays a major role in affecting fire behavior and shaping the fire hazard potential. Current land cover distribution for the Plan area region is characterized by numerous vegetation communities, as presented in Table 1, and graphically in Figure 3. Vegetative cover data for the Plan area region, available from the National Park Service, was evaluated to understand general vegetation and fuel distribution throughout the Plan area. This vegetation data was also used in the regional fire behavior modeling efforts conducted in support of this FPP. Vegetation types were assigned fuel model and canopy cover values, each of which are included in Table 1. Based on the General Vegetation type category included in this data set, the dominant vegetative cover for the Plan area region is ceanothus (28.8%), distributed primarily at upper elevations in the northern portion of the Plan area region. This fuel type can produce high heat intensity and high flame lengths under strong, dry wind patterns, but does not typically ignite or spread as quickly as light, flashy grass fuels. Sumac also represents a significant percentage of vegetative cover (13.0%) and is concentrated primarily at lower elevations than ceanothus in the central end eastern portions of the Plan area region. Other significant vegetative cover includes chaparral (9.6%), coastal sage scrub (7.7%), coast live oak (6.2%), and grassland (5.2%), all seasonally prone to wildfire.



0 500 1,000 2,000 Feet

SOURCE: DigitalGlobe 2008, MRCA 2009, NPS 2009

Fuels Classification

- | | | |
|---------------------|--------------------------------|-------------------------------------|
| 1 - Grass | 20 - Landscape Fuels | 48 - Elderberry |
| 3 - Tall Grass | 22 - Low Load Grass | 55 - Eucalyptus |
| 9 - Hardwood Litter | 32 - Moderate Load Grass/Shrub | 72 - Low Load Broadleaf Litter |
| 14 - Manzanita | 42 - Moderate Load Shrub | 73 - Conifer Litter |
| 16 - Ceanothus | 43 - Moderate Load Humid Shrub | 76 - Moderate Load Broadleaf Litter |
| 18 - Sage/Buckwheat | 47 - Chaparral | 99 - Non-combustible |

--- Malibu City Limits

- Existing Park Administrative Area
- Proposed Camping Area
- Proposed Parking Area
- LA County Fire Stations
- Park Boundaries

Trail Corridors

- Primary Trail (see P&S Project Plans)
- Primary Trail (Existing)
- Connector Trail (Existing)
- Backbone Trail
- Other Existing Trail

FIGURE 3

Regional Fuels Distribution

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**Table 1
Plan Area Region General Vegetation Types**

General Vegetation Type	Fuel Model	Canopy Cover	Acreage	Percentage Cover
Agriculture	GR2	0	71.10	0.4
Alder	9	3	33.86	0.2
Barren	GS2	0	88.90	0.5
California Bay	SH7	0	349.57	1.8
Buckwheat	SCAL18	0	154.21	0.8
Burned	1*	0	27.14	0.1
Cactus	SCAL18	0	8.99	0.0
Ceanothus	SCAL16	0	5,584.36	28.8
Chaparral	SH7	0	1,849.32	9.6
Coast Live Oak	9	3	1,193.05	6.2
Conifer	TL3	3	4.48	0.0
Coyotebrush	SH2	0	136.61	0.7
Coastal Sage Scrub	SCAL18	0	1,489.39	7.7
Deerweed	SCAL18	0	136.33	0.7
Disturbed	1*	0	7.82	0.0
Elderberry	SH8	0	7.20	0.0
Eucalyptus	TU5	3	77.97	0.4
Exotic	20**	0	51.24	0.3
Grass	1	0	1,005.08	5.2
Iceplant	TL2	0	7.85	0.0
Invasive	3	0	63.30	0.3
Lemonadeberry	SH7	0	16.10	0.1
Mallow	SCAL18	0	806.68	4.2
Manzanita	SCAL14	0	4.28	0.0
Mulefat	SH3	0	13.67	0.1
Poison Oak	SH7	0	33.39	0.2
Rock	99	0	52.26	0.3
Sand	99	0	56.85	0.3
Scrub Oak	SH7	0	64.62	0.3
Sumac	SH7	0	2,526.77	13.0
Sycamore	9	3	451.01	2.3
Toyon	SH7	0	31.14	0.2
Urban	20**	0	2,558.40	13.2
Walnut	TL6	3	270.36	1.4
Water	99	0	24.26	0.1
Willow	9	3	105.65	0.5
Total			23.87	100.00

* Assumes conversion to grassland-type fuels

** Custom University of California Santa Barbara Landscape fuel model 20, which represents landscaping fuels
SOURCE: National Park Service Vegetation Data, Santa Monica Mountains National Recreation Area 2007.

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Variations in vegetative cover type and species composition have a direct effect on fire behavior. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (leaf size, branching patterns), and overall fuel loading. For example, the native shrub species that compose sage and chaparral communities in the Plan area are a high potential hazard based on such criteria.

Vegetation distribution throughout the Plan area varies by location and topography. The importance of vegetative cover on fire suppression efforts is its role in affecting fire behavior. For example, fire burning in grasslands may have shorter flame lengths than those burning in chaparral or coastal scrub; however, fire in grasslands often spreads more rapidly than fire in other vegetation types.

As described, vegetation plays a significant role in fire behavior. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes affects plant community succession. Succession of plant communities, most notably the gradual conversion of shrublands to grasslands with short fire intervals and grasslands to shrublands with long fire intervals, is highly dependent on the fire regime. Biomass and associated fuel loading will increase over time, assuming that disturbance (such as wildfire) or fuel reduction efforts are not diligently implemented. It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the fuel modification guidelines discussed later in this FPP.

2.4 Fire History and Hazard

Fire history is an important component of FPPs. Fire history information can provide an understanding of fire frequency, fire type, most vulnerable project areas, and significant ignition sources, amongst others. The topography, vegetation, and climatic condition associated with the Malibu and Santa Monica Mountains region create a unique situation, sometimes referred to as "wildfire corridors." These corridors are the result of the alignment of high winds and topography and often result in large, damaging wildfires, especially when they occur during Santa Ana wind conditions. The history of wildfires in Malibu is significant and is graphically portrayed in Figure 4. This exhibit presents fire history for the Plan area region. Based on a review of fire perimeter data from Cal Fire's Fire and Resource Assessment Program (FRAP), nearly the entire Plan area region has burned and portions of the region have burned up to 10 times during the recorded fire

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history period dating back to 1878 (FRAP 2009)¹. Significant large fires (in excess of 10,000 acres) in the region include:

- The 1996 Calabasas Fire (approximately 12,500 total acres)
- The 1993 Old Topanga Fire (approximately 16,000 total acres)
- The 1982 Dayton Canyon Fire (approximately 43,000 total acres)
- The 1978 Kanan Fire (approximately 25,000 total acres)
- The 1970 Wright Fire (approximately 28,200 total acres)
- An Un-named 1958 Fire (approximately 18,000 total acres)
- The 1956 Sherwood/Zuma Fire (approximately 35,000 total acres)
- The 1943 Woodland Hills No. 65 Fire (approximately 15,000 total acres)
- The 1935 Malibu Fire (approximately 28,200 total acres).

In addition, smaller fires that have burned in the Plan area include:

- The 2008 Bluff Fire (approximately 0.3 total acres)
- The 2007 Corral Fire (approximately 4,700 total acres)
- The 2007 Canyon Fire (approximately 3,800 total acres)
- The 2007 Malibu Fire (approximately 37 total acres)
- The 1994 Latigo Fire (approximately 63 total acres)
- The 1985 Piuma Fire (approximately 5,400 total acres)
- An Un-named 1978 Fire (approximately 60 total acres)
- An Un-named 1972 Fire (approximately 6 total acres)
- The 1967 Latigo Fire (approximately 2,900 total acres)
- An Un-named 1953 Fire (approximately 170 total acres)

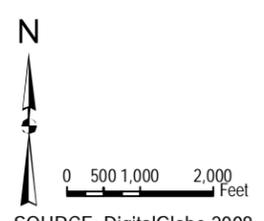
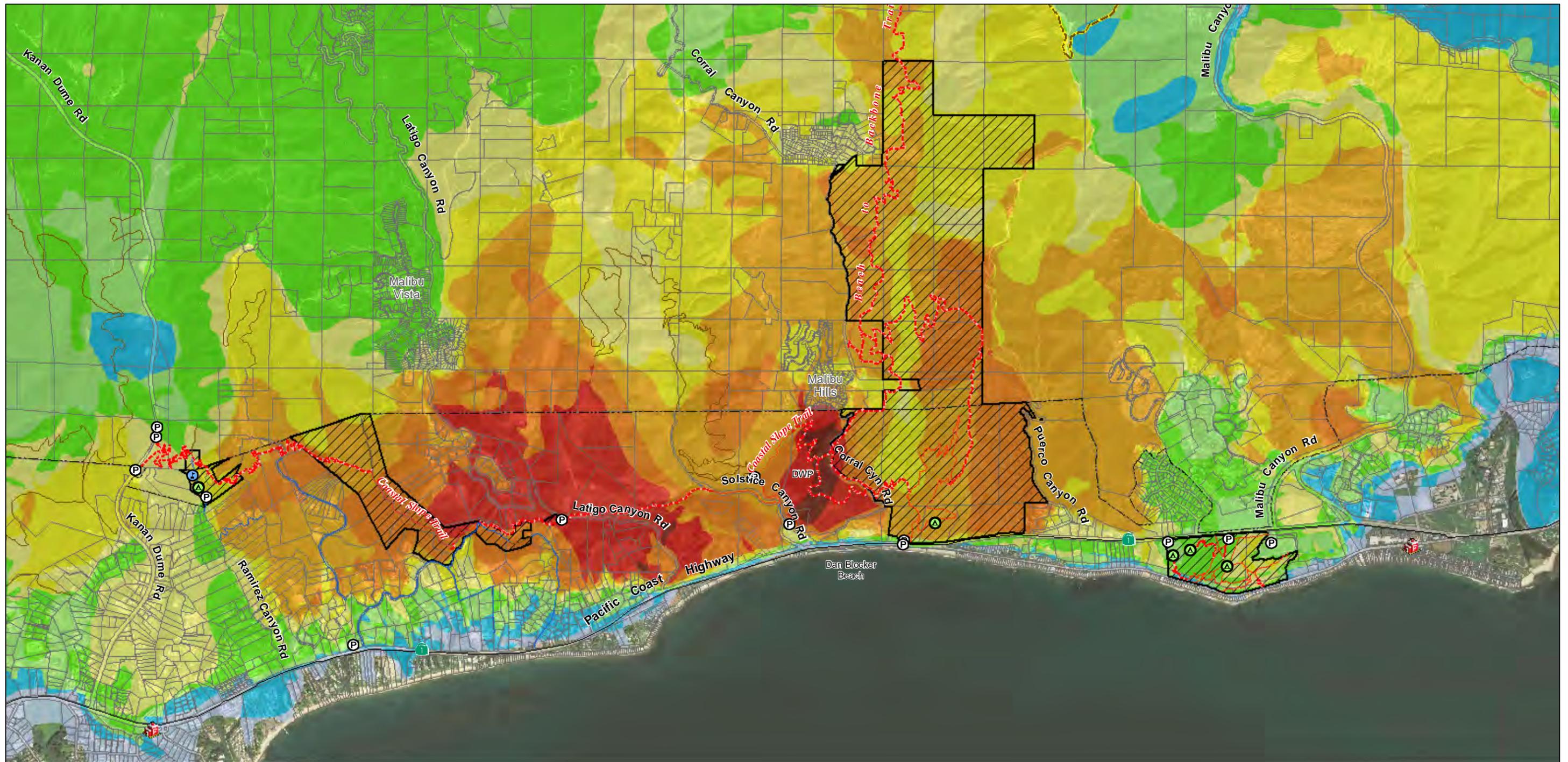
Based on fire history data for the vicinity, fire return intervals range between 1 and 11 years, indicating significant recurring wildfire potential for the Plan area.

¹ Based on polygon GIS data for CAL FIRE, USDA Forest Service Region 5, BLM, National Park Service, Contract Counties and other agencies fires measuring 10 acres and greater in size. The data covers fires back to 1878 and fires 10 acres and

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greater.



SOURCE: DigitalGlobe 2008, MRCA 2009, FRAP 2009



- Malibu City Limits
- Ⓜ Existing Park Administrative Area
- ⓐ Proposed Camping Area
- Ⓟ Proposed Parking Area
- 🚒 LA County Fire Stations
- ▭ Park Boundaries

- Trail Corridors**
- 🔴 Primary Trail (see P&S Project Plans)
 - 🔴 Primary Trail (Existing)
 - 🔵 Connector Trail (Existing)
 - 🟡 Backbone Trail
 - 🟠 Other Existing Trail

FIGURE 4
Fire History

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3.0 RISK ANALYSIS METHODS

3.1 Field Assessment

Dudek conducted a field assessment of the Plan area in order to confirm site plan mapping data and document existing site conditions and potential wildfire risk. While in the Plan area, Dudek assessed topography, vegetation and fuel loading, and general susceptibility of the Plan area to wildfire as well as discussing fire occurrences and behavior with MRCA Rangers.

Photographs were collected and fuel conditions were mapped using 200-scale aerial images. Field observations and interviews were utilized to augment existing Plan area data in generating the fire behavior models and formulating the requirements and recommendations presented in this FPP.

3.2 FlamMap Fire Behavior Modeling

Following field evaluation and vegetative fuels data collection efforts, fire behavior modeling was conducted to document the type and intensity of fire that would be expected in the Plan area region, given characteristic features including topography, vegetation, and weather. Fire behavior models prepared for this FPP are based on existing site conditions. Fire behavior modeling conducted for this project includes a high level of detail and analysis, which corresponds to reasonably accurate representations of how wildfire may move through available fuels. Fire behavior calculations are based on fuel model parameters supported by fire science research that analyzes heat transfer related to specific fire behavior characteristics. To objectively predict flame lengths and fireline intensity values for the Plan area region, FlamMap fire behavior modeling software was applied using expected low fuel moisture values during peak fire season, variable wind speeds, and 18 representative fuel models observed in the Plan area region.

In addition to the regional FlamMap analysis, focused fire behavior evaluations were conducted for each of the specific park properties using the BehavePlus (v. 4.0.0) fire behavior fuel modeling system. This analysis allowed for a more detailed evaluation of fire behavior potential using site-specific vegetation mapping data available for the Plan area. A discussion of these efforts is included in the Park-specific focused FPPs included in Appendices A through D.

Predicting wildland fire behavior is not an exact science due to the many variables that must be considered. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting and the weather that is often "created" by firestorms. Nevertheless, practiced and experienced judgment, coupled with a

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validated fire behavior modeling system, results in useful and accurate fire information (Rothermel 1983).

To be used effectively, the basic assumptions and limitations of fire behavior modeling applications must be understood.

- First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations is the dead fuels less than 0.25 inches in diameter. These are the fine fuels that carry fire. Fuels greater than 1 inch have little effect, while fuels greater than 3 inches have no effect on fire behavior.
- Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within 6 feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
- Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, creating their own weather, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.
- Fourth, fire behavior computer modeling systems are not intended for determining sufficient fuel modification zone/defensible space widths. However, it does provide the average length of the flames, which is a key element for determining defensible space distances for minimizing structure ignition.

Although FlamMap has limitations, it can still provide valuable fire behavior predictions, which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur in a particular landscape. The type and quantity will depend upon soil, climate, geographic features, and fire history. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

The seven fuel characteristics help define the 13 standard fire behavior fuel models (Anderson 1982) and the more recent custom fuel models developed for Southern California (Weise and Regelbrugge 1997). According to the model classifications, fuel models used in

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BehavePlus have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface-to-volume ratio. Observation of the fuels in the field (on site) determines which fuel models should be applied in modeling efforts. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models and the custom Southern California fuel models:

- **Grasses** – Fuel Models 1 through 3
- **Brush** – Fuel Models 4 through 7, SCAL 14 through 18
- **Timber** – Fuel Models 8 through 10
- **Logging slash** – Fuel Models 11 through 13.

