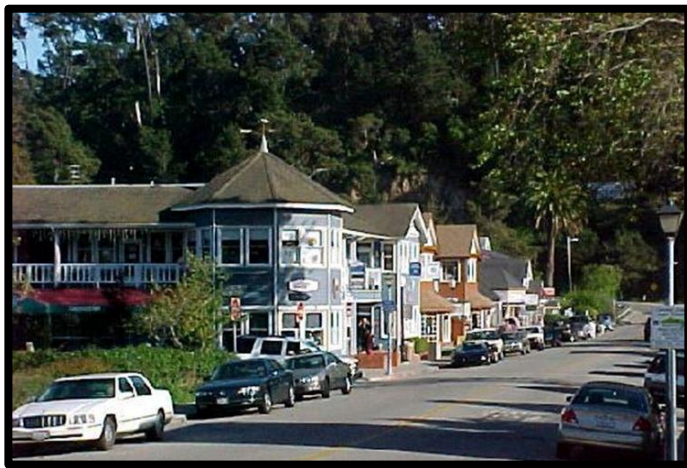


COMMUNITY WILDFIRE PROTECTION PLAN



A report presented to the Cambria Fire Department

Prepared by CALFIRE SLU Pre Fire Division, Los Osos



Contributing Authors

This CWPP contains portions of work created as a part of the “Wildland Urban Interface Fire Protection” class taught by Dr. Christopher Dicus and former County Fire Chief Dan Turner at California Polytechnic University San Luis Obispo. The final document was compiled by Nicola C. Leyshon and Noël Fie at CALFIRE SLU Los Osos. Some chapters contain excerpts from the classwork of Cal Poly Students.

Executive Summary

This report provides an analysis and evaluation of the current and prospective fire hazard, and suggested mitigation strategies for the village of Cambria, located along Highway 1 between San Francisco and Los Angeles, California. This CWPP has taken into account environmental, socioeconomic and political factors that affect the management and safety of the Cambria Community.

The land and community management guidelines presented in this CWPP have been supported using GIS (Geographic information System) analysis and Fire Behavior analysis (FARSITE and WFDSS).

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Chapter 1- Introduction

1.1. Community Overview

The village of Cambria, California is located along Highway 1 in Northern San Luis Obispo County (Figure 1.1). Cambria contains approximately 4,062 housing units and is home to 6032 people. Cambria is also a scenic and popular destination for tourists; Cambria contains one of only 4 Native Monterey Pine stands to exist globally, as well as pristine beaches and a unique local culture.

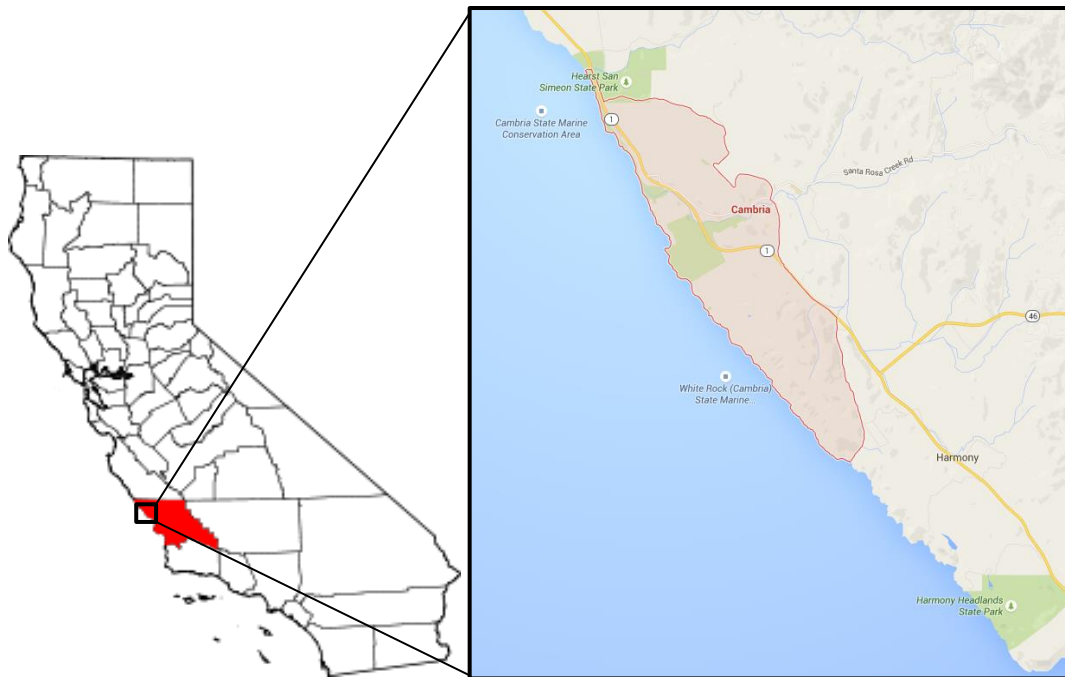


Figure 1.1: Location of Cambria in Relation to State of California/San Luis Obispo County

The Monterey Pine forest in Cambria currently has a high mortality rate, this is due in part to the spreading of Pitch Canker and an over suppression of naturally occurring wildfire.

1.2. Historical Background

The village of Cambria was first known as “Slabtown” because the structures were constructed using wooden slabs. It was considered the second largest town in San Luis Obispo County by 1880 with several developing industries. On October 1st 1889 a fire wiped out 7 homes and most of the Cambria Business district. Almost immediately after the fire, the residents began to rebuild.



Figure 1.2: Cambria in the 1800's (Cambria Historical Society 2015)

The building of California State Highway One along the Big Sur coast can be traced back at 1894. After the S.S. Los Angeles ran aground near Point Sur Light Station, people became convinced of the need along the coast.

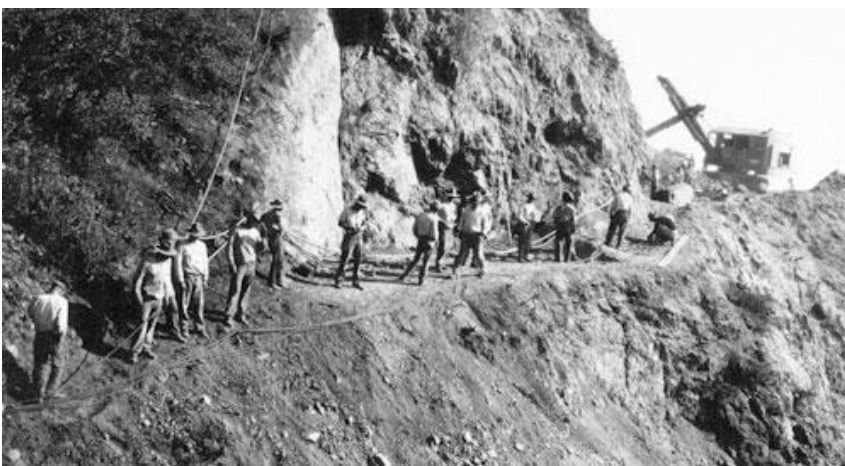
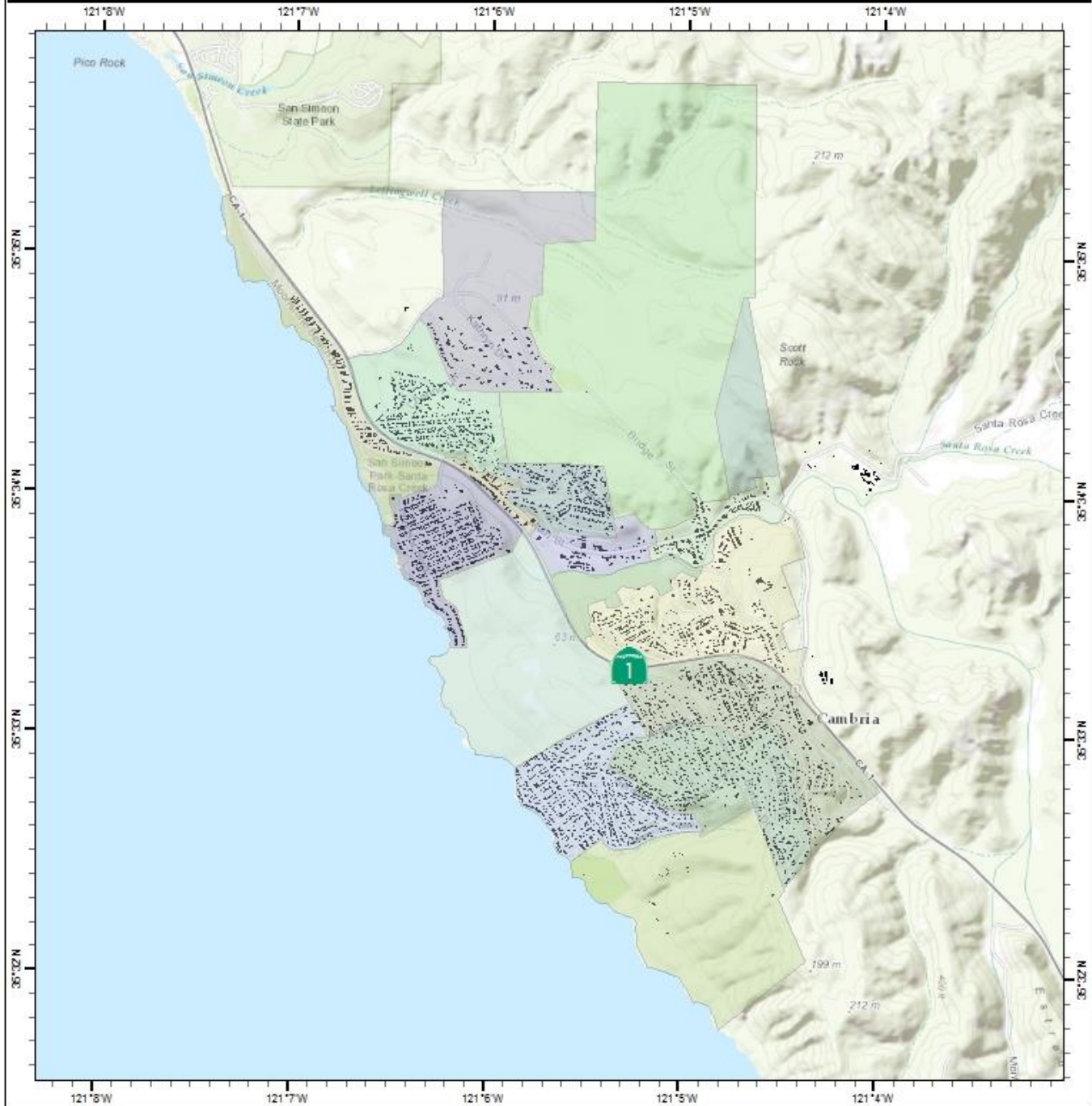


Figure 1.3: The construction of Highway 1 (Cambria Historical Society 2015)

Cambria Community Layout

09/30/2015



- | | | |
|----------------------|----------------------------|-------------------------------------|
| Covelli Ranch | Leimert | Park Hill |
| East Village | Lower Lodge Hill | Pine Knolls |
| Fiscalini Ranch East | Marine Terrace | Strawberry Canyon/ Camp Ocean Pines |
| Fiscalini Ranch West | Mid Village | Upper Lodge Hill |
| Fish and Wildlife | Moonstone Beach | West Village |
| Happy Hill | North Lodge Hill/ Tin City | |

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBC, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MSTI, Swisstopo, (Switzerland), Esri, Mapbox, OpenStreetMap contributors, and the GIS User Community

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Chapter 2- Collaboration

2.1. Stakeholders

The Healthy Forests Restoration Act of 2003 requires that the applicable local government, local fire department, and State agency be responsible for forest management and have a collaborative agreement to the Community Wildfire Protection Plan. The stakeholders for this CWPP include:

- Cambria Fire Department
- Cal Fire
- The Nature Conservancy
- PG&E
- Cambria Residents and business owners
- Other agencies including but not limited to; the Cambria Forest Committee, Friends of Fiscalini Ranch, and Cambria Green Space.

