



MONTECITO

COMMUNITY WILDFIRE PROTECTION PLAN



FEBRUARY 22, 2016

PREPARED BY:



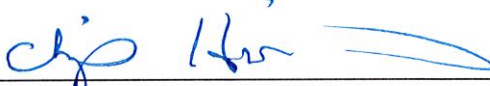
GEO ELEMENTS, LLC
PO Box 461179
LEEDS, UTAH 84746-1179
WWW.GEOELEMENTSLLC.COM

COMMUNITY WILDFIRE PROTECTION PLAN
MUTUAL AGREEMENT PAGE

The Community Wildfire Protection Plan developed for the Montecito Fire Protection District:

- ✓ Was collaboratively developed. Interested parties, key stakeholders, local fire departments, and federal land management agencies managing land in the vicinity of Montecito have been consulted.
- ✓ This plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect the community of Montecito.
- ✓ This plan recommends measures to reduce the ignitability of structures throughout the area addressed by the plan.

The following entities mutually agree with the contents of this Community Wildfire Protection Plan:

Recommended by: 
Chip Hickman
Fire Chief, Montecito Fire Department

Approved by: 
Eric L. Peterson
Fire Chief, Santa Barbara County Fire Department

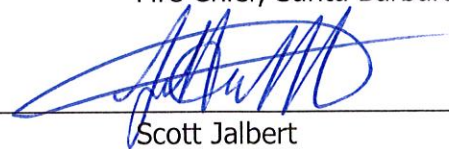
Approved by: 
Scott Jalbert
Fire Chief, San Luis Obispo Unit – CAL FIRE

TABLE OF CONTENTS

SECTION 1. INTRODUCTION.....	6
1.1 PURPOSE OF THE PLAN.....	6
1.2 GOALS AND OBJECTIVES.....	6
1.3 POLICY AND REGULATORY FRAMEWORK.....	7
1.3.1 Federal Level Policy	7
1.3.2 State Level Policy	9
1.3.3 Montecito Fire Protection District Level Policy	13
1.4 CWPP Planning PROCESS.....	13
1.4.1 Montecito’s Collaborative Approach.....	14
SECTION 2. COMMUNITY OVERVIEW	16
2.1 VALUES AT RISK.....	16
2.1.1 Life Safety	18
2.1.2 Homes, Structures, and Neighborhoods	21
2.1.3 Critical Infrastructure and Municipal Facilities	23
2.1.4 Natural and Historic Resources.....	25
2.1.5 Recreation Amenities/Facilities	27
2.2 LAND USE and ZONING.....	29
2.3 FIRE PROTECTION	31
2.3.2 Additional Fire Protection/Collaborative Agreements	33
2.3.3 1998 Montecito Community Fire Protection Feasibility Study	33
2.3.4 Water System Study	34
2.3.5 2014 Standards of Coverage Study and Risk Assessment.....	35
SECTION 3. DEFINING THE WILDFIRE PROBLEM	37
3.1 FIRE ECOLOGY.....	37
3.1.1 Vegetation.....	37
3.1.2 Wildlife	38
3.2 CLIMATE.....	38
3.2.1 Climate Change.....	39
3.2.2 Drought.....	39
3.3 LOCAL FIRE HISTORY.....	39
3.4 MONTECITO’S WILDLAND FIRE ENVIRONMENT.....	41
3.4.1 Fuels	41
3.4.2 Weather	45
3.4.3 Topography.....	46
3.4.4 Fire Behavior Characteristics	47
SECTION 4. MONTECITO: A COMMUNITY AT RISK	48
4.1 Montecito’s Wildland Urban Interface.....	48

4.2	Montecito's Natural and Historic Values	48
SECTION 5.	WILDFIRE ASSESSMENT.....	51
5.1	<i>CALIFORNIA AND LOCAL FIRE HAZARD SEVERITY ZONES.....</i>	51
5.2	<i>ASSESSMENT.....</i>	52
5.2.1	FlamMap	52
5.2.2	FARSITE.....	52
5.2.3	Behave Plus.....	52
5.2.4	FireFamily Plus	53
5.2.4.1	Data Sources for Models.....	53
5.3	<i>Hazard Assessment.....</i>	54
5.4	<i>Risk Assessment</i>	57
5.5	<i>Defensibility Analysis</i>	57
5.6	<i>Ember Exposure Zones.....</i>	61
5.7	<i>Fire Run Damage Potential.....</i>	64
5.8	<i>Additional Analyses.....</i>	66
5.9	<i>Structure Vulnerability</i>	67
SECTION 6.	ACTION PLAN.....	70
6.1	<i>COMMUNITY PREPAREDNESS.....</i>	70
6.1.1	Existing Emergency Preparedness Programs.....	71
6.1.1.1	District Programs.....	71
6.1.1.2	Community Programs	73
6.1.1.3	County or Regional Programs	73
6.2	<i>PROTECTING VALUES.....</i>	74
6.2.1	Life Safety	74
6.2.2	Reducing Structure Ignitability	76
6.2.3	Natural and Cultural Resources	79
6.3	<i>FUELS MITIGATION STRATEGY</i>	79
6.3.1	Fuel Treatment Activities	79
6.3.1.1	Existing Fuel Treatment Activities.....	79
6.3.1.2	Roadside Fuel Treatments	80
6.3.1.3	Vegetation Management Units	80
6.3.1.4	Fuel Treatment Maintenance	85
6.3.1.5	Vacant Parcels	86
6.3.2	Prioritization of Fuel Treatments	86
6.3.3	Fuel Treatment Prescriptive Guidelines	87
6.3.4	Fuel Treatment Types.....	94
6.5	<i>EVACUATION.....</i>	95
6.5.1	During a Wildfire Event.....	96
6.5.2	Evacuation Routes	96
6.5.3	Potential Issues with Evacuation	96
SECTION 7.	FISCAL RESOURCES.....	99

7.1	POTENTIAL GRANT FUNDING SOURCES.....	99
SECTION 8.	MONITORING.....	101
8.1	CWPP MONITORING.....	101
8.2	FUEL TREATMENT MONITORING.....	101
SECTION 9.	CWPP RECOMMENDATIONS.....	102
SECTION 10.	REFERENCES	105
SECTION 11.	APPENDICES	108
Appendix A	Glossary	109
Appendix B	Stakeholder Input	112
Appendix C	Fire Behavior Modeling Methodology	117
Appendix D	FARSITE Maps	120

SECTION 1. INTRODUCTION

Montecito and its surrounding area has an extensive history of catastrophic wildfires that have been costly in terms of fatalities and injuries, damage and loss of multiple structures, and extremely high fire suppression and fire rehabilitation costs. Although these devastating wildfires do not occur every year, wildfires are not fully preventable and thus stakeholders must take action to mitigate the threat to the community in preparation of the inevitable – that it is not a question of *if* a wildfire will burn, but *when* it will burn.

The Montecito Community Wildfire Protection Plan (CWPP) is the result of a community-wide planning effort to quantify and evaluate the wildfire threat to Montecito, and develop mitigation strategies that enhance protection of human life safety and the community's values from wildfire. It meets the requirements of the 2003 Healthy Forests Restoration Act, and positions the District well to compete for state and federal grants. This plan incorporates the latest wildfire science and wildfire analyses tools with information from previous plans including the 1998 Montecito Community Fire Protection Feasibility Study and the 2014 Citygate Standards of Coverage Study and Risk Assessment Report.

1.1 PURPOSE OF THE PLAN

The primary purpose of this CWPP is to enhance protection of human life and reduce the wildfire threat to community values such as structures, critical infrastructure, businesses, and natural and historic resources within Montecito. This CWPP serves to guide future actions of the Montecito Fire Protection District (District), property-owners, business-owners, homeowner associations, and other interested parties in their efforts to reduce the wildfire threat to the community of Montecito.

This CWPP will serve to guide the District in community wildfire protection activities. It is subject to available funding, other District priorities, ability to implement projects on private lands, and environmental review under the California Environmental Quality Act (CEQA).

1.2 GOALS AND OBJECTIVES

District staff and stakeholders developed the following goals and objectives during the outreach period of the CWPP planning process (Table 1).

Table 1 CWPP Goals and Objectives

GOALS	OBJECTIVES
Reduce the wildfire threat to life safety within and adjacent to the District	<ul style="list-style-type: none">• Identify specific areas within the Fire District with the greatest wildfire threat• Evaluate wildfire protection capabilities and readiness for evacuation• Develop guidelines and mitigation strategies to mitigate the threat to life safety• Develop guidelines and identify activities that enhance evacuation processes
Enhance protection of values (such as homes, businesses,	<ul style="list-style-type: none">• Assess potential damage and loss of structures from burning embers and a flaming fire front

critical infrastructure, natural resources, and historic resources) at risk from wildfire	<ul style="list-style-type: none"> • Evaluate Montecito’s wildfire preparedness, firefighting capabilities, fuel reduction activities, community education program, and existing wildfire hazard mitigation program • Utilize models and field visits to evaluate existing and future fuel treatment activities for effectiveness • Identify and prioritize hazard mitigation strategies and hazardous fuel reduction activities that enhance protection of values • Identify strategies that reduce structure vulnerability • Develop specific guidelines and strategies that minimize the wildfire threat to Montecito’s values • Recommend actions that can enhance Montecito’s preparedness, firefighting capabilities, fuel reduction mitigation activities, community education program, and wildfire hazard mitigation program
Balance wildfire protection strategies with natural and historic resources sustainability	<ul style="list-style-type: none"> • Implement mitigation strategies that consider visual quality • Ensure mitigation activities follow best management practices regarding natural and historic resources
Develop a plan that will enhance the Fire District’s opportunities to compete for grant funding related to the wildfire threat	<ul style="list-style-type: none"> • Ensure the CWPP meets or exceeds the requirements of the Healthy Forests Restoration Act of 2003 • Identify grant funding sources within the CWPP
Engage the community, government partners, fire agency cooperators, and interested parties in development of the CWPP, and in future pre-fire mitigation activities and strategy development	<ul style="list-style-type: none"> • Ensure open dialogue in the initial project scoping, as well as throughout the planning process • Identify opportunities for community pre-fire education • Identify opportunities for collaboration on pre-fire education and hazard and risk mitigation activities with adjacent agencies • Identify opportunities for individual property-owners to receive on-site education as it pertains to pre-fire prevention planning and living in the WUI

1.3 POLICY AND REGULATORY FRAMEWORK

Knowledge of policies and regulations ensure a path of compliance for the wildfire mitigation recommendations presented in this CWPP. This CWPP is consistent with objectives and policies set forth in the following federal, state, county, and fire district policies and regulations:

1.3.1 Federal Level Policy

Disaster Mitigation Act (2000–present)

Section 104 of the Disaster Mitigation Act of 2000 (Public Law 106-390) enacted Section 322, Mitigation Planning of the Robert T. Stafford Disaster Relief and Emergency Assistance Act that created incentives for state and local entities to coordinate hazard mitigation planning and implementation efforts, and is an important source of funding for fuels mitigation efforts through federal hazard mitigation grants.

National Incident Management System (NIMS)

NIMS provides a systematic, proactive approach to guide government agencies, nongovernmental organizations, and the private sector to work together to prevent, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment. NIMS improves a community's ability to prepare for and respond to potential incidents and hazard scenarios.

National Fire Plan (NFP) 2000

The summer of 2000 marked a historic milestone in wildland fire records for the United States. Dry conditions (across the western United States), led to destructive wildfire events on an estimated 7.2 million acres, nearly double the 10-year average. Costs in damages including fire suppression activities were approximately 2.1 billion dollars. Congressional direction called for substantial new appropriations for wildland fire management. This resulted in action plans, interagency strategies, and the Western Governor's Association's "*A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment - A 10-Year Comprehensive Strategy - Implementation Plan*", which collectively became known as the National Fire Plan. This plan places a priority on collaborative work within communities to reduce their risk from large-scale wildfires.

Healthy Forest Initiative (HFI) 2002 ⇨ Healthy Forest Restoration Act (HFRA) 2003

In August 2002, the intent of the Healthy Forests Initiative (HFI) is to reduce the severe wildfires risks that threaten people, communities, and the environment. Congress then passed the Healthy Forests Restoration Act (HFRA) on December 3, 2003 to provide the additional administrative tools needed to implement the HFI. The HFRA strengthened efforts to restore healthy forest conditions near communities by authorizing measures such as expedited environmental assessments for hazardous fuels projects on federal land. This Act emphasized the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects and places priority on fuel treatments identified by communities themselves in their CWPPs.

Quadrennial Fire Report (2009)

The Quadrennial Fire Review is a strategic assessment process conducted every four years to evaluate current mission strategies and capabilities against best estimates of future environment for wildland fire management. This integrated review is a joint effort of the five federal natural resource management agencies and their state, local, and tribal partners that constitute the wildland fire community. The objective is to create an integrated strategic vision document for fire management.

National Cohesive Wildland Fire Management Strategy (2009)

The National Cohesive Wildland Fire Management Strategy is a strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress towards the three goals: resilient landscapes, fire adapted communities, and safe and effective wildfire response. Its vision is to safely and effectively extinguish wildfire when

needed; use wildfire where allowable; manage our natural resources; and as a nation, to live with wildland fire.

National Fire Protection Association

The NFPA maintains numerous codes and standards that provide direction on development in the WUI including:

- NFPA 1, Fire Code, Chapter 17
- NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas
- NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting
- NFPA 1143, Standard for Wildland Fire Management
- NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire

1.3.2 State Level Policy

California Environmental Quality Act (CEQA)

The 1970 CEQA has evolved into one of the most prominent components of community planning in California. It requires state and local agencies to follow a protocol of analysis and public disclosure of environmental impacts in proposed projects and to include feasible measures to mitigate those impacts. Any proposed hazardous fuel treatment project recommended in this CWPP must comply with CEQA regulations.

Water Quality, Supply, and Infrastructure Improvement Act of 2014: Protecting Rivers, Lakes, Streams, Coastal Waters, and Watersheds

In protecting and restoring California rivers, lakes, streams, and watersheds, the purposes of this chapter are to implement fuel treatment projects to reduce wildfire risks, protect watersheds tributary to water storage facilities, and promote watershed health. It also determines priorities for water security, climate, and drought preparation.

California Strategic Fire Plan (updated 2012)

This statewide plan is a strategic document, which guides fire policy for much of California. The plan aims to reduce wildfire risk through pre-fire mitigation efforts tailored to local areas through assessments of fuels, hazards, and risks.

California State Multi-Hazard Mitigation Plan, (updated 2013)

The purpose of the State Multi-Hazard Mitigation Plan (SHMP) is to significantly reduce deaths, injuries, and other losses attributed to natural- and human-caused hazards in California. The SHMP provides guidance for hazard mitigation activities emphasizing partnerships among local, state, and federal agencies as well as the private sector.

Public Resources Code Section 4290

This provision grants authority to State Board of Forestry and Fire Protection to develop and implement fire safety standards for defensible space on State Responsibility Area (SRA) lands.

Public Resources Code Section 4291

A state law, effective in January 2005, this section extends the required defensible space clearance around homes and structures from 30 feet to 100 feet for wildfire protection. The code

applies to all lands that have flammable vegetation. The regulations include several requirements for how the vegetation surrounding buildings and structures should be managed to create defensible space.

Public Resources Code 4292-4296 and 14 CCR 1256: Fire Prevention for Electrical Utilities

These statutes and regulations address the vegetation clearance standards for electrical utilities. They include the standards for clearing around energy lines and conductors such as power-line hardware and power poles. These regulations are critical to wildland fire safety because of the substantial number of power lines in wildlands, the historic source of fire ignitions associated with power lines, and the extensive damage that results from power line caused wildfires in severe wind conditions.

Public Resources Code 4741

In accordance with policies established by the board, the department shall assist local governments in preventing future wildland fire and vegetation management problems by making its wildland fire prevention and vegetation management expertise available to local governments to the extent possible within the department's budgetary limitations. Department recommendations shall be advisory in nature and local governments shall not be required to follow such recommendations.

Title 14, 1270.04

This subchapter applies to the following: (a) local jurisdictions shall provide the Director with notice of applications for building permits, tentative parcel maps, tentative maps, and use permits for construction or development within SRA, (b) Director shall review and make fire protection recommendations on applicable construction or development permits or maps provided by the local jurisdiction, and (c) the local jurisdiction shall ensure that the applicable sections of this subchapter become a condition of approval of any applicable construction or development permit or map.

2013 California Fire Code

This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding residences and historic buildings. The Code includes: 1) hazards of fire and explosion arising from the storage, handling or use of structures, materials or devices; 2) conditions hazardous to life, property or public welfare in the occupancy of structures or premises; 3) fire hazards in the structure or on the premises from occupancy or operation; 4) matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems; and 5) conditions affecting the safety of fire fighters and emergency responders during emergency operations.

Government Code 51175-51189: Very High Fire Hazard Severity Zones

This code defines Very High Fire Hazard Severity Zones and designates lands considered by the State to be a very high fire hazard. It also defines defensible space, fuel, fuel management, and wildfire.

Government Code 51189: WUI Building Standards

This code directs the Office of the State Fire Marshal to create building standards for wildland fire resistance. The code includes measures that increase the likelihood of a structure withstanding intrusion by fire (such as building design and construction requirements that use fire-resistant building materials) and provides protection of structure projections (such as porches, decks, balconies and eaves), and structure openings (such as attics, eave vents, and windows).

California Building Code 2013 Edition Section 705A

Establishes minimum standards for the protection of life and property by increasing the ability of a building located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire and contributes to a systematic reduction in conflagration losses.

Government Code 65302.5: General Plan Fire Safety Element Review

This statute requires the State Board of Forestry and Fire Protection to provide recommendations to a local jurisdiction's General Plan fire safety element at the time that the General Plan is amended. While not a direct and binding fire prevention requirement for individuals, General Plans that adopt the Board's recommendations will include goals and policies that provide for contemporary fire prevention standards for the jurisdiction.

Section 13800 to 13970 inclusive, of the Health and Safety Code of the State of California, Fire Protection District Law of 1987

This section provides the authority for the organization and powers of fire protection districts.

Section 17053.1 to the Revenue and Taxation Code (PENDING LEGISLATION)

Bill AB1329 for taxable years beginning on or after January 1, 2016, would allow a credit under that law in an amount equal to 25% of the qualified costs, as defined, paid or incurred by a qualified taxpayer, not to exceed a specified amount, during the taxable year for fuel management activities, as defined, performed on qualified real property owned by the qualified taxpayer.

1.3.3 Santa Barbara County Level Policy

Office of Emergency Services – Multi-Jurisdictional Hazard Mitigation Plan

This plan is a tool for stakeholders to increase public awareness of local natural and human-made hazards and risks, while providing information about options and resources available to reduce risks by hazard mitigation measures.

Santa Barbara Unit Strategic Fire Plan - 2015

The Santa Barbara Unit Fire Plan is intended to convey management direction from the County Fire Chief, involve and educate stakeholders on the wildfire environment, establish strategic priorities for wildfire prevention and suppression projects and programs into a single unified plan, and be a living document that will adapt to changing conditions and be updated on a regular basis.

Santa Barbara Operational Area Mutual “All Risk” Mutual Aid Plan

To provide, in an expedient manner, fire, rescue, emergency medical services, hazardous materials, urban search and rescue or other expertise in the form of resources and qualified personnel as would be necessary to manage a major incident or disaster that would exceed the capabilities of a single agency. Santa Barbara County is located in California Mutual Aid Region I, which includes San Luis Obispo, Ventura, Los Angeles, Orange, and Santa Barbara counties. Each county is required to have a Mutual Aid Plan that outlines procedures, policies, resources, and personnel information. This Plan assists local, state, and federal fire agencies in preparing for a major emergency.

Santa Barbara Comprehensive Plan

A comprehensive, long-term plan mandated by California state planning law for the physical development of a city or county. Various elements of the plan are mandated, including land use, circulation, open space, conservation, housing, safety, and noise. The objective of this plan was to analyze regional resources and environmental constraints in order to be able to identify and rank opportunities for urban development, agricultural expansion, and recreational activities. Areas to be preserved because of environmental hazards, ecological communities, or scenic value also were evaluated. Additional elements in Santa Barbara County include groundwater resources, oak tree protection, air quality, and coastal land use. Montecito resides in the South Coast study area of this plan.

Montecito Community Plan (updated 1995)

Montecito Community Plan identifies specific goals, actions, and development standards relating to community development, public facilities and services, and resources and constraints. It states the objectives of the goals, names specific policies and necessary actions to carry out those policies. It includes a Safety Element, outlines the District boundary, and identifies fire facilities and fire hazards.

Chapter 35 Codes and Ordinance, Section 35-1 Santa Barbara County Land Use and Development Code

This document is currently applicable to the unincorporated areas of the County outside the Coastal Zone and the Montecito Planning Area. Although this document contains regulations that relate to the Coastal Zone, these portions will not be in effect until the Coastal Commission certifies this document as an amendment to the County’s Local Coastal Program. This document implements the Comprehensive Plan (and eventually the Coastal Land Use Plan) by classifying and regulating the uses of land, buildings and structures in the unincorporated area of the county located outside of the Montecito Planning Area. This document also contains road naming and street addressing standards as well as sign regulations.

Chapter 35 Codes and Ordinance, Section 35-2 Montecito Land Use and Development Code

This code implements the Comprehensive Plan and the Montecito Community Plan by classifying and regulating the uses of land, buildings and structures in those areas of Montecito located outside of the Coastal Zone. This document also contains road naming and street addressing standards as well as sign regulations.

Chapter 35 Codes and Ordinance, Section 35B Montecito Growth Management Ordinance Number 4763 (updated 2010)

The purpose is to pace residential growth with resources and services such as water, fire, wastewater systems, and transportation through 2030.

Article II - Coastal Zoning Ordinance

This ordinance is applicable to the unincorporated coastal zone and implements the Coastal Land Use Plan by classifying and regulating the uses of land, buildings, and structures in the coastal zone.

Article IX - Deciduous Oak Tree Protection and Regeneration Ordinance

This ordinance addresses deciduous oak tree removal in the inland rural areas if such removal is not associated with development that requires a permit under Section 35-1 and Section 35-2 of Chapter 35 of the County Code or Ordinance 661.

Montecito Architectural Guidelines and Development Standards (1995)

The purpose of this document is to assist the property owner, homeowner, architect, developer and builder in designing projects that will be harmonious with the existing character of Montecito and includes guidance for access roads, brush removal, and landscaping related to wildfire. During the development of this CWPP, the existing architectural guidelines and applicable zoning regulations are under review and open for potential revisions.

1.3.3 Montecito Fire Protection District Level Policy

This policy consists of all the regulatory and penal ordinances and a certain number of administrative ordinances of the Montecito Fire Protection District, codified pursuant to the provisions of Sections 50022.1—50022.8 and 50022.10 of the Government Code. Items that pertain to wildfire include:

Ordinance Number 2014-01 Montecito Fire Protection Plan

This adopted plan serves as an amendment to the California Fire, Building, and Residential Codes. The plan contains requirements for roofing assembly, vegetation management, water supply for fire protection, water storage for fire protection, installation requirements for residential and non-residential sprinkler systems, access requirements for private roads and driveways, and requests for modification for post disaster rebuilds.

1.4 CWPP PLANNING PROCESS

The development of a CWPP is a collaborative process by which community stakeholders assess the wildfire threat, define their wildland urban interface (WUI) boundaries, identify their community's values at risk from wildfire, and then develop solutions to mitigate the wildfire threat. The language in the 2003 HFRA provides maximum flexibility for communities to determine the substance and detail of their plans and the procedures they use to develop them. The CWPP planning process provides communities the autonomy to develop their own individual plans that influence where and how federal agencies implement fuel treatment activities on federal land and the distribution of federal funds for projects on non-federal lands.

The CWPP planning process brings together broad and diverse local interests to identify and discuss mutual concerns related to public safety, community sustainability, natural resources sustainability. The process should provide a positive, solution-oriented environment in which to address the challenges of living in a community at risk from wildfire. Because not all community members will attend workshops or meetings, it is important to provide multiple opportunities in which to solicit input, collect issues and concerns, and provide information related to the development of a CWPP.

As part of the 2003 HFRA, there are three minimum requirements for a CWPP, including:

1. *Collaboration.* A CWPP must be collaboratively developed. Local officials and state officials must meaningfully involve federal agencies that manage land in the vicinity of the community and other interested parties, particularly non-governmental stakeholders.
2. *Prioritized Fuel Reduction.* A CWPP must identify and prioritize areas for hazardous fuel reduction treatments on both federal and non-federal land and recommend the types and methods of treatment that, if completed, would reduce the risk to the community.
3. *Treatment of Structural Ignitability.* A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

1.4.1 Montecito's Collaborative Approach

A priority for the District was to engage stakeholders and get community buy-in for development of the CWPP. The initial step was to organize a workshop to educate stakeholders on the CWPP planning process, encourage participation, and solicit input from a broad range of stakeholders. Stakeholders were invited to the workshop via phone calls, direct emails, a media release in the *Montecito Journal*, EdHat (a local online magazine) and posting on the District's website and calendar.

The workshop took place at the District's Headquarters on the evening of June 18, 2015. Stakeholders who took part in identifying issues and concerns at this workshop included citizens, homeowner association representatives, District staff, Santa Barbara County Fire Department, Carpinteria-Summerland Fire Protection District staff, Santa Barbara City Fire staff, Dan Meade – Biologist with Althouse & Meade, and Los Padres National Forest Fire Management staff. Montecito Fire District Chief Chip Hickman provided opening remarks followed by a presentation by Geo Elements staff. This visual presentation included a description of the CWPP planning process, fire model outputs that identified hazard areas, draft WUI map, and examples of potential goals and objectives for the CWPP. Following the formal presentation, an informal phase of the workshop provided stakeholders with the opportunity to talk with District and Geo Elements' staff on specific topics of interest or concern. Index cards were offered and provided stakeholders with an additional opportunity for comments and input.

A second presentation was made to the Montecito Planning Commission on August 19, 2015. Invitations were sent to stakeholders that did not attend the June 18th meeting. This meeting was advertised in the Montecito Journal, EdHat, and on the Fire District's website. Direct outreach and invitations went out to those that attended the June 18th meeting, those interested stakeholders that were inadvertently not included in the invitation to the June 18th meeting, and other interested stakeholders.

Additional public outreach occurred through direct emails, phone calls, and updates on the district website including the PowerPoint presentation, draft documents, and draft CWPP maps. The outreach period for the initial input began in June 2015 through December 4, 2015.

On January 4, 2016, the District posted the final draft CWPP on the District's website and advertised the date for the final stakeholder meeting of February 10, 2016. This timeframe gave stakeholders ample time to review the final draft before the meeting. The presentation of the final draft CWPP occurred with stakeholders on February 10th. A visual presentation by District and Geo Elements staffs included a description of the CWPP planning process, the contents of the plan, and the District's next steps related to the CWPP. Stakeholders in attendance were pleased with the planning process and the final plan.

A summary of all workshop and meeting notes, index cards, and stakeholder comments are available in Appendix B.

SECTION 2. COMMUNITY OVERVIEW

The District is located approximately 90 miles northwest of the City of Los Angeles in an unincorporated area of southeast Santa Barbara County. The District covers approximately 21.7 square miles and borders the Santa Ynez Mountain Range and Los Padres National Forest to the north, the City of Santa Barbara to the west, Carpinteria-Summerland Fire Protection District to the east, and the Pacific Coastline to the south (See Figure 1).

The landscape rises dramatically from sea level along the coast to approximately 3,800 feet on the Santa Ynez Mountain Range above Montecito. The coastline and mountain range along this section of the Pacific Coast is uniquely oriented east to west. Large riparian corridors such as San Ysidro, Cold Springs, and Romero Canyons run north to south through the community. The heavily vegetated slopes dominated by chaparral contrast sharply with the urban development below.

Although Montecito is not an incorporated town or city, the United States Census Bureau identifies it as a census-designated place. In 2013, the estimated population of Montecito was 8,992 individuals that resided in approximately 4,198 housing units that include small condominiums, modest homes of various styles and size up to very large estates (U.S. Census Bureau, <http://factfinder.census.gov>, 07 July 2015).

Montecito is an idyllic and highly desirable place to live and visit. The natural beauty of chaparral and oak woodland vegetation, the steep and rugged Santa Ynez Mountains, a valuable watershed, scenic coastal and mountain views, miles of trail systems, wildlife, and small town atmosphere all contribute to the feelings of residents and visitors that this is one of the best places to live and visit. However, often overlooked by residents and visitors is that the area is highly prone to large wildfires. The combination of hot and dry Mediterranean climate, highly ignitable vegetation, numerous fire ignitions, and human development create significant potential for a major disaster to values at risk from wildfire.

2.1 VALUES AT RISK

A community's values include structures, critical infrastructure, businesses, and other tangible elements; but values can also include intangible elements such as natural resources, sensitive species, cultural and historical resources, visuals resources, and how residents feel about their community and the landscape around them.

Although intangible values cannot be addressed in mitigating wildfire hazard and risk, actions can be taken to protect those values by developing strategies that reduce the wildfire threat overall. The challenge for Montecito is to balance the level of hazard mitigation work required to protect one set of values without compromising others.

Montecito's stakeholders emphasized the importance of the following values:

- Life Safety
- Homes/Structures/Neighborhoods

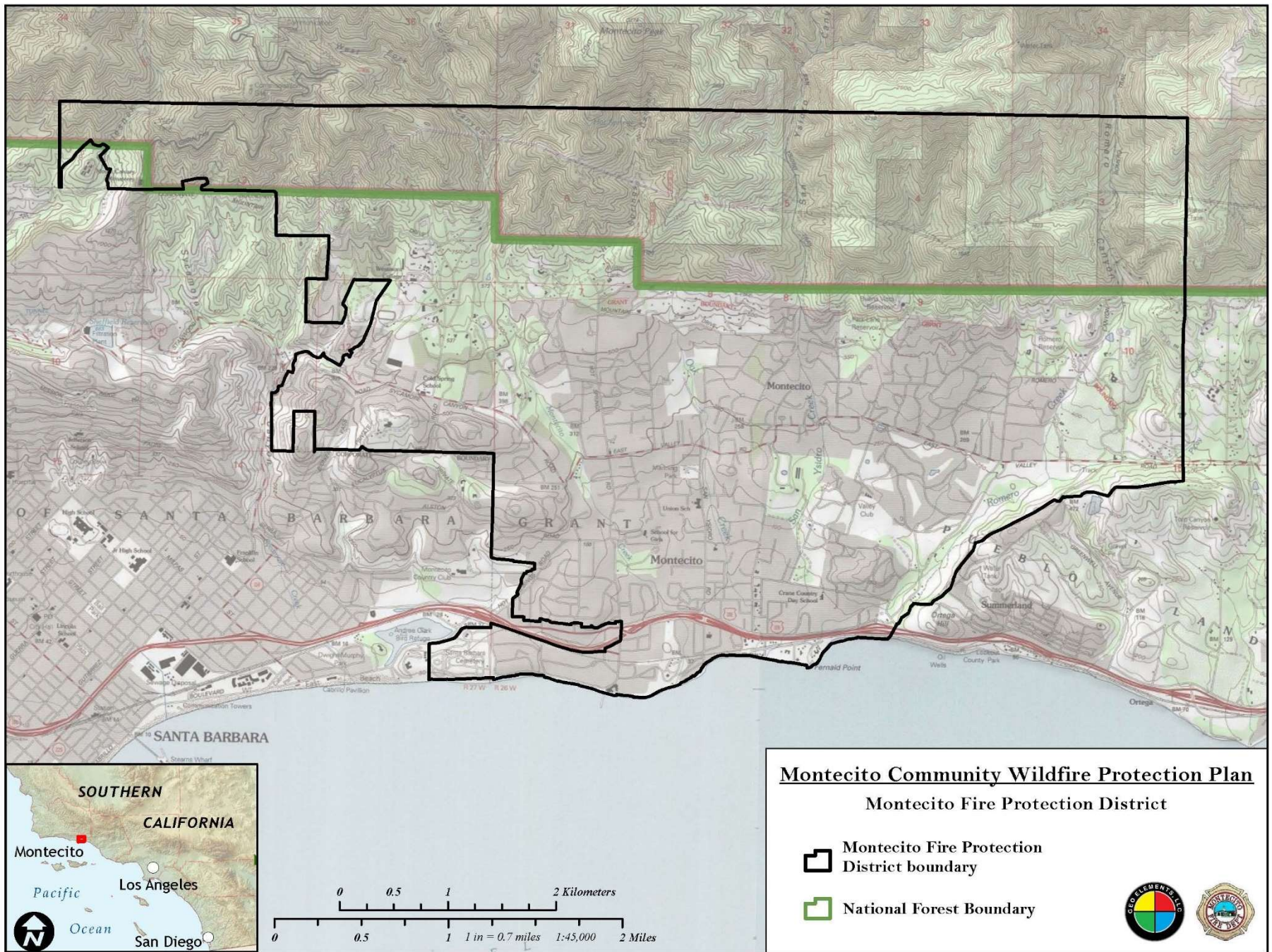


Figure 1 Montecito Fire Protection District Boundary Map

- Critical Infrastructure
- Municipal Facilities
- Natural and Historic Resources
- Recreation Amenities/Facilities

2.1.1 Life Safety

The District's highest priority is human life safety. Large wildfires on the south coast of Santa Barbara County, such as the Romero, Coyote, and Painted Cave fires, have killed firefighters and a resident. Recent wildfires that threatened Montecito, such as the 2009 Jesusita and the 2008 Tea fires, have resulted in firefighter and civilian injuries and public evacuations.

Life safety considers both the life and physical well-being of all people in a community.

Montecito's WUI (See Figure 10, WUI Map) presents numerous life safety issues to consider during a wildfire, including decisions on whether to evacuate and/or shelter in place, how to evacuate and transport vulnerable or functional-needs populations, locations of temporary shelters, access and egress issues, restricted and/or congested transportation systems, lack of defensible space, and structure vulnerability.

As described in Citygate's 2014 Standards of Coverage Report, Montecito's semi-rural character, topography, and past development practices significantly impedes access and egress that affect emergency services response times and the evacuation of residents, visitors, and businesses. These impediments include narrow winding roads, steep roads, vegetation encroachment into roadways, gates, bridges, addresses not clearly visible from the road systems, and other speed limiting factors such as bulb-outs, speed bumps, unlit roads and intersections, unlit street signage, and limited turnaround capabilities. Fast moving wildfires, such as the 2009 Jesusita and 2008 Tea fires, demonstrate the speed of a wildfire and the potential threat to life safety.

Based on U.S. Census Bureau data, the Westmont College area south to Sycamore Canyon Road and including Cold Spring School has the highest concentration of individuals in the District followed by areas south of Highway 192 east of Hot Springs Road and west of Sheffield Drive and north of Highway 101. See Figure 2, Population Density Map.

The northern portion of the District, especially areas north of State Highway 192 (East Valley and Sycamore Canyon Roads), have limited options for access/egress with many road systems having only one access/egress route. These issues also occur in the eastern portion of the District east of Romero Canyon Road and Lilac and Mariposa Lanes, but the lack of coverage from fire suppression resources enhances the threat to life safety for this area of the District. All road systems within and adjacent to the District can quickly become congested during a wildfire as evacuations of the public and responding emergency services personnel compete for space on primary travel routes within and adjacent to the community.

Often during wildfire events, emergency responders issue evacuation orders to residents, visitors, and business-owners for protection of their life safety. Individuals may choose not to evacuate immediately and stay to defend their homes and/or businesses, or decide to shelter in place until the fire danger passes. Some residents believe a secondary evacuation order will be issued prior to conditions becoming truly life threatening. These actions have put their lives at risk as well as

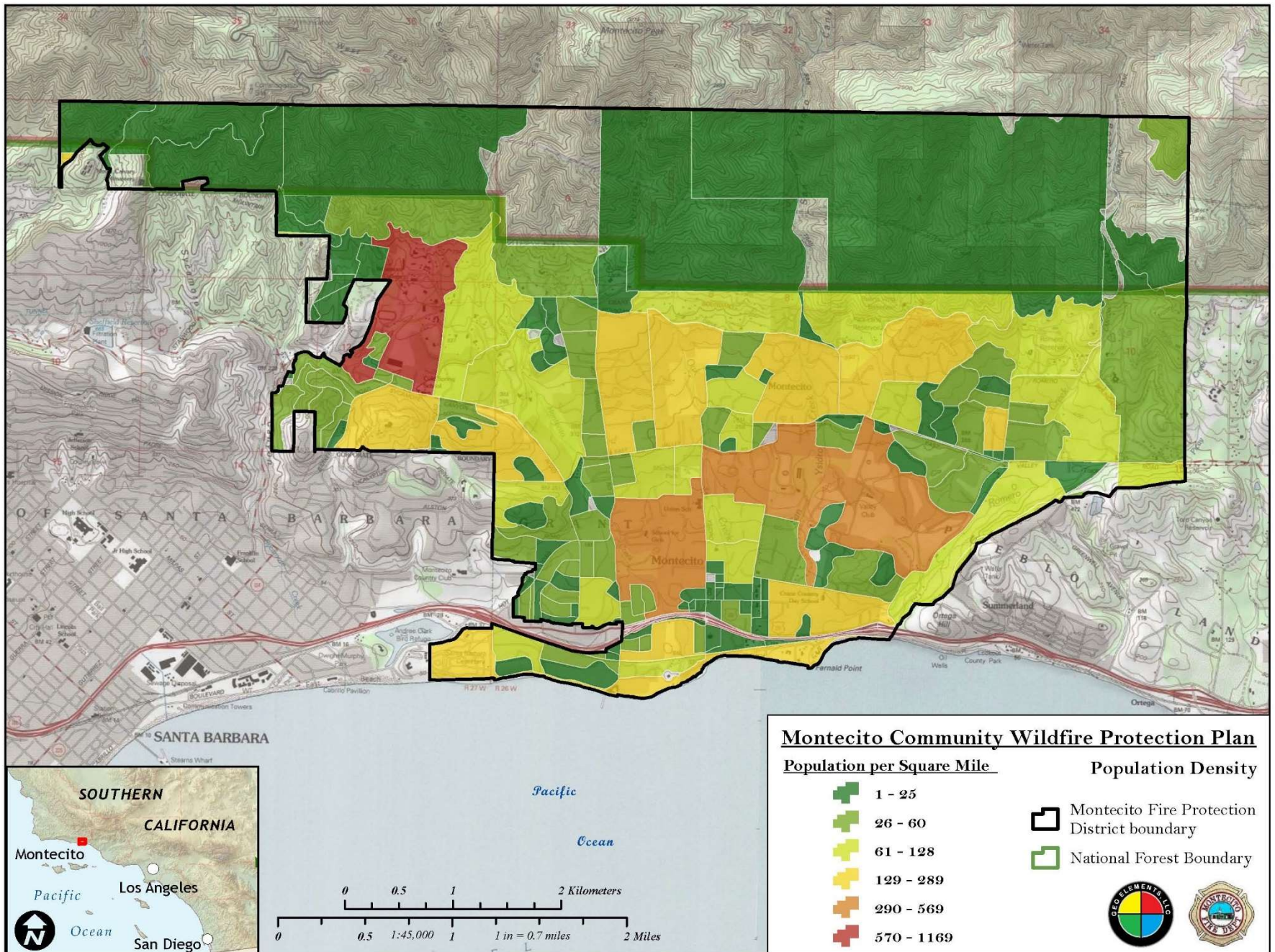


Figure 2 Population Density Map

those of firefighters and law enforcement personnel as evacuation delays can negatively impact emergency operations by first responders.

