

DRAFT

**MONTEREY COUNTY
COMMUNITY WILDFIRE PROTECTION
PLAN**

MONTEREY COUNTY, CALIFORNIA

Monterey Fire Safe Council

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**Monterey Fire Safe Council
Monterey County Community Wildfire Protection Plan**

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1.0 INTRODUCTION

This Community Wildfire Protection Plan (CWPP) was developed by the Monterey Fire Safe Council (MFSC) with guidance and support from the California Department of Forestry and Fire Protection, the United States Forest Service and the Bureau of Land Management, along with wildfire protection planning consultants from Dudek.

This CWPP covers Monterey County, California. The purpose of this collaboratively prepared CWPP is to serve as a fire protection planning document that presents the County's physical characteristics, the fire hazard assessment work that has been completed to date, ranked fire hazard risk areas, and designated fuel reduction projects and specifications for the area. The ultimate goal of the vegetation treatment work outlined in this CWPP is the reduction of fuels within County wildland urban interface (WUI) areas so that structures and assets are provided additional protection, reducing the potential for wildfire-originated ignitions.

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2.0 CWPP DEVELOPMENT PROCESS

This section outlines the representatives or organizations either involved in the development of the Monterey County CWPP or who provided information for the completion of this CWPP. The organization, roles, and responsibilities are indicated in the following table:

Table 1. CWPP Development Team

Organization	Roles/Responsibilities
Monterey Fire Safe Council (MFSC) Web site, documents, forms, grant management	Provides review and guidance for CWPP preparation, prepares sections of the CWPP, coordinates community involvement, and is involved with CWPP review team and approval process; Planning information and resources, web site forms and information; Member input, review, meeting attendance and coordination; Responsible for grant administration and management
Dudek Wildfire Protection Planners	Prepared wildfire hazard reduction plan, recommendations for fuel reduction and structural ignition reduction; Primary development of CWPP with guidance and input from the MFSC, community risk and value assessment, development of community protection priorities, and establishment of fuels treatment project areas and methods
California Department of Forestry and Fire Protection (Cal Fire)	Primary fire suppression for SRA lands within County, provides input and expertise on minimum standards, SRA lands, and fuel reduction
Bureau of Land Management (BLM)	Primary fire suppression for BLM lands within County, provides input and expertise on CWPP preparation, existing and proposed projects, and fuel reduction efforts
United States Forest Service (USFS)	Primary fire suppression for USFS lands within County, provides input and expertise on CWPP preparation, existing and proposed projects, and fuel reduction efforts

2.1 Decision Makers

The primary decision makers for this Community Wildfire Protection Plan include:

1. Local Government:
 - a. Monterey County Board of Supervisors
2. Local Fire Chiefs:
 - a. George Haines, *Aromas Tri-County FPD, Carmel Highlands FPD, Cypress FPD, Pebble Beach CSD Fire Department, South Monterey County FPD*

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- b. Frank Pinney, *Big Sur Volunteer Fire Brigade*
 - c. Skee Stanley, *Cachagua FPD*
 - d. Andrew Miller, *Carmel Fire Department*
 - e. Sidney Reade, *Carmel Valley FPD, Pacific Grove Fire Department*
 - f. Michael Thomas, *Soledad Fire Department*
 - g. Rick Rubbo, *Gonzales Volunteer Fire Department*
 - h. John Sims, *Greenfield Volunteer Fire Department*
 - i. Danny Conatser, *King City Fire Department*
 - j. Harald Kelley, *Marina Department of Public Safety*
 - k. Cheryl Goetz, *Mid Coast Fire Brigade*
 - l. Sam Mazza, *Monterey City Fire Department*
 - m. Chris Orman, *North County Fire District*
 - n. Jack Riso, *Presidio of Monterey*
 - o. Ed Montez, *Salinas City Fire Department*
 - p. Michael Urquides, *Salinas Rural Fire District*
 - q. Scott Wittman, *San Ardo Volunteer Fire Department*
 - r. Jerry Wombacher, *Seaside Fire Department*
 - s. Rich Foster, *Soledad Fire Department, Spreckels Volunteer Fire Department*
 - t. Patrick Reid, *Fort Hunter Liggett Fire Department*
3. California Department of Forestry and Fire Protection (Cal Fire)
- a. George Haines, *San Benito – Monterey Unit Chief*

These decision makers were initially notified of the intent to prepare a CWPP via letters mailed on May 1, 2006. On [insert date] these decision makers were invited to attend a meeting on [insert date] to provide comments and feedback on a draft of the CWPP. The CWPP was then revised to incorporate decision maker input.

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2.2 Federal Agencies

Representatives of the federal agencies managing land in Monterey County are:

Table 2. Federal Agencies Involved

Agency	Representative	Initial CWPP Intent Letter Sent	Date Invited to Participate in Agency Meeting
United States Forest Service (USFS) Los Padres National Forest	Steve Davis Pete Harris	May 1, 2006	January 15, 2009
Bureau of Land Management (BLM) Hollister Field Office	Michael Chiodini	May 1, 2006	January 15, 2009
National Park Service (NPS)	Dana Sullivan	May 1, 2006	January 15, 2009
United States Fish and Wildlife Service (USFWS)	Terry Palmisano	May 1, 2006	January 15, 2009
USDA Resource Conservation District	Danny Marquis	May 1, 2006	January 15, 2009
Tribal Governments	Louise J. Ramirez	May 1, 2006	January 15, 2009

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2.3 State and Local Agencies

Representatives of the state/local agencies that have jurisdictional responsibilities in Monterey County are:

Table 3. State and Local Agency Representatives

Agency	Representative	Initial CWPP Intent Letter Sent	Date Invited to Participate in Agency Meeting
California Department of Parks and Recreation (CDPR)	Loren Rex	May 1, 2006	January 15, 2009
California Department of Fish and Game (CDFG)	Chuck Hughes	May 1, 2006	January 15, 2009
California Department of Transportation (CalTrans)	Mike Mendoza	May 1, 2006	January 15, 2009
California Highway Patrol, Monterey	Debbie Hershey	[insert date]	[insert date]
Monterey Air Pollution Control District (APCD)	Bob Nunez	May 1, 2006	January 15, 2009
Monterey County Office of Emergency Services (OES)	Phil Yenovkin	May 1, 2006	January 15, 2009
Monterey County Public Works and Planning Departments	Ed Muniz	May 1, 2006	January 15, 2009
Monterey Peninsula Regional Parks District	Tim Jensen	May 1, 2006	January 15, 2009
American Red Cross, Monterey	Lynda Maguite	May 1, 2006	January 15, 2009
Monterey County Water District	Alice Forbes	May 1, 2006	January 15, 2009

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2.4 Interested Parties

Parties from the communities in Monterey County that have shown interest in fire management or may be interested in this CWPP are:

Table 4. Interested Parties Involved

Interested Parties	Initial CWPP Intent Letter Sent	Date Invited to Participate in Community Meeting
Fire Safe Councils Monterey Fire Safe Council	May 1, 2006	[insert date]
Local Landowners/Managers Big Sur Land Trust Mason Ranch Santa Lucia Preserve Cattlemen's Association El Sur Ranch Packard Ranch Rancho Rico	May 1, 2006	[insert date]
Recreation Organizations	May 1, 2006	[insert date]
Environmental Organizations Monterey Bay Chapter, California Native Plant Society The Nature Conservancy	May 1, 2006	[insert date]
Local Utility Companies Pacific Gas & Electric	May 1, 2006	[insert date]
Homeowners Associations Coast Property Owners Association Rancho Tierra Grande Homeowners Association Rancho Rio Vista Homeowners Association Sunset West Homeowners Association Toro Park Homeowners Association Corral de Tierra Homeowners Association Rancho Bolsa Nueva Homeowners Association White Oaks Homeowners Association Lower Carmel Rive) Advisory Committee Laguna Seca Homeowners Association San Jerardo Housing Co-op	May 1, 2006	[insert date]
Other Parties Davey Resource Group	May 1, 2006	[insert date]

2.5 Funding/Grant Management

Funding for the preparation of this CWPP is made available from a National Fire Plan grant, made possible by federal financial assistance provided to the California Fire Safe Council from

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the Bureau of Land Management. The project is funded via WUI Community Rural Fire Assistance, CFDA # 15.228. The grant number for this project is 08BLM0149. The grant period extends from February 2008 to April 2009. Grant management and reporting is being conducted by the MFSC.

3.0 MONTEREY COUNTY PLANNING AREA

This CWPP covers Monterey County, California. Located in central coastal California, Monterey County encompasses over 2 million acres with a population of approximately 425,000 distributed among 12 cities and unincorporated County areas (County of Monterey 2008). This section presents more detailed information about Monterey County, specifically a description of factors affecting wildfire risk within the County.

In 2006, the MFSC contracted with Cal Fire's Fire and Resource Assessment Program (FRAP) to more thoroughly evaluate wildfire risk in Monterey County. While state-level risk analyses are made publicly available by FRAP, the analysis conducted for Monterey County refined fuels distribution, fire threat, and fire risk ratings that were instrumental in identifying the Communities at Risk presented in this CWPP. A more detailed discussion of the methods used in the FRAP study are presented in Section 5.1.

3.1 Site Characteristics

This section presents a discussion of the variables affecting fire behavior and risk assessment for Monterey County.

3.1.1 Topography

The topography of Monterey County is extremely variable. Within the Salinas River valley, slopes are relatively flat across the valley floor (0-10%). Elevations in this region range from sea level, where the valley meets the Pacific Ocean in the north, up to nearly 400 feet above mean sea level (AMSL) in the southern portions of the valley. More significant topographic variation is found in the eastern and western portions of the County, characterized by often steep slopes, deeply incised canyons, and narrow valleys. The elevation range within Monterey County ranges from sea level to over 5,800 feet AMSL (FRAP 2006). Slope measurements reach up to 175% gradients, most notably in the Los Padres National Forest in the western portion of the County and the Gabilan Range along the eastern County boundary (FRAP 2006). Topography for Monterey County is graphically presented in Appendix B-1.

The regional topographic conditions within Monterey County can have considerable effect on wildland fire behavior, as well as on the ability of fire fighters to suppress those fires. Steep

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slopes and canyons alignments are conducive to channeling, deflecting, concentrating, or dispersing winds, and creating extremely erratic wildfire conditions, especially during wind-driven fire events.

3.1.2 Vegetation/Fuels

In addition to weather and topography, vegetation (or fuel) plays a major role in affecting fire behavior and shaping fire hazard potential. Vegetation distribution throughout the County varies by location and topography, with dramatic differences observed between coastal and inland regions. Current land cover/fuels distribution within the County is characterized by fourteen different vegetation/fuel types (FRAP 2006), as presented in Table 5. Dominant vegetative cover within Monterey County is herbaceous, or grassland cover (31.3%), distributed primarily in the low-lying valley areas along the Highway 101 corridor. While this fuel type can burn quickly under strong, dry wind patterns, it does not produce the high heat intensity and high flame lengths associated with chaparral fuel types. Other significant vegetative cover types include light brush (21.3%), light grass/woodland (14.8%), and hardwood litter (13.1%). These vegetation types are primarily associated with the steeper, upland areas in the southern, western, and northern portions of the County. Fire behavior in brush fuel types produces higher flame lengths than that in grassland, although spread rates are typically slower. Fire behavior in woodlands is variable, depending on surface fuel conditions and the presence of ladder fuels. The distribution of fuels in Monterey County is graphically presented in Appendix B-2.