In addition, the aforementioned fuel characteristics were utilized in the recent development of 40 new fire behavior fuel models (Scott and Burgan 2005) developed for use in the BehavePlus and FlamMap modeling systems. These new models attempt to improve the accuracy of the 13 standard fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the 40 new fuel models:

- **Non-burnable** – Models NB1, NB2, NB3, NB8, NB9
- **Grass** – Models GR1 through GR9
- **Grass shrub** – Models GS1 through GS4
- **Shrub** – Models SH1 through SH9
- **Timber understory** – Models TU1 through TU5
- **Timber litter** – Models TL1 through TL9
- **Slash blowdown** – Models SB1 through SB4.

Table 2 provides a description of 18 fuel models (including one non-burnable model) coded for the Plan area region that were subsequently used in BehavePlus and FlamMap analysis for this project.

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**Table 2
Fuel Model Characteristics**

Fuel Model	Description	Land Cover Classification
1	Short grass	Non-native grassland, burned areas, disturbed areas
3	Tall grass	Invasives
9	Hardwood litter	Riparian tree cover, coast live oak cover
20	So. California landscape fuels	Exotic species, urban landscapes
GR2	Low Load, Dry Climate Grass	Agriculture
GS2	Moderate Load, Dry Climate Grass-Shrub	Barren (assumes conversion to grass/shrub complex)
SCAL 14	Manzanita	Manzanita
SCAL 16	Ceanothus	Ceanothus
SCAL 18	Coastal sage scrub	Coastal scrub, buckwheat., deerweed,
SH2	Moderate Load Dry Climate Shrub	Coyotebrush
SH3	Moderate Load, Humid Climate Shrub	Mulefat, moist shrub areas
SH7	Very High Load, Dry Climate Shrub	Chaparral, sumac, scrub oak, large native shrub area
SH8	High Load, Humid Climate Shrub	Elderberry
TL2	Low Load Broadleaf Litter	Iceplant
TL3	Moderate Load Conifer Litter	Conifer litter
TL6	Moderate Load Broadleaf Litter	Walnut understory
TU5	Very High Load, Dry Climate Timber-Shrub	Eucalyptus understory
99	Non-burnable	Sand, rock

3.2.1 FlamMap Analysis

FlamMap software was utilized to graphically depict fire-modeling results for the Plan area region. FlamMap utilizes the same fire spread equations built into the BehavePlus software package, but allows for a geographical presentation of fire behavior outputs as it applies the calculations to each pixel in the associated GIS landscape (Finney 1998). Both summer weather conditions (on-shore flow) and more extreme fall weather conditions (off-shore, Santa Ana conditions) were modeled.

FlamMap software requires a minimum of five (5) separate input files that represent field conditions in the Plan area region, including elevation, slope, aspect, fuel model, and canopy cover. Each of these files was created as a raster GIS file using ArcGIS 9.3 software, exported as an ASCII grid file, then utilized in creating a FARSITE (Finney 1998) Landscape file that served as the base for the FlamMap runs. The resolution of each grid file and associated ASCII file that

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was used in the models described herein is 3 meters, based on Interferometric Synthetic Aperture Radar (iFsar) digital terrain data available from the National Oceanic and Atmospheric Administration (NOAA) (NOAA 2009). In addition to the Landscape file, wind and weather data are incorporated into the model inputs. The output files chosen for each of the modeling runs included flame length (feet) and fireline intensity (British Thermal Units/ft/second).

The following paragraphs provide descriptions of the input and output variables used in processing the FlamMap models. In addition, data sources are cited and any assumptions made during the modeling process are described.

Elevation

Elevation data were derived from the iFsar digital terrain data available from NOAA, projected in North American Datum 1983, California State Plane, Zone 5 with units in feet. The resolution of the file was 3 meters and elevation within the Plan area region ranges from 0 feet (sea level) to 759 feet. These data were utilized to create an elevation grid file, using units of feet above sea level. The elevation data are a necessary input file for FlamMap runs and are necessary for adiabatic adjustment of temperature and humidity and for conversion of fire spread between horizontal and slope distances.

Slope

Using ArcGIS Spatial Analyst tools, a slope grid file was generated from the elevation grid file described above. Slope measurements utilized values in percent of inclination from horizontal. Slope values on site range from 0% to 124%. The slope input file is necessary for computing slope effects on fire spread and solar radiance.

Aspect

Using ArcGIS Spatial Analyst tools, an aspect grid file was generated from the elevation grid file described above. The aspect values utilized were azimuth degrees. Aspect values are important in determining the solar exposure of grid cells.

Fuel Model

Vegetation coverage data in the form of a GIS shapefile were used in this analysis to create a fuel model file, which was derived from vegetative cover data for the Plan area region available from the National Park Service. Using the General Vegetation type category, each vegetation type was coded with a unique fuel model value as described in Table 1. Vegetation mapping data was

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utilized in field efforts to classify vegetation cover type with an appropriate fuel model. Additionally, available LANDFIRE (LANDFIRE 2009) fuels data were consulted during the fuel model assignment process. The result includes 18 separate fuel models utilized for the Plan area region, of which, one is a non-combustible classification (e.g., rock, sand). Once fuel model values were assigned to general vegetation types, the vector-based vegetation data file was converted to a grid file for inclusion in FlamMap modeling. Table 1 outlines the fuel model values applied to the general vegetation types found in the Plan area region.

Canopy Cover

Canopy Cover is a required raster file for FlamMap operations. It is necessary for computing shading and wind reduction factors for all fuel models. Canopy cover is measured as the horizontal fraction of the ground that is covered directly overhead by tree canopy. Crown closure refers to the ecological condition of relative tree crown density. Stands can be said to be "closed" to recruitment of canopy trees but still only have 40% or 50% canopy cover. Coverage units can be categories (0–4) or percentage values (0–100).

For the purposes of the FlamMap analysis, Dudek utilized vegetation type classifications to determine canopy cover assignments. For the purposes of this analysis, tree-dominated vegetation types (e.g., coast live oak, California sycamore) were assigned a value of "3," while non-tree vegetation types were assigned a value of "0." Canopy classifications by vegetation type are presented in Table 1.

Weather

For the purposes of understanding regional weather conditions, Dudek evaluated data from three Remote Automated Weather Stations (RAWS) located within the Santa Monica Mountains. The following summarizes the location and available data ranges for the two stations:

- Leo Carrillo RAWS
 - Latitude: 34.04556
 - Longitude: -118.93583
 - Elevation: 50 feet
 - Data years: 1999 to 2008
- Malibu RAWS
 - Latitude: 34.05833
 - Longitude: -118.63333

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- Elevation: 1,575 feet
- Data years: 1994 to 2008

- Malibu Canyon RAWS
 - Latitude: 34.08389
 - Longitude: -118.70333
 - Elevation: 610 feet
 - Data years: 2006 to 2008.

Utilizing the FireFamily Plus v. 4.0.0 (FireFamily Plus 2007) software package, data from all three RAWS were analyzed by developing a Special Interest Group (SIG). The SIG is a composite of weather station data that is analyzed concurrently. In this case, the SIG weighted data from each RAWS equally and was analyzed to determine 50th and 97th percentile wind and fuel moisture conditions for inclusion in all fire behavior modeling efforts conducted for this FPP. Fuel moisture information was analyzed and incorporated into the Initial Fuel Moisture file used as an input in FlamMap, as well as directly input into the focused BehavePlus runs included in the Focused FPP's prepared for each Park area. Wind speed (20-foot) values for all fire behavior modeling runs were manually entered during the data input phase and were based on two wind scenarios: summer fire (50th percentile) with 11 mph on-shore winds, and fall fire (97th percentile) with 69 mph winds (maximum documented wind gust speed²). The use of 69 mph winds in modeling efforts is intended to represent wind gusts rather than sustained maximum wind speeds. The maximum RAWS wind speed for the SIG was 52.1 mph, which represents a 10-minute average wind speed, not the maximum gust speed. As FlamMap presents a static representation of fire behavior, the inclusion of gust speed is appropriate to evaluate worst-case fire behavior outputs. Table 3 presents the weather and fuel moisture input variables used for all fire behavior modeling conducted for this FPP.

² National Oceanic and Atmospheric Administration 2007 data summary, http://www.wrh.noaa.gov/lox/archive/pns_2007summary.pdf

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**Table 3
Fire Behavior Weather and Fuel Moisture Inputs**

Model Variable	50th Percentile (Onshore Flow)	97th Percentile (Offshore/Santa Ana conditions)
1 h fuel moisture	7%	2%
10 h fuel moisture	8%	3%
100 h fuel moisture	12%	7%
Live herbaceous moisture	40%	30%
Live woody moisture	95%	60%
20-ft. wind speed (mph)	11 mph	69 mph (representing max. gust)
Wind direction	Onshore, 225° for FlamMap	Offshore, 10° for FlamMap

3.2.2 FlamMap Fuel Model Outputs

Two output grid files were generated for each of the two FlamMap runs, and include representations of flame length (feet) and fireline intensity (BTU/foot/second). The aforementioned fire behavior variables are an important component in understanding fire risk and fire agency response capabilities. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews, Bevins, and Seli 2004). It is a somewhat subjective and non-scientific measure of fire behavior, but is extremely important to fireline personnel in evaluating fireline intensity and is worth considering as an important fire variable (Rothermel 1991). Fireline intensity is a measure of heat output from the flaming front, and also affects the potential for a surface fire to transition to a crown fire. The information in Table 4 presents an interpretation of these fire behavior variables as related to fire suppression efforts.

**Table 4
Fire Suppression Interpretation**

Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4	Under 100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8	100 to 500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11	500 to 1,000	Fires may present serious control problems—torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11	Over 1,000	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

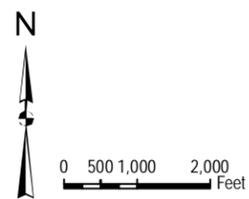
SOURCE: BehavePlus 3.0.2 fire behavior modeling program (Andrews, Bevins, and Seli 2004)

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Maps depicting flame length and fireline intensity values for the 50th and 97th percentile weather scenarios are included in Figures 5 through 8. The fire behavior analysis results for the Plan area region vary depending on topography and fuel type. As FlamMap utilizes site-specific digital terrain data (including slope, vegetation, aspect, and elevation data) slight variations in predicted flame length values can be observed based on fluctuations of these attributes across the landscape. As presented, wildfire behavior in each of the fuel types varies depending on weather conditions. Maximum flame lengths may exceed 60 feet in some areas of the Parks under worst-case conditions. As presented in Figures 6 and 8, expected fire behavior during extreme, Santa Ana wind-driven fires is closely correlated with fuel type. Areas with light, flashy fuels (grasses) exhibit lower flame lengths and resulting fireline intensities but will promote fire spread at faster rates than heavier chaparral and sage scrub fuels, which exhibit higher flame lengths and resulting intensities. In general, the southern portion of the Plan area exhibits lower flame length and fireline intensity potential due to lower fuel loads and more gently sloping topography. The fire behavior modeling outputs, along with LACoFD input, were incorporated into the analysis for determining optional, emergency fire shelter locations and fuel modification widths and requirements.

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* FlamMap modeling results using Summer Fire weather inputs as described in this FPP.

Flame Length*

Feet
n/a
0 - 4
4 - 8
8 - 11
11 +

- Malibu City Limits
- Ⓜ Existing Park Administrative Area
- Ⓜ Proposed Camping Area
- Ⓜ Proposed Parking Area
- 🚒 LA County Fire Stations
- Ⓜ Park Boundaries

Trail Corridors

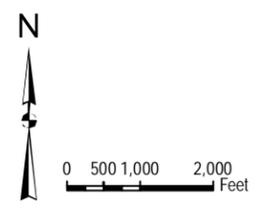
- 🔴 Primary Trail (see P&S Project Plans)
- 🔴 Primary Trail (Existing)
- 🔵 Connector Trail (Existing)
- 🟡 Backbone Trail
- 🟡 Other Existing Trail

FIGURE 5

FlamMap Flame Length Analysis - Summer Fire

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* FlamMap modeling results using Fall Fire weather inputs as described in this FPP.

Flame Length*

Feet

White	n/a	Orange	11 - 20
Light Blue	0 - 4	Red	20 - 40
Light Green	4 - 8	Brown	40 - 60
Yellow	8 - 11	Dark Brown	60 +

- Malibu City Limits
- Ⓜ Existing Park Administrative Area
- Ⓜ Proposed Camping Area
- Ⓜ Proposed Parking Area
- 🚒 LA County Fire Stations
- Ⓜ Park Boundaries

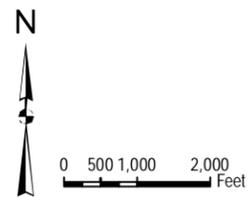
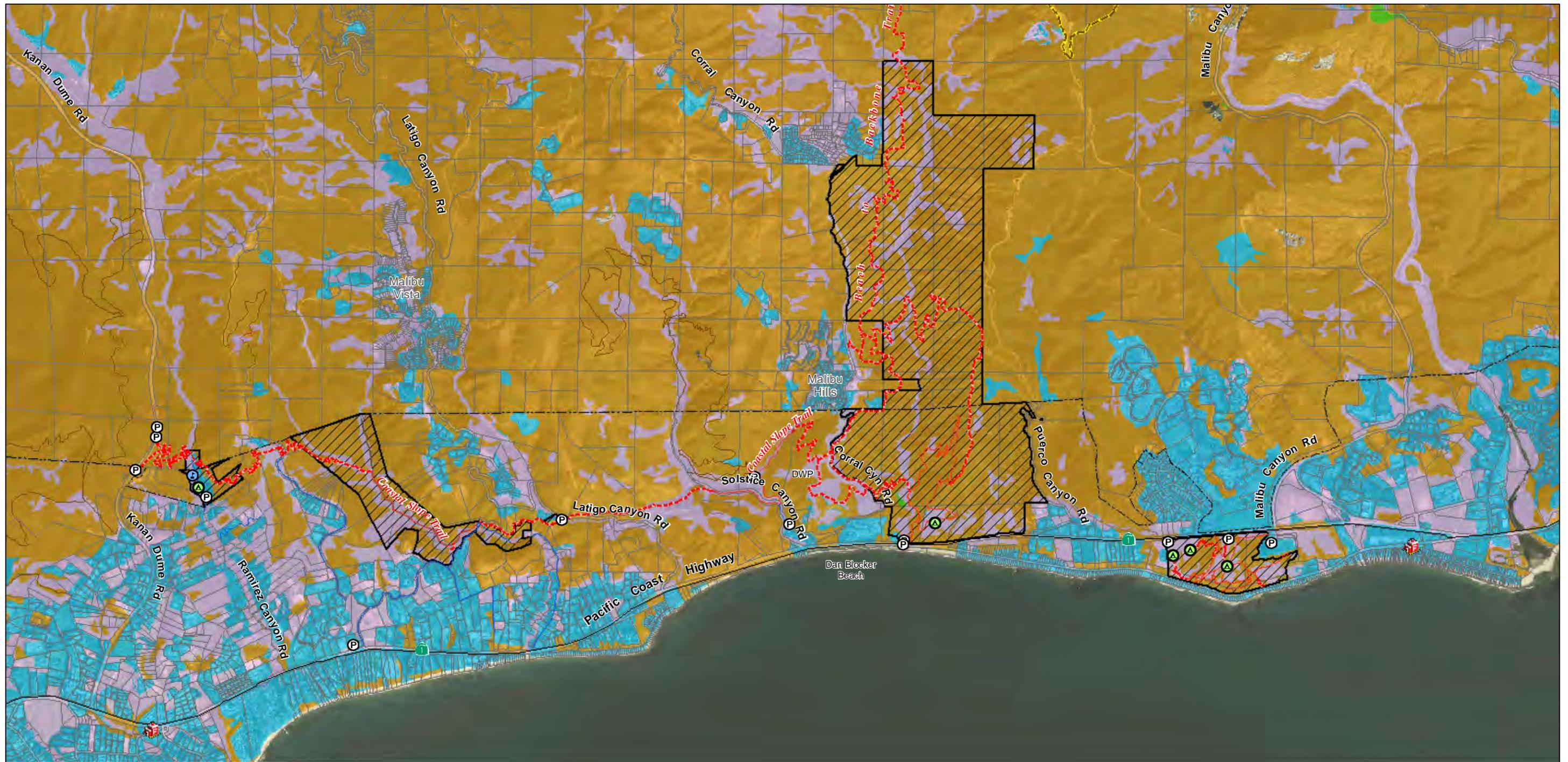
- Trail Corridors**
- 🔴 Primary Trail (see P&S Project Plans)
 - 🔴 Primary Trail (Existing)
 - 🔵 Connector Trail (Existing)
 - 🟡 Backbone Trail
 - 🟡 Other Existing Trail

FIGURE 6

FlamMap Flame Length Analysis - Fall Fire

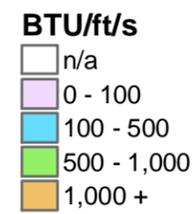
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* FlamMap modeling results using Summer Fire weather inputs as described in this FPP.