Vulnerable or functional-needs populations have special needs and may be less likely to respond to, cope with, and recover from a wildfire. These individuals are also less likely to get involved in wildfire mitigation activities (Ojerio, 2008). In 2013, the United States Census Bureau estimated that Montecito Census-Designated Place had approximately 758 disabled residents, 17% of residents in Montecito were under the age of 18 years old, 866 residents were foreign born-residents, and 719 residents spoke *other than English* as a primary language (U.S. Census Bureau, <http://factfinder.census.gov>, 07 July 2015).

Vulnerable or functional-needs populations include those who are physically and/or mentally disabled (blind, cognitive disorders, mobility limitations), limited or non-English speaking, culturally isolated, medically or chemically dependent, homeless, deaf and hard-of-hearing, frail elderly, and children.

Age, along with physical and mental limitations, can restrict mobility, making it more difficult for these individuals to evacuate in a disaster. Lack of financial resources may hinder the ability for low-income populations to invest in emergency preparedness or mitigation measures as well as recover from loss. Language issues can result in communication barriers to evacuation or support services. In addition, visitors to Montecito are likely unfamiliar with the wildfire threat or the extent of their exposure or appropriate evacuation routes making them potentially vulnerable as well. Planning for vulnerable or functional-needs populations is important to consider and gauge.

Another life safety consideration is the presence of short-term residents, visitors, and/or guests in Montecito. A survey included in the 2014 Citygate Report estimated that approximately 85.7 percent of residents in Montecito live there less than 6 months per year. It is unknown how many people visit the Montecito area at any given time but hiking trails, businesses, hotels, recreation facilities/amenities, short and long-term home rentals, and vacation homes pose another element of risk. These individuals are likely not familiar with the wildfire threat, road systems, or what to do in the event of evacuation. They may also bring with them inaccurate notions of a wildfire and operational responses and capabilities.

Pets, service animals, and large domestic animals are also vulnerable populations to consider when considering evacuation planning. Animals can become frightened and more difficult to manage during a wildfire and many emergency shelters and evacuation centers deny admission to pets for health and safety concerns with the exception of service animals. The 2011 *Hazard Awareness and Preparation Study* conducted by Santa Barbara County stated that only 34.6% of respondents have a plan for evacuating their pets (e.g., cats, dogs) and only 0.63% answered that they have a plan for evacuating large animals (e.g., horses, cows). Pets and large domestic animals can face death or suffering due to poor disaster planning by their human caretakers.

During wildfire events, people have risked their lives and the lives of others to save their pets and homeowners may be unwilling to evacuate or enter a shelter during an emergency without their animals, instead choosing to remain in harm's way rather than leave without their animals.

2.1.2 Homes, Structures, and Neighborhoods

Wildfires have historically caused significant structure and property loss in Montecito, most recently with the 2009 Jesusita and 2008 Tea fires. Whether a structure survives or not depends primarily on exterior construction material, structure design, housing density, placement relative to nearby homes, geographic location, and whether the structure has adequate defensible space.

Most housing in Montecito consists of single family homes on lots that vary widely in size. The greatest densities of homes are in areas south of Highway 192 east of Hot Springs Road and west of Sheffield Drive and north of Highway 101 (See Figure 3, Housing per Square Mile Map). Where homes are more tightly spaced, strong winds, and/or steeper slopes can cause a wildfire to spread from structure to structure. Once ignited, structure fires threaten adjacent structures and improvements with their long burn time, intense radiant and convective heat, and the production of burning embers transported in the air to other structures and fuels.

Structures north of State Highway 192 (East Valley and Sycamore Canyon Roads) and the eastern portion of the District (east of Romero Canyon Road and Lilac and Mariposa Lanes) are especially at risk of damage and/or loss from wildfires. This is due to their proximity to the wildland vegetation of the Santa Ynez Mountains and Los Padres National Forest and the lack of emergency services coverage in the eastern portion of the District. Many homes in these areas have access and egress issues related to narrow winding roads, slope, topography, gates, bridges, or roadways fringed with heavy concentrations of wildland and landscaping vegetation that increase response times and the defensible space necessary for safe firefighting operations and evacuation.



Currently, there is no data about the specific number of homes with wood shingle roofs but District staff estimates that less than fifty homes in Montecito have wood shingle roofs (Kerry Kellogg, personal communication, July 2015). In addition to wood shake shingle roofs, factors that can result in the loss of structures in Montecito include:

1. Wood exposures attached to homes, such as wooden fences, decks, and patio covers.
2. Homes may have ineffective attic screens. Substandard or damaged screens will not prevent burning embers from entering, potentially causing ignitions in attics.
3. Hazardous ornamental and native vegetation create significant fire hazards when not properly maintained and watered, especially during periods of extended drought.
4. Leaf and litter buildup occurs in rain gutters that provide an ignition source for burning embers.
5. There is potential for structure loss even outside of the Very High Fire Hazard Severity Zones. Fire modeling shows that burning embers from wildfires in the Montecito area can be carried by the wind over one mile away so structures located south of Highway 192 that are poorly maintained, landscaped with flammable ornamental vegetation, and/or have rain gutters built up with flammable debris are at significant risk.
6. A structure's location on the terrain (e.g., midslope, mountain/hill top).

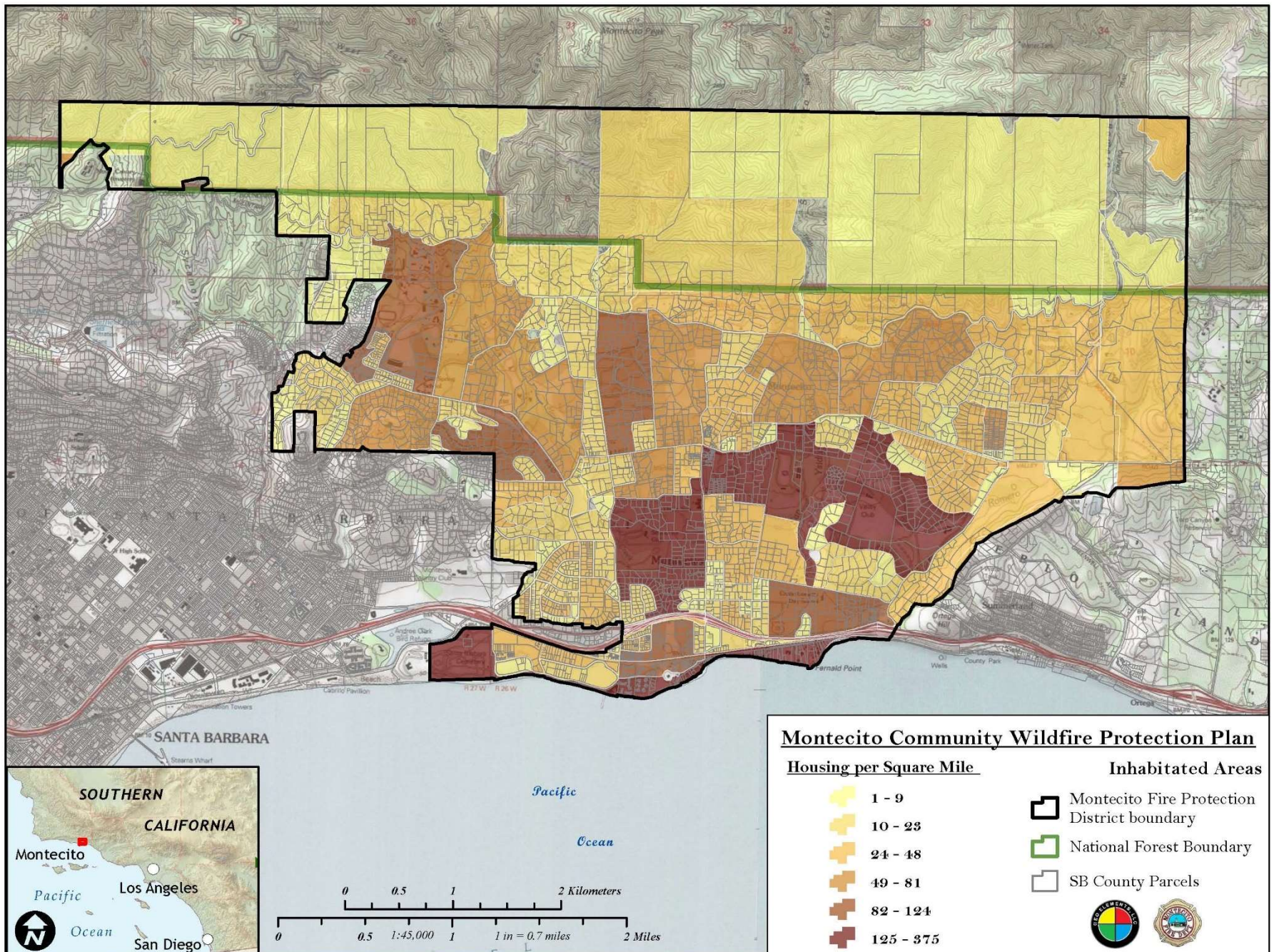


Figure 3 Housing per Square Mile Map

The enactment of stringent building codes can significantly reduce the potential loss of residential structures, however will not completely eliminate the risk. Structure loss can still occur, even if structures and neighborhoods are built under modern fire resistant building codes. A study of the 2007 fires in San Diego County indicated that the fires destroyed 13% of the homes within the fire perimeters. Homes built under building codes enacted in 2001 had a loss rate of 4%, while homes built under fire codes modified in 2004 had a loss rate of only 2% (Rahn, 2009).

Wildfire can take a devastating financial toll on local homeowners. In 2015, the estimated median home value in Montecito is \$4.2 million per home (Scott Williams Real Estate, www.scottwilliams.com/montecito-median-home-prices, 18 September 2015). In addition to the expense of rebuilding a home, there are repair or replacement costs for smoke damage, living expenses while rebuilding, re-landscaping costs, and replacement of personal belongings and vehicles. The amount covered by insurance policies will vary and depends on the individual insurance coverage by homeowners.

2.1.3 Critical Infrastructure and Municipal Facilities

Wildfires can cause significant damage and loss to critical infrastructure, municipal facilities, and cause substantial economic losses that often go well beyond traditional impact indicators. Repairing and/or replacing critical infrastructure and restoring basic services after a disaster is a top priority for public agencies and utility companies such as Southern California Edison, Southern California Gas, Verizon, Montecito Water District, Santa Barbara County Road Department, and California Department of Transportation (Cal Trans) among others. These agencies and companies can incur significant repair, restoration, and rehabilitation costs after a wildfire including the cost of maintenance and damage assessment teams, field data collection, watershed rehabilitation and restoration efforts, preparation for future potential floods, replacement or repair of utility supply lines, and replacement or repair of roads, guardrails, bridges, signage, culverts, and landscaping. Figure 4 depicts critical infrastructure in the area within and adjacent to the District.



During the 2003 San Diego wildfires significant losses occurred to San Diego's infrastructure. The estimated total economic impact of the wildfires on infrastructure was \$147.3 million. The majority of this economic impact was associated with the loss of 3,200 utility power poles, 400 miles of wire, 400 transformers, and damage to 100 other related elements of utility equipment (Rahn, 2009).

Short and long-term losses to critical facilities, infrastructure, and services can include:

- loss of day-to-day services to and from local businesses
- school can be damaged or destroyed
- damage or loss of water treatment facilities
- roads and bridges can be damaged
- damaged railroad tracks
- delayed or canceled flights out of and into the Santa Barbara Airport due to smoke impacts

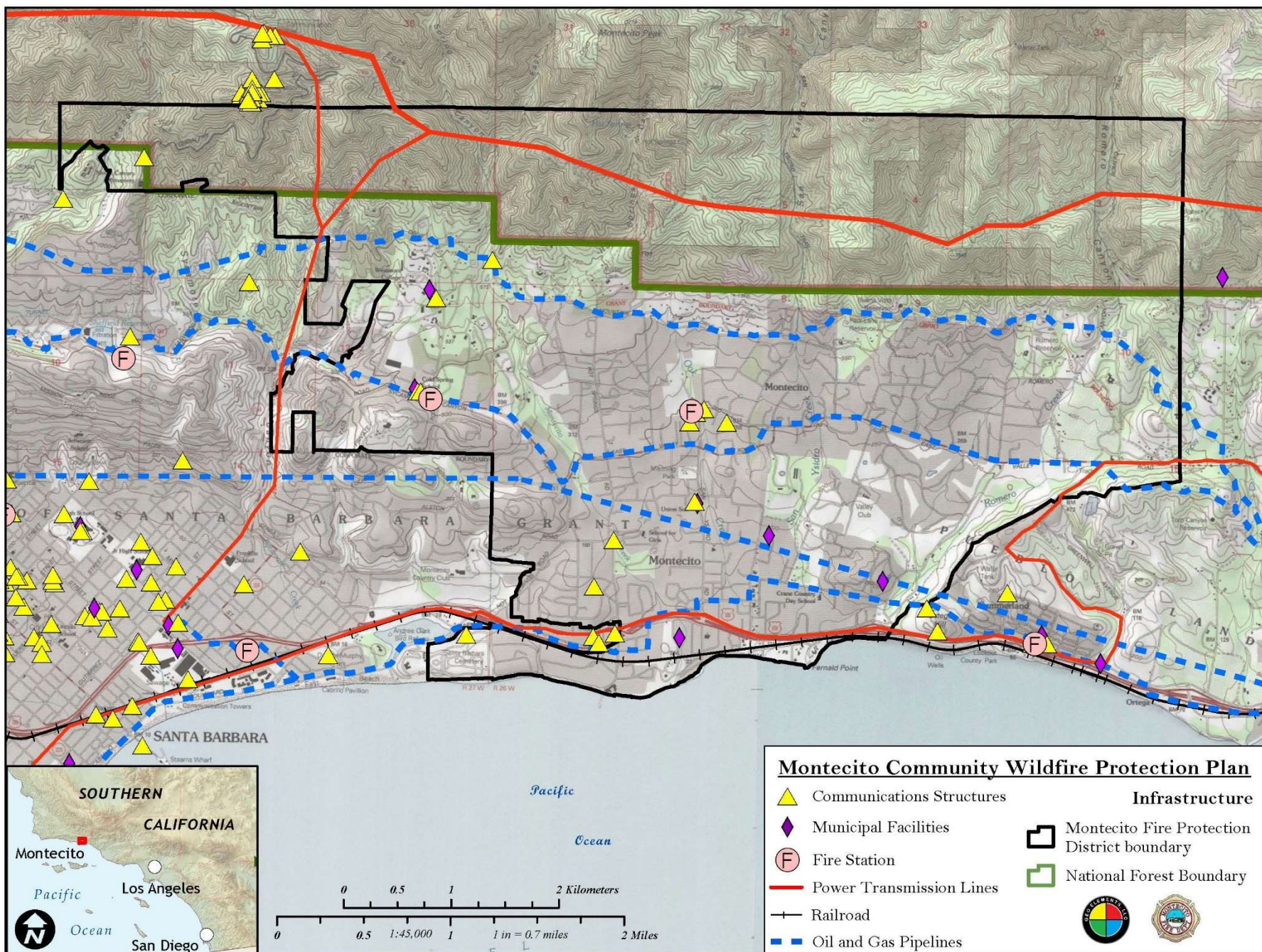


Figure 4 Infrastructure Map

- loss of business
- loss of communication towers and antennas
- depleted water systems
- damaged sewer systems
- contamination of municipal water supplies by ash and debris from a wildfire
- destruction of above ground utility lines
- soil erosion or debris deposits into waterways after the fire
- disruption of electrical service due to burned power poles and damaged powerlines

There are not only costs to repair or rebuild municipal facilities such as fire stations, water district buildings, water treatment plants, communication structures, sanitary district buildings, and others, but also the associated costs of lost work time, temporary rental of other buildings or offices, and moving expenses can impact the cost to the community.

Costs associated with wildfire losses include lost tax revenues in a number of categories such as sales and county taxes, as well as business revenue and property loss that accumulate over the long term. Additionally, private and commercial properties that escape damage in the fire may still experience dramatic drops in value as the area recovers.

Economic and financial losses can have long-term effects on a community's economic vitality due to destroyed businesses and the loss of tax revenue. It can take days, weeks, or months to repair critical infrastructure, restore services, and rebuild businesses following a wildfire. A study of the 2003 wildfires in San Diego showed that there was an estimated 15% loss of business activity (Rahn, 2009).

Montecito has two primary business districts, the Upper Village along East Valley Road and Lower Village along Coast Village Road, but businesses are located in various locations throughout Montecito. The most recent business data from the Census Bureau shows that in 2007, an estimated 1,525 firms were located in Montecito (U.S. Census Bureau, <http://factfinder.census.gov>, 07 July 2015) with approximately 4,446 individuals employed (seasonally adjusted) in Montecito (U.C.S.B, Economic Forecast Project, <http://bit.ly/1Y6MlnM>, 13 July 2015). Loss and/or damage to businesses due to wildfires can affect employment opportunities and increase the cost of unemployment insurance (Diaz, 2012).

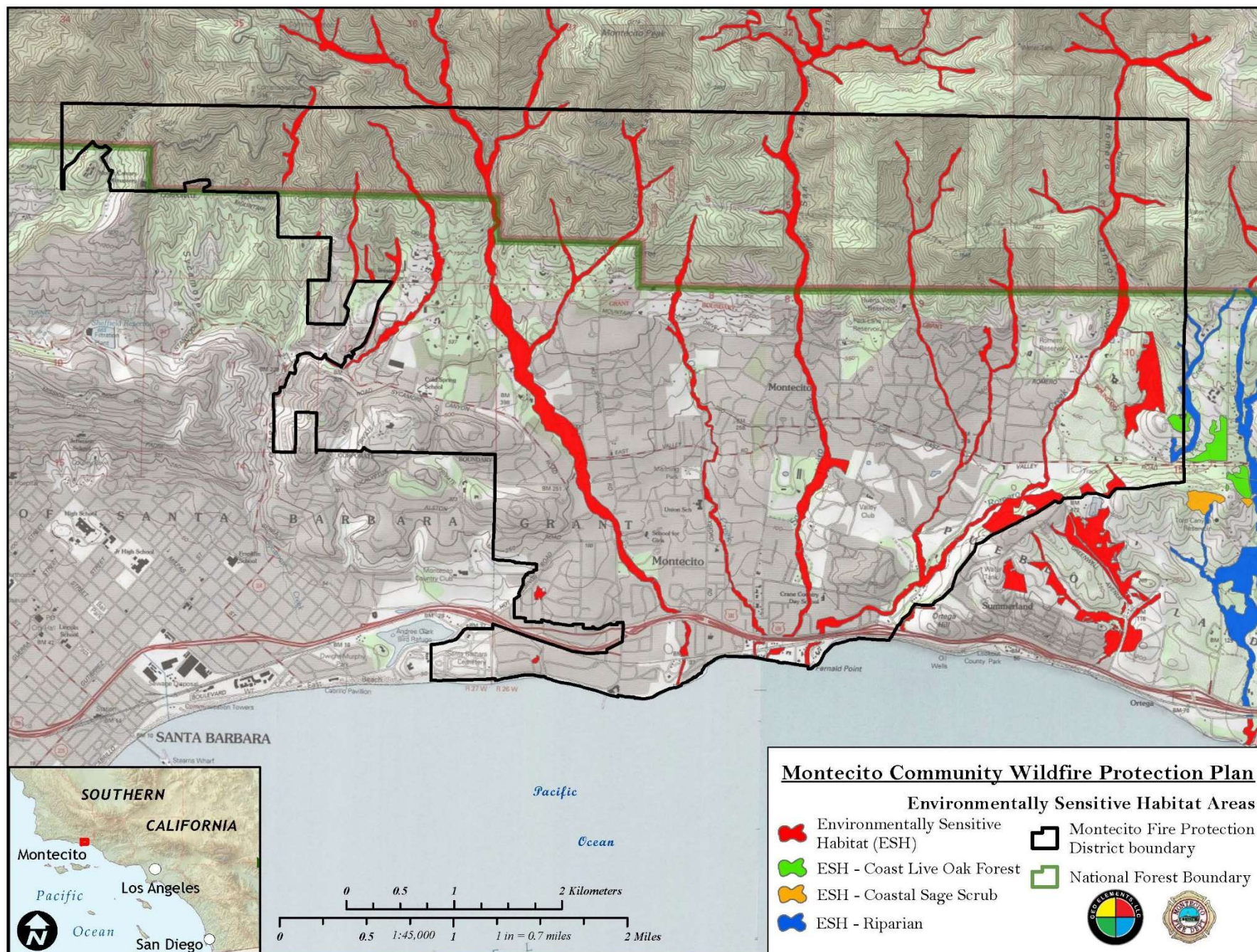
2.1.4 Natural and Historic Resources

The range of responses of natural and cultural resources to wildfire can vary from no effect to those that are temporarily altered to damaged and/or destroyed. The following provides a general description of these resources.

Natural Resources

The setting within and adjacent to Montecito includes a variety of natural resources and environmentally sensitive areas that exemplify key natural resource values. The Montecito Community Plan EIR identifies six natural habitats within the planning area including marine interface, chaparral, oak woodland, riparian, coastal sage scrub, and grassland. These Environmentally Sensitive Habitat areas are available in Figure 5, Environmentally Sensitive Areas Map. There are approximately fifty species of mammals, birds, insects, reptiles, and plants

Figure 5 Environmentally Sensitive Habitat Areas Map



identified within and/or adjacent to the District (California Natural Diversity Database, www.dfg.ca.gov/biogeodata/cnddb, 09 August 2015).

Natural resources damaged by wildfire can take years to recover and can require significant and unique restoration activities. Additionally, post-fire events such as flooding can create significant damage to watersheds and additional damage to habitat. Subsequent impacts may also include an increase in invasive species and erosion.

Scenic resources in Montecito are of significant importance to those that live and visit Montecito, with views of the Santa Ynez Mountains and the Pacific Ocean. Wildfire impacts on scenic resources are generally temporary as the post-fire blackened landscape begins to regrow in the first spring after a wildfire. Finding a balance with community wildfire protection planning and protection of natural resources is a goal of this plan.

Historic Resources

Historic resources are an important value to the community. They include archaeological sites and the built environment such as historic sites, buildings, structures, and landscapes (See Figure 6 of Historic Sites Map). Montecito has one historic site, Casa del Herrero (also known as the Steedman Estate) on the National Register of Historic Places. This property is designated a National Historic Landmark, and is recognized as one of the finest examples of Spanish Colonial Revival architecture in America.



Montecito and Santa Barbara County have identified almost one hundred fifty historic sites within the District classified as Historic Resource, Potential Historic Resource, Landmark, Structure of Merit, Place of Historic Merit, and Potential Structure of Merit. These sites include Leaping Greyhound Bridge, Juarez-Hosmer Adobe (including two trees), Deane School Buildings, Canby House, San Ysidro Adobe, Rancho Las Fuentes Lemon Packing House, and the Moody Sisters Cottage. These historic sites are located in well-maintained areas; however, burning embers from wildfires can pose a threat to these resources.

Archaeological sites such as Shawala Meadow have experienced human disturbance and wildfire exposure in the past. However, under the National Historic Preservation Act protection of known archaeological resources must occur during all fire suppression and fuel treatment activities. Fire protection planning should include awareness and understanding of the inherent hazards and risks that wildfire poses to historic and cultural values.

2.1.5 Recreation Amenities/Facilities

Montecito's recreation amenities and facilities include extensive trail systems and public parks such as Manning Park. Damages following wildfire can significantly impact recreational opportunities for months or years after the burn.

Manning Park consists of almost 12 acres that includes a variety of picnic areas, ball field, tennis courts, horseshoes, biking and hiking trails, restrooms, a renovated, historic carriage house, and manicured landscaping and specimen trees.

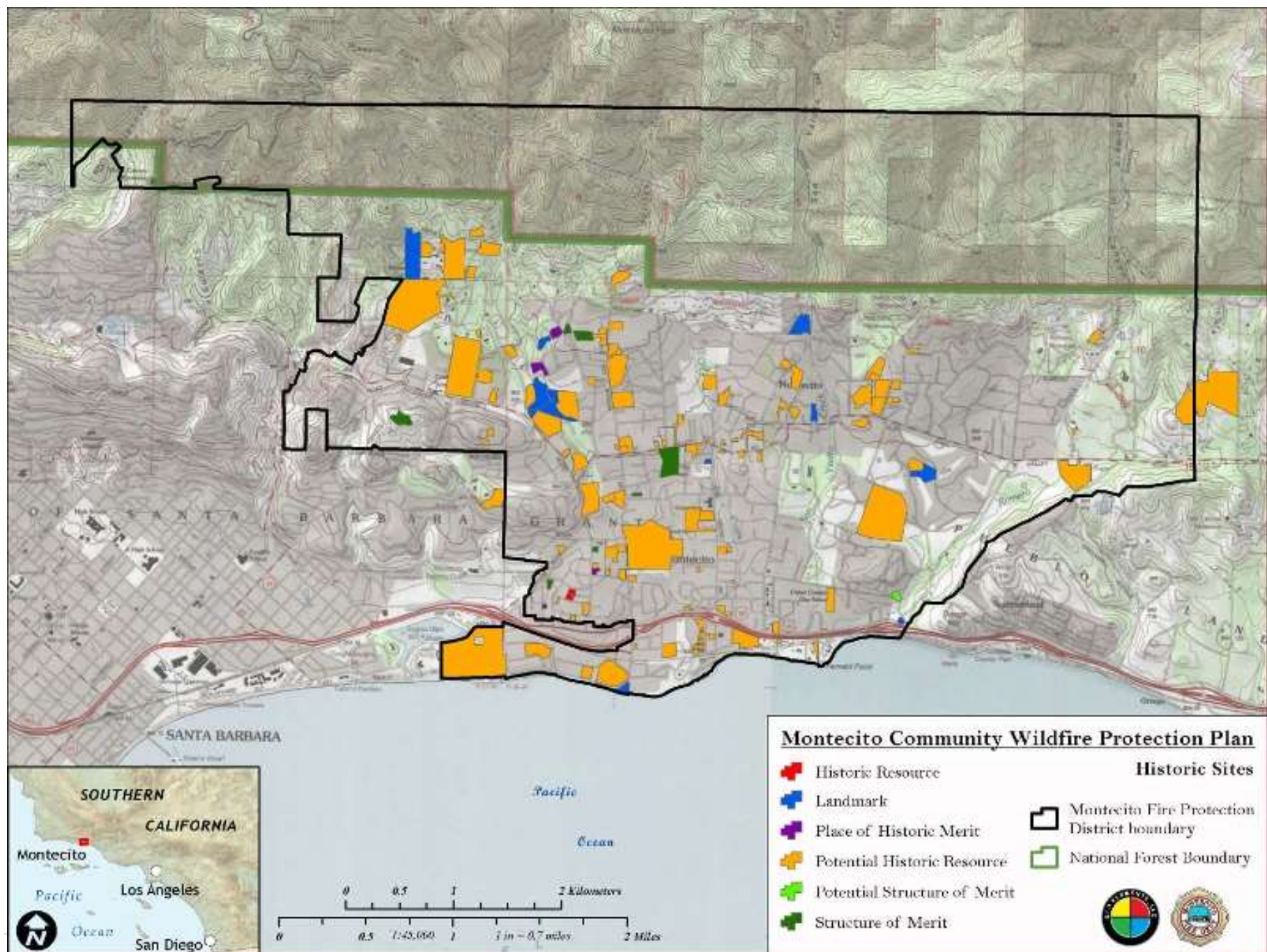


Figure 6 Historic Sites Map

Ganna Walska Lotusland is a 37-acre historic estate that operates as a private foundation and features more than 3,000 different plants from around the globe arranged in nearly 20 gardens. It includes collections of rare cycads, cacti, palms and euphorbias. Additional gardens feature ferns, aloes, lotuses, water lilies, bromeliads, and a cactus garden. Theme gardens include the blue garden, theatre garden, and a Japanese garden.

Mar y Cel (Sea & Sky) was a 350-acre estate in the Santa Ynez Mountain foothills above Montecito. This site contains the remains of an intricate array of stone aqueducts and water works, Romanesque arches, and Greek-like statues. Unfortunately, on November 13, 2008, the Tea fire ignited and destroyed the historic "Tea House" structure above Mountain Drive within the Mar y Cel property.



Montecito has an extensive trail system for hiking, walking, biking, and horseback riding including Rattlesnake, Cold Spring, Hot Springs, San Ysidro, Buena Vista, Romero, and connector trails. The trailheads are predominately located in drainages that run up into the chaparral covered Santa Ynez Mountains and Los Padres National Forest. While it is unknown how many recreationists utilize the trail systems at any given time, the parking areas at the trailheads indicate a high use of the trail system.

The coastal beaches of Butterfly, Hammonds, and Miramar beaches are quiet, secluded public beaches where local recreationists enjoy the surf, views of the Channel Islands and Santa Ynez Mountains, sunsets, and tide pools.

The impacts of wildfires to recreational opportunities includes the loss of recreation facilities, loss of trail integrity post fire due to flooding and slides, degradation of scenic values, loss of picnic tables, recreation related structure loss, loss of wildlife viewing experiences, degradation of water quality, and loss of spending by visitors in local businesses (e.g., groceries, restaurants, gas, etc.). Closures due to wildfire activity or post fire resource damage can limit and/or eliminate recreational opportunities to visitors and the community.

2.2 LAND USE AND ZONING

As a means of preserving and protecting Montecito's unique character, Santa Barbara County's Montecito Lands Use & Development Code identifies land use designations and specific goals, policies, and actions relating to community development. Zones and Allowable Land Uses in Montecito include Agricultural, Resource Protection, Residential, Commercial, Special Purpose, and Montecito Overlay. These land use designations preserve the existing semi-rural, predominantly large lot, single-family character of the community while still allowing development of new housing units on vacant residential lots. These land use and development codes provide for wildfire hazard mitigation strategies.

The Coastal Land Use Plan classifies and regulates the uses of land, buildings, structures in the coastal zone, and provides for fire prevention activities through thoughtful fuel modification. The Coastal Zone within the District runs along the southern portion of the District (See Figure 7, California Coastal Zone Map).

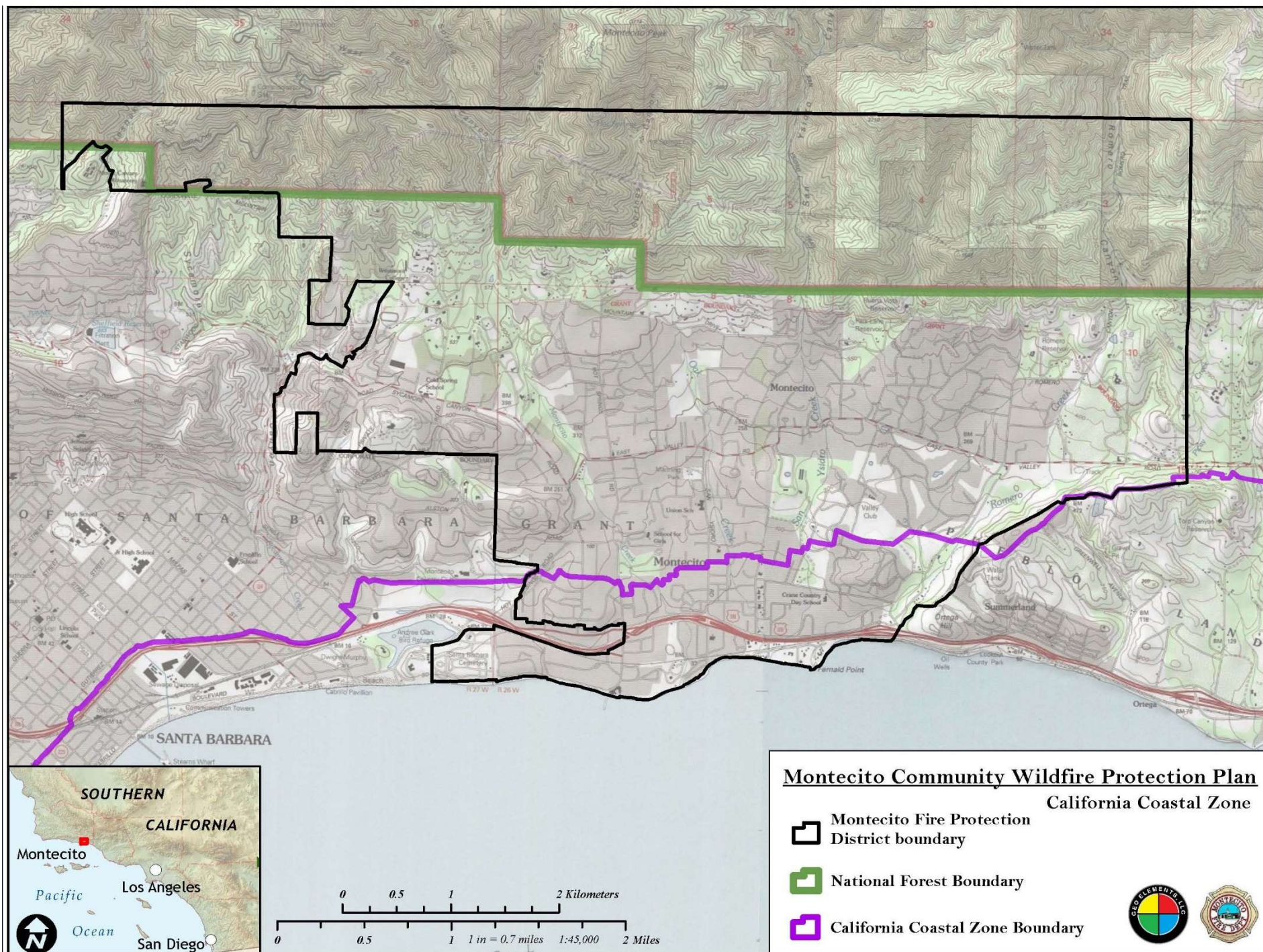


Figure 7 California Coastal Zone

2.3 FIRE PROTECTION

Wildland fire protection in the State of California is the responsibility of the state, local, or federal governments. These fire protection responsibility areas represent areas of legal responsibility for fire protection, including State Responsibility Areas (SRA), Federal Responsibility Areas (FRA), and Local Responsibility Areas (LRA). The District boundary includes the following areas:

- **Local Responsibility Areas (LRA)**

These areas are private lands outside of watershed areas designated by the state or lands incorporated into cities. City fire departments, fire protection districts, counties, and CAL FIRE under contract to local governments typically provide fire protection for these areas.

Important Note: *The Montecito Fire Protection District is responsible for fire protection of LRA throughout the District boundary.*

- **State Responsibility Areas (SRA)**

SRA is the area of the state where the State of California is financially responsible for the prevention and suppression of wildfires. SRA does not include lands within incorporated city boundaries, fire protection districts, or in federal ownership.

Important Note: *Santa Barbara County has a contract with the State of California to provide wildland fire protection on SRA within the County including the District. The County functions as a CAL FIRE Unit and is responsible for implementing all Strategic Fire Plan activities on SRA within the District boundary (See Section 1.3.2 for additional details on the Unit Strategic Fire Plan). SRA within the District boundary is north of Highway 192.*

- **Federal Responsibility Areas (FRA)**

The primary financial responsibility for wildfires suppression and prevention on federal lands is that of the federal government through the United States Forest Service (USFS), Department of the Interior - Bureau of Land Management, National Park Service, Fish and Wildlife Service, Bureau of Indian Affairs, and Defense Department for military lands.