2.2. Cooperative Assistance

The location and size of San Luis Obispo County require that local fire resources must be used effectively since these resources are limited. Fire-related problems mandate the cooperative use of fire service resources. Cooperative assistance is provided on reciprocal contributions without charge and may be provided in two forms:

-Automatic Aid: a predetermined immediate joint response as a means to provide effective fire protection

-Mutual Aid: Responses to supplement the resources of any fire agency during a period of actual or potential need, including move-up and over assignments. Equipment and resources are expected to be provided by mutual aid.

The San Luis Obispo County Fire Services Mutual Aid Plan intends to provide cost effective use of all jurisdiction's resources while balancing the give and take of resources.

Mutual aid will address and respond to fire, rescue, hazardous materials, earthquake, natural and human-caused disasters and EMS/mass casualty incidents.

Table 2.1. Fire departments, districts, and agencies currently engaged in Automatic/Mutual Aid agreements in San Luis Obispo County

Atascadero Fire Department	Morro Bay Fire Department
Atascadero State Hospital Fire Department	Paso Robles Fire Department
Avila Beach Fire Department	Pismo Beach Fire Department
CAL FIRE San Benito-Monterey Unit	Santa Barbara County Fire Department
Camp Roberts Fire Department	South Bay Fire Protection District
Cayucos Fire Protection District	San Luis Obispo County Fire
CAL FIRE	San Luis Obispo City Fire Department
Cambria Fire Protection District	San Miguel Fire Protection District
California Men's Colony	Santa Maria Fire Protection District
CAL FIRE Fresno-Kings Ranger Unit	Santa Margarita Fire Protection District
Five Cities Fire Authority	Templeton Fire Protection District
Guadalupe Fire Protection District	U.S. Forest Service (Los Padres National Forest)

Chapter 3 - Hazard Assessment

The following chapter will outline the methods and results of the hazard assessment completed as part of the proposed community wildfire protection plan for village of Cambria.

3.1. Fire Hazard Severity Zones

Cambria has been designated as a High fire hazard severity zone by Cal Fire. There are also some Very High Fire Hazard Severity Zones to the North East of the Village.

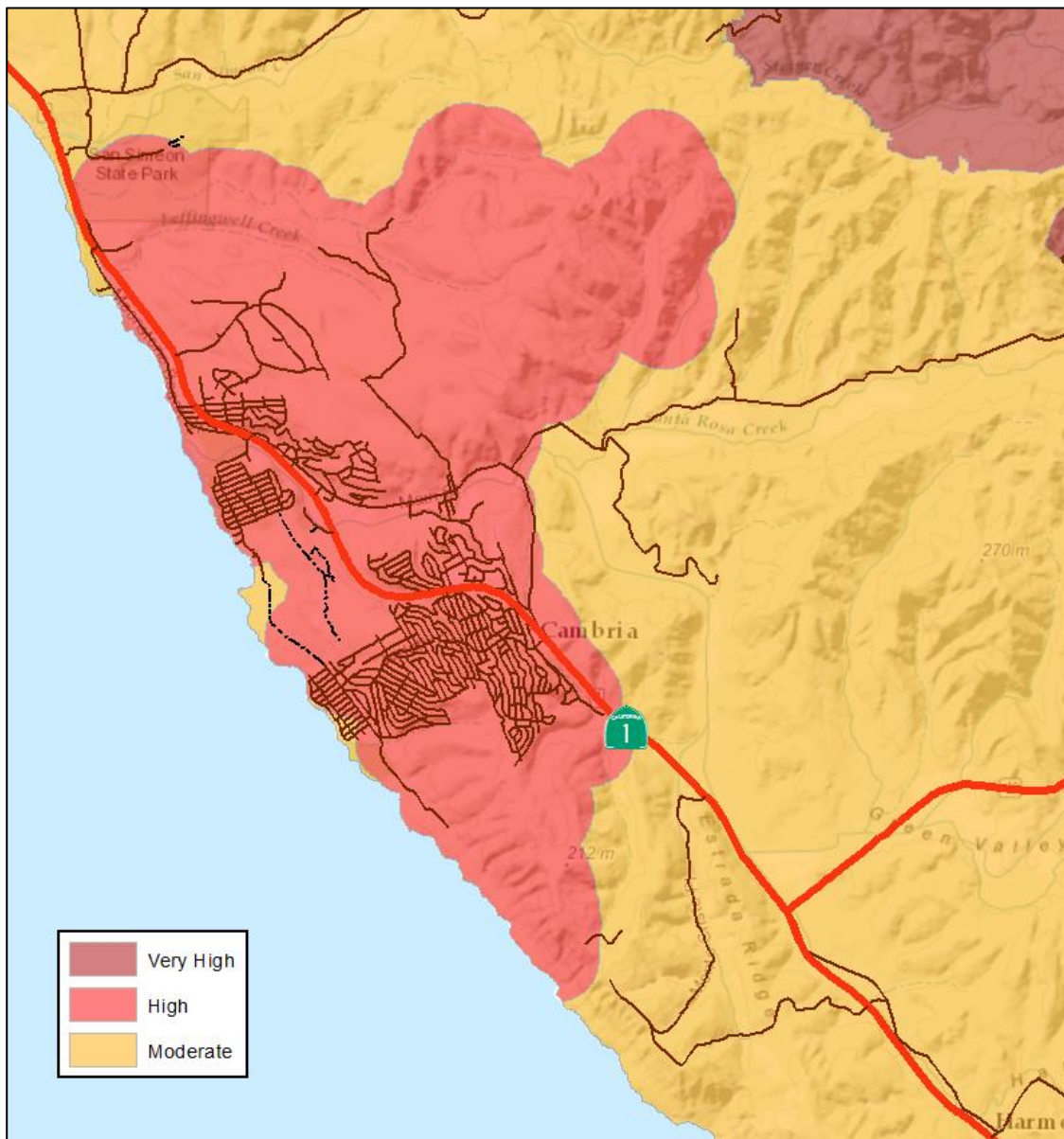


Figure 3.1- SRA Fire Hazard Severity Zones (Roberts & Herold, 2004).

3.2 Fuels

The data for the fire model was collected from LANDFIRE, an interagency vegetation, fire, and fuel characteristics mapping program, sponsored by the United States Department of the Interior (DOI) and the US Forest Service.

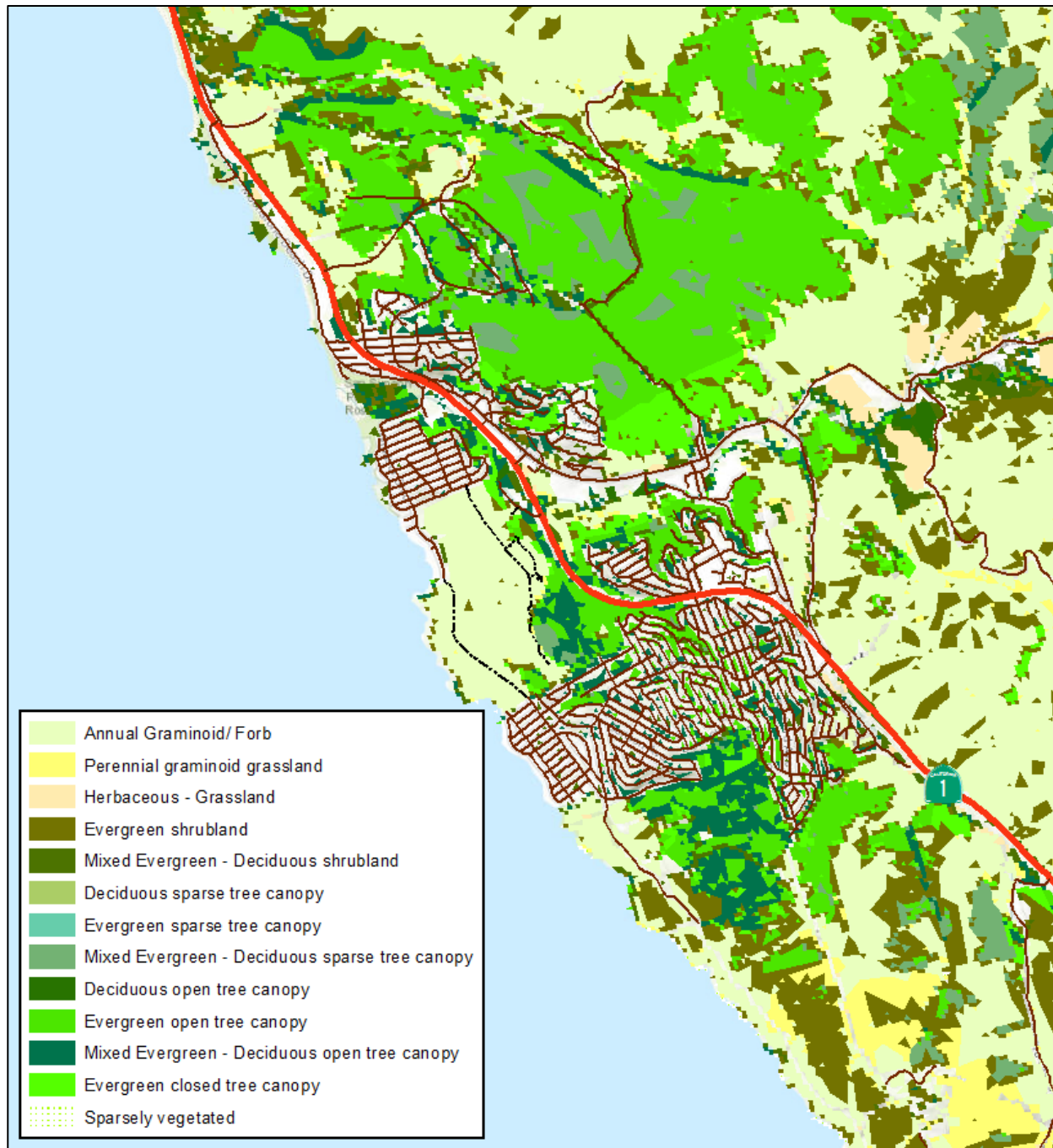


Figure 3.2- Vegetation distribution in and around Cambria

3.3. Weather

The weather data for the Cambria hazard assessment includes average and extreme weather measurements for the months of July, August, and September, 2015 (Table 2.2).

Measurements were collected from the new portable RAWS unit in Cambria. The weather data used in this hazard assessment included the last six days in the month of July (due to limited data) and the entire months of August and September, 2015.

Table 3.1- Weather data for the Village of Cambria (July-September 2015) (Cal Fire data)

Date (2015)	Mean Temperature (° F)		Precipitation (in.)	Wind (mph)	
	Average	Extreme		Average	Extreme
July	62	74	0	6	21
August	64	85	0	7	24
September	66	85	0	4	22
3-month average	64	81	0	6	22

The weather data illustrates that there is a much higher fire hazard in extreme conditions. With high wind speeds, low relative humidity and no precipitation, there is a higher chance of ignition. In the case of an ignition, fire will spread more rapidly under the extreme conditions.

3.3.1 Wind Direction

Wind direction plays a critical role in the spread of a wildfire. In Cambria the typical wind directions are North North West (NNW), South South West (SSW) and East North East (ENE Santa Ana winds). The NNW and ENE wind directions will be used for the hazard assessment as they occur during fire season. The SSW winds generally come in with colder weather.

3.3.2. Topography

Much of Cambria is West facing with gentle slopes in the Windsor/ Fiscallini areas. There are some steep slopes in the Lodge Hill, Leimert, Happy Hill and Pine Knolls communities.

3.4. Fire History in Cambria

In 1889, Cambria experienced a catastrophic wildfire which wiped out the business district as well as 7 homes (Cambria Historical Society, 2015). This fire is the only large fire to take place within the village of Cambria since 1889; however 6 wildfires have burned nearby Cambria (see map on p. 10). This lack of wildfire within Cambria itself has resulted in an ageing Pine stand and therefore an increased fire hazard.