Fireline Intensity*



- Malibu City Limits
- Ⓢ Existing Park Administrative Area
- ⓐ Proposed Camping Area
- Ⓟ Proposed Parking Area
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- Park Boundaries

Trail Corridors

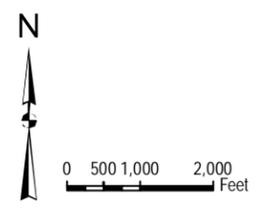
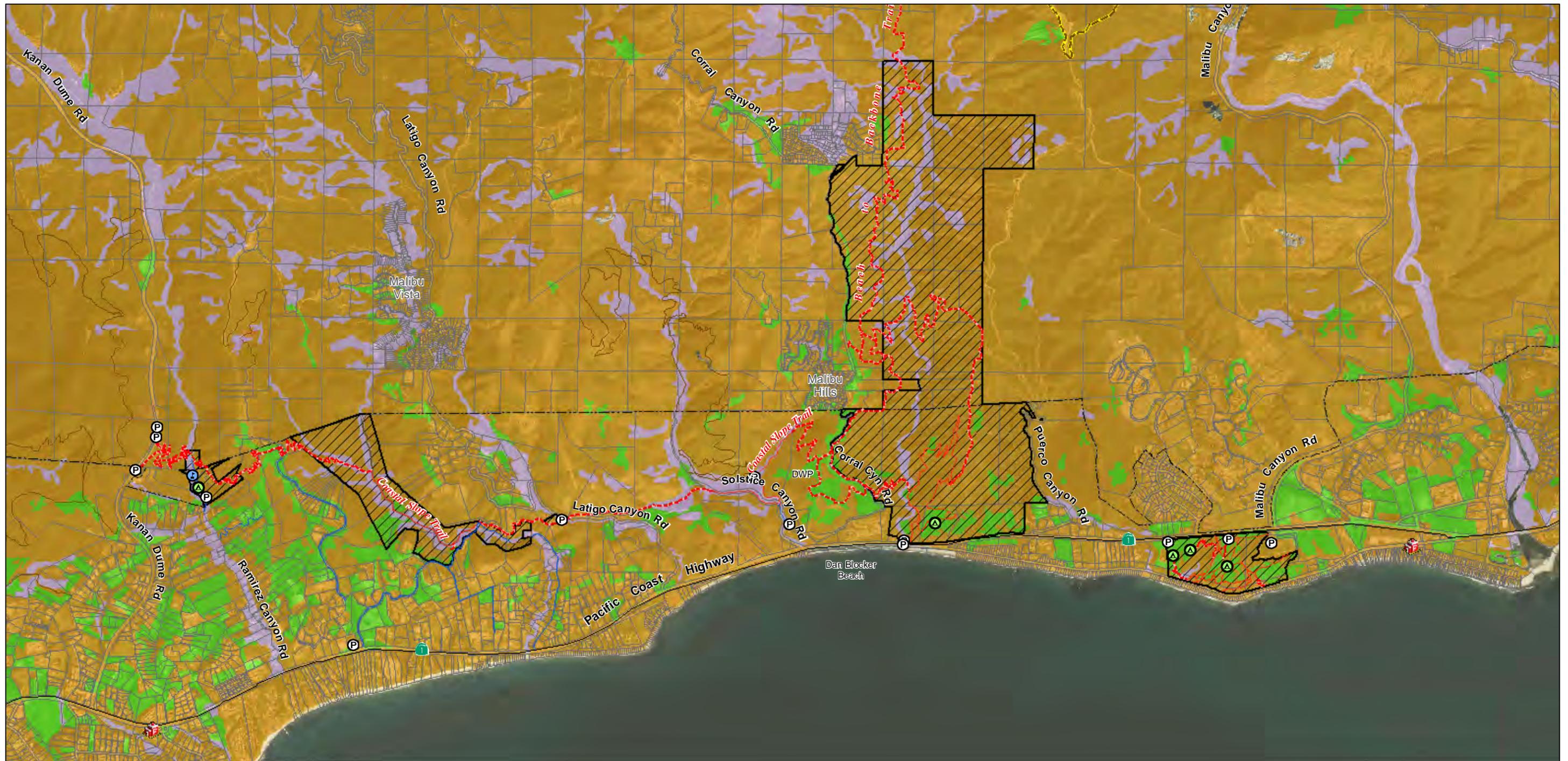
- Primary Trail (see P&S Project Plans)
- Primary Trail (Existing)
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- Backbone Trail
- Other Existing Trail

FIGURE 7

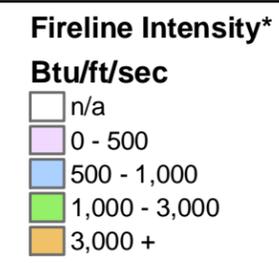
FlamMap Fireline Intensity Analysis - Summer Fire

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* FlamMap modeling results using Fall Fire weather inputs as described in this FPP.



- Malibu City Limits
- Ⓜ Existing Park Administrative Area
- Ⓜ Proposed Camping Area
- Ⓜ Proposed Parking Area
- 🚒 LA County Fire Stations
- Ⓜ Park Boundaries

- Trail Corridors**
- 🔴 Primary Trail (see P&S Project Plans)
 - 🔴 Primary Trail (Existing)
 - 🔵 Connector Trail (Existing)
 - 🟡 Backbone Trail
 - 🟡 Other Existing Trail

FIGURE 8

FlamMap Fireline Intensity Analysis - Fall Fire

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3.2.3 Fire Potential

Given the climatic, vegetation, and topographic characteristics of the Plan area region, along with the fire history and fire behavior modeling results previously discussed in this FPP, the Plan area is considered potentially vulnerable to wildfire starting in, burning onto, or spotting onto the site. The fire behavior results described herein depict values based on inputs to the FlamMap software. Localized changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis, but assumed across the landscape based on the available data resolution. Further, this modeling analysis assumes a correlation between the available vegetation data and fuel model characteristics. Recent fire activity may temporarily alter fuel beds, but fire behavior modeling efforts conducted for this project assume natural succession of burned areas to more mature stand conditions, resulting in a conservative (near worst-case) estimate of fire behavior. Since fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns, modeling results are applicable as a basis for planning, but need to be considered in context with other site variables.

3.3 BehavePlus Fire Behavior Modeling

While FlamMap fire behavior modeling was conducted for the Plan area region, more focused fire behavior modeling utilizing BehavePlus 4.0.0 was conducted for the focused FPPs presented in Appendices A through D.

3.3.1 BehavePlus Fuel Model Inputs

Dudek utilized BehavePlus software to evaluate fire behavior potential for each Park area. Two weather scenarios were evaluated, including a summer, onshore weather condition, and a more extreme fall, offshore weather condition. All fuel moisture and weather inputs remain consistent between the FlamMap and BehavePlus modeling efforts conducted in support of this FPP and the focused FPPs presented in Appendices A through D.

BehavePlus software requires site-specific variables for surface fire spread analysis, including fuel type, fuel moisture, wind speed, and slope data. The output variables used in this analysis include flame length (feet), fireline intensity (BTU/feet/second), and spotting distance (miles). The following provides a description of the input variables used in processing the BehavePlus models for each Park area.

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Weather

The same historical fuel moisture and wind speed data that was analyzed and used in the FlamMap analysis discussed previously were used for all BehavePlus runs prepared for this FPP. Table 3 presents the fuel moisture and wind speed values used for the BehavePlus analyses included in the focused FPPs presented in Appendices A through D.

As wind speed values derived from RAWS data represent 20-foot wind speeds, BehavePlus includes a wind adjustment factor. In the case of the BehavePlus analyses completed in support of the focused FPPs (all of which occurred in shrub vegetation types), a wind speed adjustment factor of 0.5 was utilized to account for vertical differences in wind speed from the 20-foot recording height to mid-flame height prior to BehavePlus modeling efforts. A conservative wind adjustment factor of 0.5 indicates a fuel bed that is unsheltered from the wind with a fuel bed depth greater than 2.7 feet. It should be noted that mid-flame wind speeds may be only 10% of the wind speeds recorded or predicted at 20 feet, resulting in a conservative calculation.

Topography

Elevation data were derived from digital topographic files available for each Park area. This data source was evaluated in ArcGIS software in order to determine specific site elevation ranges and slope gradients. Elevation and slope are important components in fire behavior analysis as they affect temperature, humidity, solar radiance, and fire spread rates.

Fuel Model

Fuel model assignments for each of the BehavePlus modeling runs were based on field observations documented during the fire hazard assessments conducted in support of this FPP. Fuel model assignments are presented in the discussions of fire behavior modeling contained in the focused FPPs presented in Appendices A through D.

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4.0 CURRENT FIRE PROTECTION STATUS

As previously discussed, the Park properties vary somewhat on level of improvements, but are generally without improvements other than trails and picnic areas, except for Ramirez Canyon Park, which includes a more urbanized landscape. Fire protection on these properties varies currently from robust (Ramirez Canyon Park) to limited (other parks) based on lack of structures and other "assets" which require protection. The following sections provide brief descriptions of the current fire protection status.

4.1 Existing Water Supply and Fire Flow

Water supply for the Park properties varies based on the current uses, presence of structures or other assets, and potential risk, as described in the following sections.

Ramirez Canyon Park

Ramirez Canyon Park currently exhibits the highest level of water availability. An 8-inch mainline in Ramirez Canyon Road connects to the site's existing waterlines that provide water throughout the Park. Ramirez Canyon Park includes a centrally located wharf-type hydrant as well as a hydrant at the park entrance road, a 4,500-gallon water tank and a 10,000 gallon water tank, a 25,000-gallon swimming pool, and a 3,500-gallon portable dip tank, totaling 40,000 gallons within the Park. The current volume of stored water at Ramirez Canyon Park is adequate to supply approximately 40 Type I fire engines. Post project, stored water will be consistent with current conditions, but availability from three new hydrants in Phase 1 would significantly improve the already substantial water availability to fire engines. Hydrants located near the park, along Ramirez Canyon Road and Via Acero achieve varying flow rates ranging from 661 to 2,500 gallons per minute (LA County Water Works).

Escondido Canyon Park, Latigo Trailhead, Corral Canyon Park and The Bluffs

There is currently no water available within Escondido Canyon Park and there are no planned water improvements under the Modified Redesign Alternative. However, an 8-inch water distribution line exists within the Winding Way road alignment adjacent to and within the southeast portion of the Park, which supplies two fire hydrants near the terminus of the improved roadway. The Latigo Trailhead property and Corral Canyon Park also presently lack existing on-site water supply but are located directly adjacent to an 8-inch water distribution line within Latigo Canyon Road and Pacific Coastal Highway, respectively. Along Latigo Canyon Road, the existing 8-inch line supplies two fire hydrants east of the Latigo Trailhead property and will be extended to supply Latigo Trailhead parking area fire hydrant(s). Along Pacific Coast Highway,

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an 8-inch water distribution line supplies three hydrants (all testing at least 2,500 gallons per minute – LA County Water Works data) near the Corral Canyon Park entrance. The Bluffs also does not currently include on-site water; however, there are several hydrants located along the periphery of the park property. There are two hydrants served by an 8-inch line on the north side of Pacific Coast Highway opposite the Park, and two hydrants located at the northeast corner of the Park on the south side of Pacific Coast Highway and near the entry drive to the City's Malibu Bluffs Park.

The project will augment the existing water availability through construction of water lines to provide water to the proposed campsites and park/trail facilities as well as for increased fire protection. Water lines would connect to proposed water tanks (except at Escondido Canyon Park, Latigo Trailhead, and Ramirez Canyon Park) and parks would be provided additional hydrants. The Bluffs would receive two 10,000-gallon water tanks, which will provide an additional water source fitted with fire department connections. A separate on-site water conveyance system for fire fighting will be provided at all Facilities except Escondido Canyon Park with the Modified Redesign Plan through additional fire hydrants. Escondido Canyon Park will not receive additional water. Corral Canyon Park will receive a 10,000-gallon water tank located on a knoll resulting in a pressurized water source for fire fighting. A pump station will provide adequate water pressure to fill the tank as necessary.

4.2 Existing Fire Access

Fire and emergency access is provided to the Parks as follows:

Ramirez Canyon Park

Access to the Ramirez Canyon Park property is provided by paved roads from Pacific Coast Highway (PCH) via Paradise Cove/Ramirez Canyon Road or via West Winding Way and Delaplaine, and then through a gated entrance at the terminus of Ramirez Canyon Road. The park currently provides 54 parking spaces; however, public access to and recreational use of the park property is currently by appointment only and limited to special outreach and education programs. The project will provide additional parking and road improvements, if required, designed to aid overall vehicular circulation to and within the Park.

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Escondido Canyon Park and Latigo Trailhead

Escondido Canyon Park

Escondido Canyon Park is presently only accessible via pedestrian access along an improved trail easement on the road shoulder of East Winding Way. A 17-space parking lot located on Winding Way at Pacific Coast Highway, approximately 1 mile south of the park boundary, is the starting point where visitors park their vehicles and then hike to the Park. A number of dirt trails then take access from Winding Way into various portions of the park property. Emergency access is available via Winding Way through a locked gate where the improved portion of Winding Way terminates at the southeast portion of the Park.

Latigo Trailhead

The Latigo Trailhead property is accessed by Latigo Canyon Road, approximately 0.8 mile from its intersection with Pacific Coast Highway. A short, chain link gated driveway enters the property and provides access to the proposed camp area and trailhead. The project will provide a new entry drive and parking area designed to support public access and recreational use of the property.

Corral Canyon Park

Corral Canyon Park is accessed directly from Pacific Coast Highway where an existing 15-space parking lot supports public access to the park. The park may also be accessed via public transit where a MTA bus stop is located at the entrance to the park. Access to/from the Park and adjacent public beach can also be gained beneath Pacific Coast Highway through a storm drain underpass, although passage is difficult and would not be recommended during winter. One trail takes access from the parking area and across Corral Canyon Creek into the Park while another trail takes access from the parking area to and along the north side of Pacific Coast Highway and then enters the Park on the east side of the creek, thus avoiding the creek crossing. Emergency access to the Park is also provided from Pacific Coast Highway via an existing maintenance road in this location (east side of Corral Canyon Creek). The project will provide an improved parking area and accessible vehicle drop-off area designed to support public access and recreational use of the property.

Santa Monica Mountains Conservancy-Owned Malibu Bluffs

Access to the Bluffs is provided directly from Pacific Coast Highway via a shared driveway and parking lot that supports access to the Bluffs and the City's adjacent Malibu Bluffs Park. The

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park may also be accessed via public transit where a MTA bus stop is located near the property on Pacific Coast Highway and on Malibu Road (both directions). Pedestrian access to the park is accommodated at the existing parking lot, along Pacific Coast Highway, and along Malibu Road. The Bluffs currently does not include parking separate from the City's Malibu Bluffs Park. The project will provide new parking and internal access improvements designed to aid overall access and circulation to and within the Park.