Table 5. Monterey County Land Cover

Fuel Model Number	Description*	Approximate Acreage	Percent Cover
1	Grass	662,270	31.3%
2	Light Grass/Woodland	312,639	14.8%
4	Heavy Chaparral	58,945	2.8%
5	Light Brush	450,958	21.3%
6	Moderate Brush	70	0.0%
7	Young Maritime Chaparral	6,209	0.3%
8	Hardwood Litter	276,924	13.1%
9	Light Conifer Litter	35,039	1.7%
10	Heavy Conifer Litter w/ Understory	9,007	0.4%
28	Urban	43,525	2.1%
30	Maritime Live Oak Forest	95	0.0%
97	Agriculture	240,714	11.4%
98	Water	15,033	0.7%
99	Barren	5,698	0.3%
	Total:	2,117,126	100.0%

*FRAP Monterey Fire Risk Analysis, 2006

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

As described, vegetation plays a significant role in fire behavior. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes affects plant community succession. Succession of plant communities, most notably the gradual conversion of shrublands to grasslands with high frequency fires and grasslands to shrublands with fire exclusion, is highly dependent on the fire regime. Biomass and associated fuel loading will increase over time, assuming that disturbance or fuel reduction efforts are not implemented.

Wildfire disturbances can also have dramatic impacts on plants and plant composition. Heat shock, accumulation of post-fire charred wood, and change in photoperiods due to removal of shrub canopies may all stimulate seed germination. The post-fire response for most species is vegetative reproduction and stimulation of flowering and fruiting. The combustion of aboveground biomass alters seedbeds and temporarily eliminates competition for moisture, nutrients, heat, and light. Species that can rapidly take advantage of the available resources will flourish. It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the overall establishment and maintenance of the fuel reduction projects included in this CWPP.

Sudden Oak Death

Of concern within Monterey County is the presence of the Sudden Oak Death (SOD) pathogen that primarily affects tanoaks (*Lithocarpus densiflorus*), coast live oaks (*Quercus agrifolia*), and other oak and tree species found in coastal forest environments. Other affected species include California bay trees (*Umbellularia californica*), rhododendron, redwood and many other tree and plant species. The potential for SOD is concentrated primarily in the coastal portions of Monterey County, as the pathogen (*Phytophthora ramorum*) is a fungus that requires moist environments for survival and spore dissemination. The SOD fungus infects the water flow system of susceptible trees and shrubs, eventually blocking this flow and resulting in rapid plant/tree mortality. Precautions must be used when handling infected plant material and/or tools used in trimming/removal of infected wood. More information on SOD can be found via the California Oak Mortality Task Force (<http://www.suddenoakdeath.org/index.html>).

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The implication of this forest disease in relation to fire prevention and protection is the relatively rapid mortality that occurs, resulting in increased dead fuel loads. Standing dead fuels contribute to increased wildfire hazard and require treatment and/or removal, especially within wildland urban interface areas.

3.1.3 Climate

Weather conditions in Monterey County can be categorized into two primary patterns. Localized weather patterns may vary significantly in different portions of the County as humidity levels and plant moisture content near the coast can be higher than inland locations due to the influence of the Pacific Ocean. The north-western portions of the County adjacent to the Pacific Ocean exhibit a typical coastal weather pattern with morning low clouds and fog burning off by mid day with maximum temperatures reaching over 80 degrees F. In the southern and eastern (leeward side of the Santa Lucia Mountain Range) portions of the County, clouds and fog are less prevalent allowing maximum temperatures to reach 90 to 100 degrees F (Cal Fire 2005). Average annual rainfall in Monterey County is approximately 19 inches. Fluctuations in wind patterns are expected due to the influence of topography, although predominant wind direction is northwest with average speeds between 7 and 10 mph (Cal Fire 2005).

3.1.4 Fire History

Fire history is an important component in understanding fire frequency, fire type, significant ignition sources, and vulnerable areas/communities. The topography, vegetation, and climatic condition associated with Monterey County combine to create a unique situation capable of supporting large-scale, often damaging wildfires. The history of wildfires in Monterey County is significant, and is graphically portrayed in Appendix B-3.

Based on historical fire perimeter data (FRAP 2008)¹, portions of the County are more susceptible to wildfires, with some areas having burned up to six times during the recorded fire history period. Specifically, the western portion of the County within and adjacent to the Los Padres National Forest exhibits more frequent fires over the recorded history. Fire size within the County is also extremely variable, with fire sizes ranging from less than 5 acres to over 100,000 acres. Notable wildfires in excess of 10,000 acres burning in Monterey County are presented in Table 6.

¹ Based on polygon GIS data for Cal FIRE fires measuring 300 acres and greater in size, and U.S. Forest Service (USFS) fires measuring 10 acres and greater between 1950 and 2007. However, some fires before 1950 and some CAL FIRE fires burning less than 300 acres are also included.

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Table 6. Monterey County Fires in Excess of 10,000 Acres

Fire Name	Year	Approximate Acreage Burned
Marble-Cone Fire	1977	173,000
Basin Complex	2008	162,000
Kirk Fire	1999	86,000
Indians Fire	2008	76,000
Gorda-Rat Fire	1985	56,000
Un-named Fire	1924	55,000
Buckeye Fire	1970	42,000
Cherry Fire	1985	41,000
Wild Fire	1996	26,000
Sam Jones Fire	1953	24,000
Casey Fire	1953	21,000
Un-named Fire	1928	21,000
Un-named Fire	1942	21,000
Un-named Fire	1942	19,000
Un-named Fire	1944	18,000
Chalk Fire	2008	16,000
Un-named Fire	1913	15,000
Rico Fire	2006	15,000
Un-named Fire	1985	14,000
Devil Fire	1954	13,000
Un-named Fire	1913	12,000

The average interval between large wildfires in excess of 10,000 acres burning within Monterey County is 7.3 years, with intervals as short as 1 year and as long as 16 years. The median interval between such fires is 7 years. Most recently, three large fires in 2008 (the Basin Complex, the Indians Fire, and the Chalk Fire) burned over 250,000 acres within Monterey County combined. The Basin Complex, the largest of these fires, started on June 21, 2008, triggered a state of emergency announcement by Governor Schwarzenegger on June 23, 2008 and ultimately burned over 160,000 acres, destroying 58 structures and causing 9 injuries, before it was contained on July 27, 2008 (InciWeb 2008).

3.1.5 Population and Housing

The estimated population of Monterey County is 425,960 people within 12 incorporated cities and unincorporated County lands (County of Monterey 2008). The largest population center is the City of Salinas, with approximately 150,000 people, followed by unincorporated County areas that include approximately 106,000 people. Other relatively large cities in the County

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include Seaside (approx. 34,000 people), Monterey (approx. 30,000 people), and Soledad (approx. 28,000 people). The remaining population is spread out among the remaining eight cities. The County includes approximately 138,000 housing units (US Census 2008). Housing density within Monterey County was analyzed by FRAP in 2006. The results presented in Table 7 reflect housing density classifications and were ultimately used in developing the wildland urban interface and fire threat rankings discussed in this CWPP.

Table 7. Monterey County Housing Density

Housing Density*	Approximate Acreage	Percent
One unit per 40 acres, or less	2,019,515	95.4%
One unit per 5 acres to one unit per 20 acres	37,162	1.8%
One unit per acre to one unit per 5 acres	22,131	1.0%
Greater than one unit per acre	38,318	1.8%
Total:	2,117,126	100.0%

*FRAP Monterey Fire Risk Analysis, 2006

3.1.6 Land Ownership

Over 70 percent of the land within Monterey County is privately owned. Other significant ownership includes the Los Padres National Forest (14.3 percent), U.S. Army installations (9.7 percent), and the Bureau of Land Management (1.9 percent). The current distribution of land ownership within Monterey County is presented in Table 8. Land ownership distribution for Monterey County is presented in the Land Ownership map in Appendix B-4.

Table 8. Monterey County Land Ownership

Ownership Type*	Approximate Acreage	Percent
Private	1,512,658	71.5%
USFS (Los Padres National Forest)	302,627	14.3%
US Army (Fort Ord, Presidio, Fort Hunter Liggett, Camp Roberts)	204,460	9.7%
BLM	40,555	1.9%
California State Parks	26,005	1.2%
City/County Park	22,741	1.1%
CDFG	3,318	0.2%
California State Lands Commission	2,948	0.1%
NPS (Pinnacles National Monument)	1,190	0.1%
US Navy	581	0.0%
Other Military	43	0.0%
Total:	2,117,126	100.0%

*FRAP Land Ownership data, 2008

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3.1.7 Fire Threat

Based on vegetation/fuel distribution, topography, and fire history, fire threat was evaluated for Monterey County during the 2006 FRAP analysis. This analysis characterizes fire threat as the summation of fire probability (based on fire history) and hazard or expected fire behavior (based on fuels, weather, and topography). The FRAP fire threat analysis ranks areas of the County into five separate categories, including little/none, moderate, high very high, or extreme. Table 9 presents fire threat acreages for Monterey County, while the map in Appendix B-5 graphically presents the distribution of fire threat rankings across the County.

Table 9. Monterey County Fire Threat

Fire Threat Ranking*	Acreage	Percent
Little to None	261,698	12.4%
Moderate	87,911	4.2%
High	719,366	34.0%
Very High	646,759	30.5%
Extreme	401,394	19.0%
Total:	2,117,127	100.0%

* FRAP Monterey Fire Risk Analysis, 2006

3.2 Existing Plans

The following sections describe existing fire management plans prepared by agencies and/or local districts that affect fuel management activities in Monterey County.

3.2.1 California Department of Forestry and Fire Protection

The 2005 Fire Plan prepared by the California Department of Forestry and Fire Protection San Benito – Monterey Unit (BEU) addresses the goals and objectives set forth in the California Fire Plan, focusing on overall wildfire risk reduction at a local level (Cal Fire 2005). The Plan outlines local stakeholders, discusses the local fire environment, evaluates assets at risk, and identifies priority fuel treatment areas. The Communities at Risk and fuel treatment priorities outlined in this CWPP include those presented in the 2005 Cal Fire Plan. A copy of this plan is available on-line at <http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf160.pdf>.

3.2.2 Bureau of Land Management

The BLM Hollister Fire Management Plan (FMP) presents fire management strategies for BLM land in Monterey County (BLM 2008). It identifies resource values and conditions pertaining to fire management on BLM land and recommends strategies for wildland fire suppression,

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prescribed fire, non-fire fuels treatment, and community assistance/protection. The strategies outlined in the BLM FMP are utilized in preparing the annual agency work plan and associated budgets. Management guidelines in the FMP prioritize public/firefighter safety, reduction of hazardous fuels, and wildfire risk reduction through prevention, mitigation, and education, amongst others.