Figure 3.4: The Great Fire of 1889 (Cambria Historical Society 2015)

Cambria Fire History 1918 - 2015

09/17/2015



3.5. Fire Behavior Analysis Results

Fire behavior mapping software is used to predict wildfire activity in a given area. For this analysis, FARSITE modeling software was used. The FARSITE results presented below are representative of the spread and speed of the fire given the local vegetation and given weather scenarios (using average and extreme weather conditions from table 2.2). Twelve models were run under both average and extreme conditions. The ignitions were located at four sites:

- Bridge Street
- CA 1 Highway/ Ardath
- Santa Rosa Creek Road by High school

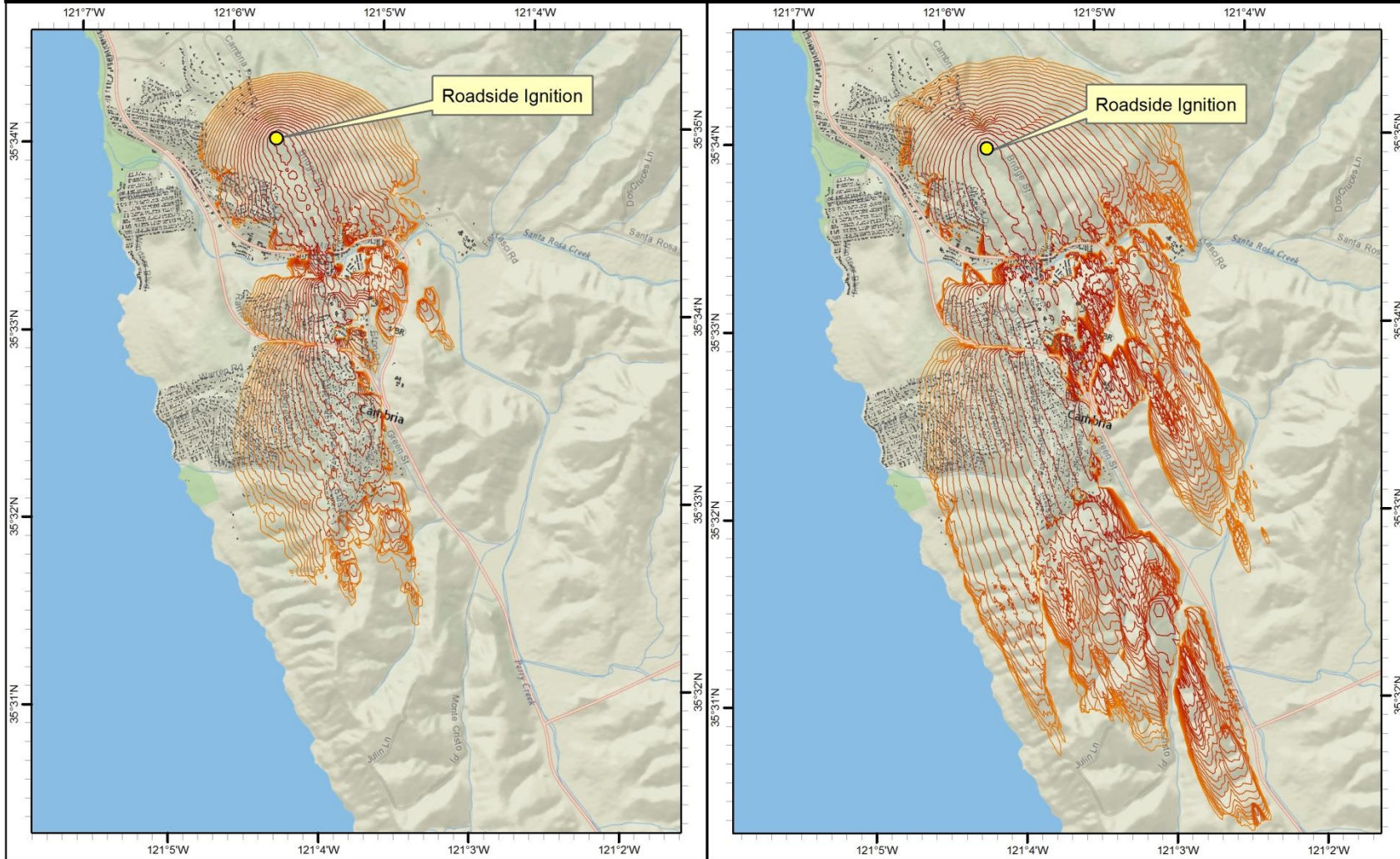
The simulations used two wind scenarios, North North West, and East North East (Santa Ana). In the models, each line shows the distance of fire spread over 2 hours. Each model represents a 10am ignition burning for 2 days. All 12 models showed a development of a fire over the 4 day period. Eight models were selected based on the apparent threat posed to the community in the simulation. The models chosen to be displayed in this CWPP included,

- Bridge Street ignition under average NNW conditions
- Bridge Street ignition under extreme NNW conditions
- Bridge Street ignition under average Santa Ana (ENE) conditions
- Bridge Street ignition under extreme Santa Ana (ENE) conditions
- High school ignition under average Santa Ana (ENE) conditions
- High school ignition under extreme Santa Ana (ENE) conditions
- Highway 1 ignition under average Santa Ana (ENE) conditions
- Highway 1 ignition under extreme Santa Ana (ENE) conditions

NB. As this model uses the surrounding vegetation to indicate fire spread throughout Cambria, the model does not intend to predict the loss or survival of the structures. The locations of the structures have been included for reference purposes only. This model is intended to indicate a likely path for wildfire under given conditions.

Bridge Street Ignition - Average and Extreme NNW Conditions

10/8/2015



Normal fire conditions: NNW wind 20mph
Extreme fire Conditions: NNW wind 40mph

48 hour burn under Normal conditions (left) and Extreme conditions (right).

Urban Fuel Models changed to represent vegetation in Home Ignition Zone.
Models are for reference of possible fire spread only and do not represent
likelihood of structure loss.

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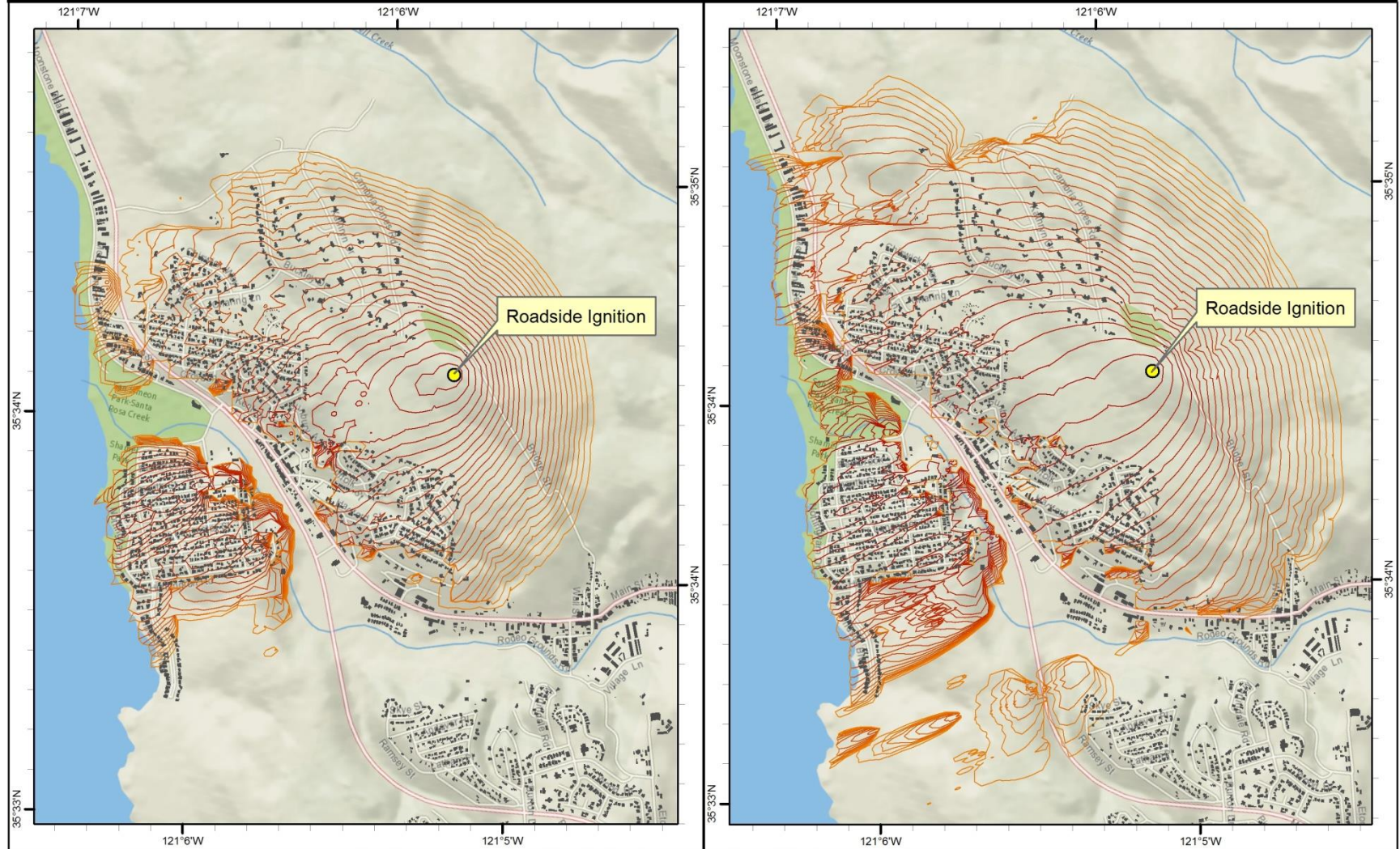


Miles 0 0.5 1 1.5 2 2.5 3 Miles



Bridge Street Ignition - Average and Extreme ENE Conditions

10/8/2015



Normal fire conditions: ENE wind 20mph
Extreme fire Conditions: ENE wind 40mph

48 hour burn under Normal conditions (left) and Extreme conditions (right).

Urban Fuel Models changed to represent vegetation in Home Ignition Zone.
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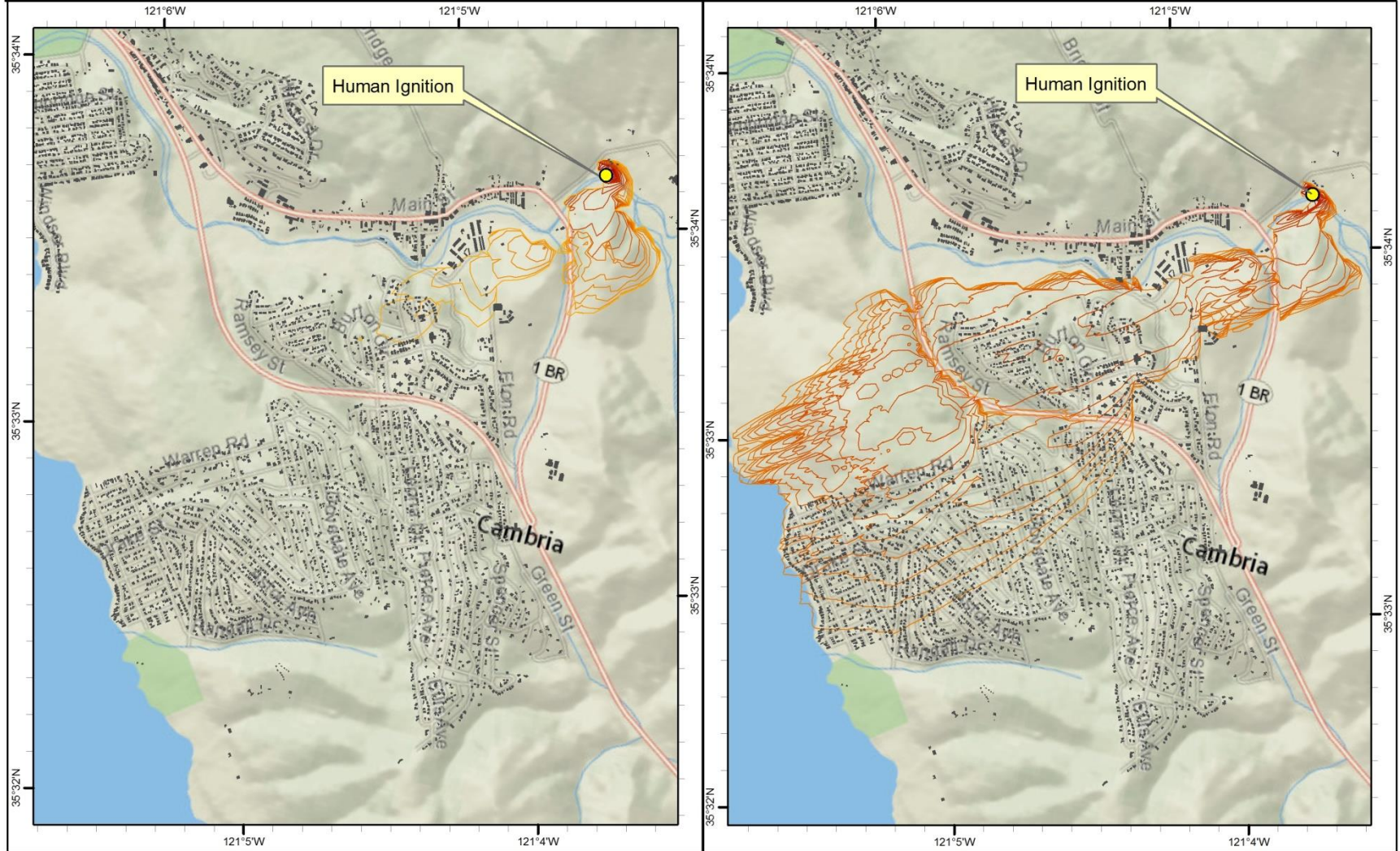