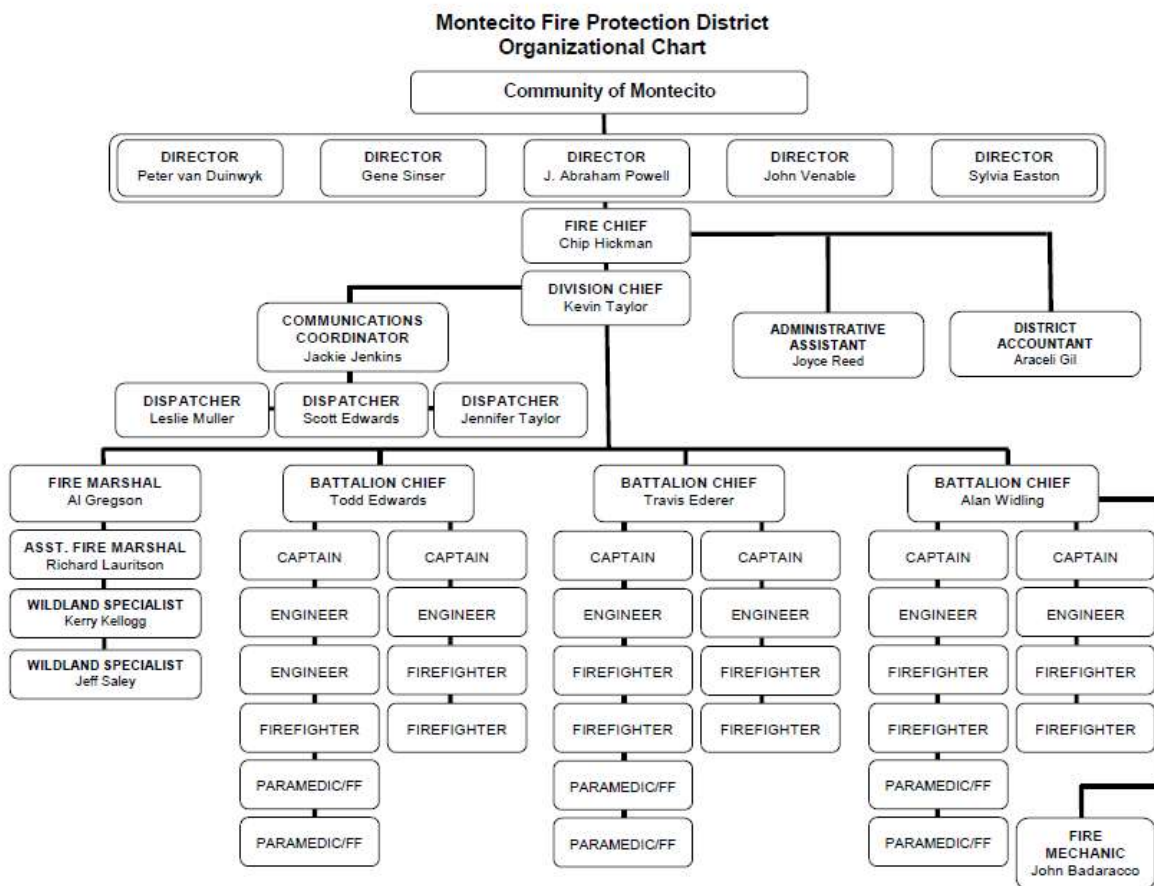
Important Note: *The Los Padres National Forest is responsible for the prevention and suppression of wildfires on FRA within the USFS administrative boundary of the District.*

Montecito Fire Protection District

The lands designated as LRA are under direct protection by the Montecito Fire Protection District. Organized on June 20, 1917, the District is governed by five members of a Board of Directors elected by residences within the District. The Fire Chief carries out the policies and plans of the Fire District Board, directs the activities of District employees, and manages District financial operations in conformity with board-established policies. The District's tax base primarily comes from residential property and does not collect development impact fees.

The District provides fire suppression, advanced life support, emergency medical services, technical rescue, and hazardous material response services with thirty-three emergency response personnel operating from two fire stations, as well as a fire prevention bureau along with thirteen administrative support staff. Figure 8 displays the District's organizational chart.

Figure 8 Montecito Fire Protection Organizational Chart



Currently, the District has two fire stations including:

- Montecito Fire Protection District Headquarters/Fire Station 1
595 San Ysidro Road
- Fire Station 2
2300 Sycamore Canyon Road

Fire equipment available at these fire stations include:

Table 2 Montecito Fire Equipment

Number of Equipment	Type of Equipment
4	Type 1 Structural Fire Engines (one is a reserve)
2	Type 3 Wildland Fire Engines
1	Type 6 Brush Patrol
1	Type 7 Brush Patrol
1	Type 4 Rescue Apparatus
1	Medium Urban Search and Rescue Apparatus
1	Reserve Ambulance
1	Mechanic Service Vehicle
3	Command Vehicles
5	Staff Vehicles

The District also operates its own dispatch center from Station 1, which provides contractual dispatch services for the Carpinteria-Summerland Fire Protection District.

Since 2003, the District has been working towards building a third fire station. Multiple studies have supported the need to improve service to the eastern portion of the District, including the 2014 *Citygate Standards of Coverage Study and Risk Assessment*. Its findings determined that eastern Montecito is underserved and that an additional station would provide similar levels of service to the eastern portion of the District as currently experienced by the rest of the District (Citygate, 2014).

2.3.2 Additional Fire Protection/Collaborative Agreements

The District has well established protocols for obtaining support from fire cooperators during an escalating wildfire through automatic and mutual aid agreements with adjoining jurisdictions including the City of Santa Barbara, Santa Barbara County Fire Department, and Carpinteria-Summerland Fire Protection District. Additionally, the Los Padres National Forest provides support to the District during mutual aid wildland fires.

The following is a brief summary of existing agreements and mechanisms through which the District can request assistance for fire suppression operations.

Automatic Aid: As a member of California's Office of Emergency Services Region 1, the District has agreements in place with the City of Santa Barbara, Santa Barbara County Fire Department, and Carpinteria-Summerland Fire Protection District. In addition, a local agreement is in place for automatic aid from the U.S. Forest Service, who will respond to reported vegetation fires within the District boundary. Aircraft consisting of fixed-wing air tankers and rotor-wings (helicopters) from Santa Barbara County and the United States Forest Service (USFS) Los Padres National Forest are part of the automatic aid response.

Master Mutual Aid: The California Disaster and Civil Defense Master Mutual Aid Agreement between the State of California and each of its counties and incorporated cities create a formal structure for the provision of mutual aid. Once a local emergency is declared, requests for additional firefighting resources can occur through the Operational Area Fire and Rescue Coordinator. If the emergency persists, additional resources are available from the regional or statewide system.

California Fire Assistance Agreement: This agreement is between the State of California, California Emergency Management Agency (CAL OES), California Department of Forestry and Fire Protection (CAL FIRE), and the five federal fire agencies (e.g., United States Forest Service, National Park Service, Bureau of Land Management, Fish and Wildlife Services, and Bureau of Indian Affairs). It provides the framework for coordinating the use of and reimbursement for local government fire and rescue resources used at wildfire incidents. Mobilization of firefighting resources occurs through the California Fire Assistance Agreement; however, reimbursement of expenses incurred in support of the District may be required.

2.3.3 1998 Montecito Community Fire Protection Feasibility Study

In 1998, the District contracted Firewise 2000, Incorporated to address wildfire concerns brought forward by the community. This Feasibility Study addressed wildfire hazards and risks, evaluated the Fire District's response to wildfires, proposed a range of fire protection programs to abate

and/or minimize the threat of wildfire, and determined “state-of-the-art” fire protection equipment to minimize the wildfire potential. It also assigned priorities for wildland fire protection funding, determined permits necessary to implement recommendations, and proposed an insurance company initiative for the community of Montecito.

The results of this study guided the District to build a successful District-wide fuel treatment program, a Fire Prevention Bureau, and increased staffing from one part-time Wildland Fire Specialist position to one fulltime and one part-time Wildland Fire Specialist position.

2.3.4 Water System Study

The District contracted RBF Consulting, a Michael Baker International company, to provide computer hydraulic modeling services to assist the District in identifying the approximate flow capacity of fire hydrants within the District boundary. RBF Consulting estimated that, although there were 872 fire hydrants in the data provided by the District to RBF, approximately 105 of those fire hydrants were non-District hydrants. These fire hydrants are not part of the existing Montecito Water District’s (MWD) pipeline infrastructure (e.g., private water lines) and/or part of other water systems (e.g., City of Santa Barbara) so were not assigned a fire flow capacity by RBF. The remaining 767 fire hydrants were included as part of the study.

Based on results from the study, it is estimated that approximately 14 percent of the fire hydrants in the District are incapable of delivering the required minimum 500 gallons per minute fire flow as required by the District’s Fire Protection Plan, especially in steeper areas north of Mountain Drive. This can put all values in this area of the District at greater risk, especially with their proximity to wildland vegetation and steeper slopes where fire behavior will likely burn with greater intensity.

2.3.3.1 Other Water Sources

Other water supplies within and adjacent to the District were not included in the Water System Study but do provide sources of water for wildfire suppression. These sources include:

Table 3 Water Sources (provided by Montecito)

Water Source	Capacity
Cold Springs Reservoir	1 million gallons
Hot Springs Lane Reservoir	0.8 million gallons
Park Lane Reservoir	1.3 million gallons
Buena Vista Reservoir	2 million gallons
Terminal Reservoir	3 million gallons

Romero Reservoir	1 million gallons
Ortega Hill	Unknown
Doulton Reservoir	Unknown
Crestview Road Reservoir	Unknown
Jameson Lake	Estimated 2 billion, 162 million gallons (2162 Mg)

Access to some of these water sources is limited due to narrow roads, inadequate turnarounds, and lack of parking for more than one apparatus. During times of drought, water sources (e.g., water tanks, reservoirs) may not be adequate to meet the needs of fire suppression resources and aerial water sources may not be available increasing turnaround times for firefighting aircraft potentially making them less efficient and/or effective in their suppression efforts.

The Citygate report rates the District's risk as it relates to droughts and water supplies as *High*. The risk factors identified by Citygate include the distances to fire hydrants, available flows, duration of available flows (storage capacity), redundant power for water system pumps during fire events, the proximity of water supplies to values at risk, and available flow and duration (Citygate, 2014).

Additionally, the effects of climate forecasts that include extended periods of drought, less winter precipitation, earlier snowmelt and rainwater runoff, all coupled with prolonged fire seasons exacerbate the need for a reliable firefighting water delivery system for fire suppression operations.

2.3.5 2014 Standards of Coverage Study and Risk Assessment

In 2014, the District retained Citygate Associates, LLC to conduct a community risk assessment, evaluate the District's fire station placement plan, assess the District's headquarters and support functions, and conduct an online community survey. Wildfire was one of nine risks included as part of this report. As it relates to wildfire, Citygate identified that Montecito has:

- a moderate to very high risk of wildland fire occurrence north of Highway 101
- inadequate response times to the eastern portion of the District
- approximately fourteen (14) percent of the fire hydrants within Montecito are incapable of delivering a minimum of five hundred (500) gallons per minute as required by the District's Fire Protection Plan
- significant access and egress impediments that can adversely affect emergency response times and evacuations
- high risk vulnerability to drought occurrences
- taken aggressive steps to minimize both the occurrence and severity of impacts from wildfire

- adopted a comprehensive Community Fire Protection Plan and associated Final Environmental Impact Report
- implemented an intensive vegetation reduction and modification program
- implemented an aggressive defensible space program
- a good wildland fire response capability supported by local and regional fire agencies, strategic response force augmentation, an adopted evacuation plan, and multiple mass notification systems to minimize the impacts of all but the most severe wildland fires

SECTION 3. DEFINING THE WILDFIRE PROBLEM

Wildfire is inevitable in Santa Barbara County and the probability of a catastrophic wildfire occurring at any particular location within or adjacent to Montecito is dependent on a chain of events that includes fire ignition, fire weather, fire behavior, suppression actions taken, and the interaction of these factors. Each year firefighters from the District and cooperating agencies combine efforts to contain most wildfires to less than one acre. A rapid and aggressive fire suppression response from the air and ground, favorable weather and fuels conditions, timely fire reporting, and/or good access to wildfires by fire suppression resources all contribute to the success in suppressing these wildfires. However, when an ignition occurs under the wrong weather and fuel conditions, and/or firefighting resources are committed to fighting simultaneous wildfires in Southern California, and/or access for fire suppression resources is limited or impossible, then a wildfire has the potential to escape the best efforts of fire suppression resources. These wildfires can rapidly threaten life safety and destroy homes, infrastructure, natural resources, and other values at risk.

Although wildfire in Montecito is inevitable, the protection of human life and the reduction of the threat of loss and/or damage to homes, businesses, critical infrastructure, and other values can be achieved through thoughtful planning and careful wildfire preparation.

3.1 FIRE ECOLOGY

Fire ecology is the science of fire's natural role in an ecosystem. The term includes the study of fire history and the evolutionary change of vegetation and animals in response to fire. The following will describe Montecito and the surrounding area's fire ecology.

3.1.1 Vegetation

Chaparral

Over 35% of the District contains chaparral vegetation. Chaparral within and adjacent to Montecito is best described as a mosaic of grasslands, shrublands, and woodlands that includes a range of native chaparral vegetation such as manzanita, Ceanothus, mountain-mahogany, flannel bush, Christmas berry, cherry, oak, coffeeberry, chamise, sumac, and sugar bush. These species are adapted to regenerate after a fire through various means of post fire reproduction, such as:

- *obligate seeders* – mature plants are killed by fire and populations regenerate from seedlings that germinate the following winter or spring
- *sprouters* – shrubs that are top-killed by fire resprout vigorously from root crown or burl
- *combination seeders and sprouters* – regenerate from seedlings and resprout from root crowns or burls
- *fire followers* – annual and perennial herbaceous species dominate an area during the first year or two after a fire but decline within 2 – 5 years as shrub cover increases. They drop seeds that lay in wait to the next wildfire event to regenerate

These species are also adapted for seasonal and larger episodic droughts with characteristics such as small evergreen resin and/or waxy leaves, leaves that roll when dry, leaves or needles with fine hairs, and older leaves that drop in the summer months.

Recent research suggests that larger widespread fire events occurring now have been occurring for at least 300 to 400 years. The smaller, more localized fires were more numerous and frequent in the past, and have been nearly eliminated from the modern regime (Lombardo, 2012).

Fire frequency in the chaparral plant community is highest in the summer; however, the majority of the acres burned occur in the fall. The last significant wildfire activity in the chaparral plant community that surrounds Montecito occurred during the 2008 Tea fire.

Oak Woodland

Oak woodlands encompass approximately 18% of the District including stringers of woodland areas running through the District in riparian areas. These unique environmental features occur along canyons and major drainages within intermittent streams or at the bottom of steep drainages such as Hot Springs, San Ysidro, and Romero Canyon.

Under more moderate weather conditions, these riparian corridors can be partial barriers to wildfire spread due to the cooler, shaded environment produced by the overstory of coast live oak trees. The shaded conditions help to keep fuel moisture higher and fuel temperature lower than the surrounding area(s). However, under downslope wind events, such as Sundowners, these riparian corridors can act as a wick to bring fire from the wildlands down into more developed neighborhoods in the District. Dead material and dried herbaceous fuel within these woodlands can aid in fire spread under moderate to strong Sundowner weather conditions.

Under typical weather conditions, fire severity is often lower in oak woodlands. Most commonly, wildfire scorches riparian plants or the outermost portions of the tree canopies burns during wildfire. Oak, sycamore, and willow trees are all strong sprouters and, if fire severity is low, the vegetative structure of the riparian area can quickly recover after fire. In rare cases, entire trees can die. While some tree species can recover by sprouting, years are required to restore the pre-fire woodland canopy cover.

3.1.2 Wildlife

Wildlife depend on vegetation such as chaparral and oak woodlands for food and shelter, therefore wildfire affects their distribution by altering the structure of vegetation and availability of many foods. During a wildfire, larger mammals and bird species can move quickly away from the fire and some smaller mammals and reptiles can take refuge in burrows underground, but species that cannot leave or find protection die in a wildfire.

Unburned areas or islands within a wildfire perimeter and unburned edges of wildfires create areas of dispersal for animal populations that can travel back into burned areas as they recover. The continued existence of all wildlife after a fire within and adjacent to Montecito is determined by the habitat created and vegetation recovery post fire.

3.2 CLIMATE

The Köppen-Geiger Climate Classification System classifies Montecito as Csb “dry-summer subtropical” often referred to as “Mediterranean” with a precipitation pattern that is dry during

the summer months, and warm and moist in the late winter and spring (Köppen-Geiger Climate Classification System; <http://koeppen-geiger.vu-wien.ac.at/index.htm>; 18 August 2015). Although not common, snow occasionally falls on the mountains above the District but rarely stays for more than a few days. These long, dry summer and fall months ensure a prolonged fire season every year.

3.2.1 Climate Change

Climate change has been affecting California for decades with observations that include increases in average temperatures, more hot days, fewer cold nights, a lengthening of the growing season, less winter precipitation falling as snow, snowmelt and rainwater running off sooner in the year, and longer periods of drought. As a result, fire seasons are prolonged. Additionally, it is estimated that sea levels have risen by as much as seven inches along the California coast over the last century thereby increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources (California Fire Plan, 2010).

Locally, these changes have affected local water availability due to drought, the frequency and behavior of wildfires, vegetation recovery after a wildfire, and the timing and length of fire season.

3.2.2 Drought

A recent study in Southern California showed a significant relationship between localized fire events, drought, and years of below average precipitation. This relationship was only evident during the year of the fire event meaning that previous years' conditions were not a significant factor in driving fire occurrence. In addition, the relationship between localized fire events and the El Niño are non-existent except between El Nino events two years prior to the fire event. The researchers speculated that the moisture received two years prior to a fire event might have assisted in building an abundant fuel source (Lombardo, 2012).

3.3 LOCAL FIRE HISTORY

Research has shown that over the past 500 years, large wildfires have occurred in the Santa Barbara area on an average of every 20 to 30 years (Mensing et al., 1998). This same research also indicates that the frequency of wildfire along the Santa Barbara Front has increased in recent years. Since the decade of the 1950s, the greater Santa Barbara area averaged one large fire per decade. However, since 2008, three large fires (i.e. fires greater than 500 acres) have burned within this same geographic region (See Figure 9). Montecito and neighboring communities have a long history of large wildfires. Historically, three presidential disaster declarations have occurred in Santa Barbara County due to the impacts of wildfire on local communities.

The most recent destructive fire in Montecito occurred in November of 2008, when the Tea fire began from an abandoned bonfire at the historic Tea House on the Mar y Cel Open Space Preserve. Driven by winds gusting in excess of 70 mph the Tea fire severely injured two residents and destroyed 210 homes in Montecito and Santa Barbara, and heavily damaged a portion of Westmont College (Rob Kuznia, Noozhawk, 2008).

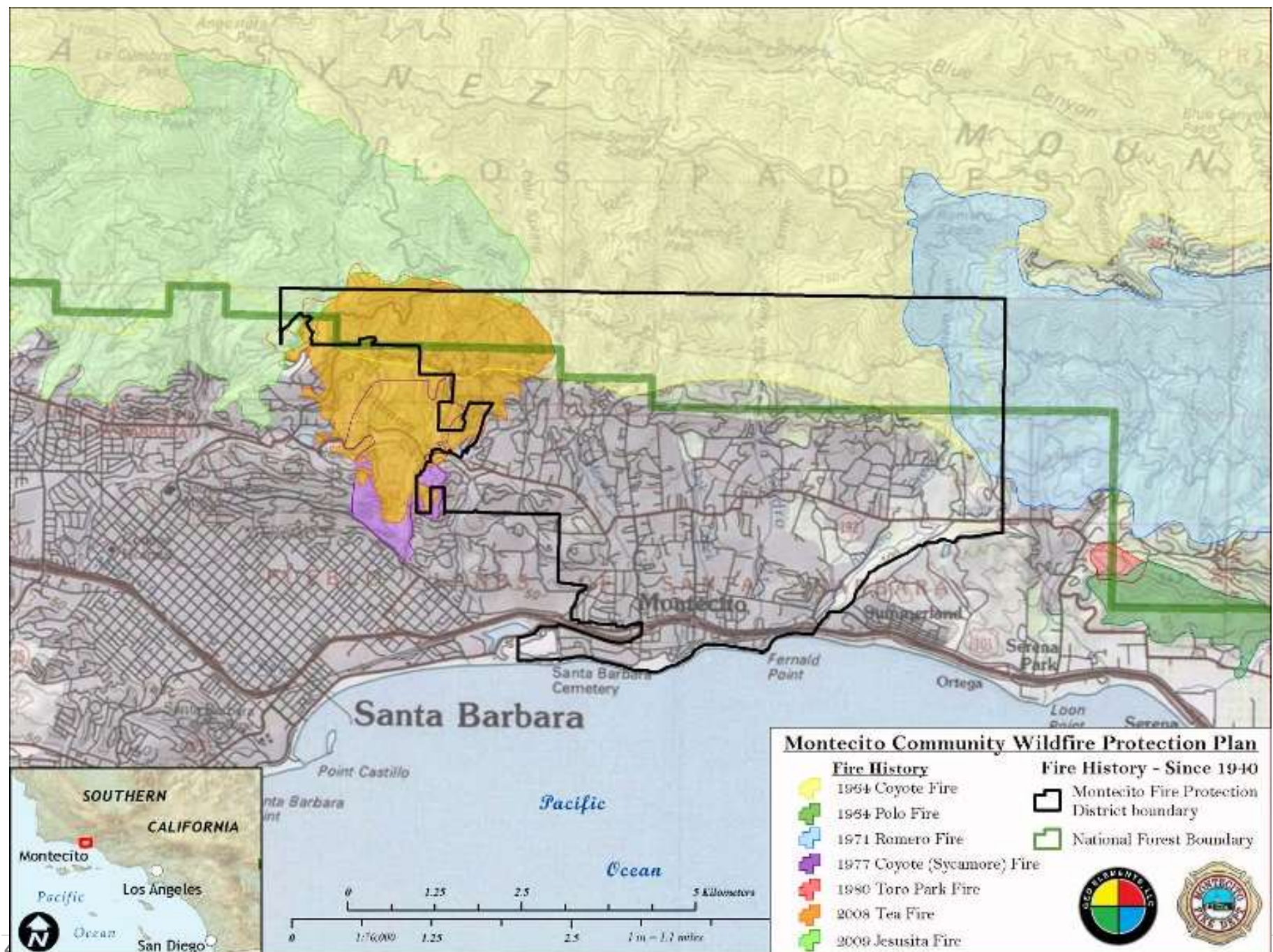


Figure 9 Fire History Map

Another example of a destructive wildfire within Montecito was the 1977 Sycamore Canyon fire, which burned just over 800 hundred acres within a seven-hour period and destroyed a reported 234 homes.

Montecito missed the direct impacts of recent large fires including the Jesusita, Painted Cave, and Gap fires that destroyed homes and took lives in adjacent communities. In the 1970s, the 1977 Sycamore and 1971 Romero fires burned substantial portions of the District. Structure loss was great on the Coyote and Sycamore fires, but no lives were lost. Unfortunately, fire statistics from the Romero fire indicate that 4 firefighters died and 91 people were injured during the course of this wildfire (Always Remember Website, www.wlfalwaysremmeber.org, 07 July 2015).

Table 4 lists wildfires that have threatened and/or destroyed homes within the sphere of influence of the District.

Table 4 Large Fire History

Fire Name	Date	Estimated Fire Size (acres)	Structures Lost	Fatalities
Jesusita	May, 2009	8,733	160	0
Tea	November, 2008	1,940	210	0
Painted Cave	June, 1990	4,900	440 homes, 28 apartments, 30 other structures	1
Sycamore Canyon	July, 1977	805	195	0
Romero Canyon	October, 1971	15,650	4	4
Coyote	September, 1964	65,339	106	1

3.4 MONTECITO'S WILDLAND FIRE ENVIRONMENT

The interaction of fuels, topography and weather all affect the likelihood of a fire starting, the speed, direction and intensity of the fire and the resistance to firefighting control efforts. This section describes the wildland fire environment within and surrounding the community of Montecito.

3.4.1 Fuels

Vegetation is the primary fuel source for wildfires and is the most important factor in determining fire hazard; however, many human-made sources act as fuel such as structures and ornamental vegetation. They also contribute to the fire environment and can significantly affect fire behavior.

Development in Montecito is primarily residential structures on large lots with substantial natural and ornamental landscaping. The community plan states, "To maintain the semi-rural character of Montecito, the natural landscape must continue to be the dominant feature of the community." (County of Santa Barbara Planning and Development, 1995). The retention of the natural environment within the community, while desirable from a quality of life perspective, also means that flammable vegetation will be intermixed in the community.

Limited amounts of commercial (e.g., Central Urban Sub Area), open space (e.g., Mountain Sub Area) and agricultural lands occur within the community. Manning Park is the only designated public open space within the District boundary. The 12-acre park contains a mix of native and ornamental vegetation, manicured lawns, and hardscape.

Undeveloped federal lands exist to the north of Montecito along the interface with the Los Padres National Forest. The interface between the community and the forest is a potentially hazardous location during wildfires as modeled fire intensity is greatest at this interface.

Table 5 lists the existing vegetation types that occur within the District boundary. This vegetation is the fuel that will support wildfire activity in Montecito.

Table 5 Existing Vegetation Types within the District

Vegetation Type	Acres	Percent of Area
Agriculture Pond or Water Feature	2.62	0.03%
Annual Grasses and Forbs	255.72	2.84%
California Bay	16.42	0.18%
California Sagebrush	121.50	1.35%
California Sycamore	8.95	0.10%
Ceanothus Mixed Chaparral	1316.57	14.62%
Chamise	42.53	0.47%
Coast Live Oak	1525.51	16.94%
Coastal Mixed Hardwood	191.09	2.12%
Dune	19.99	0.22%
Eucalyptus	10.41	0.12%
Lower Montane Mixed Chaparral	1569.57	17.43%
Non-Native/Ornamental Grass	380.41	4.22%
Non-Native/Ornamental Hardwood	1846.55	20.50%
Non-Native/Ornamental Shrub	11.21	0.12%
Orchard Agriculture	178.85	1.99%
Pastures and Crop Agriculture	11.01	0.12%
Reservoir	0.40	0.00%
Riparian Mixed Hardwood	9.48	0.11%
Scrub Oak	36.90	0.41%
Soft Scrub Mixed Chaparral	40.62	0.45%
Urban or Industrial Impoundment	0.59	0.01%
Urban/Developed (General)	1401.72	15.56%
Urban-related Bare Soil	4.13	0.05%
Water (General)	2.88	0.03%
Grand Total	9005.61	100.00%
Source: FRAP GIS evveg Data, 2015		

The *Montecito Community Plan* identifies Environmentally Sensitive Habitats (ESH) within the District boundary, which includes Riparian Woodland Corridors, Monarch Butterfly Roost Sites,

Sensitive Native Flora, and Coastal Sage-Scrub. These habitats all reflect vegetative conditions, which under certain environmental conditions, will support wildfire spread. Policy BIO-M-13 of the *Montecito Community Plan* states that “ESH areas within the Montecito Planning Area shall be protected, and where appropriate, enhanced.” Policies and Development Standards that define appropriate actions within ESH areas are available within the Community Plan, pages 103-110. Consultation of these policies and standards will occur when designing fuel treatment projects within ESH areas.

3.4.1.1 Fuel Characteristics

Characteristics of fuels (wildland vegetation) that affect fire behavior include fuel type, fuel moisture content, fuel loading (the amount of fuel expressed as tons/acre), chemical content, horizontal continuity, and vertical arrangement. Each of these characteristics contributes to one or more fire behavior processes. Understanding the association between fuel characteristic and fire behavior can facilitate the design of effective fuel treatment strategies.

3.4.1.1.1 Fuel Types/Fuel Models

Fuel types within and adjacent to the community include grasses, shrubs/brush, and ground litter associated with forested areas (e.g., oak and eucalyptus woodlands). Fuel types are broken in to specific fuel models that describe the physical properties of vegetation that support wildfire. Each specific fuel model has associated burning characteristics. Burning characteristics can change significantly, as fire spreads through different fuel models across a landscape. Through the removal or rearrangement of vegetation, it is possible to modify the fuel model and therefore modify the fire behavior at a specific location on the greater landscape.

3.4.1.1.2 Fuel Moisture

Fuel moisture is a dynamic variable controlled by seasonal and daily variations in the weather. The moisture of living and dead fuel is an important component that influences wildland fire behavior. Simply stated, vegetation is most flammable when fuel moisture levels are low and less flammable when fuel moisture levels are high. The amount of moisture in a fuel will largely determine if fuel is available to burn.

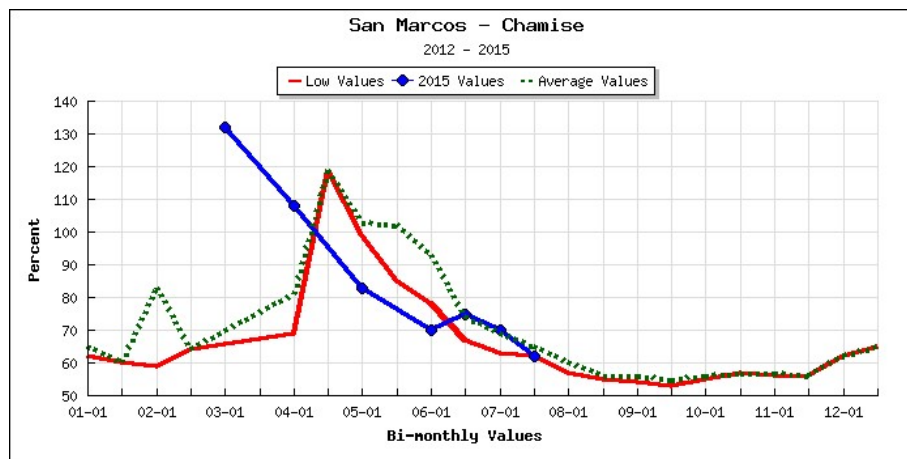
The fire environment influences two types of fuel moistures: dead fuel moisture and live fuel moisture. Dead fuels act like a sponge absorbing or giving up moisture to the air and ground that surrounds the fuel. This exchange of moisture with the environment changes the fuel moisture content of dead fuels. In general, the more moist the air or ground the more moist the fuel, and conversely the more dry the air and ground the more dry the dead fuel.

Fire managers use the concept of “timelag” to define how rapidly this exchange of moisture occurs between dead fuel and the surrounding environment. Smaller diameter fuels such as dry grasses exchange moisture quite rapidly. This is why a dry grass field may be covered in dew early on a summer morning, but can burn in a wildfire later that same afternoon. Table 6 displays the rate of exchange of moisture between dead fuel and the environment. Times shown reflect the hours required for 2/3 of the volume of a dead fuel to come into equilibrium with its surrounding environment. Timelag is the time required to reach equilibrium.

Table 6 Dead Fuel Moisture & Timelag Relationship to Fuel Size

Diameter Class	Timelag	Fuel Description
0 – 0.25"	1-hour	Grasses, forbes
0.25 – 1.0"	10-hour	Small sticks and branches
1.0 – 3.0"	100-hour	Larger branches, small logs
3.0" and greater	1000-hour	Larger logs

Live fuel moisture is the moisture in living, growing vegetation. Control of live moisture is through internal physiological mechanisms and external influences such as rainfall patterns, drought, aspect, elevation, and normal seasonal drying patterns. Typically, live fuel moistures in the area are highest in the spring through early summer and at their lowest in late summer through winter. Locally, live fuel moisture sampling of chamise occurs throughout the year by the Los Padres National Forest at San Marcos Pass Ranger Station. Live fuel moistures can range as low as 55% to as high as over 124% (National Fuel Moisture Database, www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103, 09 September 2015). Live fuel moistures of 60% or below in chamise indicate a critical threshold where live fuels display similar burning characteristics as dead fuels. Figure 10 displays average and low fuel moisture data from San Marcos Pass.

Figure 10 San Marcos Fuel Moisture Data

3.4.1.1.3 Fuel Loadings

Fuel loadings vary greatly by fuel types. Generally, grasslands produce fuel loadings between 1 to 5 tons per acre, while brush species may produce 20 to 50 tons per acre, and timber up to 100 tons per acre. Fuel loading correlates to fire intensity with areas of heavier fuel loads releasing more heat energy than areas with lighter fuel loads.

3.4.1.1.4 Horizontal Continuity

The horizontal continuity of fuels describes the uniformity or patchiness of fuels across the landscape and affects the ability of a fire to spread. The fuelbed north of the community is generally continuous up to the Camino Cielo Road, creating a potential for a fire to spread into the community under off shore wind events such as the Sundowner winds. Within Montecito, fuel continuity is disrupted by road systems and neighborhoods; however, flammable native and

ornamental vegetation is used extensively along roadways as screening, limiting the disruption of the fuel bed normally associated with road systems. Riparian corridors also provide continuous fuel pathways into the community.

Wildfire cannot spread through a discontinuous fuel bed without the presence of a strong wind, steep slopes, and/or through ember cast igniting new spot fires ahead of the primary fire front. Fuels throughout Montecito are receptive to burning embers or firebrands, which leads to a high probability of spot fires occurring within the community, especially when a fire is burning under offshore wind conditions.

3.4.1.1.5 Vertical Arrangement

Vertically arranged fuels are those that can carry fire burning in surface fuels into the canopy (i.e., crowns) of taller shrubs and trees. The continuous vertical continuity of the fuel bed is known as “ladder fuels”. This condition is common in the District within riparian corridors and in eucalyptus-dominated areas such as Eucalyptus Hill Road.

3.4.1.1.6 Chemical Properties

Chemical properties of fuel relates to the presence or absence of volatile substances such as oils, resins, wax, and pitch. Locally, chaparral species, sages, and eucalyptus have higher concentrations of volatile chemical compounds when compared to grasses.

During summer months, an increase in ether extractives occurs in vegetation resulting in increasing combustibility in some plant species (Philpot, Mutch, 1971). Ether extractives in many species can rise from 8.3 to 15% during the summer, making foliage more easily ignited (Philpot, 1969). An extractive content over 10% indicates high crown fire potential (Philpot, Mutch, 1971).

Eucalyptus is a species of concern for firefighters due to highly flammable eucalyptus oil. On warm days in Australia, vaporized eucalyptus oil can be seen raising above the trees creating the characteristic blue haze of the landscape. While the heat released by wildfires from the combustion of eucalyptus species is similar to those of many North American tree species, in a study conducted by McArthur and Cheney, the leaves of eucalyptus with their volatile oils burned nearly twice as hot as the wood (Whelan, 1995). Eucalyptus groves are more susceptible to fire and fire spread due to the trees close proximately to each other and the heavy accumulation of dead fuel on the ground. Stand-alone eucalyptus trees are much less of a threat to the spread fire particularly when they are well maintained and ground litter is removed.

3.4.2 Weather

Weather is the most variable element of the wildland fire environment and the least predictable. Important components of fire weather are temperature, relative humidity, precipitation, wind, and atmospheric stability. All of these elements have the potential to enhance or retard wildfire spread and intensity.

Situated in the coastal zone, the Pacific Ocean greatly influences weather along the Central Coast. Fog is common on the lower slopes of the District throughout the spring and early summer, lessening in depth and duration in late summer and fall.

August is the warmest month of the year with an average maximum temperature of 74°Fahrenheit (F), although extremely hot temperatures can occur. The Montecito Remote

Automated Weather Station (RAWS) recorded a record temperature of 112°F in September 2012. The coldest month of the year is December with an average minimum temperature of 42°F. The lowest recorded temperature within the 18 years of weather data analyzed from the Montecito RAWS was 36 °F.

The annual average precipitation in the District is 20.04 inches with the vast majority of the precipitation occurring between November and April. February is historically the wettest month of the year with rainfall averaging 4.43 inches (Santa Barbara County Flood Control District, 2015).

Based on 18 years of wind records from the Montecito RAWS, the mean average wind speed is 4.3 mph with west and south as the dominant wind directions. While this data represents the average wind speed, it is the strong offshore winds associated with Sundowner wind events that drive large wildfire development along this portion of the Central Coast.

Sundowner winds are a significant weather pattern unique to the Santa Barbara Front. These winds often begin in the late afternoon or early evening and are associated with a rapid rise in temperature and decrease in relative humidity. The mechanism that triggers these wind events is more common in the summer than the fall. Sundowner winds occur when a high-pressure ridge sets up north of the east-west Santa Ynez Mountains and the pressure gradient amplifies the typical late afternoon downslope winds. As these winds move downhill, they heat through compression. They then channel through the primary drainages that bisect the District as they push downslope over the Santa Ynez Ridge. Wind data from the 2008 Tea fire indicate a six-hour period where wind speeds averaged in excess of 45 mph. The strongest gust recorded during this time period was 72 mph. This combination of high temperatures, low relative humidity and high winds create explosive conditions under which wildfires can adversely impact the community.

3.4.3 Topography

Topography is the configuration of the earth's surface including its relief and the position of its natural and human-made features. It is the most stable of the elements in the fire environment and plays an important role in how a fire will burn. Topography modifies general weather by channeling wind, inducing slope and valley winds, creating thermal belts, producing orographic thunderstorms, and contributing to Foehn or Sundowner winds. Factors of topography that affect fire behavior include slope, aspect, terrain or land features, and elevation. Of all the topographic features, the steepness of slope is the most influential on fire behavior.

Covering approximately 9.3 square miles, the District sits along the east-west trending segment of the California coastline on a low elevation alluvial coastal plain. The coastal plain is relatively flat within the southern portion of the community, but gains elevation rapidly as the Santa Ynez Mountains begin to rise towards the Los Padres National Forest. Montecito Peak, located north of the community, is the dominant topographic feature rising to an elevation of 3,216 feet (Google Earth, 2015). Slopes north of East Mountain Drive/Bella Vista in the Los Padres National Forest routinely exceed 80%.

Five major north-south trending canyons (e.g., Rattlesnake/Sycamore, Cold Springs, Hot Springs, San Ysidro, and Romero) originate from the Santa Ynez Mountains and bisect the community. These drainages descend sharply from the ridgetop before flattening as they pass through the

developed portions of the community. The drainages help define the natural environment of the community, supporting a diverse oak woodland/riparian vegetation mix. However, these drainages also serve as major flow paths for Sundowner and Santa Ana winds, channeling and accelerating the offshore winds.