The FMP also identifies and describes BLM-specific fire management units (FMU) and provides target fuel treatment objectives, treatment types, special conditions, and at-risk communities/assets associated with each FMU. Table 10 summarizes the BLM FMU characteristics and management objectives within Monterey County.

Table 10. BLM FMU Characteristics and Objectives in Monterey County

Fire Management Unit/ID	BLM Acreage	Fuel Type/Fuel Model	Target Rx Burn Acreage	Target Mechanical Treatment Acreage	Comments
Fort Ord BLM Land FMU CA-190-02	7,253	Maritime chaparral Fuel Model 4	500 ac. (annual); 5,000 ac. (decadal)	500 ac. (annual); 5,000 ac. (decadal)	Former Fort Ord military base. HMP-covered species present. Rx burns in 1997, 2003, 2005. At risk communities: Del Rey Oaks, Marina, Salinas, Sand City, and Seaside.
Sierra de Salinas, Williams Hill FMU CA-190-09	23,581	California chaparral Fuel Model 4	100 ac. (annual); 1,000 ac. (decadal)	100 ac. (annual); 1,000 ac. (decadal)	Monterey knobcone pine present in FMU. At risk values: oil/gas reserves, habitat, communication sites, sensitive plant species.
Parkfield FMU CA-190-10	5,099	California chaparral and grassland Fuel Model 4 and 1	1,000 ac. (annual); 5,000 ac. (decadal)	1,000 ac. (annual); 5,000 ac. (decadal)	Rugged terrain in Diablo Range. At risk values: oil/gas reserves, communication site at Charley Mountain, fire lookout at Smith Mountain, homes.
Ventana Contiguous WSA FMU CA-190-11	655	California chaparral Fuel Model 4	100 ac. (annual); 500 ac. (decadal)	none	Steep terrain, adjacent to Los Padres NF. At risk values: City of Carmel, White Rock gun club adjacent to the west side of FMU, habitat, Los Padres NF.

3.2.3 United States Forest Service

The 2008 Los Padres National Forest (LPNF) Fire Management Plan is a strategic document that addresses the fire management program and guides fire management activities on the LPNF (LPNF 2008). The Monterey Ranger District, responsible for management of USFS lands in Monterey County, segregates areas of the National Forest into two primary Fire Management

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Units (FMU) that are differentiated by management objectives, fire suppression expectations, and values at risk. The Developed and General Forest unit (FMU1) encompasses the majority of Communities at Risk identified through the National Fire Plan and focuses on public/firefighter safety, cost containment, and full suppression as primary objectives. The Wilderness, Research, Natural, and Special Interest Areas (FMU2) are generally removed from developed areas and focus primarily on Minimum Impact Suppression Tactics (MIST), where applicable.

Fire prevention planning and management within FMU1 focuses on maintaining defensible space around structures/improvements, and strategically treating fuels to interrupt fire spread and enhance suppression efforts.

3.2.4 Pebble Beach Community Services District

Included as Appendix A-5 of the 2005 Cal Fire BEU Fire Plan (Cal Fire 2005), the Fire Defense Plan for Pebble Beach (PBCSD 2005) addresses fire and life safety related to wildland fires within the Del Monte Forest area of Pebble Beach. The plan addresses emergency access and fuel treatment standards for the following open space areas: Huckleberry Hill Natural Area/SFB Morse Botanical Preserve, Pescadero Canyon, Navajo Tract open spaces, and undeveloped vacant parcels. The plan outlines roadside fuel treatment methods, fire break maintenance criteria, road and access gate identification standards, environmental protection, and target fuel break areas.

3.2.4 Other Plans

In addition to the aforementioned plans dealing with wildland fire issues in Monterey County, several other plans have been or are being prepared for areas within the County, including:

- Santa Lucia Preserve Fuel Management Plan. Addresses habitat-based fire management concerns for the Santa Lucia Preserve
- Monterey County Emergency Permit, Sudden Oak Death. Permit for removal of dead trees infected with SOD in the Palo Colorado Canyon and Big Sur areas of Monterey County.
- Big Sure Fire Plan. *Currently being prepared under direction of the MFSC.*

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4.0 MONTEREY COUNTY BASE MAP

The Monterey County base map prepared in support of this CWPP is included in Appendix C. This map presents the Communities at Risk to wildland fire as identified in this CWPP, and includes:

1. Aromas
2. Big Sur
3. Carmel
4. Carmel Highlands
5. Carmel Valley (includes Cachagua)
6. Carmel Valley Village
7. Castroville
8. Del Monte Forest
9. Del Rey Oaks
10. Elkhorn
11. Fort Ord
12. Gonzales
13. Greenfield
14. Jack's Peak
15. King City
16. Las Lomas
17. Lucia
18. Marina
19. Monterey
20. Pacific Grove
21. Pajaro
22. Pine Canyon
23. Prunedale
24. Rancho Tierra Grande

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25. Salinas
26. Sand City
27. Seaside
28. Soledad
29. Toro Park

Areas containing critical human infrastructure, such as escape routes, municipal water supplies, and power or communication structures, include:

1. Highway 1
2. Highway 68\Laureles Grade
3. Highway 101
4. Highway 156
5. Moss Landing Power Plant
6. Monterey County Water District Facilities

After considering the location of inhabited areas, the critical human infrastructure, and the risk of wildfire, the community has identified on the Monterey County base map (Appendix C), a wildland-urban interface (WUI) zone around the community assets, which in general includes the area within 1.5 miles from the community or structure. The Monterey County border serves as the boundary of the community base map. The WUI Zone, as defined herein and graphically presented on the Monterey County base map, designates potential hazardous fuel treatment areas within the County intended to reduce wildfire hazard and structural ignition potential.

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5.0 MONTEREY COUNTY RISK ASSESSMENT

As previously discussed, in 2006, the MFSC contracted with Cal Fire's Fire and Resource Assessment Program (FRAP) to more thoroughly evaluate wildfire risk in Monterey County. This section presents the risk assessment approach for Monterey County, including a summary of the FRAP analyses, and the prioritization of Communities at Risk and associated hazard reduction treatments.

5.1 Community Risk Assessment

5.1.1 Fuel Hazards

Fuel hazards and their associated threat to communities and infrastructure were evaluated in the context of the 2006 FRAP Monterey Fire Risk Analysis. The risk analysis and accompanying geographic information systems (GIS) data were utilized in identifying, evaluating, ranking, and mapping the Communities at Risk and the wildland urban interface areas within Monterey County that present opportunities for focused fuel reduction efforts. These areas are graphically presented in Appendix C and a more detailed summary of the FRAP analyses is provided below.

Fire and Resource Assessment Program Risk Assessment

The primary objectives of the FRAP analysis for Monterey County were to develop data and models to be used for fire planning purposes, utilize quantitative risk assessment methods, identify needs and potential mitigation strategies, and develop products that can be used in community outreach. The methodology employed by FRAP in this process included field, air, and imagery analysis to refine fuels data throughout the County and develop fuel rank, fire rotation and threat, and community risk GIS data for analysis and presentation purposes.

Fuels and fire hazard analysis utilized vegetation maps, aerial photography, fire history data, and terrain modeling in combination with field and air review. The refined vegetation/fuels data for Monterey County was then analyzed using FlamMap software, in combination with topographic and weather data, to evaluate anticipated fireline intensity. The resulting data from FlamMap analysis was used to classify fuel rank. Table 11 presents fuel ranking for Monterey County.

Table 11. Monterey County Fuel Rank

Fire Threat Ranking*	Acreage	Percent
Little to None	261,455	19.4%
Moderate	410,187	45.4%
High	960,478	22.9%
Very High	485,007	12.3%
Total:	2,117,127	100.0%

* FRAP Monterey Fire Risk Analysis, 2006

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Fire threat was then analyzed and characterized as a summation of fire probability and hazard or expected fire behavior (previously determined). In this context, fire probability is the historic fire rotation over the last 50 years of fire history data. The combination of these factors yielded a fire rotation class, presented in Table 12. In this classification, ‘Very High’ indicates expected fire rotation of less than 100 years, ‘High’ indicates expected fire rotation between 100 and 300 years, and ‘Moderate’ indicated expected fire rotation greater than 300 years. The fire threat values for Monterey County are presented in Table 9.

Table 12. Monterey County Fire Rotation Class

Fire Threat Ranking*	Acreage	Percent
Moderate	799,335	32.2%
High	391,494	22.3%
Very High	564,618	45.5%
Total:	1,755,447	100.0%

* FRAP Monterey Fire Risk Analysis, 2006

The risk analysis performed by FRAP included an assessment of risk to ecosystems, risk to soils, and risk to communities. Risk is defined as expected loss, and for the purposes of this CWPP, the focus is on risk to communities. The analysis included an initial evaluation of the WUI, where significant housing assets are within or adjacent to wildland fire threats. Including both housing density data (Table 7) and proximate fire threat, FRAP quantified risks to people and property within Monterey County. The risk areas, in combination with the 1.5 mile buffer zone around these areas, identify the footprint of the WUI in Monterey County. This WUI defines the potential fuel treatment areas for the County and is graphically presented, along with the Communities at Risk and fire threat potential, in the community base map in Appendix C.

Fire and Resource Assessment Program Fire Behavior Modeling

Fire behavior modeling was conducted by FRAP utilizing the refined topography and fuels data developed during the risk assessment portion of the project. Utilizing FlamMap, FARSITE, and 3D wind modeling software packages, simulations were conducted for three separate areas within the County: Fort Ord, Carmel Valley, and the North County. For each area, two ignition scenarios and two weather scenarios (moderate and severe) were evaluated to assess fire behavior potential. The following summarizes the FRAP findings for each area, based on modeling results.

Fort Ord. During severe weather conditions, wildfire in maritime chaparral on Fort Ord is expected to produce high spread rates, moderate to high intensity, and typically close-range spotting. During moderate weather, modeled fire behavior is significantly less intense. Of concern is the capability of a fire to leave the Fort Ord property, affecting adjacent properties and assets. Modeling results indicate this potential under severe weather conditions.

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Recommendations resulting from FARSITE modeling efforts indicate that a 200-300 foot wide linear fuel break along South Boundary Road dramatically slows the frontal spread of the fire and reduces escaped spot fires.

Carmel Valley. Modeling efforts evaluated assume ignitions at the top of Laureles Grade with variations in wind and fuel moisture conditions. Under severe weather conditions, fires burn rapidly in light, flashy fuels. Those in light and heavier shrub fuels progress slightly slower, although short- and mid-range spotting are problematic. As with the models for Fort Ord, during moderate weather, modeled fire behavior is significantly less intense. Of note is the slowing of fire progression when encountering oak woodland/forest vegetation types under both weather conditions.