Miles 0 0.5 1 Miles



High School Ignition - Average and Extreme ENE Conditions

10/8/2015



Normal fire conditions: ENE wind 20mph
Extreme fire Conditions: ENE wind 40mph

48 hour burn under Normal conditions (left) and Extreme conditions (right).

Urban Fuel Models changed to represent vegetation in Home Ignition Zone.
Models are for reference of possible fire spread only and do not represent likelihood of structure loss.

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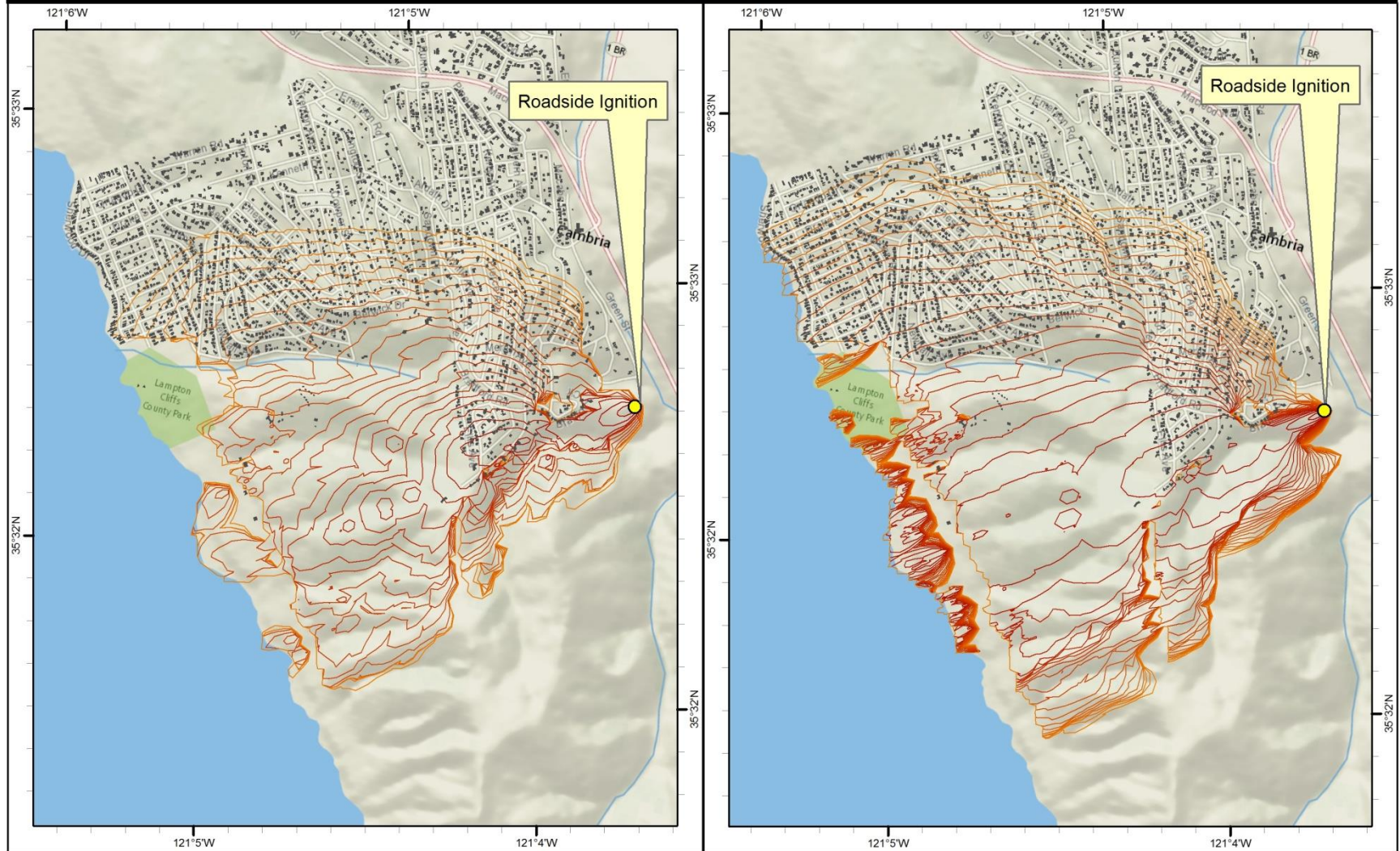


Miles 0 0.5 1 1.5



Highway 1 Ignition - Average and Extreme ENE Conditions

10/8/2015



Normal fire conditions: ENE wind 20mph
Extreme fire Conditions: ENE wind 40mph

48 hour burn under Normal conditions (left) and Extreme conditions (right).

Urban Fuel Models changed to represent vegetation in Home Ignition Zone.
Models are for reference of possible fire spread only and do not represent likelihood of structure loss.

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Miles 0 0.5 1 Miles



3.6. Management Implications

The fire behavior analysis showed that the community of Cambria has a high potential for a catastrophic wildfire, particularly under extreme summer conditions. Each line in the model represents the spread of the fire over 2 hours. Under these extreme conditions an ignition close to Bridge Street could reach the community of Cambria in less than 2 hours (p.22 and p.23).

Given the potential for an extreme rate of spread through the community of Cambria, it is critical that local planners and residents take the necessary steps to ensure the structures are fire resistant and the community as a whole is fire adapted.

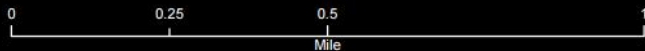
In 1987, the Morse fire burned 190 acres in Pebble beach Monterey County. This fire took place in a Monterey Pine stand similar to that in Cambria, it burned over the course of one day into a wildland urban Interface community. This fire may be useful as a historical comparison for a possible burn scenario in Cambria (p.27).

Morse Fire 1987

Pebble Beach, California



190.33
Acres



Morse Fire 1987 Perimeter

Cambria, California



Chapter 4 - Assets at Risk

For the purposes of the CWPP, assets are values that may be at risk from wildfire. Assets nearby and within the town of Cambria include cellular sites, power generation and transmission facilities, emergency communication facilities, transportation infrastructure, tourist and recreation areas, environmental areas and natural resource production facilities.

Table 4.1– Assets at risk in and around Cambria

Asset	Details	Consequences of loss/ compromise due to wildfire
Cellular Towers/Sites	4	Loss of communications Economic costs of recovery
Bridges	4	Loss of transportation route Economic costs of recovery
Facilities Other (Cambria Fire Station)	1	Loss of services Economic costs of recovery
Schools	7	Loss of services Economic costs of recovery
Business District	East and West Village	Loss of places of employment Economic costs of recovery
Agricultural	Livestock and horses	Loss of services Loss of places of employment Economic costs of recovery
State Highway (46)	1	Loss of evacuation route Economic costs of recovery
US Highway 1	1	Loss of evacuation route Economic costs of recovery
Homes	Cambria Village	Structure loss Economic costs of recovery Endangerment of lives/need for evacuation

It is important to note that in addition to being assets at risk, roads and highways are also hazards. They introduce a possible source of wildfire ignition into the environment. Ignition causes include vehicle collisions and power lines brought down or coming into contact with trees and birds.

4.1. Critical Infrastructure

The critical infrastructure of a community provides the essential services that protect the economy security and health of a community. Critical infrastructure includes sources of water, food, communication and infrastructure.

Table 4.2– Critical Infrastructure in and around Cambria

Asset	Count	Consequences of loss/ compromise due to wildfire
Roads	N/A	Costs of recovery Endangerment of lives/ need for evacuation
Water Systems (sewer, pumping system, reservoirs)		
Cambria homes	4,941 homes	Structure loss Costs of recovery Endangerment of lives/ need for evacuation
Schools	7	Structure loss Loss of employment center Costs of recovery
Communications sites	Rocky Butte 5.6 Miles NE of Cambria	Loss of Major point of communications. Problems for response and recovery.
Hearst Ranch	National and State Historical Landmark	Economic impact by major loss of tourism, and state park natural habitat.
Cambria Hotels	29 hotels	Structure loss Loss of employment center Economic cost of loss of tourism Costs of recovery
Business District	N/A	Structure loss Loss of employment center Economic cost of loss of retail Costs of recovery
Public Parks		Loss of recreation facility Costs of recovery
Equestrian Staging	Covell Ranch	Loss of recreation facility Endangerment of animals and possibly people Costs of recovery
Trails	Fiscallini Ranch	Loss of recreation facility Costs of recovery Possible endangerment of hikers