4.3 Existing Fire Protection

A number of fire protection resources and features are currently available and deployed at the Parks including, but not limited to:

- Trained fire fighting personnel (varies throughout the year, and year to year, with 103 total trained firefighters in 2009)
- A formal Wildland Fire Academy, certifying MRCA wildland fire fighting personnel to Federal and State standards. This program also trains state and regional firefighters, including the Local Fire departments and resource agencies. The MRCA academy provides continuing education, including; advanced training in wildland fire behavior, and tactics, emergency medical services (EMS), and urban interface fire fighting.
- A mentoring program for youth and entry level firefighters in areas of leadership, teamwork, technical skills, problem solving, outdoors wilderness training, first responder CPR and first aid. Current programs include Youth Adventures, outdoor education with the Las Virgenes Unified school district, Touch a Truck, and Los Angeles County Regional Occupational Program class in wildland firefighting.
- Fire fighting apparatus, including one four-wheel drive Type II fire engine, one Type I Class A foam engine, one four-wheel drive Type III engine with Compressed Air Foam System, two Type III engines, one water tender, two mobile command units, 40+ chainsaws, two four-wheel drive Type IV engines equipped with Compressed Air Foam System and a minimum of 300 gallons of water and eight four-wheel drive Type IV engines equipped with a minimum of 200 gallons of water
- Stored water and portable high pressure firefighting pumps for fire fighting purposes
- Ramirez Canyon Park Conservancy/MRCA Western Sector Emergency Command Center for fire/disaster/public safety emergencies
- Pre-Plan/Fire Action Plan for responding to fire emergencies

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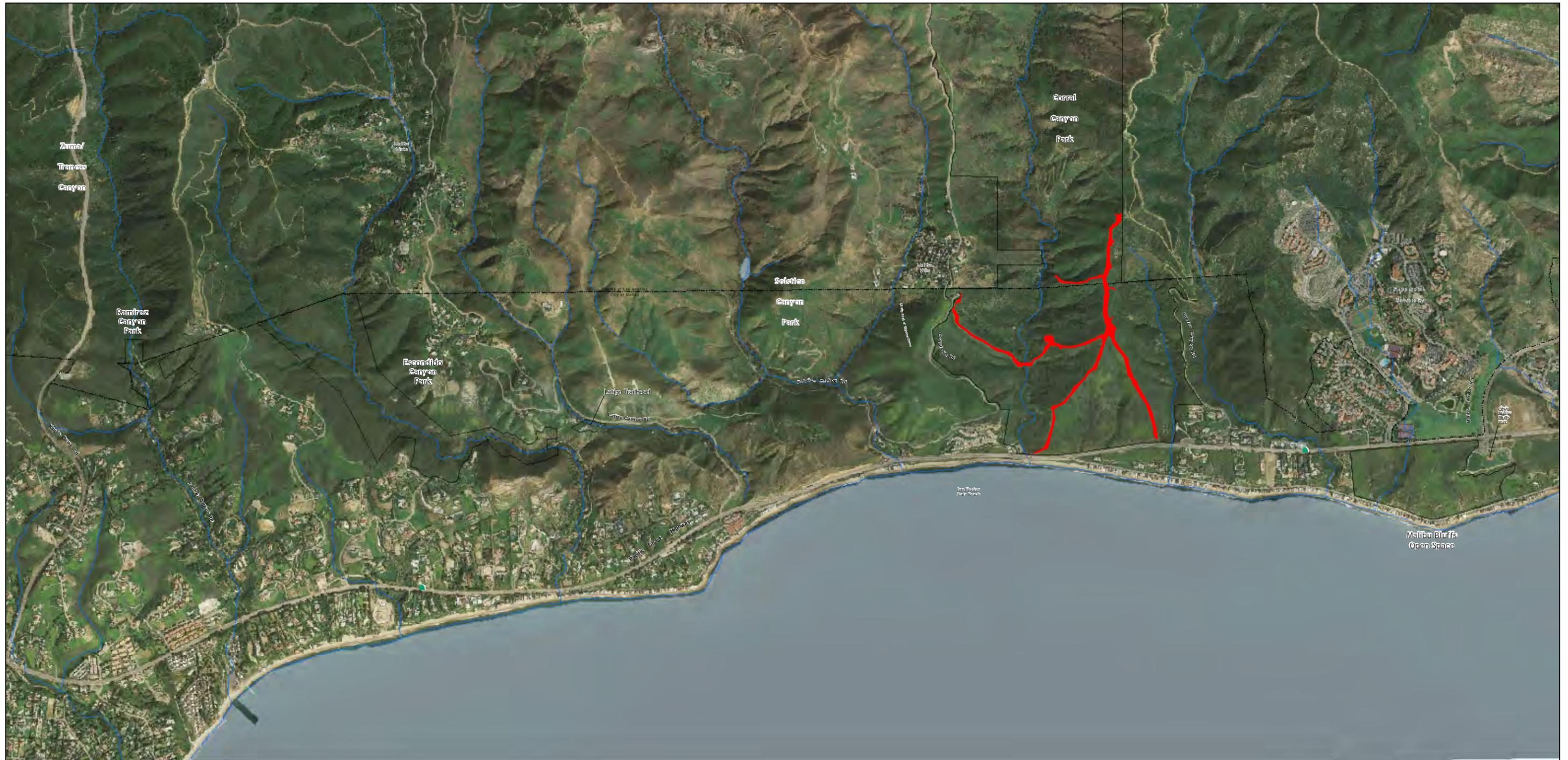
- Fire behavior pre-plan trigger point modeling – internally conducted and built into relocation and pre-planning
- Communication and training with LACoFD and all other surrounding Fire Agencies
- Fuel modification, including 200 feet of modification for structures at Ramirez Canyon and varying fuel modification areas along roadsides
- Existing fire/fuel breaks that occur within the Plan area (Figure 9).

4.4 Fire Response

The project is located within the City of Malibu and adjacent unincorporated Los Angeles County and is served by LACoFD. LACoFD is under contract to Cal Fire for State Responsibility Area (SRA) fire protection. LACoFD provides initial response to SRA fires, and Cal Fire provides response when necessary based on size and type of fire. MRCA fire fighters, due to the proximity of the MRCA fire engines and personnel, would typically be on-scene providing initial attack and coordinating with LACoFD. Regionally, the LACoFD provides fire, emergency medical, and rescue services from 22 battalions and 170 stations. The Department serves over 4 million residents throughout 58 cities and all unincorporated portions of Los Angeles County. The Project lies within the jurisdiction of Battalion 5, which consists of 12 stations. While portions of the Plan's proposed trail system and parking improvements are located in Los Angeles County, the majority of the Plan's park facility improvements, including all new camp areas, would be located within the City of Malibu. The City of Malibu is served directly by four LACoFD fire stations (Stations 70, 71, 88, and 99); however, additional stations within the LACoFD are available to service the City if necessary. Additionally, the Ventura County Fire Department, Los Angeles City Fire Department and the National Park Service are available indirectly to provide fire services to the City if needed.

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0 500 1,000 2,000 Feet

Fire Breaks

SOURCE: Penfield&Smith 2009

FIGURE 9
Fire/Fuel Breaks Occurring within the Plan Area

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The MRCA assists LACoFD in fighting wildland fires and in protecting the array of resources on and off its own properties. The MRCA:

- Maintains communication and mutual aid agreements with the LACoFD the Los Angeles City Fire Department, the Ventura County Fire Department, California State Parks, and the National Park Service, to promote cooperative efforts to prevent and defend against wildfire.
- Deploys its own fire fighting equipment and personnel including 15 engines and a variety of support vehicles and equipment.
- Provides helicopter-landing zones on its property for Ventura County Fire Department, Los Angeles County Fire Department, and Los Angeles City Fire Department helicopters.
- As part of Interagency Pre-Plan, coordinates with LA County Sheriff and during emergency situations, requests use of Sheriff’s helicopter for remote area notification/rescue
- Provides locations for LACoFD Remote Automated Weather Stations

LACoFD's average response time of arrival for urban areas has historically been fast, averaging 4.8 minutes, based on 2006 statistics (County of Los Angeles 2008). The estimated response time for the LACoFD Stations to the various individual Park sites is discussed within Appendices A through D. In general, at least one LACoFD Station is within 5 minutes response to each of the Park assembly areas, which are the Park entrances/parking areas (excludes trail areas). In addition, MRCA fire fighting personnel and apparatus are within less than 5 minutes to the Parks and have apparatus on-site at Ramirez Canyon Park.

Table 5 provides the staffing levels at the LACoFD stations serving the Plan Area

**Table 5
Fire Station Staffing Levels and Equipment Resources**

LACoFD Station No.	Address	Staffing/Equipment
70	3970 Carbon Canyon Road Malibu, California 90265	Four-person engine company and a battalion chief
71	28722 W. Pacific Coast Highway Malibu, California 90265	Four-person engine company and a two-person paramedic squad
88	23720 Malibu Road Malibu, California 90265	Three-person engine company and a two-person paramedic squad
99	32550 Pacific Coast Highway Malibu, California 90265	Three-person engine company

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4.5 Estimated Calls and Demand for Service from the Project

4.5.1 Estimated Annual Emergency Call Volume

The following estimated annual emergency call volume is based upon per capita data from LACoFD calls within their jurisdiction, based on 2006 data (County of Los Angeles 2008).

- Total population served by LACoFD: 4,100,000
- Total annual calls: 298,824. Per capita call generation: 0.073
- Total annual fire calls: 10,333. Per capita call generation: 0.003
- Total annual EMS/rescue/miscellaneous calls: 288,491; per capita call generation: 0.070.

Using the assumptions above, the estimated annual emergency call volume for the Plan area was calculated. In order to provide this conceptual estimate, MRCA provided population estimates for the existing and proposed park properties and trail system based on anticipated use of the proposed recreation enhancements under the Modified Redesign Alternative average daily trips, parking spaces, and special events. This number has been averaged to reflect typical on-site presence since special events, educational programs, and similar temporary gatherings are not indicative of the typical on-site population, but do contribute to the overall population average.

Based on this information, the total, conservatively estimated average daily estimated population associated with the Modified Redesign Plan, above the baseline total, including all five of the Parks, is 259 persons, as summarized for each park below.

Ramirez:	150*
Escondido:	0
Latigo:	12
Corral:	32
<u>Malibu Bluffs:</u>	<u>65</u>
Total:	259*

*Note: Ramirez Canyon Park will include a lower number of average on-site population increase for Phase 1. This analysis assumes long-term population increase associated with Phase 2 implementation, and is conservatively applied.

Assumptions for each park and its expected population level throughout the year are provided in Appendix E.

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This number is a *conservative* estimate that is likely higher than the actual average on-site population. Based on this conservative population estimate, the calculated call volumes by type of call are provided in Table 6.

Table 6
Calculated Call Volume Increase (Conceptual Based on 259 Persons)

Type of Call	Per Capita Call Generation Factor	Number of Estimated Annual Calls (Per Day)
Total Calls	0.073	19 / (0.05)
Total Fire Calls	0.003	0.8 / (0.002)
Total EMS/Rescue Calls	0.070	18 / (0.05)

These conceptual estimates for increased emergency call volume due to the proposed park improvements are likely high, as the LACoFD annual data includes areas within its jurisdiction where call volumes are typically higher due to the type of calls associated with higher density urban populations compared to the Plan's Park properties, which would support low-intensity recreational uses. Medical emergencies will account for the majority of calls associated with the Modified Redesign Alternative. The calculated fire related call volume associated with the project is based on long-term projected populations with implementation of Phase 2 and is a pre-fire safety measure estimate. The application of the layered system of fire prevention and protection measures detailed in this FPP is designed to significantly reduce the potential for fire related calls from the already low levels.

The Park enhancements would potentially increase the call volume at a rate of roughly 0.05 calls per day, 0.4 calls per week and just fewer than 1.6 calls per month, with over 97% being medical related. Medical related calls often require fast response, such as in the case of heart attack victims. MRCA is able to provide fast response to medical emergencies with trained personnel who can provide initial assessment and treatment. Rangers and fire fighters receive Professional Rescuer training six times per year and will be able to quickly respond to medical emergencies as first responders until paramedics arrive. Portable defibrillators and other first aid equipment/accessories are currently maintained at Ramirez Canyon Park and will be provided at all Park facilities and/or in mobile units with trained personnel.

Regardless of the call volume at the first responding station, the level of service demand associated with the Modified Redesign Alternative is not likely to materially raise overall call volume or overly stress existing capabilities. For perspective, five calls per day are typical in an urban or suburban area and the projected population increase associated with the project would

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increase that volume by less than 1%. A busy fire station company would be one with 10 or more calls per day.

4.5.2 Impacts on Fire Response

Impacts from new development and land uses can cause fire response service decline and must be analyzed for each project. The proposed project represents a calculated minimal increase in service demand due to the type of proposed development and use, and based on the average on-site population. The requirements described in this FPP, including on-site MRCA fire fighters and apparatus, pre-planning, use restrictions, camp area restrictions, access and water supply improvements, and on-going fuel modification maintenance, are designed to aid firefighting and medical response personnel and minimize demand on the fire service. The project is not anticipated to have a material impact on the response capability of LACoFD responding Fire Stations. Substantiating this analysis, LACoFD Planning Division confirmed that current staff levels and facilities at stations within Battalion 5 are sufficient to support the incremental increase in recreational demands associated with the proposed Plan (Chin 2009)

4.6 On-Site Risk Assessment

The Plan area is potentially vulnerable to wildfire, given the climatic, vegetation, topographical, and fire history of the region. In summary, wind or topography driven wildfire burning under a north or northeastern (Santa Ana) wind pattern downward through the canyons in the Santa Monica Mountains could result in an extreme wildland fire. Further, the potential for spotting (airborne firebrands) from such fires adds to the hazard potential for the Plan area.

As indicated by National Fire Data (Karter 2009), the risk associated with wildfires on this site are low when compared to structure fires. The approval of thousands of residential structures, where most fires and injuries occur, throughout LA County and 45 residential structures since 2008 that have been approved in the Malibu area within the vicinity of the Conservancy/MRCA Plan area, all within wildland urban interface and very high fire hazard zones presents a greater risk for fire and public safety than the Modified Redesign Alternative project. This FPP designed for the Modified Redesign Alternative focuses on likely ignition sources based on local historical fire data and prescribes specific measures to minimize the likelihood of ignition from those sources that may be associated with the Modified Redesign Alternative project, as described in the following section.

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California Wildfire Causes

Causes of wildfires in California can be classified as either natural (lightning, volcanic) or anthropogenic (human-caused), including intentional (arson) and unintentional sources (railroad, escaped prescribed burn, equipment use, etc.). Traditional recreation-based land uses introduce potential wildfire ignition sources that differ from other development types such as road construction, power line installation, or residential development. Potential fire ignition risks associated with recreation-based land use typically include illegal or unattended campfires, smoking, arson, or vehicle-originated fires (e.g., catalytic converters). Of these, only campfire ignition sources are specific to recreation-based land uses. The California Department of Forestry and Fire Protection (Cal Fire), through its Fire and Resource Assessment Program (FRAP), maintains a GIS database of wildfire perimeters for the state of California from 1878 to 2008 which includes amongst its attributes a fire cause designation. Based on an analysis of this data set (FRAP 2009), wildfire incidents in California originating from campfire ignition sources are extremely low. Specifically, of the 16,852 fires over 10 acres recorded in California between 1878 and 2008 (FRAP 2009), only 268 (1.6%) were caused by campfires. Based on the same data set, of the 2,208 fires recorded in Los Angeles County over this time period, only 10 (0.5%) were caused by campfires. Further, none of the historic wildfires in the Santa Monica Mountains have campfire origins. The dataset does not distinguish between campfires in managed and patrolled campgrounds as compared to those in unmanaged areas or illegal campfires, the latter of which is more likely to result in escape. However, all of the referenced Los Angeles County "campfire-caused" fires were in the Angeles National Forest. A personal interview with Angeles National Forest staff revealed that there have been no known fires caused by campfires in developed campgrounds.

More likely causes for wildfires in the Plan area and the greater Santa Monica Mountains region are associated with other anthropogenic sources including roadways (tossed cigarette, vehicle accidents, catalytic converter, or car fire), unattended children, arson, electrical transmission lines, or gas powered mowers, trimmers or other equipment. Public access to parklands may increase ignition potential based on some of the aforementioned causes, however, carefully planned and controlled access and increased patrols along with the restrictions regarding flames of any type, and better education of park visitors will result in the lowering of such ignition risks, as has been demonstrated at other camp areas throughout the state. There has been a steady decline in outside fires since 1977 when there were a reported national total of 1,658,500 outside fires down to a low of 700,500 national outside fires in 2008 (NFPA 2009), a 58% decrease. This statistics supports the success of the focused fire safety education campaigns that have occurred over the last three decades.