North County. Simulations for the North County area indicate potential fire growth in annual grasslands assumed to be rested from grazing pressure. Under severe weather conditions, fire spread is rapid in light, flashy fuels, but slows when it reaches closed-canopy oak forests. Isolated tree torching and spotting encourage fire growth. Of note in this area is the potential for a relatively broad fire front and significant fire perimeter distance.

5.1.2 Risk of Wildfire Occurrence

As designated on the Community Base Map, Table 13 lists the associated wildfire risk, by community. Those designated as a Community at Risk from the California Fire Alliance were published in the Federal Register in 2001 and are considered at risk of damage from wildfire.

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Table 13. Risk of Wildfire Occurrence, by Community

Community or Area at Risk	California Fire Alliance Community at Risk	Fuel Hazard	Risk of Wildfire Occurrence	Structural Ignitability	Firefighting Capability	Overall Risk
Aromas	X	Medium	Medium	Medium	Medium	Medium
Big Sur	X	High	High	High	Medium	High
Carmel	X	Medium	Low	High	High	Medium
Carmel Highlands		High	Medium	High	Medium	High
Carmel Valley (includes Cachagua)	X	High	Medium	High	Medium	High
Carmel Valley Village	X	High	Medium	High	Medium	High
Castroville		Low	Low	Medium	Medium	Low
Del Monte Forest	X	High	Medium	High	High	High
Del Rey Oaks	X	High	Medium	High	High	High
Elkhorn	X	Medium	Medium	Medium	Medium	Medium
Fort Ord	X	High	Medium	High	High	High
Gonzales	X	Low	Low	Low	Medium	Low
Greenfield	X	Low	Low	Low	High	Low
Jack's Peak		High	Medium	High	High	High
King City	X	Medium	Medium	Medium	Medium	Medium
Las Lomas	X	Medium	Medium	Medium	Medium	Medium
Lucia	X	High	High	High	Medium	High
Marina	X	Low	Medium	Medium	High	Medium
Monterey	X	Medium	Medium	High	High	High
Pacific Grove	X	Medium	Low	High	High	Medium
Pajaro	X	Medium	Medium	Medium	Medium	Medium
Pine Canyon		Medium	High	Medium	Medium	Medium
Prunedale	X	Medium	Medium	Medium	Medium	Medium
Rancho Tierra Grande		High	Medium	High	High	High
Salinas	X	Medium	Medium	Medium	Medium	Low
Sand City	X	Low	Low	Medium	Medium	Low
Seaside	X	Low	Medium	High	High	Medium
Soledad	X	Low	Low	Low	Medium	Low
Toro Park		High	Medium	High	High	High

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5.2 Community Priority

Table 14 presents the community priority, as a function of risk, community values, and cultural values.

Table 14. Monterey County Community Priority Ranking

Community or Area at Risk	Overall Risk	Community Value	Cultural Value	Overall Priority
Aromas	Medium	Low	Low	Medium
Big Sur	High	High	High	High
Carmel	Medium	High	High	High
Carmel Highlands	High	High	High	High
Carmel Valley (includes Cachagua)	High	High	High	High
Carmel Valley Village	High	High	High	High
Castroville	Low	Low	Low	Low
Del Monte Forest	High	High	High	High
Del Rey Oaks	High	High	High	High
Elkhorn	Medium	Low	Low	Medium
Fort Ord	High	High	High	High
Gonzales	Low	Medium	Low	Low
Greenfield	Low	Medium	Low	Low
Jack's Peak	High	High	High	High
King City	Medium	Medium	Medium	Medium
Las Lomas	Medium	Low	Low	Medium
Lucia	High	High	High	High
Marina	Medium	High	High	High
Monterey	High	High	High	High
Pacific Grove	Medium	High	High	High
Pajaro	Medium	Low	Low	Medium
Pine Canyon	Medium	Medium	Medium	Medium
Prunedale	Medium	Low	Low	Medium
Rancho Tierra Grande	High	High	High	High
Salinas	Low	Medium	Low	Low
Sand City	Low	Medium	Low	Low
Seaside	Medium	High	High	High
Soledad	Low	Medium	Low	Low
Toro Park	High	High	High	High

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5.3 Community Hazard Reduction Priorities

The risk assessment process resulted in the identification of fuel treatment recommendations for the Communities at Risk identified in this CWPP. Fires in the WUI have the potential to move from wildland fuels to urban fuels (e.g. landscape plantings, outbuildings, decks, and homes), and create the greatest risk with regards to public and firefighter safety. As such, this CWPP focuses on prioritizing fuel treatments within the WUI (areas within 1.5 miles of structures or other assets at risk). This section also identifies the overall priority ranking for the Communities at Risk in Monterey County.

5.3.1 Public Resource Code 4291

The State of California Public Resource Code 4291 (PRC 4291) requires owners of property to create defensible space around structures on their property where firefighters can provide protection during a wildfire. PRC 4291 applies to areas of the state within the responsibility area of Cal Fire and includes:

“a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material...”

PRC 4291 outlines fuel treatment criteria, which have been incorporated into the specific treatment recommendations contained in this CWPP. The defensible space distance is measured along the grade from the perimeter or projection of the building or structure. Under PRC 4291, the defensible space distances require up to 100 feet, or to the property limit, whichever is closer.

5.3.2 Priority Areas

Based on the results of the community priority ranking for Monterey County, the community recommendations for the type and method of treatment for the surrounding vegetation are listed in Table 15.

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Table 15. Priority Area and Treatment Designation

Community or Area at Risk	Type of Treatment	Method of Treatment	Overall Priority
Aromas	Defensible space, hazard fuel reduction	Chipping, thinning	Medium
Big Sur	Defensible space, hazard fuel reduction	Chipping, thinning, prescribed burn	High
Carmel	Defensible space, hazard fuel reduction	Chipping, thinning	High
Carmel Highlands	Defensible space, hazard fuel reduction	Chipping, thinning	High
Carmel Valley (includes Cachagua)	Defensible space, hazard fuel reduction	Chipping, thinning	High
Carmel Valley Village	Defensible space, hazard fuel reduction	Chipping, thinning	High
Castroville	Defensible space, hazard fuel reduction	Chipping, thinning	Low
Del Monte Forest	Defensible space, hazard fuel reduction	Chipping, thinning	High
Del Rey Oaks	Defensible space, hazard fuel reduction	Chipping	High
Elkhorn	Defensible space, hazard fuel reduction	Chipping, thinning	Medium
Fort Ord	Defensible space, hazard fuel reduction	Chipping, thinning, prescribed burn	High
Gonzales	Defensible space, hazard fuel reduction	Chipping, thinning	Low
Greenfield	Defensible space, hazard fuel reduction	Chipping, thinning	Low
Jack's Peak	Hazard fuel reduction	Chipping, thinning	High
King City	Defensible space	Chipping	Medium
Las Lomas	Defensible space, hazard fuel reduction	Chipping, thinning	Medium
Lucia	Defensible space, hazard fuel reduction	Chipping, thinning, prescribed burn	High
Marina	Defensible space, hazard fuel reduction	Chipping, thinning	High
Monterey	Defensible space, hazard fuel reduction	Chipping, thinning	High
Pacific Grove	Defensible space, hazard fuel reduction	Chipping, thinning	High
Pajaro	Defensible space, hazard fuel reduction	Chipping, thinning	Medium
Pine Canyon	Defensible space, hazard fuel reduction	Chipping, thinning	Medium
Prunedale	Hazard fuel reduction	Chipping	Medium
Rancho Tierra Grande	Defensible space, hazard fuel reduction	Chipping, thinning	High
Salinas	Defensible space, hazard fuel reduction	Chipping	Low
Sand City	Defensible space, hazard fuel reduction	Chipping, thinning	Low
Seaside	Defensible space, hazard fuel reduction	Chipping	High
Soledad	Defensible space, hazard fuel reduction	Chipping, thinning	Low
Toro Park	Defensible space, hazard fuel reduction	Chipping, thinning	High

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6.0 TREATMENT OF STRUCTURAL IGNITABILITY

In cooperation with Cal Fire, the Monterey Fire Safe Council supports and promotes Firewise activities by educating its citizens in ways to reduce structure ignitability through meeting State requirements.

The partnership that exists between the listed organizations (federal, state, local, and citizens) allows the communities in Monterey County to reduce hazardous vegetative fuels that could ignite residences and commercial facilities during fire weather conditions. Maintaining properties with the appropriate defensible space is a key factor to protecting lives and property in the Communities at Risk.

A progressive process typically occurs as a structure is exposed to a wildland fire. First, ashes are cast in front of a fire by its smoke or convection column. In some instances, these ashes retain enough heat and/or flame that secondary ignitions are possible. Following the lighter ash, heavier embers/firebrands with more surface area and mass, and consequently, more heat, are blown in front of advancing flames and often provide sources of additional ignition to structures and vegetation. Finally, intrusion of a flame front and the associated radiant heat flux can expose combustible material outside of a building and the exterior of the structure itself to various levels of radiant heat. Studies reveal that the actual exposure of a building to a typical wildland flame front by the perimeter of a fire is usually less than six minutes. However, exposure to the other forms of ignition source materials can result in proliferation of secondary ignitions of structures or adjacent vegetation and a longer exposure, depending on wind, topography and fuel conditions.

To enhance structural survivability, the primary focus must include first, providing sufficient measures to prevent the ignition of structural materials from objects (fire brands) that are cast in front of the fire and, second, reducing the likelihood that direct flame impingement will occur and preventing flames from penetrating into the building and resulting in an interior fire. There are considerable problems in achieving these objectives without the benefit of new construction subject to the latest building codes.

All forms of fire protection are classified as either active or passive. Active fire protection includes implementing specific action to control a fire in some manner. Passive fire protection uses resistance to ignition or provides some form of warning that allows other action to be taken. These two classifications of self-defense mechanisms create different problems with regard to being accepted as alternatives for building construction. Furthermore, certain self-defense mechanisms must be incorporated during new construction, and others may only be capable of being added as a retrofit to existing structures. In the absence of ignition resistant construction, the focus for reducing structural ignitability shifts to landscaping and fuel treatment areas.

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Many of the residential structures within the Monterey County Communities at Risk are not built to current building code standards, which have been implemented statewide and based on intelligence gained from large wildfire events that included structure loss. It is not realistic to retrofit existing homes with enhanced ignition resistant construction, although the existing code can trigger upgrades to current code requirements for certain home additions. Based on the type of development within the Monterey County Communities at Risk and the existing fuels and terrain, structural ignition reduction will primarily be realized through implementation of fuel modification as described in this CWPP. Recommended standard fuel treatment prescriptions are presented in Section 6.1.