4.2. Natural Assets

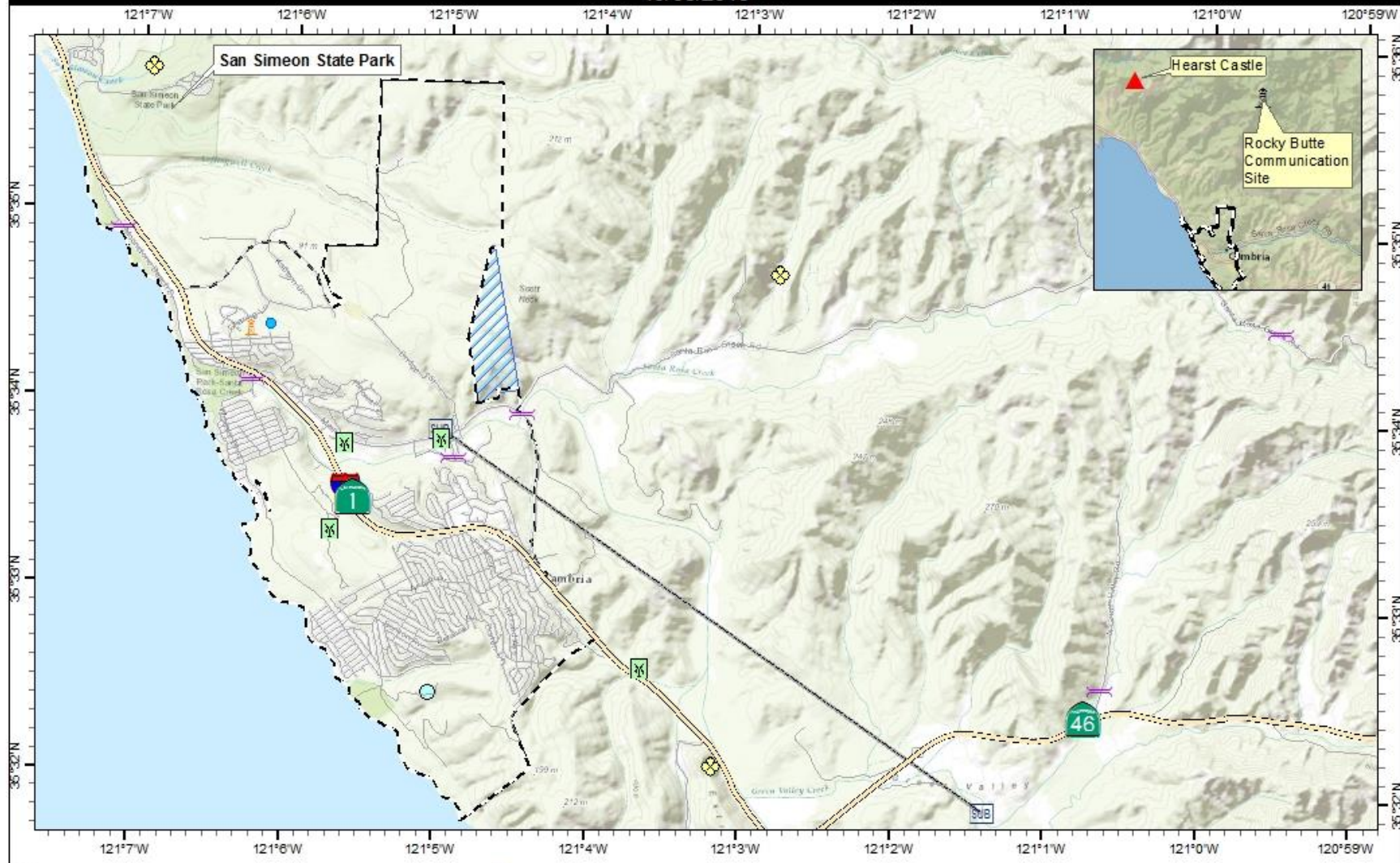
Cambria is designated critical habitat for California red-legged frog (CRLF), tidewater goby, and western snowy plover. The habitat type along Cambria Village area consists of primarily urbanized areas with a large area of pine woodland habitat (approximately 1,620 ac) supported by scattered shrub/chaparral areas (809 ac.) and riparian vegetation (100 ac.).

Table 4.3– Natural assets in and around Cambria

Asset	Consequences of Loss/Compromise Due to Wildfire
Hearst San Simeon State Park (San Simeon Cove)	Loss of habitat Loss of recreation Loss of economic income to community
Cambria on the Pines	Loss of habitat Loss of recreation Loss of economic income to community
Ranch Preserves: Fiscalini Ranch Preserve Kenneth S. Morris Rancho Marino Covell's Clydesdale Ranch Strawberry Canyon	Loss of habitat Loss of recreation Loss of economic income to community Loss of employment
Camp Sites: Camp Ocean Pines Camp Yeager	Loss of recreation Loss of economic income to community
Critical Habitat: CRLF Tidewater Goby Western Snowy Plover	Loss of habitat Possible loss of local species Loss of bird nesting sites
Oaks and other Native trees	Loss of bird/ owl habitat Possible loss of local species Decreased soil stability on slopes
Native Fauna	Possible loss of local species Loss of bird nesting sites Endangerment of animals- deer

Assets at Risk in Cambria Village

10/08/2015



- Cambria Village
- Bridges
- Cellular Sites
- CDFW Ownership (Santa Rosa Creek)
- State Highway
- Mines
- Camp Ocean Pines
- PG&E Transmission Line
- Roads
- Facilities
- Camp Yeager
- Substations

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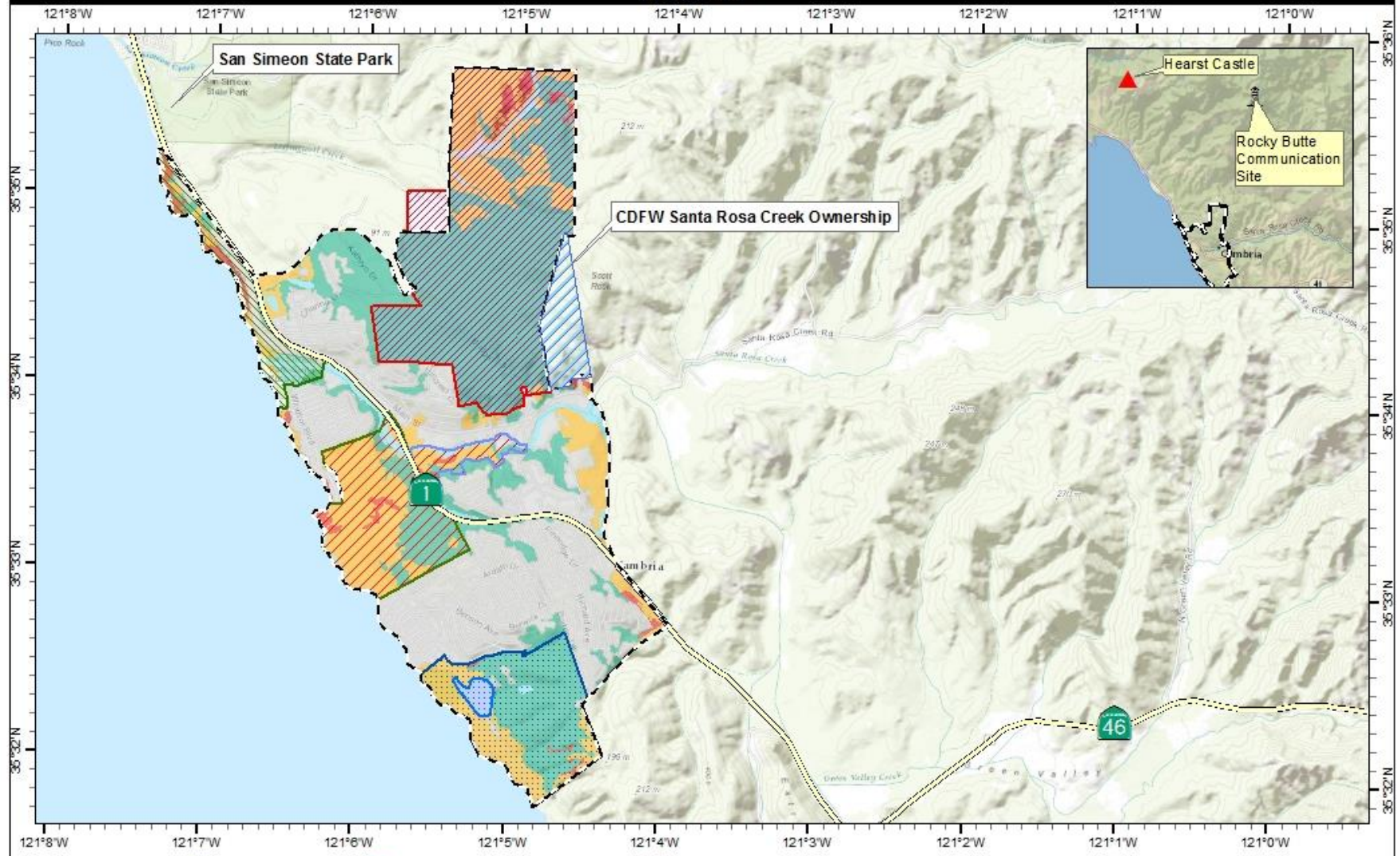


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Natural Assets at Risk in Cambria Village

10/08/2015



- | | | | |
|-----------------|-----------------------|----------------------------------|---------------------------|
| Cambria Village | Fiscalini Ranch East | Covell Clydesdale Ranch | Pine Woodland (1,616 ac) |
| State Highway | Strawberry Canyon | Kenneth S. Norris Marino Reserve | Riparian/Wetland (108 ac) |
| CDFW Ownership | Fiscalini Ranch West | Habitat Types | Scrub/Chaparral (88 ac) |
| Moonstone Beach | Open/Ag Land (802 ac) | Urban Area (1,265 ac) | |

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Miles 0 0.5 1 1.5 2 2.5 3 3.5



Chapter 5 - Prioritized Fuel Reduction

Fuel reduction strategies can be implemented in and around Cambria to minimize the wildfire hazard in the area. Cambria is designated as having a high fire hazard severity. However given the current condition of the fuels in and around Cambria, it is recommended that the community maintain a level of fire safety and hazard reduction conducive to that a Very High Fire hazard severity zone.

This section will cover the sociopolitical and biophysical aspects of fuel reduction in terms of prevention, mitigation, and preparation for the community of Cambria.

The following Fuel Reduction plans are discussed in this chapter

- Thinning of Native hazardous vegetation
- Shaded Fuel Breaks- Bridge Street, Covell Ranch
- Roadside Fuel Breaks- Highway 1
- Grazing
- Prescribed Burns

5.1. Hazardous Plants

The habitat type in Cambria Village study area consists of an urbanized area (1,265 ac) with scattered patchwork of landscaping, a large population of pine woodland habitat (approximately 1,616 ac), scattered shrub and chaparral populations (88 ac.), riparian/wetland vegetation (108 ac.), and a portion of agricultural/open land (802 ac.). The mosaic patchwork of landscaped settings within the urbanized and residential areas of Cambria Village includes native plants, ornamentals, and invasive species including eucalyptus trees, pampas grass patches, and several ice plant mats. The hazardous plants surrounding and within Cambria Village include portions of native and non-native plants within the pine woodlands, scrubs/chaparral, open/ag lands, and landscaped habitat areas. Some of the most common hazardous woodland species and scrub/chaparral species include the following: chamise (*Adenostoma fasciculatum*), coyote brush (*Baccharis pilularis*), buck brush (*Ceanothus cuneatus*), California sage (*Artemisia californica*), Himalayan blackberry (*Rubus armeniacus*), pine trees (*Pinus* sp.), and coast live oaks (*Quercus agrifolia*). The open/agricultural habitat areas also include hazardous non-native annual grasses including brome (*Brachypodium* sp.), soft chess (*Bromus hordeaceus*), wild oats (*Avena sativa*), common mustard (*Brassica rapa*), slim oat (*Avena barbata*), black mustard (*Brassica nigra*), Farmer's foxtail (*Hordeum murinum*), and rattlesnake grass (*Briza maxima*).



Figure 5.1- Hazardous plants common in Cambria, Left to Right- Chamise, Manzanita and Coyote Brush

5.1.1. Woodland Habitat

Community alliance and alliance codes used in this report follow A manual California vegetation, 2nd edition (Sawyer et. al. 2009). The dominating existing woodland habitat in Cambria Village is classified as a Monterey Pine Forest Alliance because over 25% cover in the tree layer consists of Monterey Pine trees (*Pinus radiata*). The native pine forest of Cambria Village is one of three native pine forests left on the U.S. mainland. The Cambria Village Monterey pine forest consists of highly uneven-aged structures including pine trees that have either reached or are nearing their normal life span of 80 to 100 years. Some areas of the pine stands support a dense understory dominated by coyote brush and chamise.

The old growth stands of Monterey pine trees are located along hill sides and residential neighborhoods of Cambria Village. These old growth pine stands are considered extremely hazardous in the case of fire ignition, evacuation, high winds, and the infectious tree disease, Pitch Canker. When a tree is hazardous because of structural weakness this poses a risk to civilians and fire fighters. Hazardous trees with structural weakness may result in the loss of evacuation routes, homes, or in some cases fatality of fire fighters/civilians. Trees infested with the drought driven bark beetle epidemic, dwarf mistletoe, western gall rust, invasive species, or with Pitch Canker, a disease that causes die-back of individual pine branches, may result in pre-mature deaths thus posing a risk to the 6,000 civilians of Cambria Village that reside within the infected pine stands. In addition to risks to the civilians, the mortality in the diseased forests also creates an extreme wildfire hazard.