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Fire Risk Addressed by FPP Measures

It has been established that the Plan area includes a higher fire danger as an existing condition due to the terrain, fuels, ignition sources, weather, and history of wildfires. The project will enable an increased number of average daily visitors and overnight campers. In the Santa Monica Mountains, most wildfires are the result of humans, including arson, power lines, trash burning, vehicle and building fires, power equipment, and smoking, resulting in 95% of known fire starts. Of the total acres burned between 1982 through 2008, a total of 92% resulted from two sources, arson (72%) and power lines (19%) (ForeverGreen Forestry 2010). Based on this data from 1982 through 2008, the causes for increased ignitions in the nearby Santa Monica Mountains, which represent the most significant fire threat to the Plan area, would be primarily from accidents associated with vehicles, power lines, power equipment, cooking fires, or intentional sources.

In order to reduce the potential ignition sources, this FPP provides a number of measures that directly address the potential for increased ignitions from these sources that historically have caused fires in the Santa Monica Mountains (along with measures for other potential sources), such as:

Vehicle sources

- Wider roadways and fuel modification along all access roads
- Restrictions and requirement for vehicle/equipment operation
- Walk-in camping

Power Lines

- There are no new, above ground power lines proposed by the project.

Power Equipment

- Restrictions on mechanical device use
- Requirement for mechanical device use
- Exclusion of mechanical devices from camp sites

Cooking Fires

- No flames will be allowed at any campsites.
- Cooking will be allowed on provided flameless, electric hot plate or similar

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- Lanterns will be battery or solar powered only.

Other Potential Plan Area Sources

- Enforcement of a No Smoking policy in all parks, punishable by a minimum \$541 fine
- Regular monitoring and patrols
- Visitor Education program
- Campground fuel modification
- Communication maintained with the LACoFD, City of Los Angeles Fire Department, the Ventura County Fire Department, California State Parks, and the National Park Service to promote cooperative fire prevention and response efforts
- Performance of annual brush clearance and fire prevention on its properties
- Maintaining fire extinguishing/fighting equipment on site
- Restricting and monitoring most aspects of site use

Arson

The last primary potential ignition source, intentional fires/arson, has historically been an issue in the Malibu area. The trend has been toward increasing area burned in wildfires, resulting from the high number of arson-related ignitions associated with Santa Ana winds (ForEverGreen Forestry 2010). When the weather conditions are favorable for wildfire ignition and spread, arsonists have made their presence in the Santa Monica Mountains known. The importance of the Santa Ana winds to overall wildfire severity and risk cannot be understated. Statistics reveal that wildfires ignite with approximately equal occurrences in summer and fall, but almost 90% of the total area burned occurs in late fall, when Santa Ana winds are blowing (National Park Service 2005).

To address these risks, the FPP requires:

- Closure of parks and trails on Red Flag Warning days/periods – the period when arson has been at its peak. Results in removing visitors from potential risk and enables Rangers to monitor any unauthorized persons or vehicles on site.
- Monitoring of park use visitation to protect Park properties from potential risks associated with unauthorized and unattended visitors

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- Additional eyes and ears in the field when open to visitors and campers - increasing the number of humans in the area who are wildfire educated and monitored by the equivalent of law enforcement agents (MRCA Rangers) may have an opposite effect in reducing arson related ignitions

In addition, the project will participate and implement the following programs throughout the Plan area, which will support LACoFD efforts throughout the remaining wildlands of Los Angeles County:

- Support wildfire education programs for all visitors and in the community
- Involvement in the “We Tip” program with signage indicating Ranger telephone numbers
- Neighborhood Watch program participation
- Work with LA County Fire on testing and using Remote Ignition Detection Systems
- Supporting coordination and training between agencies

In order to reduce potential on-site risks associated with human-influenced wildfire ignitions, the Conservancy/MRCA also implements the following measures, which will be continued, and in some cases made more restrictive, with the project:

- Employment of 75 (total increases during high fire season) trained wildland fire fighting personnel
- Maintenance and deployment of its own fire fighting equipment, including:
 - 1 Type I Class A Foam engine
 - 1 4 wheel drive Type II engine
 - 1 Type III 4x4 engine with Compressed Air Foam System
 - 2 Type III engines
 - 2 4 wheel drive Type IV engines with
 - 2 4 wheel drive Type IV engines with Compressed Air Foam System
 - 8 Type IV engines
 - 1 Water tender
 - Provisions for fire engine sheds at Malibu Bluffs and Corral Canyon Park, as discussed in the focused FPPs for those facilities.
- Storage of water for fire fighting purposes in parks with campsites
- Housing of a remote automated weather service station for the LACoFD at Ed Edelman Park in Topanga Canyon
- Providing helicopter-landing zones on its property.

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These measures combine to address potential ignition sources that have historically caused fires in the Plan area.

Despite current Conservancy/MRCA fire prevention measures intended to minimize wildfire risk within Parks, the potential does exist for wildfires originating off site and burning or spotting into the Plan area. As such, this FPP outlines numerous fire protection standards that are more restrictive than those already in place by State Parks in campgrounds in the Santa Monica Mountains. These protection standards are outlined in Section 5.0 and are intended to augment currently employed fire risk reduction efforts and minimize fire risk within the Plan area.

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5.0 FIRE SAFETY REQUIREMENTS

The preparation and implementation of this FPP and the site-specific risk assessments for each Park property included in the Plan area provide fire protection and emergency relocation measures designed to minimize the risk of fire ignition, reduce the risk to Park users and adjacent properties, enhance the ability of responding fire fighters to access the Parks, and provide for off-site relocations or contingency sheltering should an emergency wildfire occur.

The following sections detail the fire safety requirements that will be provided for the Park sites.

5.1 Notification and Enforcement

Long-standing practices, notification and enforcement policies will be improved and implemented. The standard park rules and regulations per existing policies of the Conservancy/MRCA along with new policies defined herein will be enforced, including those related to fire safety:

- Except in designated camp areas, park properties shall be closed sunset to sunrise.
- No smoking or fires.
- No alcoholic beverages.
- No littering or dumping.
- No unauthorized vehicle use.
- Possession of firearms, bow and arrow prohibited.
- Violations subject to \$1,000 fine and/or 6 months in County jail.

This partial list of restricted activities, along with additional restrictions/requirements defined herein, will be prominently displayed on site, and in handouts provided at registration for camp uses.

Visitor notification of Park restrictions and fire safety measures will occur through a variety of communication methods. Among the notification procedures, printed material will be provided at check-in, information will be shared verbally by Park personnel and Rangers, signage will be placed at Parking areas and key areas associated with the proposed improvements, educational materials will be provided on-site, and Web-based information will be added to the existing Web Page.

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5.2 Fuel Modification

5.2.1 Zones and Permitted Vegetation

As indicated in preceding sections of this FPP, an important component of a fire protection system is the fuel modification area. Fuel modification areas are designed to gradually reduce fire intensity and flame lengths from advancing fire by reducing fuels, placing thinning zones, restricted vegetation zones, and irrigated zones adjacent to each other on the perimeter of structures and adjacent naturally vegetated areas. As outlined in their Fuel Modification Plan Guidelines (Appendix F), the LACoFD designates a variable width fuel modification area based on fuels, topography, fire history, and construction type. Cal Fire also requires fuel modification around structures, although less restrictive and specific than that specified by LACoFD. Fuel Modification Plans will be prepared for the various Park improvements and will incorporate fuel modification requirements as outlined in this FPP, incorporating important considerations for fuel reduction and maintenance.

The fuel modification zones will provide defensible space set backs and will be maintained on at least an annual basis by May 15 or more often, as needed. Maintenance will be provided by the Conservancy/MRCA and will be consistent with standard fuel management practices, described below.

Improving the overall fire safety in the Plan area region is a supplementary goal of this FPP. As such, it is encouraged that neighboring property owners provide defensible space around their structures as required by state law (Public Resources Code, Section 4291) for SRA lands and by LACoFD for properties within their jurisdiction. The combined efforts of the MRCA and its neighbors will improve the overall fire safety and reduce risk in the area.

The following descriptions are fuel modification guidelines that will be fully or partially implemented, as directed by the focused FPPs in Appendices A through D, with approval of this FPP. The fuel modification guidelines are modeled after LACoFD's guidelines and customized for the site's recreational uses and improvements.

Ramirez Canyon Park currently receives the most complete and extensive fuel modification maintenance based on the existence of buildings throughout portions of the Park. Escondido Canyon Park and Latigo Trailhead, Corral Canyon Park and the Bluffs currently receive minimal fuel modification based on the lack of potentially combustible or other buildings to which the fuel modification guidelines apply. This project proposes to provide fuel modification areas around proposed campsites, parking areas, roadways, and camp host accommodations, optional

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emergency fire shelters (at some Park facilities) and fire truck sheds that are appropriate for the type of use and that implement the LACoFD fuel reduction concepts.

Fuel modification requirements will vary at each park property depending on site-specific characteristics and the type of improvement/uses proposed. Site-specific planting and spacing requirements apply to all Parks, as described in Appendices A through D.

Fuel Modification Zones

Zone A – Irrigated Zone Applicable at Ramirez Canyon Park , Corral Canyon Park, and Conservancy-Owned Malibu Bluffs

The setback Zone A encompasses all areas of the project site extending 20 feet beyond the edge of combustible structures, attached accessory structures, or appendages and projections. Irrigated Zone A applies only to Ramirez Canyon Park and to Corral Canyon Park (host accommodation structure); however, the planting and spacing requirements of Zone A are applicable at all Parks, as described in Appendices A through D and in the following sections. Zone A shall be planted and maintained according to this FPP and based on LACoFD requirements.

Specific Requirements – Zone A

- Irrigation by automatic or manual systems shall be provided to landscaping to maintain healthy vegetation with high moisture content (Ramirez Canyon Park, all structures and Malibu Bluffs and Corral Canyon Park, host accommodations only).
- Landscaping and vegetation in this zone shall consist primarily of ground covers, and adequately spaced shrubs and trees. The overall characteristics of the landscape shall provide adequate defensible space in a fire environment. Such defensible space shall be to the design standards, and maintenance requirements of the FAHJ.
- Plants in this zone shall be highly fire resistant and included on the updated LACoFD Desirable Plant List (Appendix F). Other species may be utilized subject to approval of fuel modification plans.
- Target tree species (including, but not limited to eucalyptus, pine, juniper, cypress, cedar, Canary Island date palm, California fan palm, Mexican fan palm, bougainvillea, and other flammable species) shall not be allowed within 10 feet of combustible structures.
- Vines and climbing plants shall not be allowed on any combustible structure.

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- Complete removal of undesirable plant species (chamise, redshank, California sagebrush, buckwheat, sage, pampas grass, cypress, eucalyptus, juniper, and pine) is required in this zone.

Zone B –(Irrigated Portion Applicable at Ramirez Canyon Park for Existing Structures, Corral Canyon Park and Conservancy-Owned Malibu Bluffs for Camp Host Accommodations)

The irrigated Zone B extends from the outermost edge of Zone A up to 100 feet from structures and is very similar to Zone A with regards to plant types, densities, and maintenance requirements. The irrigation component of this Zone is applicable at all Parks adjacent permanent host accommodations. The planting and spacing requirements (except for irrigation) of Zone B are applicable at Corral Canyon Park and the Bluffs adjacent to Fire Engine Sheds and optional Fire Shelters, as described in Appendices A through D and in the following sections.

Specific Requirements – Zone B

- Irrigation by automatic or manual systems shall be provided to landscaping to maintain healthy vegetation with high moisture content (Ramirez Canyon Park, Corral Canyon Park and the Bluffs permanent Camp Host Accommodations, only).
- Fine fuels (grasses) shall not exceed 3 inches in height.
- Plants in Zone B shall be fire resistant and spaced appropriately. Species selection should be made referencing the updated LACoFD Plant List included in Appendix F. Other species may be utilized subject to approval of fuel modification plans.
- Plant spacing in this zone shall be in accordance with LACoFD standards.
- Complete removal of undesirable plant species (chamise, redshank, California sagebrush, buckwheat, sage, pampas grass, cypress, eucalyptus, juniper, and pine) is required.

Zones C and D –

The thinning Zone C and interface thinning Zone D extend from the outermost edge of Zone B, up to 200 feet from structures. Zone C and D apply at Ramirez Canyon Park, all structures, Corral Canyon Park and the Bluffs adjacent to optional Fire Shelter structures and permanent camp host structures.

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Specific Requirements – Zone C/D (shall be consistent with current maintenance practices)

- Irrigation systems are not required for these zones.
- Removal of the majority of undesirable plant species (chamise, redshank, California sagebrush, buckwheat, sage, pampas grass, cypress, eucalyptus, juniper, and pine) is required.
- Removal of dead/dying vegetation is required.
- Fine fuels (grasses) shall not exceed 3 inches in height.
- Landscaping and vegetation in this zone may consist of modified existing native plants, adequately spaced ornamental shrubs and trees, or both. There may also be replacement landscape planting with ornamental or less flammable native species to meet minimum slope coverage requirements
- Fuel loading shall be reduced by pruning/trimming retained shrubs and trees without reducing overall canopy cover or removal of root systems.
- Natural vegetation shall be thinned by reduced amounts as the zone moves away from structures.
- Plants in Zone C and D shall be spaced appropriately. Species selection should be made by referencing the updated LACoFD Plant List included in Appendix F. Other species may be utilized subject to approval of fuel modification plans.

Fuel Modification Requirements Applicable at All Parks (Except Escondido Canyon Park)

Campsite, Parking, and Non-Combustible Camp Host and Fire Truck Shed Fuel Modification

An annual fuel modification plan for vegetation management at each Park (except Escondido Canyon Park) will be prepared by Conservancy/MRCA and implemented prior to the fire season with special focus provided for road interface areas, parking area adjacency, optional emergency fire shelters, and campsites. The fuel modification program will focus on:

Campsites, Parking, Restrooms, Employee/Camp host RV

A total of 20 feet of fuel modification in one zone will be provided. The fuel modification area adjacent to all sides of these improvements will consist of thinning zones where existing vegetation is removed to represent a 75% thinning (from existing conditions) for the extent of the 20-foot wide zone. Thinning will include removal of highly flammable plant species, dead and dying plant material, creating horizontal and vertical spacing, mowing grasses and understory

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plants to 3-inch height, and creating a highly interrupted, non-continuous fuel zone. Plant species and maintenance requirements will be consistent with those in LACoFD's Zone A and B as described above, with the exception of irrigation for all but Corral Canyon Park's Camp Host Accommodations.

Permanent Camp Host Accommodations

The camp host accommodations at Corral Canyon Park will be located in the parking lot area, within the existing 200-foot wide fuel modification area of off-site structures. Based on the location of the camp host accommodations and adjacent ESHA, the structure will receive 100 feet of fuel modification, consisting of an A and B zone, including irrigation. The terrain and vegetation in this area justify a reduced fuel modification zone width, as proposed.

Permanent camp host accommodations at Malibu Bluffs will be located in Camp Area 1 and Camp Area 3. These structures will each receive 200 feet of fuel modification as previously described.

Fire Engine Shed

A total of 100 feet of fuel modification in two zones will be provided for each fire engine shed. The fuel modification area adjacent to all sides of the sheds will consist of thinning zones where existing vegetation is removed to represent a 75% thinning (from existing conditions) in the first 50 feet and a 50% thinning (from existing conditions) for the next 50 feet, to 100 feet total. Thinning will include removal of highly flammable plant species, dead and dying plant material, creating horizontal and vertical spacing, mowing grasses and understory plants, and creating a highly interrupted, non-continuous fuel zone. Plant species and maintenance requirements will be consistent with those in LACoFD's Zone A and B as described above, with the exception of irrigation.

Fire Access Road Zone

This zone extends 20 feet, which is twice the code requirement except in select locations for some parking locations/roads at Latigo and Malibu Bluff to avoid/minimize native vegetation impacts) from the edge of any proposed public or private roadway (excluding driveways), and may be used as access for firefighting apparatus or resources.