6.1 Hazard Reduction Prescriptions

The following descriptions of vegetation treatment/hazard reduction tasks are provided as guidelines for fuel reduction efforts within the WUI adjacent to the Communities at Risk in Monterey County. The intent of these descriptions is to detail vegetation treatment actions aimed at reducing fire spread rates and heat intensity, while providing defensible space for fire suppression efforts. Although these treatment descriptions are aimed at reducing current fuel volumes and creating both vertical and horizontal separation between vegetation groups, long-term maintenance of the landscape within the WUI should adhere to the vegetation spacing, fuel volume reduction, and vegetation clearance recommendations contained herein. Finally, these fuel reduction techniques should be conducted annually during the early spring and late summer in order to avoid the accumulation of hazardous conditions over time.

- **Vegetation Thinning.** Thinning of vegetation within the WUI involves an overall reduction of woody biomass to break up horizontally and vertically continuous fuels. Thinning efforts shall reduce overall vegetation volume by 30% to 50%, based on distance from structures. Heavier thinning (50% reduction) should be conducted in areas within the first 50- feet (horizontal) from structures, while lighter thinning (30% reduction) should be conducted in areas between 50- and 100- feet (horizontal) from structures. Site specific conditions will dictate thinning percentages in relation to structures and will be heavily dependent on topography, vegetation type, and building construction characteristics.

In cases where shrubs and/or trees require removal, root systems shall be left intact to maintain slope stability. In such cases, annual treatment of stump growth or re-sprouting will be required to maintain reduced fuel load volumes.

- **Tree Removal.** Removal of trees within the WUI should focus primarily on removing dead and dying trees from the defensible space area, although live tree removal may be necessary to improve vegetation spacing and reduce overall fuel continuity. All fuel

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treatment operations should comply with the criteria set forth in the California Public Resource Code 4291. Tree removal may require oversight by a Registered Professional Forester (RPF).

- **Dead/Dying Plant Removal.** Removal of dead and dying plant material from the WUI will help reduce low fuel moisture biomass. This practice should also be conducted in combination with vegetation thinning efforts and may help reach or completely satisfy thinning objectives in some areas.
- **Exotic/Invasive Plant Removal.** Removal of non-native and invasive plants from the WUI defensible space zone will help reduce the presence of undesirable species and enhance thinning efforts aimed at reducing overall biomass levels. Typical undesirable exotic species include, but are not limited to:
 - Palm trees (various species)
 - Eucalyptus trees (*Eucalyptus spp.*)
 - Pepper trees (*Schinus spp.*)
 - Fennel (*Foeniculum vulgare*)
 - Mustard (*Brassica spp.*)
 - French broom (*Genista monspessulana*)
 - Poison hemlock (*Conium maculatum*)
 - Thistle (various species)
 - Hardinggrass (*Phalaris aquatica*): a large, dense, aggressive perennial bunch grass that can significantly increase fuel loads in grasslands and woodland edges.
- **Tree and Shrub Pruning.** Trees or large tree-form shrubs (reaching 4- feet or taller at maturity) that are to be retained in the WUI defensible space zone should be trimmed or pruned to reduce both vertical and horizontal fuel continuity:

Vertical Separation. Pruning of vegetation off the ground should provide vertical clearance that measures 3- times the height of the understory vegetation or 10- feet, whichever is higher. Vertical separation serves to minimize the potential for a ground fire to transition to a crown fire. This process will remove ladder fuels and reduce the potential for fire spread from lower shrubs to higher trees and structures.

Horizontal Separation. Pruning of vegetation shall result in horizontal clearance that measures three times the height of the plant material height or 20 feet, whichever is greater. Horizontal separation serves to minimize fire spread from plant to plant and from plant to structure.

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Vegetation Grouping. Maintaining groups of shrubs is recommended to provide a mosaic pattern in the landscape. However, shrub groups should be separated from other shrub groups according to the horizontal separation criteria discussed above.

- **Mowing.** Mowing of native, non-native grasses and exotic weeds should be conducted to maintain grass heights at 8- inches or lower. Focus should be primarily on invasive weed prevention, suppression and monitoring; and properly timed and implemented grassland management (e.g. mowing, grazing) that promotes the establishment of less volatile native perennial grasses.
- **Chipping.** Chipping and spreading of existing dead biomass or that resulting from fuel reduction efforts within the WUI is an effective method for weed suppression. However, chip or mulch depth should not exceed 6- inches.
- **Grazing.** Browsing livestock (namely goats) has proven to be an effective method for reducing fuel volumes in wildland-urban interface areas. Management, maintenance, public safety, and environmental permitting issues should be considered prior to use.
- **Vegetation Clearance from Structures.** All vegetation should be trimmed such that a clearance of 10- feet exists between structures and exposed wildland vegetation. In cases where vegetation is planted within 10- feet of a structure (vines, shrubs), such vegetation should be maintained free of dead material and shall be pruned and maintained to reduce overall fuel volume.

In cases where tree canopies extend over roof tops, 10- feet of clearance should be maintained between the roof and the lowest tree branch extending over the structure. Any tree adjacent to or overhanging a structure should be maintained free of dead or dying wood (PRC 4291 (d)).

Firewood or other combustible debris should not be stored within 15- feet of existing structures.

All combustible material, including tree leaves, pine needles, branches, and twigs should be removed from roofs and rain gutters (PRC 4291 (e)).

All vegetation should be trimmed such that a clearance of 10- feet exists in all directions between landscape vegetation and the outlet of a chimney or stovepipe (PRC 4291 (c)).

All vegetation should be trimmed such that a 10- foot wide clearance exists along both sides of a structure, from the street to the rear of the property to promote firefighter access/egress. In cases where property setback widths are less than 10- feet, the entire width should be maintained free of obstructing vegetation.

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- **Prescribed Burning.** This management technique is currently employed on BLM and USFS property by trained professionals. This treatment technique is not recommended for use by private homeowners and should be restricted to managing fuels on BLM or USFS property in accordance with existing management plans and objectives.

7.0 ASSESSMENT STRATEGY AND ACTION PLAN

Federal agencies and private landowners responsible for managing the vegetation surrounding the identified Communities at Risk within Monterey County were invited to submit projects that provide for wildfire protection and reduce risk. Table 16 presents a list of projects submitted, the responsible agency, project funding source, the time frame for implementation, and the associated community recommendation.

Table 16. Fuel Reduction Projects and Community Recommendations

Community or Area at Risk	Project	Agency/Landowner	Funding Needs	Time Table	Community Recommendation
2009					
Big Sur	Partington Ridge hazard fuel removal	Private	Grant funding	2009	Yes
Big Sur	Big Sur Fire Plan	Private	Grant funding	2009	Yes
Corral de Tierra	Fort Ord fuel reduction, mowing	BLM	Agency budget	2009	Yes
County-wide	Residential Chipper Program	Cal Fire	Grant funding	2009	Yes
Del Rey Oaks	Henneken Road fuel break	BLM	Agency budget	2009	Yes
Del Rey Oaks	Manzanita Road fuel break	BLM	Agency budget	2009	Yes
Del Rey Oaks	Eucalyptus Road hazard fuel reduction, handwork	BLM	Agency budget	2009	Yes
Fort Ord Community	Henneken Road fuel break	BLM	Agency budget	2009	Yes
Fort Ord Community	Barloy Road fuel reduction	BLM	Agency budget	2009	Yes
Fort Ord Community	Three Sisters Road fuel break	BLM	Agency budget	2009	Yes
Fort Ord Community	Fort Ord pile burning	BLM	Agency budget	2009	Yes
Marina	Crescent Bluff fuel break	BLM	Agency budget	2009	Yes
Marina	Crescent Bluff hazard fuel reduction	BLM	Agency budget	2009	Yes
Marina	Sandy Ridge Road fuel break	BLM	Agency budget	2009	No

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Marina	East Machine Gun Flats fuel break	BLM	Agency budget	2009	Yes
Marina	Creekside Condo hazard fuel reduction	BLM	Agency budget	2009	Yes
Marina	Watkins Gate fuel break	BLM	Agency budget	2009	Yes
Monterey	Chipping	Private	Grant funding	2009	Yes
Rancho Tierra Grande	Chipping	Private	Grant funding	2009	Yes
Seaside	Watkins Gate fuel break	BLM	Agency budget	2009	No
Seaside	Watkins Gate hazard fuel reduction, handwork	BLM	Agency budget	2009	Yes
Seaside	Sheep grazing	BLM	Agency budget	2009	Yes
Toro Park	Fuel break	Private	Grant funding	2009	Yes
Toro Park	Recreation Sites hazard fuel reduction	BLM	Agency budget	2009	Yes
2010					
Corral de Tierra	Lookout Ridge fuel break	BLM	Agency budget	2010	Yes
Fort Ord Community	Eucalyptus Road fuel break	BLM	Agency budget	2010	Yes
Fort Ord Community	Sandstone Ridge fuel break	BLM	Agency budget	2010	No
Fort Ord Community	Barloy Road fuel break	BLM	Agency budget	2010	Yes
Fort Ord Community	Fuel break hazard reduction	BLM	Agency budget	2010	Yes
King City	Sierra de Salinas fuel treatment	BLM	Private	2010	Yes
Marina	Cuervo VMP	Private	Grant funding	2010	Yes
Marina	Fort Ord mowing	BLM	Agency budget	2010	Yes
Marina	Merill Road fuel break	BLM	Agency budget	2010	Yes
Rancho Tierra Grande	Demonstration garden	Private	Grant funding	2010	Yes
Salinas	Reservation roadside hazard reduction	BLM	Agency budget	2010	Yes
Seaside	Barloy Road fuel break	BLM	Agency budget	2010	Yes
Seaside	Guidotti Bridge hazard fuel reduction	BLM	Agency budget	2010	Yes
Seaside	Engineer Canyon hazard fuel reduction. Handwork	BLM	Agency budget	2010	Yes
2011					
Highway 68/Laureles Grade	Ryan Ranch fuel break	Private	Grant funding	2011	Yes

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Relize Canyon	Fuel break	USFS/Private	Grant funding	2011	Yes
2012					
Del Rey Oaks	Fuel Break	Private	Grant funding	2012	Yes

The community intends to assess the progress annually and invite agencies, landowners, and involved citizens to submit projects that provide community protection. Project identification and implementation is an on-going process and additional projects will be displayed in an updated appendix to this CWPP (Appendix D).

7.1 Long Term Maintenance

Long-term maintenance and monitoring of fuel reduction efforts within Monterey County is important in maintaining reduced fuel loads in critical threat areas and identifying new or additional projects necessary for reducing overall community wildfire risk. Annual maintenance of hazardous fuels is recommended within the WUI and can typically be completed at a cost less than that for the initial effort. Further, long-term maintenance is also essential for this CWPP, primarily to address completed projects, on-going fuel reduction efforts, and, most importantly, to address and define new priority areas and associated fuel reduction projects.

The Fuel Reduction Projects and Community Recommendations, included as Table 16 in this CWPP should be updated annually by the MFSC and incorporated into this CWPP as an updated appendix. Appendix D of this CWPP is intended to accommodate updated project tables.