The District has a mostly southern aspect with fine scale variation along mesas, creeks, and drainages. This south aspect receives greater amounts of solar radiation than does a north-facing slope. Typically, a southern aspect creates an environmental condition where lighter, flashier fuels exist. However, the cool and moist coastal climate of the Central Coast overpowers the influence of solar radiation and little difference occurs between fuels that exist on south or north facing slopes.

3.4.4 Fire Behavior Characteristics

Fire behavior characteristics describe how a fire will burn, where it burns, how fast it spreads, and the amount of energy it releases. The diversity of fuels, topography and weather found in the District leads to a fire environment that can support the full spectrum of fire behavior. The range of how a wildland fire burns includes:

- Ground fires burn in the organic material beneath the surface litter, such as the layer of duff, roots, and buried or partially buried dead and decaying woody material
- Surface fires burn in material above the ground including low vegetation such as grasses, low shrubs, small trees, and woody debris on the soil surface
- Crown fires burn in the tops of trees and tall shrubs or brush. The classification of crown fires include passive, active, and independent
- Spotting occurs when wind, convection, or gravity outside the main perimeter of the fire transport firebrands. Whether or not a "spot fire" develops is dependent on if a firebrand lands on a receptive fuel

During the summer fire season, the District experiences generally moderate weather conditions, with light winds, cool temperatures, and high humidity associated with coastal fog. Under these conditions, wildfires spread slowly as surface fires. Generally, firefighters contain these types of wildfires very quickly.

However, severe weather conditions such as Sundowner wind events happen on a regular basis along the front range of the Santa Ynez Mountains. The combined high temperatures, low relative humidity, and strong winds associated with these weather events creates wildfire behavior that exceeds the ability of firefighting personnel to suppress. Fire behavior observed on past wildfires in the area burning under these conditions include flame heights of over 70 feet, rate of spread in excess of 2-miles per hour and spotting distances of $\frac{3}{4}$ of a mile. Wildfires burning under severe weather conditions have resulted in loss of life, structures, infrastructure, and important natural and cultural resources.

SECTION 4. MONTECITO: A COMMUNITY AT RISK

The 2000 National Fire Plan (NFP) specifically directs funding for projects designed to reduce wildfire risks to communities and restore ecological health on Federal lands. An essential step in achieving this goal was to identify communities at high risk of damage and/or loss from wildfire. In 2001, the Federal Register identified communities at risk from wildfire that were located near Federal lands. Montecito was designated as a community at risk (CAR) in August 2001 (National Archives and Records Administration Federal Register, 2001).

The NFP initially excluded communities that were not located near Federal lands from this funding opportunity, although they were still at significant risk from wildfire. In 2003, states had the opportunity to identify all CARs. The California Department of Forestry and Fire Protection (CAL FIRE) led the effort to identify all CARs in California. With California's extensive WUI situation the list of communities extends beyond those on Federal lands. CAL FIRE used three main factors to determine which communities were at risk and their level of fire threat, defining these factors as: 1) high fuel hazard, 2) probability of a fire, and 3) proximity of intermingled wildland fuels with urban environments. Currently, Montecito is one of 1,327 communities in California identified as a CAR.

4.1 Montecito's Wildland Urban Interface

The general definition of the WUI is the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels. This area poses a tremendous threat to life safety, property, and infrastructure. The WUI is one of the most dangerous and complex situations that firefighters face.

The greatest threat to Montecito is from the wildland area of the Los Padres National Forest. Montecito has a distinct line where the community and wildland vegetation meet along the north side of East Mountain and Bella Vista Drives. However, there are areas in Montecito where the wildland fuels, urban fuels and structures intermix on private lands, especially along riparian corridors and open spaces in the northwestern and eastern portions of the District.

The 2003 HFRA generally limits the WUI to within 1/2 mile of a community's boundary or within 1-1/2 miles when mitigating circumstances exist, such as sustained steep slopes or geographic features that aid in creating a firebreak, *unless* the WUI is otherwise defined in a CWPP. It was necessary to refine the District's WUI boundary beyond the generic description provided in the HFRA due to Montecito's fire history and wildfire threat. Stakeholders that attended the June 18th, 2015 meeting worked collaboratively to define Montecito's WUI that extends north into the Los Padres National Forest along the Santa Ynez Ridge, west into Santa Barbara City and County, east to Carpinteria-Summerland Fire Protection District, and south throughout the entire community (See the WUI Map, Figure 11).

4.2 Montecito's Natural and Historic Values

Natural and historic resources are desirable values cherished by residents and business-owners as part of the community. These values are also at risk of loss and/or damage due to wildfire. Wildfires igniting from human activities within the community threaten the natural and historic resources adjacent to and surrounding the District. These important values have been exposed

to wildfire well before urban development; however, the frequency of fire occurrence and increase in fire intensity has increased the potential for loss to these important assets.

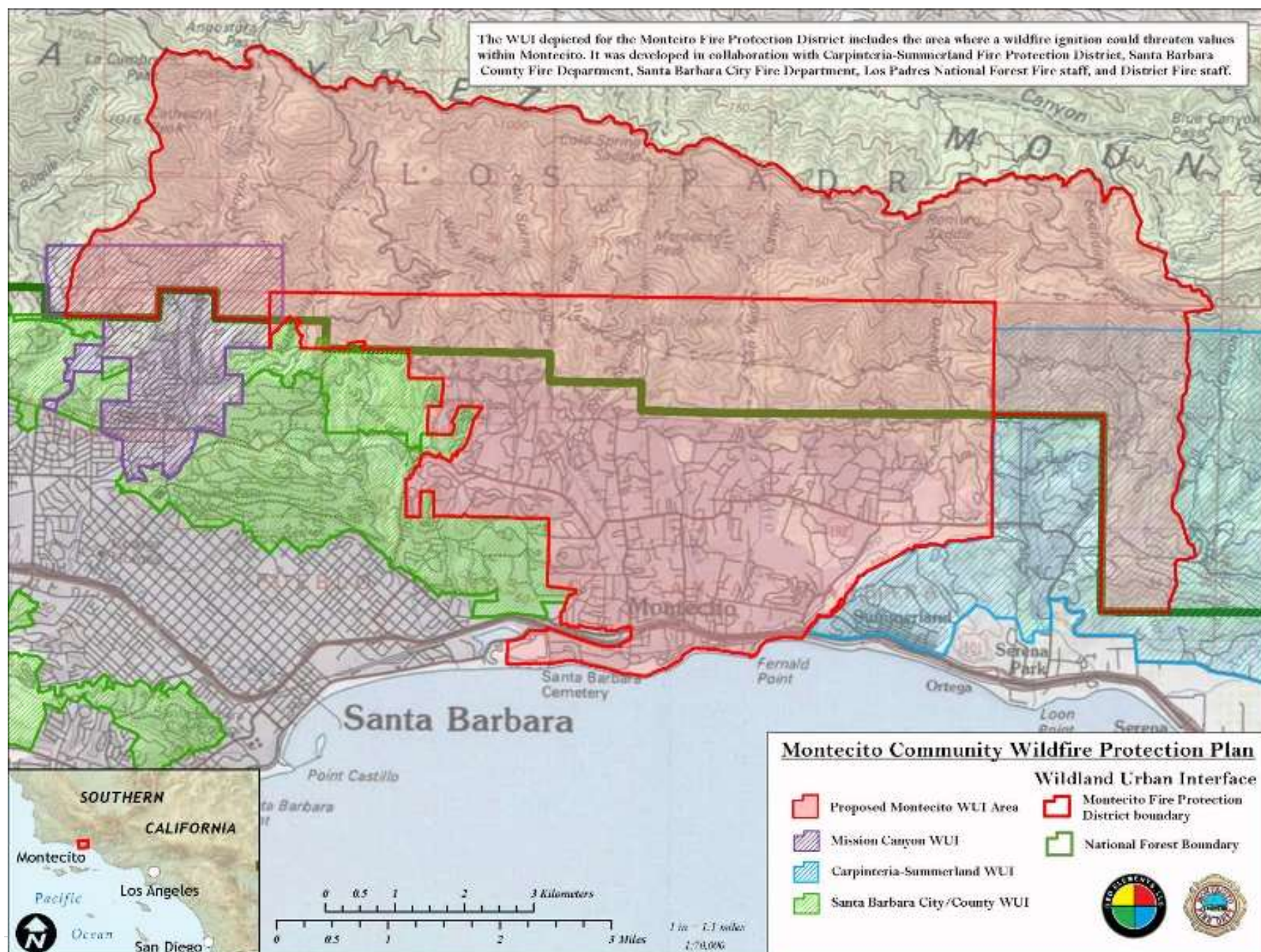


Figure 11 WUI Map

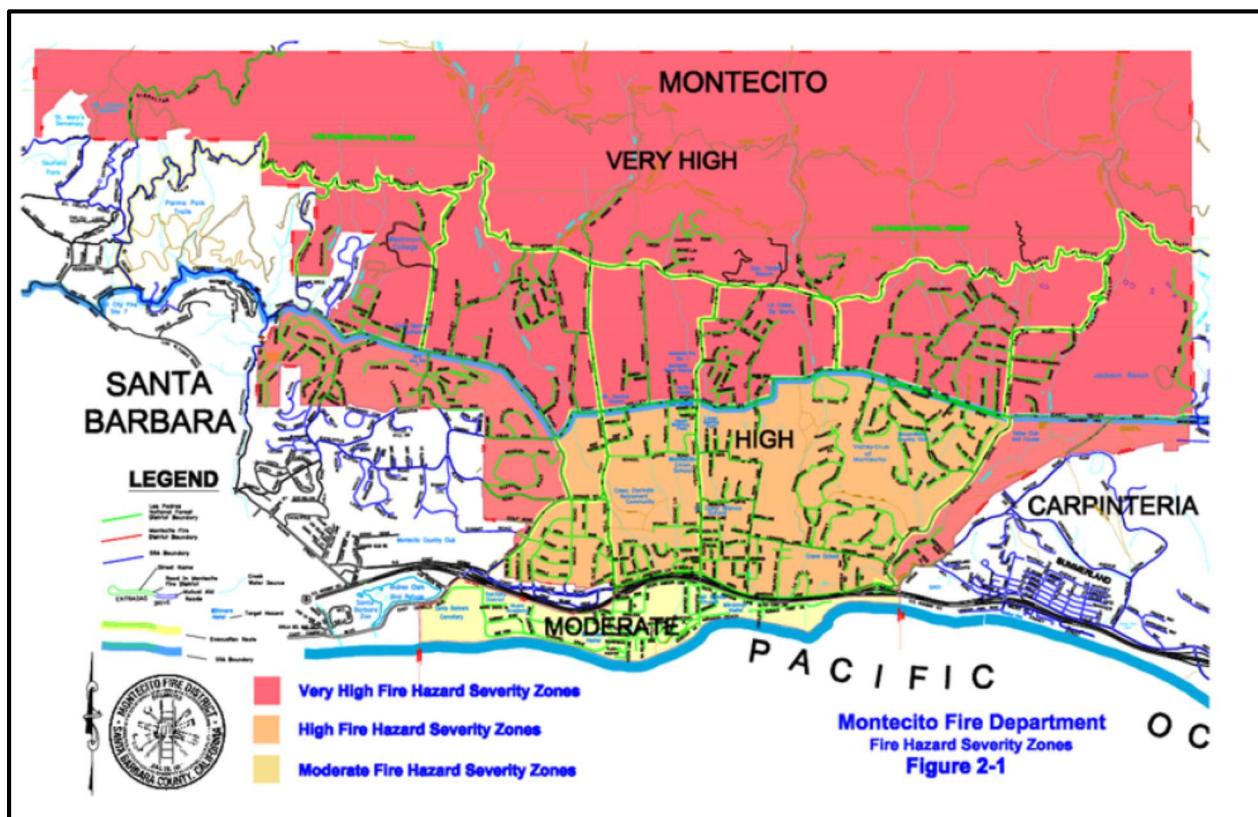
SECTION 5. WILDFIRE ASSESSMENT

Fire history is a great indicator of the wildfire threat; however, this alone cannot define the specific wildfire threat or help to design mitigation measures that protect a community. An analysis of the wildfire potential utilized established assessment methods, scientifically accepted fire models, new analysis tools, and validation of model outputs by fire professionals to identify the District's greatest wildfire hazard, wildfire risk, defensibility, ember exposure, and fire run damage potential. The purpose of the assessments is not to determine the wildfire hazard or risk for individual parcels but to provide the framework for prioritizing potential wildfire mitigation strategies for the entire District.

5.1 CALIFORNIA AND LOCAL FIRE HAZARD SEVERITY ZONES

California state law mandates that CAL FIRE identify "fire hazard severity zones" throughout the State. These fire hazard severity zones are defined as areas that have similar burn probabilities and fire behavior characteristics (CAL FIRE, 2015). The District, through its local authority, has established severity zones that meet this requirement. Three zones exist within the community roughly defined by primary east-west oriented roads. Areas north of East Valley Road are classified as a Very High Fire Severity Zone, areas south of East Valley Road and north of Highway 101 are classified as a High Fire Severity Zone, and areas south of Highway 101 are classified as a Moderate Fire Severity Zone (Figure 12).

Figure 12 Montecito Fire Hazard Severity Zones



5.2 ASSESSMENT

Historically, the greatest wildfire threat to the community comes from the Los Padres National Forest and SRA lands in the Santa Ynez Mountains above Montecito. Continuous chaparral vegetation, steep terrain, and the potential hot and dry weather associated with Sundowner winds can combine to create an extremely hazardous wildfire environment. While this interface with the National Forest is a wildfire threat, there are locations within Montecito proper that also represent a hazard to local citizens.



Established wildland fire models provided the basis to evaluate the wildfire hazard, defensibility, ember exposure, and the fire run damage potential for the community including FlamMap (Version 3.0), Behave Plus 5.0.4 (Build 305), FARSITE, (Version 4), and FireFamily Plus (Version 4). These fire models are the best available science for analyzing wildfire potential. Data used in the models came from state and federal sources, including LANDFIRE, Weather Information Management System (WIMS), and the Fire Resource and Assessment Project (FRAP). The following sections describe the models used and their application:

5.2.1 FlamMap

FlamMap is a spatial fire behavior mapping and analysis program that uses elevation, slope, aspect, surface fuel model, canopy cover, fuel moisture, and historic weather data to evaluate fire behavior (Finney, 2004). The outputs from FlamMap provide a reasonable representation of surface fire behavior and crown fire potential across the landscape. Fire professionals used previously observed fire behavior and site visits to calibrate FlamMap inputs and validate the model outputs. FlamMap allows evaluation of an entire analysis area under a defined set of environmental conditions, thus providing insight into how fire behavior changes across the landscape.

5.2.2 FARSITE

FARSITE is a fire growth simulation modeling system that uses geospatial information on topography and fuels along with weather and wind data to evaluate fire growth under defined spatial and temporal parameters (Finney, 2006). FARSITE is unique among the fire models as it generates fire growth perimeters for site-specific conditions. These perimeters help assess potential structure losses, plan evacuation lead-time requirements, and identify flow paths of a potential or ongoing wildfire. FARSITE evaluated potential damage to structures from a modeled wildfire.

5.2.3 Behave Plus

This model is the most commonly used program for predicting fire behavior. Behave Plus predicts surface fire characteristics at a single point on the landscape under defined environmental conditions (Andrews, Bevins, 2008). This program does not analyze fire spatially, and is not compatible with GIS analysis. Behave Plus is useful to evaluate specific points of interest or to assess how fire behavior might change as environmental inputs such as wind, slope, or fuel

moistures change. For the purpose of this plan, Behave Plus provided insight to fire managers on the strength of wind needed to spread fire in a downslope direction.

5.2.4 FireFamily Plus

Fire Family Plus is a fire climatology and occurrence program that combines the functionality of various weather and climate programs into a single package (Bradshaw, McCormick, 2000). The model allows the user to summarize and analyze historic weather observations for use in FlamMap, FARSITE, and Behave Plus. Historic weather data was obtained from the Montecito Remote Automated Weather Station (RAWS) and analyzed in FireFamily Plus to determine 90th percentile weather conditions for the assessment area. The results of this analysis provided inputs into the fire behavior models.

5.2.4.1 Data Sources for Models

Much of the data used for modeling came from the LANDFIRE program, a federal government sponsored database that supports wildfire planning at the landscape level. More than fifty data products are available from LANDFIRE; however, for the purposes of this assessment only elevation, slope, aspect, surface fuel model, canopy cover, and existing vegetation are used. The vegetation layers in LANDFIRE are created from satellite remote sensing data, and are updated frequently (approximately 3 – 4 years) in order to capture changes in vegetation due to both growth and disturbances like wildfire. The LANDFIRE data used for this analysis was updated in 2012 and includes the effects of the 2008 Tea and 2009 Jesusita fires.

5.2.4.1.1 Weather Data

Historical weather data used to support fire modeling came from the Montecito RAWS, which has continuous weather records dating back to 1997. The data for the analysis represents the summer and fall fire seasons in Montecito, June 20th through October 20th. This time period was selected as “fire season” since fire danger records indicate that this is the time of the year when the minimum Energy Release Component (ERC) derived from the National Fire Danger Rating System (NFDRS) is consistently greater than zero. An ERC of zero indicates that a fire will not spread. This does not mean that fire will not burn during other times of the year, only that weather conditions are such that fire activity can be expected at any time during this time period. Both the 90th percentile weather conditions and actual observed weather data from the 2008 Tea fire provided two separate fire model scenarios for the analysis.

5.2.4.1.2 Wildland Fuel Models

A wildland fuel model is a mathematical representation of a vegetative fuel complex that specifies all fuel descriptors required for use in the fire models. The fire behavior modeling associated with the CWPP assessment utilized the Scott and Burgan’s Standard Fire Behavior Fuel Model (FBFM) classification system that describes the composition and characteristics of both surface and canopy fuels (Scott, Burgan, 2005).

A major challenge in wildfire assessments is accurate mapping of fuels in order to determine spatial fire hazard and to plan mitigation efforts. The Landscape Fire and Resource Management Planning Tools (LANDFIRE) fuels layer represents the best available data for Montecito and was spot checked to validate fuel models as reported in the LANDFIRE data were representative of on-the-ground conditions. The 30-meter resolution of the fuels data available from LANDFIRE

does not capture the level of detail needed for assessing small open spaces; however, for planning purposes the 30-meter resolution of the data is sufficient to assess overall wildfire hazard and to make recommendations for mitigating identified hazards. A list and explanation of the fuel models used in fire modeling are available in Appendix C.

5.3 Hazard Assessment

Using 90th percentile weather conditions, the results from FlamMap show areas with flame lengths in excess of 11 feet within the community and to a greater extent immediately north of East Mountain Road and Bella Vista Road where the interface with the National Forest occurs (Figure 13, Wildfire Hazard Map).

The eastern portion of the District displays the greatest wildfire potential, especially in areas near Romero Creek. Wildfires burning at these intensities are difficult to control, and are extremely hazardous to life safety of residents and firefighters. Values (e.g., structures, infrastructure, and natural resources) threatened by wildfires burning at these intensities are at significant risk of damage and loss.

When the model parameters reflect more extreme weather conditions, such as a Sundowner wind event, the results increase significantly across the entire District. The areas previously identified as supporting flame lengths in excess of 11 feet remain, but the spatial extent of the 11-foot plus flames increases. Table 7 displays the abilities of firefighting resources to suppress wildfires based on the flame lengths, while Table 8 shows the changes in flame length by category between 90th percentile weather conditions and those weather conditions associated with the 2008 Tea fire.

Table 7 Fire Behavior Characteristics and Suppression Capability

Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Interpretations
0 – 4	0 – 100	Fires can generally be attacked at the head or flanks by persons using hand tools. Handline should hold the fire.
4 – 8	100 – 500	Fires are too intense for direct attack on the head by persons using hand tools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft can be effective.
8 – 11	500 – 1,000	Fires may present serious control problems—torching out, crowning, and spotting. Control efforts at the head of the fire will probably be ineffective.
11+	1,000+	Crowning, spotting, and major runs are common. Control efforts at the head of the fire are ineffective.
<p><i>Caution: These are not guides to personal safety; fires can be dangerous at any level of intensity; Wilson (1977) has shown that most fatalities occur in light fuels on small fires or isolated sections of large fires.</i></p> <p><i>Source: NWCG Fireline Handbook, Appendix B Fire Behavior, April 2006.</i></p>		

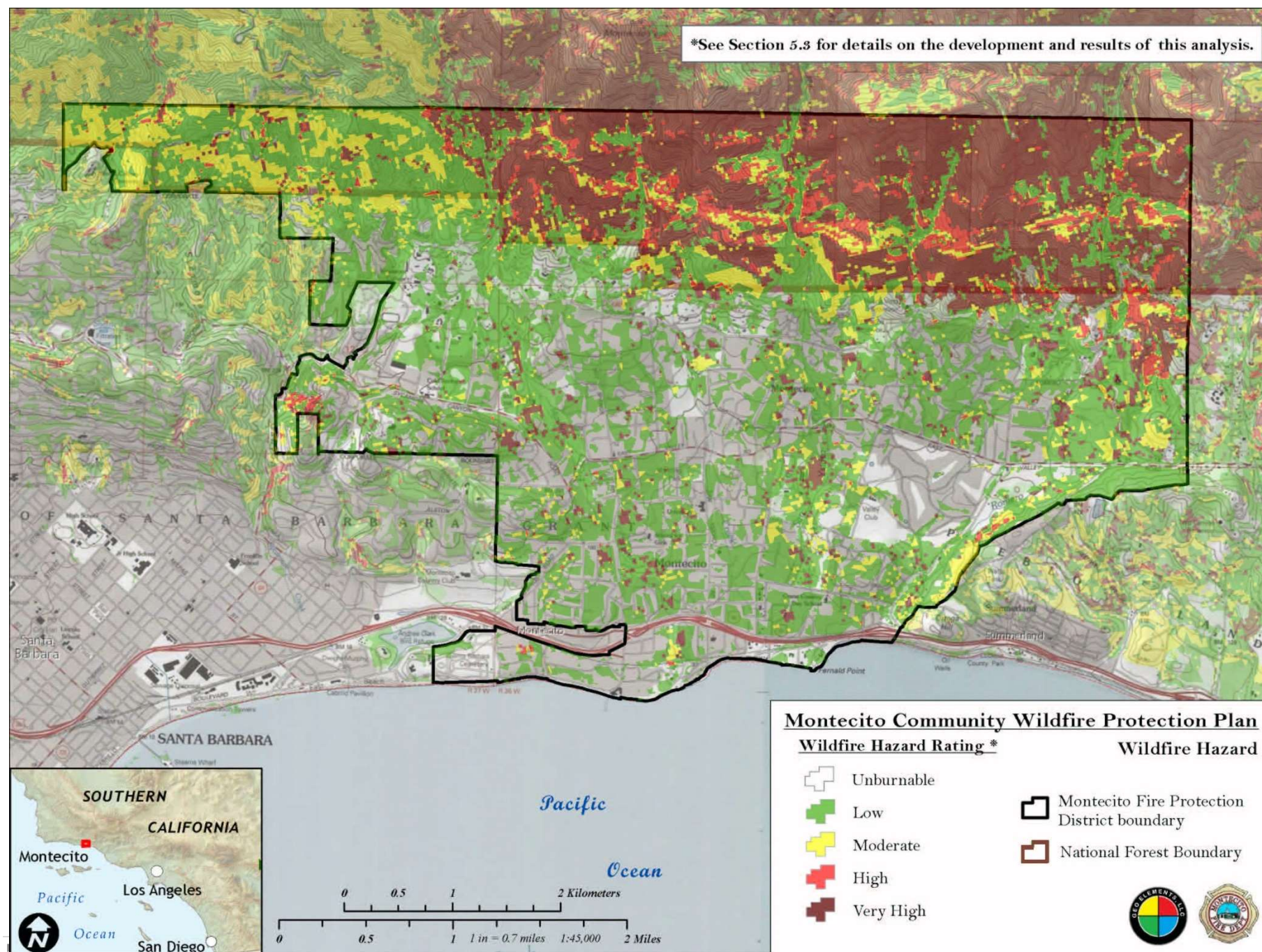


Figure 13 Wildfire Hazard Map

Table 8 Flame Length Comparison - 90th Percentile Weather versus Tea Fire Weather Conditions

Flame Lengths	90 th Percentile Weather	Tea Fire Weather Conditions
Unburnable	37.45%	23.50%
0 - 4 feet	29.10%	20.98%
4 - 8 feet	11.87%	18.69%
8 - 11 feet	2.87%	8.83%
11+ feet	18.72%	28.00%

IMPORTANT NOTE: *Although there appears to be areas on the hazard map that are not at risk from a wildfire, this is not a correct interpretation. Fire models have limitations and "nonburnable fuels" (e.g., structures, roads, infrastructure, ornamental vegetation, crops, and bare ground), are present throughout the planning area. These "unburnable" areas are those considered insufficient to carry wildfire under any condition in the model but they are included to facilitate consistent mapping of these areas.*

The representation of unburnable portions of a landscape does not accurately reflect fire potential as was evident during the 2008 Tea and 2009 Jesusita fires. These wildfires clearly demonstrate the ability of a fire to burn readily and intensely through these "unburnable" zones. Additionally, the fire models do not account for the influence of ornamental vegetation and other "nonburnable fuels" during a wildfire nor does the model consider the impact of firebrands landing on flammable vegetation and vulnerable structures causing ignition of structures.

The combined fire behavior outputs of flame length and crown fire potential from FlamMap provided the basis for categorizing the wildfire hazard for the District into four hazard categories:

- Very High
- High
- Moderate
- Low

Flame lengths correlate to surface fireline intensity and the ability of firefighters to control a wildfire (See Table 7). The lowest flame lengths are typically in lighter fuels, such as grasses and oak woodlands where no understory is present and the longest flame lengths typically occur in areas of heavier fuels, such as chaparral and coastal scrub.

Crown fire potential is the likelihood of a fire spreading through the canopy of tall shrubs and trees. FlamMap represents crown fires as:

- Surface - no crown fire activity occurring
- Passive - small groups or single trees burning in a non-continuous manner
- Active - spreading as a flaming front through the crowns

Table 9 is the matrix used to assign areas of one of four wildfire hazard categories. Based on this matrix, Geographic Information System (GIS) analysis spatially depicted the final fire hazard ratings for the District based on where these two fire behavior characteristics intersect on the landscape.

Table 9 Wildfire Hazard Determination Matrix

Crown Fire Potential	Flame Lengths (feet)			
	0-4	4-8	8-11	11+
Surface (1)	Low	Moderate	High	Very High
Passive (2)	Moderate	High	Very High	Very High
Active (3)	High	Very High	Very High	Very High

5.4 Risk Assessment

Citygate's 2014 report identified that Montecito was vulnerable to damage from a wildfire and categorized the community into three fire risk zones. Areas north of Highway 192 rated Very High Risk, the central area of the community between Highways 192 and 101 rated High Risk, and the area south of Highway 101 rated Moderate Risk. While this study provides general insight into the risk that the District faces from wildfire, it does not provide spatially specific information to make informed decisions regarding wildfire hazard mitigation.

The following two methodologies more specifically evaluated the wildfire risk. The first uses historic wildfire data and evaluates the number of times an area has burned in a wildfire. This historical data includes 75 years of fire records and shows historically where fires tend to impact the community. The following identifies the categories used for wildfire risk:

- One wildfire occurrence – Low Risk
- Two fire occurrences – Moderate Risk
- Three or more fire occurrences – High Risk

The second methodology uses wildfire ignition data for the years 1992 through 2013. This ignition data is laid over the District boundary and surrounding areas to look for specific locations where wildfire ignitions have historically occurred. The assessment of historical fire occurrences is important to understanding areas where wildfires have affected the community and to identify clusters of ignitions that may indicate a fire prevention issue. Information about historic fire spread and fire ignitions is useful for prioritizing fuel treatments and the developing fire prevention strategies.

Figure 14 shows the spatial relationship of ignitions to the District boundary. The distribution of ignitions indicates that areas outside of the District have the greatest ignition density, in particular areas in the Los Padres National Forest. A number of ignitions have occurred along Gibraltar Road above the District boundary. This ignition distribution corroborates input from District staff who stated that the greatest threat from a wildfire to the District is from ignitions beyond the District boundary.

5.5 Defensibility Analysis

Defining the degree to which a structure might be defensible during a wildfire is a highly complex process. Many variables can affect the determination as to whether a structure has a high probability of defense or a lower probability.

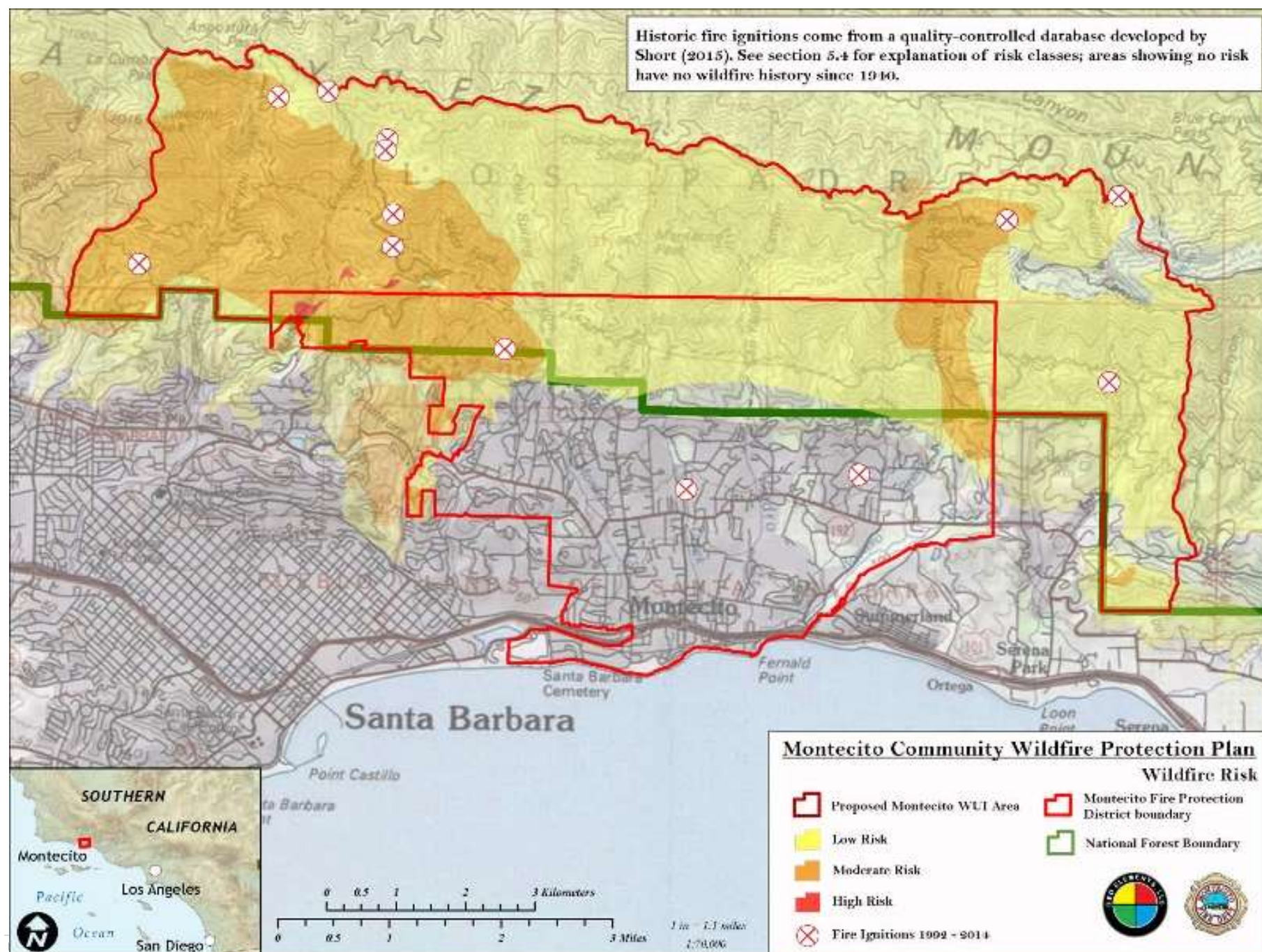


Figure 14 Wildfire Risk Map

One of the key factors in defending a structure during a wildfire is the ability to secure a safe operational space from which firefighters can conduct safe structure defense. The wildfire hazard assessment described above provided guidance on where it may be potentially safer for firefighters to engage in structure defense activities. Once a safe operational space is established, firefighters have the ability to address several tactical challenges that may be less than optimal for successful structure defense.

The Incident Response Pocket Guide developed by the National Wildfire Coordinating Group (NWCG) identifies the following as potential tactical challenges of fighting fire in the WUI, almost all of which occur in Montecito (NWCG, 2014).

- Narrow roads, unknown bridge limits, and septic tank locations
- Ornamental plants and combustible debris next to structures
- Poor driveway access and low clearances
- Limited opportunities to observe the main fire
- Wooden siding and/or wooden roof materials
- Structural components, such as open vents, eaves, decks, and other ember traps
- Fuel tanks, propane tanks, and hazardous materials
- Powerlines
- Limited water sources or low water flow rates
- Property-owners remaining on-site

This analysis does not include these tactical challenges, but rather provides a more generalized approach to defensibility, allowing the public and Fire District personnel to understand where structure defensibility issues exist on a community scale.

The other key factor in developing defensibility potential is how quickly firefighters can secure a fireline in various fuel types. Generally, grasses and low brush have faster fireline production rates than do heavy brush or timber-based fuel models. Assignment of “fireline production rates” of slow, medium, or fast are based on the density of each fuel model and provided categories for this analysis. The West Wide Wildfire Risk Assessment developed for the Council of Western State Foresters and the Western Forestry Leadership Coalition (Sanborn Map Company, 2013) provided the production rates used in this evaluation.

Table 10 details the matrix used to determine how fireline production rates and wildfire hazard combined to create the defensibility potential in this analysis and Figure 15 spatially depicts the defensibility potential. Much of the northern and eastern portions of the District and scattered pockets within the District depict a *Low* to *Medium* potential for defensibility. Those areas pose significant problems for firefighters in protecting values due to life safety issues and likely slower fireline production rates.

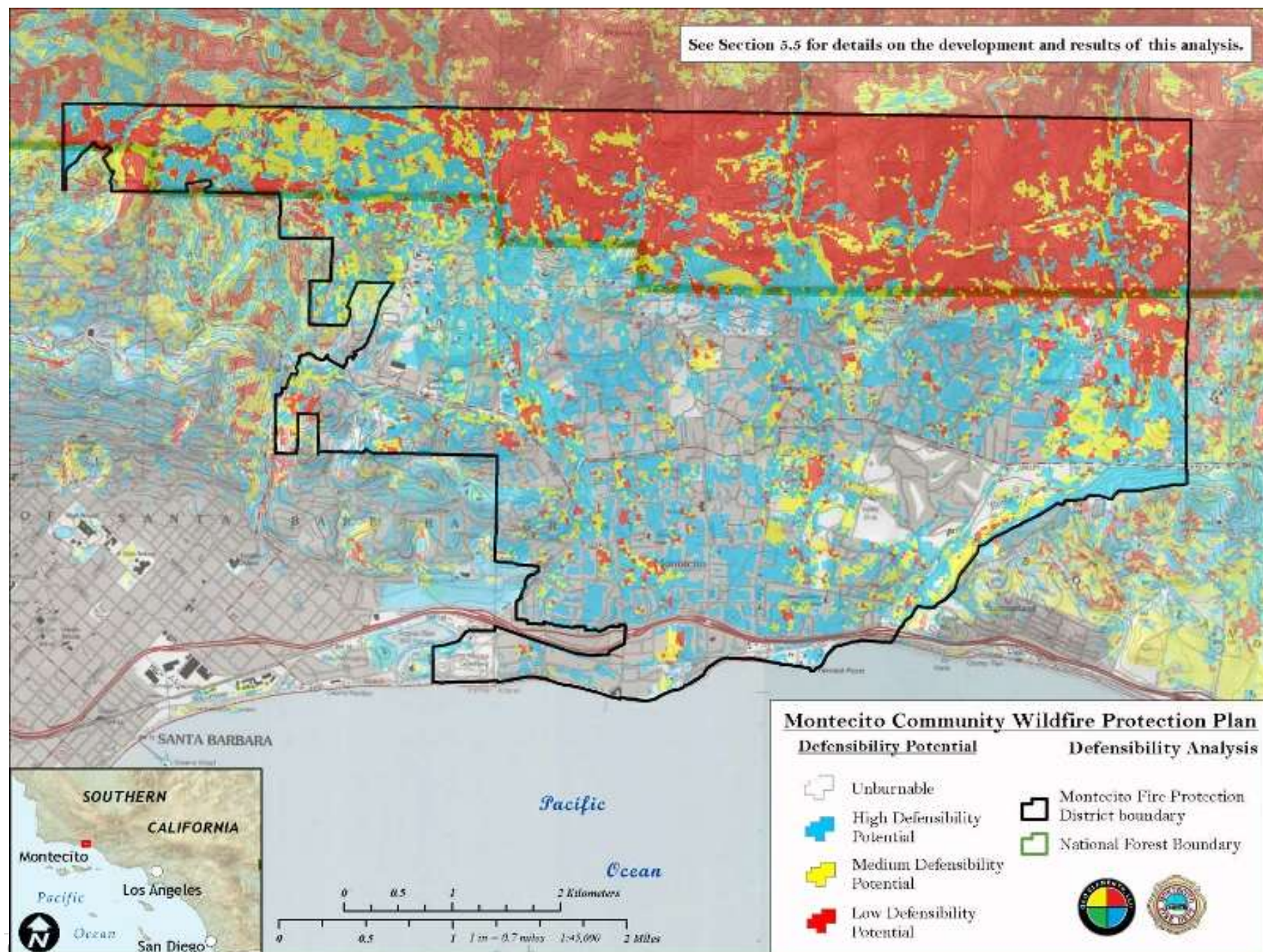


Figure 15 Defensibility Analysis Map

Table 10 Defensibility Potential Matrix

Defensibility Potential			
Wildfire Hazard	Fireline Production Rate		
	Slow	Medium	Fast
Low	Medium	High	High
Moderate	Low	Medium	Medium
High	Low	Low	Low
Very High	Low	Low	Low

IMPORTANT NOTE: *Property-owners and stakeholders should recognize that locations classified as having Unburnable or having a High Potential of being defensible during a wildfire are still at risk of damage or destruction. Past wildfires in the area have damaged and destroyed structures even in more moderate burning conditions. In those areas, fireline production rates may be faster but life safety issues are a big concern. In rapidly developing wildfires, such as the 2008 Tea and 2009 Jesusita fires, firefighting capacity is often out-paced by fire spread and the ability of a structure to withstand the passage of the fire is directly related to the quality of the defensible space and structure hardening completed by property-owners long before the fire started.*

5.6 Ember Exposure Zones

Spot fires generated from embers produced by a wildfire are a function of three elements of the wildland fire environment: firebrand sources, transport mechanism, and a receptive fuelbed away from the main fire. Without all of these elements occurring within the fire environment, spot fires will not propagate and spread. A fire burning within or adjacent to the District has ready access to fuels that will support firebrand production and the convection column of a wildfire influenced by the prevailing winds provide the transport mechanism; however, the availability of a receptive fuelbed within the District is highly variable.