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Specific Requirements – Fire Access Road Zone

- Clear and remove flammable growth for a minimum of 20 feet on each side of Fire Access Roads (Fire Code Section 317.10) or to property or easement line; Ramirez Canyon Road vegetation will be trimmed back, if required. Note that there are limited areas where 10 feet (Code requirement) of fuel modification will be provided adjacent to parking and roads at Latigo and Malibu Bluffs to avoid/minimize native vegetation impacts.
- Fire access roads, driveways, and turnarounds shall be maintained in accordance with Fire Code. Fire Access Roads shall have unobstructed vertical clearance (Fire Code Section 503.2.1) of a minimum of 13 feet 6 inches.
- Landscaping and native plants within the 20-foot Fire Access Road Zone shall be appropriately spaced and maintained to provide safe egress in wildland fire environments, including the removal of high Btu producing elements

Optional Emergency Fire Shelters and Ramirez Canyon Park Designated On-Site Shelters - Fuel Modification

A total of 200 feet of fuel modification in four zones will be provided for each project optional emergency fire shelter (Corral Canyon Park, the Bluffs, and Murphy Way) and at the Ramirez Canyon temporary on-site shelters. The fuel modification area adjacent to all sides of the shelters will consist of thinning zones where existing vegetation is removed to represent a 75% thinning (from existing conditions) in the first 100 feet and a 50% thinning (from existing conditions) for the next 100 feet, to 200 feet total. Thinning will include removal of highly flammable plant species, dead and dying plant material, creating horizontal and vertical spacing, mowing grasses and understory plants, and creating a highly interrupted, non-continuous fuel zone free of sustained high Btu producing elements. Plant species and maintenance requirements will be consistent with those in LACoFD's Zone A and B as described above, with the exception of irrigation. Ramirez Canyon Park structures will include irrigated Zones A and B.

Maintenance

All Fuel Modification Zone maintenance will be completed at least annually by May 15 of each year and more often as needed for fire safety, as determined by the appropriate fire agency. MRCA will provide on-going/as-needed fuel modification zone maintenance that will include:

- Pruning of foliage to reduce fuel load, vertical continuity, and removal of plant litter and dead wood.

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- Removal or thinning of undesirable combustible vegetation and replacement of dead or dying landscaping.
- Chipping removed material to at least 4 inches diameter and distributing on site in fuel modification areas around campsites to reduce likelihood of weed growth.
- Pruning lower branches of trees and tree-form shrubs to one-third of their height (or 6 feet from the lowest hanging branches) to help prevent fire from spreading upward into the crown.
- Maintaining ground cover at a height not to exceed 18 inches. Annual grasses and weeds shall be maintained at a height not to exceed 3 inches.
- Removing accumulated plant litter and dead wood. Debris and trimmings produced by thinning and pruning should be removed from the site or chipped and evenly dispersed in the same area to a maximum depth of 5 inches.
- Maintaining manual and automatic irrigation systems (Ramirez Canyon Park and Corral Canyon Park) for operational integrity and programming. Effectiveness should be regularly evaluated to avoid over or under-watering.
- Complying with these FPP requirements on a year-round basis. Annual inspections are conducted following the natural drying of grasses and fine fuels, between the months of April and June, depending on precipitation during the winter and spring months.

Preparation of Plan area-specific fuel modification plans will commence and be completed prior to site preparation work. The fuel modification plans will be prepared by a qualified fire protection planner and will include CAD-generated drawings of the improvements and specific fuel modification requirements for each improvement. Final review and approval of the fuel modification plans will be provided by the appropriate fire agency.

Construction Phase Vegetation Management

Vegetation management requirements shall be implemented at commencement and throughout the construction phase. Vegetation management shall be performed pursuant to this FPP on all building and/or campsite locations prior to the start of ground disturbing work and prior to any import of combustible construction materials. Adequate fuel breaks shall be created within proposed development areas around all grading, site work, and other construction activities in areas where there is flammable vegetation.

In addition to the requirements outlined above, the Project will comply with the following important risk-reducing vegetation management guidelines:

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- Any new power lines shall be underground for fire safety during high wind conditions or during fires on a right-of-way that can expose aboveground power lines.
- Construction equipment will be properly equipped with spark arrestors and catalytic converters, as appropriate, and permits will be obtained before their use.
- Fire suppression equipment, including U.L. rated fire extinguishers, shovels, and a 5 gallon backpack pump, shall be on-site and ready for use during any construction activities that could result in vegetation ignition including vehicle operation, hot work (welding, grinding, cutting), grading, vegetation management, etc.
- Although not anticipated on this site, vegetation management zones cannot extend beyond the property ownership without written, legal permission of off-site landowners, and shall not extend into sensitive biological areas, or other areas controlled by the City, County, and/or resource agencies, without first having written formal permission from all applicable agencies.
- Caution must be used not to cause erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping, or irrigation. No uprooting of treated plants is necessary.
- All vegetation management and maintenance work performed annually at the various Park facilities will be entered into a Fire Prevention/Fuel Modification database. The database will be useful for planning annual maintenance and tracking work completed throughout the Plan area.

5.3 Campgrounds

The intended site improvements associated with Ramirez Canyon Park, Latigo Trailhead, Corral Canyon Park and the Bluffs are limited to varying implementation of campsites, picnic and parking facilities, camp host accommodations, optional emergency fire shelters (Corral Canyon Park and the Bluffs) and fire engine sheds. Escondido Canyon Park will receive trail improvements only. Application of full fuel modification zones of 200 feet or more for some of these uses is not considered appropriate based on the lack of permanent buildings and variation from intent of defensible space requirements (e.g., campsite locations include low-impact, cold camping in which campfires and any open flame are strictly prohibited and include no permanent structures). However, these uses will receive fuel modification specifically intended to minimize risk of fire ignitions, as previously described. In addition, the following restrictions will be enforced at campsites, picnic and parking facilities, camp host accommodations, project optional fire shelters, and fire engine sheds:

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- Shall be located within existing public use areas to ensure easy access for purposes of maintenance and patrol, and in case of emergency.
- Shall generally be placed in areas with flat or nearly flat terrain and shall be located in areas of lower intensity fuel types.
- A Camp Host, staff maintenance person, or Ranger, who is wildland fire-trained, will be on site at each park property during the times camping is permitted. When camping is not permitted, rangers will make regular patrols. See Patrols text (DEIR, Chapter 2.0). Every Camp Host shall be a public officer designated pursuant to the MRCA Park Ordinance as authorized by the Public Resources Code. As public officers, Camp Hosts, and/or Park Rangers shall enforce all applicable ordinances and regulations, including the "cold-camping" provisions cited within the PWP. To ensure adequate staffing and to meet this condition, the following overnight accommodations are provided as part of the plan:
 - Conservancy's Malibu Bluffs Property: two permanent residential structures, two camp host RVs
 - Corral Canyon Park: one permanent residential structure
 - Ramirez Canyon Park: Year-round park oversight and management is provided from existing on-site Ranger/maintenance supervisor residence utilized by MRCA staff charged with security, site management, and public safety duties.

Staffing from the Conservancy's Malibu Bluffs Property will be available to cover shifts at Corral Canyon Park if necessary. Park patrols shall be conducted daily at each park property when campers are present. Adjustments to patrol procedures will be made as necessary to ensure park rule enforcement and compliance.

- No person shall make or maintain, nor aid and abet others in making or maintaining, a campfire or any other open fire in any of the park facilities. The only cooking apparatus permitted shall consist of small electrical cooking appliances when permitted and consistent with the terms of the approved FPP.
- Lanterns will be limited to battery or solar powered only.
- Campers shall be required to utilize designated, flameless cook stations (hospitality stations) provided at each approved campsite, which shall be designed of nonflammable materials and capable of being enclosed vertically on three sides. Cold-camping apparatus such as flame-less cook-stoves and lanterns shall be required. Prospective campers shall be informed of the No Campfire/Cold Camp Policy upon reserving and/or registering for use of camp facilities and will be offered the opportunity to check out a dual burner electrical hot plate for cooking purposes during their stay. Small electric cooking

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appliances may be brought with campers, subject to inspection and approval by MRCA rangers, camp host or staff. To facilitate the use of flameless cook surfaces, each approved camp site will be provided an all weather electric outlet. Further, campers will be put on notice that unauthorized use of fire-related camping and cooking apparatus specifically prohibited by the No Campfire/Cold Camp Policy (including liquid fuel: alcohol, kerosene, unleaded gasoline, white gas, mentholated Spirit, etc.; canister fuel (propane, butane, etc.; wood, wax or any other type of combustible material, etc) will be cause for confiscation of such devices and/or expulsion of visitors from camp facilities. Signs shall be posted and camp areas will be routinely patrolled to enforce the No Campfire/Cold Camp Policy and notification provided that violation of the No Campfire/Cold Camp Policy may be punishable by fines up to \$1,000.00. In addition, campers would be notified that use of the cook station electrical outlet(s) for space heaters, lighting sources, hair curling and flattening devices, blow dryers, stereos or other devices emitting audible noise would be cause for confiscation of such devices and/or expulsion of visitors from camp facilities

- Fire protection equipment shall be provided and maintained at all camp facilities and shall include, at a minimum:
 - Water storage tank or water delivery system (water lines, hydrants, hose cabinets) designed, located, and maintained to provide a dependable water supply for fire protection at each proposed camp area at all times.
 - A portable and air-powered quick attack firefighting system to be provided at each camp facility for ready deployment by trained Camp Host, Ranger, or park personnel in the event of a fire.
 - Portable, self-contained, U.L. rated fire extinguisher units to be provided for each cluster or group of campsites.

5.4 Access

The Modified Redesign Alternative project will improve access and parking for recreational uses throughout the Plan area and the Focused FPPs included in Appendices A through D provide details regarding access and egress improvements for each Park.

In summary, Ramirez Canyon Park access would receive the most extensive improvements and they would occur within Phase 1, if required by the FAHJ (or other similar alternative measures required by the appropriate fire agency consistent with Fire Code allowances). Because the project does not propose a typical subdivision of land, and existing roadways would serve the

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project, improvements will be subject to the FAHJ and may include widening of Ramirez Canyon Road and Delaplane Road to 20 feet unobstructed with four segments of 26 foot width for 50 linear feet at existing fire hydrant locations (or other similar alternative measures required by the FAHJ consistent with Fire Code allowances).

Secondary access for Ramirez Canyon Park would be provided by Via Acero Road off Kanan Dume Road in Phase 2, subject to securing easements or by eminent domain. Via Acero Road, like Ramirez Canyon Road and Delaplane Road, would be improved, if required by the FAHJ and would include widening, surfacing, grade specifications, and fuel modification (or other similar alternative measures required by the FAHJ consistent with Fire Code allowances). The Road would be utilized as an emergency ingress/egress route with an LACoFD approved gate.

Vehicular access at the other Parks will be supported by new or improved driveways to parking areas that are accessed from Pacific Coast Highway (Corral Canyon Park and Bluffs,) and Latigo Canyon Road (Latigo Trailhead), in addition to the existing emergency access roads presently included at Escondido and Corral Canyon Parks (described in Section 4.2).

To assist with fire department access and staff and visitor egress, the following requirements will be implemented:

- A Relocation Plan (Appendices A through D) for each park property exists and will be revised per this FPP and as necessary where ongoing drills and training result in gained efficiencies.
- Early relocation will be the highest priority and therefore a conservative management action point (trigger) to evacuate staff and visitors from the Parks will be utilized, freeing the roadways up for responding firefighter access and adjacent property owner evacuation.
- Ramirez Canyon Park will include several access improvements, implemented with Phases discussed above:
 - The proposed Plan includes widening of Ramirez Canyon Road to 20 feet unobstructed width in Phase 1, if required (or other similar alternative measures required by the FAHJ consistent with Fire Code allowances).
 - The existing gate and pilasters along Delaplane Road will be removed and a new gate with 20-foot wide opening would be constructed in Phase 1, if required.
 - The Wooden Bridge Reinforcement Plan, previously developed and implemented to provide for reinforcement of the existing wood bridge over Ramirez Canyon Creek, shall be maintained to ensure that the bridge will safely support 75,000 pounds so fire

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- apparatus are accommodated for emergency access. This improvement would occur in Phase 1, if required. The wood bridge shall be maintained in sound condition to ensure safe and adequate emergency access to the Park.
- An Emergency Access and Emergency On-Site Parking Plan for Ramirez Canyon Park, prepared by a licensed civil engineer and approved by the appropriate Fire Agency as compliant with applicable state and county fire and life safety regulations, shall be maintained.
 - All Ramirez Canyon Park uses, including administrative uses, public outreach, events, gatherings, tours, and workshops, etc. shall be limited in size, duration and occurrence to comply with the proposed maximum of 40 round trips per day on Ramirez Canyon Road. This measure will ensure that vehicle trips associated with Park uses on Ramirez Canyon Road will be limited to 40 round trips/day each day (in addition to Park closures on Red Flag Warning and Flash Flood/Flood Warnings or Urban/Small Stream Advisory when no trips would be generated on Ramirez Canyon Road for Park uses), and thus will maintain available capacity on Ramirez Canyon Road for responding firefighter access and adjacent property owner evacuation in the event of emergency.
 - Special events held during the fire season at Ramirez Canyon Park shall retain all guest vans, shuttles, and drivers continuously on site during the event such that persons can be quickly evacuated from the park by readily available on-site transportation. Additional vehicles shall be provided, as needed, on site at Ramirez Canyon Park so that there would be enough vehicular capacity to relocate all persons on site for any event in one trip out. Driver's will be given training covering egress routes and procedures for the early relocation of visitors.
 - The proposed Plan requires the use of vans and shuttles for Public Outreach Programs, Events, Gatherings, Tours, and Workshops at Ramirez Canyon Park to minimize traffic trips on Ramirez Canyon Road, and requires that such vehicles travel with maximum passenger capability and in convoys, whenever feasible. Transportation to/from Ramirez Canyon Park for these pre-arranged group activities is generally required to use 10 to 15-passenger vans, except for Public Outreach Programs that may utilize 22-passenger vans, mini-coaches (24 feet long) or small buses limited to a maximum of 30 feet in length.
 - There will be no large group outreach programs for Escondido Canyon Park, Latigo Trailhead, Corral Canyon Park, or the Bluffs.

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5.5 Access Control

The restrictions that will be enforced at the Parks to reduce the possibility of fire and the effects of fire and to provide for the safety of Park users will be managed by MRCA rangers. To assist them with their duties, the following policies will be applied:

- Ramirez Canyon Park, Escondido Canyon Park and Latigo Trailhead, Corral Canyon Park and the Bluffs will be closed to all public use during any Red Flag Warning day/period as declared for the Santa Monica Mountains area by the National Weather Service, a division of NOAA as a provision to remove visitors during the period where large, severe wildfires occur in the Santa Monica Mountains (National Park Service 2005). Park properties shall be posted and patrolled to inform visitors of Red Flag Warning closures and notification provided that violation of the Red Flag Warning closure policy may be punishable by fines up to \$1,000.00.
- Camping and all recreational activities at all park properties will be prohibited, and Ramirez Canyon Park shall be closed to events, tours, camping reservations or other special functions, when any Flash Flood/Flood Warnings or Urban/Small Stream Advisory is issued. Signs will be posted and camp areas will be routinely patrolled to notify park users and to enforce restrictions on park use during all Flash Flood/Flood Warnings and Urban/Small Stream Advisories as determined by the National Weather Service, a division of NOAA. Written warnings of the cancellation policy shall be provided to potential campers and prospective program and event sponsors prior to contracting for park use.
- Public Outreach, Events, Gatherings, Tours, and Workshops at Ramirez Canyon Park will be subject to the following limitations:
 - Continuation of existing small events (e.g., public outreach meetings, etc. (Phase 1))
 - Year-Round, Permitted 2 Days/Week
 - Maximum 40 Participants (with an additional 20 staff on-site)
 - 8:00 AM – Dusk
 - Minimum 10 Outreach Events Conducted Per Month at Ramirez Canyon Park, Escondido Canyon Park or Corral Canyon Park, with no

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more than 8 outreach events conducted at Ramirez Canyon Park
(except when precluded by public safety concerns)

- Conservancy/ MRCA Employee Training and Workshops (Phase 1)
 - Year-Round, Permitted twice per month.
 - Maximum 60 persons on-site.
 - 8:00 AM – Dusk

- Phase 2 – Public Outreach Programs
 - Year-Round, Permitted 7 Days/Week
 - Maximum 40 Participants (with an additional 20 staff on-site)
 - 8:00 AM – Dusk
 - Minimum 10 Outreach Events Conducted Per Month at Ramirez Canyon Park, Escondido Canyon Park or Corral Canyon Park, 5 of which shall be conducted at Ramirez Canyon park (except when precluded by public safety concerns)
 - Tours and/or Small Gatherings (Phase 2)
 - Year-Round, 12 Tours or Gatherings Permitted/Month
 - Maximum 40 Participants (with an additional 20 staff on site)
 - 8:00 AM – Dusk
 - Special Events (gatherings of participants/ guests numbering more than 40) (Phase 2)
 - March – October, 16 Events Permitted/Year, 1 Event Permitted/Week
 - Maximum 200 Participants (April 1 through July 31) (with additional 50 staff and employees of service providers)

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- Maximum 150 Participants (March 1 through March 31 and August 1 through October 31) (with additional 50 staff and employees of service providers)
- 8:00 AM – 9:00 PM Sunday-Thursday, and 8:00 AM to 10:00 PM Friday and Saturday, One Additional Hour is Allotted for Personnel Clean-Up and Securing the Facility.