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8.0 CWPP AUTHORIZATION

The Monterey County Community Wildfire Protection Plan was collaboratively developed. Interested parties local, state, and federal agencies managing land within or adjacent to the Communities at Risk, as defined in this CWPP, have been consulted. This CWPP also identifies and prioritizes areas for hazardous fuel reduction treatments and provides recommendations for the types and methods of treatment that will protect the Communities at Risk of Monterey County. Further, recommended measures to reduce the ignitability of structures within the wildland urban interface areas of Monterey County are addressed by this CWPP.

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

George Haines, San Benito-Monterey Unit Chief
California Department of Forestry and
Fire Protection (Cal Fire)

Rob Thompson
Monterey FireSafe Council President

Rick Cooper
Bureau of Land Management

Steve Davis
United States Forest Service

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InciWeb: Incident Information System. 2008. On-line at: <http://www.inciweb.org/>

Los Padres National Forest (LPNF) 2008. Fire Management Plan.

Pebble Beach Community Service District (PBCSD) 2005. Fire Defense Plan for Pebble Beach.

Monterey Fire Safe Council

Monterey County Community Wildfire Protection Plan

10.0 RESOURCES

Bureau of Land Management, Hollister Field Office

<http://www.blm.gov/ca/st/en/fo/hollister.html>

California Department of Forestry and Fire Protection (Cal Fire)

<http://www.fire.ca.gov/>

http://www.fire.ca.gov/communications/communications_firesafety_100feet.php

http://www.fire.ca.gov/communications/downloads/fact_sheets/Checklist.pdf

California Fire Alliance

<http://www.cafirealliance.org/>

Fire and Resource Assessment Program (FRAP)

<http://frap.cdf.ca.gov/>

The Firesafe Council

<http://www.firesafecouncil.org/>

Firewise Communities

<http://www.firewise.org/>

United States Forest Service, Los Padres National Forest

<http://www.fs.fed.us/r5/lospadres/>

APPENDIX A

Glossary of Terms

Appendix A: Glossary of Terms

Authority Having Jurisdiction (AHJ) – The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure (NFPA, *NFPA 1144*, 2002, p. 4).

Aspect – Compass direction toward which a slope faces (NFPA, *NFPA 1144*, 2002, p. 4).

Building – Any structure used or intended for supporting or sheltering any use or occupancy (NFPA, *NFPA 1144*, 2002, p. 4).

Combustible – Any material that, in the form in which it is used and under the conditions anticipated will ignite and burn or will add appreciable heat to an ambient fire (NFPA, *NFPA 1144*, 2002, p. 5).

Community Wildfire Protection Plan (CWPP) – Address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection. The process of developing a CWPP can help communities clarify and refine their priorities for the protection of life, property, and critical infrastructure in the wildland-urban interface (Source: *Preparing a Community Wildfire Protection Plan*. March, 2004).

Condition Class – Describes fire-related risk to ecosystems and relates current expected wildfires to their historic frequency and effects. Condition class ranks are defined as the relative risk of losing key components that define an ecosystem. Higher ranked areas present greater risk to ecosystem health. Condition class is a measure of the expected response of ecosystems to fire given current vegetation type and structure that often is far different from that historically present.

Class	Departure from natural regimes	Vegetation composition, structure, fuels	Fire behavior, severity, pattern	Disturbance agents, native species, hydrologic functions	Increased smoke production
Low Condition Class 1	None, minimal	Similar	Similar	Within natural range of variation	Low
Moderate Condition Class 2	Moderate	Moderately Altered	Uncharacteristic	Outside historical range of variation	Moderate
High Condition Class 3	High	Significantly different	Highly uncharacteristic	Substantially outside historical range of variation	High

(Source: *CDF FRAP 2003 Forest and Range Assessment*, p. 98)

Defensible Space – An area as defined by the AHJ (typically a width of 30 feet or more) between an improved property and a potential wildland fire where combustible materials and vegetation have been removed or modified to reduce the potential for fire on improved property

Appendix A: Glossary of Terms

spreading to wildland fuels or to provide a safe working area for fire fighters protecting life and improved property from wildland fire (NFPA, *NFPA 1144*, 2002, p. 5).

Disaster – Disaster is characterized by the scope of an emergency. An emergency becomes a disaster when it exceeds the capability of the local resources to manage it. Disasters often result in great damage, loss, or destruction (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110).

Dry Hydrant – An arrangement of pipe permanently connected to a water source other than a piped, pressurized water supply system that provides a ready means of water supply for fire-fighting purposes and that utilizes the drafting (suction) capability of fire department pumpers (NFPA, *NFPA 1144*, 2002, p. 5).

Dwelling – One or more living units, each providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation (NFPA, *NFPA 1144*, 2002, p. 4).

Emergency – A deviation from planned or expected behavior or course of events that endangers or adversely affects people, property, or the environment (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110).

Fire Behavior – The manner in which a fire reacts to the influences of fuel, weather, and topography (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Fire Frequency – A broad measure of the rate of fire occurrence in a particular area. For historical analyses, fire frequency is often expressed using the fire return interval calculation. For modern-era analyses, where data on timing and size of fires are recorded, fire frequency is often best expressed using fire rotation (*CDF FRAP 2003 Forest and Range Assessment*, p. A-12).

Fire Hazard – A fuel complex, defined by volume, type condition, arrangement, and location that determine the degree of ease of ignition and of resistance to control (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Fire Hydrant – A valved connection on a water supply system having one or more outlets and that is used to supply hose and fire department pumpers with water (NFPA, *NFPA 1144*, 2002, p. 5).

Fire Lane – A means of access or other passageway designated and identified to provide access for emergency apparatus where parking is not allowed (NFPA, *NFPA 1141*, 1998, p. 4).

Appendix A: Glossary of Terms

Fire Protection – All measures taken to reduce the burden of fire on the quality of life. Fire protection includes measures such as fire prevention, fire suppression, built-in ***fire protection systems***, and planning and building codes (NFPA, *NFPA 1141*, 1998, p. 4).

Fire Protection System – Any fire alarm device or system or fire extinguishing device or system, or their combination, that is designed and installed for detecting, controlling, or extinguishing a fire or otherwise alerting occupants, or the fire department, or both, that a fire has occurred (NFPA, *NFPA 1141*, 1998, p. 4).

Fire Threat – The combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). Components include surface fuels, topography, fire history, and weather conditions (Source: CDF FRAP, <http://frap.cdf.ca.gov/frapgisdata/output/fthrt.txt>, *CDF FRAP 2003 Forest and Range Assessment*, p. A-12, <http://frap.cdf.ca.gov/assessment2003/>).

Fire Regime – A measure of the general pattern of fire frequency and severity typical to a particular area or type of landscape: The regime can include other metrics of the fire, including seasonality and typical fire size, as well as a measure of the pattern of variability in characteristics (*CDF FRAP 2003 Forest and Range Assessment*, p. A-12).

Fire Rotation – An area-based average estimate of fire frequency, calculated as the length of time necessary for an area equal to the total area of interest to burn. Fire rotation is often applied to regionally stratified land groupings where individual fire-return interval across the variability of the strata (i.e., the fine scale pattern of variation in timing of fires) is unknown, but detailed information on fire size is known. Hence, fire rotation is a common estimate of fire frequency during periods of recorded fire sizes (*CDF FRAP 2003 Forest and Range Assessment*, p. A-12).

Fire Weather – Weather conditions that influence fire starts, fire behavior or fire suppression (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Fuels – All combustible material within the wildland/urban interface or intermix, including vegetation and structures (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Fuel loading – The volume of fuel in a given area generally expressed in tons per acre (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Fuel Models – Description of the types of vegetative combustible material:

Light Fuels – grasses, forbs

Medium Fuels – short light brush and small trees

Appendix A: Glossary of Terms

Heavy Fuels – tall dense brush, timber and hardwoods

Slash Fuels – logs, chunks, bark, branches, stumps, and broken understory trees and brush (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Fuel Modification – Any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

GIS - See **Geographic Information Systems**

Geographic Information Systems – The combination of skilled persons, spatial and descriptive data, analytic methods, and computer software and hardware – all organized to automate, manage, and deliver information through geographic presentation (i.e., maps) (Zeiler, M., *Modeling Our World*, ESRI Press, 1999, p. 46).

Hazard – Refers generally to physical characteristics that may cause an emergency. Earthquake faults, flood zones, and highly flammable brush fields are all examples of hazards (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110). Also see **Fire Hazard**.

Healthy Forests Restoration Act (HFRA), 2003 – Gives incentives for communities to engage in comprehensive forest planning and prioritization. This legislation includes statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction priorities. The Act emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and it places priority on treatment areas identified by communities themselves in a CWPP (Source: *Preparing a Community Wildfire Protection Plan*. March, 2004).

Improved Property – A piece of land or real estate upon which a structure has been placed, a marketable crop is growing (including timber), or other property improvement has been made (NFPA, *NFPA 1144*, 2002, p. 5).

Intermix – An area where improved property and wildland fuels meet with no clearly defined boundary (NFPA, *NFPA 1144*, 2002, p. 5).

Ladder Fuels – Fuels that provide vertical continuity allowing fire to carry from surface fuels in the crowns of trees or shrubs with relative ease (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Mitigation – Action that moderates the severity of a fire or risk (NFPA, *NFPA 1144*, 2002, p. 5).

National Fire Protection Association (NFPA) - a non-profit membership association that

Appendix A: Glossary of Terms

produces the National Fire Codes and fire and life safety educational material and programs (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

NFPA-1144 Standard for Protection of life and Property from Wildfire – Standard developed by the NFPA to be used to provide minimum planning, construction, maintenance, education, and management elements for the protection of life, property, and other values that could be threatened by wildland fire. The standard shall be used to provide minimum requirements to parties responsible for fire protection, land use planning, property development, property maintenance, and others responsible for or interested in improving fire and life safety in areas where wildland fire could threaten lives, property, and other values (NFPA, *NFPA 1144*, 2002, p. 4).

Noncombustible – Any material that, in the form in which it is used and under the conditions anticipated will not ignite and burn nor will add appreciable heat to an ambient fire (NFPA, *NFPA 1144*, 2002, p. 5).

Overstory – That portion of the trees in a forest that forms the upper or uppermost layer (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Risk – The potential or likelihood of an emergency to occur. For example, the risk of damage to a structure from wildfire is high if it is built upon, or adjacent to, a highly flammable brush field or other area deemed to have a high ***Fire Threat*** (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110).

Slope – The variation of terrain from the horizontal; the number of feet rise or fall per 100 feet measured horizontally, expressed as a percentage (FIREWISE Communities, 2003, <http://www.firewise.org/communities>). Upward or downward incline or slant (NFPA, *NFPA 1144*, 2002, p. 5).

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 (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Turnaround – A portion of a roadway, unobstructed by parking, that allows for a safe reversal of direction for emergency equipment (NFPA, *NFPA 1144*, 2002, p. 5).

Turnouts – A widening in a travelway of sufficient length and width to allow vehicles to pass one another (NFPA, *NFPA 1144*, 2002, p. 5).

Understory – Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the ***Overstory*** (FIREWISE Communities, 2003, <http://www.firewise.org/communities>).

