The Mt. Pinos
Communities Wildfire Protection Plan

Created by
HangFire Environmental
for the
Mt. Pinos Communities Fire Safe Council
and the citizens they strive to protect.
December 2006

This Plan was provided by funding by the National Fire Plan from the Bureau of Land Management through the California Fire Safe Council.

Dedication

This Fire Safe Plan is dedicated to the men and women of the fire agencies throughout the Mt. Pinos Communities that constantly place themselves in harms way for the protection of life, property, and natural resources.

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Community Wildfire Protection Plan Certification and Agreement

The Community Wildfire Protection Plan developed for the Mt. Pinos Communities:

Was collaboratively developed under contract by the Mt. Pinos Communities Fire Safe Council. The council is a partnership of the communities within the Mt Pinos study area. Members of the council include representatives of Kern County Fire Department, USDA Forest Service-Los Padres National Forest, USDI Bureau of Land Management and Ventura County Fire Department

This plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect the communities within the Mt Pinos study area.

This plan recommends measures to reduce the ignitability of structures throughout the area addressed by the plan.

The following entities attest that the standards listed above have been met and mutually agree with the contents of the Community Wildfire Protection Plan:

_____
Janine Tominaga, President
Mt. Pinos Communities Fire Safe Council

_____
Thomas A. Kuekes, Mt. Pinos District Ranger
USDA Forest Service, Los Padres National Forest

_____
Dennis Thompson, Fire Chief
Kern County Fire Department

_____
Patty Gradek, Acting Field Manager
Bureau of Land Management

_____
Bob Roper, Fire Chief
Ventura County Fire Department

Acknowledgments

The author would like to acknowledge the following people who contributed significantly to the creation of this plan. Denise and Breanna Walsh, my family for their patience, understanding and final editing.

Members of the Kern County Fire Department were instrumental to the completion of this plan. Battalion Chief Ken Stevens shared his intimate knowledge of the Mt Pinos study area and answered countless emails. His commitment to the protection of the Mt. Pinos Communities should be commended. Fire Captain John Smith spent countless hours of time working on this plan both from inside the office and more importantly, in the field. He provided information concerning the Kern County Fire Department, resource capabilities, and active forest management ideas. Fire Captain Chuck Dickson met several requests for data and always provided them in a timely manner. Lastly, many of the photographs found in the plan would not have been possible without a flight. Kern County Fire Department Air Operations Pilot Scott Beck provided the flight for the aerial photographs in Helicopter 408.

Matt Pontes from the Kern County Parks Department shared his pictures and expertise.

District Ranger Thomas Kuekes and Division Chief Marc Nelson from the Los Padres National Forest provided information about the Forest Service (USFS). Robert Rivelle and Chris Clervi provided USFS data for proposed and completed fuel management projects.

The Mt. Pinos Communities Fire Safe Council (MPCFSC), for understanding the risk of living with wildfire and taking the proactive step of creating a community wildfire protection plan.

For those that I forgot to mention, I am sorry.

Timothy P. Walsh

Executive Summary

The wildland fire scenario waiting to occur in the Mt. Pinos Communities may be catastrophic! All of the components necessary for one or more communities to suffer a large damaging wildfire are in place. Several communities are positioned upslope from high population areas that experience wildland fires. The Mt. Pinos Communities are isolated from a rapid wildland fire response from fire engines and other fire suppression resources outside of the area due to the steep grades found on Interstate 5 and the Frazier Mountain Park Road. Fuel loading or vegetation is extremely high. This fuel loading will feed a fire that will burn into one or more communities taxing fire suppression resources beyond their capabilities. Many roads are dead ends making evacuation difficult or impossible while fire engines try to make access into the communities to protect structures. Most structures are made of combustible wood that will ignite adding more fuel to the conflagration.

The goals of the community wildfire protection plan are to survey the homeowners to query what is understood about the fire problem and possible solutions. It will also assess the hazards found in the communities and list possible solutions.

Solutions are not simple, quick, or cost effective! Homes must be made fire resistive or the fuel must be modified. Obviously, the later is the only realistic solution! It is up to the communities, Kern County Fire Department, Forest Service, Ventura County Fire Department and other stakeholders to implement the fuel reduction projects in this plan that will increase the communities' odds of surviving a wildfire.

Introduction-Project Background and Scope:

The Mt. Pinos Communities Fire Safe Council (MPCFSC) under the National Fire Plan received a grant from the Bureau of Land Management through the California Fire Safe Council. The focus of this grant is to assess the wildfire risk to the Mt. Pinos Communities and propose possible remedies to lessen the impact of the inevitable fire. The goals of the grant include:

- Collate existing information about high-priority hazards, risks and values in the Mt. Pinos Communities using maps, narratives and fire history.
- Conduct market research to identify community awareness levels and the potential community support or opposition for fuel reduction projects.
- Prepare a community wildfire protection plan that includes educational methods and fuel management projects that would be most effective. The plan should be in a format that is easy to update and use.
- Identify future funding sources for plan implementation.

HangFire Environmental

Figure 1: Tim Walsh

Timothy Walsh was hired to meet the goals of the grant and write the Mt. Pinos Communities Wildfire Protection Plan. As the Principal Analyst for HangFire Environmental, Timothy is a 23-year veteran of the fire service and is a handcrew superintendent with the Marin County Fire Department.

Prior to his employment with Marin County, Captain Walsh has served as a firefighter, helitack firefighter, fire apparatus engineer, fire captain, fire captain specialist, and battalion chief with the California Department of Forestry and Fire Protection (CDF).

Captain Walsh has the unique background of serving on both a CDF Incident Command Team as a Geographic Information Systems Technical Specialist and on a Forest Service Type I Incident Management Team as a Fire Behavior Analyst. This background has provided Captain Walsh the opportunity to perform analysis on wildfires in California, Nevada, Oregon, Idaho, Montana, Colorado, Wyoming, South Dakota, New Mexico, and Tennessee. He was also utilized at the Pentagon during the September 11, 2001 tragedy providing analysis and detailed maps for the Urban Search and Rescue Teams, the FBI, and others.

Captain Walsh's work has been featured in USA Today, the New York Times, the San Diego Union Tribune, and the Marin Independent Journal. He has contributed chapters in the books Disaster Response-GIS for Public Safety and Confronting Catastrophe-A GIS Handbook.

The Study Area

The Mt. Pinos fire safe study area is located in Kern, Ventura, and Los Angeles Counties within the state of California (Map 1). It is nestled within the Los Padres National Forest one hour from both Bakersfield and Los Angeles. Elevations range from 1000 feet (305 meters) to over 8500 feet (2591 meters). The boundary of the study area was delineated by the Mt. Pinos Communities Fire Safe Council (Map 2) The following communities are within the MPCFSC:

Lebec
Los Padres Estates
Frazier Park
Lake of the Woods
Cuddy Valley
Pinon Pines
Pine Mountain Club
Lockwood Valley
Camp Scheideck/ Ozena Valley
Highway 33 Corridor

There are future plans for new communities with the study area. Along Interstate 5, the new community of Frazier Park Estates proposes approximately 750 new homes. Much of the area in the new development was burned during the Gorman Fire of 2005. Another proposed community in or near the study area is the Centennial development with approximately 23,000 homes built over 20 years. The Tejon Mountain Village Community would develop 3500 homes near the study area.

California Interstate 5 transects the study area and is a major thoroughfare with steep grades over the Grapevine. Due to the very steep grades found in the study area, many fires have been ignited by hot brakes and vehicle fires.

Due to the mountainous terrain with high elevations, summer high temperatures are moderated reaching the high eighty degree range in July and August. Due to the proximity of the Mojave Desert, the communities in the study area only receive 12-18 inches of precipitation annually.

Map 1: Study Area

Map 2: The Mt. Pinos Communities Fire Safe Council Communities

Motivation

Could a wildfire happen in the Mt. Pinos Communities? Up until this year, most residents lived in a sense of denial. The 2006 fire season posed several different threats to the communities within the study area. Fires, both natural and human caused burned several thousand acres and destroyed structures within the study area. On July 9th, the Arco Fire started on Interstate 5 and burned south of Digier Canyon.

On July 23th, a severe lightning storm moved over the study area that ignited numerous fires. Several of these fires were confined to a single tree but others grew large threatening communities within the study area. The fires burned a total of 3179 acres. One of the lightning fires, called the Scott Fire, burned up to the outskirts of Frazier Park. And the headlines read:

Frazier Park Residents Ready to Run

BY IAN HAMILTON, Californian staff writer
e-mail: ihamilton@bakersfield.com | Monday, Jul 24 2006 10:15 PM

Last Updated: Monday, Jul 24 2006 10:21 PM

"*FRAZIER PARK -- Andrea Knutson went to work despite the 600-acre fire burning near her home.*

PHOTOS:

Photo by Tim Kupsick

Kern County firefighters hike up toward Los Padres National Forest where more than 500 acres have been consumed near Scott Russell Road. The fire was sparked by a lighting strike early Sunday afternoon.

She wasn't taking any chances, however. She spent half of Monday morning choosing the items to stuff in her car in case the worst happened.

Firefighters worked through Monday night on the Scott fire burning north of Frazier Park. It's named after Scott Russell Road, located near the lightning strike that started the fire on Tecuya Ridge Sunday afternoon.

The fire was listed as No. 2 on the state's priority list of nine serious fires Monday, behind a 6,600-acre fire in San Diego County, according to Brian Marshall, deputy fire chief with the Kern County Fire Department.

While helicopters flew to over dump water onto the Scott fire, Stan Myers watched television and his grandson played in the yard. Myers lives less than a mile from the "trigger point," a spot where, if reached by the fire, would spark a voluntary evacuation of Frazier Park and its approximately 800 homes and businesses.

While watching TV, Myers also listened to fire crew activity on a scanner. His important documents and meaningful pictures were loaded in the car nearby. "I'm worried a little bit, but not too much," said Matt Verdon, whose home is in the northwest corner of Frazier Park near the trigger point. "Some people may think three-quarters of a mile is pretty close -- but not with these (firefighters)."

A fire line was created Monday morning about half a mile north of the trigger point to halt the advance of the blaze any farther south. Wind blew away from the homes and the south end of the fire is now less-threatening.

“The line at the south of the end of the fire is holding, which is one step toward containment," said Engineer Tony Diffenbaugh with the Kern County Fire Department.

The north end of the fire has received less attention and there is no word yet on when it is expected to be contained. As of 3 p.m. Monday, fire crews had achieved 15 percent containment. There is less danger to life or structures to the north of the fire, however, with miles of the Los Padres National Forest in that direction.

About 280 firefighters have battled the Scott fire, some working more than 24 hours straight, according to Diffenbaugh. There have been no injuries or structural damage.

In the past week, the Kern County Fire Department has responded to several hundred fires caused by lightning strikes. Fire crews performed some sort of suppression on 75 percent of these, Marshall said.

Some lightning strikes can be put out by heavy rain and light rain can usually hold one in check. Marshall said the weather responsible for these fires may continue through the weekend.

Three other lightning fires are burning in the Los Padres National Forest. Three of the four fires and any additional lightning strike fires in the immediate area will be handled from a command post inside Frazier Mountain High School.

Personnel from the county fire department, U.S. Forest Service, Ventura County Fire Department, California Highway Patrol and Kern County Sheriff's Department were helping."

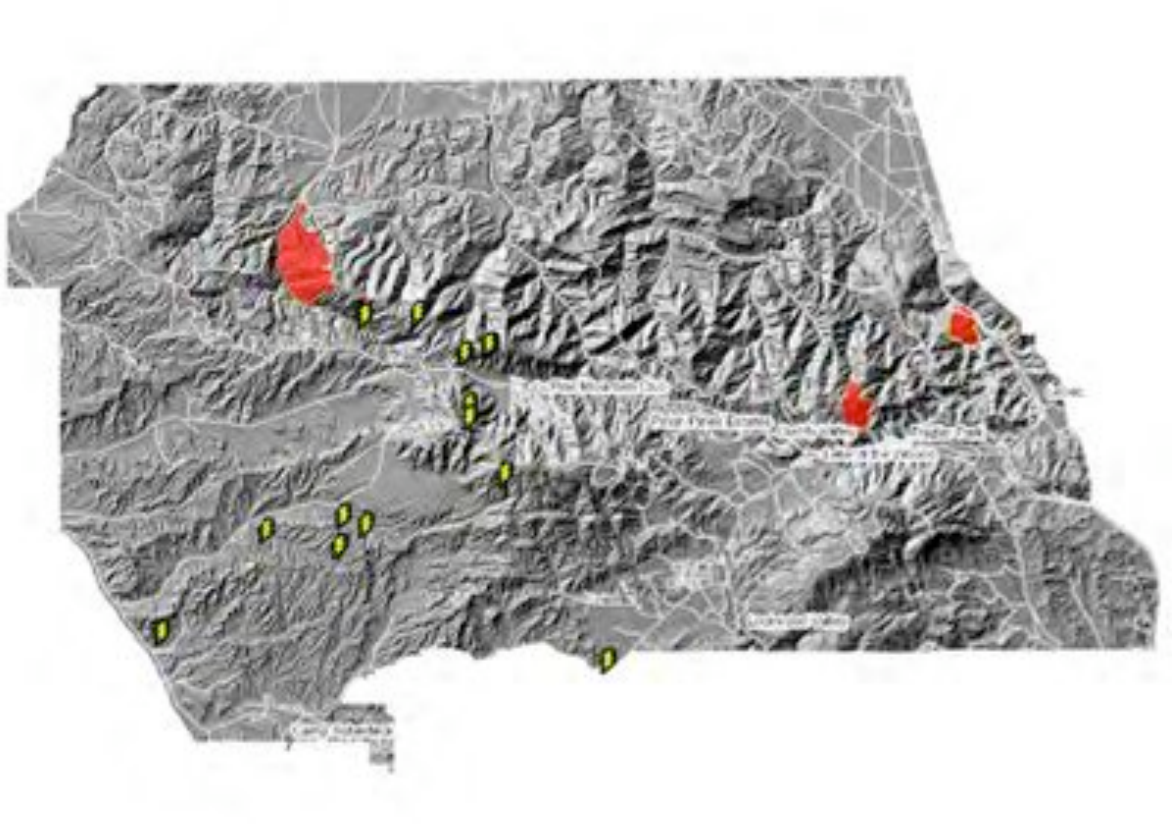
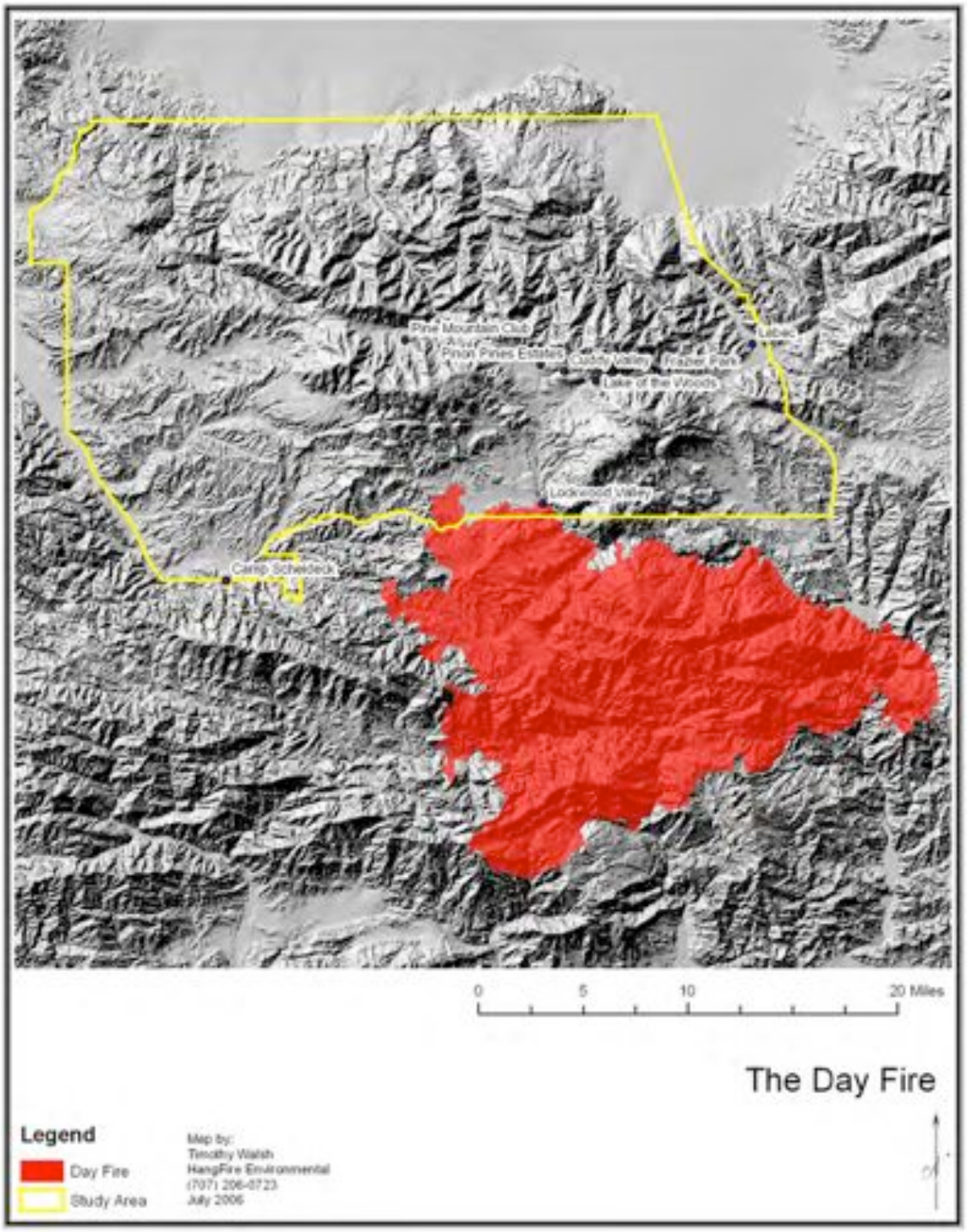


Figure 2: The lightning bolts indicate fires ignited by lightning. Most of these fires were small but two grew to considerable size. The fire seen to the west of Pine Mountain Club was named the Ridge Fire (2418 acres). The fire west of Frazier Park was the Scott Fire (736 acres). The fire north of Lebec was the Arco Fire (698 acres) that was not a lightning ignition. Under a different weather pattern, these fires could have destroyed many assets throughout the study area.

The final fire to threaten the communities burned the most acres, destroyed the most structures, and cost more than any other within the study area. The Day Fire burned 163,908 acres with a suppression cost to date estimated at 75 million dollars. At the height of the fire, there were over 4600 firefighters, 290 fire engines, and 100 handcrews assigned to the incident. The fire destroyed 11 structures, including two barns, three trailers, a cabin, and five vehicles in the Lockwood Valley area. Seven minor injuries were also reported. All of the communities within the study area were under various evacuation orders during the incident. Fortunately, most of the fire burned outside of the study area (Map 3).

Figure 3: The Day Fire burning within the Los Padres National Forest.

While these fires provided many nervous days for residents of the Mt. Pinos Communities, it should provide the needed motivation to prepare for future wildfires. Wildfires will continue to threaten and damage homes within the forest that surrounds the homes within the study area. The forest needs to be thinned of combustible vegetation, wood roofs need to be replaced, and defensible space needs to be around every structure. The time is now; don't let the motivation of the fire season fade from memory!



Map 3: The Day Fire seen in red is almost one half the size of the study area. It burned into the study area damaging structures in Lockwood Valley.

Land Use and Fire Protection Responsibilities

Figure 4: A chimney is the only piece of the home that remains after the Scout Fire that burned within the Los Padres National Forest July 2004.

Within the study area, there are several agencies responsible for fire protection but very few firefighting resources when compared to the number of homes and other improvements. When a fire threatens a community, firefighting resources are torn between protecting structures and controlling the fire. It is the ultimate Catch-22 where if engines are parked to protect structures, there are not enough resources to fight the fire. If firefighters commit to fighting the fire and keeping it small, fewer homes may be threatened but some homes may burn due to the lack of direct protection.

The study area is composed of large areas of public land (Map 4). The Forest Service Los Padres National Forest surrounds most the communities within their 208,374 acres found in the study area. The Forest Service is charged with fire protection and prevention for these lands but not the protection of structures. To compound the wildland fire issue relating to urban interface, the south and southeastern edge of Pine Mountain Club is bordered by the Chumash Wilderness. Although fuel reduction work can be done on wilderness lands, it is not an easy task. It depends on the type of project and the specific language in the particular act of Congress that authorized the particular wilderness.

The next largest holding of land within the study area is not publicly held but held by the Wildland Conservancy as the Wind Wolves Preserve. The Wind Wolves Preserve is the largest privately held preserve on the West Coast at 97,000 acres. Over 82,900 acres are found within the study area but currently closed for public use. According to the Wildland Conservancy's website, the land will soon open to the public on weekends for hiking, picnicking, and camping. This change may increase the opportunity for wildfire ignitions. The Kern County Fire Department is responsible for fire protection on these lands.

The Bureau of Land Management has islands of property within the Wildland Conservancy Preserve as well as to the west. They manage over 7,500 acres of real estate within the study area and provide fire protection for their lands.

In the northwestern corner of the study area is the United States Fish and Wildlife Service's Bittercreek National Wildlife Refuge. Purchased to protect dwindling California condor foraging and roosting habitat in 1985, the 14,097-acre refuge is the site where the last wild female condor was trapped in 1986. The refuge is

Map 4: Land Ownership within the Mt. Pinos Fire Safe Study Area

closed to the public reducing the opportunity for accidental fire ignition. This land is protected by the Forest Service-Los Padres National Forest.

The California Department of Parks and Recreation manages two parks within the study area, Ft. Tejon Historic State Park and Hungry Valley State Vehicular Recreation Area. At 17,028 acres Hungry Valley is the second largest unit of California State Park's Off-Highway Motor Vehicle Recreation Division. Hungry Valley offers over 130 miles of scenic trails for motorcycle, All-Terrain Vehicles (ATV), dune buggies, and 4x4 recreation. All vehicles are required to have a spark arrestor to reduce the opportunity for a wildland fire ignition. This land is under the protection of the Los Angeles, Ventura, and Kern County Fire Departments

Understanding of Fire's Role

Fire is a natural process. Its role as the forest burns is to reduce the overstocking of trees, eliminate some forms of pest and disease, and return nutrients and seeds into the soil. As settlers migrated and developed the region, the role of fire was considered dangerous and a suppress-all-fires attitude prevailed. Excluding wildfire may have lead to the build-up of vegetation that today fuels fires that are bigger, costlier, and more damaging. With the number of homes found in the Mt. Pinos Communities, it is inevitable that future wildfires will threaten or damage the life, health and property of the residents.

The purpose of this plan is to synergize the agencies and citizens of the Mt. Pinos Communities. The emphasis of the plan is to inform all citizens of the potential of wildland fires and the mitigation strategies that may be employed. Strategies to protect residents and property from the potential impacts of wildfire include construction of shaded fuel breaks, prescribed burns, public education to prevent unwanted fires, and focused enforcement of the fire codes and laws within the communities.

The Mt. Pinos Communities Wildfire Protection Plan is a recipe for making the communities safer from wildfire. The ingredients include an assessment of the landscape to define hazards and risk. Included with the assessment will be pre-suppression strategies to reduce the impacts of a wildfire.

Treatment measures or mitigation strategies are not always popular amongst citizens within a community. Some people do not want a fuelbreak in their backyard while others realize the benefit. Some people see a prescribed burn as a forest destroyed versus a forest renewed. Some people do not want to maintain a defensible space[1] around their dwelling while others realize that the

[1] Defensible space is defined as a perimeter of land reduced in vegetation to prevent fire from burning a home

odds of structure survivability increases significantly through this modest investment of time and money.

The next ingredient in the planning process is to define which pre-suppression strategies are understood and embraced by the citizens. A property owner's wildland fire safety questionnaire was written by the fire safe council and mailed to 1000 homeowners. The survey's focus is to assess what fire safe perceptions are held by the various communities and where public education may be needed prior to implementing a fuel reduction project.

Fire Safe Survey

The Mt. Pinos Communities Fire Safe Council mailed 1000 surveys to homeowners throughout the area. There were only 95 surveys or 9.5 percent returned providing a very a questionable picture of the perceptions and feelings concerning wildfires and prevention. The replies were entered into a database and answers were charted for easy interpretation. For many of the questions, the answer "maybe" was used when residents circled both "yes" and "no" on the survey.

Question One A:

Which of the following statements best describes your residential status?

Chart 1: Survey Question Number One A

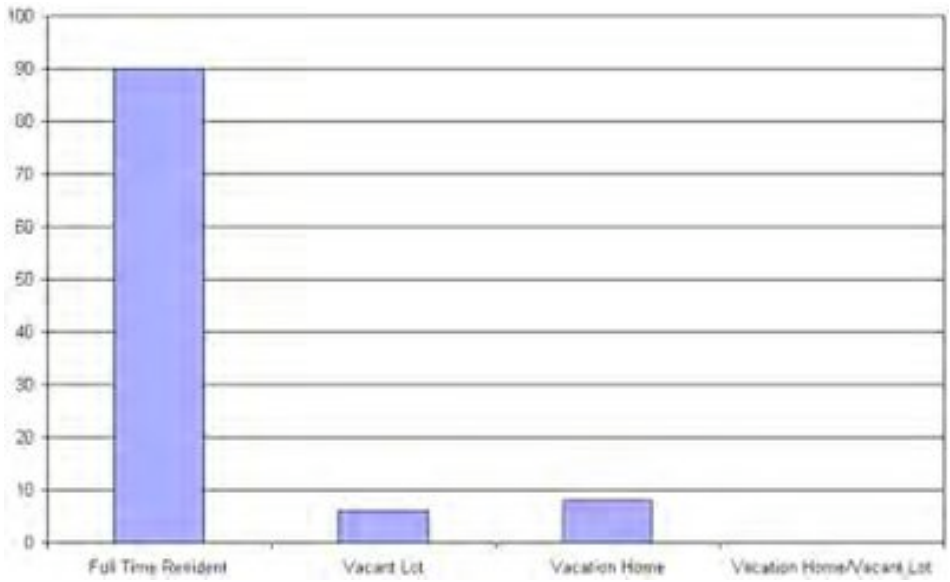


Table 1: Statistics for Question One A

Lot Status	Total	Percent
Full Time Resident	90	86.54
Vacant Lot	6	5.77
Vacation Home	8	5.77
Vacation Home/Vacant Lot	0	0.00
Grand Total	104	

It may be an important statistic to show how many homes are at risk by part time owners. Residency is very important during a wildfire. With 90 percent of the respondents stating that they are full time residents, evacuation may be a concern during a wildfire. This population may cause traffic congestion in the mountain communities with limited access in areas like Pine Mt. Club, Pinon Pines, and Frazier Park. Although not a safe practice, many people do not evacuate even when ordered to. Many of these homeowners provide structure protection by removing stacked firewood next to homes and putting out small fires on or under their decks with garden hoses. This can only be accomplished if the residents are home!

Question One B:

What community do you reside in?

Chart 2: Survey Question Number One B

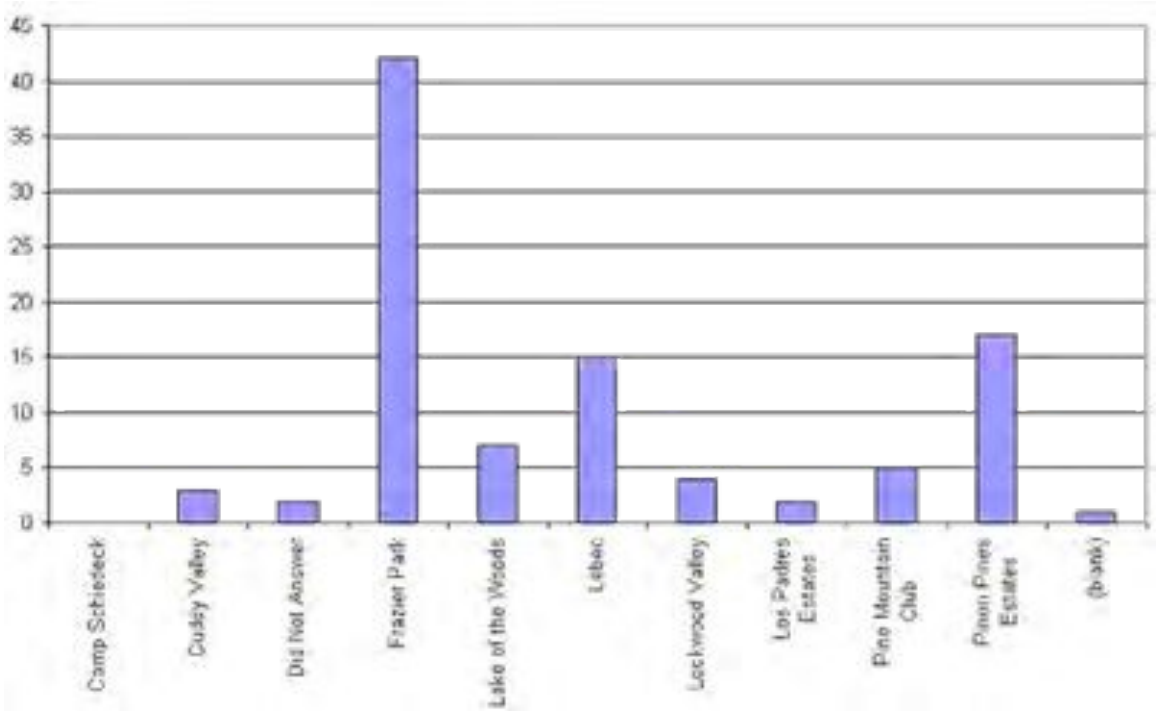


Table 2: Statistics for Question One B

Lot Status	Total	Percent
Camp Scheideck	0	0.00
Cuddy Valley	3	3.06
Did Not Answer	2	2.04
Frazier Park	42	42.86
Lake of the Woods	7	7.14
Lebec	15	15.31
Lockwood Valley	4	4.08
Los Padres Estates	2	2.04
Pine Mountain Club	5	5.10
Pinon Pines Estates	17	17.35

Question Two:

If the fire safe council wanted to publicize fire information, where would you most likely see or hear the information?