5.6 Building Standards

Structural components proposed for the Park enhancement project are limited to restroom facilities, water tanks, camp host accommodations (Corral Canyon Park and Malibu Bluffs), optional emergency fire shelters (Murphy Way, Corral Canyon Park and the Bluffs) and fire engine sheds. Where it is infeasible or not appropriate to meet all applicable current Building and Fire Code requirements for fire protection due to site or resource constraints, this FPP provides alternatives, as provided by Section 702A of Chapter 7A of the 2007 California Building Code and Section 4702.1 of the 2007 California Fire Code, as may be amended for review and approval by the authority having jurisdiction. Modifications proposed in this FPP are based on the type of occupancy/use, analyzed site fire risk and proposed measures for reducing the risk including design, construction, maintenance and operation requirements of the park improvements in compliance with applicable fire codes and, where necessary, fire protection enhancement requirements to provide "same practical effect" or functional equivalency for any non-code complying park improvement element.

5.6.1 Ignition-Resistant Structural Requirements for Fire Safe Shelters and Retrofits

The following descriptions address the ignition resistance of the various structures proposed for this project including: optional emergency fire shelters, fire engine sheds, restrooms, host accommodations, and retrofits to designated fire shelters and existing structures at Ramirez Canyon Park.

LACoFD has previously required the placement of emergency fire shelters for the proposed Plan. The optional (as proposed in this FPP) fire shelters are planned at various locations near the camp areas at Corral Canyon Park and Conservancy-Owned Malibu Bluffs (Figure 10) and trail locations at Murphy Way (Trail 2a6) and Corral Canyon Road (Trail 13b) based on LACoFD review and recommendation. These shelters are described in more detail in the following section. The Modified Redesign Plan concentrates camping in areas adjacent highways, roadways, open

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irrigated parks, or irrigated campus lawn. The shelters are not considered a crucial component of fire protection planning at these locations given location and the other restrictive components outline in this FPP. These shelters are considered optional and would only be installed if required and approved by the Coastal Commission, CAL FIRE (or its representative), and/or the Los Angeles County Fire Department (LACoFD); all Conservancy-owned properties are under the fire jurisdiction of CAL FIRE, while MRCA-owned properties are under the fire jurisdiction of LACoFD.

Optional Emergency Fire Shelters

The optional emergency fire shelters proposed for this project would be built completely on-site, be delivered completely built/pre-fabricated, or pieces would be built off-site and assembled on site. They would be consistent with or exceed the Fire Code standards for ignition resistance.

The seven optional fire shelters are proposed for:

- West of Murphy Way Road, trail 2a6 – not associated with a particular Park facility
- Corral Canyon Park, east of Corral Canyon Road, trail 13b
- Corral Canyon Park, two within Camp Area 1
- Malibu Bluffs, Camp Area 3, two within Camp Area 4.

Each optional, emergency fire shelter would have a window and a door and would be made of Timbercrete or cement-based equivalent. Timbercrete has a very high fire resistance, exceeding a 4 hour exterior rating (Appendix G) and includes insulated metal fire resistant door, fire resistant triple paned glass window, and a fire resistant “spy hole”. The system used to prevent smoke and gas from entering the structure includes airtight construction for all but the door surround. The structures would be equipped with an air tank that can be turned on as a fire approaches. This slightly pressurizes the structure, forcing excess cooler air out around the small gaps surrounding the door, preventing smoke or gases from entering the structure. The foundation for the shelters would likely be poured in place with the use of a small cement mixer, or a larger cement truck where possible. These shelters would be 10.5 feet (width) × 11.8 (length) feet x 10.5 feet (height) and up to 12 feet (w) × 16 feet (l). The smaller shelter could, in an emergency situation, temporary shelter up to 17 people, based on 7 square feet per person. The larger structure could temporary shelter up to 27 people for a short period. The structures will be painted with ignition resistant paint colors that are earth-toned, camouflage, or otherwise compatible with the existing landscape.

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Fire Engine Sheds

In addition to the optional emergency fire shelters, the project will include two enclosed steel structures on concrete slab for parking fire engines and housing fire protection equipment. A 45-foot-long × 15-foot-wide × 12-foot-high fire truck shed structure will be placed in the existing parking area at Corral Canyon Park and a similarly sized structure will be placed on the Bluffs in the proposed parking area 1, in the western portion of the park (Figure 10).

Existing Structure Retrofits

If required by Cal Fire, existing structures at Ramirez Canyon Park may be retrofitted to provide improved ignition resistance. Retrofits will be focused on preventing ember intrusion into attics and crawl spaces and may include retrofitting vents and other openings (doors, windows). Additionally, each structure will be retrofitted with monitored interior sprinklers.

Camp Host Accommodations

The camp host accommodations will include mobile, travel trailer (Recreational Vehicle) based structures, with the exception of the one host accommodation at Corral Canyon Park and two of the host accommodations at Malibu Bluffs. These permanent modular structures will meet the latest fire and building codes, as applicable. The following section outlines the ignition-resistant construction (for applicable structures) that will meet the requirements of the 2007 CFC and CBC (Chapter 7A). Wind-borne embers and incendiary material present the largest risk from wildland fires for the proposed structures. The following features are designed to reduce ember penetration and shall be utilized as a guide for retrofitting designated structures that may be utilized as contingency shelters at Ramirez Canyon Park (discussed in detail in later sections of this FPP):

1. Exterior walls shall be approved noncombustible (stucco, masonry, or approved cement fiber board) from grade to underside of roof system. Any unenclosed under-floor areas shall have the same protection as exterior walls. Wall coverings shall extend from top of foundation to the roof. The underside of any cantilevered or overhanging appendages and floor projections shall maintain the ignition-resistant integrity of exterior walls, or projection shall be enclosed to grade. The Fire Code allows 0.375-inch plywood or 0.75-inch drop siding if there is an underlayment of 0.5-inch fire rated gypsum sheathing tightly butted or taped and mudded (Section 704A.3 CBC).
2. Two-inch nominal solid blocking shall be provided between rafters at all roof overhangs under exterior wall covering (Section 7041.3.1.1 CBC).

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3. Eaves and soffits shall meet requirements of the State Fire Marshal 12-7A-3 or shall be protected by ignition resistant materials or noncombustible construction on the underside (Section 704A.2.3 CBC).
4. All roofs shall be a Class "A" listed and fire-rated roof assembly, installed per manufacturer's instructions, to approval of the state Fire Marshal. Any openings on ends of roof tiles shall be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings shall not be less than 0.019-inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of No. 72 American Society for Testing and Materials cap sheet running the full length of the valley (Section 704A.1 CBC).
5. No attic ventilation openings or ventilation louvers shall be permitted in soffits, rakes, eaves, cornices, eave overhangs, or between rafters at eaves, or in other overhanging areas in the Wildland Urban Interface (WUI) area. Attic or foundation ventilation openings or ventilation openings in vertical walls or other similar ventilated openings shall be louvered and covered with corrosion-resistant metal screening or other approved material that offers equivalent protection. Vents are required to have a 1/8-inch mesh and shall not exceed 144 square inches each. Attic and foundation ventilation shall also comply with the requirements of the CBC. It is recommended that Flame and Ember resistant vents with internal baffles are applied to all wildland-exposed sides of these residences.
6. Vents shall not be placed on roofs unless they are approved for Class "A" roof assemblies or are otherwise approved by the state Fire Marshal.
7. Vents, such as roof vents, dormer vents, gable vents, foundation vent openings, vent openings in walls, or other similar vent openings, shall be covered with louvers and the required 1/8-inch mesh or are specific flame and ember resistant (i.e., Brandguard Vents).
8. Turbine vents shall not be utilized.
9. Glazing, including glass, or other transparent, translucent, or opaque glazing, or leaded glass, shall be one of the following: double pane with one tempered pane or glass block, or have a fire rating of 20 minutes (Section 704A.3.2.2). Plastic or vinyl window frames shall be of an approved type, which will not melt, ignite, or fail. Vinyl frames shall have welded corners and metal reinforcement in the interlock area to maintain integrity.
10. Skylights shall be certified to Architectural Manufacturers Association/Window and Door Manufacturers Association/Canadian Standards Association 101/I.S-2/A440 structural requirements. (Section 2405.5 CBC).

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11. Exterior doors shall be approved noncombustible or 1.25-inch solid-core wood or have a 20-minute fire rating. Windows within doors and glazed doors shall comply with item 11 above (Section 7904A.3.2.3 CBC).
12. All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbeques and grills, shall have spark arrestors of a type approved by the state Fire Marshal. Spark arrestor openings shall be a maximum 0.5 inch.

5.6.2 Fire Protection Systems

Infrastructure, Structural Fire Protection, and Fire Protection Systems

WUI fire protection requires a systems approach, which includes the components of vegetation management, structural safeguards (both previously addressed), and adequate infrastructure. This section summarizes the various proposed infrastructure improvements.

Water Supply

There are no new structures (other than stand-alone restroom facilities, water tanks, three camp host modular accommodation, optional emergency fire shelters and fire engine sheds) proposed for the park enhancements. Therefore, the needed fire flow typically calculated based on structure size, hydrant spacing, etc., is not applicable on some of these sites. Where not applicable, Parks will receive water infrastructure water capacity and delivery improvements appropriate for wildland fire fighting purposes and for recreational camp area uses. Latigo Trailhead will receive water improvements for day use areas and hydrants at the parking area. Escondido Canyon Park will not receive water improvements .

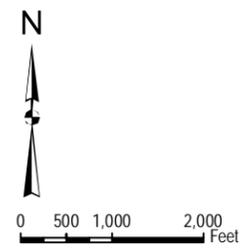
- The water supply for each Park is provided by Los Angeles County Waterworks via existing mains and connections as described in Section 4.1, and would be expanded and improved for the parks as described in the following section.
- The Ramirez Canyon Park swimming pool, 25,000 gallons, and existing 4,500-gallon and 10,000-gallon water tanks will be available for fire fighting purposes. An on-site pump is maintained and it is recommended that a drain and discharge line connected to a draft hydrant is provided.
- Portable dip tanks (3,500 gallons) are available at Ramirez Canyon Park and are positioned and filled during Red Flag Warning weather events.

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- Corral Canyon Park will receive a 10,000-gallon water tank and the Bluffs will receive two 10,000-gallon water tanks for water storage as well as a conveyance system of water lines to provide potable and fire fighting water.

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SOURCE: Penfield&Smith 2009

FIGURE 10
Optional Fire Shelter and Fire Engine Shed Locations

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Fire Hydrants

All of the park properties, except Escondido Canyon Park will receive new hydrants for fire protection. New hydrants would be installed at the parking areas at Latigo Trailhead and will have a maximum 4-inch feed from existing water distribution lines located along Latigo Canyon Road. New hydrants would also be installed at each of the Bluffs' two proposed parking areas and would have a minimum 4-inch feed from PCH. The hydrants at Latigo Trailhead, Corral Canyon Park and the Bluffs will provide fire flow necessary for wildland fire fighting. The hydrants at Ramirez Canyon Park are anticipated to provide fire flow of at least 1,500 gpm at 20-psi residual for at least 2 hours, which meets code (all existing structures will be retrofitted with interior sprinklers). Fire protection services for Ramirez Canyon Park would include three new hydrants and would continue to be supported by existing 4,500-gallon and 10,000-gallon water tanks, a 25,000-gallon swimming pool, and a central wharf head (all served by existing water lines). Corral Canyon Park wildland hydrants would draft from the proposed 10,000 gallon water tank. The standard fire hydrant in the parking area would be served by the water main PCH. The addition of three hydrants (Phase 1) and improved flow Ramirez Canyon Park provides a considerable increase in the water availability to fire fighters from current conditions.

In addition to the hydrants described above, wildland fire hydrants would be installed at each park property within 50 feet of any proposed camp area, all of which would be served by the water distribution lines described above, with the exception of Corral Canyon Park. Proposed wildland fire hydrants at Corral Canyon Park would be served by a new 10,000-gallon water tank, and water tanks would be installed at the Bluffs to provide a secondary unpressurized (gravity fed) water source for fire-fighting (in addition to the hydrants). The wildland fire hydrants would include a 2½-inch hose connection for Fire Department use.

Fire Sprinklers

Corral Canyon Park and Malibu Bluffs include modular-type camp host accommodations (3 total). These structures will be provided interior fire sprinklers, if required by Code, at the time of construction. Existing structures at Ramirez Canyon Park will be fitted with interior fire sprinklers meeting NFPA 13-D, or as appropriate based on occupancy type and square footage, as part of the RCP retrofit project.

Emergency Power

Emergency power generators and fuel supply at Ramirez Canyon Park necessary to maintain emergency lighting for at least 12 hours currently exist and shall be maintained on site. Diesel fuel storage shall be provided in a ConVault type above ground, protected tank.

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6.0 EMERGENCY PLANNING

Early relocation from the Parks will be the preferred method of safety when adequate warning is provided, which is anticipated to be the majority of the time when wildfires occur. Recent wildfires in Southern California, including the 2009 Jesusita Fire in Santa Barbara County, various wildfires in Los Angeles County and the 2007 San Diego County wildfires have proven the successful use of mass notification systems that help implement early relocations. The City of Malibu and the County of Los Angeles have recently purchased and rolled-out this mass notification technology (Reverse-911), partially in response to the damaging 2007 Corral and Canyon Fires in the Santa Monica Mountains, at which time this technology was not available in the County. With an emphasis on very conservative relocation Management Action Point, County Office of Emergency Management and fire authorities, including the on-site MRCA fire fighting personnel and Rangers at the Western Sector Emergency Operations Center for the MRCA, will enact pre-planned procedures to initiate relocation. During relocation, MRCA Emergency personnel will direct staff and visitors to utilize the primary access points in the various Parks, as detailed in the focused FPPs in Appendices A through D. In the case of the unlikely, but possible event, where relocation to an off-site area out of harms way would be too dangerous due to the location of the wildfire, the weather, or other circumstances, staff and/or visitors may be advised to relocate to temporary refuge from the approaching wildfire in one of two primary temporary options described below.

6.1 Relocation Planning

Wildfire emergency response procedures will vary depending on the type of wildfire and the available time in which decision makers from MRCA, Cal Fire, LACoFD, and/or County Office of Emergency Management can assess the situation and determine the best course of action. The term "relocation" is used instead of "evacuation" in this FPP as the term more accurately captures the intent of this FPP's relocation planning process, which is an orderly, pre-planned process where people are "relocated" from one area to an off-site area or to an emergency fire shelter. Orderly movement of people is the result of planning, training, education, and awareness, all of which will be proactively implemented by MRCA. Evacuation has been the standard term used for emergencies and implies imminent or threatening danger. The term relocation in this FPP similarly indicates that there is a perceived threat to staff and visitors and movement out of the area or to designated on-site locations is necessary. Visitor reactions may vary during a relocation event, although several studies indicate that orderly movement during wildfire and other emergencies is not typically unmanageable. Social science research literature indicates that reactions to warnings follow certain behavior patterns that are defined by people's perceptions (Aguirre 1994, Drabek 1991, Fitzpatrick and Mileti 1994, Gordon 2006, Collins 2004) and are

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not unpredictable. In summary, warnings received from credible sources by people who are aware (or have been made aware) of the potential risk, have the effect of an orderly decision process that typically results in successful evacuation. This success is heightened when evacuations are practiced (Quarentelli & Dynes 1977; Lindell & Perry 2004) as will be performed routinely throughout the Plan area. MRCA administration, rangers and fire fighters are provided on-going training regarding relocation events and effective management of individuals, small groups, and large events. Education regarding threat of wildfire will occur through the existing Web Page, at visitor check in/arrival on site, through printed materials, and reinforced by trained, on-site personnel.