Appendix A: Glossary of Terms

Water Supply – A source of water for fire-fighting activities (NFPA, *NFPA 1144*, 2002, p. 5).

Wildfire – Any fire occurring on undeveloped land; the term specifies a fire occurring on a wildland area that does not meet management objectives and thus requires a suppression response. Wildland fire protection agencies use this term generally to indicate a vegetation fire. Wildfire often replaces such terms as forest fire, brush fire, range fire, and grass fire (*CDF FRAP 2003 Forest and Range Assessment*, p. A-17).

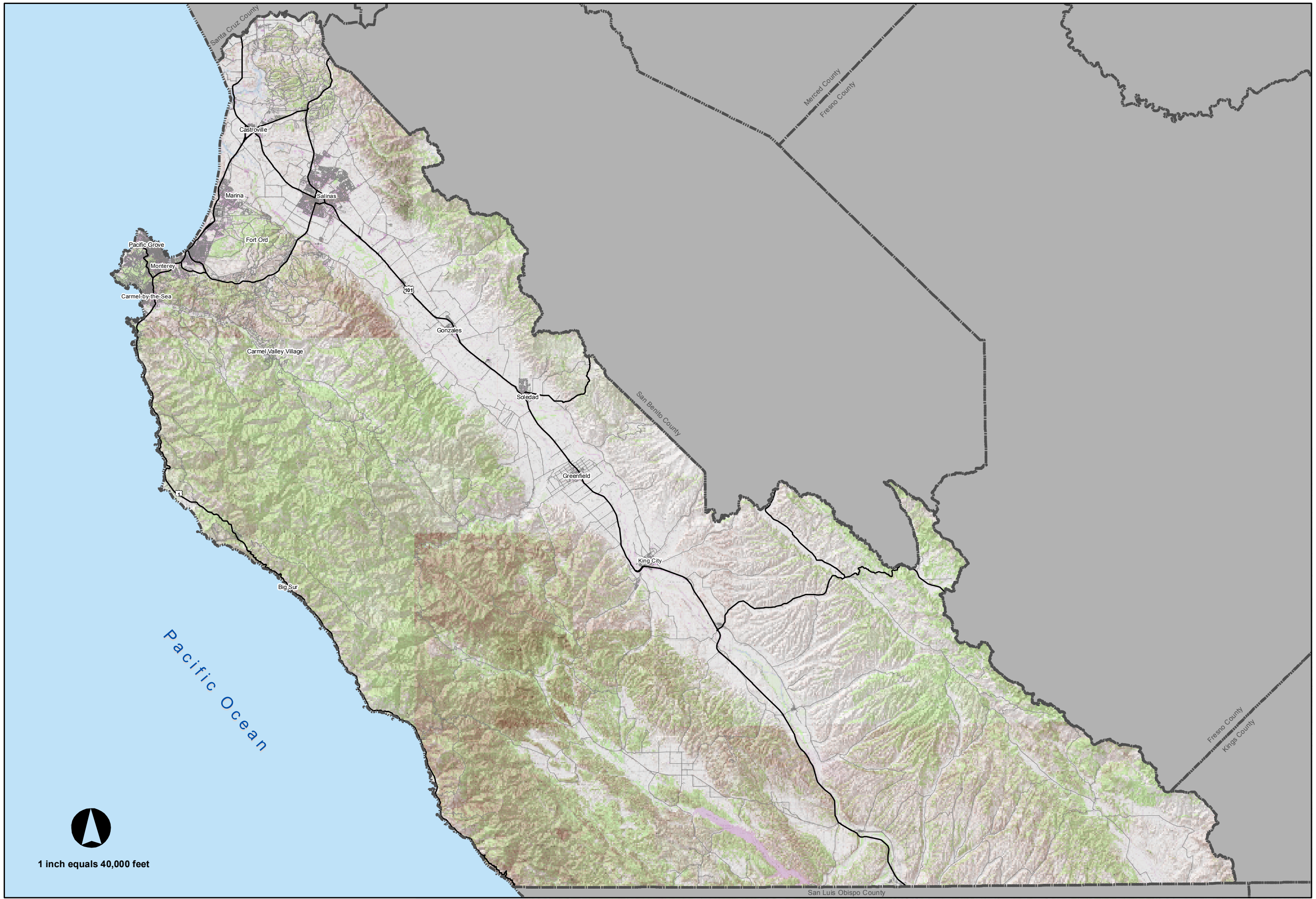
Wildland – A region with minimal development as evidenced by few structures; transportation networks may traverse region. Region typically contains natural vegetation and may be used for recreational or agricultural purposes (*CDF FRAP 2003 Forest and Range Assessment*, p. A-17).

Wildland-Urban Interface (WUI) – Commonly described as the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels. In the absence of a CWPP, Section 101 (16) of the HFRA defines WUI as “ (I) an area extending ½ mile from the boundary of an at-risk community; (II) an area within 1 ½ miles of the boundary of an at-risk community, including any land that (1) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (2) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (3) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; (III) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community.” A CWPP offers the opportunity to establish a localized definition and boundary for the wildland-urban interface (Source: *Preparing a Community Wildfire Protection Plan*, March, 2004).