Chart 3: Survey Question Number Two

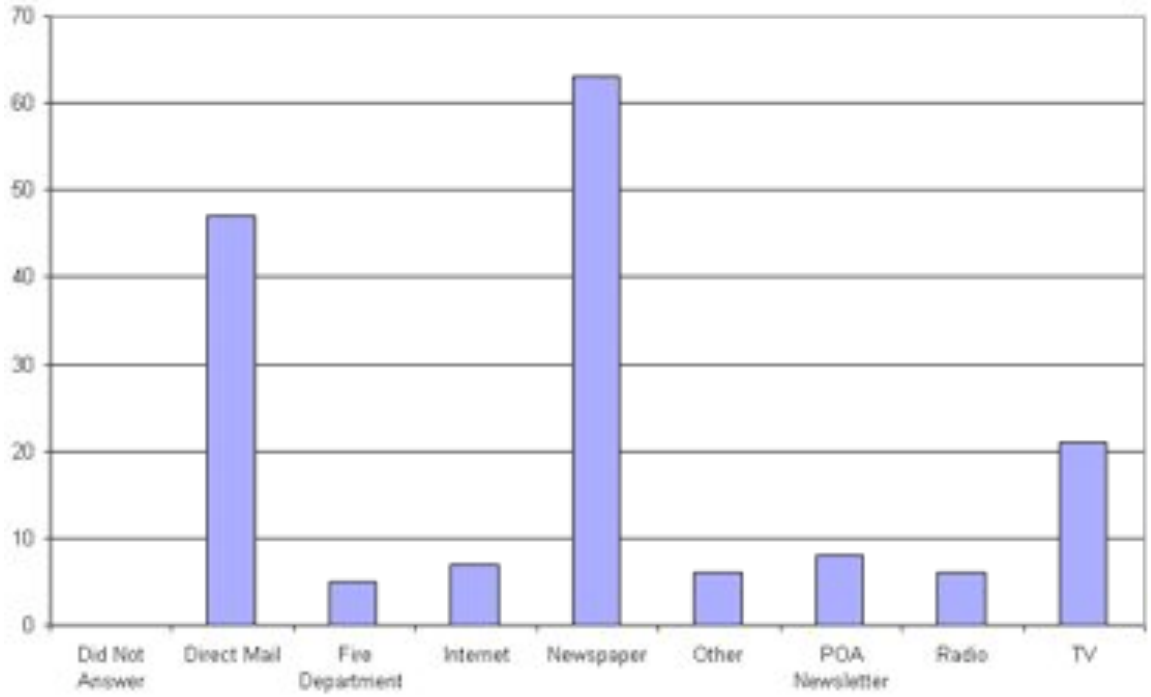


Table 3: Statistics for Question Two

Information Source	Total
Did Not Answer	0
Direct Mail	47
Fire Department	5
Internet	7
Newspaper	63
Other	6
POA Newsletter	8
Radio	6
TV	21
Grand Total	163

The newspaper would be the most popular form of communication but if this information was to include critical information such as road closures and evacuation centers, there would be a serious time delay. This would also be the case with direct mail and the property owner's association newsletter. It is recommended that the fire safe council develop a website where time critical information could be posted. The shortcoming to this approach is that not all residents own computers with internet access.

Question Three:

Does the natural vegetation around your property pose a threat to your house or a neighbor's house?

Chart 4: Survey Question Number Three

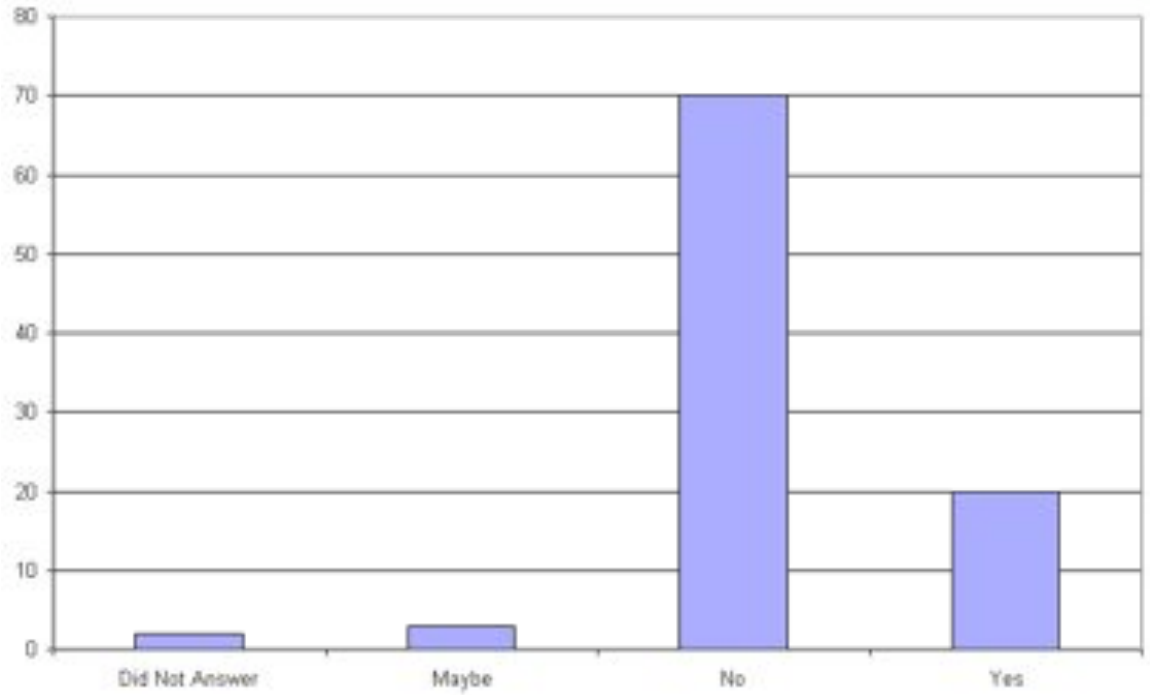


Table 4: Statistics for Question Three

Does the Vegetation on Your Lot pose a Fire Threat?	Total	Percent
Did Not Answer	2	2.11
Maybe	3	3.16
No	70	73.68
Yes	20	21.05

Over 70 percent of the homeowners believe that their natural vegetation does not pose a threat to themselves or to their neighbor. Almost all vegetation that is not regularly irrigated poses a wildfire threat, especially during the hot and dry summer months. Almost a quarter of the respondents acknowledged that they have a wildfire threat posed by natural vegetation. One landscape problem documented was the act of planting trees as wind breaks along property lines. After the trees were planted, water was shut off resulting in several dead trees along the properties. This would be a very hazardous condition during a wildfire.

Question Four:

Are you concerned about neighboring parcels that have not been cleared for defensible space?

Chart 5: Survey Question Number Four

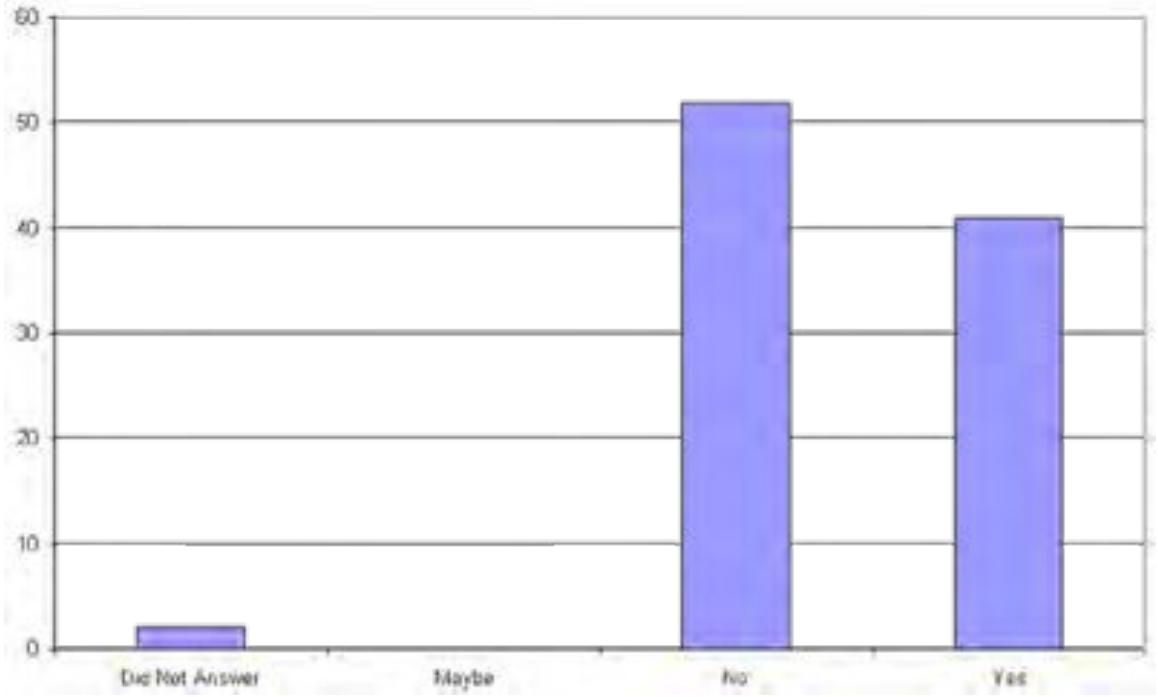


Table 5: Statistics for Question Four

Are you concerned about neighboring parcels that have not been cleared?	Total	Percent
Did Not Answer	2	2.11
Maybe	0	0.00
No	52	54.74
Yes	41	43.16

This is a very interesting reply compared to the previous question. Over 70 percent of the homeowners feel that their property does not pose a threat to themselves or their neighbors. When the vegetation is on the other side of the fence, over 40 percent of the replies feel that their neighbor's parcels are a fire threat. In some cases, where the land is owned by a public agency, this may be a very accurate answer. Another issue is privately owned vacant lots within the study area. Several of these parcels have not been thinned and pose a threat to the neighboring structure.

Question Five:

To your knowledge, does your Community have a wildfire evacuation plan?

Chart 6: Survey Question Number Five

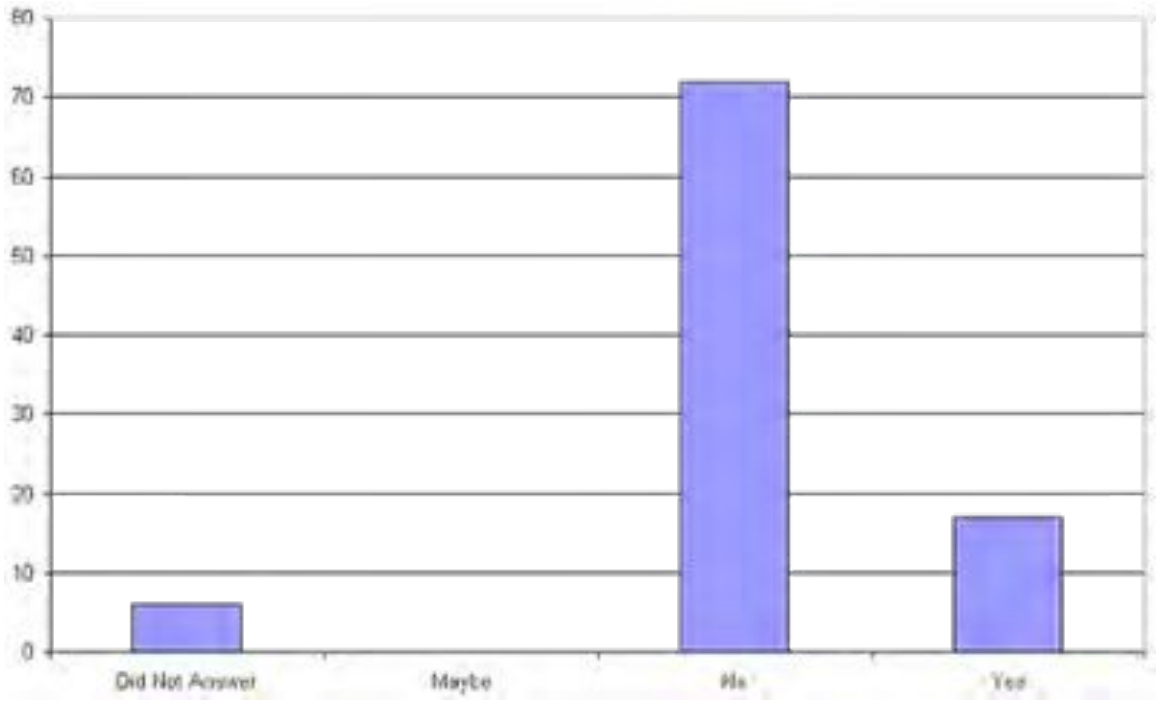


Table 6: Statistics for Question Five

Does your Community have a wildfire evacuation plan	Total	Percent
Did Not Answer	6	6.32
Maybe	0	0.00
No	72	75.79
Yes	17	17.89

Nearly 18 percent of the surveyed homeowners believe their communities have a wildfire evacuation plan. If plans have been developed, the fire safe council should enquire to the level of planning? Have the residents decided in the event of a wildfire, they will drive down a narrow road or shelter in place. Have factors such as fire size, direction of spread, and basic fire behavior been considered? Do they know they should leave the interior and exterior lights on making the structure more visible to firefighters? Do they know they should close shutters over windows to reduce ignition potential? Do they know combustible patio furniture should be moved away from their homes?

Question Six:

Are you aware of any community safety zones in the event of a wildfire evacuation?

Chart 7: Survey Question Number Six

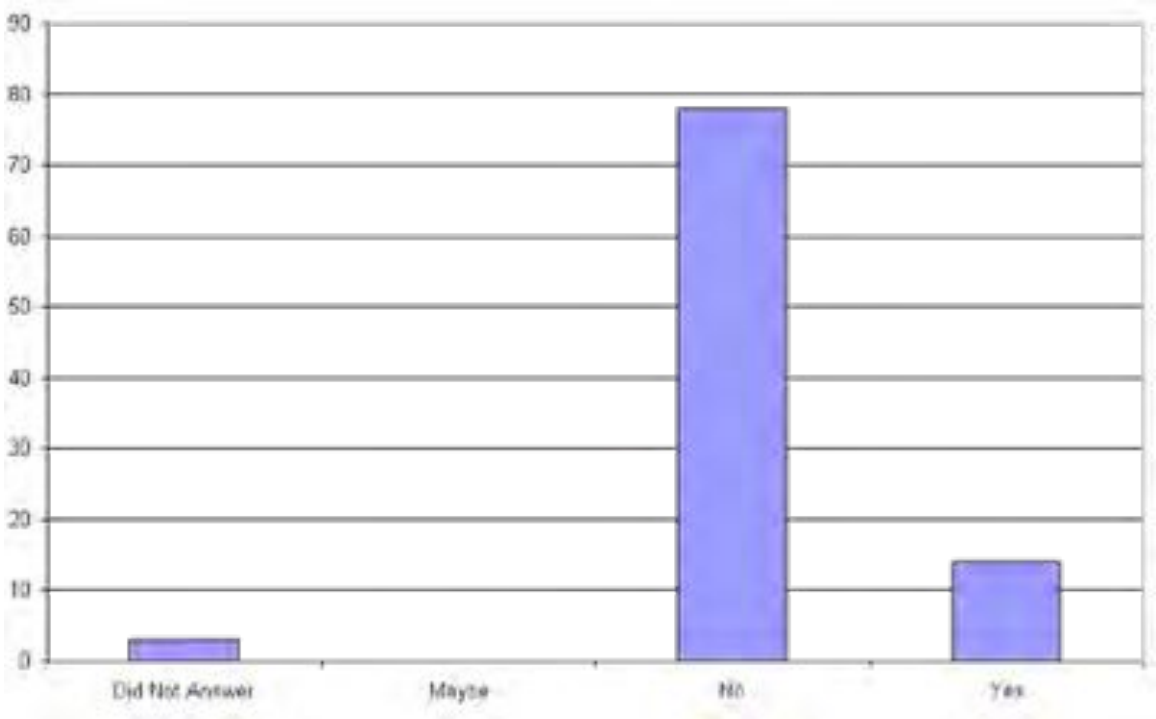


Table 7: Statistics for Question Six

Are you aware of any community safety zones in the event of a wildfire evacuation?	Total	Percent
Did Not Answer	3	3.16
Maybe	0	0.00
No	78	82.11
Yes	14	14.74

A large majority of the surveyed homeowners realize that currently there are no community safety zones in place. Sheltering citizens in a community safety zone has proven successful during past devastating fire storms. During the Cedar Fire in San Diego County 2003, citizens stayed in a casino while a fast moving wildfire burned through the area. For this practice to be successful, a large building that is built beyond the current fire safe codes would need to be employed. This building would need a large area of defensible space that would allow the building not to ignite under the most severe wildfire conditions. A golf course that surrounded a casino was used to shelter residents during the San Diego Cedar Fire. Areas that should be analyzed for safety zones include the Clubhouse surround by the golf course in Pine Mt. Club and possibly the aggregate plant in Lockwood Valley.

Question Seven:

Do you, your family, and neighbor have an emergency communication plan in the event of a wildfire situation?

Chart 8: Survey Question Number Seven

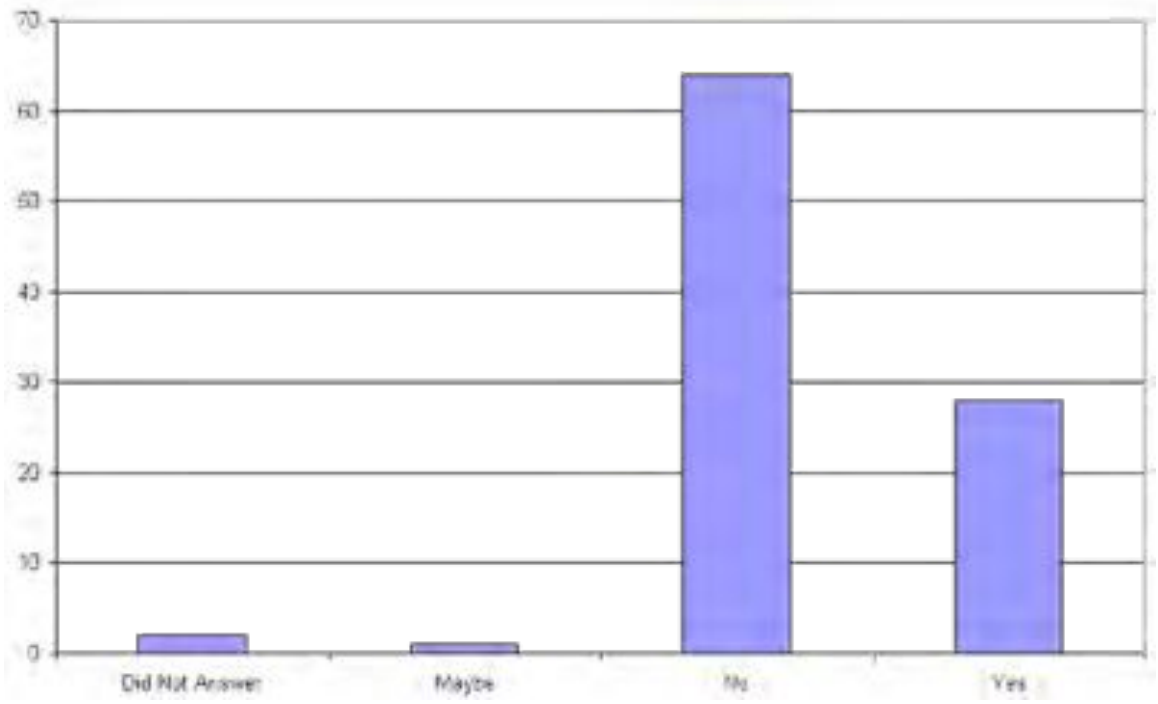


Table 8: Statistics for Question Seven

Do you have a Wildfire Communication Plan	Total	Percent
Did Not Answer	2	2.11
Maybe	1	1.05
No	64	67.37
Yes	28	29.47

A majority of the surveyed homeowners do not have an emergency communication plan. This question may be the first time they have given any thought to the idea of planning to communicate information during and after a wildfire. The various property owner associations may want to consider adopting a formal emergency communication plan. This would include informing residents where information would be posted. Fire information and structure damage could be posted on the Mt. Pinos Communities Fire Safe Council's website once developed.

Question Eight:

Do you and your family members know how to turn off the propane supply to your house?

Chart 9: Survey Question Number Eight

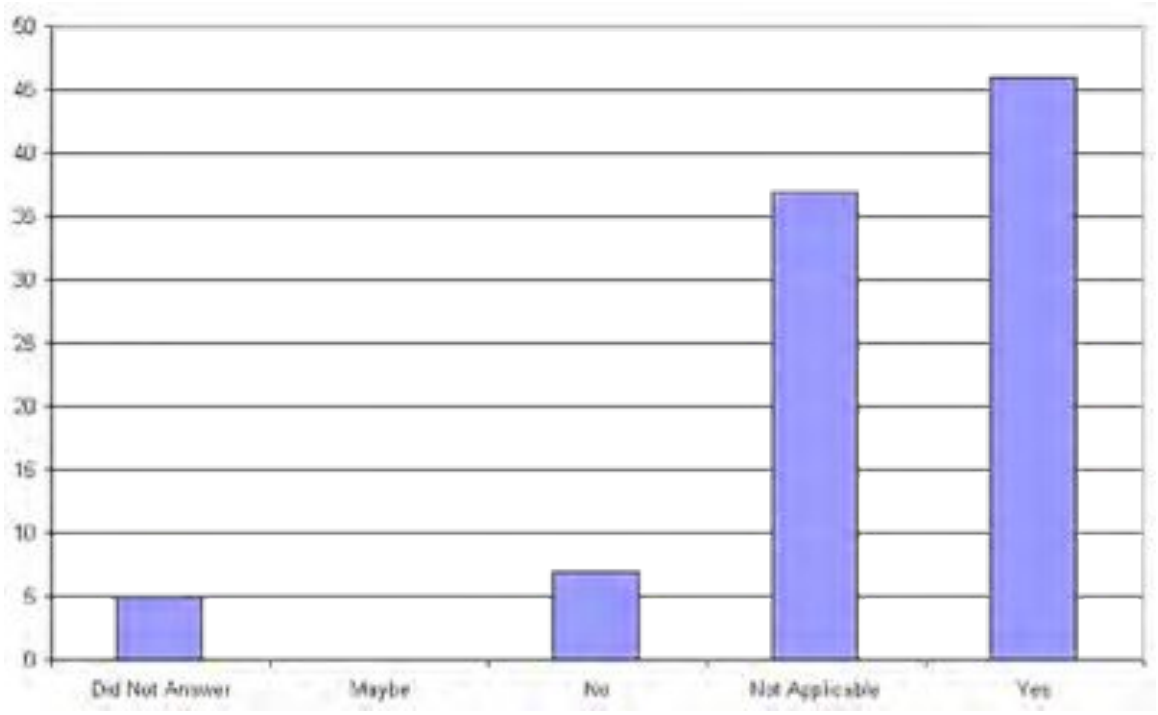


Table 9: Statistics for Question Eight

Do you know how to turn off the propane?	Total	Percent
Did Not Answer	5	5.26
Maybe	0	0.00
No	7	7.37
Not Applicable	37	38.95
Yes	46	48.42

Most of the residents know how to shut off their propane. Over 38 percent of the residents may not have propane from the "Not Applicable" replies. For the few residents that do not know how to shut off their propane, a review during the various property owner associations meeting may be beneficial. Another approach would be to offer assistance and training from either the propane provider or fire department to teach residents how to shut off their propane.

Question Nine:

Does your driveway provide adequate access for fire fighters, their equipment, and trucks?

Chart 10: Survey Question Number Nine

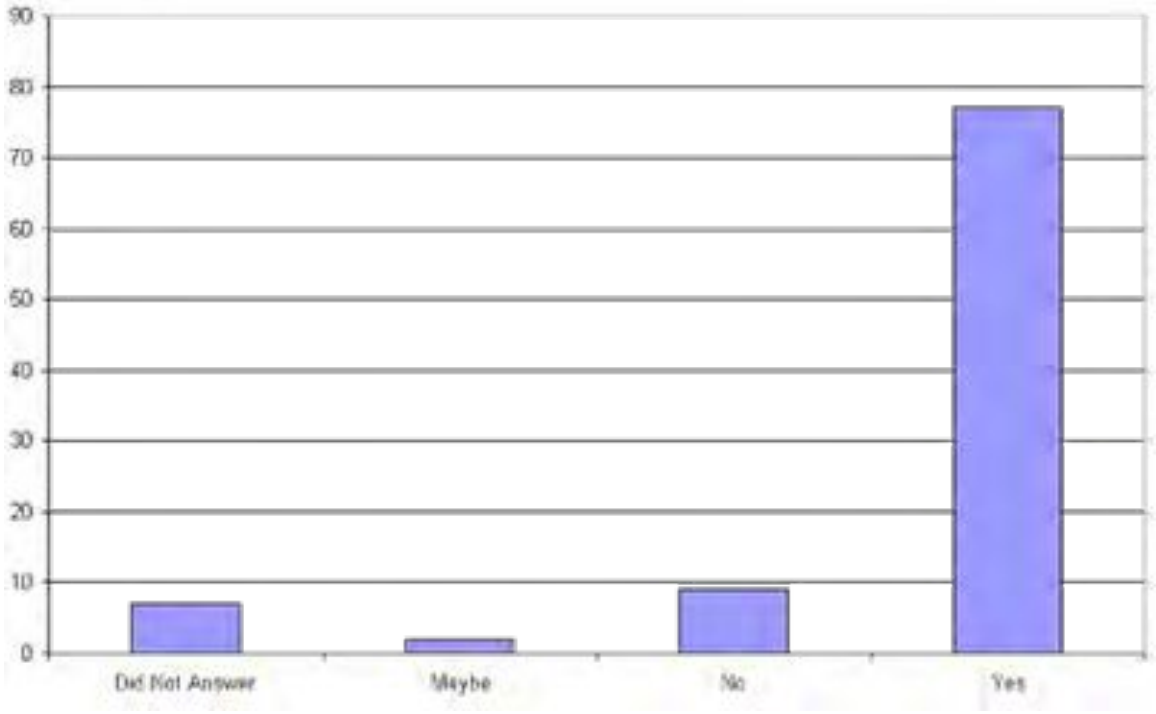


Table 10: Statistics for Question Nine

Does your driveway provide adequate access for fire equipment?	Total	Percent
Did Not Answer	7	7.37
Maybe	2	2.11
No	9	9.47
Yes	77	81.05

Are non-firefighting citizens able to accurately judge whether a driveway is adequate for firefighting access? Maybe a better question to ask after reading the replies is; could a fire engine turn around in your driveway? Another valid question would be; how long is your driveway? Many of the trails in Frazier Park are very narrow and just getting to a driveway may be difficult. Firefighters will not normally pull into a driveway forward. They will back in so they can exit quickly if fire conditions force them to leave quickly. Several of the homes will be protected from the street due to the location of the driveway or lack thereof.

Question Ten:

Would you support controlled burning on public land?