The Barwood building at RCP currently serves as the Western Sector Emergency Operations Center for the MRCA, with full computer and radio dispatch capabilities in the event of an emergency. Trained dispatch personnel would be on-site at the Barwood building during a wildfire emergency. This on-site resource provides an additional layer of support for the Plan area relocation strategy by offering heightened access to important wildfire information for determining which relocation option to employee. Among the Barwood building communications and information support capabilities:

- VHF Base radio – high powered stationary radio with a fixed repeater in Upper Ramirez Canyon
- Satellite phone
- VHF Hand held radios (numerous)
- GIS mapping center
- Phone system
- Inforad Emergency Paging system

6.1.1 Wildfire Emergency Pre-Plan

The MRCA has pre-planned for wildfire emergencies and will continue to update the relocation component of that pre-plan as drills and on-going planning continue. Subject areas that shall be included in the emergency preparedness planning for each of the Parks include:

- Staff training (by MRCA, LACoFD)
- Building and facility protection (as defined in this FPP)
- Grounds protection (fuel modification zone purpose)

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- Fire prevention during High Fire Danger and Extreme High Fire Danger periods
- Emergency supplies (fire extinguishers, First-aid and AED kits, etc.)
- Telephones/communications
- Web based communication tactics – text messages, e-tools for information, education, and critical notifications
- Command list
- MRCA Emergency Operations Plan
- Annual review and update
- Emergency notification procedures
- Advisement of potential fire danger
- Emergency relocation/evacuation plan.
- Temporary sheltering in Peach House and Ranger/maintenance supervisor residence
- Temporary sheltering in Corral Canyon Park and the Bluffs optional fire shelters

6.1.2 Relocation Alternative Scenario

The following relocation scenarios are provided for illustration of decision-making and alternatives available for the Parks. Specific relocation plans are provided in the focused FPPs in Appendices A through D. Ramirez Canyon Park offers a last resort option of temporarily sheltering within designated fire protected structures. Corral Canyon Park and Malibu Bluffs offer project-optional fire shelters for last resort refuge.

The first priority for all Park facilities is early relocation from the Park to off-site areas away from the Plan area. This is evidenced by and will be aided by the fact that on declared Red Flag Warning days/periods, when vegetation ignition would be most likely to spread, the park will be closed to visitors and other activities, including camping. However, because southern California's fire season is now considered to be nearly a year-round event, wildfire may occur when persons are at the site, on non-Red Flag Warning days. Fires in the absence of high winds and low humidity during these periods would be expected to have much less aggressive behavior, but still require provisions for early relocation out of the area. Therefore, the Park includes provisions for following the “Ready, Set, Go!” policy that has been formulated and endorsed by FIREScope (FIrefighting REsources of Southern California Organized for Potential Emergencies”). The Ready, Set, Go! Program was designed for citizens in fire prone areas; FIREScope, with

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Ventura County Fire Department and Orange County Fire Authority, developed and approved the program that focuses on preparation and early evacuation. In addition to the early relocation plan, three of the Park facilities include a contingency, "last resort," temporary on-site sheltering, should relocation from campsites or the developed portions of the Park be determined to be more dangerous than remaining on site. The following sections discuss emergency response decision making and the relocation and temporary on-site sheltering alternatives available Park staff and visitors.

Generally, relocations will include conducting sweeps of the park facilities, camp areas and day-use areas, and immediately adjacent trails, and directing staff and visitors to their vehicles for relocation from the area via improved roadways, which service each of the Park areas.

On at least an annual basis, MRCA will conduct fire relocation drills to train staff on efficient and effective relocation of each Park area during a wildfire emergency. MRCA fire fighters will observe and participate in annual drills and will have the authority to revise the procedure as necessary to provide the most efficient and safest relocation process.

If relocation of staff and visitors is required, the following procedures would be followed.

6.1.3 Off-Site Relocation Process

Relocations of Park visitors will typically occur during large, distant wildfire events that, due to weather patterns and difficulty in gaining control, could threaten the area. Under this scenario, MRCA Emergency Staff and administrators, in consultation with fire officials involved with the fire Incident Command and supported by the Ramirez Canyon Park located Western Sector Emergency Operations Center for MRCA, would evaluate the wildfire event and determine at which point relocation would occur, with a conservative Management Action Point threshold (i.e., relocations will be required well before fire is threatening the greater Malibu area).

As discussed, during Red Flag Warning days/periods as declared for the Santa Monica Mountains area by the National Weather Service, a division of NOAA, all the Parks will be closed to all recreational use. On non-Red Flag Warning days, when wildfire potential is lower and wildfire behavior is more predictable and controllable, visitors will be allowed. On a non-Red Flag Warning day/period, should a wildfire occur that allowed time to relocate, visitors at all Park facilities in the Plan area would be quickly relocated with the assistance of MRCA's internal pre-plan which includes Ranger delivered warnings, visitor "round up" and accounting, and disbursement without the need for local law enforcement assistance, as described below.

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In the event of a notification of wildfire and the decision to relocate:

- Staff will conduct a sweep of the facility and of the trail system within the vicinity of the parks to notify hikers/pedestrians of the relocation decision. Hikers will be briefed at check in and by signage regarding wildfire danger and responses. MRCA Rangers will broadcast an alarm/siren from vehicle mounted or portable public address systems so hikers on trails beyond the immediate vicinity of the Park and Trailhead are alerted and return to their vehicle. Communication with registered campers will be via cell phone (cell phone numbers will be collected at check in and may be utilized for tracking individuals' locations via GPS in an emergency) and may include the use of e-tools to support critical notification such as text messages, twitter alerts, or other e-alerts, and/or when possible, trail sweeps by MRCA Rangers. To retain camper privacy, all camper personal cell phone and text information will be purged from the MRCA digital and/or hard copy file within one week following camper departure. This information will not be used for any other purpose than emergency or camping-related contacts. In addition, another resource available for notification that has been used in the past, MRCA's Interagency Pre-Plan includes coordination with LA County Sheriff's Office for helicopter assistance with notification and/or rescue of remote trail users during emergency situations.
- Visitors will be directed to their vehicles. Visitors without vehicle transportation will carpool with other visitors or with MRCA staff. Visitors with special needs will be provided assistance by MRCA rangers, as necessary, so that relocation occurs in a safe and efficient manner.
- Vehicles will exit the site via the primary site access points and eventually onto PCH.
- The vehicles will drive either east or west on PCH, as directed by MRCA fire personnel and/or law enforcement, depending on location of fire front and direction of fire movement. Staff and visitors will be directed by law enforcement as to the designated safe areas.

6.1.4 Temporary On-Site Sheltering – Contingency Option for Ramirez Canyon Park, Corral Canyon Park and the Bluffs

Wildfire scenarios that would not allow enough time to safely evacuate Ramirez Canyon Park, Corral Canyon Park, and the Bluffs, such as fires igniting very close to the Parks and driven by a wind from the north or south, may trigger MRCA Rangers to opt to relocate visitors to the Project optional temporary on-site shelters. Latigo Trailhead would not include optional fire

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shelters based on the absence of camping and the proximity of day use areas to the parking areas and primary egress routes, and based on input from LACoFD. Escondido Canyon Park does not include site improvements other than to trails and is not considered for optional fire shelter siting.

There is a high probability that wildfire in or near the Parks will be spotted and reported by MRCA personnel first, based on the fact that its staff members are in the area, on the grounds every day and at least one will be hosting the sites as part of the proposed project. Once a fire is spotted or reported, the pre-planned emergency response will be initiated. The temporary on-site sheltering decision at Ramirez Canyon Park, Corral Canyon Park and the Bluffs would include analysis of the options and when the results indicated that a higher risk to people exists on the trails or roads than in the designated structure(s), the temporary on-site sheltering plan would be initiated in communication with local fire authorities (when possible).

It is considered very unlikely that a wildfire scenario will occur that would preclude safe relocation of visitors and staff from the Plan area. However, in the rare event that there is not enough time to safely relocate out of the area from any of these three Park facilities, such as fires igniting within or directly adjacent the Park and driven by a wind from the north or south on a non Red Flag Warning day/period (when people could be at the site), may result in MRCA Camp hosts determining that all or some of the affected Parks' campers will need to temporarily seek emergency shelter. As mentioned, MRCA will hold regular relocation drills with timed facility sweeps for visitor "round up." The sweeps will include the park facilities and campsites (excluding remote trails). Remote trail hiker's cell phones will be called (when possible) as a first attempt at communication. Text messages, e-mails, and e-alerts will also be sent. Audible alarm/sirens (vehicle mounted or portable public address system) will be broadcast from several locations as a secondary communication attempt to alert remote trail hikers of the need to return to the Park as quickly as possible. Lastly, remote trails will be swept by MRCA Rangers and/or LA County Sheriff helicopter, if adequate time is available.

In cases where temporary sheltering is required, MRCA Rangers will direct hikers/visitors to the provided fire shelters upon making contact during the park sweeps and warning period. All registered visitors will be familiar with the fire shelters, their purpose, and use based on information that will be provided at reservation and check in.

Contingency, temporary sheltering, when off-site relocation is not possible, will be available in seven optional project fire shelters proposed at:

- West of Murphy Way Road, trail 2a6

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- Corral Canyon Park, east of Corral Canyon Road, trail 13b
- Corral Canyon Park, two in Camp Area 1
- Malibu Bluffs, Camp Area 3, two within Camp Area 4.

Existing structures, discussed in more detail below, provide temporary sheltering at Ramirez Canyon Park.

Malibu Bluffs and Corral Canyon Park Options

The Malibu Bluffs site has several alternatives for relocation in an emergency. Campers may move to the City's Malibu Bluffs Park's irrigated turf areas or ball fields and/or the large expanse of irrigated lawn located just north of the park at Pepperdine University are secondary options. At Malibu Bluffs and Corral Canyon, hikers/campers could also travel across Malibu Road or PCH, respectively, where they could seek temporary shelter at beach areas. In the rare event that a wildfire results in campers at a campsite unable to evacuate before flames encroach, the use of optional emergency fire shelters will be the last resort, contingency option. At registration, campers will be provided information regarding the last-resort fire shelters provided at the campsites. These optional shelters are provided so that in an extreme situation where relocation via trails and/or vehicles is not possible or would not be considered safe, then the shelters may be utilized. Both Corral Canyon Park and the Bluffs will include on-site fire engine sheds and they may be available for initial attack or for visitor protection.

Ramirez Canyon Park Options

Temporary sheltering in Ramirez Canyon Park would include the preferred option of moving to the retrofitted Ranger/maintenance supervisor residence (Phase 1) or "Peach House" (available with Phase 2). On-site fire fighting capabilities include an engine designated for foam/gel application. The engine includes access to up to 38,500 gallons of water (10,000 gallon water tank, 25,000 gallon swimming pool, and 3,500 gallon dip tank) without utilizing hydrants. As part of MRCA's existing fire action plan, Engine 12 has been stationed at Ramirez Canyon Park full time. The engine has been modified specifically to produce high volumes of class A foam or Fire gel. The engine can be used to pre-treat, then reapply, a thick blanket of foam on all of the structures within the park boundaries in advance of a wildland urban interface fire. The engine is completely mobile in the Park and has the capacity to carry four hundred fifty gallons of foam concentrate and fire gel on board; according to MRCA fire personnel, that coupled with the 38,500 gallons of stored water that is available on-site, would be more than sufficient to pre-treat,

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then apply, a thick blanket of foam to each of Ramirez Canyon park structures, including the on-site shelter(s).

If determined necessary, MRCA fire fighters would direct staff and visitors to the structures and would proceed to foam the outside of these structures prior to the fire, assuming enough time to allow this process to occur safely. If not, the ignition resistance upgrades provided from the Code retrofit project is designed to resist ember penetration and provide safe refuge for the short duration sheltering will occur.

As noted by the office of the State Fire Marshal, a building will be exposed to the main flame front of a wildfire for a relatively short period of time, 5 to 10 minutes on average (Ramsey and Rudolph 2003). This exposure time will be shorter and less intense when proper fuel modification zones are in place. Buildings are subject to pre- and post-fire for a longer period of time, which may include wind, flying embers, and spot fires. The temporary shelter structures provided at each park site will provide a safer environment than remaining outdoors, exposed to the wildfire. Proposed emergency fire shelters at Ramirez Canyon Park will be "linked" via intercom, radios or other communication systems with implementation of Phase 2, such that staff can contact each other from any building to stay apprised of the situation and of the safety of visitors.

As detailed in this FPP, the combined system, including site-specific, maintained fuel modification zones, infrastructural improvements, stand-by fire fighting apparatus including a dedicated foam engine, ignition resistant building upgrades, and emergency fire shelters is designed to provide contingency areas for temporary sheltering during a wildfire. This option is considered a contingency, emergency alternative and that message would be stressed to all Park and trail users.

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7.0 ALTERNATIVE ANALYSIS

Appendix H includes brief descriptions of two project alternatives, the 2002 LCP Alternative and the Redesign Alternative. The alternatives include relatively few differences that affect the application of this FPP and the focused FPPs. Therefore, the memoranda in Appendix H serve to address the analysis required for the project environmental impact report.

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8.0 CONCLUSION

This FPP has been prepared as an evaluation of the adverse environmental effects that the proposed Malibu Parks Public Access Enhancement Plan – Public Works Plan, Modified Redesign Alternative at Ramirez Canyon Park, Escondido Canyon Park and Latigo Trailhead, Corral Canyon Park, and the Bluffs may have from wildland fire. It further evaluates methods for reducing effects to ensure that the above referenced project does not unnecessarily expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

This FPP utilizes a "systems approach" for specifying fire protection measures. The measures consist of the components of fuel modification, structural protection, water supply, fire protection systems, access (ingress/egress), optional emergency shelters at two Park and two trail facility locations, and well-planned emergency response. In addition, the plan augments and memorializes the MRCA's existing pre-planning and fire action plans as well as the recommended and required actions that will be enforced on these Parks as part of the Plan-wide fire reduction efforts. This FPP provides details regarding the general fire protection features as well as the site specific, restrictive policies that will govern each park property with regards to fire protection.

The requirements and recommendations provided in this FPP have been designed specifically for the proposed improvements adjacent or within the WUI zone at the various Park sites. Because this project proposes primarily recreation improvements with minimal structural additions, the requirements for fire safety are customized for the various sites and are, in most cases, not covered under existing Fire or Building codes. Where possible, the codes are applied or used as guidance. Where infeasible or not applicable, alternative measures are provided that will reduce the likelihood of ignitions, such as prohibitions on camp fires, provision for flameless cook stations at campsites, and Park closures on Red Flag Warning days/periods, amongst others. An important additional consideration, fuel modification zones, will be provided on all project sites and will be maintained on an on-going basis and inspected annually, maintaining the plants at very high levels of ignition resistance and removing all dead and dying materials and maintaining appropriate horizontal and vertical spacing within these zones. In addition, plants that establish or are introduced to the fuel modification zones that are not on the approved plant list will be removed.

Ultimately, it is the intent of this FPP to guide the fire protection efforts for this Plan area in a comprehensive manner. Implementation of the measures detailed in this FPP will reduce the risk of wildfire at these sites, will improve the ability to safely relocate from the area during wildfire events, and will improve the ability to fight fires on the properties and protect park property and

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neighboring resources irrespective of the cause or location of ignition. It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not burn. Precautions and actions identified in this report are designed to reduce the likelihood that fire will impinge upon Park's assets or threaten its staff or visitors and that vegetation is not ignited from Park activities. Implementation of the required enhanced construction features provided by the applicable codes and the fuel modification requirements provided in this FPP will reduce the site's vulnerability to wildfire. It will also help accomplish the goal of this FPP to assist firefighters in their efforts to defend existing structures and reduce the risk to Park visitors.

In order to ensure that the proposed park improvements and uses minimize risks associated with wildfire, all components of the fire protection system must be in place and maintained. This FPP, when approved, provides the direction and nexus for that maintenance to occur. Specifically, the MRCA will conduct at least annual inspections of the fuel modification areas, fire protection systems, and infrastructure to ensure that they meet the requirements specified in this FPP.

This FPP does not provide a guarantee that all, MRCA staff and visitors or community members will be safe at all times because of the advanced fire protection features and measures it requires for the project. There are many variables that may influence overall safety. This FPP provides requirements and recommendations for implementation of the latest fire protection features that have proven to result in reduced wildfire related risk and hazard.

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