The definition of a receptive fuelbed is a fuel that will ignite and support the spread of a wildfire when a firebrand lands on it. This may be wildland or ornamental vegetation, but could also be debris found in rain gutters or flammable roofing materials. Obviously, roads, parking lots, lawns, bare earth, and clean fire-resistant roofing limit the probability that an ember from a wildfire will cause a spot fire.

Montecito is a unique community in that it has well-defined structural screening requirements and a number of wildland fuel enclaves within the community itself. This ornamental screening as well as the native vegetation found in the wildland enclaves serve as potential receptive fuels for firebrands and have the potential for spot fire development near structures within the core of the community. While receptive fuels exist within the District, proactive steps taken by property-owners to harden their structures from the potential damage associated with spot fires can

mitigate this threat. Most important of these steps is compliance with California Public Resources Code (CPRC) Section 4191 and Montecito's Ordinance 2014-01 that defines the standards for defensible space near a structure. More details regarding this subject are available in Section 1.3.

This CWPP uses fire modeling to evaluate the potential ember exposure of spatially specific locations expected under offshore winds associated with a Sundowner weather event. While spotting can occur from wildfires burning under onshore winds, fire intensity under these conditions is generally lower with fewer firebrands produced and reduced transport distances when compared to a strong off shore wind.

The MAXSPOT output of FlamMap evaluated the maximum distances that a firebrand can travel given a 60 mile per hour wind blowing from the northeast. While FlamMap is currently the best available science for fire modeling, it does have limitations in evaluating chaparral-dominated systems. The greatest limitation of this model is that chaparral fuels do not create "crown fires" within the model so therefore do not produce firebrands for use in the MAXSPOT function. The limitation of the model means that ember exposure as presented in Figure 16, Ember Exposure Zone Map is likely underrepresented and should be used for comparative purposes rather than a specific quantified measurement of the maximum spotting distance of a wildfire. This is why a relative scale to quantify ember exposure is used in the CWPP.

To derive the Ember Exposure map, FlamMap modeled the maximum spotting distance of an ember originating from vegetation in each pixel on the digital landscape using a 60 mph northeast wind and the "dry" fuel moisture scenario (i.e. 3%, 4%, 5%, 30%, and 60%). ArcGIS created buffers that represent the maximum spotting distance from each pixel on the landscape represent the maximum spotting distances. For example, a pixel with a 300-foot MAXSPOT distance expands 300 feet in all directions from the center of the pixel. This creates a circle on the digital landscape with a 300-foot radius. Ember spotting distances were aggregated across the landscape such that the value of each pixel in the final map represents the amount of area from which it would receive embers. Areas that can potentially receive embers from a high number of potential ember sources are rated a "High Ember Exposure Zone" while areas impacted by few external sources of embers are considered a "Low Ember Exposure Zone". The gradation between these two ember exposure extremes creates a colored coded frequency map to evaluate the potential of an ember landing on any specific location of the landscape.

Unfortunately, FlamMap does not consider ember production from chaparral fuels, therefore BEHAVE Plus was used to determine how far an ember could be transported from the flaming front of a wildfire under a variety of wind speeds. The point of the flaming front considered in this analysis was along the Hot Springs Trail above East Mountain Road. Using a variety of 20-foot wind speeds, spotting distances from the model are available in Table 11. This table shows the potential exposure to ember cast under the strongest winds including structures and other improvements nearly one-mile downwind.

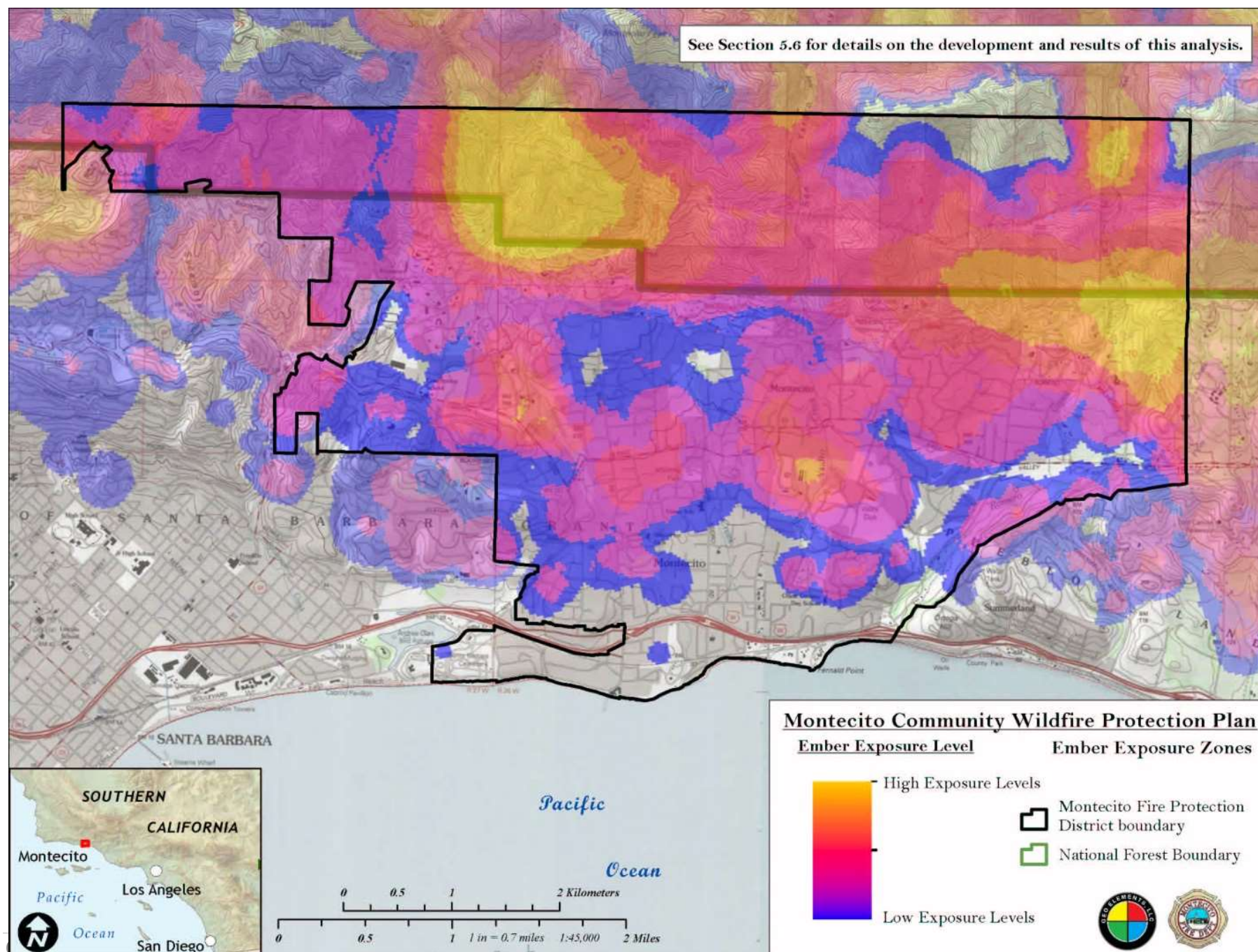


Figure 16 Ember Exposure Zones Map

Table 11 Maximum Spotting Distances - BEHAVE Plus

20-foot Wind Speed (mph)	Maximum Spotting Distance (miles)
30	0.4
40	0.6
50	0.7
60	0.8
70	0.9
Based on a 13-foot surface flame length, three torching trees, and a downwind canopy height of 45 feet.	

IMPORTANT NOTE: *It only takes a single burning ember to create a spot fire or to ignite flammable vegetation on or adjacent to a structure, therefore areas classified as a "Low Ember Exposure Zone" are still at risk during a wildfire.*

5.7 Fire Run Damage Potential

Fire damage potential can be difficult to quantify. Variables such as available firefighter resources, time of day, weather conditions, defensible space, and structure construction standards can all influence the degree of threat to structures, business, and infrastructure. For this analysis, the following simplified methodology quantifies the potential monetary damages and estimated loss of structures from a wildfire.

A point near the trail in Hot Springs Canyon serves as an ignition point for this fire model scenario. The fire was modeled using the wind data associated with the 2008 Tea fire for the time period 1200 to 2200 hours on November 13. This data shows sustained winds reached a maximum of 71 mph (10-minute average wind speed) during this time period with a wind direction predominately from the north and northeast. During the 10-hour period of the wildfire scenario modeled, approximately 3,737 acres burned and approximately 90 spot fires occurred within Montecito (See Figure 17, Fire Run Damage Potential Map).

Using ArcGIS, the final perimeter of the modeled fire was laid over a map of Montecito. Based on parcel data provided by Santa Barbara County, approximately 462 parcels exist within the intersection of the final fire perimeter and the District. This wildfire simulation extended beyond the District boundary into the City of Santa Barbara, but any intersection of the fire and a parcel outside of the District is not included in this assessment. The median home price in Montecito reported by Forbes Magazine in 2014 is \$4.2 million per home (Carlyle, 2014). Multiply this amount by 462 parcels, which results in the potential fire loss of approximately \$1.94 billion dollars.

Assumptions to determine the potential monetary losses from this wildfire simulation include:

- One residential structure per parcel
- Destruction of all structures within the fire perimeter, no partial value loss for fire damage is considered
- Non-residential parcels have a value within the fire perimeter
- The modeled fire burns unsuppressed for 10 hours

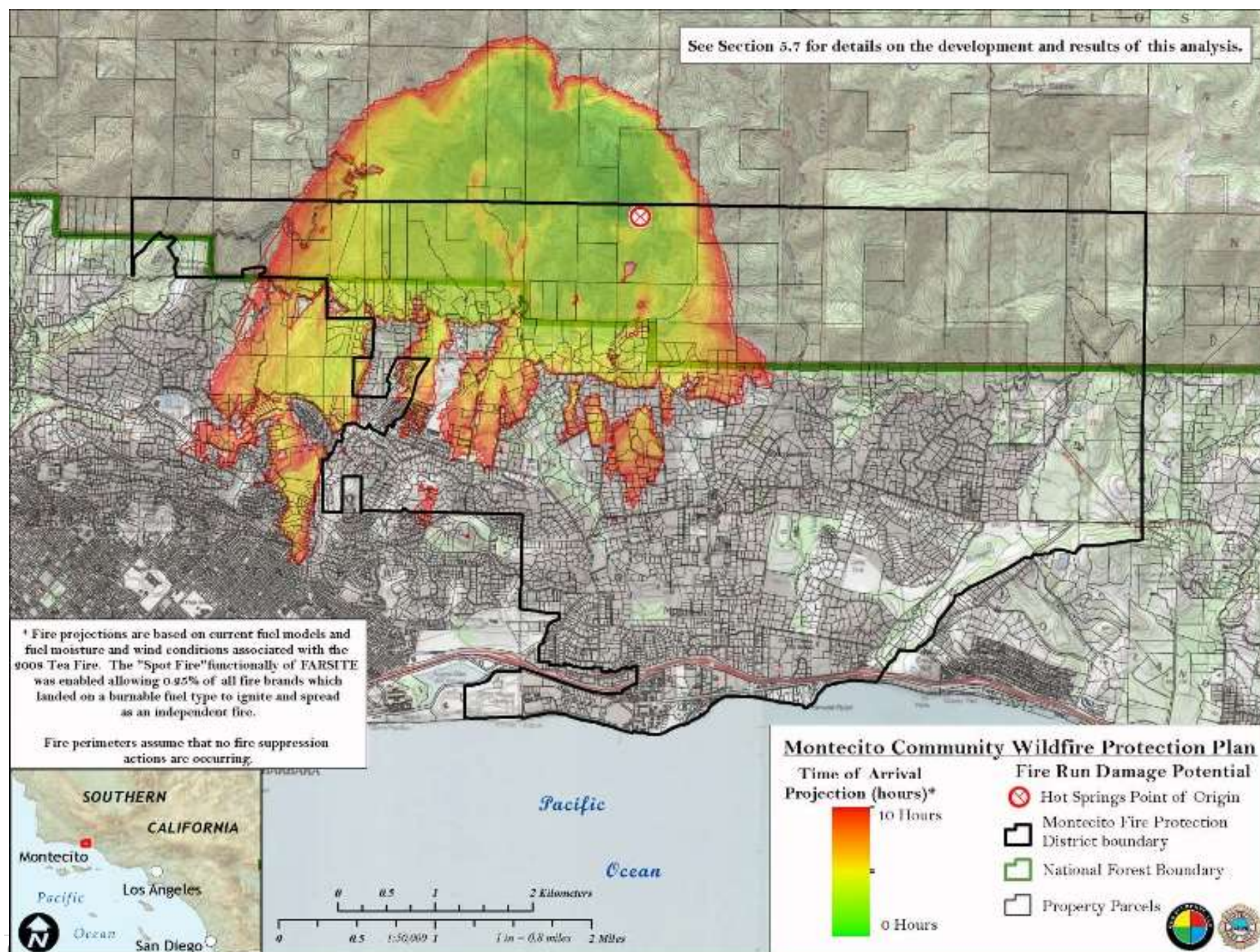


Figure 17 Fire Run Damage Potential Map

5.8 Additional Analyses

Wildfire Spread Potential

Locations considered vulnerable for wildfire potential ignitions by District staff include Toro Saddle, Sycamore Canyon, Romero Saddle, the point of origin of the 1971 Romero Fire, San Ysidro Canyon, and the point of origin of the 2008 Tea Fire. Modeling wildfire spread potential from these locations provides insight into how wildfires in those areas might threaten the community. In each modeled fire event, weather is consistent with the 2008 Tea Fire between the hours of 1200 and 2200 on November 13, 2008 with the exception of the 1971 Romero Fire location that was modeled using 90th percentile thresholds. Enabling of the crown fire function in the model and the spotting function was set so that 0.25% of all firebrands that landed on a receptive fuel would allow a spot fire to grow independently.

Table 12 summarizes the fire statistics for these simulations. Maps of these fire simulations are available in Appendix C.

Table 12 Fire Statistics from FARSITE Simulations.

Fire Statistics	Fire Name					
	Toro Saddle	Sycamore Canyon	Romero Saddle	Romero 1971	San Ysidro Canyon	Tea Fire 2008
Fire Size (acres)	8,693	846	3,475	915	1,401	1,715
Total Number of Spot Fires	995	40	147	10	97	33

Slope Reversal

Slope reversal occurs when a wildfire changes from a slope-dominated fire with the fire spreading in an upslope direction to a wind-dominated fire with the primary direction of spread being downslope. BEHAVE Plus 5.0 was used to determine the wind speed in which firefighters should be concerned about the wind overpowering the effects of slope on fire spread, thereby causing the flaming front of a fire to burn downslope. The transition from upslope fire spread to downslope fire spread can be gradual until the wind speed strengthens.

For this analysis, a moderate load, dry climate, shrub fuel model (SH5) was used to reflect the fuel conditions north of the community of Montecito. A variety of slope steepness and wind speeds were used in the fire model to evaluate when downslope spread becomes the primary direction of fire spread. The Direction of Maximum Spread and Rate of Spread outputs in the Surface Fire module of BEHAVE were used to display the primary direction of spread and the speed that a fire might spread under the given set of environmental conditions. Table 13 displays the results from this analysis.

Table 13 Slope Reversal

20-ft Wind Speed	Slope Steepness (Percent)			
	40	50	60	70
Rate of Spread – Chains/hour*				
0	20.8	30.6	42.7	56.9
2	7.2	17.1	29.2	43.4
4	16.5	6.7	11.9	26.1
6	35.6	25.8	13.7	7.0
8	56.0	46.1	34.1	19.8
10	77.3	67.5	55.4	41.2
12	99.5	89.6	77.6	63.3
14	122.4	112.5	100.5	86.2
16	145.9	136.0	124.0	109.7
18	169.9	160.1	148.0	133.8
20	194.5	184.7	172.6	158.4

*Highlighted cells indicate the direction of spread is downslope.

IMPORTANT NOTE: *The backing fire function of BEHAVE has not been evaluated but these wind speeds can be used as indicators for a fire's transition from upslope fire spread to downslope fire spread.*

5.9 Structure Vulnerability

From 2004 - 2014, the National Interagency Fire Center (NIFC) estimates that on average approximately 2,600 structures per year are lost due to wildfires across the United States with more than half of these losses as primary residences (National Interagency Coordination Center, <www.predictiveservices.nifc.gov/intelligence/intelligence.htm>. 25 July 2015). In 2015 alone, wildfires destroyed almost 3,000 structures in California.

Research has shown repeatedly that the main reason for structure loss during a wildfire is due to the ignitability of the structure itself and is not always the large high intensity fires that destroy or damage structures. Low intensity fires can destroy structures that are highly ignitable while structures with low ignitability can survive high intensity fires (Cohen, 2000).

Wildfires can ignite structures in numerous pathways. These pathways depend on a variety of characteristics found in the WUI, examples include:

- adjacent wildland open space – fuels, terrain, weather, and fire's influence on itself
- community – housing density, zoning, separation distance, and physical barriers
- structure – exterior structure construction material, structure design, site location (e.g., midslope, hilltop), structure maintenance, and heat sources (e.g., landscaping, flammable exposures) within 100-200 feet

The risk of a structure's ignition is a direct result of exposure by wildfire from radiation, convection, and/or burning embers and the vulnerability or ignitability of the structure. Structures ignite in three ways:

- Convection: Is the transfer of heat by the movement of rising hot air or gasses. Convective heat tends to rise – visually observed as flames and smoke columns.

Convection lifts firebrands into the sky. Flames can overwhelm a structure by direct flame impingement, which could be a result of inadequate spacing of structures, lack of defensible space, and/or extreme fire behavior.

- **Radiation:** Heat energy is released in all directions from a burning object. Exposed flammable structural elements reach their ignition temperature causing a structure to ignite. Nearby burning structures can ignite other structures in close proximity moving the fire from structure to structure. The potential for ignition is greatly reduced as space between structure and fuel (e.g., wildland and urban) is increased.
- **Burning Embers:** Burning embers include flammable material (i.e. wood shingles, tree bark, leaves) that detach from the main fire front get carried by strong convection drafts and/or winds to receptive fuel downwind. Wildfires can produce hundreds to thousands of burning embers that can be carried very long distances by winds.

Sections of the District north of Highway 192 are especially vulnerable to wildfires due to their proximity to wildland vegetation and their proximity to the Santa Ynez Mountains and Los Padres National Forest. However, structures well south of Highway 192 are also vulnerable due to firebrands carried downwind into receptive fuels south of the highway.

Structures below Highway 192 are potentially at risk of loss outside of the Very High Fire Hazard Severity Zone because firebrands can travel with the wind for up to a mile or more away from the main fire front. These firebrands then land on receptive fuels such as flammable landscaping, litter and debris build up in rain gutters, and other flammable material igniting spot fires.

Enclaves, islands, and riparian corridors of wildland vegetation, ornamental vegetation, and/or eucalyptus tree woodlands are interspersed with structures and subdivisions throughout the community. These create significant opportunities for wildfires to ignite, establish, and destroy structures. Vulnerable parts of a structure that contribute to ignition during a wildfire include:

- **Roofing** – Roof construction and maintenance has been a key factor in structure loss on many fires. It is not just the type of roofing material, but also the design, construction details, the condition of the material, and whether the roof is clear of burnable material (e.g., pine needles and other debris).
- **Garages** - Garages with gaps at the top, bottom and edges of doors allow firebrands to enter. Oftentimes garages contain flammable materials that can enhance ignition potential. Garages usually have vents at various locations, especially if they contain gas furnaces or hot water heaters. These vents can be easy entry points for embers.
- **Siding** - Flammable siding can provide a pathway for flames to reach vulnerable portions of a structure, such as the eaves or windows. Siding needs a source of ignition, which in many cases includes vegetation, wooden decks, and fences, or stacked firewood or other flammable material in close proximity to a structure. This can provide a heat source that can ignite siding.
- **Vents** - Soffit vents in the eaves are an easy entry point for wind-driven burning embers during a wildfire. Attic fires are not easily detected from the outside and structures have been lost when fire personnel have left the scene unaware that a fire has ignited within the attic.

- Windows - Unprotected and inadequate windows can be another major entry point for fire. Windows broken by airborne materials or cracked by thermal expansion during a wildfire ignite materials in the structure through radiation, convection, and/or firebrands.
- Nooks and crannies - Little grooves, inside corners, and roof valleys all become areas where flammable debris (e.g., pine needles, bird's nests) have collected over time. Burning embers can land on this debris, igniting it.
- Crawlspace Vents – If not adequately screened, these areas, not just under a structure but also under decks and other attachments, are difficult to protect. Much like vents in the attic, firebrands enter these areas and flammable material underneath a structure can ignite.
- Wood Fences – Firefighters have observed that wood fences act as a fuel source that can carry fire to a structure. Fences when attached to homes present a threat to the structure.
- Wood Decks – Decks act as a source of fuel that is attached or directly adjacent to structures. When ignited by wildfire the radiant and convective heat output can ignite structures. In addition, most decks are adjacent to large windows or glass sliders and the heat from a deck fire can cause the glass to fail allowing the wildfire to enter a structure.
- Flammable landscape vegetation and/or flammable items such as firewood or flammable debris piled in close proximity to the house. As a result, structures are more susceptible to ignition when exposed to significant radiant and convective heat from burning material. Defensible space is the space between a structure and the wildland area or neighboring structures that, under normal conditions, creates a sufficient buffer that modifies the spread of a wildfire to a structure. Defensible space can protect a structure from direct flame impingement, radiant heat, and reduce the number of burning embers and is essential for structure survivability during wildfires.

SECTION 6. ACTION PLAN

Wildfire will continue to threaten the community of Montecito despite all efforts to prevent it from occurring; however, stakeholders can and should take proactive measures to mitigate this threat. Current land use planning, zoning regulations, and codes adopted by the State of California and the District provide the regulatory basis for preparedness, but these alone will not protect life safety and the District's values.

Whether a wildfire is catastrophic or not depends on the efforts of all stakeholders at all levels including residents, property-owners, local organizations and associations, businesses, District staff and planning officials along with adjacent county, state, and federal agencies. Preparedness requires participation by all stakeholders, at all levels. The greatest responsibility for the protection of life safety and structures in the community rests not on District staff, but with property-owners. Actions taken by these individuals will enhance protection of life safety and greatly influence the survival of homes, businesses, infrastructure, and other important values in the community during a wildfire event.

Based on the results of the analyses described in Chapter 5, actions and activities identified below can mitigate the wildfire hazards and risks that threaten Montecito. The following describes existing community preparedness programs, actions to protect values, fuels management strategy, and evacuation guidelines:

6.1 COMMUNITY PREPAREDNESS

The challenge for Montecito and other communities in the Central Coast is how to generate interest and maximize awareness of the wildfire threat and to encourage participation in preparedness activities that effect change at the individual and community level.

As part of their 2014 report, Citygate conducted an online community survey to assess emergency preparedness. Although only 4.1 percent of the community responded, over 75 percent of those respondents were familiar with one or more of the District's emergency notification systems but many residents replied that they had not taken appropriate steps to ensure that they receive emergency notifications through one or more of the District's systems. Those respondents placed very high value on pre-established emergency evacuation plans and prioritized five key planning strategies as follows:

1. Enhance wildland fire mitigation efforts
2. Improve emergency response times
3. Provide paramedic services from all stations
4. Increase general emergency preparedness and education
5. Strengthen enforcement of hazard abatement and access codes

Citygate's report recognized that the District has an active outreach and community education program with approximately 72.6 percent of survey respondents having had direct contact with the District and 74 percent rated the District as excellent and 24 percent gave a rating of above average in regards to public education (e.g., schools). Additionally, 83 percent of those respondents rated Montecito Emergency Response & Recovery Action Group as excellent and 13 percent above average with public education.

The survey also reported that approximately 89.5 percent of those that responded said that efforts to reduce the impacts of wildfire such as vegetation reduction and homeowner property surveys are very important to extremely critical. It also reported that approximately 11.3 percent responded that the District's fire apparatus cannot easily access their residences with impediments such as narrow roads/driveways, vegetation, speed bumps, electric gate, steep road, and bridges with narrow roads/driveways and electric gates as primary concerns.

Preparedness for the inevitable wildfire events includes a range of activities including community education, protection of values and reducing structure ignitability, a comprehensive fuels mitigation strategy, and evacuation preparedness. The following describes the community's preparedness at the local, county, and regional levels:

6.1.1 Existing Emergency Preparedness Programs

6.1.1.1 District Programs

Ready! Set! Go! Plan

This plan includes information for defensible space, home hardening, preparing families, and checklists to help Montecito's residences. Available at the District's website at <http://bit.ly/1MkK9l7>.

Fire Danger Ratings

The District provides daily updates on their website to inform stakeholders and businesses of the fire danger rating forecasts so they can modify their outdoor activities to help reduce the threat of wildfire ignitions. These ratings are available at www.montecitofire.com and explanation of those ratings are available at <http://bit.ly/1O1uzhd>.

District Signage

The District has an active signage program to educate and communicate fire prevention messages to the public, especially in high fire danger areas along Mountain Drive, Romero Canyon Road, and at Montecito Fire Station 2 along Sycamore Canyon Road. The District also posts Red Flag Alert signs at all local trailheads during Red Flag events. This helps to mitigate the risk of wildfire ignitions along trail systems.



Wildland Fire Initial Attack Plan

This is an operational plan developed by the District in an effort to provide guidance during initial attack activities. This plan is distributed by the District to incoming firefighters during a wildfire to provide them with the District's initial attack objectives, a safety message, a communication plan with frequencies, a medical plan, a structure defense guide, and identifies fire staging areas, a helicopter landing zone, and other documents helpful for operational activities.

Emergency Notification Systems

Reverse 911

This system is managed by the Santa Barbara County Sheriff's Department with home phone numbers registered and geocoded to the registered location. Individuals can add cell phone numbers associated with their location by registering at www.sbsheriff.org/reverse911a.html.

COMLabs Emergency Warning System and HomeALERT Receivers

Residents who live within the Montecito Fire Protection District can purchase a tone alert radio for their home or office to augment their emergency notification methods. This radio, called HomeALERT, will transmit an up to 90-decibel tone and scrolling text with instructions on how to respond when activated. The system utilizes FM frequencies to distribute the notifications via the HEARO Network through a partnership established with KDB Radio, FM 93.7. These radios are programmed with the address they are purchased for, which corresponds with pre-identified evacuation zones within the District (See Section 6.5, Evacuation). Individuals can get these receivers at Montecito Fire Department Headquarters - Station 1, 595 San Ysidro Road, Santa Barbara, CA 93108 or can call 805-969-7762

NIXLE

The District sends messages utilizing NIXLE Wire that allows residents to subscribe to the service free of charge and receive trustworthy information directly from the District regarding emergency and non-emergency community notifications immediately by text message, email and/or web. The messages may include community messages and emergency advisories and Alerts. Subscribers can receive these notifications free at www.nixle.com.

District Social Network Programs

The District has an active social network program that includes both Facebook and Twitter. These allow the District to keep stakeholders up to date on events, advisories, and alerts instantaneously. These programs are available at www.facebook.com/MontecitoFire?ref=ts and <https://twitter.com/montecitofire>.

AM 1610

This station is a low powered AM Radio station owned and operated by the District. During normal activities, the station broadcasts fire prevention and disaster preparedness information continually on a loop; however, during emergencies, the District broadcasts evacuation and other critical information as it becomes available. It is important to understand that most home stereo systems do not pick up AM broadcasts - especially those coming from a low power station. To hear these broadcasts, individuals should listen to them on a battery powered portable radio or your car radio. The radio station is available at <http://bit.ly/1wetK93>.

Local Media Outlets

Local media TV, radio and print have provided email and text messaging contact information to the District and are notified as soon as possible on all emergency events. They have also been provided with contact information for our Public Information Officers as well.

6.1.1.2 Community Programs

Montecito Emergency Response and Recovery Group (MERRAG)

MERRAG utilizes the Community Emergency Response Team (CERT) Program to create a network of trained volunteers. These volunteers generally work and live in the Montecito area and are prepared to respond to a community disaster during the critical first 72 hours following an event. Since 1987, the mutual “self-help” organization has been serving Montecito’s almost 9,000 residents with the guidance and support of the Montecito Fire Protection, Water, and Sanitary Districts. More information on MERRAG can be found at www.merrag.org

6.1.1.3 County or Regional Programs

American Red Cross of Central California

The American Red Cross Central California Region stretches over 10 counties: Mariposa, Madera, Merced, Fresno, Tulare, Kings, San Luis Obispo, Kern, Santa Barbara, and Ventura. Through the help of volunteers and the donations of individuals and corporate sponsors, the Red Cross serves the over 4.4 million residents of Central California.

The Central California Region Chapter seeks to help people prevent, prepare for, and respond to natural and human-caused disasters through the immediate mobilization of people and resources and the provision of community, workplace, and school-based training. In addition to disaster relief, the Region delivers Community-Disaster Education, First Aid/CPR, and other types of life-saving health & safety training to thousands of people across our region to help people prevent, prepare, and respond to emergencies. American Red Cross of Central California for Santa Barbara County’s website is available at www.redcross.org/local/ca/central/local-chapters/pacific-coast and the Santa Barbara County Red Cross Facebook page is available at www.facebook.com/RedcrossSantabarbaraCounty.

Santa Barbara County Office of Emergency Services (OES)

This department is within the County Executive Office and is responsible for emergency planning and coordination for the Santa Barbara Operational Area. OES is responsible for emergency planning and coordination among the Santa Barbara Operational Area entities including the District.

OES has in place an emergency management plan that addresses natural disasters, technological incidents, and national security emergencies within the Santa Barbara Operational Area. The Plan does not address normal day-to-day emergencies or the well-established and routine procedures used in coping with such emergencies, but the operational concepts reflected in this plan focus on potential large-scale disasters that can generate unique situations requiring unusual emergency responses. A copy of this plan is available at www.countyofsb.org/uploadedFiles/ceo/OEM/Docs/OEM_EMP_Final-2013.pdf.

Santa Barbara Fire Safe Council

The Santa Barbara County Fire Safe Council is a non-profit community organization formed in 1997. The Santa Barbara County Fire Safe Council provides education, evacuation planning,

community vegetation management projects, fund raising, and neighborhood assistance. The District's Wildland Fire Specialist participates as a member of the Council.

Santa Barbara Amateur Radio Emergency Services (ARES)

ARES is part of the Amateur Radio Relay League's (ARRL) extensive volunteer field organization dedicated to public service. The Santa Barbara ARES is comprised of local amateur radio operators who volunteer to provide a resource of trained operators for reliable primary or secondary communications links for governmental agencies and non-profit organizations. Every licensed amateur, regardless of membership in the ARRL or any other organization, is eligible for membership in ARES. Additional information is available at www.sbarc.org/ares-net

Equine Evacuation

The Santa Barbara Equine Assistance and Evacuation Team assists all Santa Barbara County emergency responding agencies and large animal owners in the evacuation, temporary care and sheltering of large animals in time of fire, flood, earthquake and other disasters or accidents. Upon notification of disaster and need for large animal evacuation this group establishes a mobile command center at a designated site and prepares for the intake and sheltering of large animals. Volunteer crews with trucks and trailer assemble and deploy to evacuate large animals to designated sheltering areas where qualified volunteers will care for them. Additional information is available at <http://sbequineevac.org/home>.

Santa Barbara Humane Society

Since 1887, the Santa Barbara Human Society has provided service to people and animal populations of Santa Barbara County. The Humane Society occupies a five-acre site midway between Carpinteria and Gaviota, serving the community with a shelter, animal adoption services, a spay and neuter clinic, humane education center, boarding kennels, large animal holding center and corral, and inspection and rescue services. Additional information is available at <http://sbhumanesociety.org>.

Volunteer Organizations Active in Disasters (VOAD)

VOAD is a non-binding membership organization that fosters cooperation, communication, coordination, and collaboration among local organizations to enable them to work together more effectively to help individuals and families affected by disasters. Each member organization maintains its own identity and independence while collaborating with other member organizations, faith groups, and local, state, and federal authorities. Additional information on VOAD is available at www.voidsbc.org.

6.2 PROTECTING VALUES

This section describes actions to enhance protection of the District's values:

6.2.1 Life Safety

The District's first priority is life safety with the protection of property (e.g., homes, businesses, historic sites, infrastructure, etc.) as the second priority. Often in wildfire situations, it is extremely unsafe and/or impossible for property-owners to protect their property or firefighters to make a safe effective stand to protect structures; therefore, structures and other values must

be able to survive on their own. Fighting wildfires and protecting structures is extremely complex and dangerous. In most cases, it is advisable that property-owners evacuate when directed to do so.

There are many factors that affect the ability of firefighters to protect structures and other improvements so firefighters arriving on scene quickly perform an assessment or “triage” to determine whether a structure or improvement is safely defensible. Prior to engaging in structure protection activities, firefighters look for access and egress issues, whether a structure or improvement has characteristics of vulnerability, hazardous material issues, adequate water sources, adequate defensible space, and whether the defensible space provides them safe operational space. Often, the required 100-foot minimum defensible space may not be sufficient for firefighters to engage in structure defense safely.

Although not tested, guidelines established for wildfire safety zones can enhance safe operational space for firefighters and property-owners in the WUI; however, the additional element of burning structures and other “non-native” fuels will significantly increase fire intensities that can threaten the life safety of firefighters and property-owners.

Recently updated safety zones guidelines calculate the Safe Separation Distance (SSD) between a wildfire and firefighters based on the height of the vegetation. In order to determine the SSD, using the table below, firefighters can multiply the constant number eight (8) times a slope/wind factor times the height of the vegetation (See Table 14). An example is a 15 mph wind with a 24 percent slope, and 6-foot tall vegetation equals an SSD of 144 feet (8x3x6=144 feet), which is greater than the minimum defensible space standard of 100 feet (Butler, 2014).

Table 14 Preliminary Proposed Safety Zone Rule (July 2014)

New Preliminary Proposed Safety Zone Rule (July 2014)			
Calculating a Safe Separation Distance (SSD)			
SSD = 8 * Slope wind Factor * Height of the surrounding vegetation			
SLOPE-WIND FACTOR			
Wind Speed	Flat 0% Slope	20% Slope	>30% Slope
Light 0-10 mph	1	2	3
Moderate 11-20 mph	2	3	5
Strong > 20 mph	3	5	6

***Disclaimer:** This proposed safety zone rule should be considered preliminary. It is based on limited data and analysis and is subject to increased or decreased spacing based on additional

factors. It was presented for release in 2014 with the intent of increasing firefighter safety and reducing risk of injury. There have been no updates to these guidelines for 2015 and beyond.

Although the assessment in Chapter 5 provides some guidance with flame lengths using 90th percentile weather conditions, an onsite consultation with Fire Department personnel is recommended to determine whether the clearance around a structure or other improvement is sufficient to provide a safer working environment. Observations by firefighters along the Santa Barbara Front have shown that flame lengths exceeding 70-feet do occur and vegetation in excess of 6-feet tall exists so defensible space distances greater than 100-feet may be needed.

6.2.2 Reducing Structure Ignitability

There simply are not enough fire engines or fire personnel to protect every structure in Montecito and, in some cases; it would not be safe for firefighters to engage in structure protection. Whether a structure survives a wildfire or not often depends on a structure's susceptibility to ignite even in the absence of firefighter protection. Structures must be able to stand on their own.

Most actions to reduce the ignition potential of a structure are associated with the structure itself and within 100-200 feet distance from the structure. Under some circumstances, reducing fire intensity for life safety will involve extending beyond 200 foot depending on the location of the structure on the terrain, high wind events (e.g., Sundowner winds), vegetation density, and fire behavior. The primary responsibility for protecting a structure lies with the property-owner and is the area within the Home Ignition Zone (HIZ).

The HIZ includes the structure itself and everything from the foundation out 100 – 200 feet depending on fire behavior conditions (NFPA, 2015). Within this 200-foot area, there are three zones:

Zone 1 encompasses the structure and all its attachments (e.g., wooden decks, fences, and patios) for at least 30 feet on all sides. In this area:

- Ornamental and wildland vegetation should be carefully spaced, low growing, well-watered, and free of resins, oils and waxes that burn easily.
- Mow regularly and prune trees up six to ten feet from the ground.
- Create space between tree crowns and trim back any trees that overhang the house.
- Create a 'fire-free' area within five feet of the home, using non-flammable landscaping materials and/or high-moisture-content annuals and perennials.
- Remove dead vegetation from under deck, flammable piles, and within 10 feet of house.
- Consider fire-resistant material for patio furniture, etc.
- Remove firewood and/or stacks or piles of flammable material; they should not be located in this zone.
- Water vegetation and mulch regularly.
- Consider xeric landscaping.