Chart 11: Survey Question Number Ten

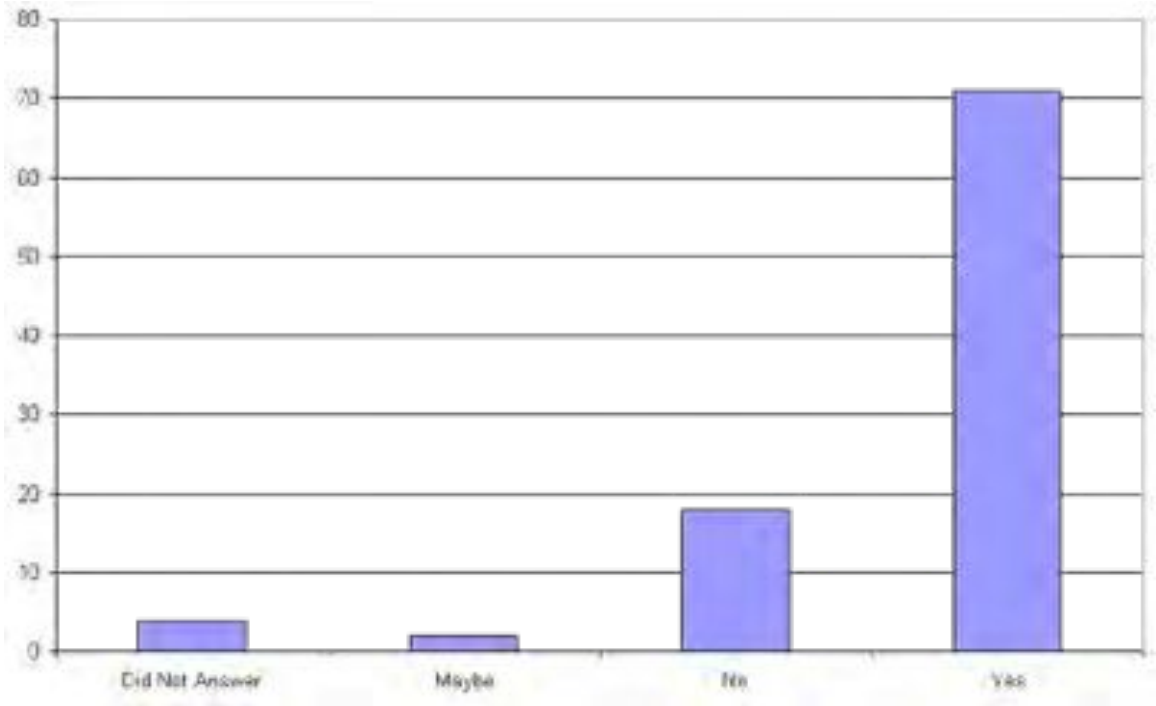


Table 11: Survey Question Number Ten

Would you support controlled burning on public land?	Total	Percent
Did Not Answer	4	4.21
Maybe	2	2.11
No	18	18.95
Yes	71	74.74

Control burning is one of the most cost effective methods to reduce the hazards associated with excessive vegetation or fuel. Control burns are conducted when safe weather conditions allow fires to be set burning the unwanted vegetation. The negative byproducts of control burns are smoke and fires that escape the control line. Smoke can often settle in an area and cause harmful health effects to those residents with breathing problems.

Fires that escape control lines often burn additional acreage and occasionally homes. Hundreds of control burns are conducted safely every year throughout the United States. Unfortunately, the media tends to publicize those rare fires that escape control and cause damage. It is promising that a majority of the

residents support controlled burning on public lands as a means of vegetation management.

Question Eleven:

Do you have any suggestions on how to better educate property owners about wildfire prevention methods?

Here are some of the suggestions offered from those that replied to the survey:

"Door to door enforcement and education."

"Create a wildfire film."

"I think the fire dept. has some excellent material they have passed out at past town council meetings. If you could get resident to read these, that would take care of the most of the problems. Yeah, I know, how do you get people to read?"

"Please come and advise us."

"Town meetings-Brochures-Newspaper pull-outs."

"Signs and reminders"

"Send out extensive literature on how to be fire safe and smart."

"It would be a good idea for a Saturday to take the entire family for a demonstration by you where you can show us everything we need to know about wildfire prevention. It could be done at a park, fire station, or in our community."

"Post fire prevention notices at Don's Gas, Ace Hardware, Frazier Park Market, or the post office.

"Bring firefighting trucks, mascot, and bounce house to a model location to show equipment/proper procedures. Do the same at a community fundraiser event."

"Clearance requirements need to be easier to understand and consistently enforced. There is a June 9th deadline but no one knows if they are in compliance or if anyone even checks."

'Things should be mailed out to property owners who own vacant lots around homes. They seem to be the worst culprits. Many people who own don't actually live in the area to see how dangerous it is and homeowners who rent out their property alike."

"Yes, have the Kern County Fire Dept. call on homeowners and walk their property with suggested prevention methods."

"Put info in newspapers, educate property owner's children in schools, and send info home with them."

"Community seminars at the high school."

"Repeated news articles and mailings…public meetings with visuals".

"Meetings in the community halls."

"Have the fire dept. issue big fines on uncleared property. People take things more serious when it cost them money."

"Pictures of what wildfires can do. Big fines for uncleared land."

"Newsletters, bulk mailings: show or label evacuation plans."

"Give information to realtors. Have fire truck parked in local areas-market, park, etc where people can come up and talk to firefighters. People might be more apt to come over since they are already there."

Question Twelve A:

Have you assessed your property for wildfire hazards such as cedar shake roofing, eaves not enclosed underneath, decking not enclosed underneath, dried debris on your roof, wood piles too close to a structure, and a 30 foot clearing from all structures of ground and ladder fuels?

Does your property have eaves not enclosed underneath?

Chart 12: Survey Question Number Twelve A

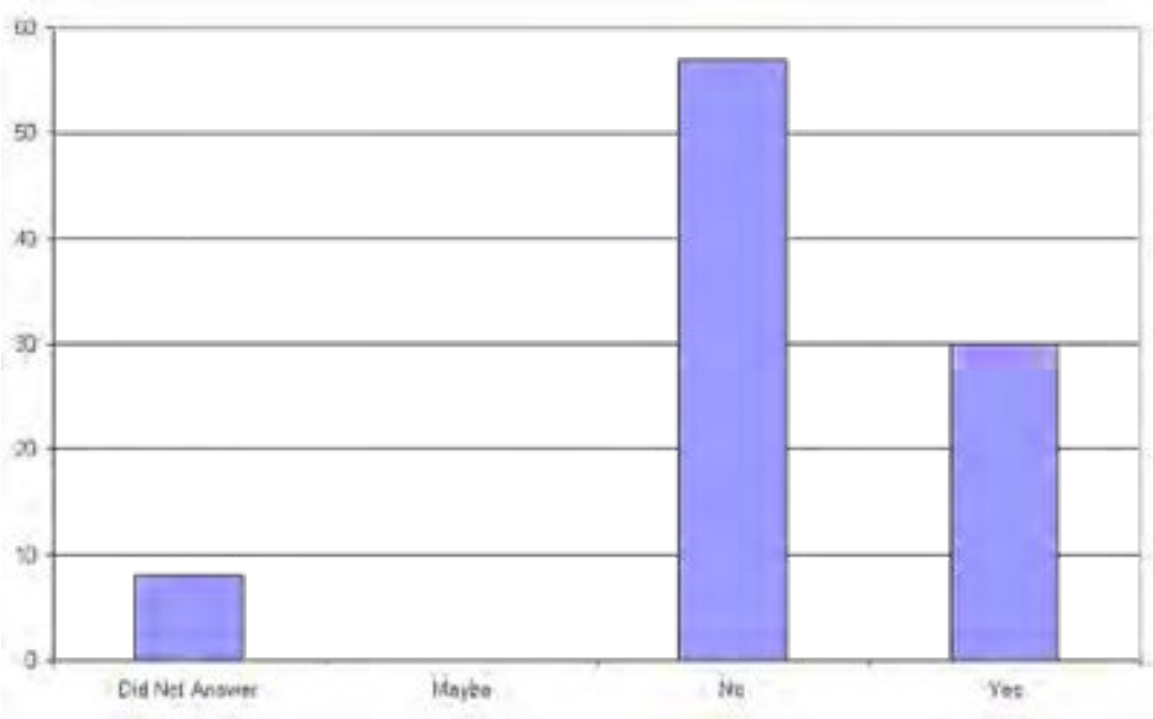


Table 12: Statistics for Question Twelve A

Does your property have eaves not enclosed underneath	Total	Percent
Did Not Answer	8	8.42
Maybe	0	0.00
No	57	60.00
Yes	30	31.58

Several homes destroyed by wildland fire are compromised by burning materials caught in the eaves of the roof assembly. This hazard can be reduced significantly by simply closing or boxing the eaves.

Question Twelve B:

Have you assessed your property for wildfire hazards such as cedar shake roofing, eaves not enclosed underneath, decking not enclosed underneath, dried debris on your roof, wood piles too close to a structure, and a 30 foot clearing from all structures of ground and ladder fuels?

Does your property have decks that are not enclosed?

Chart 13: Survey Question Number Twelve B

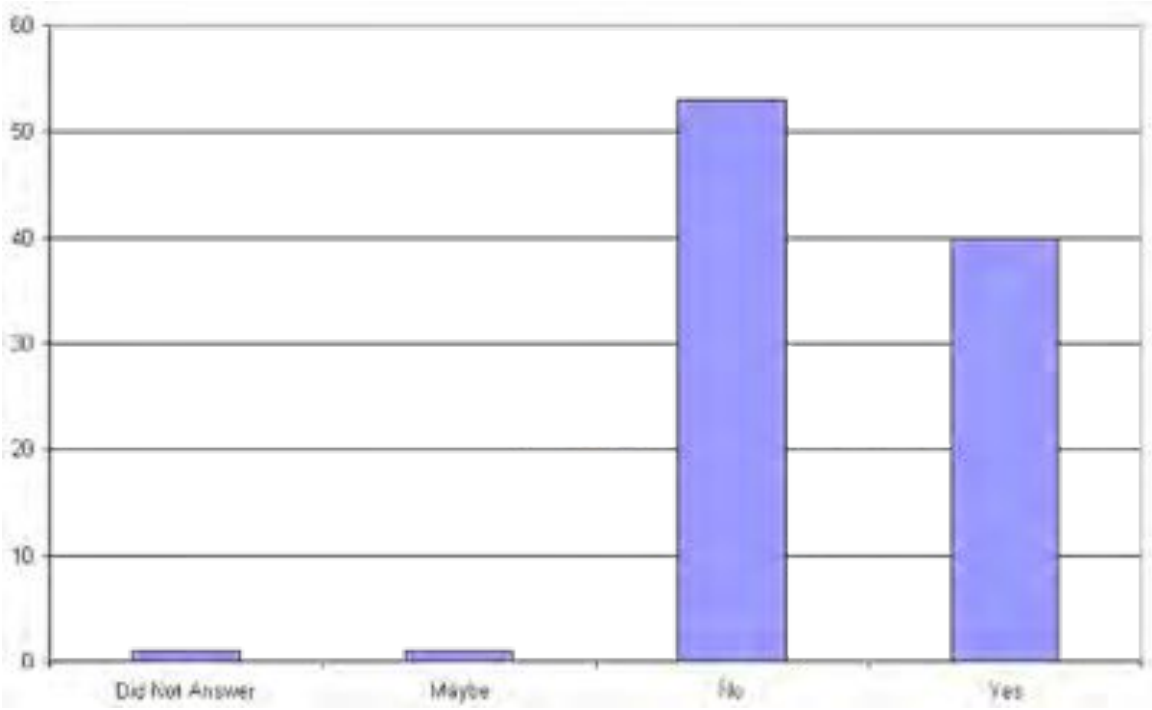


Table 13: Statistics for Question Twelve B

Does your property have decks that are not enclosed	Total	Percent
Did Not Answer	1	1.05
Maybe	1	1.05
No	53	55.79
Yes	40	42.11

After roofs, decks are the largest horizontal surface on a structure. These large flat planes are perfect for structural ignition. Burning embers can land on the decks and ignite patio furniture or piles of pine needles. If a fire is burning upslope, a deck acts as a heat trap for heated air, embers, and other materials stored under the deck. Several homes have been destroyed by materials ignited

under the deck that spread to the main structure. If the deck is enclosed, structural ignition susceptibility is reduced significantly.

Question Twelve C:

Have you assessed your property for wildfire hazards such as cedar shake roofing, eaves not enclosed underneath, decking not enclosed underneath, dried debris on your roof, wood piles too close to a structure, and a 30 foot clearing from all structures of ground and ladder fuels?

Does your property have dried debris on your roof?

Chart 14: Survey Question Number Twelve C

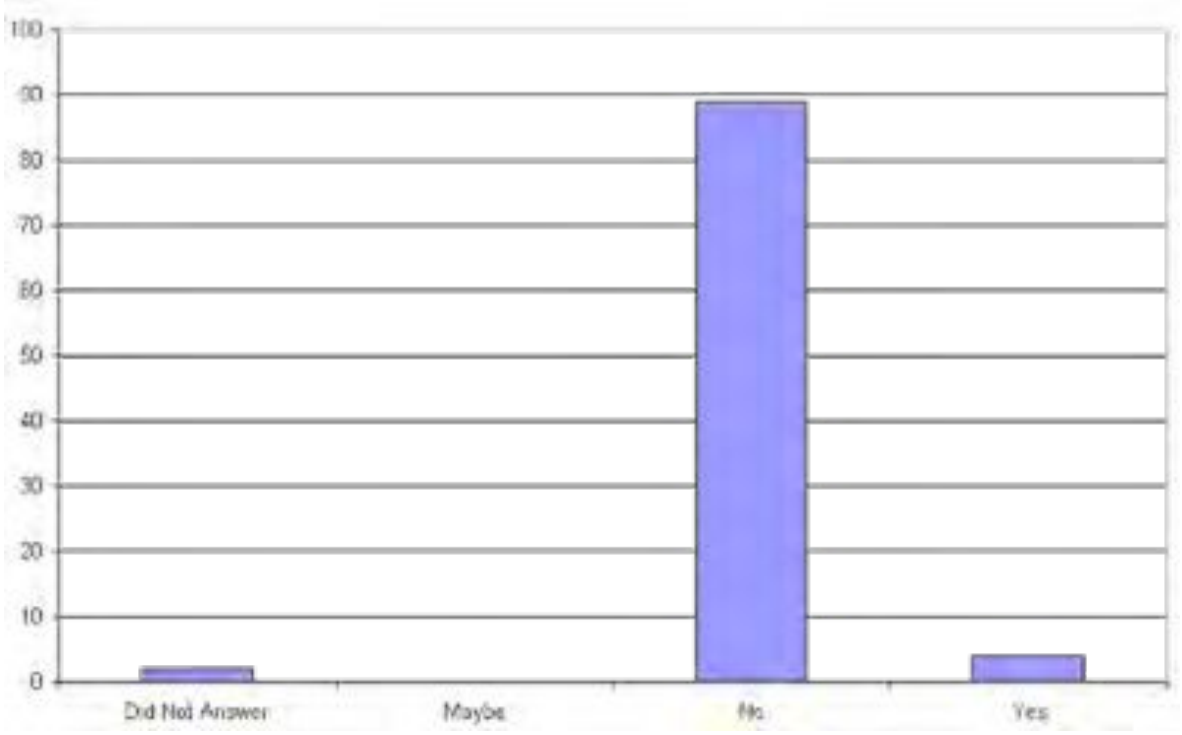


Table 14: Statistics for Question Twelve C

Does your property have dried debris on your roof	Total	Percent
Did Not Answer	2	2.11
Maybe	0	0.00
No	89	93.68
Yes	4	4.21

It is difficult to keep roofs free of debris in a forest environment. Smooth metal roofs allow most of the materials to slide off the roof although rain gutters tend to collect the debris. Dried debris is very susceptible to ignition from burning embers. Once a roof is more than one quarter involved with fire, firefighters will normally move on to another home that they can save. The best defense is to routinely clean the roof and rain gutters of any debris such as pine needles and dried leaves.

Question Twelve D:

Have you assessed your property for wildfire hazards such as cedar shake roofing, eaves not enclosed underneath, decking not enclosed underneath, dried debris on your roof, wood piles too close to a structure, and a 30 foot clearing from all structures of ground and ladder fuels?

Does your property have woodpiles too close to a structure?

Chart 15: Survey Question Number Twelve D

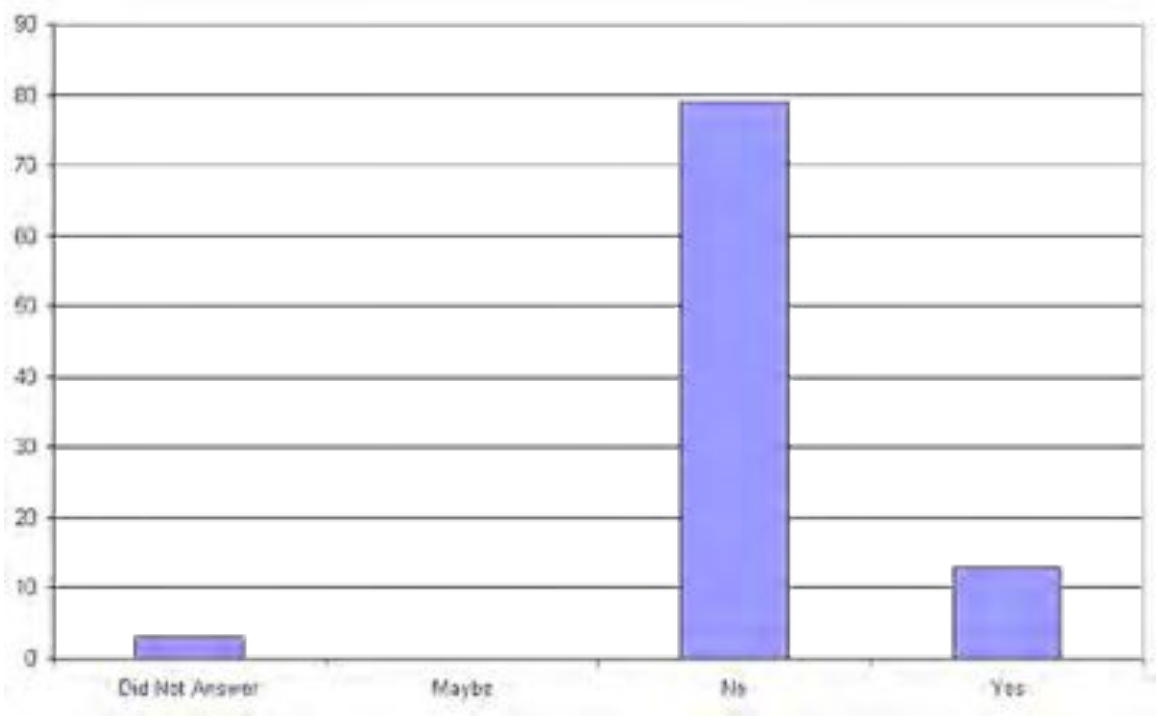


Table 15: Statistics for Question Twelve D

Does your property have wood piles too close to a structure	Total	Percent
Did Not Answer	3	3.16
Maybe	0	0.00
No	79	83.16
Yes	13	13.68

The stored energy found in a woodpile is tremendous. Once ignited, the high heat outputs will normally ignite a structure if the pile is in close proximity. Piles are normally stored next to homes for convenience combined with the drier conditions found under the eves of a home. The best practice is to store the wood away from the house in a small metal shed. The shed will keep the wood dry just like storing it under the eaves of a home. The metal shed will also provide additional protection to the wood during a wildland fire.

Question Twelve E:

Have you assessed your property for wildfire hazards such as cedar shake roofing, eaves not enclosed underneath, decking not enclosed underneath, dried debris on your roof, wood piles too close to a structure, and a 30 foot clearing from all structures of ground and ladder fuels?

Does your property have a 30-foot clearance of vegetation from all structures?

Chart 16: Survey Question Number Twelve E

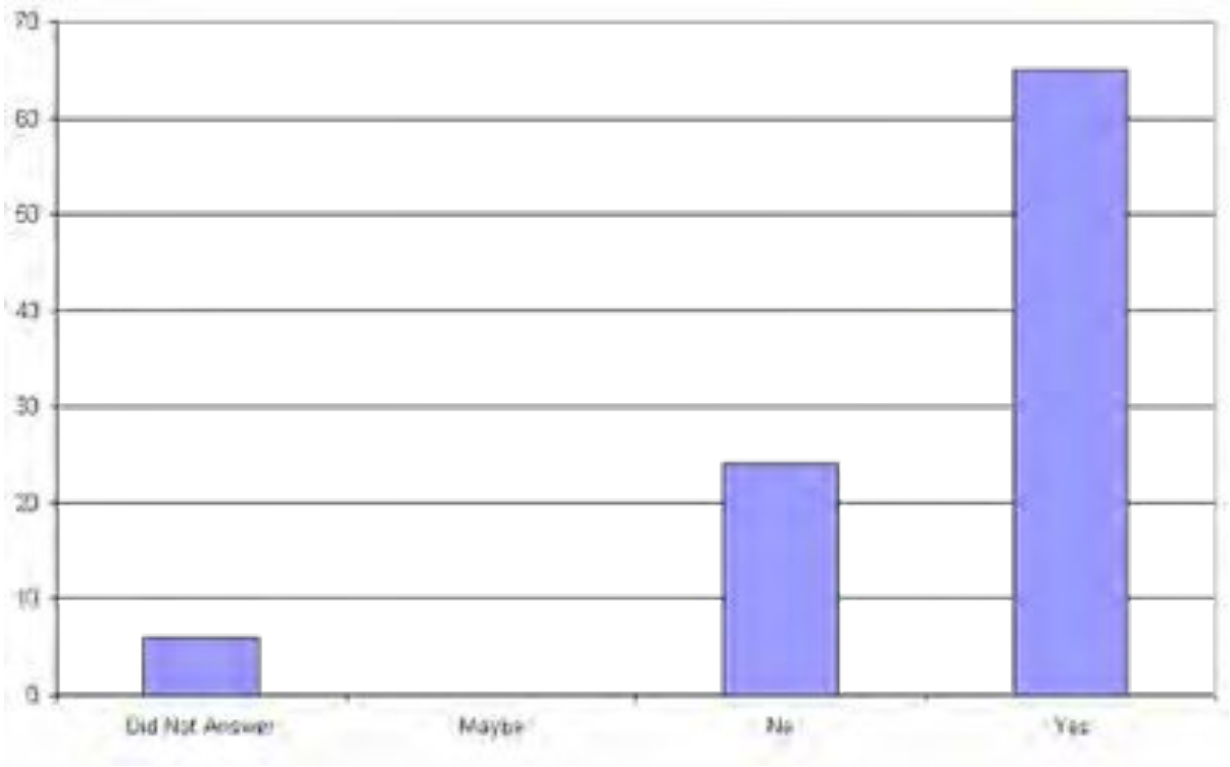


Table 16: Statistics for Question Twelve E

Does your property have a 30-foot clearance of vegetation from all structures?	Total	Percent
Did Not Answer	6	6.32
Maybe	0	0.00
No	24	25.26
Yes	65	68.42

If a building is not cleared of vegetation within 30 feet, it is very difficult to protect from a high intensity wildfire. If firefighters must make a decision which homes to protect during a wildfire, they will most likely choose structures with adequate defensible space. With sufficient defensible space, there is a much higher probability that they will be successful protecting the structure as well as surviving the experience.

Question Twelve F:

Have you assessed your property for wildfire hazards such as cedar shake roofing, eaves not enclosed underneath, decking not enclosed underneath, dried debris on your roof, wood piles too close to a structure, and a 30 foot clearing from all structures of ground and ladder fuels?

Would you want the Fire Department to do an assessment of your property?

Chart 17: Survey Question Number Twelve F

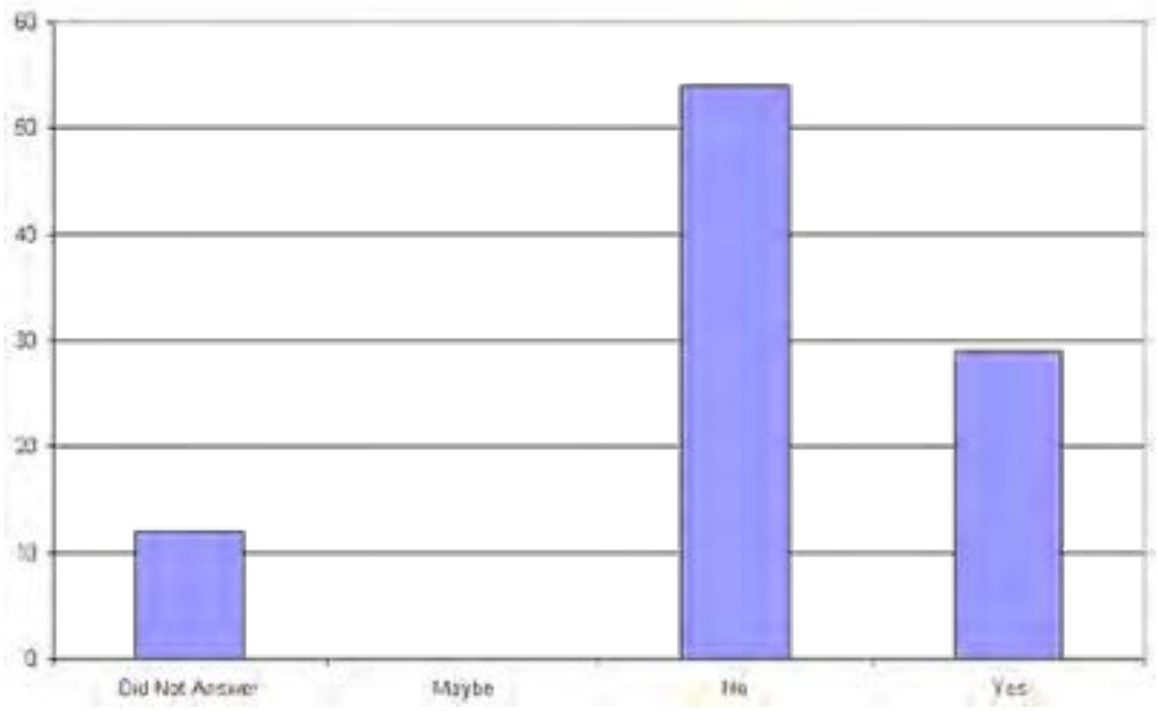


Table 17: Statistics for Question Twelve F

Would you want the Fire Department to do an assessment of your property	Total	Percent
Did Not Answer	12	12.63
Maybe	0	0.00
No	54	56.84
Yes	29	30.53

Although over half of the respondents do not want an assessment of their property, almost 30 residents would like an assessment. The names of those respondents will be included in a binder with all of the returned surveys. The information can then be delivered to the closest fire station for assessments.

Question Thirteen:

What distance does the law require you to maintain free of dead wood and dense vegetation?

Chart 18: Survey Question Number Thirteen

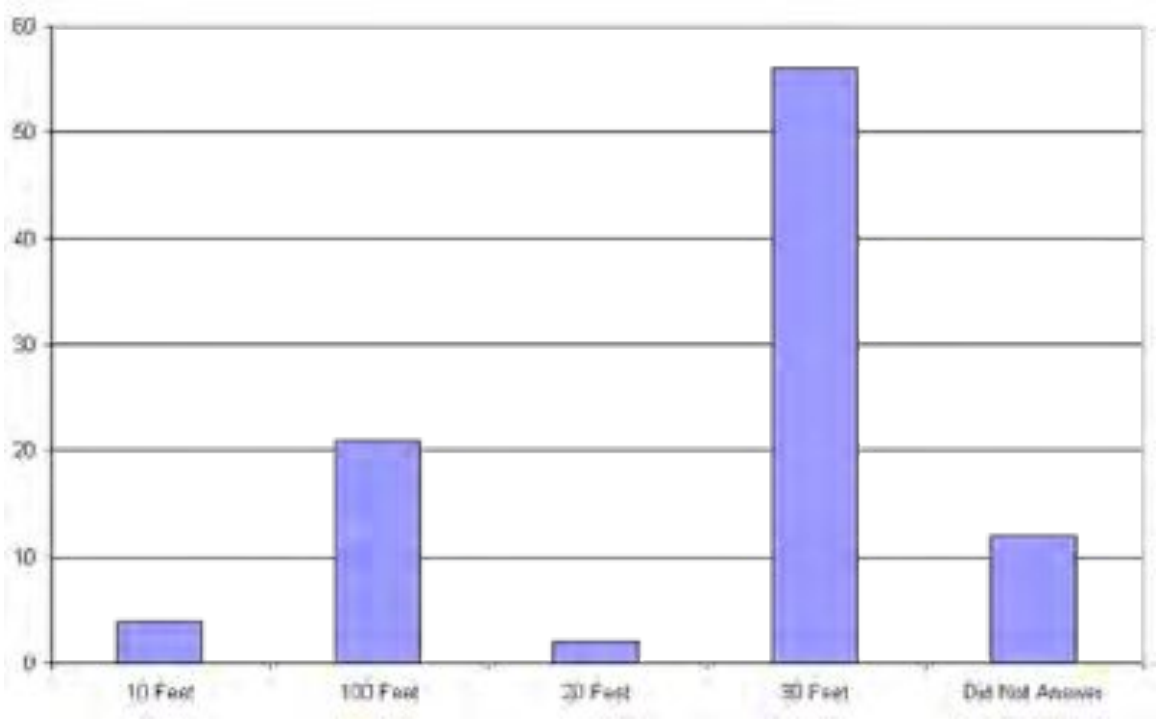


Table 18: Statistics for Question Thirteen

What distance does the law require you to maintain free of dead wood and dense vegetation	Total	Percent
10 Feet	4	4.21
100 Feet	21	22.11
20 Feet	2	2.11
30 Feet	56	58.95
Did Not Answer	12	12.63

This question may have been answered in an earlier question: Does you property have a 30-foot clearance of vegetation from all structures? Public Resource Code 4291 was recently altered changing the distance from 30 feet to 100 feet of defensible space (Appendix B). As of this writing, many agencies are starting to enforce the larger distance provided by this code alteration. By the large number of replies answering 30 feet, a new education campaign is needed to reeducate the residents of the larger distance.

Question Fourteen A:

Do you have a non-flammable roof covering?