Photo 1 – View south east along Cambria Pines Rd. displaying old growth pine tree stands. **10/06/2015**



Photo 2 –View east of a fallen pine tree blockin road in Cambria. **10/06/15**



Photo 3 –View south west of pine trees in close proximity supported by an understory of shrubs and non-native annual grasses. **10/06/2015**

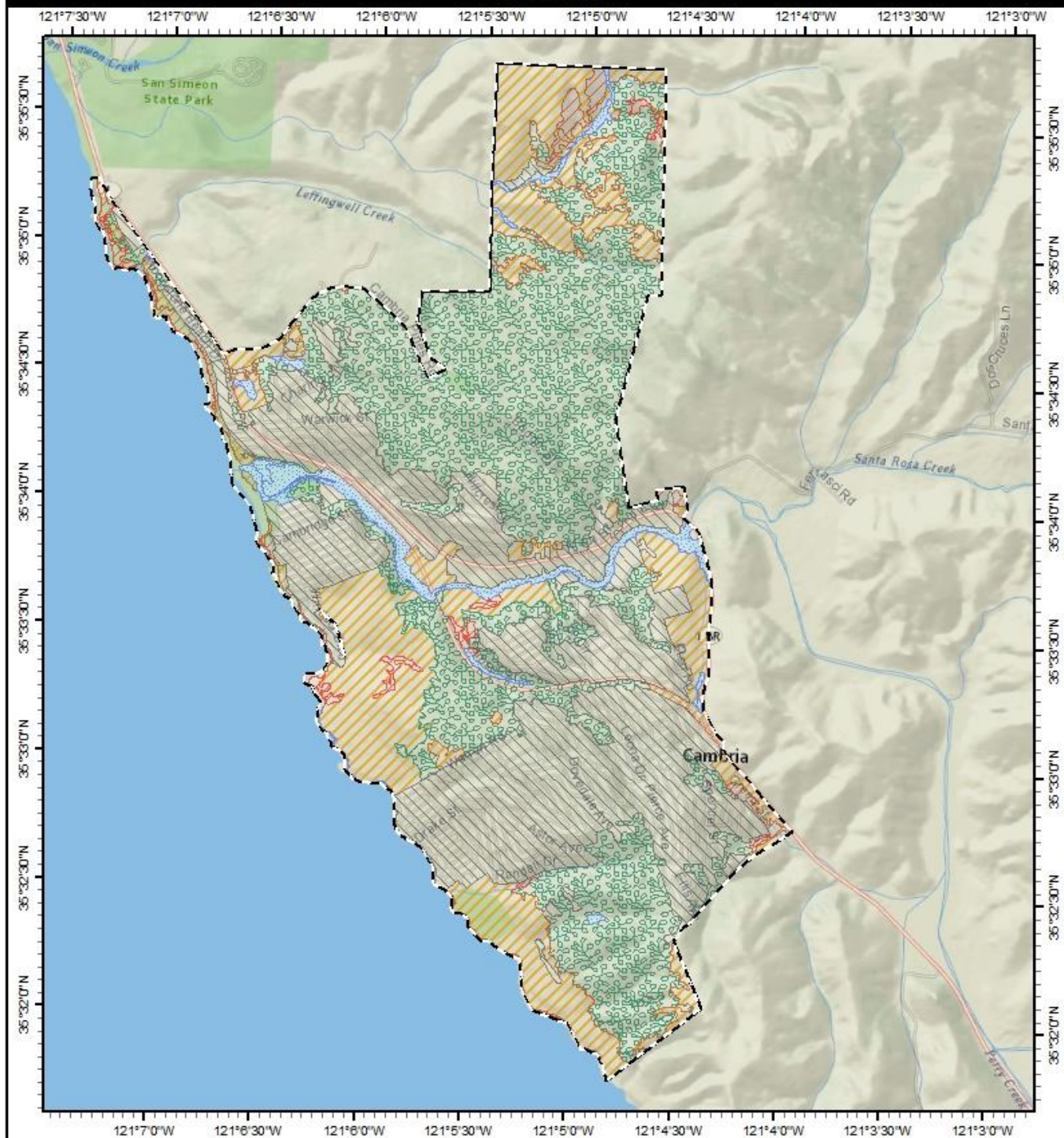


Photo 4 –View north east at a dense stand of Monterey pine trees. **10/06/2015**

Figure 5.2: Hazardous Pine trees in Cambria (Photographs taken 10/7/2015)

Habitat Types in Cambria Village

10/05/2015



- Cambria Village
- Habitat Types**
- Pine Woodland (1,616 ac)
- Riparian/Wetland (108 ac)
- Open/Ag Land (802 ac)
- Scrub/Chaparral (88 ac)
- Urban Area (1,265 ac)

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5.1.3. Ornamental vegetation

Cambria Village supports residential areas that consist of ornamental vegetation, some located directly adjacent to residential homes. Residents should avoid planting any flammable vegetation within the home ignition zone. These ornamental species may include:

- *Chamaerops humilis* (Mediterranean Fan Palm)
- *Cupressus sempervirens* (Italian Cypress)
- *P. dactylifera* (Date Palm)
- *P. reclinata* (Senegal Date Palm)
- *P. roebelenii* (Pygmy Date Palm)
- *Trachycarpus fortunei* (Windmill Palm)

Homeowners should remove all dead trees from property including dead palm fronds that contain older leaves which are extremely flammable; this requirement applies to palms within 100 feet of any structure or within 30 feet of a driveway or roadway.

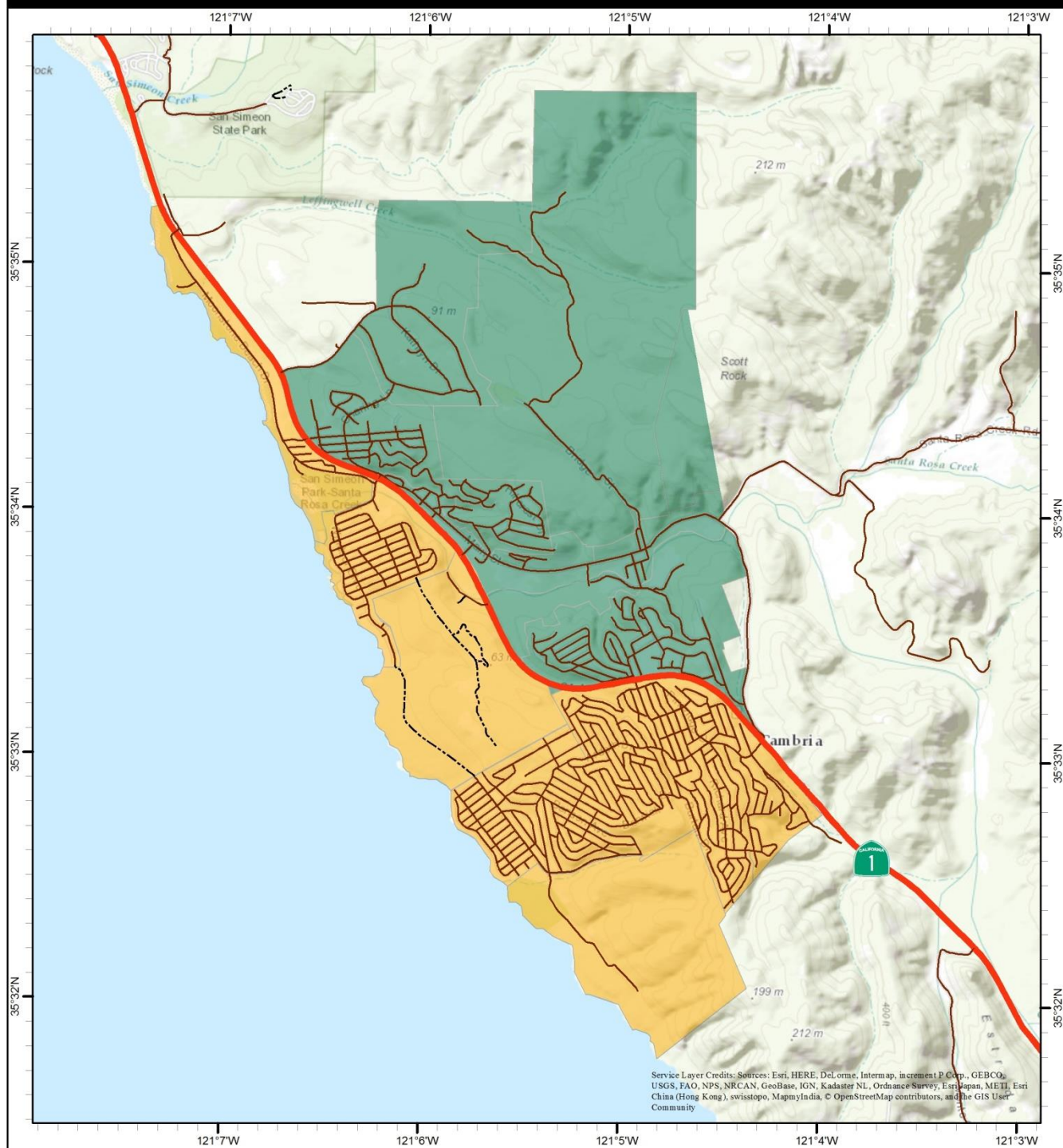
5.2. Fuels Modification

As Cambria is located in the Coastal Zone, limitations exist on the thinning or removal of trees. Therefore, a two part plan for vegetation management is being introduced to manage the hazardous fuels in Cambria.

- West of Highway 1- Forest health Green House Gas reduction
- East of Highway 1- Hazardous Fuels reduction- Forest Practices Act

Fuel Management Plans Cambria

09/16/2015



- Hazardous Fuel reduction- Forest Practices Act
- Forest Health- GHG reduction

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5.2.2. West of Highway 1- Forest health Green House Gas reduction

The area west of State Highway 1 in Cambria Village including Fiscalini Ranch, Rancho Morino, and Strawberry Canyon area is within the Coastal Zone and is designated Coastal Commission Special Treatment Area. Any forest production activities will adhere to additional requirements for resource protection per Article 11 of the FPRs during all phases of any forest operations. Tree removal outside authority of CA Forest Practice Act Timber Harvest Plans requires compliance with Coastal Zone regulations for vegetation removal and treatment methods.

From a forest health perspective, the removal of dead, dying, and diseased trees will improve forest health and resilience, reduce fire hazards and health risk, reduce pest infestation, and improve tree growth while utilizing as much biomass as possible for wood products that sequesters carbon. Removing nuisance trees will reduce disease, improve forest health, and allow new growth to occur. Removing trees from residential areas that are dying or diseased will reduce risks of damaging or losing infrastructures and/or public access.

Trees removed from Coastal Commission Special Treatment Areas will be taken to the green waste disposal site located in Cambria. Green waste disposal sites include the natural biological breakdown of organic material such as yard waste and wood scraps. This process reduces greenhouse gas emissions by allowing the carbon contained in the organic matter to remain in the compost rather than releasing into the atmosphere.

5.2.3. East of Highway 1- Hazardous Fuel reduction- Forest Practices Act

The area East of State Highway 1 in Cambria includes the Covell Ranch property, and land owned by the California Department of Fish and Wildlife and the California Parks and Recreation Department. In this area there is also a Monterey Pine Coastal Pitch Canker Zone of Infestation.

The areas East of Highway 1 in the Pitch Canker Zone of Infestation are required to comply with Public Resources Code Section 4712 through 4718. The objective for fuels management on the Eastern side of Highway 1 is to enhance and protect the forest whilst reducing Greenhouse Gas emissions.

The Cambria stand of native Monterey Pine is on the world list of endangered forests. The highly uneven-aged stand is in very poor condition with a drought driven bark beetle epidemic and areas of Pitch Canker infestation which only worsen with the continuing drought. Selective removal of dead, infected, and infested trees compliant with landowner and lease easements will improve overall forest health. A small percentage of woody material will remain onsite after tree removal for natural decomposition or pile burning. Tree removal conducted on the East side of State Highway One will be used for commercial thinning to reduce hazardous fuel, improve forest health, and stimulate wood growth to sequester carbon. Commercial thinning performed on Covell Ranch will include a portable sawmill that accepts logs and woody debris for further treatment including milling dimensional lumber, fuel pellet production, milling and treating pine fence post, composting/mulching, and shaved wood bedding for local livestock use.