Zone 2 is 30 to 100 feet from the home, and vegetation in this zone should be low growing, well irrigated and less flammable. In this area:

- Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
- Encourage a mixture of deciduous and coniferous trees.

- Create breaks in vegetation, such as driveways, gravel walkways and lawns.
- Prune trees up six to ten feet from the ground.

Zone 3 is 100 to 200 feet from the home. Thinning in this area should occur, although less thinning is required than in Zone 2. In this area:

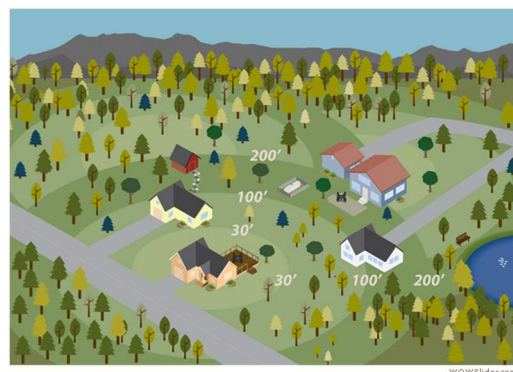
- Thin vegetation and remove heavy accumulation of combustible growth, ground litter, and debris.
- Reduce the density of tall trees so canopies are not touching.

Figure 18 Home Ignition Zone (www.firewise.org)



Mitigating risks within the HIZ is important, but requires a joint effort if a neighbor's residence is closer than the full 200' area. The figure below depicts neighboring homes with an overlapping HIZ. Whether these property-owners properly maintain their HIZ, their activities or lack of activity can influence the survivability of a neighbor's home. Tight subdivisions that have homes built within 100-200' of each can cause an overlap issue. Risk reduction efforts by all neighbors in these areas are beneficial to multiple properties.

Figure 19 Home Ignition Zone Overlap (www.firewise.org)



The HIZ concepts when applied to other improvements in the community can enhance their survivability as well. The following mitigation actions will improve protection of life safety and enhance the survivability of structures in the community:

Table 15 Structure Mitigation Actions

Structure Components	Mitigation Actions*
Defensible Space	Montecito requires 100 feet of defensible space from all sides of any structure but not beyond the property line except when adverse conditions

	exist. Follow Ordinance 2014-01 and HIZ recommendations, and detailed as prescriptive guidelines in Tables 19. Select fire resistant plants and non-combustible hardscape for the landscaping. Keep plants located within this area healthy, pruned, and maintained frequently.
Addressing	Address identification shall be Arabic numbers or alphabetical letters and be a minimum 6 inches contrasting with the background.
Roof	Replace wood-shake or shingle roofs with a Class-A – suitable for extreme fire exposure. Plug openings in roofing materials, such as the open ends of barrel tiles, to prevent ember entry and debris accumulation. Regardless of the type of roof, keep it free of bird's nests, fallen leaves, needles and branches.
Chimneys	Screen chimney and stovepipe openings with an approved spark arrestor cap with a 5/8-inch screen.
Eaves	Cover the underside of the eaves with a soffit, or box in the eaves, which will reduce the ember threat. Enclose eaves with fiber cement board or 5/8-inch thick, high-grade plywood. If enclosing the eaves is not possible, fill gaps under open eaves with caulk.
Exterior Siding	Noncombustible siding materials (e.g., stucco, brick, cement board and steel) are better choices. If using noncombustible siding materials is not feasible, keep siding in good condition and replace materials in poor condition.
Windows and Skylights	Single-pane windows and large windows are particularly vulnerable in older homes built prior to current fire codes. Recommend installing windows that are at least double-glazed and that utilize tempered glass for the exterior pane. The type of window frame (e.g., wood, aluminum or vinyl) is not as critical; however, vinyl frames can melt in extreme heat and should have metal reinforcements. Keep skylights free of leaves and other debris, and remove overhanging branches. If using skylights in the WUI, they must be flat skylights constructed of double-pane glass and must be kept free of vegetation.
Vents	All vent openings should be covered with 1/8-inch or smaller wire mesh. Another option is to install ember-resistant vents. Do not permanently cover vents, as they play a critical role in preventing wood rot. In the WUI, roof gutters shall be provided with the means to prevent accumulation of leaves, needles, and debris.
Rain Gutters	Always keep rain gutters free of bird's nests, leaves, needles and other debris. Roof gutters shall be provided with a means to prevent accumulation of leaves, needles, and debris. Check and clean them several times during the year.
Decks	Keep all deck materials in good condition. Consider using fire-resistant rated materials or heavy timber construction. Routinely remove combustible debris (pine needles, leaves, twigs and weeds) from the gaps between deck boards and under the deck. Enclosing the sides of the deck may reduce this type of maintenance. Do not store combustible materials under the deck.
Flammable Items	Keep the porch, deck and other areas of the home free of flammable materials (e.g., baskets, newspapers, pine needles and debris). Keep firewood, bales of hay or straw, and other flammable materials at least 30-feet away from a structure.
Residential Fire Sprinkler Systems	Required in all new and two family dwellings and townhouses. Existing residents that increase/replace the gross floor area to 3,500 feet or more and the aggregate structural alteration is greater than 1,000 feet in gross floor area cumulatively dating back to 1991 are required to install an

automatic fire sprinkler system. Annual maintenance service or inspection of these systems is strongly recommended to ensure operability.

*See Ordinance Number 2014-01 for additional information.

6.2.3 Natural and Cultural Resources

The fire suppression actions taken to defend and protect life safety, structures, and infrastructure will not be the same for natural or cultural resources. The first priority for fire protection in the District is life safety.

The only method to reduce the impacts of wildfire on natural and cultural resources is through implementation of fuel treatments. When defensible space, roadside fuel treatments, and other area fuel treatments are integrated into a holistic hazardous fuel mitigation strategy, the District's natural and cultural resources are also afforded an enhanced level of protection from a fire that may originate from a structure and spread into the wildland vegetation.

6.3 FUELS MITIGATION STRATEGY

Wildfires have been a significant component of the Southern California landscape for centuries, and no amount of manipulation and management will likely eliminate their presence. Focusing on the individual structures and communities where social costs are highest has the potential to increase cost savings, promote success in preventing community losses through increased efficiency of firefighting resources, and reduce impacts on native plant communities that serve as a source of biological and genetic floral diversity (Lombardo, 2012).

Section 6.2.2 contains specific suggestions for both hardening structures and modifying vegetation within the HIZ to enhance wildfire protection. Fuels mitigation, structural hardening actions, and emergency preparedness activities completed well before a wildfire event will greatly influence the success in protecting life safety and the survival of the District's values.

The basis for this fuels treatment strategy is to enhance wildfire protection for life safety, structures, and other values identified by community stakeholders while also protecting the visual quality of the community, watershed, and its biological and cultural resources. This strategy is specific to the District and considers the Montecito Architectural Guidelines, Ordinance 2014-01 Montecito Fire Protection Plan, and other pertinent documents. It provides fuel treatment guidelines that give the District maximum flexibility to carry out current and future hazardous fuel reduction projects. These projects will likely require additional site-specific planning with consideration of factors including, but not limited to, landownership, collaboration with property-owners, CEQA, cultural sites, soil concerns, balance with other District priorities, and funding availability.

6.3.1 Fuel Treatment Activities

The following details provide information on existing and new fuel treatment activities within the District:

6.3.1.1 Existing Fuel Treatment Activities

Montecito maintains an aggressive fuel treatment program based on recommendations from the 1998 Montecito Community Fire Feasibility Report. That report focused fuel treatments north of Bella Vista/East Mountain Drive in what is referred to as the "community network." Additional

fuel treatment areas recommended in the 1998 Feasibility Study are Sycamore Canyon, San Ysidro Canyon, and Romero Canyon.

The District has completed many projects within the areas identified in this report through a combination of roadside and enhanced structure protection projects. They have expanded upon those recommended treatments to create roadside fuel treatments and roadside chipping projects to improve fire apparatus access/egress and to improve life safety along primary evacuation routes within the community.

Adjacent jurisdictions have also completed fuel treatment projects that provide a level of wildfire hazard mitigations for Montecito. Santa Barbara City has completed fuel treatments just south of the northwest corner of the Fire District boundary in the vicinity of Skofield Park and Las Canoas Road, while Carpinteria/Summerland has completed treatments west of Ladera Lane and along Viola Lane.

Figure 20 Montecito Fuel Treatments Map displays known fuel treatments within the sphere of influence of the District and Figure 21 Regional Fuel Treatments Map includes all fuel treatments within and adjacent to the District.

6.3.1.2 Roadside Fuel Treatments

Roadside fuel treatments can moderate fire intensity adjacent to roads and driveways thereby providing safer operational space for firefighters, improving access/egress for firefighting equipment, and providing safer evacuation routes for residents and visitors during a wildfire event. Roadside or driveway fuel treatments range from the centerline of a road or driveway up to 100' on either side with "feathered", gradient fuel treatments soften any appearance of vegetated walls. Standards for roadsides incorporate trailheads, reducing highly ignitable fuels in undeveloped parking areas.



Roadside fuel treatments include the existing "*High Drive*" and neighborhood chipping projects but extends beyond the existing projects to include new untreated roadside sections within the District boundary (See Figure 22, Roadside Fuel Treatments Map).

6.3.1.3 Vegetation Management Units

Twenty-three Vegetation Management Units (VMUs) were established across the District for purposes of identifying fuel treatment projects (See Table 16). The VMUs contain a mixture of non-developed land, private property with wildland vegetation, and maintained landscapes (See Figure 23, VMU Map) and incorporates many existing projects.

Fuel treatment activities will not occur across entire VMUs, but work will focus on areas around structures and along driveways. Fuel treatment prescriptive guidelines presented in Table 19 provides guidance to individual property-owners and the District for implementation.

IMPORTANT NOTE: The identification of Roadside Fuel Treatments and VMUs doesn't preclude the District from working outside of these identified activity areas.

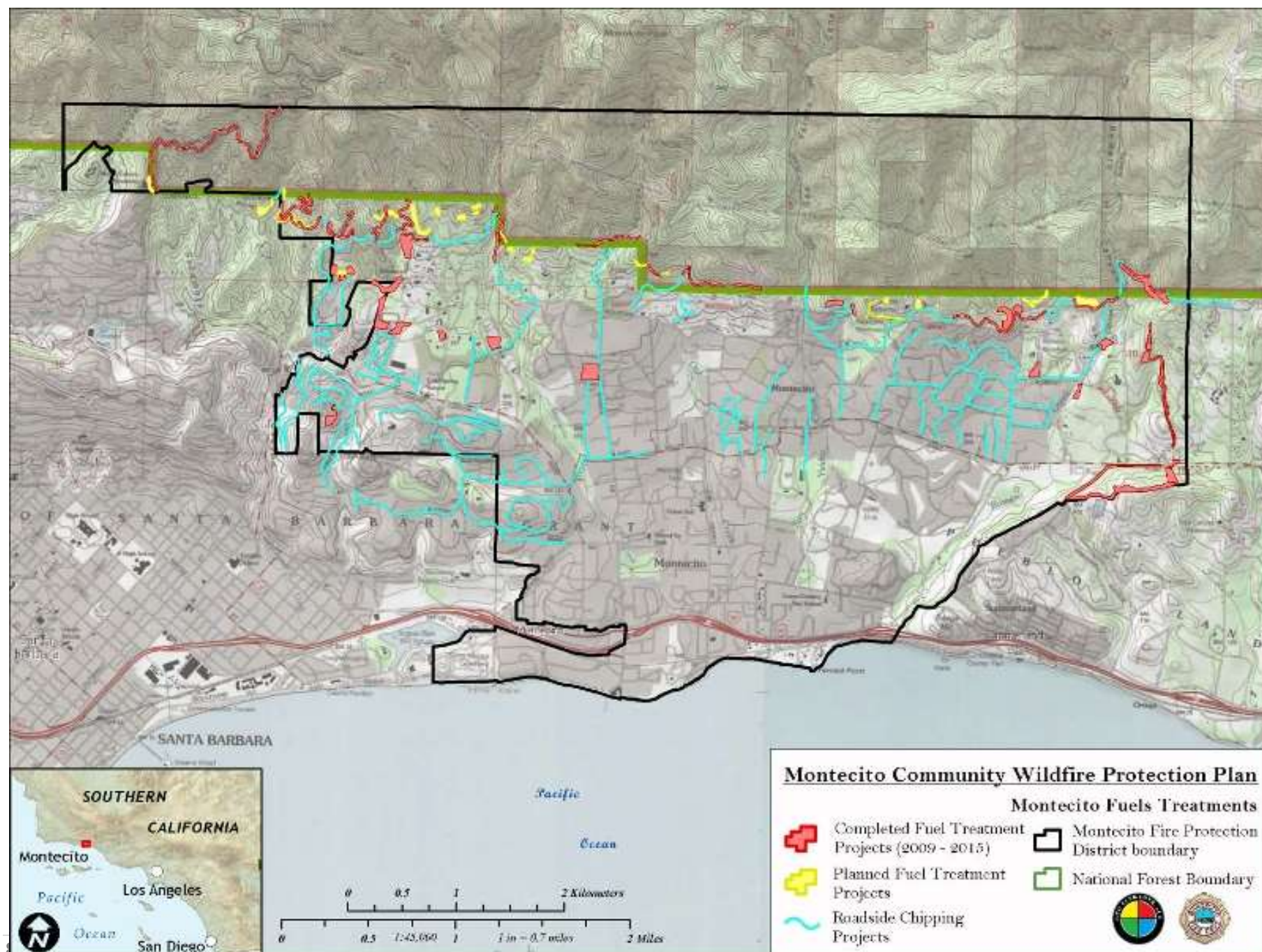


Figure 20 Montecito's Existing Fuel Treatments Map

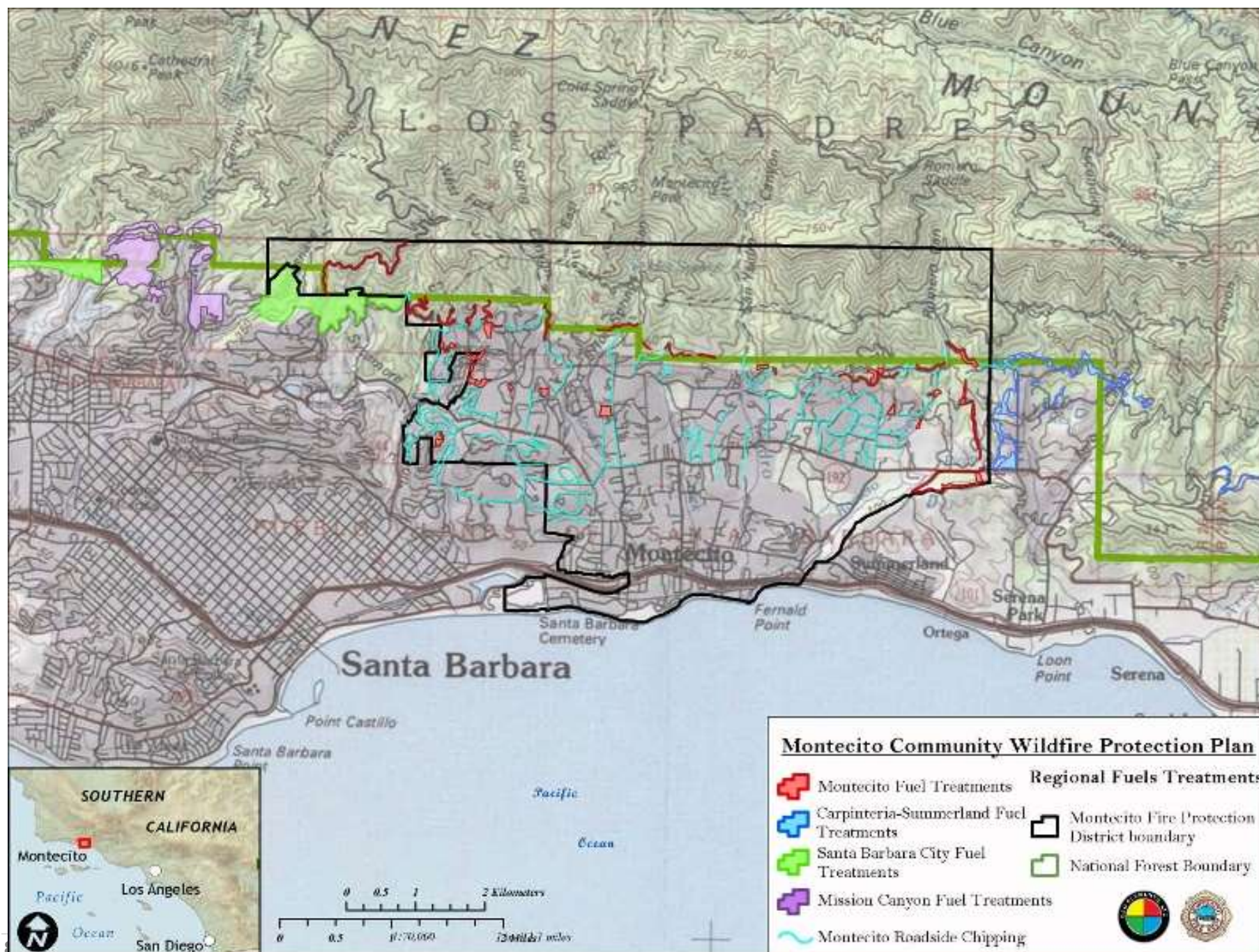


Figure 21 Regional Fuel Treatments Map

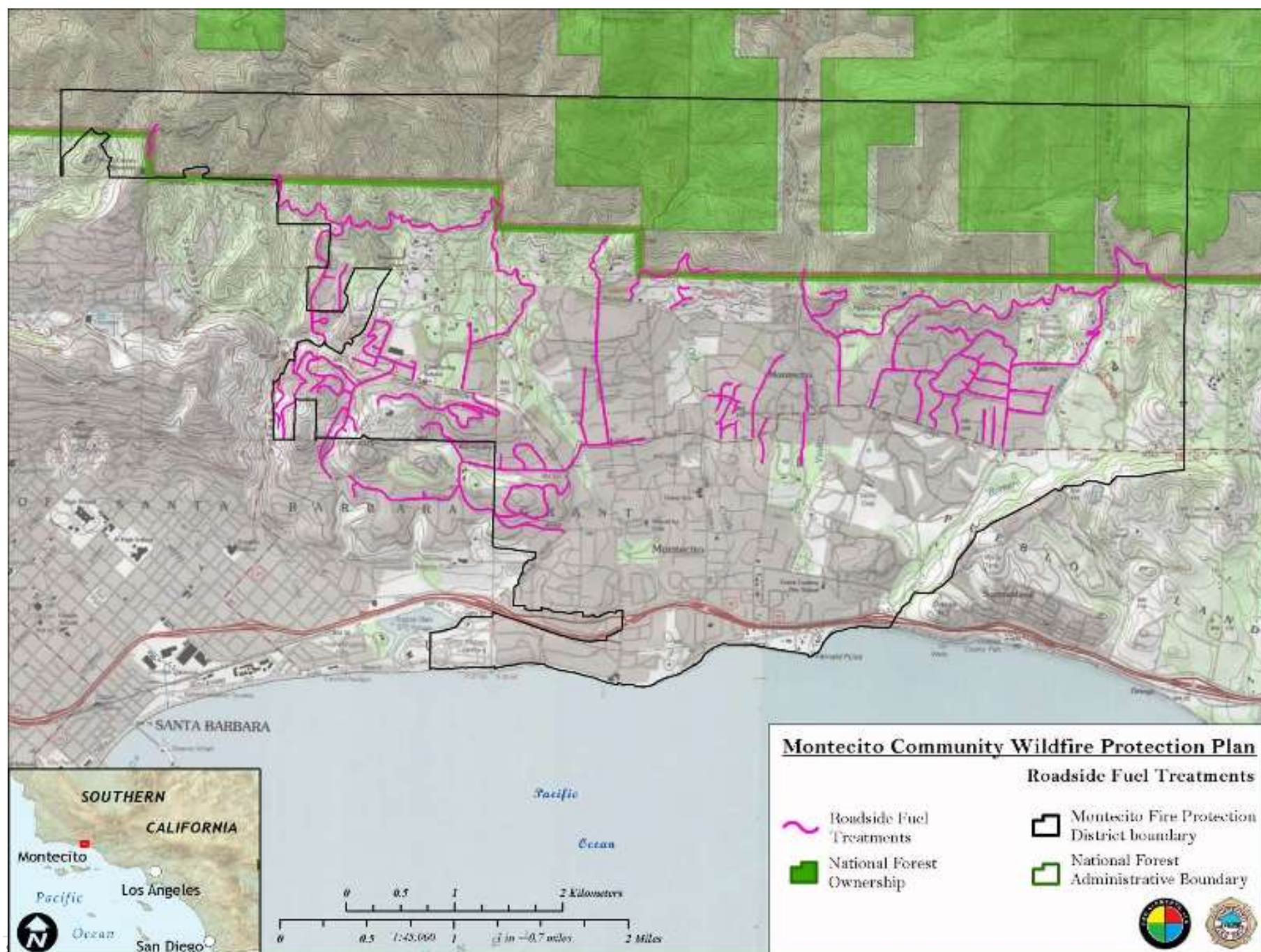


Figure 22 Roadside Fuel Treatments Map

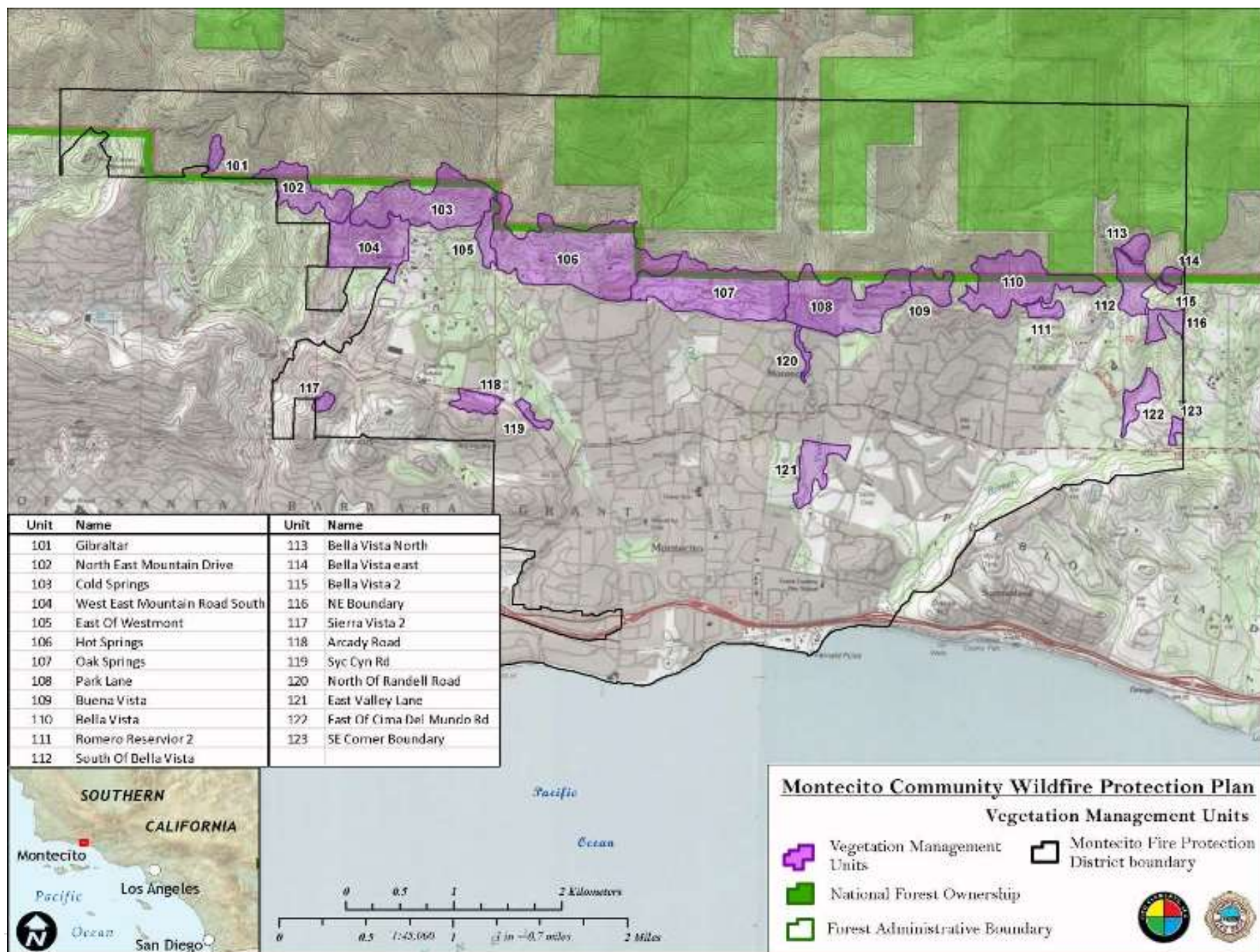


Figure 23 Vegetation Management Units Map

Table 16 Vegetation Management Units

Unit Number	Name	Acres
101	Gibraltar	321.46
102	North East Mountain Drive	2166.83
103	Cold Springs	4650.95
104	West East Mountain Road South	3176.12
105	East of Westmont	723.75
106	Hot Springs	8376.16
107	Oak Springs	5705.94
108	Park Lane	4741.64
109	Buena Vista	979.14
110	Bella Vista	4058.20
111	Romero Reservoir 2	406.44
112	South of Bella Vista	1310.44
113	Bella Vista North	446.28
114	Bella Vista East	265.45
115	Bella Vista 2	124.27
116	Northeast Boundary	700.75
117	Sierra Vista 2	256.78
118	Arcady Road	697.57
119	Sycamore Canyon Road	302.33
120	North of Randell Road	238.26
121	East Valley Lane	1437.05
122	East of Cima del Mundo Road	871.66
123	Southeast Corner Boundary	211.91
See Figure 22 for specific locations of the VMUs.		

6.3.1.4 Fuel Treatment Maintenance

The District has made a significant investment of time and money that has been expended on fuel treatment activities within the District since 2009. Without maintenance, these treatments will decrease in both magnitude and effectiveness, eventually blending back into the native vegetation. Only through reoccurring maintenance will these fuel treatment projects remain viable wildfire hazard mitigations features for the community. The amount of annual vegetation growth and regrowth will determine the frequency of fuel treatment maintenance.

The District maintains records of fuel treatments including date completed, area, project name, class, and project completion.

6.3.1.5 Vacant Parcels

The District has established minimum standards for hazard abatement of vacant parcels of land within the District boundary. This standard applies to all parcels, regardless of proximity to structures.

The following describes actions required by those landowners:

- Parcels less than one acre in size: All grasses shall be mowed or disked to less than 3 inches in height.
- Parcels one acre or larger in size: Create 30 foot wide fuel breaks around and across the property dividing it into approximately one acre sections. Grasses shall be mowed or disked to less than 3 inches in height.
- The use of mechanized equipment such as discs and plows, which tend to disturb soils, shall be avoided in all environmentally sensitive habitat areas.

6.3.2 Prioritization of Fuel Treatments

To ensure the long-term viability of past fuel treatments, maintenance of the existing treatments is the top priority for the District. The second priority for the District is the Roadside Fuel Treatments due to potential life safety issues related to evacuation and access/egress of firefighters. As funding and personnel become available, the District will look at implementation of fuel treatments within VMUs.

The VMUs are prioritized from 1 to 23 using the percentage of *Very High* fire danger ratings within each individual VMU. The VMU with the highest percent of *Very High* fire hazard is the number 1 priority for treatment, while the VMU with the lowest percent of *Very High* fire hazard is the number 23 priority. Where two VMUs display the same percent of *Very High* fire hazard, the ranking then goes to the percentage of *High* fire hazard classification to determine which VMU has a higher priority. Also considered in prioritizing VMUs are the response times and hydrant availability and flows within those VMUs taken from Citygate's 2014 report. The rankings from this process are available in Table 17.

Table 17 Vegetation Management Unit Priority for Fuel Treatment

Ranking	VMU Name	Unit Number	Percent Very High Hazard	Percent High Hazard	Within 11-Minute Response Time*	Within Adequate Hydrant Flow Area**
1	Northeast Boundary	116	57.3	15.9	No	Yes
2	Bella Vista North	113	51.0	6.1	No	No
3	Bella Vista	110	39.8	10.3	No	No
4	East Valley Lane	121	36.1	0.0	Yes	Yes
5	Sycamore Canyon Road	119	33.2	1.3	Yes	Yes
6	Buena Vista	109	30.3	4.1	Yes	Yes
7	Bella Vista East	114	29.7	3.9	No	No
8	South Of Bella Vista	112	23.2	42.6	No	Yes

9	Romero Reservoir 2	111	20.3	0.2	No	Yes
10	Sierra Vista 2	117	16.2	0.7	Yes	<i>Unknown</i>
11	Bella Vista 2	115	12.4	26.8	No	No
12	Hot Springs	106	6.6	1.4	Yes	Yes
13	East Of Westmont	105	6.4	1.4	Yes	No
14	Oak Springs	107	6.1	1.3	Yes	No
15	East Of Cima del Mundo Road	122	5.1	0.8	No	Yes
16	Southeast Corner Boundary	123	4.9	0.0	No	Yes
17	Park Lane	108	3.6	0.6	Yes	No
28	North East Mountain Drive	102	2.6	2.0	No	No
19	Gibraltar	101	2.1	1.2	No	No
20	North Of Randell Road	120	1.9	0.0	Yes	Yes
21	Cold Springs	103	0.9	0.6	No	No
22	Arcady Road	118	0.0	0.8	Yes	No
23	West East Mountain Road South	104	0.0	0.0	Yes	No
<p style="text-align: right;">* Taken from the 2014 Citygate Report ** Taken from the Hydrant Study</p>						

6.3.3 Fuel Treatment Prescriptive Guidelines

Fuel treatment prescriptive guidelines vary from high intensity to low intensity. The level of intensity is determined by the vegetation type, topography, and may be limited by location in sensitive habitats, historical and cultural sites, soil, watercourses, and proximity to structures, driveways, and roads. The intensity of treatment is measured by the amount of vegetation treatment required to meet site-specific hazard reduction goals (e.g., high intensity treatments generally remove a greater volume of fuel than does a low intensity treatment). The goal is to modify potential fire behavior, thereby reduce the wildfire impacts on community assets.

The fuel treatment plan for the District follows local and state regulations with a common objective of reducing potential fire intensity, rate of spread, and severity of fire effects. Achieving the standards of the fuel treatment plan reduces the opportunity for a wildfire to spread from undeveloped areas to structures or from human development into wildland areas.

It is important to understand that the hazard mitigation work can be costly and prone to limitations such as budget, environmental, property-owner, and workforce constraints. These prescriptive guidelines were developed in consultation with Althouse and Meade, Incorporated.

6.3.3.1 Roadside Fuel Treatment Prescription Guidelines

The following table describes the intensity levels for roadside and driveway fuel treatments:

Table 18 Roadside Fuel Treatment Prescriptive Guidelines

Location →		Primary Zone (A) (up to 50')* (distance varies with terrain & accessibility)	Secondary Zone (B) (50' – 100')* (distance varies with terrain & accessibility)
Fuel Type ↓			
Grass/ Forbs		Reduce fuel depth to 3 inches.	Treatment may not be needed.
Surface dead/down material (primarily correlated with tree and chaparral overstory)		Remove all large (>3-inches diameter) dead/down material.	Remove up to 75 percent of >3" diameter dead/down material.
Chaparral/Shrub		Remove all chaparral vegetation within this zone.	Remove up to 75 percent of chaparral vegetation. An open stand characteristic up to 40 feet spacing. Allow for intermittent small pockets or clumps of chaparral/shrubs. Small, less dense pockets/clumps of chaparral remaining should be healthy young-growth stage maintaining less volatile species composition and limbed to 1/3 height of chaparral/shrub crown. Chipped or masticated material may be "blown" back onto the slope where feasible to enhance soil coverage.
Trees Overstory (without chaparral/shrub understory)		Limb all trees to 6-feet or 1/2 of the live crown in this zone, whichever is less. Trim branches protruding over the roadway or driveway to a minimum height of 13-feet 6 inches. Thin/remove smaller trees leaving larger trees (6-inch DBH specs) with crown spacing up to 20-feet.	Same treatment as Zone A; may decrease crown spacing to 10 feet in tree overstory.
Trees Overstory (with chaparral/shrub understory)		Thinning specifications, same as Trees Overstory (without understory), but remove all understory chaparral/shrubs below trees in this zone.	Same treatment as Zone A leaving occasional small, less dense chaparral/shrub clumps and pockets in openings without canopy is acceptable.
* Treatment is subject to Architectural Design Standards and Oak tree guidelines in Montecito Community Plan.			

Implementation Restrictions for Roadside Fuel Treatment Levels:

The following describes restrictions to implement roadside fuel treatments:

- CEQA may be required prior to implementation of all site-specific projects.
- Shrubs will vary in size randomly scattered across the project area. Masticated material along roads, recreation trails, and recreation sites should not exceed 6-inches in depth.
- Burn piles will be small up to 4' x 4' x 4' to assure the burn patch will recover.
- Boundaries between treatment levels will maintain free-form shapes and feathered edges that replicate natural patterns and profiles in surrounding landscape; avoid straight lines by scalloping and feathering along edges of vegetation. The feathering of edges includes undulating edges horizontally and diverse heights of the brush retained on site.
- Precautions will be taken to prevent scarring of trees by equipment.
- Signs will be posted warning the public of potential hazards during fuel treatment activities.

Sensitive plant species:

- All locations where sensitive plant species are found will be flagged and avoided or if the density of species makes avoiding unfeasible, the area will be excluded from the treatment. Flagging and avoiding these plants will prevent damage from foot and vehicle traffic.
- There will be a limited operating period for vegetation treatments in suitable nesting habitat from March 1 through August 31. Activities can proceed during this timeframe if surveys during the current breeding season have determined that birds are not nesting within 200 feet or nesting raptors within 0.25 miles of the project area.

Noxious Weeds:

- To limit the spread and establishment of invasive plant species (e.g., noxious weeds) into project areas, all off-road heavy equipment used during project implementation will be washed free of noxious weeds and seeds or invasive exotic weeds and seeds before entering project areas. If any equipment works in an area where weeds occur, it will be washed, especially the undercarriage, to remove weed propagules prior to entering other work locations that are free of weeds and prior to leaving the project area.
- All equipment staging areas and burn pile areas will be located away from known areas with noxious weed occurrences.

Cultural Resources:

- Any known cultural resources within the proposed project area will be protected. If any sensitive cultural resources are found, work will stop and a qualified Archaeologist will be notified.

Soil and Watershed:

- All soils in project area have moderate to very high erosion potential. Every effort should be made to minimize damage to surface soil structure and to reduce potential for erosion and sediment transport to drainages due to fuel management activities.
- No mechanical equipment use on slopes greater than 30 percent with following exception: Mastication can occur on slopes greater than 30 percent where the equipment is operating on slopes less than 30 percent and accessing steeper slopes with a boom arm.
- Chipped or masticated material may be "blown" back onto the slope where feasible to enhance soil coverage.

Recommend the following Best Management Practices (BMP's):

- Environmentally Sensitive Habitat Areas (ESHA) including, but not limited to, riparian areas and wetlands should be marked on project area maps.
- Use of heavy equipment that will result in excessive damage will not be operated (e.g., tracked equipment, rubber is preferred, with low ground pressure coefficients).
- Known landslide and unstable areas should be avoided for safety reasons and because vegetation treatment activities may result in increased potential for mass wasting and sediment delivery to stream courses.
- Heavy equipment should not work on slopes greater than 30%. Movement of any heavy equipment across slopes should be minimized. Heavy equipment will not be used in riparian areas.
- To protect streams and stream courses, the following shall be implemented:
 - Activities within the riparian zone of any stream or top of bank, whichever is further from the water course, shall be subject to a *Lake and Streambed Alteration Agreement* (LSAA) with the California Department of Fish and Wildlife (CDFW). This is needed to cover removal vegetation from riparian areas of a stream or jurisdictional drainage.
 - Location and method of stream course crossing should be identified prior to fuel reduction activities to protect the stream course. Any work activity that results in fill to a jurisdictional water or wetland of the US requires a permit from the US Army Corps of Engineers and the State Regional Water Quality Control Board.
 - Contractor shall repair all damage to a stream course, including banks and channels, to the extent feasible.
 - Project vegetation debris shall be removed from the stream course in an agreed upon manner.
 - Water bars and other erosion control structures will be located so as to prevent water and sediment from being channeled into stream courses and to dissipate concentrated flows.
 - Fuel reduction activities shall not result in more than a 30 percent reduction in ground cover annually.
 - No riparian dependent plant species will be removed unless under the direction of a resource specialist and is permitted by CDFW under an LSAA. Note: current district programmatic or maintenance permits may cover activities.
- No servicing or refueling of equipment will occur on site. Operators must remove residues, waste oil, engine coolants, and other harmful materials from all worksites. Spill containment will be established prior to any on-site servicing or refueling.