Chart 19: Survey Question Number Fourteen A

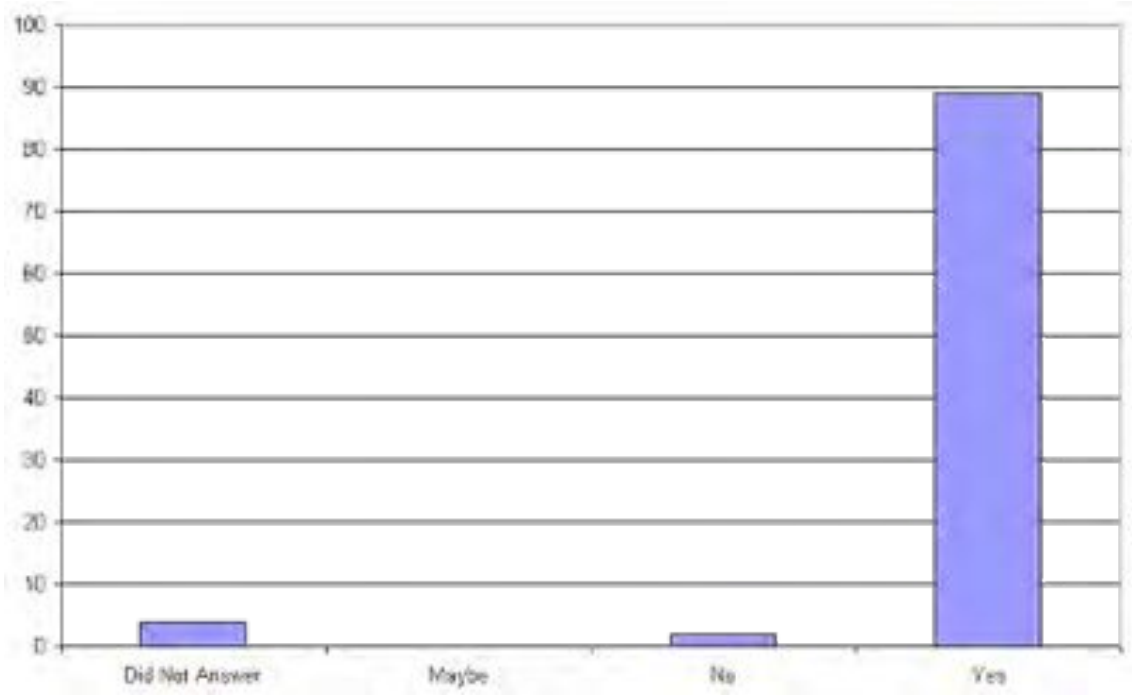


Table 19: Statistics for Question Fourteen A

Do you have a fire resistant roof covering?	Total	Percent
Did Not Answer	4	4.21
Maybe	0	0.00
No	2	2.11
Yes	89	93.68

Hopefully this is a trend throughout the study area. This indicates the power of a fire code modification. For the past several years, fire resistant roofs have been required by code. Two years ago, the Kern County Fire Department adopted the Wildland Urban Interface Code that requires more fire resistant building design, water requirements, and fire department access.

Wood roofs not only ignite easily, but become highly hazardous during wildland fires. Once ignited, wood shakes or shingles can easily dislodge and become airborne. Due to their shape, they can sail long distances within a smoke column and can land hundreds of feet away. They can ignite vegetation or structures when they land spreading the fire faster and further.

Question Fourteen B:

What is your roof made of?

Chart 20: Survey Question Number Fourteen B

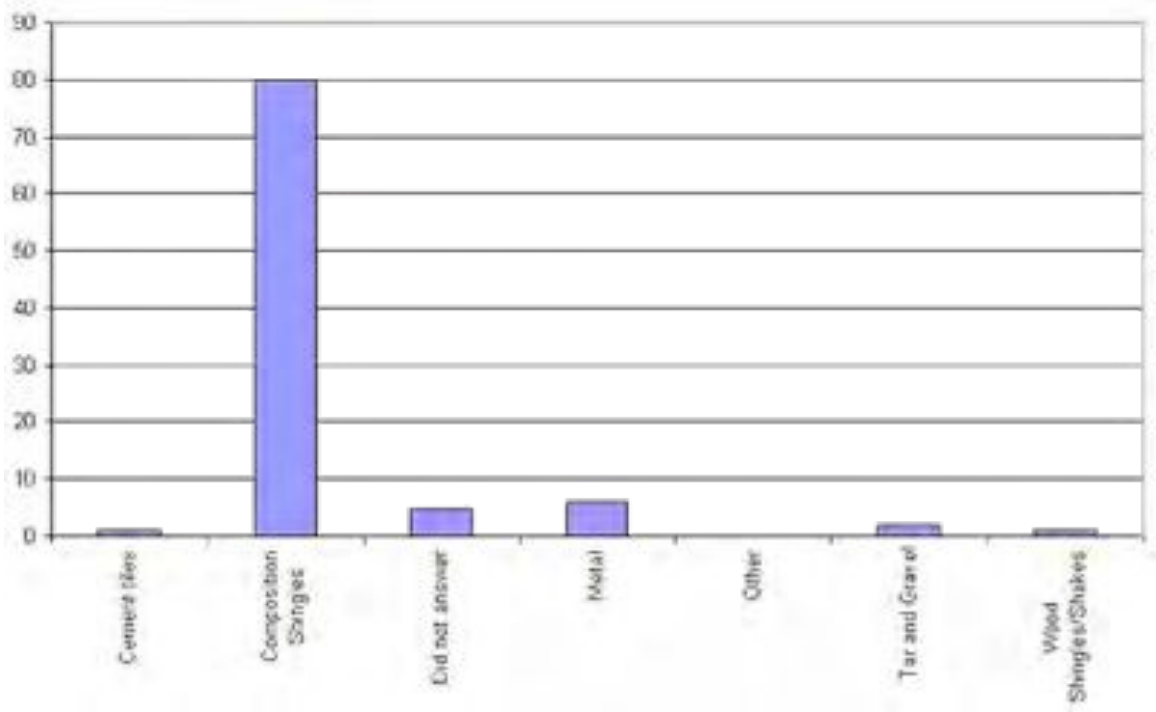


Table 20: Statistics for Question Fourteen B

What is your roof made of?	Total	Percent
Cement tiles	1	1.05
Composition Shingles	80	84.21
Did not answer	5	5.26
Metal	6	6.32
Other	0	0.00
Tar and Gravel	2	2.11
Wood Shingles/Shakes	1	1.05

Wood roofs are one of the most problematic factors of building design. A roof is the largest horizontal plane on most structures. As embers fall from the smoke column from a wildfire, many of them land on the roof. If the roof is made from wood, combined with any fine material such as pine needles or leafs, it is almost certain to ignite. It is a very positive statistic that only one percent of those respondents stated that their roofs are made of wood. Unfortunately, there are still a handful of structures throughout the study area with wood roofs.

Question Fifteen:

How concerned are you that a wildfire could change your quality of life?

Chart 21: Survey Question Number Fifteen

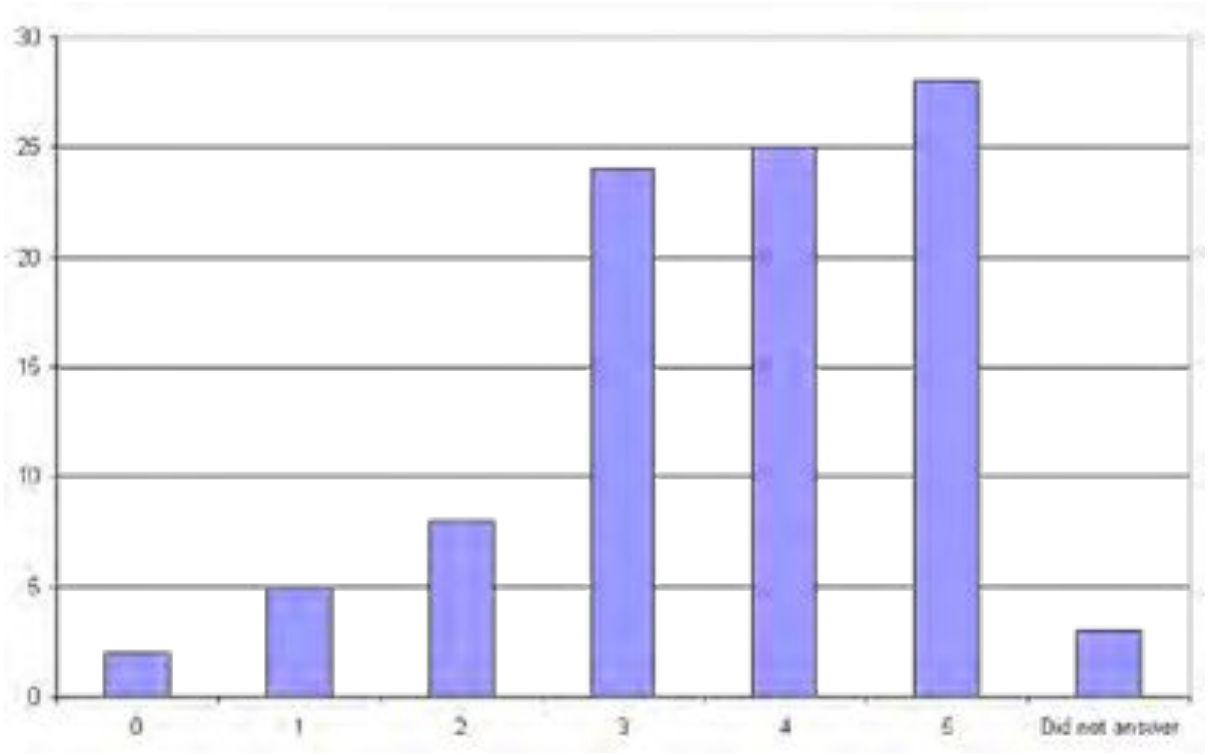


Table 21: Statistics for Question Fifteen

How concerned are you that a wildfire could change your quality of life?		Total	Percent
Not at all concerned	0	2	2.11
	1	5	5.26
	2	8	8.42
	3	24	25.26
	4	25	26.32
Extremely concerned	5	28	29.47
Did not answer		3	3.16

This question had the greatest diversity of answers. Some respondents are not concerned about a wildfire. They may not think a fire poses a threat to their structure. Over 80 percent respondents answered with a three or higher stating that they have some concern that a wildfire could change their quality of life. It could destroy all of their possessions, memories, and cause injury or death.

Question Sixteen:

Would you support controlled burning on private land?

Chart 22: Survey Question Number Sixteen

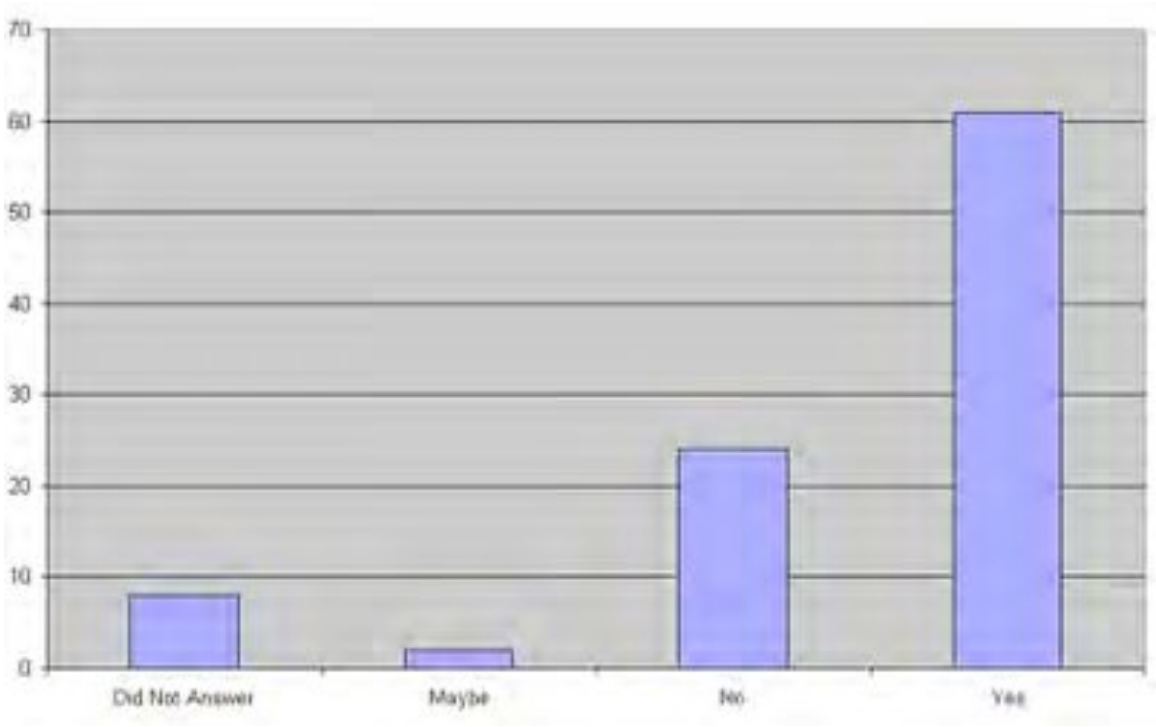


Table 22: Statistics for Question Sixteen

Would you support controlled burning on private land?	Total	Percent
Did Not Answer	8	8.42
Maybe	2	2.11
No	24	25.26
Yes	61	64.21

It is interesting to compare the answers concerning controlled burning on public and private land. When the land is public, nearly 75 percent of the replies were in support. When the land is privately held, then the number drops to only 64 percent in support. The ownership of the land does not change the risk. The slope, fuel type, and weather are the determining factors of risk. A control burn on public land can escape and cause damage to private dwelling or the opposite could occur. What is important is to understand that if nothing is done to reduce the fuel loading around a community; it is at great risk from a wildfire that does not occur when conditions are favorable. Weeks or months of planning are performed prior to any burning. Often times, buy-in from the community or the ability to burn private land with public land determines the feasibility of burning.

Question Seventeen:

Would you support lot clean up days or fuel reduction projects?

Chart 23: Survey Question Number Seventeen

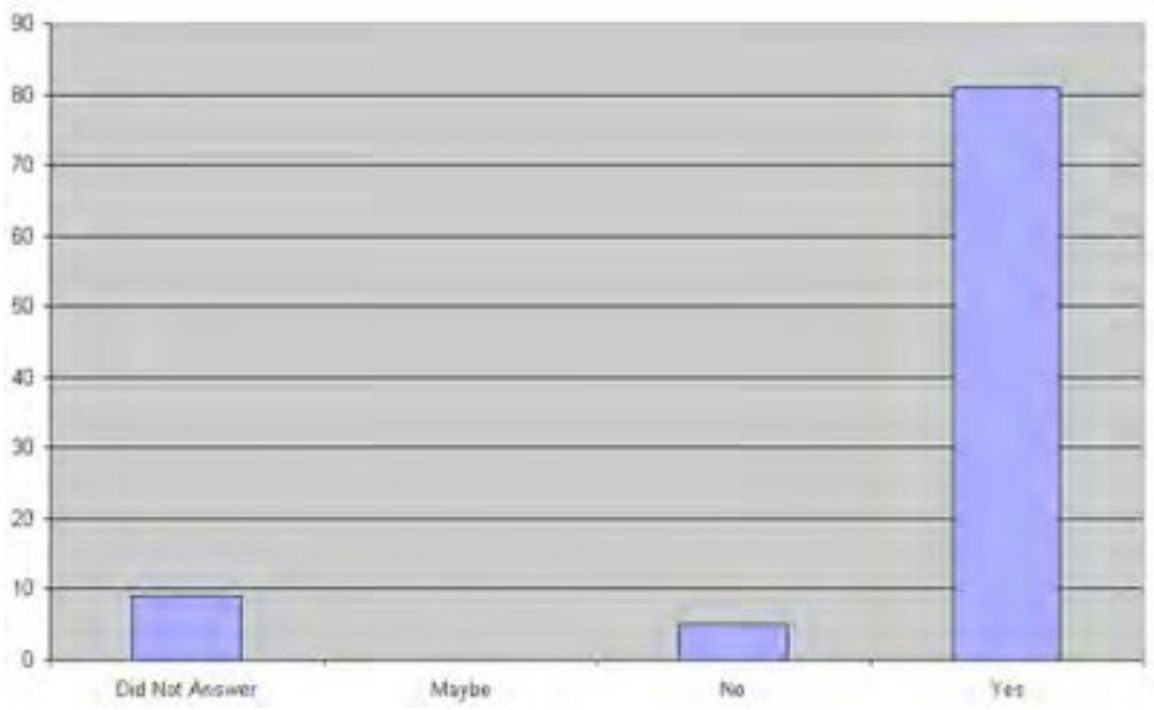


Table 23: Statistics for Question Seventeen

Would you support lot clean up days or fuel reduction projects?	Total	Percent
Did Not Answer	9	9.47
Maybe	0	0.00
No	5	5.26
Yes	81	85.26

The more vegetation that is removed from a lot, the easier it is to protect during a wildland fire. Lot clean-up days have been successfully implemented by Kern County Fire Department's Crew 82. Members of the community brought in cut brush and other vegetation for the crew to chip. Chipper projects have been implemented in Pinon Pines, Cuddy Valley and Frazier Park.
After the material was chipped, members of the community hauled off the chips for landscape projects. These projects reduce the hazard from standing vegetation while also preventing additional debris being added to a landfill.

Question Eighteen:

Do you have any further comments that might assist us in informing the community about preventing wildfires?

The following are comments found on the surveys:

> "This survey is great! It feels good to have a voice. Stricter fines and enforcement will force people to become familiar with prevention. Clearing property will make it safer and more attractive."
> "Each area should be contacted for neighborhood awareness and discussion."
> "If there is some way to offer either no charge, or reduced rate tractor mowing clearing machinery to clear the vacant rugged terrain within the neighborhoods, this would encourage fire prevention."
> "Clear explanation of clearance requirements i.e. types of vegetation to remove and those to leave including distances and example drawings."
> "Bring in goats to eat vegetation since the cattle aren't brought into our area until late summer/early fall, if brought in at all."
> "Thank you for making plans to help-especially for newer residents!"
> "Notices mailed out sooner. Larger fines for those who don't comply. Weed-wacker rental for the poorer people I the neighborhood help for the elderly from the KCFD."
> "Make all the "Trails" in Frazier Park one-way streets and mandate parking only on one side of a street to facilitate emergency vehicle access."
> "Inspection and recommendations for the individual properties. What to do with pets and livestock-where to go?"
> "Notify non-residents owners of property covered with sage brush to maintain clearance o a regular basis of a 200 foot distance from structures on neighbor's property."
> "Try a sign like the one at Lebec Road and Frazier Mt. Road. Also maybe if the County would clear the lots they are responsible for it would set an example."
> "Big fines for non-compliance."
> "Have all property owners clear their property."
> "Controlled burns soon become uncontrollable burns. Various groups (CDF, BSA, etc) should clear out dead trees and heavy undergrowth in the Los Padres Nat. Forest."
> "If firefighters could drive threw neighborhoods and leave pamphlets and notices about possible fire problems on/near specific properties and off free assessments. Some property owner may not know this service is available. I think fire service day or something similar can be a nice way to educate people and meet firefighters and neighbors. If the firefighter could be at local events where people come up and talk to them rather

than to a meeting where some people are not able to attend or not motivated to attend."
"My only comment really is about the use of weed-wackers to know the weeds down but not gathering up the clipping but just leaving them to blow around or day out and maybe pose another hazard thinking that all was needed was to make the property look better and not really "clear it" off."
Keep the community informed about fire prevention and ways to offer assistance to the elderly. Also information about young teenagers and adults and smoking in and around high fire hazard areas."

Fire Behavior

Fire behavior is how fast and intense a fire spreads. Numerous components of fire behavior can make this simple definition much more complex. A simple understanding is necessary for this assessment. Fire needs heat, fuel, and oxygen existing simultaneously known as the fire triangle. If any one of the components are removed, the fire will go out.

Figure 5: The Fire Behavior Triangle

Fuel is the live and dead vegetation and sometimes structures that feed a wildfire. A fuelbreak removes fuel from the fire triangle while prescribe burns reduce the amount of available fuels. Heat sources can be a lightning strike, an abandoned campfire, or overheated brakes. Once ignited, the fire will produce enough heat to continue to burn unless cooled by water or fire retardant. Oxygen exists in ambient air and is added in greater quantities with wind. This component of the fire triangle is impossible to remove from a wildland fire.

Figure 6: Fire Environment Triangle

If the three components of the fire triangle exist and a fire occurs, three main factors determine how fast and intense the fire will burn. The three factors that comprise the fire environment triangle are fuels, topography, and weather.

Similar to the fire triangle, fuel is the vegetation that is consumed by a wildfire. Vegetation, such as annual grass, can burn fast with moderate intensity. On the other hand, large trees and brush can burn hot enough to melt metal and cast burning embers over a half mile in front of the fire.

Topography is the lay of the land. Topographical features such as river drainages can funnel wind causing an increase in speed. Slope or the amount of vertical rise compared to horizontal distance is another factor that influences how fast a fire will spread. It also restricts where fire engines, bulldozers, and firefighters can travel.

Weather is the biggest element of the fire environment triangle relating to fire behavior. Fuel and topography exist everywhere and in some places, they do not experience the wildfire problems associated with areas that are hot, dry and windy. When some vegetation becomes very dry due to arid conditions, it produces resins to conserve what little water it can transpire. These resins are very flammable and when coupled with wind, more oxygen is added to the fire resulting in faster up and downhill rates of fire spread. Wind also causes burning embers to land in front of a fast moving fire, called spotfires.

The Fire Problem

Many places throughout the Mt Pinos study area are comparable to a powder keg waiting for a match to ignite the fuse for disaster. Using the components of the Fire Environment Triangle, a fire behavior and prediction model can be used to validate this statement. The Mt Pinos study area experiences a unique weather pattern, poses very serious topographic challenges, and has very heavy fuel loading with extremely high mortality rate in some areas. Within this fire environment exist over 4900 privately owned dwellings and commercial structures.

Fire Weather

The basic components of fire weather are temperature, humidity, wind speed and the wind direction. Weather is a very dynamic phenomena and even more diverse in mountain terrain. As different hillsides heat up as the sun moves through the sky, they can experience minor to significant changes in temperature, humidity, wind speed, and wind direction.

Temperature

Temperature is a measurement of warmth. It is dictated by several factors but mostly the amount of solar radiation that reaches the earth's surface. Cloud cover and wind can alter temperature significantly.

In the Mt Pinos study area, temperature is reactive to two sources of active warming. Located in the Transverse Range, it is sandwiched between the San Joaquin Valley to the north, the Los Angeles Basin to the south, and the Mojave Desert in the east. These areas are subject to very high daytime temperatures that influence heating on the mountain. The high elevations moderate temperature lowering the average daily maximum temperature to the mid-eighty degree range during the summer months.

Relative Humidity

Relative humidity (RH) is a measure of the amount of water in the air compared with the amount of water the air can hold at a given temperature when measured. In firefighter terms, it is how dry the air is and more importantly, it dictates how dry the vegetation or fuel is. Short-term changes (daily) in relative humidity will determine how quickly fine fuels such as grass will burn. Long-term changes (monthly) in relative humidity will dictate how quickly larger fuels such as logs will burn.

The relative humidity in the Mt Pinos study area is surprisingly low for the high mountainous elevations. It is safe to assume that the relative humidities along Interstate 5 are generally lower than those found in the higher elevations of Cuddy Valley or Pine Mountain Club. Relative humidity dictates the moisture found in both live and dead vegetation. Fuel moisture determines how easily vegetation will ignite, fires spread, and how many spot fires will land and start

new ignitions. The daily low relative humidity values in the Mt Pinos study area hover around twenty percent during fire season. Relative humidity below 30 percent results in vegetation that will ignite and allow wildland fires to burn well. At 20 percent, fire will burn with high intensities and rates of spread. With relative humidity below 15 percent, fires will burn with such high intensities that they will cast embers well ahead of the main fire front, travel through the crowns of trees, and are difficult to suppress.

Wind

Wind has the largest effect concerning fire behavior. The stronger the wind, the faster a fire will spread. As mentioned earlier, wind also adds more oxygen to the fire resulting in higher intensities. Wind bends the flames closer to the vegetation preheating the fuel closer to its ignition temperature. Lastly, wind causes embers to travel in front of the main fire. These embers land starting new ignitions called spotfires. Spotfires can pull the main fire forward increasing the rate of spread and growth exponentially.

The areas wind conditions pose a dilemma for fire behavior. In the Northern Hemisphere, the predominate wind blows from the west. This western air flow is combined with another major factor contributing to wind speed and direction which is slope heating. When the face of a slope is warmed, air currents flow up the canyons and slopes. This effect is quite dramatic when the areas are as large as the San Joaquin Valley, the Los Angeles Basin, or the Mojave Desert. The warm air travels up slope and spills through the Tejon Pass following the path of least resistance.

The worst-case scenario would be a wildfire that starts on either end of the San Andreas Fault and burns in an east-west direction or visa versa. If a fire burned from Interstate 5 under an eastern wind, it would be pushed into Frazier Park and continue west jeopardizing the other communities found in the study area. Inversely, a fire burning in Pine Mt. Club under a westerly wind would be pushed into Cuddy Valley and continue towards Interstate 5.

Weather is very difficult to predict in the Mt Pinos study area because of the effect topography has on air masses. Air masses from the Central Valley are squeezed as they channel wind up the Tejon Pass. When air is compressed, its velocity increases resulting in higher wind speeds. To the east of Tejon Pass sits the Mojave Desert. The very dry air of the desert spills into the area, especially under east wind conditions. Lastly, temperatures drop and humidity increases with an increase of elevation. In the mountainous terrain, several microclimates are formed due to the several valleys and high peaks in the area (Figure 7).

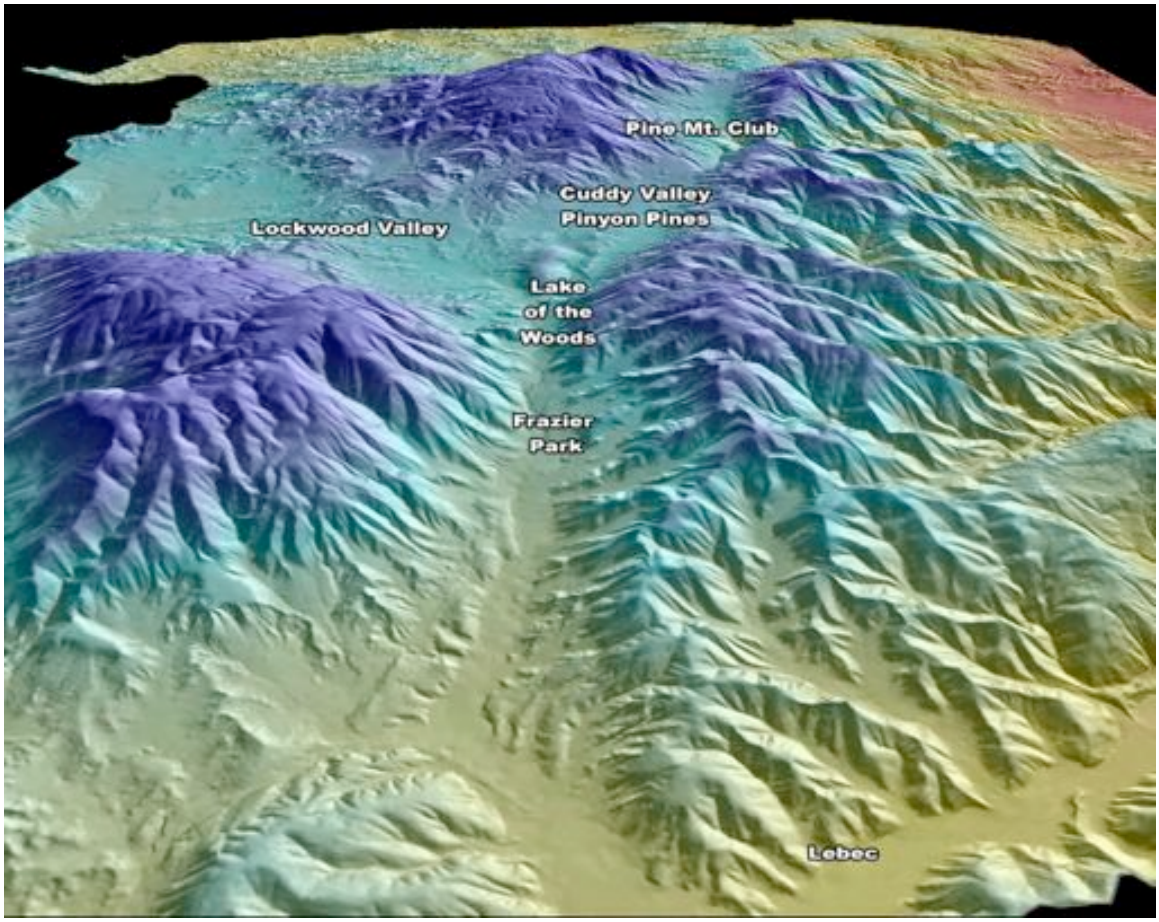


Figure 7: A three-dimensional model of the terrain in the Mt. Pinos Communities indicates all of the topographical factors that can influence weather. The center of the figure is the San Andreas Fault heading toward the west. Notice all of the constrictions within the topography where wind will funnel and thus increase speed.