The wood products of timber production can help to sequester carbon as by salvaging the wood rather than wasting it reduces the GHG emissions caused by decomposition. Wood products such as furniture and construction materials can last decades or more.

5.2.3.1. Thinning and Pruning

It is recommended that the hazardous natural vegetation across the East side of Cambria be thinned and pruned to reduce horizontal and vertical continuity.

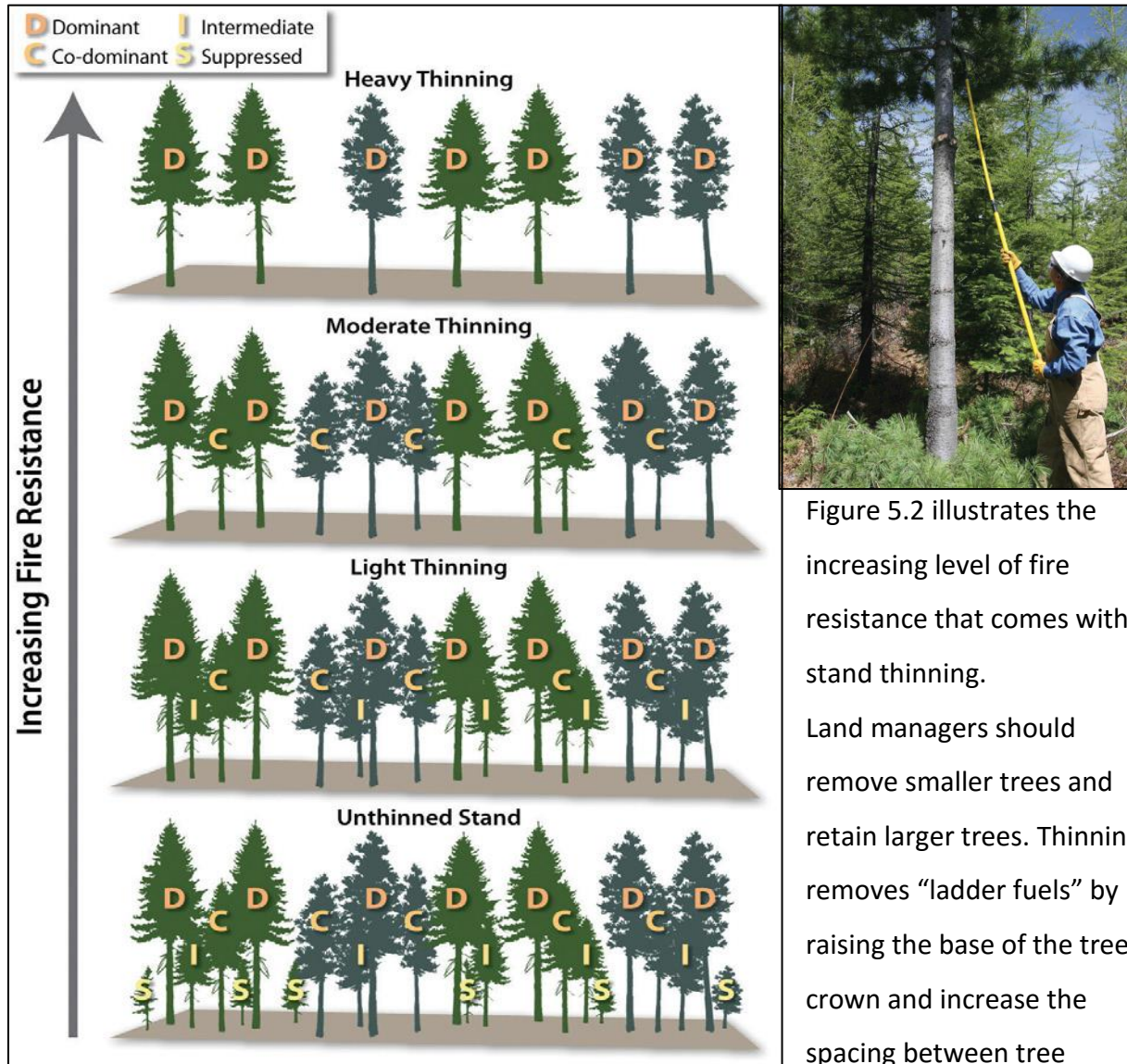


Figure 5.3- Levels of fire resistance achieved with varied intensity of stand thinning (Pacific North West Extension, 2010)

In addition to reducing the fire hazard in the tree stand. Thinning also has multiple benefits including increasing individual tree vigor, improving resistance to insects, disease and drought, and creating commercial timber.

Timing is an important consideration when thinning or pruning vegetation. Avoid thinning pines species from Winter to Mid-July, as the slash can provide breeding material for ips bark beetles which can attack healthy trees (Pacific North West Extension, 2010).

5.2.3.2. Creating Shaded Fuel Breaks

Localized thinning of tree stands can be used to create a shaded fuel break. Shaded fuel breaks are an easy way for developers to break up the continuity of the fuels in the area (Figure 5.4.). Shaded fuel breaks can also be multi-functional, providing recreational benefits including equestrian paths, hiking trails and bike paths. Shaded fuel breaks improve the health of the trees by reducing the likelihood of disease, insect damage and over competition.



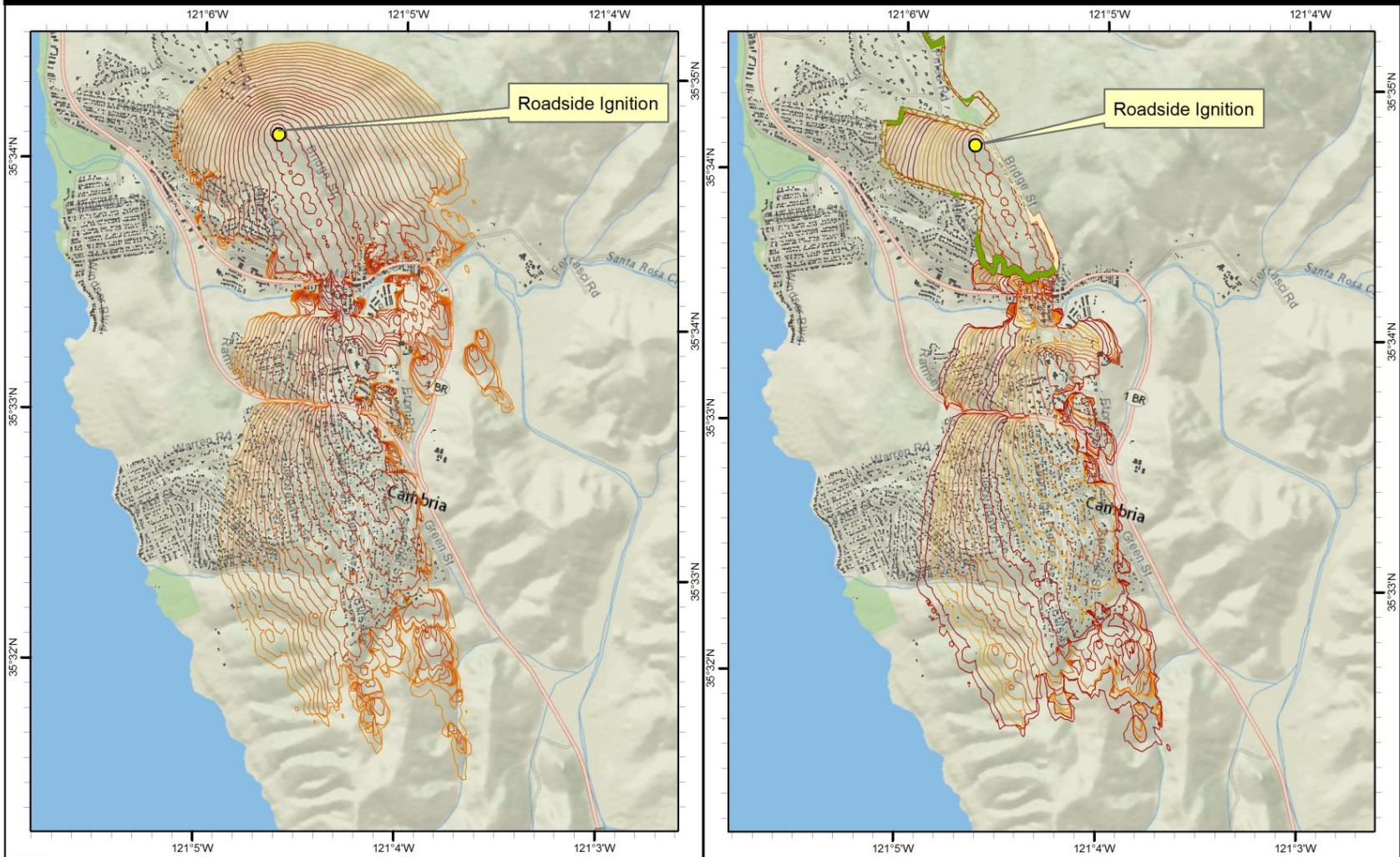
Figure 5.4.- Before (left) and after creation of shaded fuel break (right) - extracted and edited from (Natural Texas, 2015)

10/08/2015



Potential Impact of Bridge Street Fuel Reduction on Fire Behavior

10/8/2015



- Proposed Bridge Street Fuel break
- Proposed Defensible Space Fuel reduction Zone
- Completed Bridge Street Fuel Break
- Completed Defensible Space Fuel Reduction Zone

48 hour burn under Normal conditions (left) and Extreme conditions (right).
 Normal fire conditions: NNW wind 20mph
 Urban Fuel Models changed to represent vegetation in Home Ignition Zone.
 Models are for reference of possible fire spread only and do not represent
 likelihood of structure loss.

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5.2.4. Management Implications

The fire model of the potential impact of fuel modifications on fire behavior indicates that under NNW conditions, the defensible space fuel reduction zone is successful in reducing the impact of the fire on the Pine Knolls, Happy Hill and Liemert communities (p.46). However, the Southern portion of the fuel break fails to protect the Southern portion of Cambria from fire in the simulation. This could be due to the fuel type and topography in the area, it is recommended that the proposed fuel break be widened to 1.5 times the height of the pine stand to maximize the potential impact of the fuel break.

5.3. Infrastructure Hazard reduction

5.3.1. Plants and Powerlines

Trees that grow near power lines pose a potential electrical hazard. It is recommended that no tree be allowed to grow within 10 feet of electrical conductors. Pacific Gas & Electric (PG&E) is required by law to maintain minimum clearances between all vegetation and power lines. Information regarding PG&E Vegetation Management, can be found at <http://www.pge.com/en/safety/diggingyard/powerline/index.page>.

5.3.2. Roadside Fuel Breaks

Roadside fuelbreaks can reduce the risk of roadside ignitions spreading to nearby communities, forests and critical infrastructure sites. The hazard assessment identified a potential source of ignition along the Fiscilini Ranch portion of Highway 1. Due to transient activity and encampments, there is an increased risk of human caused ignition along Highway 1. It is recommended that roadside shaded fuel breaks be created along Highway 1 in these areas.