6.3.3.2 Vegetation Management Unit Prescriptive Guidelines

The following table describes prescriptive guidelines for the District’s Vegetation Management Units (VMUs):

Table 19 Vegetation Management Unit Prescriptive Guidelines

Location →	Primary Defense Zone (A) (0 – 30')*	Fuel Reduction Zone (B) (30' – 100')*	Fuel Reduction Zone (C) (100' – 200')*
Fuel Type ↓	<i>Based on Montecito's Ordinance 2014-01 and HIZ Recommendations</i>		<i>Based on Firefighter Safety</i>
Grass/ Forbs	Reduce fuel depth to 4 inches.	Same treatment as (A); longer grass in isolated open areas is acceptable.	Treatment may not be needed.
Surface Dead/Down Material	Reduce the amount of dead/down materials.	Reduce dead/down flammable material to < 3" depth; and < 5 tons/acre in non-contiguous isolated logs acceptable.	Reduce heavier pockets of dead/down flammable material to < 5" depth; < 5-7 tons/acre in isolated logs acceptable.
Chaparral/ Shrub	Remove all chaparral. Individual ornamental shrubs should be spaced generally 2x shrub height.	Remove up to 75 percent of chaparral vegetation. Allow for intermittent small pockets or clumps of chaparral/shrubs. Pockets and clumps of chaparral remaining should be healthy young-growth stage and limbed to 1/3 height of chaparral/shrub crown.	Less intensive brush removal with up to 30 foot for spacing of pockets and clumps of chaparral and shrubs. The remaining pockets and clumps of chaparral should be healthy and at the young-growth stage; and limbed to 1/3 height of chaparral/shrub crown.
Trees Overstory (without chaparral/shrub understory)	Thin smaller trees leaving larger trees (>than 6-inches DBH) at 10-20 foot crown spacing (based on slope, tree size and type); limb/prune lower branches 6-feet above grade level, or lower 1/3 of tree height on smaller trees.	Thin smaller trees leaving larger trees (> than 6-inches DBH) at approximately 10 foot crown spacing (based on slope, tree size and type); limb/prune lower branches 6-feet up, or lower 1/3 of tree height on smaller trees and removing all broken limbs and dead material.	Limb and prune lower branches of larger trees up to 6-feet and removing all broken limbs and dead material.
Trees Overstory (with chaparral/shrub understory)	Thinning specifications are the same as Trees Overstory without Chaparral/shrub understory in Zone A. Understory: remove chaparral; limb/prune ornamental shrubs to 1/3 of shrub height.	Thinning specifications are the same as Trees Overstory without Chaparral/shrub understory (Zone B). Understory: occasional small, less dense chaparral/ shrub and small tree clumps and pockets in openings without canopy and small trees in openings (non-canopy) are acceptable.	Thinning specifications are the same as Trees Overstory without chaparral/shrub understory in Zone C. Understory specifications are the same as Chaparral/shrub in Zone C except the pockets and clumps are limited to tree openings (non-canopy).
* All fuel treatments are subject to Architectural Design Standards and Oak tree guidelines in Montecito Community Plan.			

Implementation Restrictions for VMU treatment levels:

The following describes restriction to implement fuel treatments:

- CEQA may be required prior to implementation of all site-specific projects.
- Shrubs will vary in size randomly scattered across the project area. Masticated material along roads, recreation trails, and recreation sites should not exceed 6-inches in depth.
- Create small burn piles, up to 4' x 4' x 4', to assure the burn patch will recover.
- Boundaries between treatment levels will maintain free-form shapes and feathered edges that replicate natural patterns and profiles in surrounding landscape; avoid straight lines by scalloping and feathering along edges of vegetation. The feathering of edges includes undulating edges horizontally and diverse heights of the brush retained on site.
- Precautions will be taken to prevent scarring of trees by equipment.
- Signs will be posted warning the public of potential hazards during fuel treatment activities.

Sensitive plant species:

- All locations where sensitive plant species are found will be flagged and avoided or if the density of species makes avoiding unfeasible, the area will be excluded from the treatment. Flagging and avoiding these plants will prevent damage from foot and vehicle traffic.
- There will be a limited operating period for vegetation treatments in suitable nesting habitat from March 1 through August 31. Activities can proceed during this timeframe if surveys during the current breeding season have determined that birds are not nesting within 20 feet or raptors within 0.25 mile of the project area.

Noxious Weeds:

- To limit the spread and establishment of invasive plant species (e.g., noxious weeds) into project areas, all off-road heavy equipment used during project implementation will be washed free of noxious weeds and seeds or invasive exotic weeds and seeds before entering project areas. If any equipment works in an area where weeds occur, it will be washed, especially the undercarriage, to remove weed propagules prior to entering other work locations that are free of weeds and prior to leaving the project area.
- All equipment staging areas and burn pile areas will be located away from known areas with noxious weed occurrences.

Cultural Resources:

- Any known cultural resources within the proposed project area will be protected. If any sensitive cultural resources are found, work will stop and a qualified Archaeologist will be notified.

Soil and Watershed:

- All soils in project area have moderate to very high erosion potential. Every effort should be made to minimize damage to surface soil structure and to reduce potential for erosion and sediment transport to drainages due to fuel management activities.

- No mechanical equipment use on slopes greater than 30 percent with following exception: Mastication can occur on slopes greater than 30 percent where the equipment is operating on slopes less than 30 percent and accessing steeper slopes with a boom arm.
- Chipped or masticated material may be “blown” back onto the slope where feasible to enhance soil coverage.

Recommend the following Best Management Practices (BMP’s):

- ESHA including, but not limited to, riparian areas and wetlands should be marked on the project area maps.
- Use of heavy equipment that will result in excessive damage will not be operated (e.g., tracked equipment, rubber is preferred, with low ground pressure coefficients).
- Known landslide and unstable areas should be avoided for safety reasons and because vegetation treatment activities may result in increased potential for mass wasting and sediment delivery to stream courses.
- Heavy equipment should not work on slopes greater than 30%. Movement of any heavy equipment across slopes should be minimized. Heavy equipment will not be used in riparian areas.
- To protect streams and stream courses, the following shall be implemented:
 - Activities within the riparian zone of any stream or top of bank, whichever is further from the water course, shall be subject to an LSAA with the CDFW. This is needed to cover removal vegetation from riparian areas of a stream or jurisdictional drainage.
 - Location and method of stream course crossing should be identified prior to fuel reduction activities to protect the stream course. Any work activity that results in fill to a jurisdictional water or wetland of the US requires a permit from the US Army Corps of Engineers and the State Regional Water Quality Control Board.
 - Contractor shall repair all damage to a stream course, including banks and channels, to the extent feasible.
 - Project vegetation debris shall be removed from the stream course in an agreed upon manner.
 - Water bars and other erosion control structures will be located so as to prevent water and sediment from being channeled into stream courses and to dissipate concentrated flows.
 - Fuel reduction activities shall not result in more than a 30 percent reduction in ground cover annually.
 - No riparian dependent plant species will be removed unless under the direction of a resource specialist and is permitted by CDFW under LSAA. Note: current district programmatic or maintenance permits may cover activities.
- No servicing or refueling of equipment will occur on site. Operators must remove residues, waste oil, engine coolants, and other harmful materials from all worksites. Spill containment will be established prior to any on-site servicing or refueling.

6.3.4 Fuel Treatment Types

Fuel treatment types fall into five treatment categories – mechanical, manual, prescribed fire (pile burning), biological, and fire retardant application. The fuel treatment strategy for the District may involve all of these treatment types with the use of pile burning being the most complex mechanism. The following are brief descriptions of the more common fuel treatment methods:

- Mechanical – This method is generally associated with larger fuel treatment areas where the cost of contracting industrial mowers or masticators can be offset by rapidly treating larger portions of the landscape. Mechanical treatments can also be effective for linear treatments such as roadsides.

Mechanical treatments such as mowing and mastication do not reduce hazardous fuels, but rearrange it into a less flammable configuration. Both methods of treatment take vertically oriented fuels and rearrange them into horizontally oriented fuels through the process of cutting and chipping of the standing vegetation, which exposes the fuel to less wind and allows it to absorb moisture from the soil. Both of these processes reduce the potential fire behavior characteristics of the fuel.

- Manual - This process utilizes human labor to manually cut and remove or rearrange fuel. Thinning, pruning and clearing of fuel are the most common treatment. Fuels treated manually are either chipped into a less flammable state (similar to mastication), removed from the site by a vehicle, or piled for burning at a later date when weather conditions preclude fire from spreading across the landscape.

Manual fuel treatments are more precise than mechanical treatments and can address hazardous fuel conditions without having a significant impact on visual, cultural, or biological resources.

- Pile Burning – Pile burning under appropriate weather conditions can rapidly eliminate piles of fuel after manual fuel treatment activities. Pile burning is a very cost effective way to address the elimination of hazardous fuel, but requires permitting from air regulators due to possible negative impacts to air quality. As with any prescribed fire, a potential escape from a burning pile, either during the flaming or smoldering stage, is possible. This risk can be alleviated with mitigation measures. An evaluation of smoke impacts to residents prior to ignitions and smoke dispersal patterns should occur prior to an ignition in order to eliminate the possibility of smoke nuisance complaints to the air quality regulators.
- Biological – Biological treatments use grazing animals to consume hazardous fuels. This method, while effective, can be costly and comes with some concerns. The animal of choice for grazing with communities are typically goats. Containment of these animals within a treatment unit assures that they eat only the target vegetation. Goats are indiscriminate eaters and eat most plant species; however, they prefer younger soft vegetation and will often eat the non-target vegetation (e.g., ornamental vegetation) prior to eating the vegetation considered hazardous.

Goats also have the risk of spreading invasive species when not maintained on a weed free diet prior to placement on site. The goats can also cause soil disturbance as they

walk within the confined treatment unit. Smell and noise are also a concern when deploying goats within residential areas. Another consideration is the effect of animal waste on nearby waterways and ESHAs.

Goats have been effective in many southern California jurisdictions. The Forestry Division of Los Angeles County Fire Department maintains a list of approved goat wranglers in the Southern California area.

- **Fire Retardant Application** – The application of ground-based fire retardant occurs in several jurisdictions in Southern California including Montecito. The application of fire retardant serves as a mechanism to reduce the number of ignitions within a high-risk area. Retardant is mixed in a ground-based water tender and the mixed retardant is sprayed onto surface vegetation providing a coating on the fuel.

The research on the effectiveness of the application of long-term retardant is limited; however, anecdotal information from fire managers in other jurisdictions claim that the retardant remains effective for several months as long as a wetting rain event does not occur to wash the retardant from the surface of the fuel. Phos-Chek, the manufacturer of the retardant claims that “....Phos-Chek retardants react with, and alter the decomposition of wildland fuels, so that when used at the qualified mix ratio they do not support flaming or glowing combustion. This deprives the fire of fuel, reducing fire intensity and rate of spread” (Phos-chek, 2015).”

A potential negative aspect of this fuel treatment method is that the fire retardant used is a fertilizer and may chemically kill leafy material coated with the retardant. Since the material is by nature a fertilizer, application of the retardant has the potential to encourage plant growth the following fire season.

6.5 EVACUATION

Montecito presents significant challenges for evacuation due to the transportation system within and adjacent to the District and the speed and intensity in which wildfires in the area burn. As stated in Citygate’s 2014 report, Montecito has significant access and egress impediments that can adversely affect emergency response times and evacuations very quickly. This is due to narrow roads, winding roads, steep roads, vegetation encroachment on roads, gates, bridges, addresses not clearly visible from the property access point, speed-reducing features such as bulb-outs, roundabouts, and speed bumps, unlit roads and intersections, and unlit street signage.

A wildfire in the WUI is extremely dangerous, but compound this event with additional factors such as human behavior, population density, limited and overloaded transportation routes, vulnerable and mobility-limited populations, businesses’ employees, visitors, and the evacuation of animals makes the task of evacuation exponentially complex. The lead-time required to conduct mass evacuations during a wildfire event in Santa Barbara County is often very short and immediate.

In 2012, the District developed an evacuation plan and performed an evacuation field drill about six months prior to the 2008 Tea fire. Unfortunately, there are no field notes available about the lessons learned from that drill but the fact that it occurred provides a benefit to those that participated.

6.5.1 During a Wildfire Event

The Sheriff's Department will make the decision to evacuate in coordination with the Montecito Fire Department and an Incident Commander but an evacuation is the responsibility of the Santa Barbara County Sheriff's Department. California law authorizes law enforcement to restrict access to any area where a menace to public health or safety exists due to a calamity such as flood, storm, fire, earthquake, explosion, accident, or other disaster. Refusal to comply is a misdemeanor (Penal Code 409.5).

In 2010, the District developed a Public Alert and Notification Plan that determined no single notification system would accomplish 100 percent of public notification to prepare for or alert individuals adequately during an emergency event. In the event of a wildfire emergency that requires evacuation, the Sheriff's Department and Montecito Fire Department will employ all communication methods to attempt to notify and alert individuals, including:

- Reverse 911
- COMLabs Emergency Warning System and HomeALERT Receivers
- NIXLE
- Emergency Alert System (EAS) supported by the National Weather Service broadcast
- Radio and television announcements
- Exterior electro/mechanical sirens
- Door-to-door notifications
- Social media, such as Twitter and Facebook

6.5.2 Evacuation Routes

The District has identified evacuation routes (See Figure 24, Montecito's Early Warning Systems Map) that offer individuals pre-planned options for rapid egress from areas threatened by a wildfire.

IMPORTANT NOTE: *The evacuation map provides preferred evacuation routes but potential fire behavior and road conditions may necessitate changes. It is recommended that everyone in the community become familiar with the preferred evacuation routes and look for potential alternatives if fire behavior and/or road conditions require a change.*

6.5.3 Potential Issues with Evacuation

- Residents and business-owners likely do not have established preparedness plans.

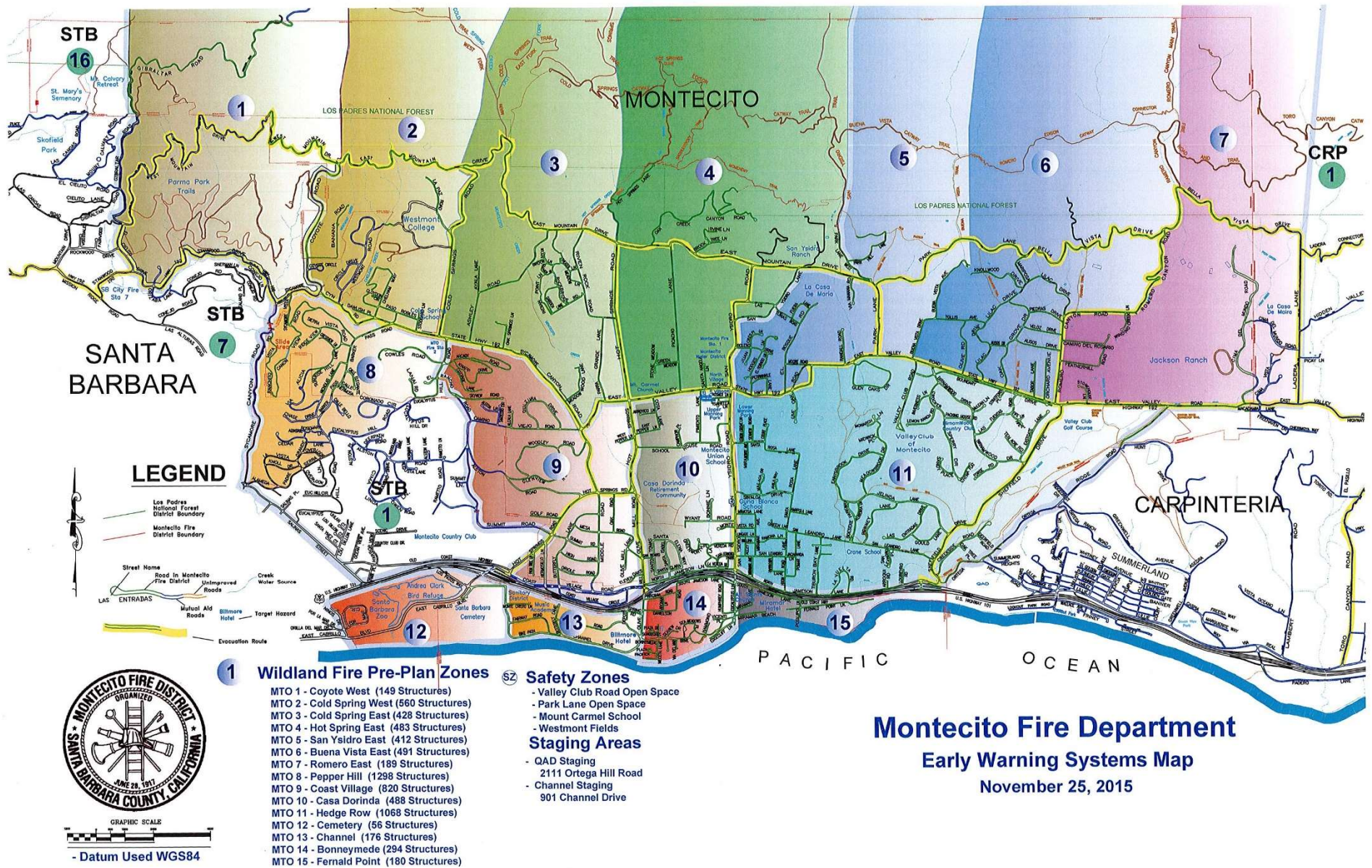


Figure 24 Montecito's Early Warning Systems Map

- Residents and business-owners may choose not to evacuate but rather to stay and defend their homes/businesses or decide to shelter in place until the fire danger passes. These residents and business-owners can put their life safety at risk as well as that of emergency personnel.
- Individuals often delay their evacuation with the intent of defending their property, or to shelter in place, or are slow to leave their homes due to packing personal items thereby jeopardizing their life safety by fleeing fires in a panic.
- Vulnerable populations and/or individuals with limited mobility may be less likely to respond to, cope with, or recover from wildfire. Age and/or physical and mental limitations can restrict mobility making it more difficult to evacuate in a disaster. Language issues can result in communication barriers to evacuation and support services. Additionally, visitors and non-permanent residents in Montecito are likely unfamiliar with the wildfire threat, the extent of their exposure, and appropriate evacuation routes that can make them more vulnerable during an evacuation.
- Evacuating pets, service animals, and large animals pose significant problems since panicked animals behave unpredictably and may refuse to respond to normal handling approaches.

SECTION 7. FISCAL RESOURCES

Fiscal resources may be limited and budgetary constraints can make it difficult to address all of the needs and implement all of the projects identified in this CWPP. A staggered approach to the implementation of the proposed fuel treatments with the existing fuel treatment program will allow the District to continue enhancing wildfire protection while seeking additional funds through external sources (e.g., grants, stewardships).

7.1 POTENTIAL GRANT FUNDING SOURCES

There are numerous opportunities for federal, state, and local grants. The following identifies several grant sources:

Fire Service Grants and Funding (AFG)

Provides direct assistance on a competitive basis to fire departments of a State or tribal nation for protecting the health and safety of the public and firefighting personnel against fire and fire-related hazards.

Fire Service Grants and Funding (AFGP)

Through the Federal Emergency Management Agency's Assistance to Firefighters Grant Program (AFGP), career and volunteer fire departments and other eligible organizations can receive funding through three different grants to enhance a fire department's organization's ability to protect the health, safety of the public and protect the health of first responders, and increase or maintain the number of trained, "front-line" firefighters available in communities.

Staffing for Adequate Fire & Emergency Response Grant (SAFER)

The Staffing for Adequate Fire and Emergency Response Grant (SAFER) was created to provide funding directly to fire departments and volunteer firefighter interest organizations to help them increase or maintain the number of trained, "front line" firefighters available in their communities. The goal of SAFER is to enhance the local fire departments' abilities to comply with staffing, response and operational standards established by the NFPA (NFPA 1710 and/or NFPA 1720).

Fire Prevention & Safety Grants (FP&S)

The Fire Prevention and Safety (FP&S) Grants are part of the Assistance to Firefighters Grants (AFG) and support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal of this grant program is to reduce injury and prevent death among high-risk populations. In 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include Firefighter Safety Research and Development.

Pre-Disaster Mitigation Grant Program (PDM)

The PDM Program, authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, is designed to assist States, territories, Federally recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes. PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.

SECTION 8. MONITORING

This section describes the monitoring of the CWPP as well as the activities described in the plan.

8.1 CWPP MONITORING

A CWPP's strength depends on collaboration, its relevance, and its ability to guide actions implemented on the ground. This CWPP provides a foundation to guide the community in wildfire protection activities based on input from stakeholders, current policy, a science-based wildfire assessment, and the development of mitigation strategies.

This CWPP should continue the progression of collaborative planning, implementation, monitoring, and adapting strategies based on lessons learned over time. The District staff will benefit from reviewing successes and challenges during the implementation of this CWPP to learn what does and does not work. Working with stakeholders, the District can identify new activities and evaluate the effectiveness of the resources necessary for successful CWPP implementation.

The Montecito Wildland Fire Specialist has the responsibility to conduct a review of this plan at 5-year intervals to ensure its relevance. Significant changes in policy, budget, and/or environmental conditions may warrant a more frequent review.

8.2 FUEL TREATMENT MONITORING

Currently, the District does not engage in formal fuel treatment monitoring. Monitoring and evaluation of a fuel treatment establishes baseline data to draw on for decisions about maintenance treatment schedules as well as determining whether there is a need to modify fuel treatment prescriptive guidelines. The primary aspects to consider in a fuel treatment-monitoring program are the type of monitoring/evaluation and the monitoring intervals.

SECTION 9. CWPP RECOMMENDATIONS

The purpose of this section is to identify and review recommendations brought forward by the 1998 Feasibility Study, the 2014 Citygate Report, and to identify additional recommendations for the District.

The following tables list recommendations and their status from the 1998 Feasibility Study for fire evacuation:

Table 20 1998 Feasibility Evacuation Recommendations and Status

Recommendation Ranking	Description	Status
1	MTO should coordinate with the County Public Works Department to establish proper road width brushing procedures, designation of road signing criteria, and placement of these signs at all evacuation route intersections.	Completed, but there are no fixed signs designating evacuation routes. The District will work with Public Works and Montecito Association.
2	MTO should designate community safety zones, make contact with officials responsible for these potential safety zones and get their concurrence, and develop a public awareness flyer discussing the importance of safety zones, when they should be used, and importance of maintaining contact with someone of their choice so they will always be accounted for during the emergency.	The District's 2014 Wildland Fire Initial Attack Plan has designated safety zones but do not believe that the public is aware of this. Safety zones are indicated on the current Early Warning Systems Map on the District's webpage.
3	MTO, in coordination with the County Sheriff's Department, establish a County "Model" Traffic Control Volunteer Program for the community of Montecito. MERRAG should be the focal point for this volunteer group	Addressed through CERT/MERRAG training; however, continued education is needed.
4	MTO explore the possibility of an Emergency Alert System for the District.	Completed.

The following table lists recommendations from Citygate's report that are associated with community wildfire protection planning.

Table 21 2014 Citygate Report Recommendations as they Relate to Wildfire

Recommendation Number	Description	Status
2-2	The District should update its pre-incident and target hazard plans at least every five-years.	This CWPP completes the wildfire portion of this recommendation.

2-3	Strongly advocate for meaningful reduction of existing access/egress impediments wherever possible.	In process through Fire Protection Certificate process associate with building permit issuance.
2-4	Aggressively seek water system improvements where available fire flow does not meet minimum District Fire Protection Plan standards.	Recent hydraulic study of the District water flow distribution for fire flow indicated that 70% of fire flow capacity meets the District standards. The District also gains improvement of the FPC process associated with building permit issuance.
2-5	The District should exercise its emergency notification systems and Evacuation Plan, including partner agencies, at least every 36 months.	Occurring
2-7	Seek reduction to environmental constraints for vegetation removal/modification where possible, especially in those areas of the District adjacent to the native chaparral fuel beds.	The District does not have the ability to reduce these constraints but the District is working within CEQA guidelines to complete projects.
2-8	Maintain existing vegetation reduction/modification projects to ensure sustained effectiveness.	Occurring
2-9	Aggressively seek additional landowner agreements for vegetation removal/modification projects, especially in those areas of the District adjacent to the native chaparral fuel beds.	In process; this CWPP supports the District's efforts.
2-10	Aggressively seek additional neighborhood vegetation removal/reduction projects that will reduce wildland fire intensity/spread potential.	In process, this CWPP will support the District's efforts.
2-11	Aggressively seek additional vegetation removal, reduction, and maintenance funding sources.	In process, this CWPP positions the District well to compete for grants.
3-3	The District should consider a long-term strategy to operate a three-fire-station model in the shape of a triangle, relocating Station 1 closer to the coast. Doing so would best fit the topography.	The District is in the planning phase of adding a third station.

The following table lists recommendations from Geo Elements that further enhances protection of values within the District:

Table 22 Geo Elements CWPP Recommendations

CWPP Section Number	CWPP Recommendations
5.2.4.1.2	Consider working with Santa Barbara County and other adjacent agencies to develop higher resolution fuels data for fire modeling that will better define fuel model data not available in LANDFIRE.
6.1	Create community-specific evacuation brochures and website links for all populations (bi-lingual) but specifically vulnerable populations. Information should include the District's evacuation plan, personal preparedness planning, transportation planning, medical and prescription needs, short and long-term sheltering needs, shelter in place plans, disaster kits, etc.
6.1	Ensure schools and educational facilities have updated and adequate preparedness and evacuation plans.
6.3	Improve tracking of fuel treatment activities by establishing a fuel treatment database. Information to collect includes name of the project, project type (e.g., roadside, VMU), date planned, date accomplished, type of treatment (e.g., manual thinning, chipping, mastication, etc.), acres treated, project cost, equipment used, and does the project have ESHA or cultural resource issues.
6.5	Consider creating and maintaining a volunteer registry of mobility-limited/disabled vulnerable populations.
6.5	Outreach to vulnerable populations and limited-mobility limited individuals and work through established disability networks and facilities annually to assist them in developing evacuation or shelter in place plans.
6.5	Continue field drills every 36 months; document lessons learned from each exercise and incorporate lessons for future drills.
8	Consider establishing a fuel treatment-monitoring program to ensure that fuel treatment activities remain effective. A suggested method for monitoring fuel treatments is photo point monitoring. Photo point monitoring is an easy and inexpensive, yet effective method of monitoring vegetation change. It consists of repeat photography of an area of interest over a period of time with photographs taken from the same location and the same field of view as the original photo. With appropriate site marking and documentation, different people can replicate photos many years apart. Details on methods for photo monitoring is available at www.fs.fed.us/pnw/pubs/gtr526 .

SECTION 10. REFERENCES

- Always Remember Website. Romero Fire Statistics. 1973. <www.wlfalwaysremember.org>; (20 July 2015)
- Andrews, P. L.; Bevins, C. D.; Seli, R. C. 2008. BehavePlus fire modeling system, version 4.0: User's Guide. General Technical Report RMRS-GTR-106WWW Revised. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station.
- Bradshaw, L.; McCormick, E. 2000. FireFamily Plus, Version 4.1. Gen. Tech. Rep. RMRS-GTR-67WWW. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Butler, B. 2014. Preliminary Firefighter Safety Zone Guidelines. < <http://1.usa.gov/1HKfhJ5> >; (11 October 2015)
- California Office of Emergency Services, 1950. California disaster and civil defense master mutual aid agreement. < <http://bit.ly/1WUgnZz> >; (23 August 23 2015)
- California Natural Diversity Database; Generated by Carol Henson using <www.dfg.ca.gov/biogeodata/cnddb>, (09 August 2015)
- Carlyle, E.; Forbes Magazine, New York dominates 2014 list of America's most expensive ZIP codes, published October 8, 2014. <<http://onforb.es/1Sm6P8o>>. (12 August 2015)
- Citygate Associates, LLC; Standards of Coverage Study and Risk Assessment Montecito Fire Protection District Volumes 1 and 2; (12 November 2014)
- Cohen, J. D., 2000. Preventing disaster: home ignitability in the wildland-urban interface. *Journal of Forestry* 98 (3): pp 15-21.
- County of Santa Barbara Resource Management Department. 1995. Montecito Community Plan Update.
- County of Santa Barbara Public Works, Flood Control District. Historical Rainfall Information. <<http://cosb.countyofsb.org/pwd/pwwater.aspx?id=3772>>; (14 August 2015)
- County of Santa Barbara Planning and Development. 1995. Montecito Architectural Guidelines and Development Standards. p 23.
- Diaz, John M. 2012. Economic impacts of wildfire. SFE Fact Sheet 2012-7. Joint Fire Science Program, Southern Fire Exchange. 3 p.
- Federal Register. National Archives and Records Administration. Urban Wildland Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire; Notice of proposed rulemaking, 66 Federal Register 160, pp. 43383. (17 August 2001)

Finney, Mark A. 2006. An Overview of FlamMap Fire Modeling Capabilities. In: Andrews, Patricia L.; Butler, Bret W., comps. 2006. Fuels Management-How to Measure Success: Conference Proceedings. 28-30 March 2006; Portland, OR. Proceedings RMRS-P-41. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 213-220

Finney, Mark A. 2004. FARSITE: Fire Area Simulator-model development and evaluation. Res. Pap. RMRS-RP-4, Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 47 p.

Google Earth (Version 5.1.3533.1731) [Software]. Mountain View, CA: Google Inc. (2009). <<http://too.lazy.to.look.it.up>>; (19 October 2015)

Hall, Frederick C. 2001. Ground-based photographic monitoring. Gen. Tech. Rep. PNW-GTR-503. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Köppen-Geiger Climate Classification System; <<http://koeppen-geiger.vu-wien.ac.at/index.htm>>; (18 August 2015)

Kuznia, R. Noozhawk Online News Article. 2008. <www.noozhawk.com/article/1114_montecito_wildfire; 210 Homes Destroyed by Tea Fire>; (19 October 2015)

LANDFIRE: LANDFIRE lcp data distribution, 2012. U.S. Department of Interior, Geological Survey. Generated by David Kerr at <<http://landfire.cr.usgs.gov>>. (10 October 2015.)

Lombardo, Keith. 2012. Chaparral Fire History and Fire-Climate Relationships in the Transverse Ranges of Southern California, USA.

Mensing, S. A., Michaelsen, J., Byrne, R. 1998. A 560-Year Record of Santa Ana Fires Reconstructed from Charcoal Deposited in the Santa Barbara Basin, California.

Montague, R.E, et.al. 1988. Montecito community fire feasibility report. FireWise 2000, Inc.

National Fire Protection Association (NFPA). The basics of defensible space and the "home ignition zone". <<http://bit.ly/1KOgXaf> >; (22 October 2015)

National Interagency Coordination Center; Retrieved from <www.predictiveservices.nifc.gov/intelligence/intelligence.htm>; (25 July 2015)

National Wildfire Coordinating Group Operations and Workforce Development Committee. Incident Response Pocket Guide. PMS 461. 2014.

National Wildfire Coordinating Group. 2013. Wildland fire incident management field guide. <<http://1.usa.gov/1M9qOW8> >; (27 October 2015)

Ojerio, R. S. (2008). Equity in Wildfire Risk Management: Does Socioeconomic Status Predict Involvement in Federal Programs to Mitigate Wildfire Risk? (Master's Thesis).

Philpot, C. W.; Seasonal changes in heat content and ether extractive content of chamise. Ogden, Utah: Intermountain Forest, and Range Experimental Station; Forest Service, U.S. Dep. Agric.: 1969; Res. Paper INT-61. 10 p.

Philpot, C. W.; Mutch, R.W., 1971. The seasonal trends in moisture content, ether extractives, and energy of ponderosa pine and Douglas-fir needles. Res. Pap. INT-102. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 21 pp.

Phos-chek Corporation, 2015. < <http://bit.ly/1iX7dy2> >; (08 September 2015)

Rahn, M. Wildfire Impact Analysis, Fire Impact Analysis, Spring 2009. San Diego, CA: San Diego University. < <http://bit.ly/1MMdioE> >; (03 October 2015)

Sanborn Map Company. West Wide Risk Assessment Final Report. 2013. < <http://bit.ly/1NNmRZD> >; (02 September 2015)

Scott, J. H.; Burgan, R. E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

State Board of Forestry and Fire Protection and CAL FIRE. 2010. California Fire Plan.

State of California, CALFIRE, 2015. Fire and resource assessment program. <<http://frap.fire.ca.gov>>. Accessed August 13, 2015.

University of California, Santa Barbara, Economic Forecast Project, < <http://bit.ly/1Y6MlnM> >; (13 July 2015)

U.S. Census Bureau; generated by Carol Henson; using American FactFinder; <<http://factfinder2.census.gov>>; (07 July 2015)

U.S. Forest Service; generated by David Kerr; using National Fuel Moisture Database; <www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103>; (09 September 2015)

Whelan, Robert J. The Ecology of Fire. Cambridge; New York: Cambridge University Press, 1995.

Williams, Scott. Scott Williams Real Estate. <www.scottwilliams.com/montecito-median-home-prices>; (18 September 2015)

SECTION 11. APPENDICES

The following provides terms or words found in or relating to this plan (additional terms are available at <http://www.nwccg.gov/glossary>):

1-Hour Timelag Fuels (a.k.a., one-hour fuels): Fuels consisting of dead herbaceous plants and roundwood less than about ¼ inch (6.4 mm) in diameter. Also included is the uppermost layer of needles or leaves on the forest floor.

10-Hour Timelag Fuels (a.k.a. ten-hour fuels): Dead fuels consisting of roundwood ¼ to 1 inch (0.6 to 2.5 cm) in diameter and, very roughly, the layer of litter extending from immediately below the surface to ¾ inch (1.9 cm) below the surface.

100-Hour Timelag Fuels (a.k.a., hundred-hour fuels): Dead fuels consisting of roundwood in the size range of 1 to 3 inches (2.5 to 7.6 cm) in diameter and very roughly the layer of litter extending from approximately ¾ of an inch (1.9 cm) to 4 inches (10 cm) below the surface.

1,000-Hour Timelag Fuels (a.k.a., thousand-hour fuels): Dead fuels consisting of roundwood 3 to 8 inches in diameter and the layer of the forest floor more than 4 inches below the surface.

Active Crown Fire: A fire in which a solid flame develops in the crowns of trees, but the surface and crown phases advance as a linked unit dependent on each other.

Aspect: Direction a slope faces.

Canopy Spacing: The distance from the edge of one tree canopy to another. Crown spacing varies from open (with 10 feet or more of space between tree canopies) to closed (where trees may be growing in very close proximity with little space between them).

Crown Fire: A fire that advances from top to top of trees or shrubs more or less independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire.

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Direct Attack: A method of fire suppression where actions are taken directly along the fire's edge. In a direct attack, burning fuel is treated directly, by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Frequency: Temporal fire occurrence described as a number of fires occurring within a defined area within a given time period.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Potential: The likelihood of a wildland fire event measured in terms of anticipated occurrence of fire(s) and management's capability to respond. Fire potential is influenced by a sum of factors

that includes fuel conditions (fuel dryness and/or other inputs), ignition triggers, significant weather triggers, and resource capability.

Fire Regime: The characterization of fire's role in a particular ecosystem, usually characteristic of particular vegetation and climatic regime, and typically a combination of fire return interval and fire intensity (i.e., high frequency, low intensity/low frequency, high intensity).

Fire Return Interval: The length of time between fires on a particular area of land

Fire Weather: Weather conditions that influence fire ignition, behavior, and suppression.

Flame Length: The distance from the base to the tip of the flaming front. Flame length is directly correlated with fire intensity.

Flaming Front: The zone of a moving fire where combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front.

Fuel: Any combustible material, which includes but is not limited to living or dead vegetation, human-built structures, and chemicals that will ignite and burn.

Fuelbed: An array of fuels usually constructed with specific loading, depth, and particle size to meet experimental requirements; also, commonly used to describe the fuel composition.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Mathematical descriptions of fuel properties (e.g., fuel load and fuel depth) that are used as inputs to calculations of fire danger indices and fire behavior potential.

Fuel Moisture Content: The quantity of moisture in fuels expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Goals: A goal is a broad statement of what you wish to accomplish, an indication of program intentions.

Ground Fire: Fire that consumes the organic material beneath the surface litter ground, such as a peat fire.

Intensity: The level of heat radiated from the active flaming front of a fire, measured in British thermal units (BTUs) per foot.

Ladder Fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. Ladder fuels help initiate and ensure the continuation of crowning.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

Mid-flame Windspeed: The speed of the wind measured at the midpoint of the flames, considered to be most representative of the speed of the wind that is affecting fire behavior.

Objectives: They contribute to the fulfillment of specified goals and are measurable, defined, and specific.

Passive Crown Fire: Also called torching or candling. A fire in the crowns of trees in which single trees or groups of trees torch, ignited by the passing front of the fire.

Safety Zone: A preplanned area of sufficient size and suitable location in the wildland expected to prevent injury to fire personnel without using fire shelters.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Riparian: Situated or taking place along or near the bank of a watercourse.

Spotting: Refers to the behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Strategy: The general plan or direction selected to accomplish incident objectives.

Surface Fire: Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation.

Surface Fuels: Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants.

Topography: Referred to as "terrain." The term also refers to parameters of the "lay of the land" that influence fire behavior and spread. Key elements are slope (in percent), aspect (the direction a slope faces), elevation, and specific terrain features such as canyons, saddles, "chimneys," and chutes.

Understory: Term for the area of a forest which grows at the lowest height level below the forest canopy. Plants in the understory consist of a mixture of seedlings and saplings of canopy trees together with understory shrubs and herbs.

Values at Risk: People, property, ecological elements, and other human and other intrinsic values within the City. Values at Risk are identified by stakeholders as important to the way of life in the City, and are particularly susceptible to damage from undesirable fire outcomes.

Wildland Fire Environment: The surrounding conditions, influences, and modifying forces of fuels, topography, and weather that determine wildfire behavior.

Stakeholder Input

The first stakeholder workshop occurred on June 18, 2015 at the Montecito Fire Department Headquarters. Solicitation of stakeholder input began with the first public workshop through the release of the final draft Community Wildfire Protection Plan (CWPP) on January 4, 2016. Invitations were sent to stakeholders through various methods including direct phone calls and emails and advertisement on the District website and local media. A presentation was also made at the Montecito Planning Commission meeting on August 19th where stakeholders were also invited to attend.

Details of the CWPP planning process and solicitation to garner input for the plan was available throughout the comment period on the Montecito Fire Protection District website.