Weather Tables

Sandberg is at 4524 feet elevation, East Slope of Mt. Pinos, Cuddy Valley, CA is at 5600 feet, and Pine Mt. Club is at 5433 feet.

Table 24: Average Weather Inputs from Sandberg at 4524 feet.

Sandberg Averages	High Temperature	Low Humidity	Wind Speed	Wind Gust
June	73	27	14	33
July	89	22	12	29
August	86	18	11	28
September	75	22	12	29

Table 25: Average weather inputs from Pine Mt. Club at 5433 feet.

Pine Mt. Club Averages	High Temperature	Low Humidity	Wind Speed	Wind Gust
June	72	24	1	1
July	87	31	0	1
August	84	24	1	1
September	74	17	1	2

Table 26: Average weather inputs from the East Slope of Mt. Pinos above Cuddy Valley at 5600 feet.

Cuddy Valley Averages	High Temperature	Low Humidity	Wind Speed	Wind Gust
June	73	28	5	12
July	88	22	4	11
August	86	19	3	13
September	75	22	3	13

What weather causes a large wildland fire? Hot, dry, and windy weather results in the biggest fires. Although many days meet this definition, ignitions are still necessary for a fire to occur. Statistically, the Mt Pinos study area has beaten the odds. There are numerous hot, dry, and windy days throughout the summer and fall without large damaging fires. The months of July and August have the hottest days resulting in the driest conditions. On July 15, 2005, the weather resulted in a pattern that could have been disastrous! Temperatures were 95 degrees, the humidity was 9 percent, and the winds blew at 5 to 9 miles per hour (MPH) with gusts to 20 MPH at the Chuchupate weather station located at the Forest Service Station. Under these conditions, fires burn very hot, fast, and cast embers ahead of the main fire front. Fire suppression is normally unsuccessful if the fire escapes the initial attack.

Fires burning under high temperature, low humidity, and dry strong winds resulted in the most damaging fires in the state. Fires such as the Tunnel Fire (2900 structures destroyed) in Oakland, the Paint Fire (641 structures destroyed) in Santa Barbara, and the Cedar Fire (4847 structures destroyed) in San Diego all burned under similar conditions.

Topography

Topography defined is simply the lay of the land. This simple definition unfortunately becomes very convoluted concerning the lay of the land in the Mt Pinos study area. Topographic features alter how a fire can burn. Elevation, slope, aspect, canyons, saddles, and ridges all play a significant role in fire behavior surrounding the mountain communities.

Elevation

If the Mt Pinos study area has one positive factor relating to fire behavior, it is elevation. Elevation moderates temperature resulting in higher relative humidity and fuel moistures. On a negative note, elevation also works against the community in the form of slope. There is a 7,000 foot elevation gain within the study area (Map 5). All of the larger communities within the study area are at an elevation above 3400 feet. Although this elevation gain may moderate fire behavior, it also supports very steep grades on Interstate 5. This steep grade will bring fire suppression resources such as fire engines and bulldozer transports to a crawl as they respond to a fire in the isolated mountainous communities.

Figure 8: The elevation extremes of the study area are seen from this photo taken from the Grapevine Exit. There is approximately 3000 feet difference from the bottom of the photo to the hills seen in the top.

Map 5: Elevation of the Mt Pinos study area.

Thermal Belt

The middle elevation of a mountain is referred to as the thermal belt. It is called the thermal belt because at night, cool air pools in lower elevations. When this occurs, a warmer band of air is trapped between two cooler bands forming an inversion layer. Within the thermal belt, nighttime and early morning temperatures are higher and humidity remains lower. This results in corresponding areas of lower overall fuel moisture. Fire activity can transition from a fire with very little activity to one that will actively burn when it moves into the thermal belt.

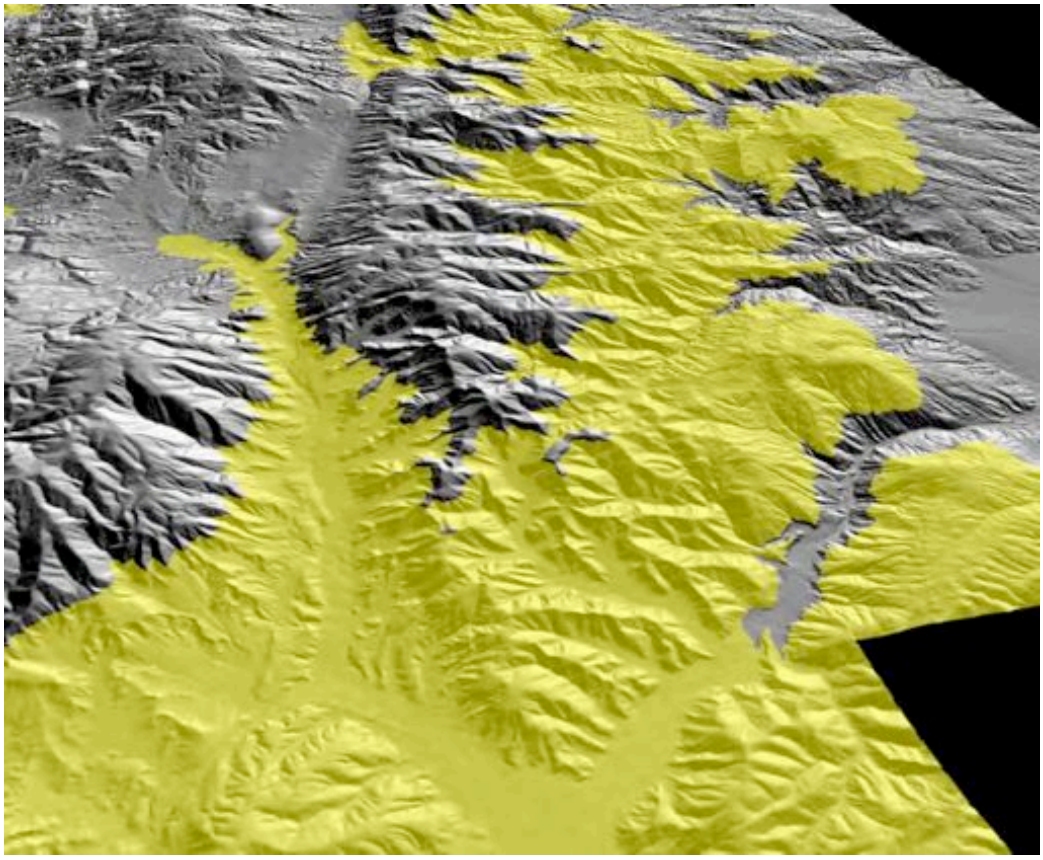


Figure 9: This three dimensional model of northeastern part of the study area shows approximately the mid-elevations in yellow where the thermal belt could develop during the evening and early morning hours under stable conditions. The San Andreas Fault is seen in the middle left of the image and Grapevine Canyon is in the lower right.

To map the thermal belt, the mean elevation of the study area was calculated. At the northeast corner of the study area, the elevation is approximately 1000 feet above sea level. The top of Mt. Pinos is 8800 feet above sea level. The mean elevation of the study area is 4300. A mountain thermal belt is found roughly in the middle third elevation and fluctuates based on temperature, relative humidity, and time of year. Lebec, Frazier Park, Lake of the Woods, eastern portions of the Cuddy Valley and the Lockwood Valley are found in this zone. Pinon Pines and Pine Mountain Club are located just above the thermal belt and fire behavior could be influenced by this topographical hazard (Map 6).

Map 6: The thermal belt found throughout the study area.

Slope

Slope is the upward or downward incline or slant of terrain. For example, a completely flat plain represents a 0% slope and a hillside that rises 30 feet for every 100 feet horizontal distance represents a 30% slope. Hot gases rise in front of the fire along the slope face, pre-heating the up-slope vegetation, moving a grass fire up to four times faster with flames twice as long as a fire on level ground. Steep grades also bring responding fire equipment to a crawl as fire engines and bulldozer transports must first climb the Grapevine, then head west on Frazier Mountain Park Road. Steep hillsides also slow firefighters as they build control lines around a fire.

Slope also poses other negative aspects concerning fire behavior. Flames are closer to the vegetation resulting in preheating. In flashy fuel types, like grass

Figure 10: Notice the amount of fire as the terrain transitions from flat to moderately steep during the Gorman Fire of 2004. Photo courtesy of the Kern County Fire Department

and sagebrush, this preheating can result in area ignition. Area ignition is the result of preheated areas and numerous upslope spotfires caused by ember casting. The separate spotfires will influence each other while they all burn together consuming great volumes of vegetation. This is an extremely dangerous phenomenon.

Slope also allows burning materials to roll downhill. Rolling pinecones and logs are notorious for spreading fire down slope. Several fuelbreaks have been compromised from rolling material. Burning rolling material can also ignite needles or other materials stored under the decks of homes.

There are rules of thumb for rates of spread of fire relating to slope. On a slope of five percent or less, there is not much influence. As the slope reaches 30 percent, the rate of spread will double. A fire burning at 10 feet per minute on a 5 percent slope will burn 20 feet per minute on a 30 percent slope. As the slope reaches 55 percent, the rate of spread will double again. A fire that was burning at 20 feet per minute is now burning at 40 feet per minute. A rate of fire spread of 40 feet per minute equates to over 6 inches per second!

The slopes within the study area are extremely steep (Map 7). They range from flat ground on the valley floor to over 100 percent. Four-wheel drive fire engines can usually traverse up to a 40 percent slope. Bulldozers can usually traverse up to a 60 percent slope.

Map 7: Slope in percent throughout the study area.

Aspect

As the sun moves through the sky during the day, it strikes some hillsides longer than others. The direction the slope faces is called aspect. Slopes that face to the south are referred to as southern aspects. The southwest aspect receives the most solar heating through the course of the day followed closely by the south and west aspects. Vegetation on these slopes is dryer due to higher temperatures and lower humidity.

These dryer conditions along with soil type dictate fuel types and fuel conditions found on different slopes. The southern slopes normally have a high concentration of flashy fuels such as grass and sagebrush. The northern slopes normally have heavier concentrations of coniferous fuels with very high fuel loadings. With the higher fuel moistures and fuel loading, fires burning on northern slopes generally burn slower but with higher intensity.

Concerning aspect, homes that are situated north of Frazier Mountain Park, Cuddy Valley and Mil Potero Roads tend to be on the warmer south slopes (Map 8).

Canyon, Saddles, and Ridges

As seen in the previous maps, there are several canyons, saddles, and ridges within the Mt. Pinos Communities. These topographic features will significantly affect fire behavior. San Emigdio Canyon, Quatal Canyon, and Apache Saddle along with smaller unnamed drainages will funnel wind upslope or cross slope during the day. The narrower the canyon, the greater increase in wind speed due to the Venturi effect[2]. Narrow canyons can also aid in the spread of fire due to radiant heat transfer. Intense heat on one side of the canyon may ignite vegetation on the other side. Narrow canyons and the ridgeline in the Mt Pinos study area may also cause winds to eddy. Eddies cause the wind to swirl and blow in several different directions. All of the topographic features within the study area pose serious concerns relating to fire behavior.

[2] The Venturi Effect is the speeding up of gas or fluid as it passes through a constriction.

gure 11: Wind can become very turbulent where drainages intersect such as this ample found where the Emigdio Creek near Mil Potrero Highway near Pine Mountain ub.

Map 8: Aspect within the study area.

Fuel

Vegetation is the fuel that is consumed by a wildland fire. The fuel type and configuration determines how much heat is generated and how quickly an area will burn. The two broad classifications of fuel are light and heavy. A more specific classification of fuel is grass, brush, timber, and slash. Slash is the debris left over from timber operations and consists of limbs, needles, and non-marketable logs. Within the study area, most fuel types and configurations are experienced.

Fuel Models

To predict fire behavior, vegetation must be mapped and a fuel model is assigned to each classification of fuel. A fuel model is a set of values that describe a fuel type for the surface fire spread model. The models used within this plan are found in the publication Aids to Determining Fuel Models for Estimating Fire Behavior[3]. Custom fuel models were assigned by the California Department of Forestry and Fire Protection (CDF) for areas covered with water, agriculture, desert, urban development, and barren earth. Their data, with minor corrections for obvious inaccuracies, were used to develop a fuel model map for the study area (Map 9).

Figure 12: Fire burns during a prescribed fire on Alamo Mountain-Los Padres National Forest. Notice during this slow moving fire that the flames are very low to the ground consuming dead fuels such as pine needles, grass, and logs. Smaller trees will be killed during a burn which helps thin a forest reducing the competition for nutrients and water for the bigger trees. Photo provided by the USDA-Forest Service.

[3] General Technical Report INT-122. Anderson, 1982

Map 9: Fuel Model Map

Fuel Types

Grass[4]

The lowlands are grass covered slopes that support fast burning but with low to moderate intensity. Most fire suppression resources are successful with extinguishing fires under low wind speeds. With higher winds or steeper slopes, fires burning in grass move faster than they can be extinguished. The grass fuel types are found within all of the communities in the study area. The fuel complex can be as large as mountains found through the Grapevine to as small as a vacant lot in Lebec.

Fire Behavior Fuel Model 1
Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one third of the area. Grasslands and savanna are represented along with stubble, grass-tundra, and grass-shrub combinations that met the above area constraint. Annual and perennial grasses are included in this fuel model.

Fuel model values for estimating fire behavior
Total fuel load, < 3-inch dead and live, tons/acre 0.74
Dead fuel load, 4-inch, tons/acre .74
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 1.0

To understand the potential for each fuel type, the BEHAVE fire modeling program was used to define fire behavior under different wind speeds[5].

Table 27: Fire behavior output for the Grass Fuel Type

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Grass/1	0	1.9	14
Grass/1	5	5.2	126
Grass/1	10	8.6	380

[4] Fuel type descriptions, values and outputs are from Aids to Determining Fuel Models For Estimating Fire Behavior, Hal E. Anderson-April 1982

[5] These calculations were performed using four percent fine dead fuel moisture and a 20 percent slope.

Figure 13: Grasslands burning during the Gorman Fire near Interstate 5. Grass burns very fast allowing fire to transition into heavier fuels. Photo provided by the Kern County Fire Department.

Grass Understory

As more elevation is gained, the grasslands give way to the valley oak savannas or conifers with a grass understory. This landscape is dominated by rolling grasslands peppered with oak trees. The grass is still the main carrier of fire but there are occasional "jackpots" of heavier fuel where limbs have broken off or entire trees have collapsed due to disease, pest or past fires. The increased fuel loads will cause a greater opportunity for embers to be cast in front of the main fire resulting in spot fires.

Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stemwood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and pine stands or scrub oak stands that cover one-third to two-thirds of the area may generally fit this model; such stands may include clumps of fuels that generate higher intensities and that may produce firebrands.

Fuel model values for estimating fire behavior:
- Total fuel load, < 3-inch dead and live, tons/acre 4.0
- Dead fuel load, 1/4-inch, tons/acre 2.0
- Live fuel load, foliage, tons/acre 0.5
- Fuel bed depth, feet 1.0

Table 28: Fire behavior output for the Grass Understory Fuel Type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Grass Understory/2	0	2.8	6
Grass Understory/2	5	7.5	52
Grass Understory/2	10	12.8	168

Figure 14: A pine forest with a grass understory burns during the Alamo Mountain prescribed fire south of the study area. Photo provided by the USDA Forest Service.

Brush

The brush species in the Mt Pinos study area burn with very high intensity and is difficult to suppress. They produce resins that help the plant preserve water during the dry months. These resins are highly combustible and may produce high intensity fires. As the brush ages, it produces dead material that is suspended in its canopy that also contributes to high intensity fires. By burning areas of brush under safe weather conditions, older stands can be replaced with younger species that do not have the problems associated with dead material.

There are three general types of brush that occupy the study area. The first classification is the mix hard chaparral found throughout the study area in the mid-elevations. Fuel Model 4 includes mature stands of manzanita, chamise, and scrub oak. Fuel Model 5 is used to model the sage brush found on the slope in all of the communities. The last classification of brush is Fuel Model 6 used to capture the fire characteristics of Pinyon-Juniper forest found in the dryer slopes within the study area.

Fire Behavior Fuel Model 4

Fire intensity and fast-spreading fires involve the foliage with live and dead fine woody material in the upper portion of a nearly continuous fuelbed. The model represents stands of mature shrubs, 6 or more feet tall, such as California mixed chaparral. Besides flammable foliage, dead woody material in the stands significantly contributes to the fire intensity. Height of stands qualifying for this model depends on local conditions. A deep litter layer may also hamper suppression efforts.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre 13.0
Dead fuel load, 4-inch,tons/acre 5.0
Live fuel load, foliage, tons/acre 5.0
Fuel bed depth, feet 6.0

Table 29. Fire behavior outputs for the mature brush fuel type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Mature Brush/4	0	9	14
Mature Brush/4	5	24.9	125
Mature Brush/4	10	38	312

Fire Behavior Fuel Model 5
Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Usually shrubs are short and almost cover the area. This model is primarily used to model young sage brush within the study area that grows quickly after a land disturbance such as fire or fuel modification.

Fuel model values for estimating fire behavior
Total fuel load, < 3-inch dead and live, tons/acre 3.5
Dead fuel load, 4-inch, tons/acre 1.0
Live fuel load, foliage, tons/acre 2.0
Fuel bed depth, feet 2.0

Table 30. Fire behavior outputs for the sage brush fuel type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Sage Brush/5	0	2.7	4
Sage Brush/5	5	7.9	41
Sage Brush/5	10	12	102

Fire Behavior Fuel Model 6
Fires carry through the shrub layer where the foliage is more flammable than fuel model 5, but this requires moderate winds, greater than 8 mi/h (13 km/h) at midflame height. Fire will drop to the ground at low wind speeds or at openings in the stand. The shrubs are older, but not as tall as shrub types of model 4, nor do they contain as much fuel as model 4. A broad range of shrub conditions is covered by this model. Fuel situations to be considered include intermediate stands of chamise, chaparral, and oak brush. This model is used primarily to model Pinyon-juniper shrublands. It may overpredict rates of spread except at high winds, like 20 mi/h (32 km/h) at the 20-foot level.

Fuel model values for estimating fire behavior
Total fuel load, < 3-inch dead and live, tons/acre 6.0
Dead fuel load, 4-inch, tons/acre 1.5
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 2.5

Table 31. Fire behavior outputs for the Juniper fuel type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Dormant/6	0	2.6	5
Dormant /6	5	7.2	48
Dormant /6	10	10.8	113

Figure 15: This stand of mature brush is located within Camp Scheideck. This brush is capable of extreme fire intensity and rates of spread. Species include manzanita, chamise, and scrub oak.

Figure 16: This stand of sage brush found on the southeast side of Frazier Park is re-growth from a fuelbreak put in place by Kern County Fuel Crew 82. Although the sage will burn, it will not pose the same high intensity due to the lack of dead material found in older growth.

Figure 17: The most predominate fuel type in the higher elevations is the pinyon pine-juniper forest.

Hardwoods

Many of the northern slopes at the mid-elevations are covered with dense stands of oaks trees. The main carrier of fire is the grass understory and litter cast by the trees including leaves and branches. Due to the heavy shading created by the tree canopy, fuel moistures are generally higher in this fuel type. Conifers usually pepper these stands in the higher elevations.

Fire Behavior Fuel Model 8

Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter an occasional "jackpot" or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humidities, and high winds do the fuels pose fire hazards. This model is used to capture the riparian vegetation throughout the study area. This layer is mainly leaves and occasionally twigs because little undergrowth is present.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre 5.0
Dead fuel load, 4-inch, tons/acre 1.5
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 0.2

Table 32: Fire behavior outputs for the hardwood litter fuel type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Hardwood Litter/8	0	.6	.5
Hardwood Litter/8	5	1.3	3
Hardwood Litter/8	10	2	6

Conifers

The conifers within the Mt Pinos study area include Single Leaf Pinyon, Jeffery, Sugar, Ponderosa and Limber Pines, White Fir, Big Cone Douglas Fir, Juniper and Incense Cedar. These trees exist at the middle and upper elevations. Fire spreads by burning the ground litter and needles cast from the trees. During periods of extreme fire weather, fire can burn through the upper portion of the trees referred to as a crown fire. Crown fires are extremely dangerous because suppression is generally ineffective.

Figure 18. A mixture of conifers surrounding homes in Pine Mountain Club. Photo by Timothy Walsh.

Fire Behavior Fuel Model 9
Fires run through the surface litter faster than model 8 and have longer flame height. Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing leaves. Closed stands of long-needled pine like ponderosa and Jeffrey pines, are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

Fuel model values for estimating fire behavior
Total fuel load, < 3-inch dead and live, tons/acre 3.5
Dead fuel load, 4-inch, tons/acre 2.9
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 0.2

Table 33: Fire behavior outputs for the light conifer fuel type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Light Conifer Litter/9	0	1.4	2
Light Conifer Litter/9	5	3.5	12
Light Conifer Litter/9	10	5.7	37

Fire Behavior Fuel Model 10

The fires burn in the surface and ground fuels with greater fire intensity than the other timber litter models. Dead-down fuels include greater quantities of 3-inch (7.6-cm) or larger limb wood resulting from overmaturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties. Any forest type may be considered if heavy down material is present; examples are insect- or disease-ridden stands, windthrown stands, overmature situations with deadfall, and aged light thinning or partial-cut slash.

Fuel model values for estimating fire behavior
Total fuel load, < 3-inch dead and live, tons/acre 12.0
Dead fuel load, 4-inch, tons/acre 3.0
Live fuel load, foliage, tons/acre 2.0
Fuel bed depth, feet 1.0

Table 34: Fire behavior outputs for the moderate conifer fuel type.

Fuel Type/Model	Wind-MPH Mid-flame Height	Flame Lengths-Feet	Rate of Fire Spread-Feet/Minute
Moderate Conifer Litter/10	0	2.6	2
Moderate Conifer Litter/10	5	6.7	13
Moderate Conifer Litter/10	10	9.4	31

Fire History

Areas that have little or no history of fire or any other type of vegetation management become overloaded with vegetation or fuel. Many areas within the Mt Pinos study area are void of fire history. Fire is nature's way to thin the forest. When a slow burning fire with little intensity has thinned a forest, trees are not competing for water and nutrients. This process allows for fewer but healthier trees. Healthy trees stand a much better chance of producing pitch that plugs boreholes made by the beetles and other pests. Even large damaging fires that replace entire stands of trees help breakup an even age class of forest providing some diversity of habitat.

Without fire, the forest may become very unhealthy full of large thickets of small trees and brush. Many areas become choked with vegetation that when a forest fire finally occurs, there is little to do but get out of the way. This is usually not a problem unless there are assets within the fuelbed. Assets such as homes, habitat, and watersheds can suffer devastation from a high intensity wildland fire.

There are 71 fires within the fire history database that maps fires from 1960 to the present day. Unfortunately, there are several fires missing from the database that were not cataloged or mapped in the 60's and 70's. Although there are fires missing in the database, it is safe to assume several large areas are void of historical fires. Some of these are overstocked with vegetation and have large amounts of dead and down woody debris (Map 10).

Figure 19: A fire scar seen from the air south of Lake of the Woods. This fire was the Lakewood Fire of 1994 and threatened the community.

Map 10: Fire history within the Mt Pinos study area.

Assessment of the Communities

The next section of the plan focuses on the communities within the fire safe council's study area. Each area will be examined to determine where the greatest hazard and risk are located. The first step in the process is to divide the entire study area into 50-acre cells (Map 11). Within each cell, the mean slope, the majority aspect, and the number of homes is calculated. A rank is assigned to each hazard category. The ranks are then summed to determine the total hazard rank.

Table 35: Mean slope hazard ranking for each 50-acre cell

Mean Slope	Rank
0-10	1
11-25	2
26-40	3
41-60	4
>60	5

Table 36: Majority aspect hazard ranking for each 50-acre cell

Aspects	Rank
South, Southwest, and West	2

Table 37: Ranks based on the number of homes within each 50-acre cell

Number of Homes	Rank
0	0
1-5	1
6-10	2
>10	3

Table 38: Total hazard ranks are the sum of the slope, aspect, and home ranks.

Total Hazard Rank	Label
1-2	Low
3-4	Moderate
5-6	High
7-10	Very High

Assessments were performed for:

Lebec /Los Padres Estates/Digier Canyon
Frazier Park
Lake of the Woods/Pinon Pines/Cuddy Valley
Pine Mountain Club
Lockwood Valley/Camp Scheideck

Map 11: 50-Acre Cells within the study area.

Lebec/Los Padres Estates/Digier Canyon

The first area assessed is the communities along Interstate 5 that include Lebec, Los Padres Estates, and Digier Canyon (Map 12). The areas greatest risk of a large damaging wildfire is from the large number of ignitions found along the freeway. Vehicles overheating as well as overheated brakes can both provide the ignition needed to initiate a wildfire. Another source of ignition is from vehicles using the off-road facility found at Hungry Valley. Most of the area is covered with grass which burns very fast and readily ignites from embers as seen in the Gorman Fire of 2005. The fire jumped across Interstate 5 multiple times before it was finally brought under control. Several homes could be destroyed due to higher wind speeds that funnel through this area. Besides several homes, other assets found in the area include the Fort Tejon State Historic Park and the Tejon Ranch Headquarters.

Fire protection within the Lebec area is provided by Kern County Fire Department (KCFD) from Station 56 in Lebec. There is an engine company and a 12 person handcrew assigned to the station. Additional KCFD engines would respond from Frazier Park, Pine Mt. Club, and Mettler. Los Angeles County Fire Department would also provide protection from Station 77 located at I-5 and Highway 138. Engines from the Forest Service would also respond.

Within this area, there are 518 developed parcels[6]. The improvement value of the parcels is $35,099,406 but this figure includes the improvements found on Tejon Ranch Commercial Park. This figure does not include the cost of the land, home contents, or increases in cost since the last assessment.

Slopes within this area range from flat near Interstate 5 and the truck stop to very steep such as Digier Canyon (Map 13). Many of the homes in this area are located in box canyons that are facing to the east. Any fire that originates from the west side of the interstate could be pulled into this area by the steep slopes. Another concern relating to slope is the

Figure 20: The series of box canyons in Lebec that could funnel winds during a wildfire.

[6] A developed parcel is defined as one that has an improvement value of $5000 dollars listed in the Kern County Parcel Database.

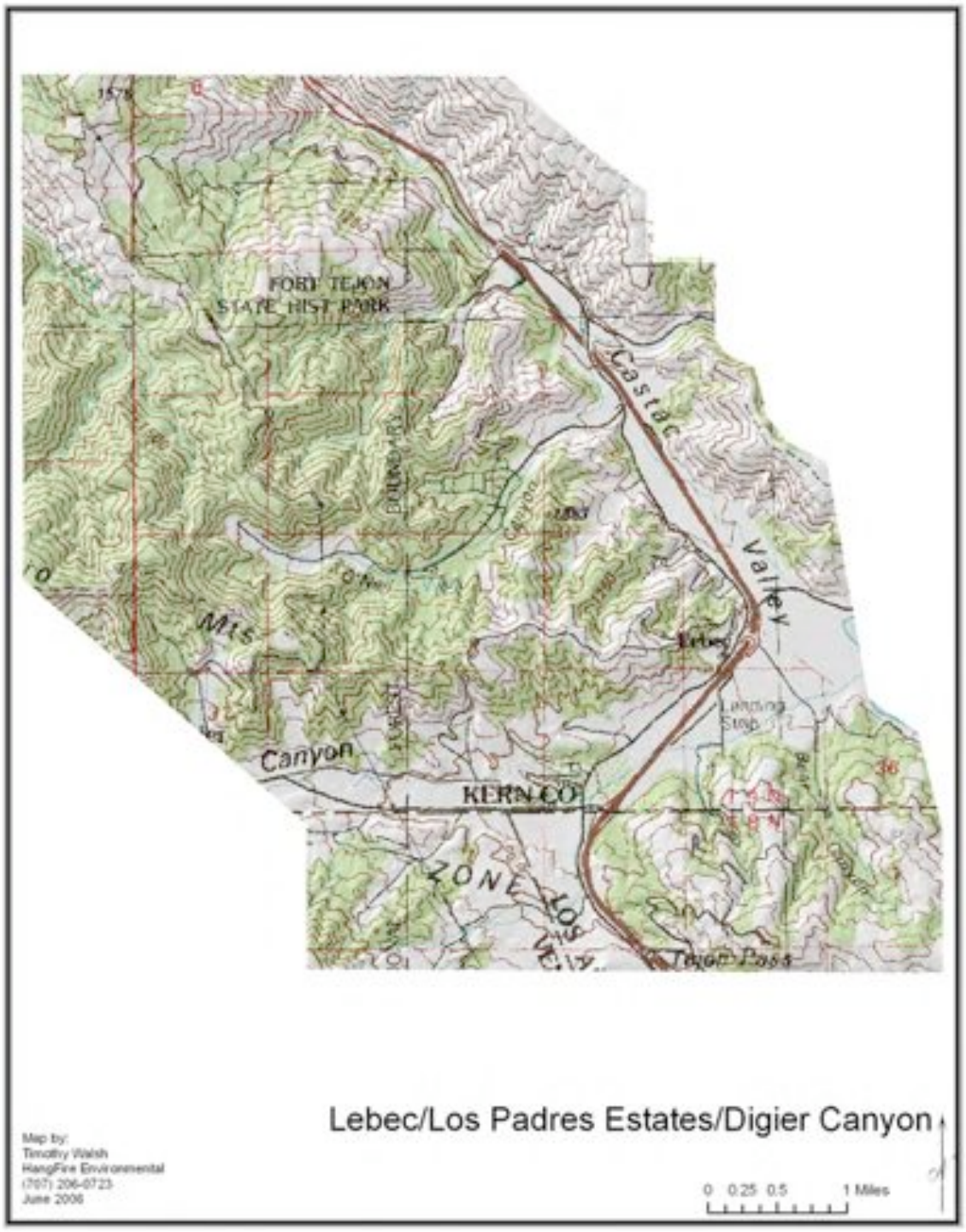
number of homes located on ridge lines. Fire burns very fast up steep grass-covered slopes which are found throughout this area.