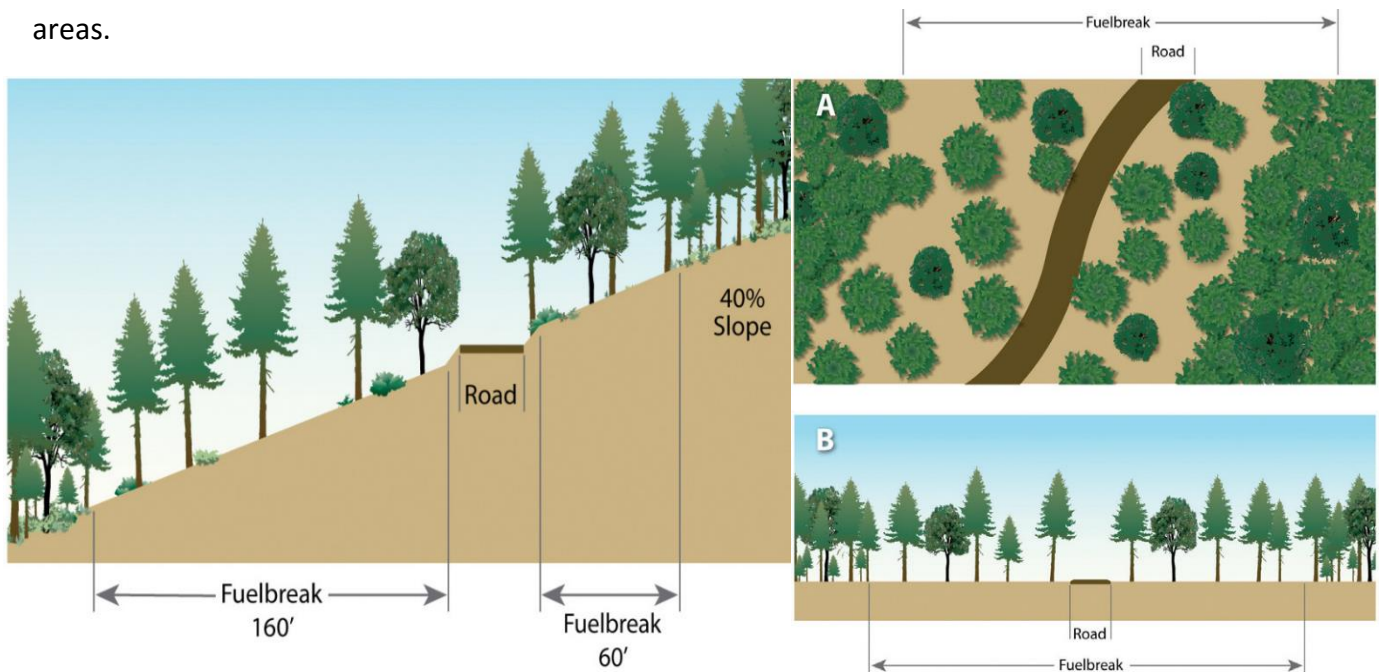


Figure 5.5- Roadside fuel breaks on slopes and flat ground using thinning techniques (Pacific North West Extension, 2010)

Proposed Roadside Fuel Break

10/08/2015



Proposed Roadside Fuel break

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, GeoMapping, AeroGRID, IGN, IGR, swisstopo, and the GIS User Community

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0.5 Miles



5.4. Long Term Fuels Reduction

Once the proposed fuels management has been undertaken, the following long term fuels management strategies are suggested

- Prescribed Burning
- Open Space Grazing

5.4.1. Prescribed Burning

Prescribed burning can be used to reduce fuel load and fire hazard in wildfire prone areas. Once the dense dry understory has been thinned and all dead or dying trees have been removed, it is suggested to use prescribed burning as a method of wildfire suppression during safe conditions. Prescribed burning can keep dry hazardous fuels under control and support healthy fire ecology in the forest.

5.4.2. Open Space Grazing

In the Hazard assessment, many dry grasses and shrubs were located throughout Cambria. Grazing can help to keep annual grasses down and helping to prevent wildfire from spreading into the community. In community open space, it is recommended that grazing be implemented to minimize fire hazard. Grazing can reduce the fire hazard in the following ways:

- Reduces the potential flame length of a fire
- Reduces potential fire intensity
- Reduces potential fire extent
- Reduces accumulation of plant litter (Figure 5.6)
- Reduces fuel load (Figure 5.7)



Figure 5.6- Effect of grazing on plant litter and dead plant material. Left- Un-grazed, Right- Grazed. Adapted from (Davies et al, 2009)



Figure 5.7- Effect of grazing on Fuel Load. Left- Un-grazed, Right- Grazed. Adapted from (Davies et al, 2009)

Chapter 6 – Community Wide Preparedness

6.1. Structural Mitigation

It is the responsibility of the homeowner to make sure all new structures are in accordance with CA. health and Safety Codes as well as State Building and Fire Codes set forth by the State Fire Marshall. It is also recommended that homeowners consider the following preparedness measures

- Installation of fire sprinklers on property
- Maintenance of roofing and siding materials
- Removal or replacements of hazardous materials such as wood shake shingle roofing or siding.
- Replacement of single pane windows with double pane
- Maintaining effective defensible space
- Maintaining property hygiene i.e. removal of litter, clutter and flammable materials (including patio furniture) within the home ignition zone.

For more information on the Home Ignition Zone and how to maintain effective defensible space, please refer to the San Luis Obispo Countywide CWPP, or visit

<http://www.firewise.org/wildfire-preparedness.aspx>

6.2. Hazard Reduction

6.2.1. Mechanical Equipment

The use of mechanical equipment can present an ignition hazard. The following mechanical equipment should be limited seasonally to correspond with changing fire hazard,

- Lawnmowers
- Chain saws
- Weed whackers
- Power saws

6.2.2. Human Activity and Accident Deterrents

Human activity is the greatest source of fire hazard in California. These activities include arson, use of illegal fireworks, mechanized equipment, campfires, cigarettes and smoking, or other human accidents. It is recommended that Cambria use signs and educational outreach to all residents and visitors while enforcing penalties for hazardous activities.

As Cambria is a popular tourist destination outside and during the fire season. Materials should be distributed in campsites, hotels and national parks to educate tourists who may not be familiar with wildfire how to prevent ignitions.

Chapter 7 - Fire Response

7.1. Fire Resources

There are two fire stations within the Cambria Village Community (p.55).

- Fire Station #10 is located at 6126 Coventry Lane, approximately 0.3 miles (two minutes) from the nearest entrance to the community.
- Cambria Fire Department is located at 2850 Burton Drive, approximately 0.2 miles (one minute) from the nearest entrance to the community.

7.2 Water Resources

In the instance of a wildfire in Cambria, suppression actions must be taken while the fire is still small. This requires a local and reliable water supply that is unaffected by power loss. Existing water resources in the area consist primarily of livestock and agricultural irrigation reservoirs located directly south east of Health Lane, west of State Highway 1 in Cambria Village. The Santa Rosa Creek a creek flowing east to west and fed by intermittent streams and rainfall is the main tributary to the Santa Rosa Creek Natural Preserve, a natural water body west of State Highway 1. Lake Nacimiento is located approximately 13 miles north east of Cambria Village. Existing water resources have been identified on p 55.

7.3. Evacuation

All homeowners should be given materials on evacuation routes and safety zones. It is important to put materials in a format which homeowners will find accessible during a wildfire. In addition to the distributed pamphlets, this CWPP suggests that the following items could be given out at local fire safety events:

- Map printed on free fridge magnets
- Map printed on Mouse pad
- Map printed on coffee mug

Evacuation maps could also be put in all local publications, i.e on the back page of the news paper

7.3.1. Ingress and Egress

An area of particular concern in Cambria for evacuation is the Lodge Hill and Marine Terrace communities. The map on p. 55 shows the Key evacuation routes in the community; during an evacuation these roads may become congested or blocked due to traffic or other hazards such as falling trees and powerlines. It is therefore recommended that the preparedness education materials emphasize a “Be prepared, leave early” strategy. Under this strategy the homeowners of Cambria will be ready to evacuate early, with knowledge of multiple evacuation routes if possible. Where evacuation routes are limited, this CWPP recommends that the construction of alternative evacuation routes be considered.

7.3.2. Exercises

It is recommended that the community of Cambria conduct annual voluntary exercises to prepare residents for the process of evacuation and to inform planners and safety personnel of potential congestion points and problem areas.

7.3.3. Elderly and Disabled Residents

The community of Cambria should prepare a voluntary database of residents requiring assistance during an evacuation. Able residents could also be encouraged to volunteer to evacuate an elderly or disabled neighbor in the event of a wildfire. In this instance it would be necessary to have the resident alert the emergency services that that person has been evacuated.

7.3.4. Livestock and Horses

Provisions should be made for the evacuation of livestock and horses during a wildfire event. Residents should be encouraged to make plans for this prior to an evacuation.

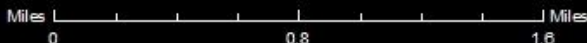
Fire Protection Resources in Cambria Village

10/08/2015



- Cambria Village Highway 1 ● Potential Water Sources
- Roads ● Fire Stations Evacuation Roads

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Chapter 8: Recovery Measures

8.1. Key Recommendations

This CWPP makes the following recommendations for recovery in the instance of a catastrophic wildfire in the Eagle Ranch:

- All rebuilt structures must be built according to the WUI building code
- If not already designated as Very High Fire Hazard, this must be implemented in the instance of a wildfire event.

8.2. Multiple Hazards

In the event of a fire in the Cambria there is a high risk of other hazards. Planning must account for the possibility that these hazards may occur at the same time. Cascading hazards can result in loss of evacuation routes, communications, or over stretching of response agencies. Hazards to consider include:

- Erosion and landslides– Once vegetation is lost, the soil loses stability. Replanting of native vegetation can reduce the risk of landslides. This is particularly important on the slopes around key evacuation routes such as Ardath and Highway 1.
- Flooding - Flash flooding is a possible hazard after a wildfire event. Replanting of vegetation can also mitigate flooding.
- Critical infrastructure loss- High voltage power lines and communication sites should have emergency action plans in case of fire.
- Planning for temporary communication sites should be conducted.
- During the incident power lines should be de-energized in order to prevent short circuits and failure of the power grid.

8.3. Community Recovery

After a catastrophic wildfire, there can be lasting negative impacts on residents and landowners. It is important to pre-plan for the recovery of normalcy within the community. The following factors should be considered in the pre-planning of social post disaster recovery:

- Re-construction of burned or damaged homes to the highest Wildland Urban Interface construction codes
- Designation of burned area to very High Fire Severity Zone
- Financial assistance for impacted residents
- Alternative locations for schools and care homes
- Alternative power and water supplies for residents

For additional information on planning for community recovery through all stages of the incident, before during and after the fire, please refer to the San Luis Obispo Countywide CWPP.

Chapter 9 – Final Recommendations

9.1 Recommendations for Fuel Reduction

- Completion of defensible space fuel reduction zone on East side of Highway 1
- Completion of Bridge Street Fuel Break on East side of Highway 1
- Widening shaded fuel breaks to 1.5 times the height of the surrounding Pine stand
- Roadside shaded fuel break along Fiscallini portion of Highway 1 to reduce the Hazard posed by encampments on roadside
- Removal of ‘nuisance’ trees from residential areas across Cambria
- Removal of all dead vegetation and pine trees across Cambria
- Thinning of native Monterey Pine stands throughout Covell ranch
- Long term grazing and prescribed burns to combat hazardous fuel growth including annual grasses and dry shrubs.

9.2 Recommendations for Reducing Structural Ignitability

- All homes must comply with defensible space policy
- Fire resistant vegetation should be used within the home ignition zone
- All dead trees must be removed from the home ignition zone
- Homeowners should maintain property hygiene by removing leaf litter, flammable furniture, and maintaining roofing and siding
- Homeowners should try to replace flammable roofing and siding where possible

9.3 Recommendations for community Management

- Community outreach: Distribution of materials, education and training
- Annual voluntary evacuation exercises to improve homeowner cooperation during incident and efficacy of evacuation
- Hosting of fire safety fairs to disseminate information and distribute educational materials.
- Evacuation materials distributed to tourists to reduce accidental ignitions

9.4 Recommendations for Critical Infrastructure

- High voltage power lines and communication sites should have emergency action plans in case of a fire.
- Planning for temporary communication sites should be conducted.
- During the incident power lines should be de-energized in order to prevent short circuits and failure of the power grid.
- The recovery of critical infrastructure should be a high priority in post-fire recovery.
- All critical Infrastructure should have appropriate fuel management plans to avoid loss in a wildfire event.
- The construction of alternative routes of evacuation should be considered in the Ardath/ Lodge hill areas to reduce the risk of compromised egress during an evacuation.
- Dead or dying trees should be removed along all roadways to reduce the possibility of trees falling and blocking roadways.

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