The following tables identify stakeholder input:

Method of Contact	Stakeholder	Comment	Response
Index card from June 18th Workshop	MB	Talked to Chief Jeff regarding - Camino Cielo as natural boundary to mitigate forest fire - Carpinteria Fire District to include their jurisdiction on eastern portion of boundary, - issue of water supply as relates to fire training, preparation and actual firefighting, -use of ocean water for helicopters (issue of biology and wear on machinery), -concern about heaps/mountains of wood chips and policing and dumped sites (ie as of San Ysidro Trail), -concern about policing (not initial code requirement) of fire/smoke detectors to aid in quick reaction to fire departments of existence of fires. Goals and Objectives seem very comprehensive, -is fire department aware of private party attempting to independently fund fire helicopter to be stationed at airport? Discussed idea of helicopter with fuel stationed near Jackson ranch.	Fuel treatment work on Camino Cielo is a strong mitigation measure; however, this area is under the Forest Service jurisdiction. The Los Padres National Forest does have an active program along the Camino Cielo Road; however, funding, environmental concerns, and other priorities can impede efforts for the Forest to pursue work in that area. Water supply is a huge issue in the Santa Barbara Front, this is identified in this plan.
“	SG	It's clear the creeks funnel the fire down canyons. I'd like to see the creeks cleared of highly flammable trees – especially non-natives like Eucalyptus. Our property was burned alongside the San Ysidro Creek in 1964. In 1965 the creek was cleared. Since then nothing has been cleared. I'd like to see an environmentally-sensitive clearing.	This plan does consider fuel treatment work in these areas. Dr. Meade provides modified fuel treatment guidelines to balance impacts to ESH.
“	Unknown	San Ysidro Trail is a road for about a mile up. After the trail proper starts, just before the road crosses San Ysidro Creek, about 400 paces up the training across the creek, to the left, is a side canyon that various people have used for a camp and for agricultural pursuits. <INCLUDED DIAGRAM OF AREA DRAWN>	We assume that this stakeholder is concerned about potential ignitions caused by illegal camping and marijuana plantations in the San Ysidro Trail area. The District has a strong signage program related to fire prevention.
“	Unknown	Using private clearing along with fire district clearing high in the front country. Help connect those cleared spaces. Take air support/pilots to those areas ahead of fire event to show where to make drops that are most effective. Jeff Saley has intelligence.	The fuel treatment mitigation presented in this plan considers existing projects in the northern portion of the District. Air support and pilots are well versed in looking for water/retardant drop opportunities through training and experience.
“	Unknown	Need to review ignition history and look at appropriate fire prevention opportunities.	Ignition data is used in the risk assessment. The District has a very active community education and prevention program.
“	Unknown	Proposed actions need to dovetail with cooperators projects.	Adjacent cooperator's projects are considered in the CWPP.
Phone Call	JB	Concerned that the Planning Commission hadn't been notified or represented at the workshop and that someone should make a presentation to the Planning Commission about the development of the CWPP. Asked how many people were in attendance and was concerned that there wasn't a cross-section of people represented there. Pleased that CG attended but was surprised that CG didn't mention anything about the	Presentation was made to the Montecito Planning Commission on August 19 th . The CWPP will support existing guidelines and policies (e.g., Montecito Architectural Guidelines) with no conflicts.

		<p>screening and wants to see a balance of maintaining screening with fire protection in the CWPP.</p> <p>Concerned about screening (vegetation) that had been removed along Romero Canyon that causes problems because you can now see someone's house that couldn't be seen before - this screening is part of the architectural guidelines.</p>	<p>Screening concerns were passed on to District Staff and are outside the scope of the CWPP, except as it relates to future work.</p> <p>Noxious/invasive weeds are addressed in this plan.</p>
Email	RH	<p>I looked over the PowerPoint. Your emphasis on home ignitability is excellent! The Star Wars Imperial Walker (the large masticator) photo - a reasonable comparison :) - on slide 22 is a concern, as is the roadside shot (both are my photos). The first is from a clearance project near Painted Cave we have been challenging because it is outside the immediate threat zone and has resulted in causing increased flammability. I've attached a photo of the result. You'll notice what happens after the soil disturbance in the background area - invasive weed invasion making the area more susceptible to ignition. The foreground has since become the same.</p> <p>The second photo shows a type converted area on Federal land from previous projects that do not reflect current policy. We are working with the Forest Service to discontinue this kind of activity on Federal lands and we're generally on the same page. Large-scale mastication projects like these have been shown to not be productive so I'd suggest eliminating the reference and the photos in the future.</p> <p>Address the issue of flammable, weedy grasses in the CWPP if it hasn't already. That's where most fires start.</p>	<p>The focus of this CWPP is on the protection of life safety, structures, other improvements, and historical/natural resources within the District. This plan follows the District's Fire Protection Plan (Ordinance 2014-01) and HIZ policy and guidelines. In some cases, life safety concerns may require an increase in the depth/width of fuel treatments due to vegetation heights, vulnerability of structures, evacuation and access/egress routes, and safe operational space for structure protection efforts.</p>
"	EH	<p>Asked about the comment period and was glad to hear there was so much time – December 4th. Eager/interested in working with us in developing the plan and will send any thoughts/comments/input to me. Apparently, the stakeholder was a firefighter at some point so is familiar with fire. The stakeholder liked that we look at work from the foundation out to reduce the threat of fire - both from the fire burning into the community from the forest and a fire starting in the community out into the forest. The stakeholder is definitely concerned about protecting the watershed...concerned about the loss in the aquifer. Said that they helped with the Mission Canyon CWPP so is familiar with CWPPs. Overall, the stakeholder seemed pleased to be involved early in the project and eager to help.</p>	<p>This CWPP focuses on the HIZ to protect values including the watershed.</p>
	SE	<p>Wanted to add some additional comments for Geo Elements; if you would please pass them on. I feel that the spring neighborhood fire clearance program is so helpful. It is a great reminder to all that it is the time of year for everyone to participate in brush clearance around homes and property. The mailing for fire clearance and defensible space is very educational. The signage for chipping serves both as a reminder and provides incentive for residents to participate in clearing their properties.</p> <p>I cannot tell you how valuable you and Jeff, as our wildland fire experts, are in providing much needed clearance advice. The clearance that the</p>	<p>The District has a strong community education program.</p> <p>Having the support of stakeholders like this individual is critical to the success of the District's efforts to protect life safety, structures, and all values in the District.</p>

		Montecito Fire District provides along the roads and vulnerable areas in the community is invaluable to our survival in the event of a wildland fire. I thought that the presentation was very interesting and I look forward to the next update.	
Phone call	EH	Contact was made to the District. About stakeholder's concerns of water diverted in riparian areas from a 'water district'. Concerned that the reduced water flow or no water flow is changing the vegetation in riparian areas from riparian vegetation to chaparral-dominated vegetation. Said that he would contact me.	Didn't receive a call. The local 'water district' concern is beyond the scope of this plan but the change in vegetation in the riparian areas is captured in recent fuel model products used in the development of the hazard assessment.
Montecito Planning Commission Meeting input	Unknown	About treatment standards for Eucalyptus. Says the stakeholder maintains their property and 3 other properties owned by non-resident owner. Is concerned about the number of Eucalyptus and how they contribute to wildfire spread.	Passed on information related to NPS study from Golden Gate Park and the effects they found regarding Eucalyptus.
“	VG	Was interested in the process and when and how the public can provide input.	Informed stakeholder of three ways to provide input through the Montecito Fire web page. Stated that the plan development is ongoing and that a draft of the CWPP will be made available for public comment on or about the end of November.
“	CC	If a high definition pdf could be made available for the 90th percentile hazard assessment so that it could be used by the board in other decision-making actions.	A pdf will be made available to the fire department who could forward
“	Unknown	Asked about standards for hazard mitigation	Please see Montecito's Fire Protection Plan. Guidelines are provided in this CWPP.
“	Unknown	I the CWPP would consider erosion or only vegetation treatments	The CWPP does not address erosion and that it would be analyzed in a project level environmental compliance document.
Email	HT	Concern about policy not being driven by the community but by individuals. Cited Dr. Miller, Professor of Environmental Design at Pomona College and concerns about road width/access, drought making wildfires high unpredictable as it relates to vulnerable populations, and evacuation of vulnerable populations.	This CWPP includes information and recommendations for the life safety of vulnerable populations. The wildfire assessments consider the unpredictable nature of wildfires in the area.
February 10, 2016 Meeting	AP	Question regarding WUI perimeter stopping at the Santa Barbara City border on the west side of the District.	The WUI perimeter was designed by stakeholders at the June 18 th meeting. It was decided that WUI to the west and east side of the District that is not within the federal administrative boundary would be covered by WUI already designated by Santa Barbara City and Carpinteria-Summerland Fire Protection District as WUI.

FIRE BEHAVIOR MODELING

The Landscape File: The .lcp file from the LANDFIRE 2012 data (LF 2012 (LF 2012 - LF_1.3.0)) is the most recent data available for Montecito planning area. This .lcp file captures all recent significant wildland fire activity in the vicinity of the community, including the 2008 Tea Fire, which was the most significant landscape disturbance event influencing the planning area in recent years. The data resolution provided by LANDFIRE is 30x30 meter, meaning that dominant .lcp file characteristics are generalized for each 30x30 meter pixel of the digital landscape. While finer scale of natural variation occurs on the ground, this level of detail is adequate for planning purposes.

Ground proofing and evaluation of the .lcp fuels data occurred over the course of two days in May of 2015. Specific locations, included Romero Canyon, Hot Springs Canyon, Eucalyptus Hill Road, and various undeveloped in-holdings. Geo Elements staff determined that modification of the fuel data obtained from LANDFIRE was not necessary. While all areas of the community could not be inspected, the sampling of locations provided fire modelers confidence that the data used to run the fire behavior models are representative of the planning area.

Weather: Based on weather records obtained from the Montecito RAWS, 90th percentile weather thresholds were developed for use in the fire behavior analysis. This RAWS has continuous weather records dating back to 1997. The dataset was evaluated in FireFamily Plus based on the height of the fire season, using June 20 and October 20 to define the fire season as this represents the time period when the National Fire Danger Rating System Energy Release Component (ERC) was at a minimum greater than zero. ERC is a measure of available potential energy released from a square foot of fuel at the flaming front of the fire. An ERC of zero would indicate that flaming combustion would not occur (Figure 1).

The fire behavior modeling performed to support this CWPP is based on two different weather scenarios, the 90th percentile weather for the fire season previously defined and the historical weather that was associated with the 2008 Tea Fire. 90th percentile weather is used to evaluate a typical high fire danger day in Montecito, which when compared to other locations in Santa Barbara County, is relatively benign. From the analysis of 17 years of weather records from the Montecito RAWS, Table 1 defines the 90th percentile weather conditions used in portions of the fire behavior analysis.

Figure 1. Energy Release Component analysis from FireFamily Plus for the Montecito Remote Automated Weather Station

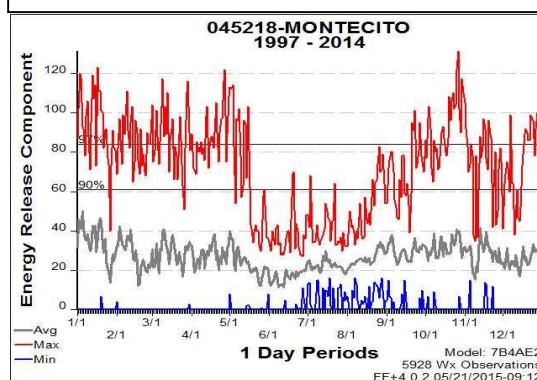


Table 1. 90th Percentile Weather Thresholds – Montecito RAWS, 1997-2014

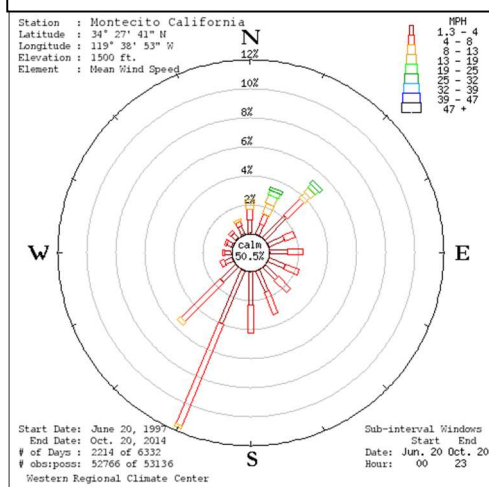
Max Temp	Min Temp*	Max RH	Min RH	Fuel Moistures (dead and live)	Wind speed
94°F	77°F	77%	17%	5%/6%/7%/76%	6 mph

*50th percentile minimum temperature was used (64 F) for modeling fire behavior purposes

Winds recorded at the Montecito RAWS range between 0 and 8 mph 81.6% of the time, with a wind direction of southeast to south occurring on 57% of the weather records. Figure 2 is a graphic depiction of the wind data from the Montecito RAWS.

A second weather dataset used in the fire behavior analysis is based on observations from the Montecito RAWS during the 2008 Tea Fire. This data was used in the FARSITE simulations that helped to determine potential fire damage losses in the event of a fire burning under similar weather conditions in the future. Data archived at the Western Region Climate Center indicate that on November 13, 2008 winds were gusting in excess of 80 mph while for the time period 1800 to 2000, sustained winds were measured between 60 and 72 mph. The temperature and humidity data for this time period lead to slightly lower fuels moistures than the historic 90th percentile. This “dry” fuel moisture scenario (3%, 4%, 5%) was used to represent dead fuel moisture in FARSITE modeling runs. The live fuel moisture was set at 73% based on the lowest live fuel moisture recorded for November by the Montecito RAWS.

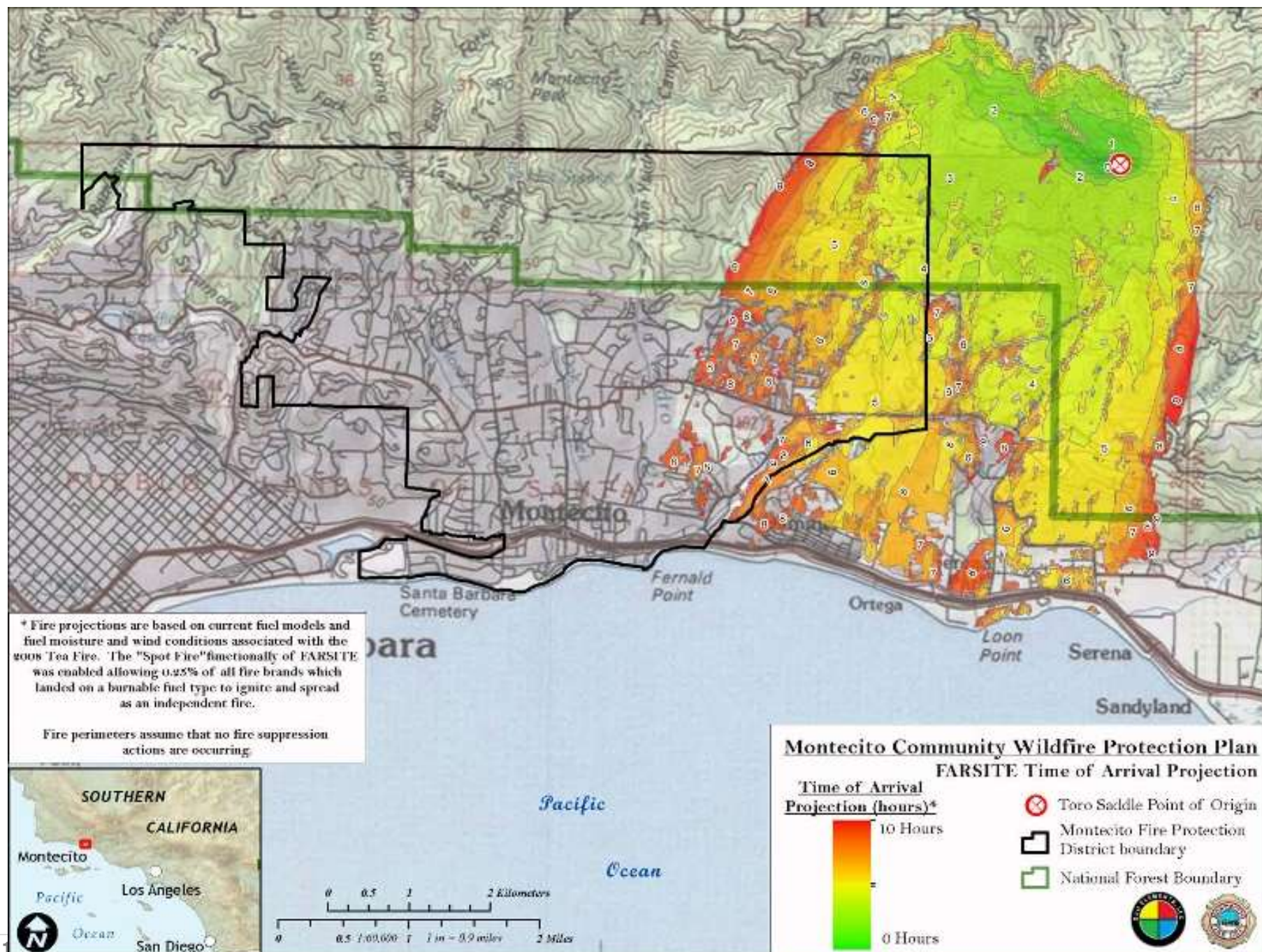
Figure 2. Montecito RAWS Wind Rose indicating southwest as the dominate wind direction

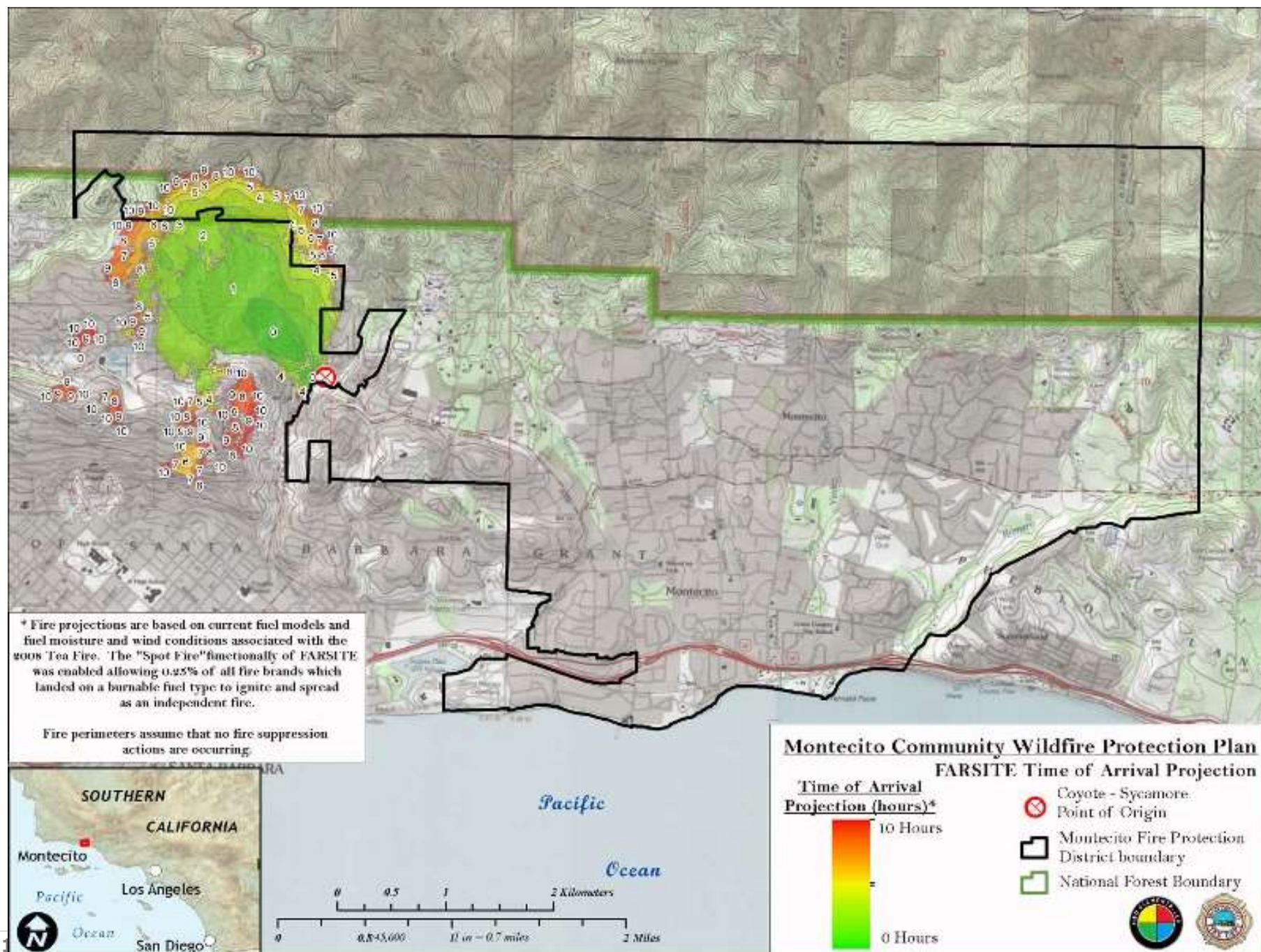


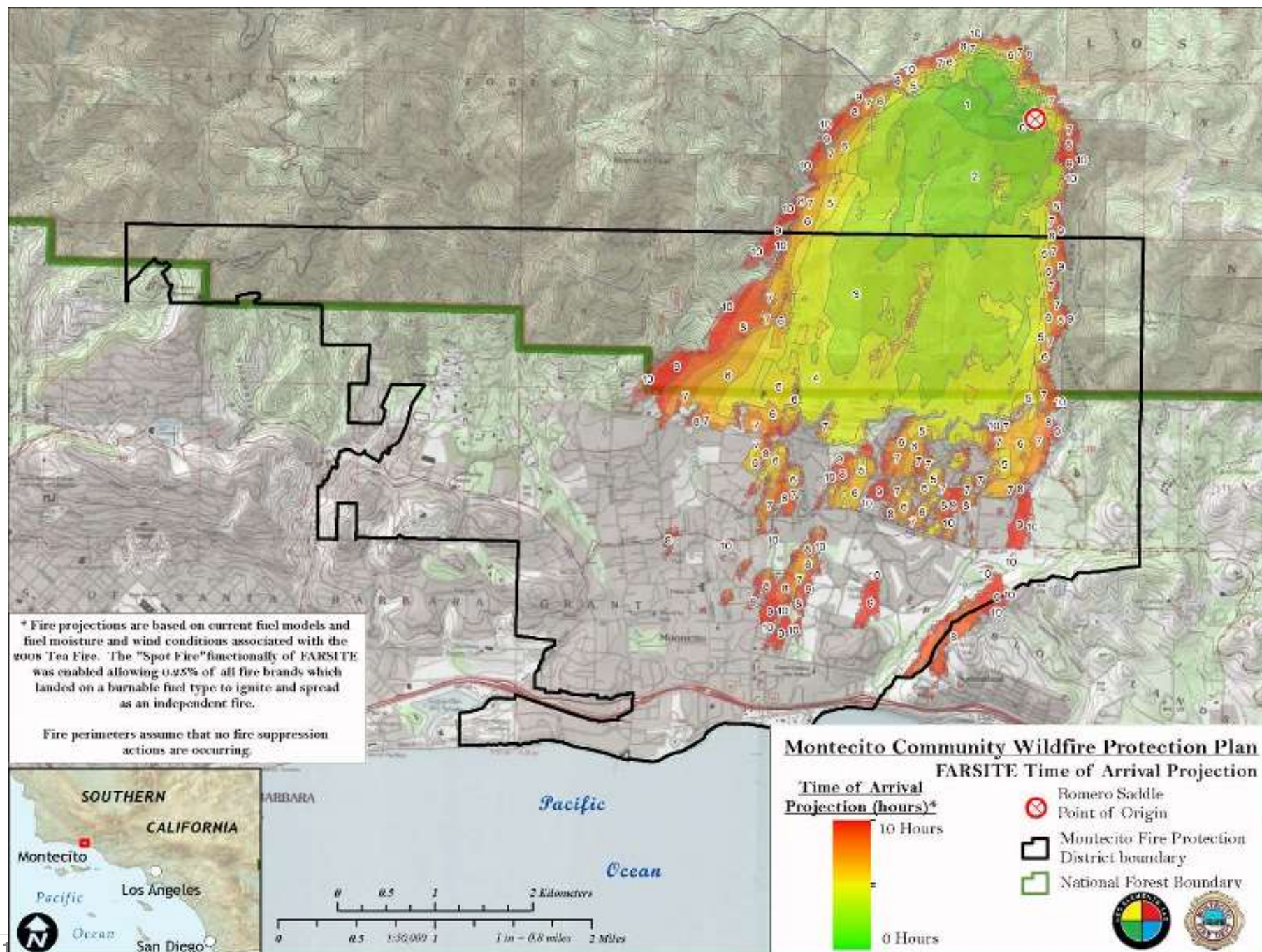
FlamMap: FlamMap generated outputs for Flame Length, Crown Fire Activity, and Maximum Spotting Distance for the Montecito Planning Area. The model was run using the 90th percentile fuel conditions developed in FireFamily Plus (4%, 5%, 7%, 30%, 75%). This moisture scenario represents mid-summer conditions when live herbaceous fuels have fully cured and live woody fuels are approaching their minimums for the fire season. The California custom fuel model file was used in FlamMap to allow the use of recently developed Burgan-Scott 40 fuel models.

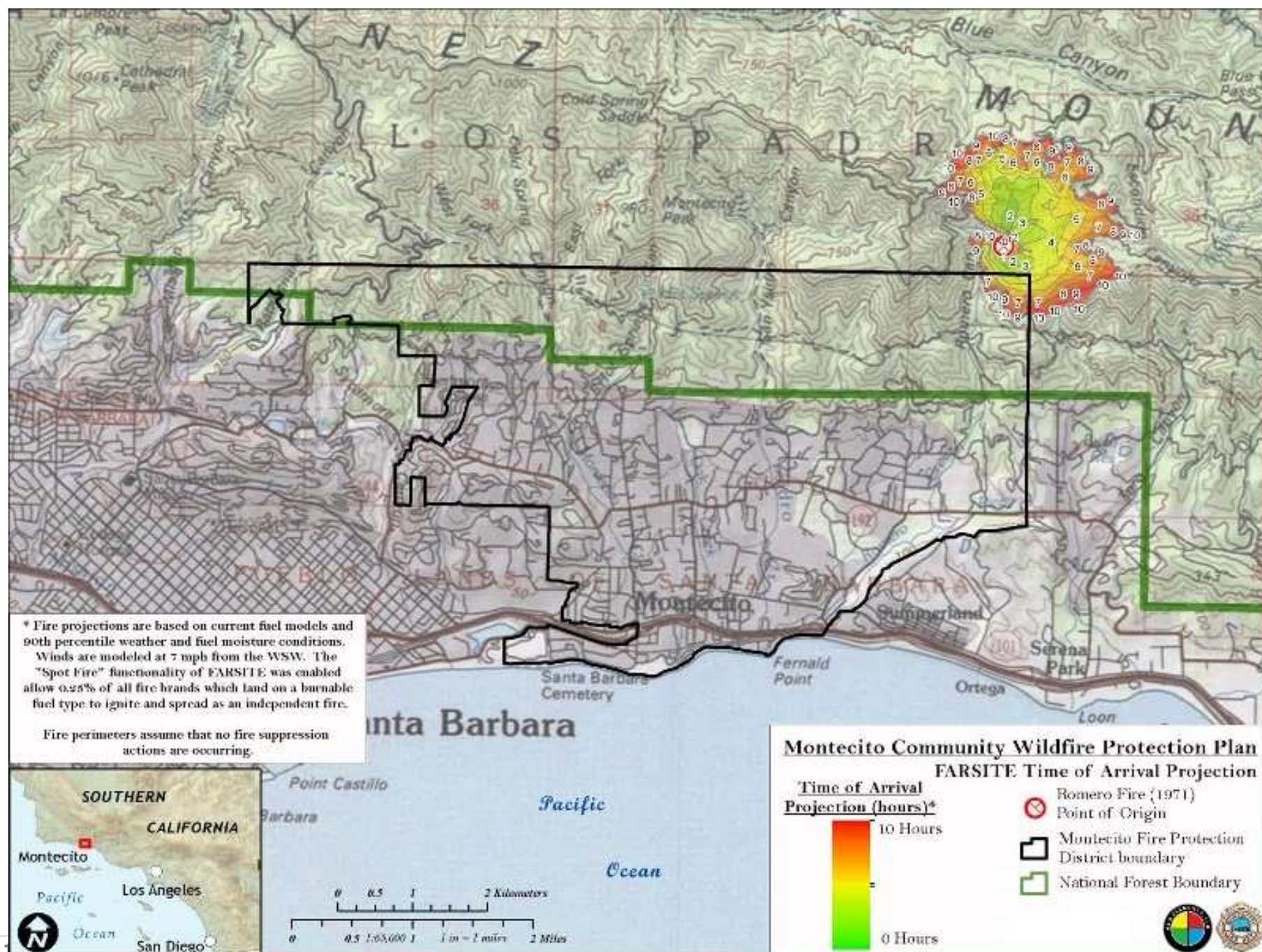
Winds in FlamMap analysis were set at 210° azimuth with wind speed in the model set to 7 mph. These inputs represent the 90th percentile conditions for the Montecito RAWS.

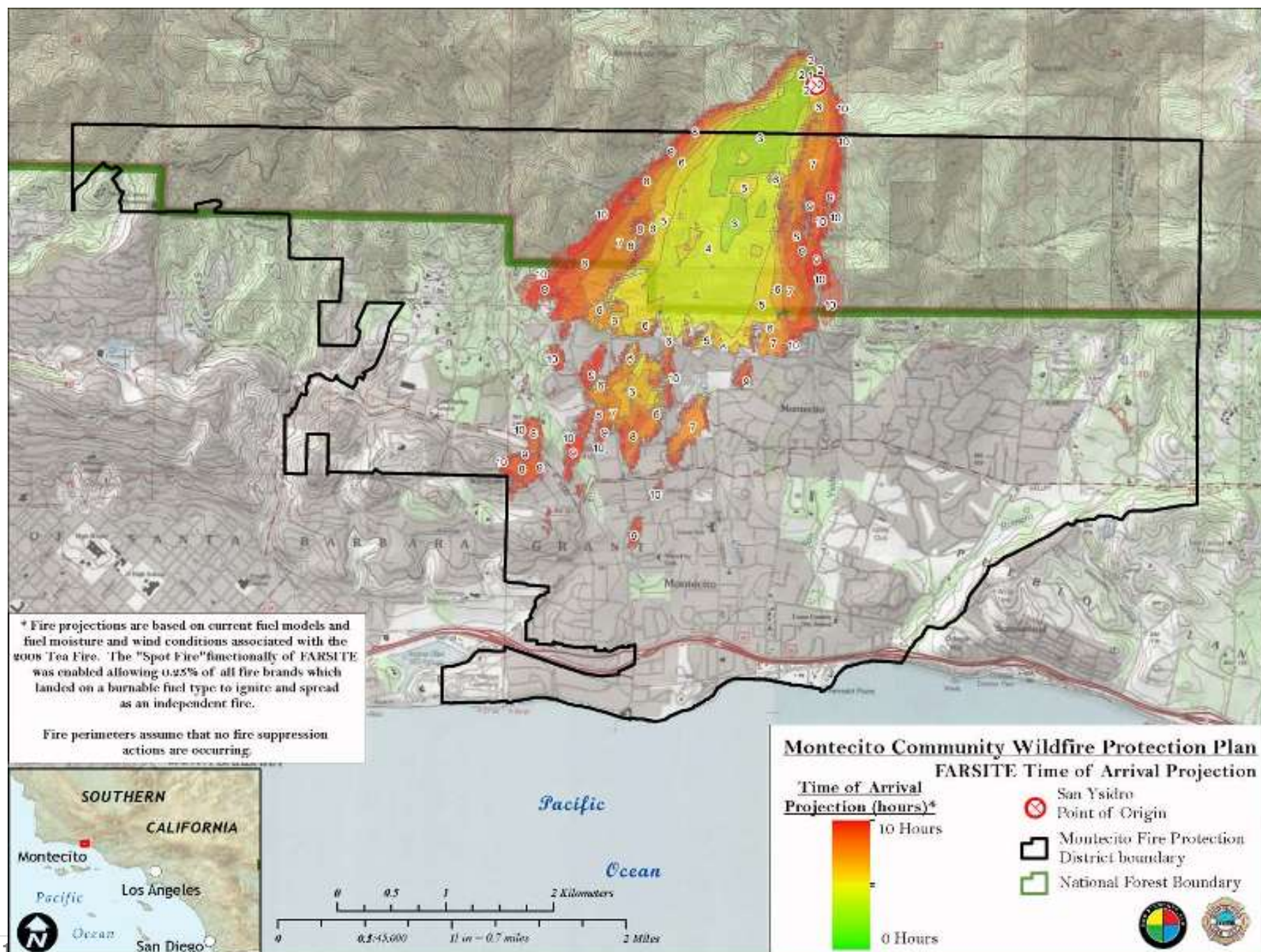
A second FlamMap scenario simulated Tea fire weather conditions. Fuel moistures were reduced (3%, 4%, 5%, 30%, 60%) with winds increased to 30 mph to represent the average sustained wind speed during the height of this Santa Ana wind event. To determine the Maximum Spotting distances from a fire burning under Tea Fire conditions, the MAXSPOT function in FlamMap was used, but with wind speeds set to 60 mph to reflect the average speed of the wind gusts during the time period November 12 through November 14, 2008.

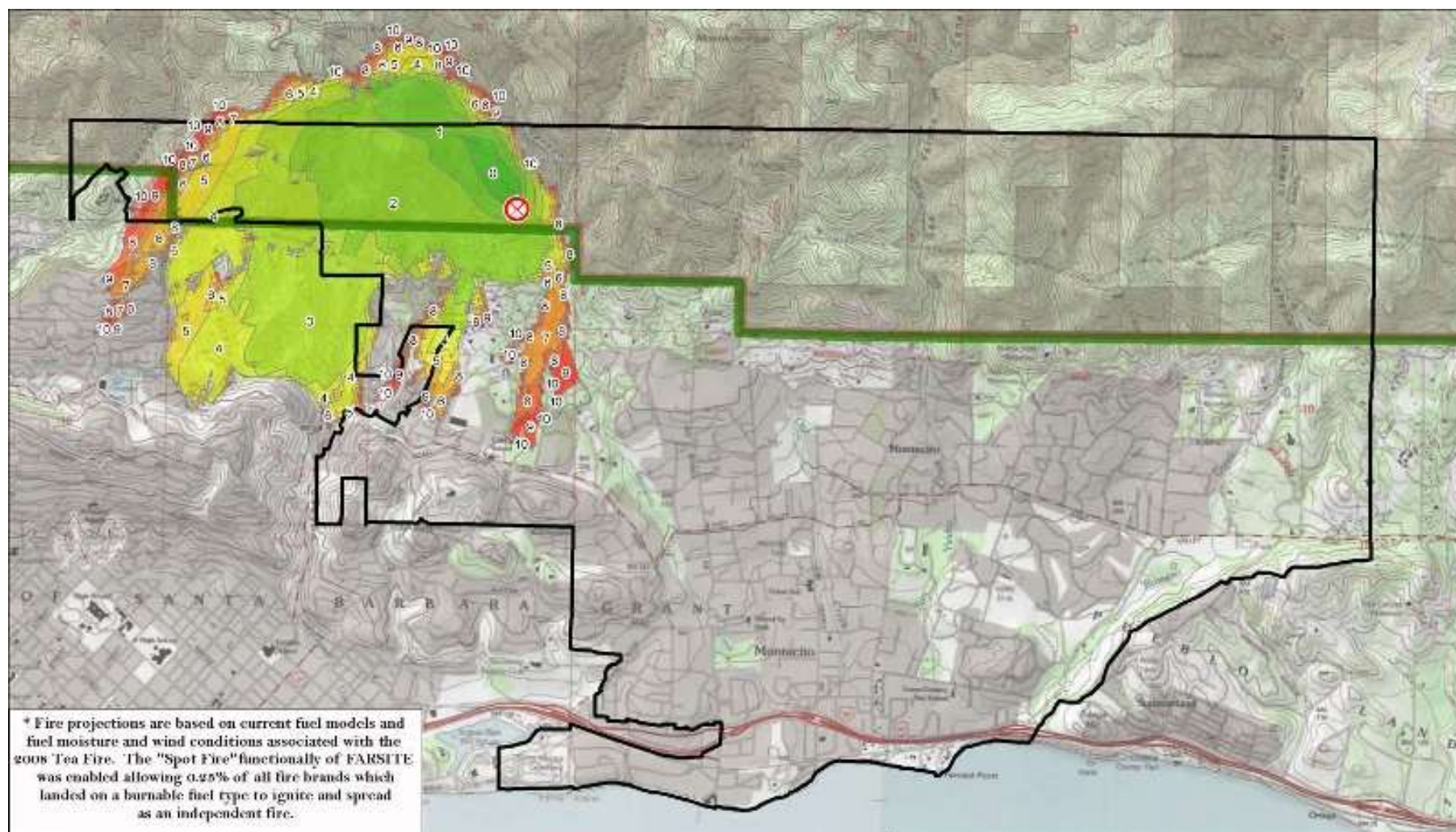












* Fire projections are based on current fuel models and fuel moisture and wind conditions associated with the 2008 Tea Fire. The "Spot Fire" functionality of FARSITE was enabled allowing 0.25% of all fire brands which landed on a burnable fuel type to ignite and spread as an independent fire.

Fire perimeters assume that no fire suppression actions are occurring.



Montecito Community Wildfire Protection Plan FARSITE Time of Arrival Projection



- Tea Fire Point of Origin
- Montecito Fire Protection District boundary
- National Forest Boundary