The area with the greatest amount of southwest facing slopes is found east of the interstate. Another area with large amounts of warmer south facing slopes are the homes found on the Chimney Canyon Road in Lebec (Map 14).

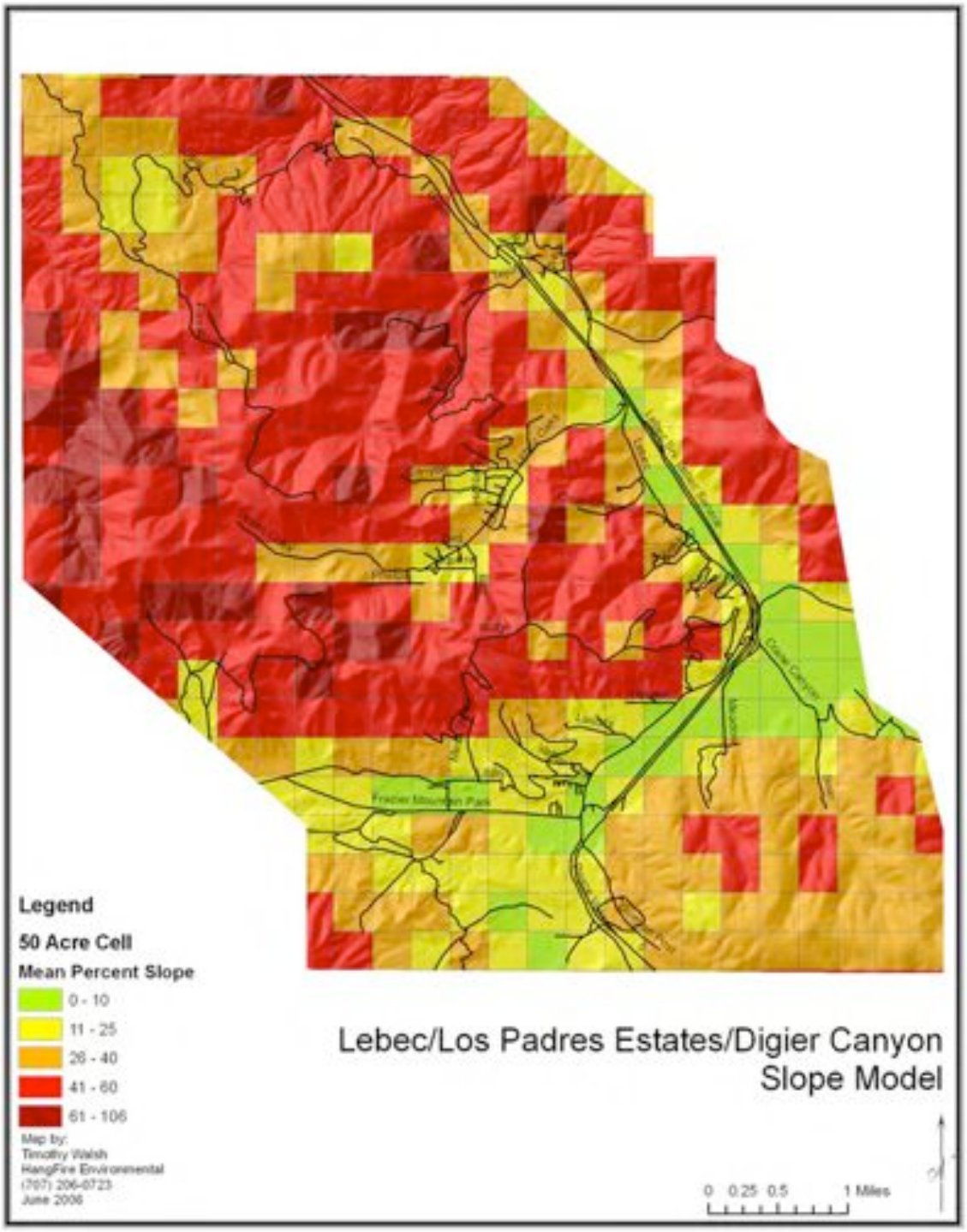
The highest number of homes in the area is located in Los Padres Estates along Lebec Canyon Road (Map 15). Numerous homes require more fire engines for protection. If homes are close together, then possibly one fire engine may protect more than one residence. One of the greatest challenges found during a wildland fire is when homes are built on large parcels requiring one fire engine for each dwelling. Digier Canyon has several homes that meet this criterion.

Figure 21: A view into Los Padres Estates portrays an example of both homes built on smaller and larger lots.

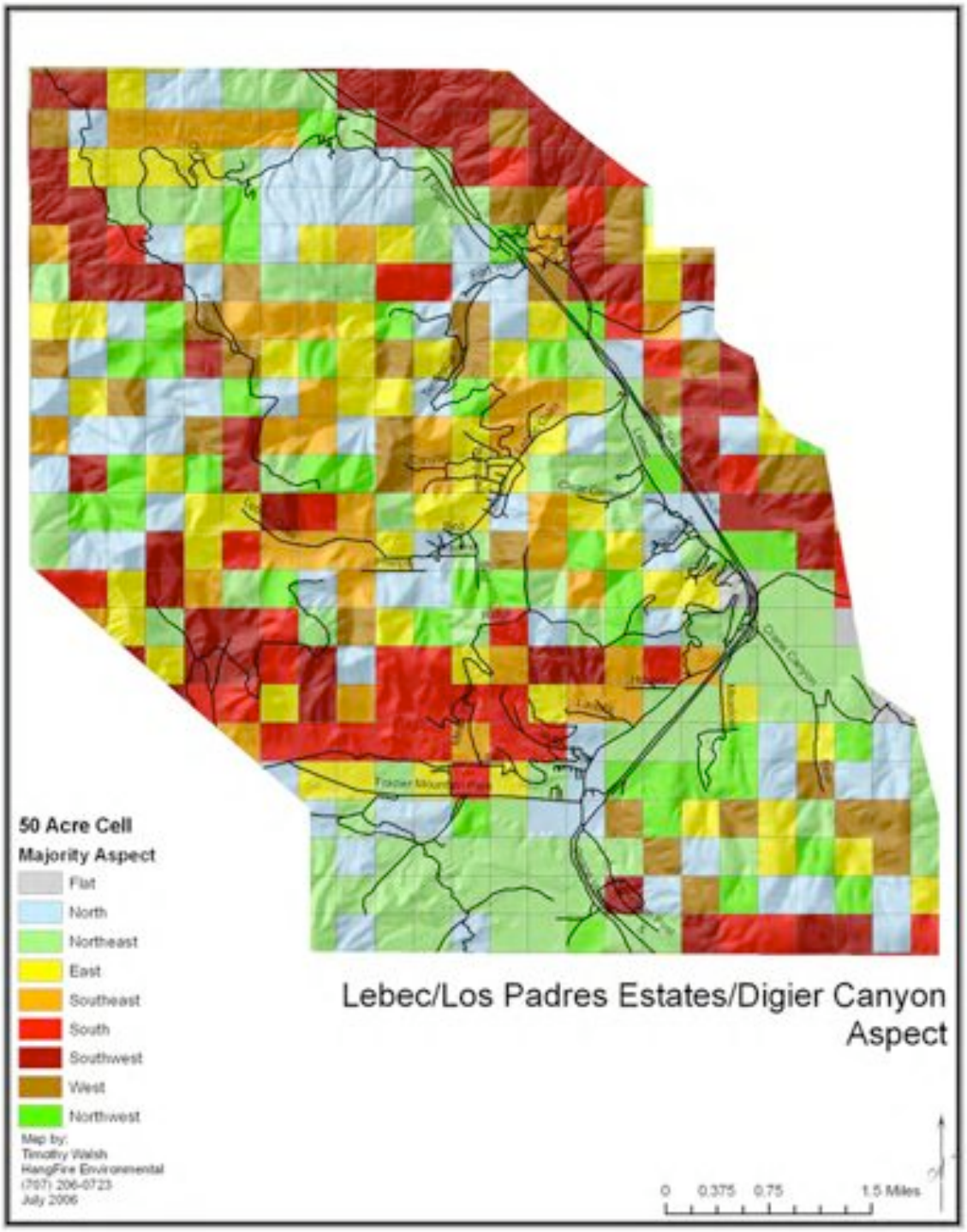
The total hazard ranks for this area are mostly moderate and high (Map 16). There are two locations that host cells with very high ranks with improvements. The first is found in the Chimney Canyon Road area. This area has mostly south facing slopes with numerous homes. The second area is located at the end of Circle Road in Lebec and has very steep slopes with numerous homes.



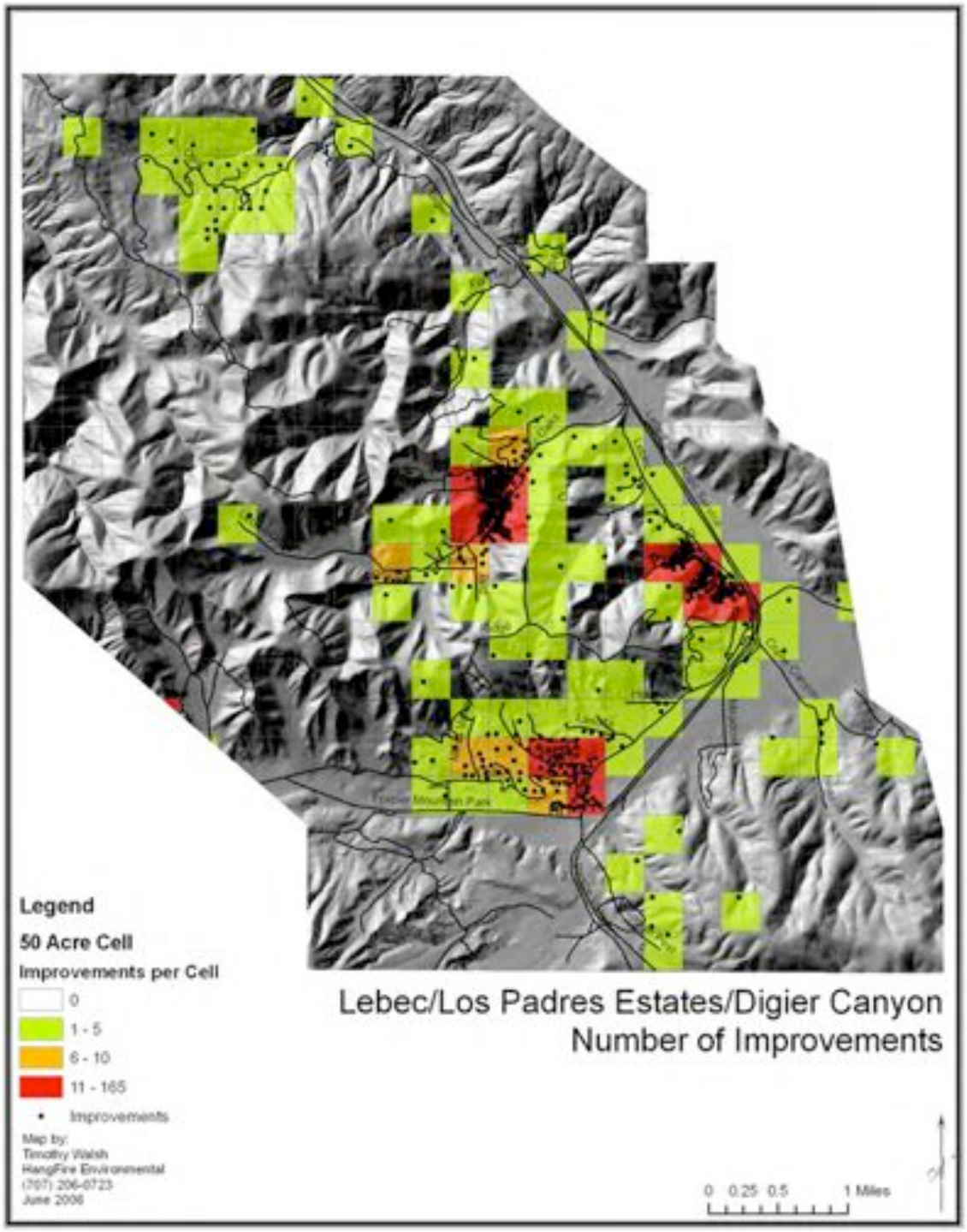
Map 12: The Lebec, Los Padres Estates, and Digier Canyon area.



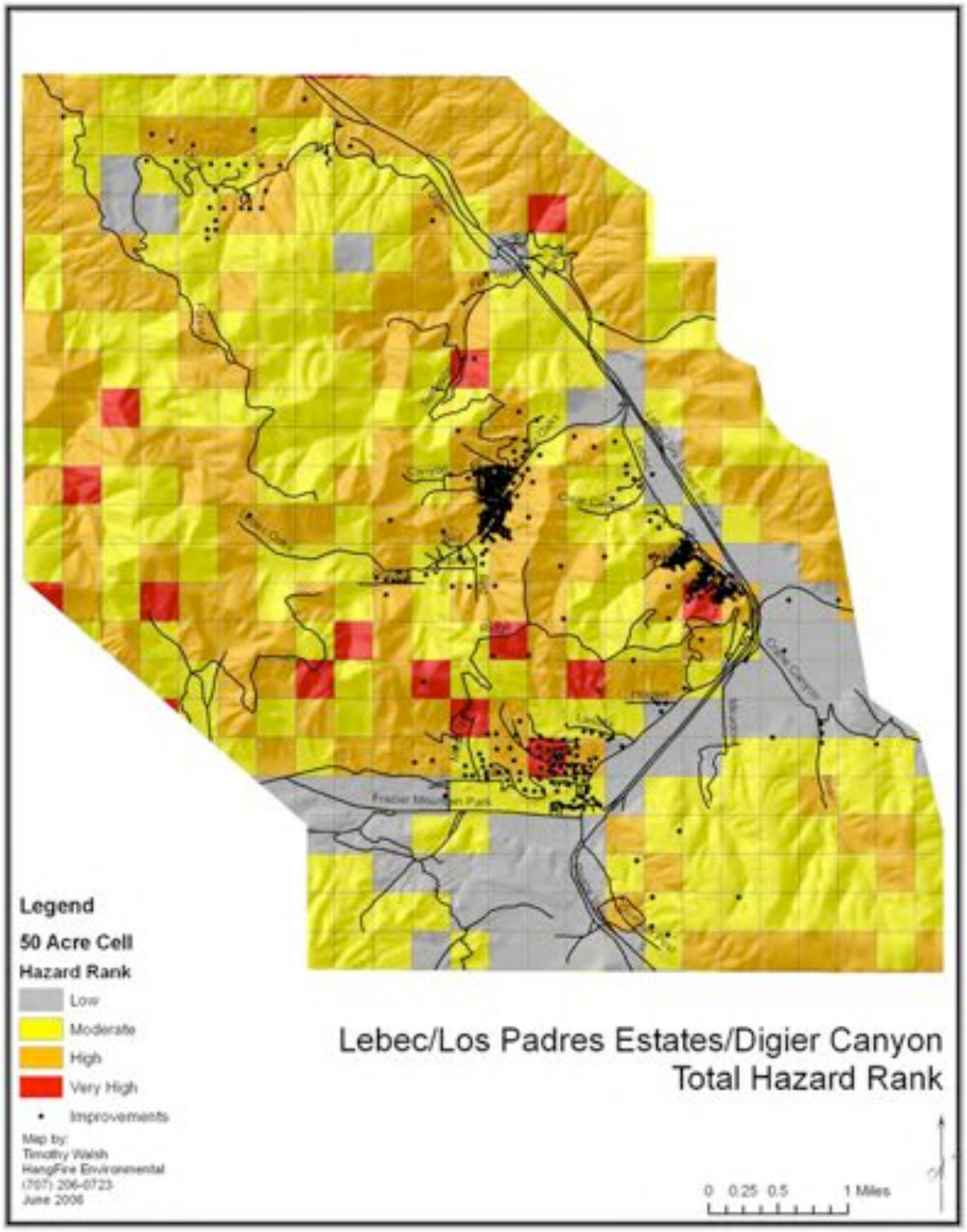
Map 13: The mean percentage of slope for each 50-acre cell in the Lebec/Los Padres Estates/Digier Canyon area.



Map 14: The majority aspect for each 50-acre cell in the Lebec/Los Padres Estates/Digier Canyon area.



Map 15: The number of improvements within each 50-acre cell for the Lebec, Los Padres Estates, and Digier Canyon areas. The dots represent the center of each developed parcel with an improvement value of at least 5000 dollars.



Map 16: Total hazard ranks assigned to each 50-acre cell are a combination of the slope, aspect, and improvement ranks.

Frazier Park

Frazier Park is located west of Lebec on Frazier Mountain Park Road (Map 17). The community is split into half by Frazier Mountain Park Road creating the north and south sides of the community. The community has been threatened by large fires in the past including the Scott Fire of 2006, Gorman Fire of 2005 and Mesa Fire in 1984. Large scale vegetation management has been employed by the Forest Service and Kern County Fire Department in an attempt to protect the community.

Primary fire protection for Frazier Park is provided by the KCFD (Frazier Park station 57) and USFS. Fire protection resources would also respond from KCFD stations located Pine Mountain Club, Lebec, and Mettler. Additional engines would also respond from Los Angeles County Fire Department.

In Frazier Park, there are 1327 developed parcels[7]. The improvement value of the parcels is $72,900,789. This figure does not include the cost of the land, home contents, or increases in cost since the last assessment.

Figure 22. This photograph taken from the air indicates how much vegetation surrounds the community of Frazier Park. Photograph by Timothy Walsh.

On both the north and south sides of Frazier Mountain Park Road, the homes are situated on flat ground. As one travels away from the road in opposite directions, it becomes a steep climb in both directions (Map 18).

On the north side of the community, homes located on San Fernando, North End, Pico, Summit and Manita Drives are built on steep slopes. On the south side of the community, homes built on South End, Oakmont, Upper, Main and Truman Drives are built on steep slopes. Most of the north side of Frazier Parks is situated on the warmer southeast, south, or southwest facing slopes (Map 19).

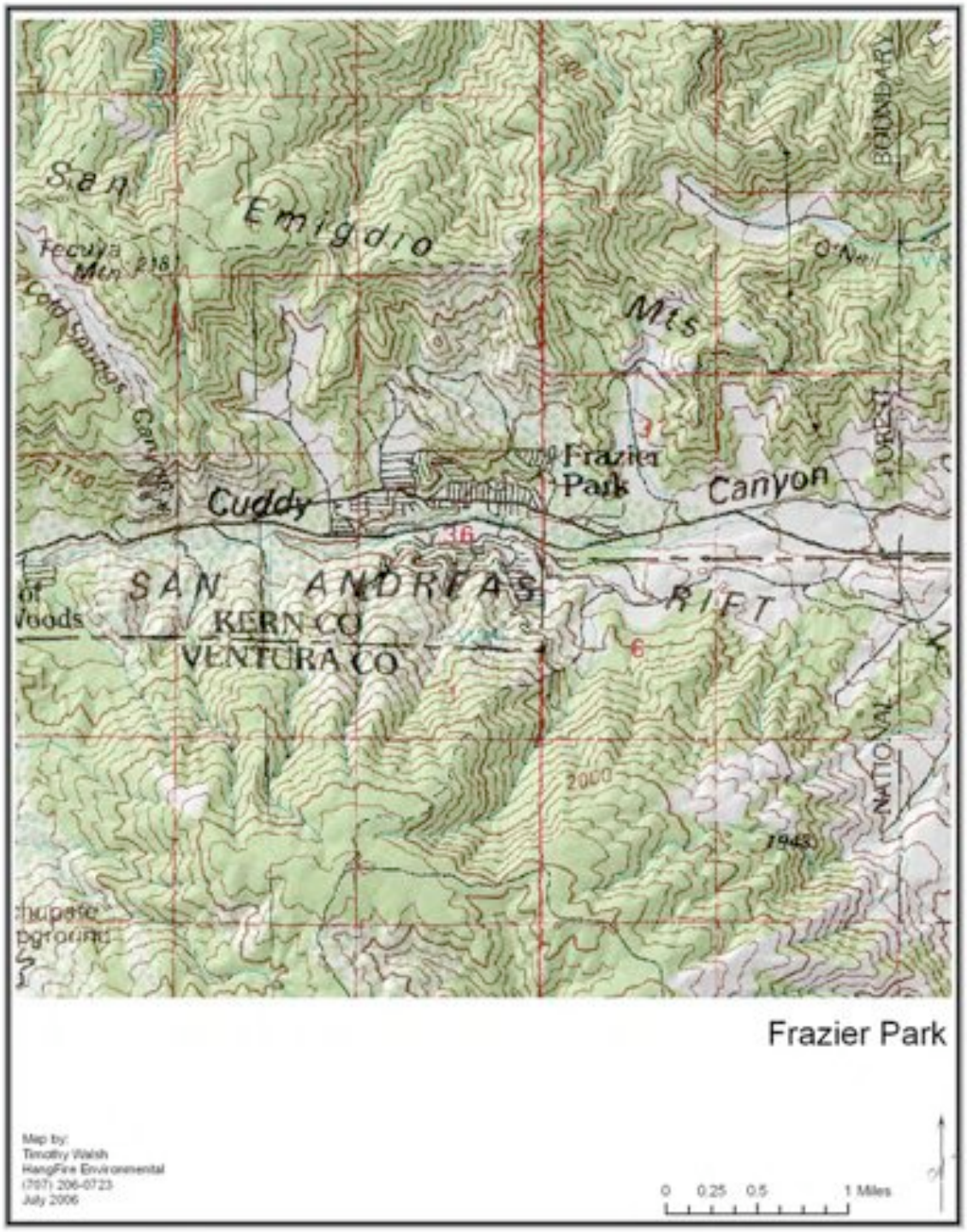
[7] A developed parcel is defined as one that has an improvement value of 5000 dollars listed in the Kern County Parcel Database.

Frazier Park has a large number of developed parcels within a small area (Map 20). Many of the properties are located on small lots with homes in close proximity to one another. During a wildland fire, radiant heat from a burning home could ignite other homes that are in the vicinity. Another serious issue within this area is the limited access found within the roads that are called “trails”. The trails are very narrow and some of them are not paved that could result in congestion during a fire. This is particularly dangerous when residents may be evacuating an area while fire apparatus try to make access.

The total hazard ranks for Frazier Park proper are mostly high and very high (Map 21). Areas with the highest hazard are located:

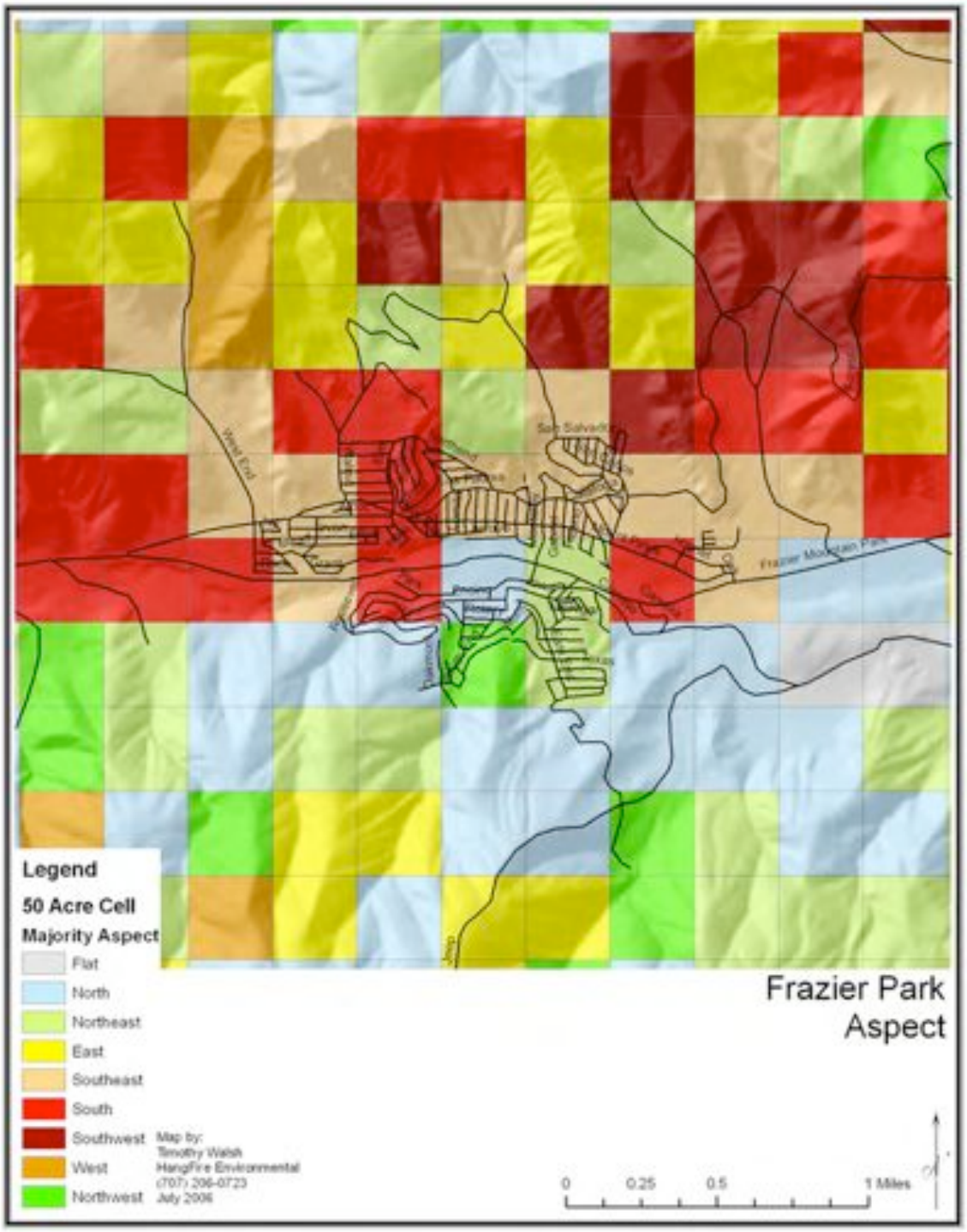
Northend Drive, Pico Trail, and Elm Drive
The area north of Mt. Pinos Way between Walnut and Anacapa Drives.
West end of Park Drive, Roosevelt, and Coolidge Trails
Southend Drive, Truman Drive, Main Trail and Oakmont Drives
Piedmont Way and Hemming Way.

Figure 23: A typical “trail” found in Frazier Park which is a narrow unpaved road with several homes. This road is barely wide enough for a fire engine. Many of the trails are steeper and poorly maintained.