APPENDIX B

Monterey County Maps

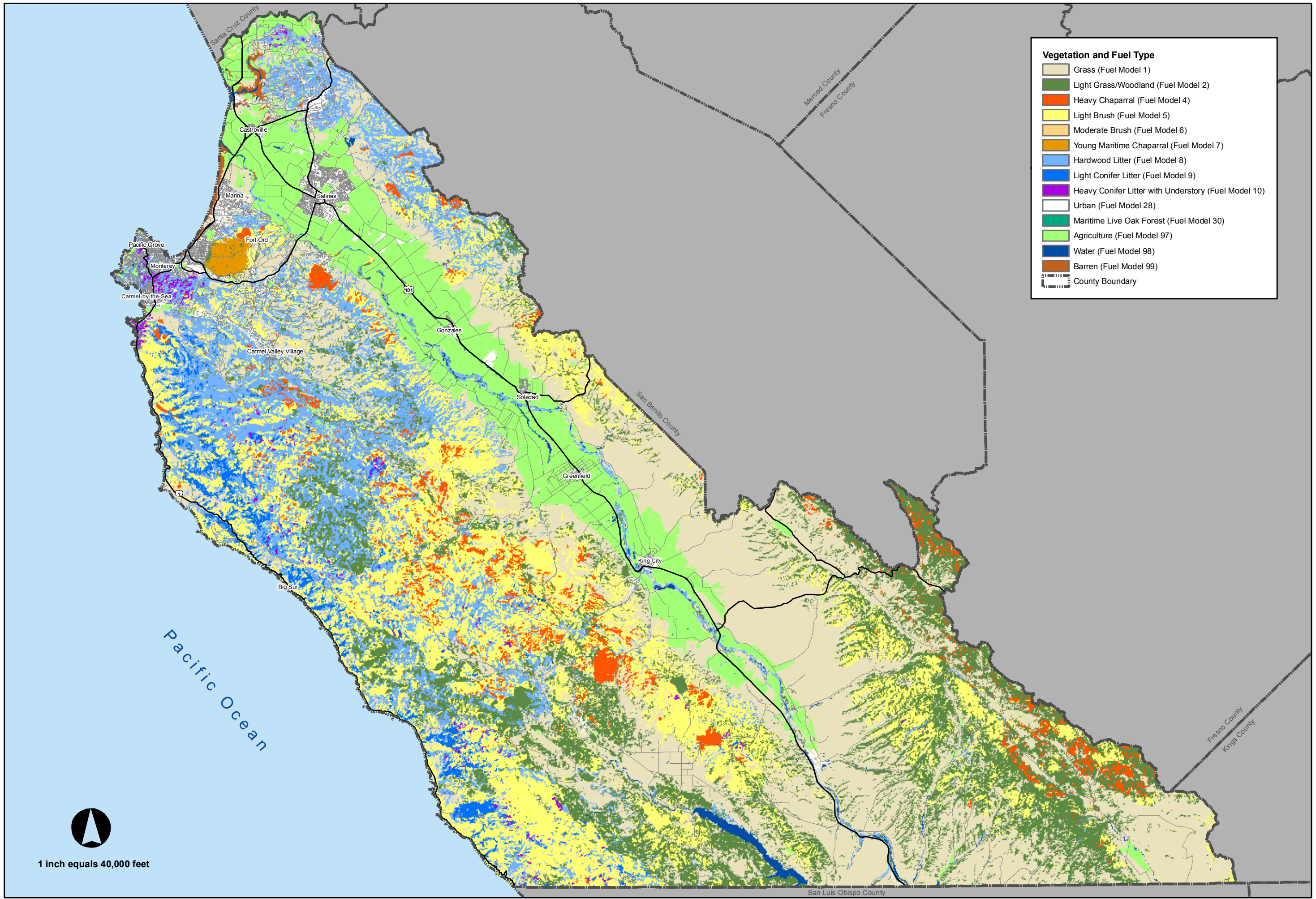
DRAFT



1 inch equals 40,000 feet

Monterey County Community Wildfire Protection Plan
Monterey County Topography





Vegetation and Fuel Type

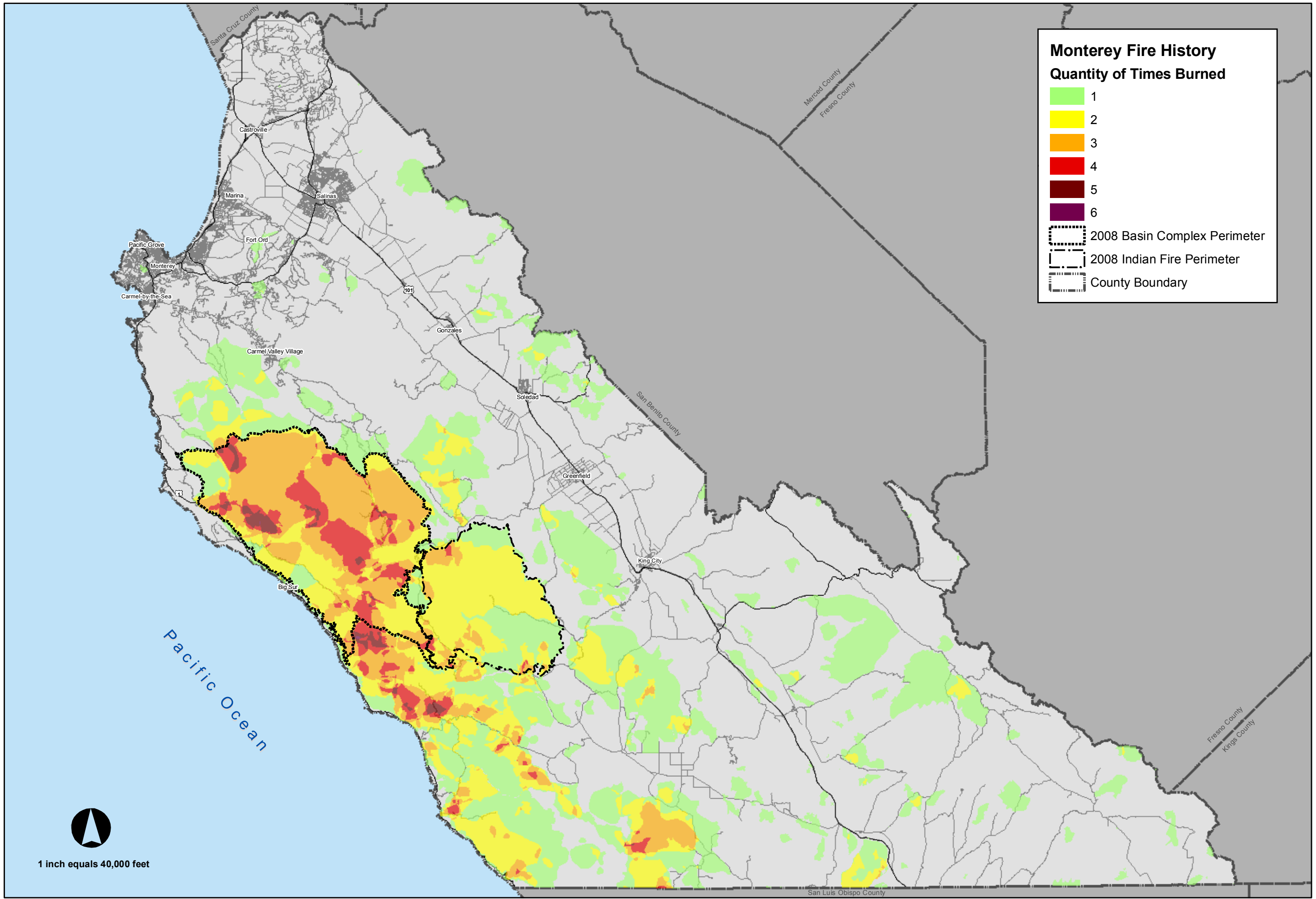
- Grass (Fuel Model 1)
- Light Grass/Woodland (Fuel Model 2)
- Heavy Chaparral (Fuel Model 4)
- Light Brush (Fuel Model 5)
- Moderate Brush (Fuel Model 6)
- Young Maritime Chaparral (Fuel Model 7)
- Hardwood Litter (Fuel Model 8)
- Light Conifer Litter (Fuel Model 9)
- Heavy Conifer Litter with Understory (Fuel Model 10)
- Urban (Fuel Model 28)
- Maritime Live Oak Forest (Fuel Model 30)
- Agriculture (Fuel Model 97)
- Water (Fuel Model 98)
- Barren (Fuel Model 99)
- County Boundary



1 inch equals 40,000 feet

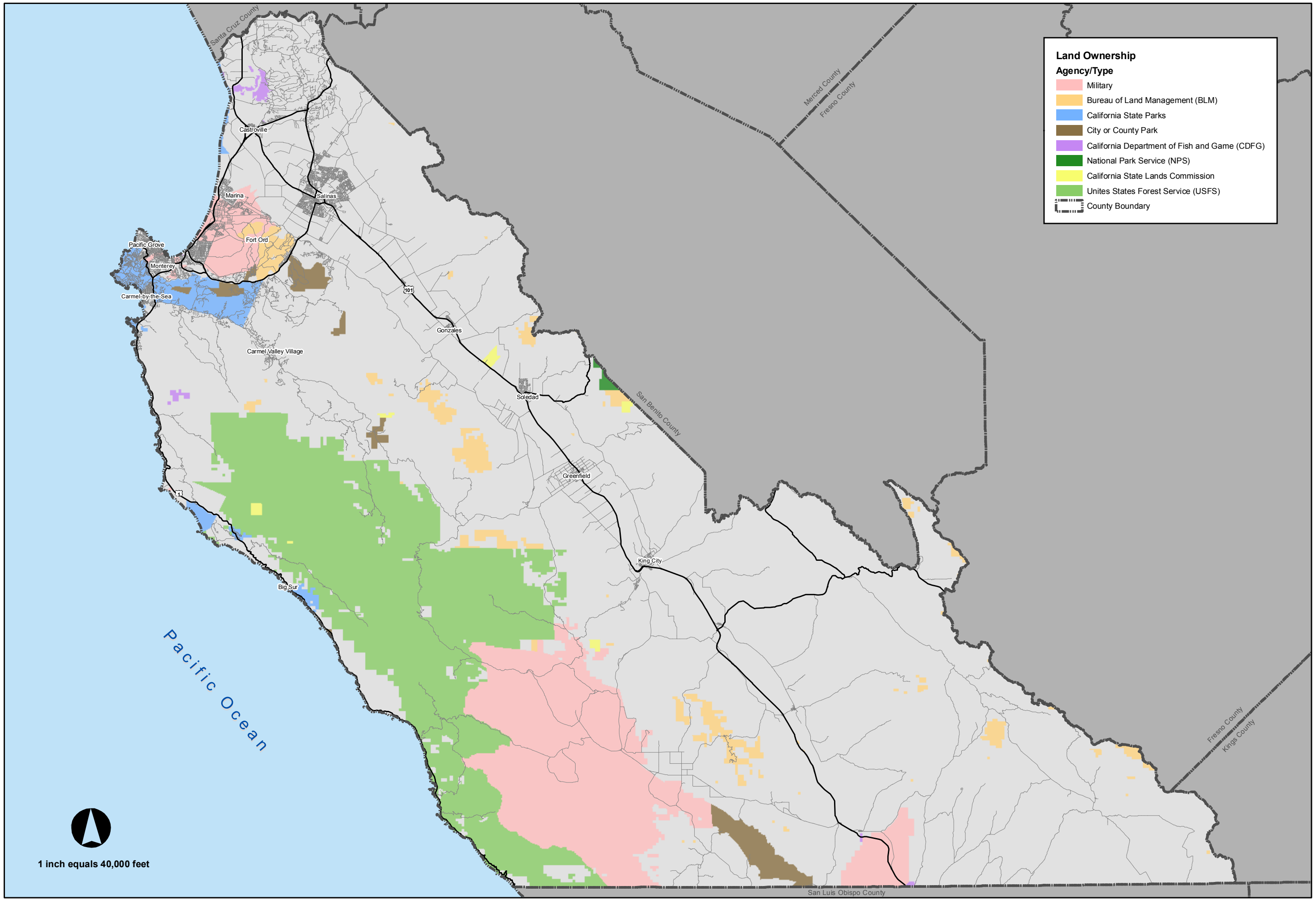
Monterey County Community Wildfire Protection Plan
Monterey County Vegetation/Fuels Distribution





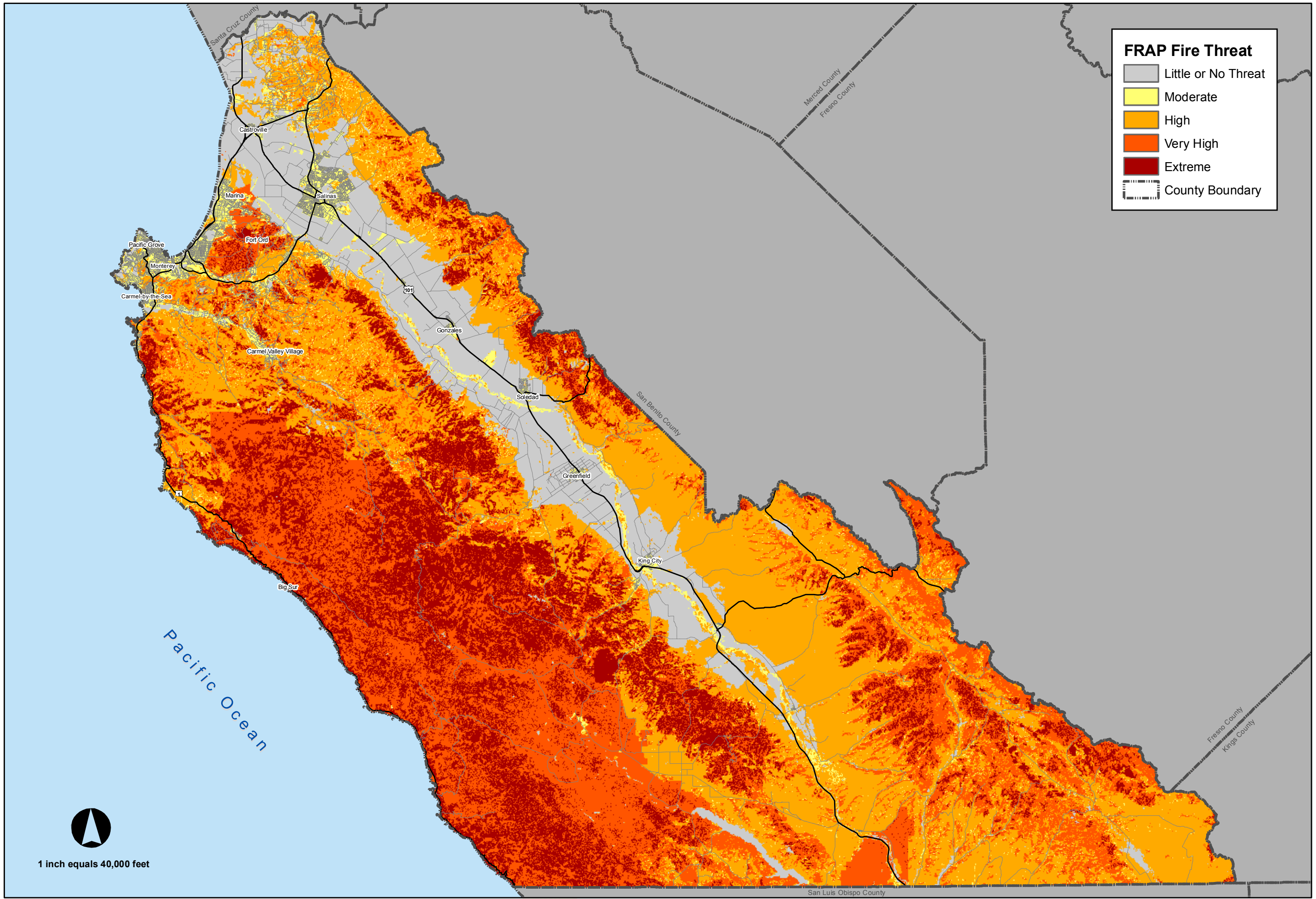
1 inch equals 40,000 feet





Monterey County Community Wildfire Protection Plan
Monterey County Land Ownership Distribution





FRAP Fire Threat

- Little or No Threat
- Moderate
- High
- Very High
- Extreme
- County Boundary



1 inch equals 40,000 feet

Monterey County Community Wildfire Protection Plan
Monterey County Fire Threat Ranking



APPENDIX C

Community Base Map

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APPENDIX D
*Updated Fuel Reduction Projects and Community
Recommendations*