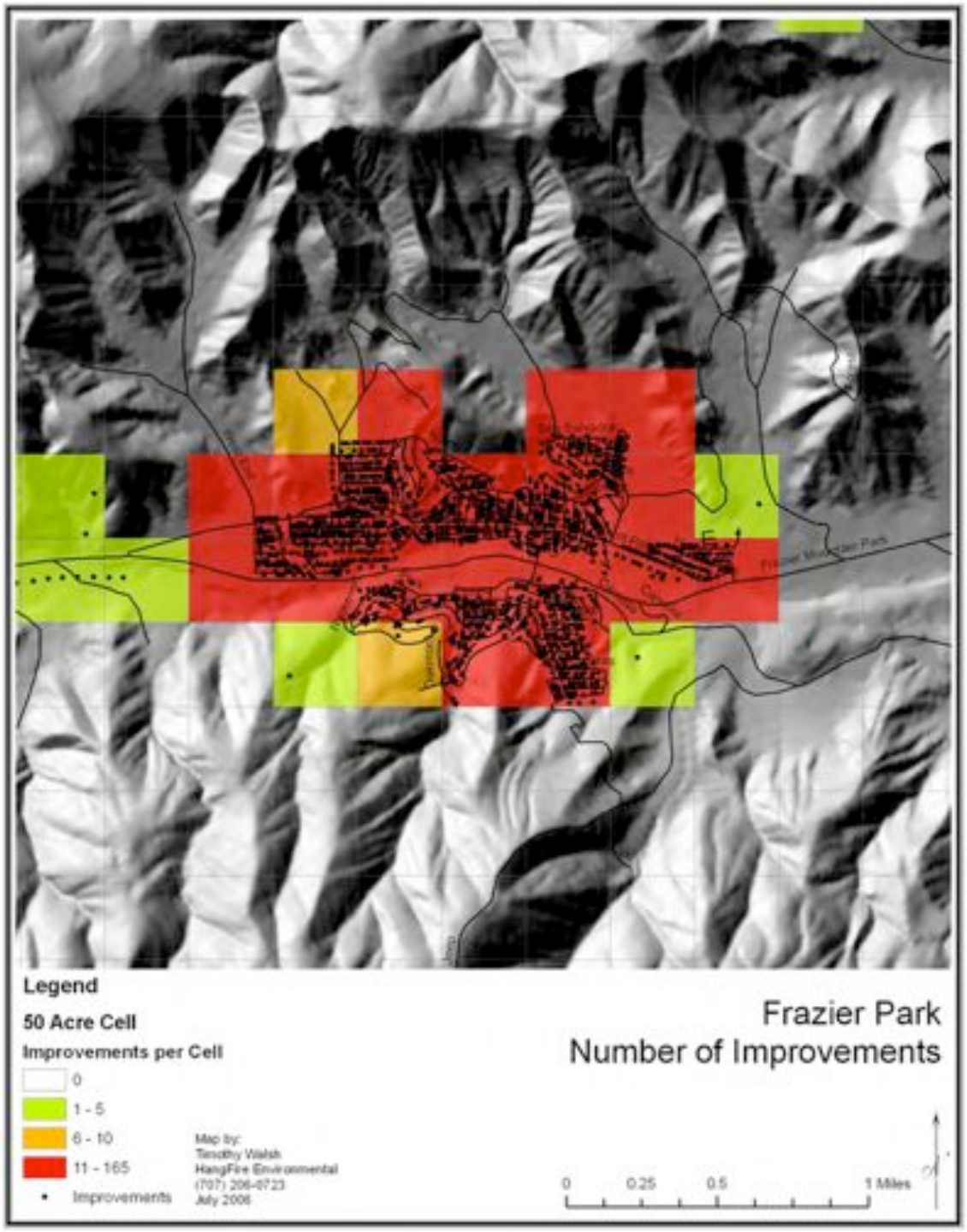


Map 17: Frazier Park

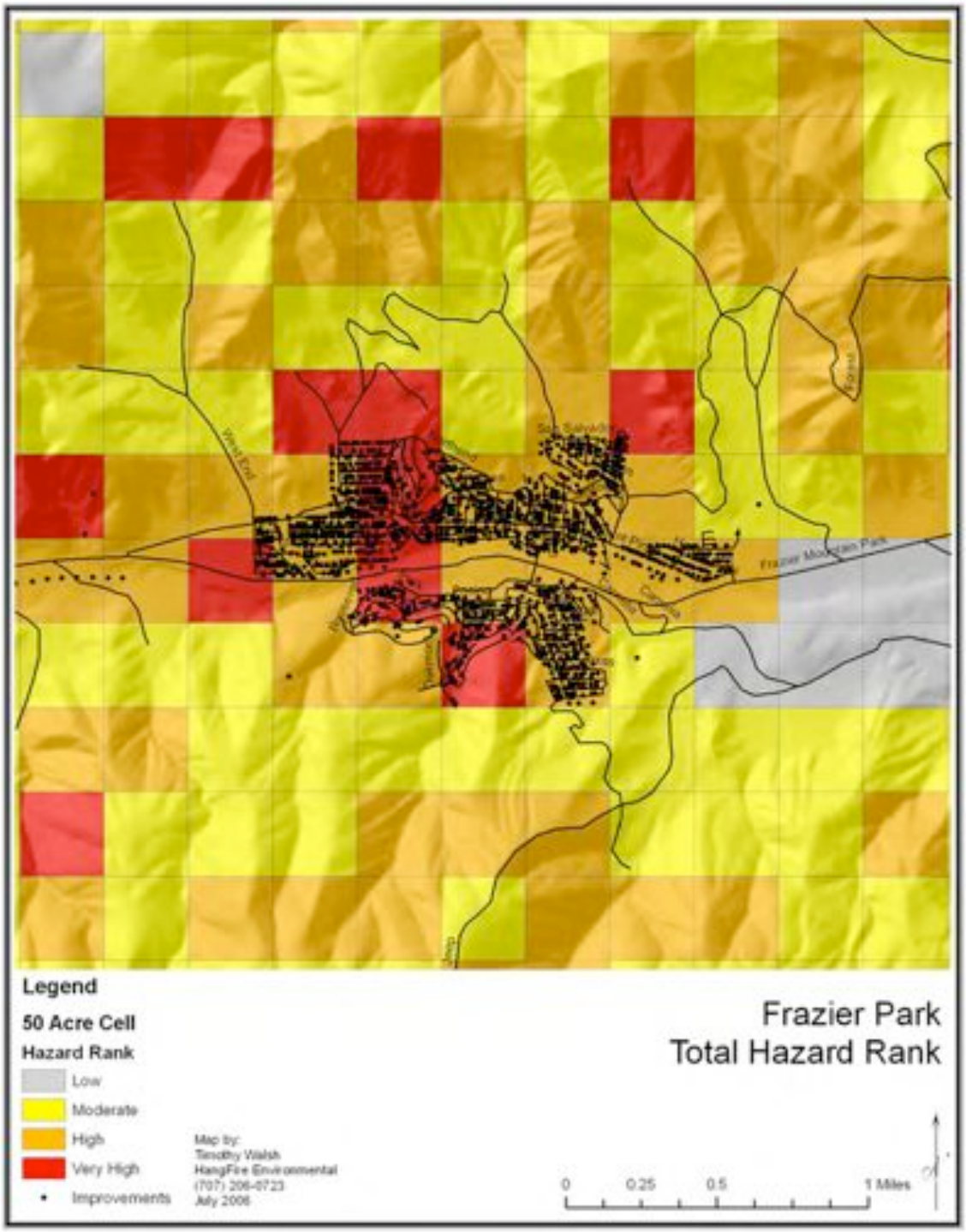
Map 18: The mean percentage of slope for each 50-acre cell in Frazier Park area.



Map 19: The majority aspect for each 50-acre cell in the Frazier Park area.



Map 20: The number of improvements within each 50-acre cell for the Frazier Park areas. The dots represent the center of each developed parcel with an improvement value of at least 5000 dollars.



Map 21: Total hazard ranks assigned to each 50-acre cell are a combination of the slope, aspect, and improvement ranks.

Lake of the Woods/ Pinon Pines/Cuddy Valley

The next area within the assessment consists of Lake of the Woods, Pinon Pines, and Cuddy Valley (Map 22). The communities span approximately six miles from the western edge of Frazier Park to Mil Potrero Highway. Lake of the Woods has dwellings on both sides of Cuddy Valley Road while the other two areas primarily have homes on the south side of the main road. The area is absent of recent fire history but this only provides more available fuel should a fire occur.

Fire protection for the area is provided by KCFD and USFS.

Within the area, there are 750 developed parcels[8]. The improvement value of the parcels is $67,912,827. This figure does not include the cost of the land, home contents, or increases in cost since the last assessment. The breakdown of improvements is approximately:

108 improvements in Cuddy Valley
247 improvements in Pinon Pines
395 improvements in Lake of the Woods

Concerning slope, the following roads within these areas pose a fire control challenge.

Lake of the Woods
- Border Street
- Lakeview Drive
- Ivins Drive
- Point Court
- Paige Road

Pinon Pines
- Viewpoint
- Leisure
- Whispering Pines Road

Cuddy Valley
- Pineridge

On a positive note, many of these homes are located above 5000 feet elevation. Elevations this high tend to moderate fire behavior due to the cooler temperatures and higher relative humidity. Both of these factors increase the moisture within dead vegetation such as grass and logs which dictates how easily ignition will occur, the intensity of burning, and the ease of spotfire production (Map 22).

[8] A developed parcel is defined as one that has an improvement value of 5000 dollars listed in the Kern County Parcel Database.

Concerning slope, the steepest developed areas are found off of Lakeview Drive, Lakeview Terrace, and Border Street in Lake of the Woods (Map 23).

The northern side of Lake of the Woods or those homes located north of Frazier Mountain Park Road/Cuddy Valley Road are situated on the hot south or southwest facing slopes. These hot slopes receive the highest amounts of afternoon sunlight creating very dry slopes with a high concentration of grass. These flashy fuel types will burn with very high rates of spread, especially when combined with the steep slopes. Within Pinon Pines, homes located south of Snowline Drive, are situated on the hot slopes. Most of the homes located in Cuddy Valley are positioned on cooler slopes (Map 24).

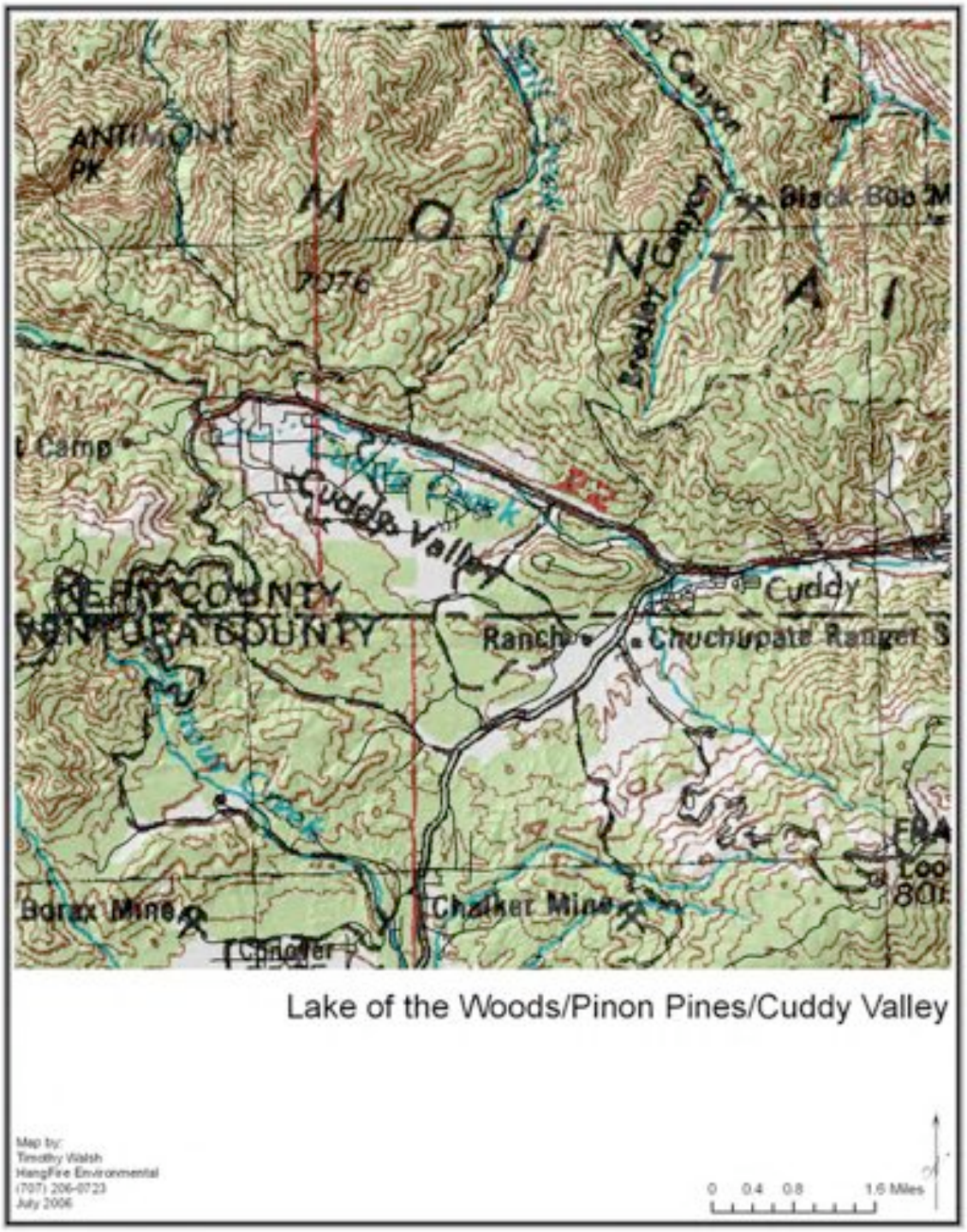
This area has three distinct wildland urban interface areas (Map 25). Lake of the Woods is situated on both sides of the main access road. Homes located in the southwest portion of the community are built on hillsides with vegetation throughout the neighborhood. The north side of Frazier Mountain Park Road has the greatest hazards due to the steep slopes found in the area.

Within Pinon Pines, there is a heavier concentration of vegetation throughout the urban interface combined with moderate slopes. It would be difficult to suppress a crown fire due to the tight canopy closure. On a positive note, the community is surrounded by a belt of light fuels as seen in Figure 24.

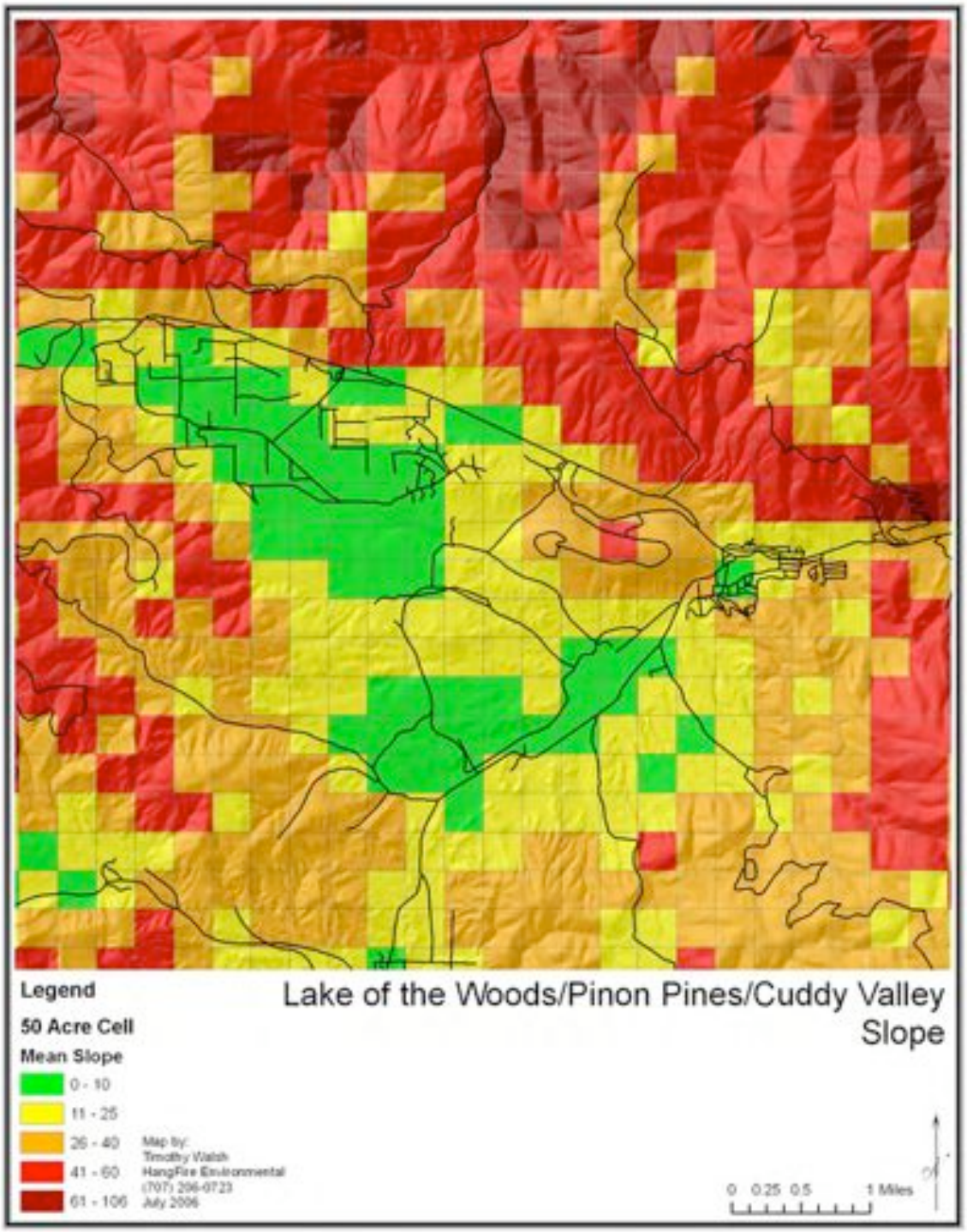
Figure 24: The community of Pinon Pines is seen in the center of the photograph surrounded by a belt of light-flashy fuels.

During a wildland fire, homes will need to be protected. This strategy is called structure protection and is difficult at best during a fast moving fire. When homes are built on larger parcels such as those in Cuddy Valley, an individual engine is needed for each structure. Due to the limited number of engines in any geographic area, this is normally not possible. Engines responding from outside of the Mt Pinos study area will need to climb the Grapevine from either direction which dramatically slows response.

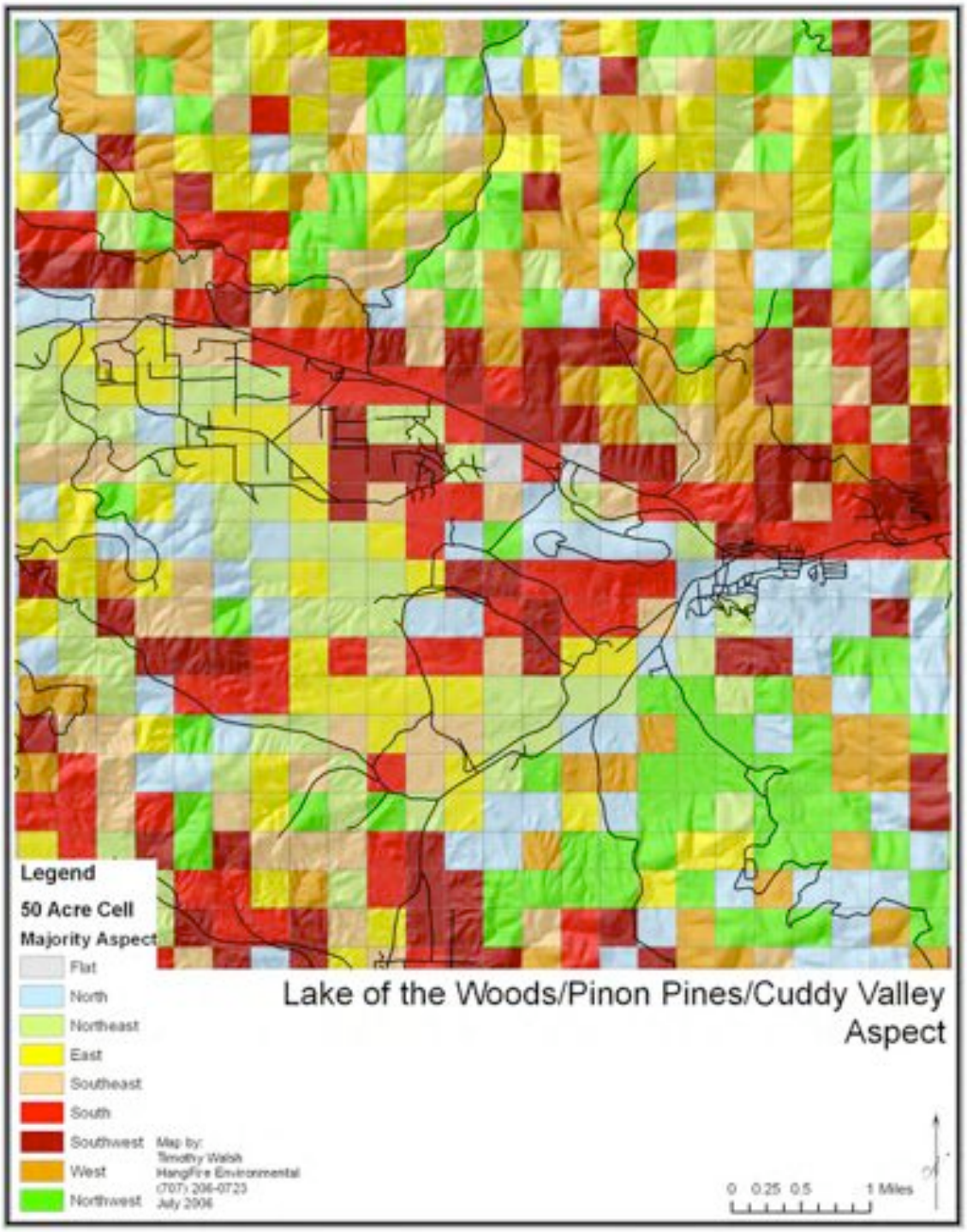
Figure 25: Burned debris and foundations are the only evidence of a wildland fire that destroyed three structures off of Whispering Pines Road on June 27, 1997.



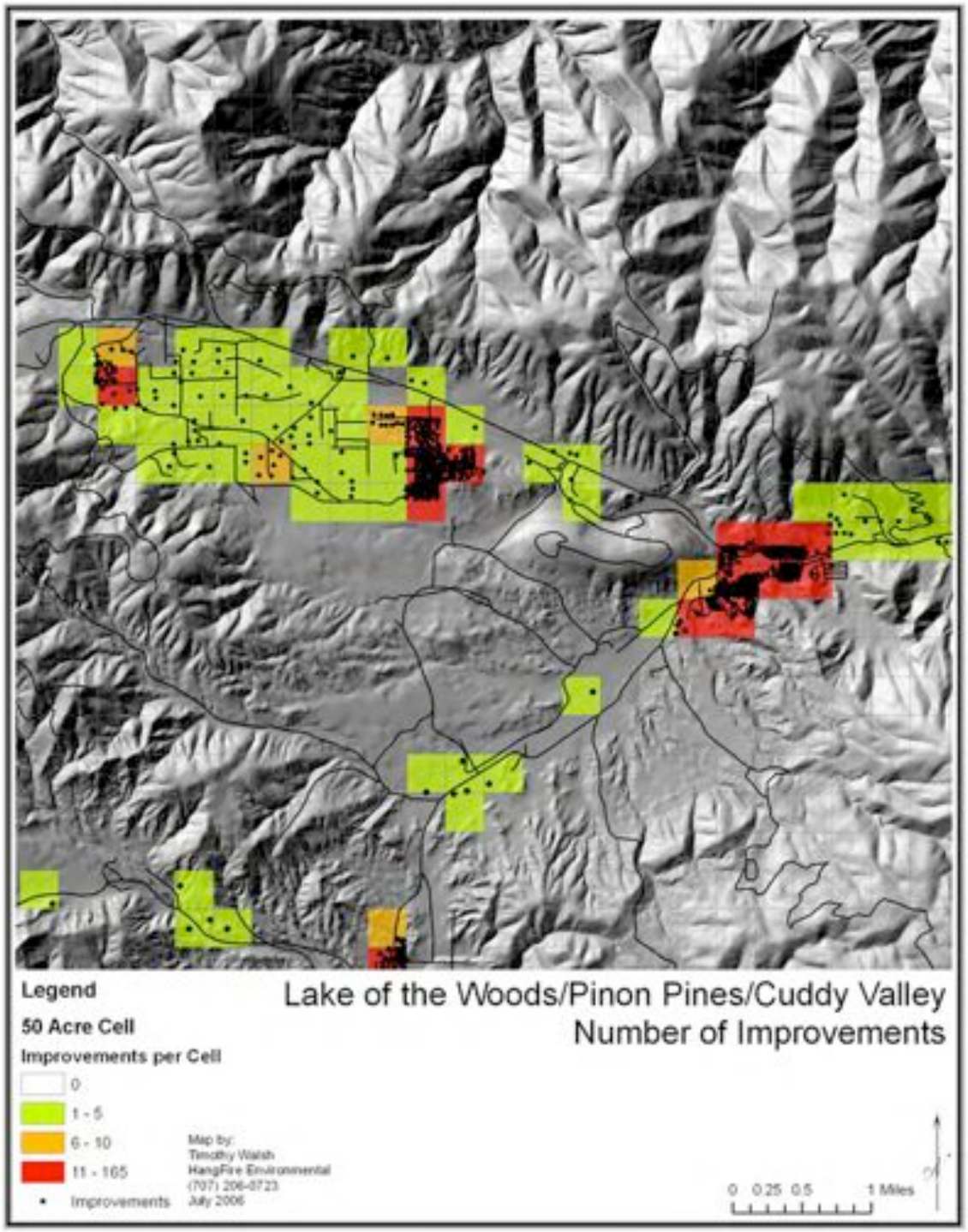
Map 22: Lake of the Woods/Pinon Pines/Cuddy Valley



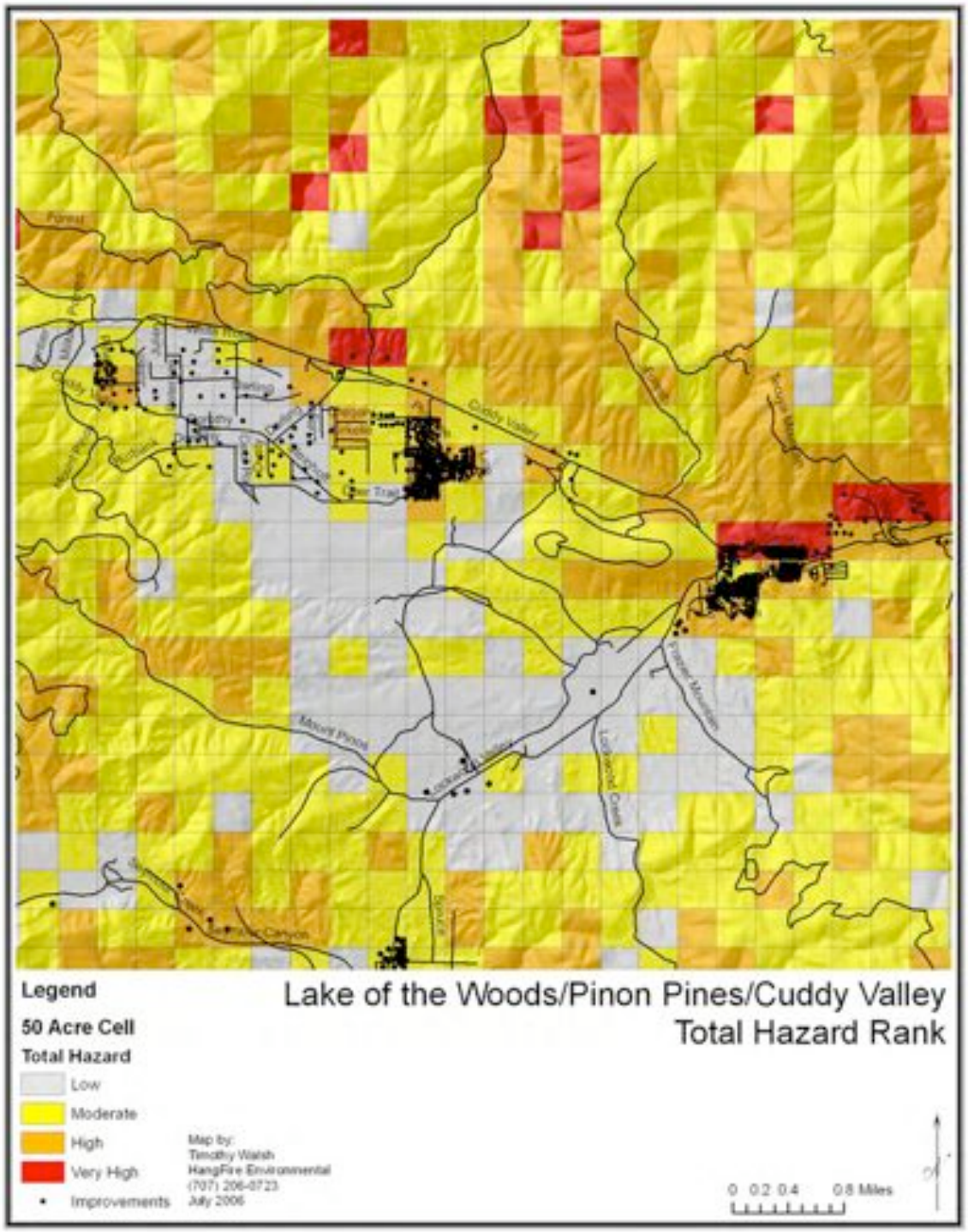
Map 23: The mean percentage of slope for each 50-acre cell in Lake of the Woods, Pinon Pines, and Cuddy Valley.



Map 24: The majority aspect for each 50-acre cell in Lake of the Woods, Pinon Pines, and Cuddy Valley.



Map 25: The number of improvements within each 50-acre cell for Lake of the Woods, Pinon Pines, and Cuddy Valley. The dots represent the center of each developed parcel with an improvement value of at least 5000 dollars.



Map 26: Total hazard ranks assigned to each 50-acre cell are a combination of the slope, aspect, and improvement ranks.

Pine Mountain Club

Pine Mountain Club (PMC) is a recreation community nestled in the Los Padres National Forest, in the shadow of Mt. Pinos to the south and Mt. Abel to the west. Comprised of 3,270 acres, the community consists of 2,947 lots and 2,270 acres of greenbelt wild lands (Map 27). Although the term greenbelt is commonly used, it infers that there is an irrigated landscaped area surrounding the community. This is not the case. During the summer months, this common area owned by the property owners association is vegetation that is dry fuel and will sustain a wildland fire.

Fire protection for PMC is provided by KCFD and USFS.

Within PMC, there are 1661 developed parcels[9]. The improvement value of the parcels is $197,270,671. This figure does not include the cost of the land, home contents, or increases in cost since the last assessment.

With the exception of the homes located on level ground near the golf course and Mil Potero Highway, most of the homes found within PMC are built on steep hillsides. These homes are at threat from a fire starting at the base of the slope and running quickly up the hillside. PMC has some of the steepest developed hillsides within the study area. On a positive note, most of these homes are located above 5000 feet elevation which generally moderates fire behavior (Map 28).

Due to the mountainous landscapes found within PMC, there are numerous aspect changes. Fortunately, most of the improvements are located on cooler northern aspects. Areas with the greatest amounts of warm western facing slopes are located in the area of Woodland Drive between Bernina Drive and Live Oak Way (Map 29).

PMC suffers from many of the same wildland urban interface issues as the other areas. Numerous homes are built on dry steep slopes with very heavy fuel loading of conifer and brush. Many of the roads are cul-de-sacs with one way access. As more and more homes are built in PMC, access will become more difficult. An increase in homes will result in an increase in road use by vehicles. During a wildland fire, these vehicles will try to move down the hill during an evacuation as fire equipment tries to gain access for fire suppression or structure protection (Map 30).

[9] A developed parcel is defined as one that has an improvement value of 5000 dollars listed in the Kern County Parcel Database.

PMC has the highest number of High and Very High cells within the study area (Map 31). The greatest threats of a damaging wildland fire would be from one that spreads from the north from San Emigdio Creek as it forks to the southeast and southwest (Figure 25).

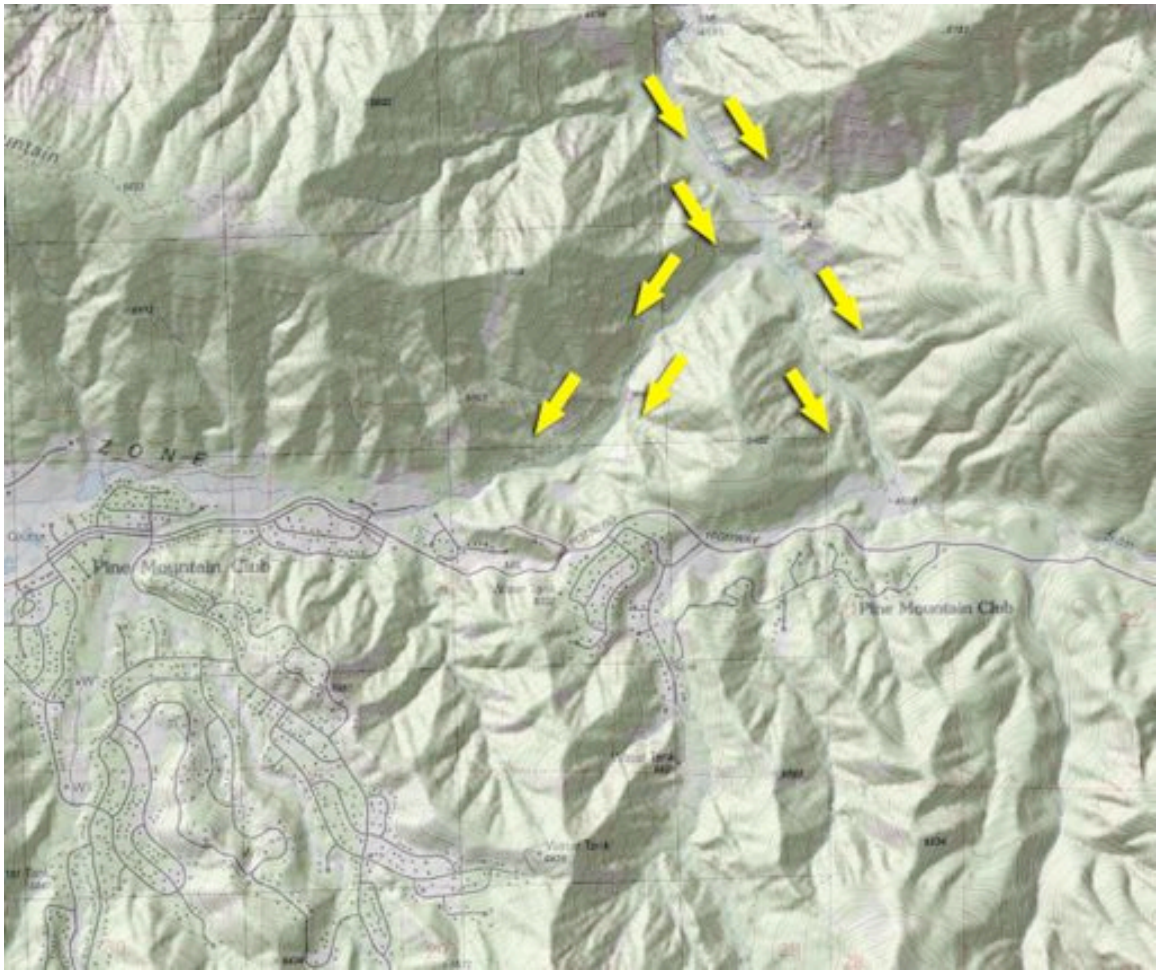
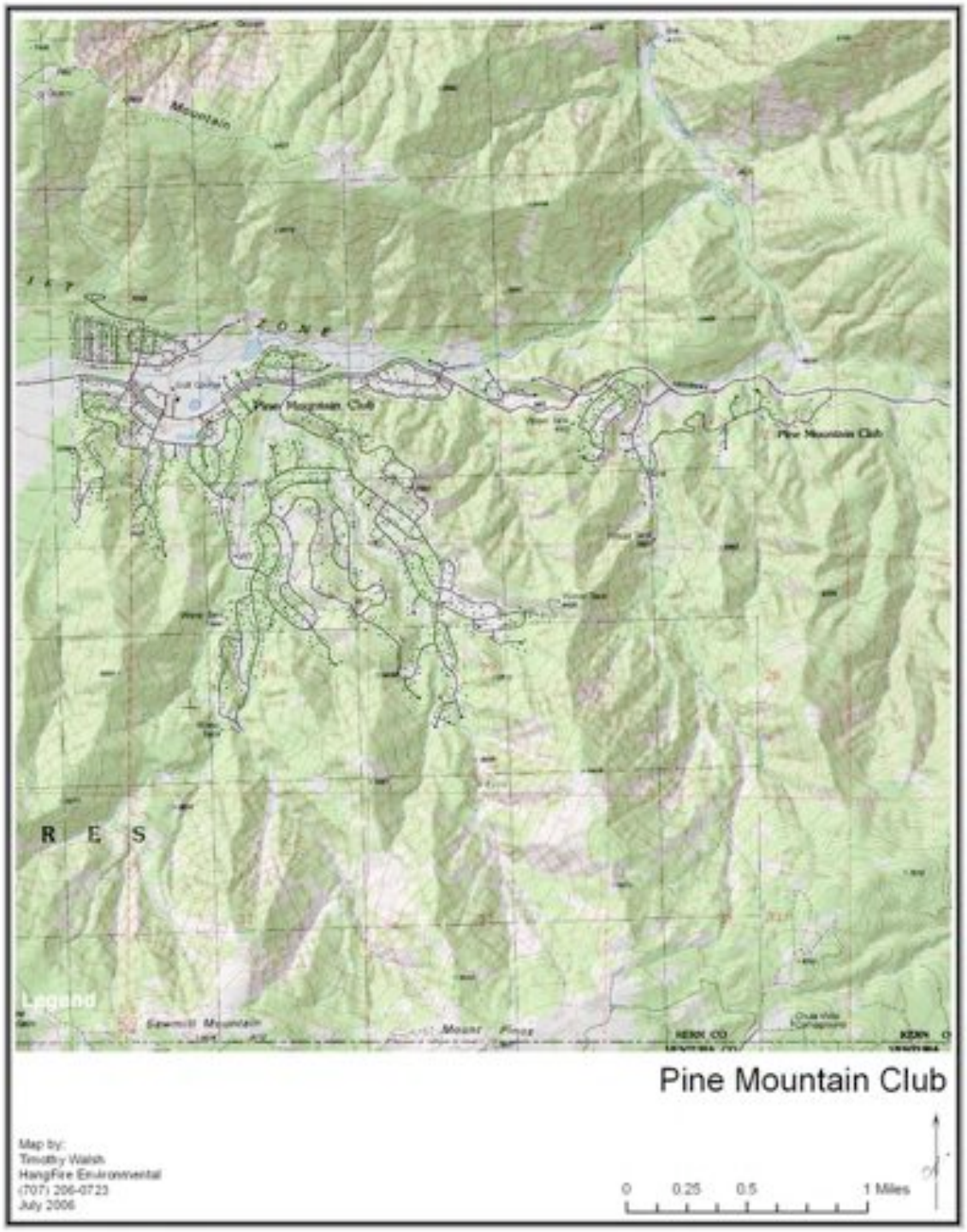


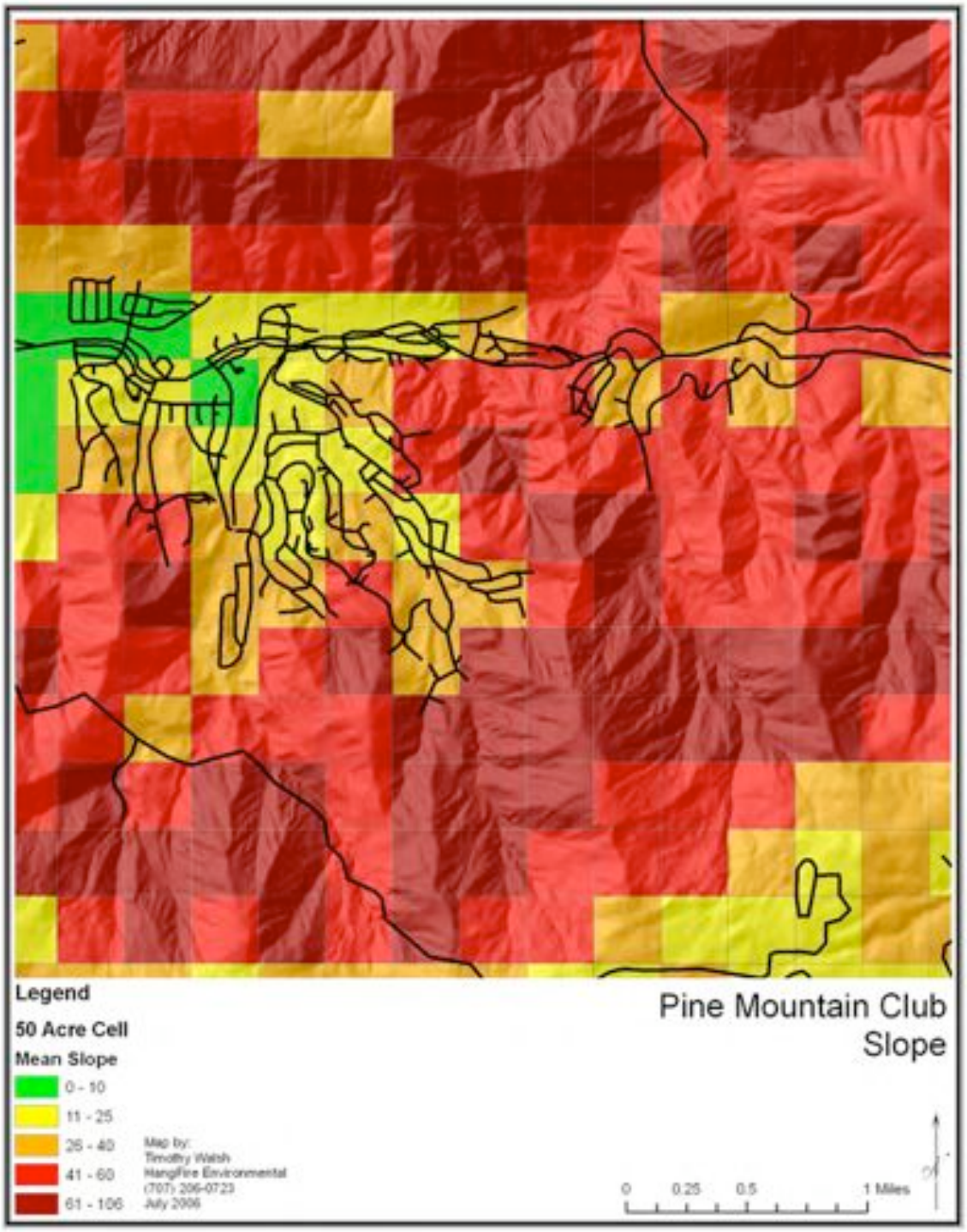
Figure 26: A fire spread from the north, indicated by the yellow arrows, into the San Emigdio drainage would fork and result in a fire with two fronts. The fire would be in alignment to spread uphill and cast embers over the Mil Potrero Highway.

Areas with the highest hazard include:

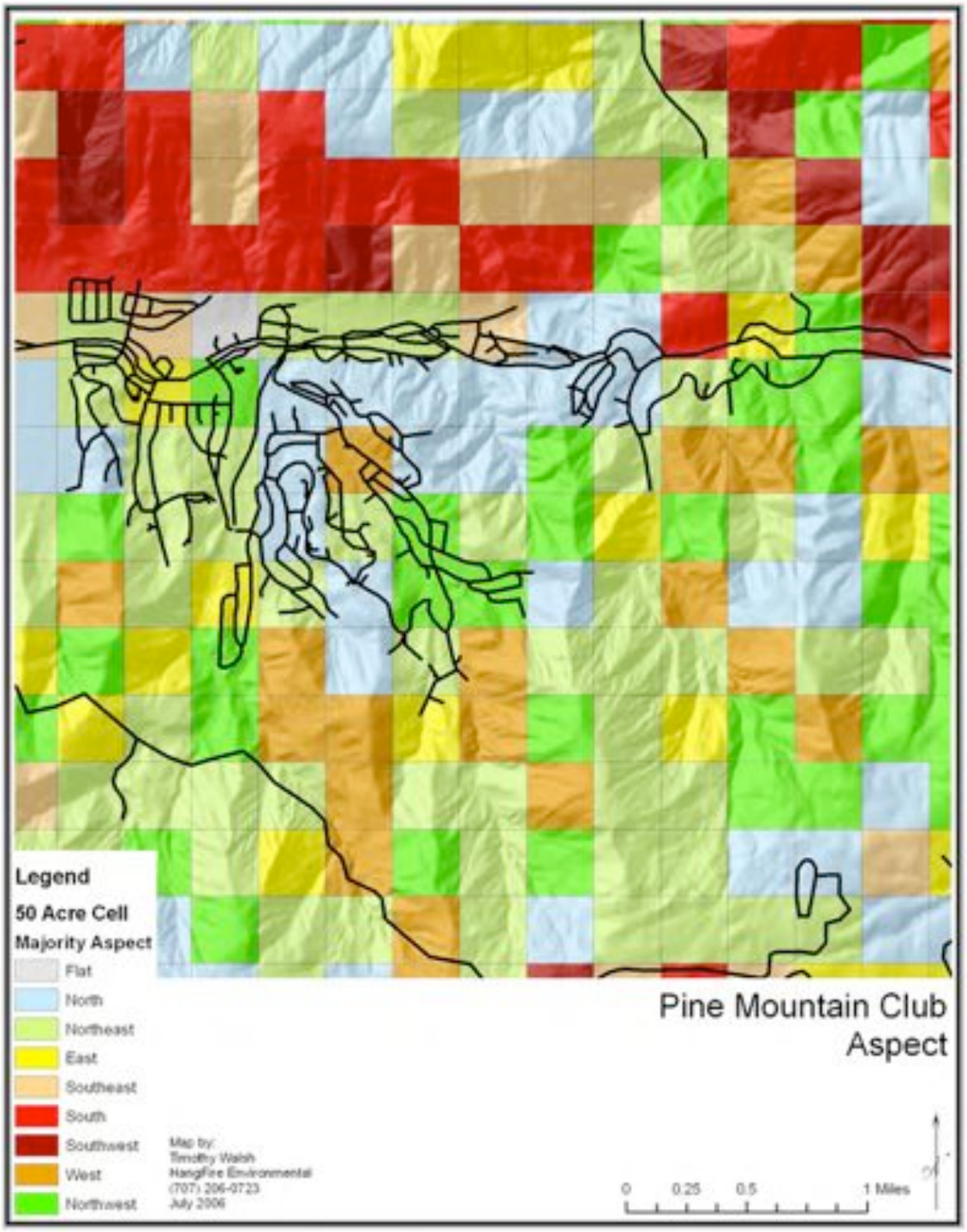
Woodland Drive near Mt. Shasta Drive
Yellowstone Drive near both Glacier Drive and Delta Lane
Arbor Way near Voltaire Drive
Saint Anton Drive near Zermatt Drive
Pinewood Court
Caribou Drive



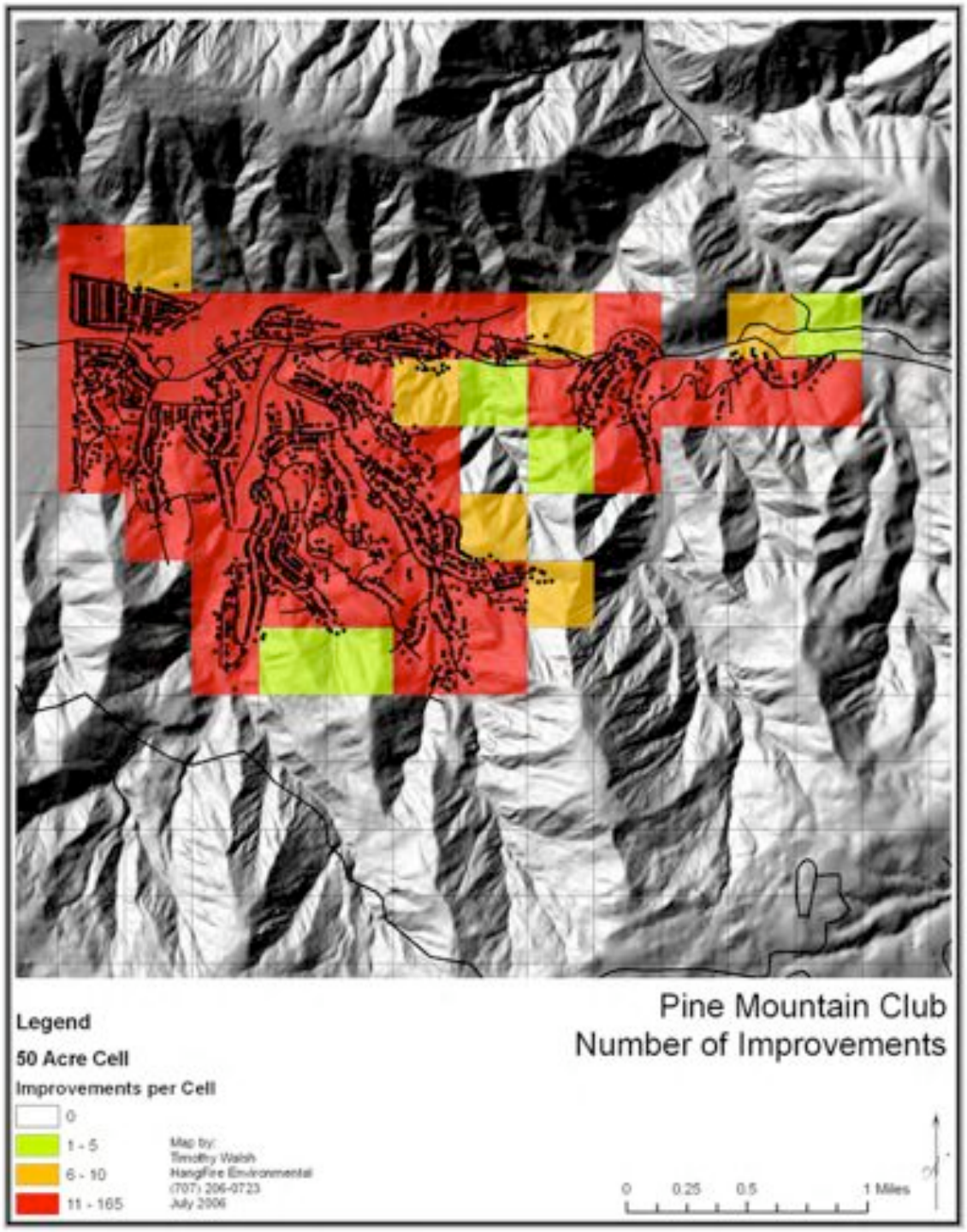
Map 27: Pine Mountain Club.



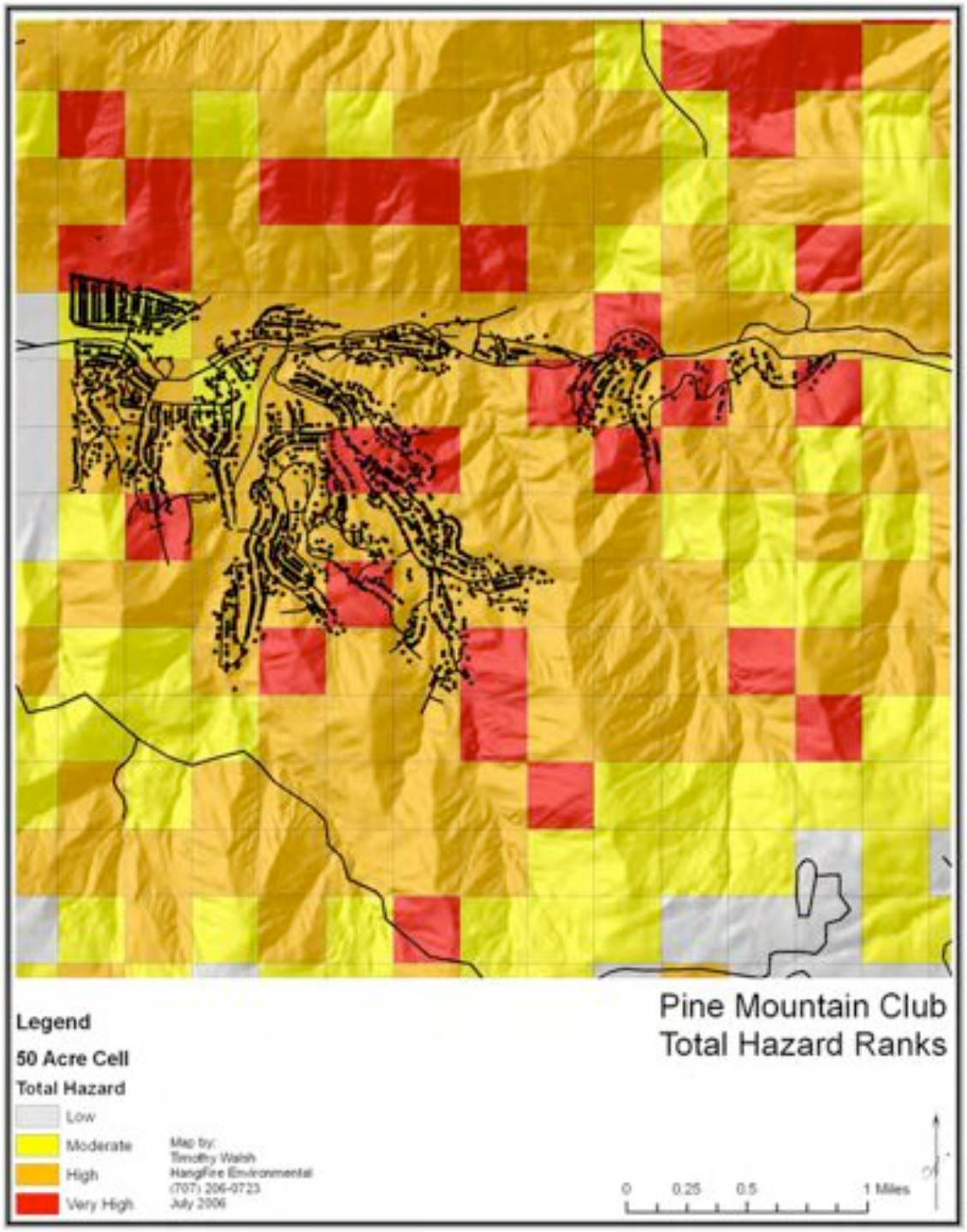
Map 28: The mean percentage of slope for each 50-acre cell in and around Pine Mountain Club.



Map 29: The majority aspect for each 50-acre cell in and around Pine Mountain Club.



Map 30: The number of improvements within each 50-acre cell within Pine Mountain Club. The dots represent the center of each developed parcel with an improvement value of at least 5000 dollars.



Map 31. Total hazard ranks assigned to each 50-acre cell are a combination of the slope, aspect, and improvement ranks.

Lockwood Valley

The Lockwood Valley is situated within Ventura County and is composed of mostly ranches (Map 32). This area is the least populated and has the lowest housing density within the study area.

Fire protection for the Lockwood Valley is provided by Ventura County Fire Department (VCFD), KCFD and USFS.

Within Lockwood Valley, there are 237 developed parcels[10]. The improvement value of the parcels is $19,197,849. This figure does not include the cost of the land, home contents, or increases in cost since the last assessment.

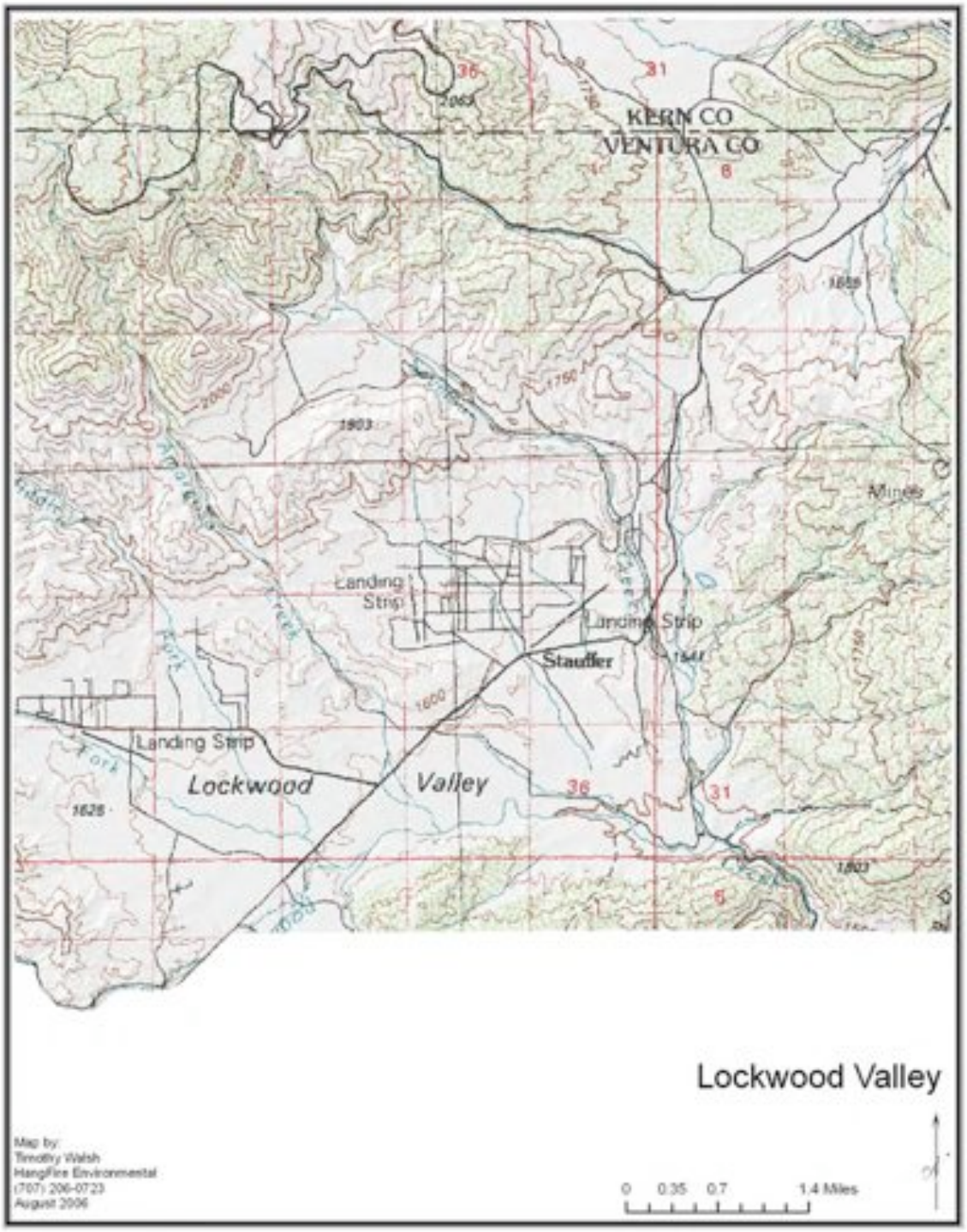
The Lockwood Valley is a wide valley that may channel wind but not with the same velocity as the more narrow passes found within the study area. The slopes within the developed areas of the valley are mostly flat with some rolling hills (Map 33).

Due to the many different changes in topography, there are numerous aspects found within the Lockwood Valley (Map 34). Areas with the greatest amounts of hot slopes within the valley are located at

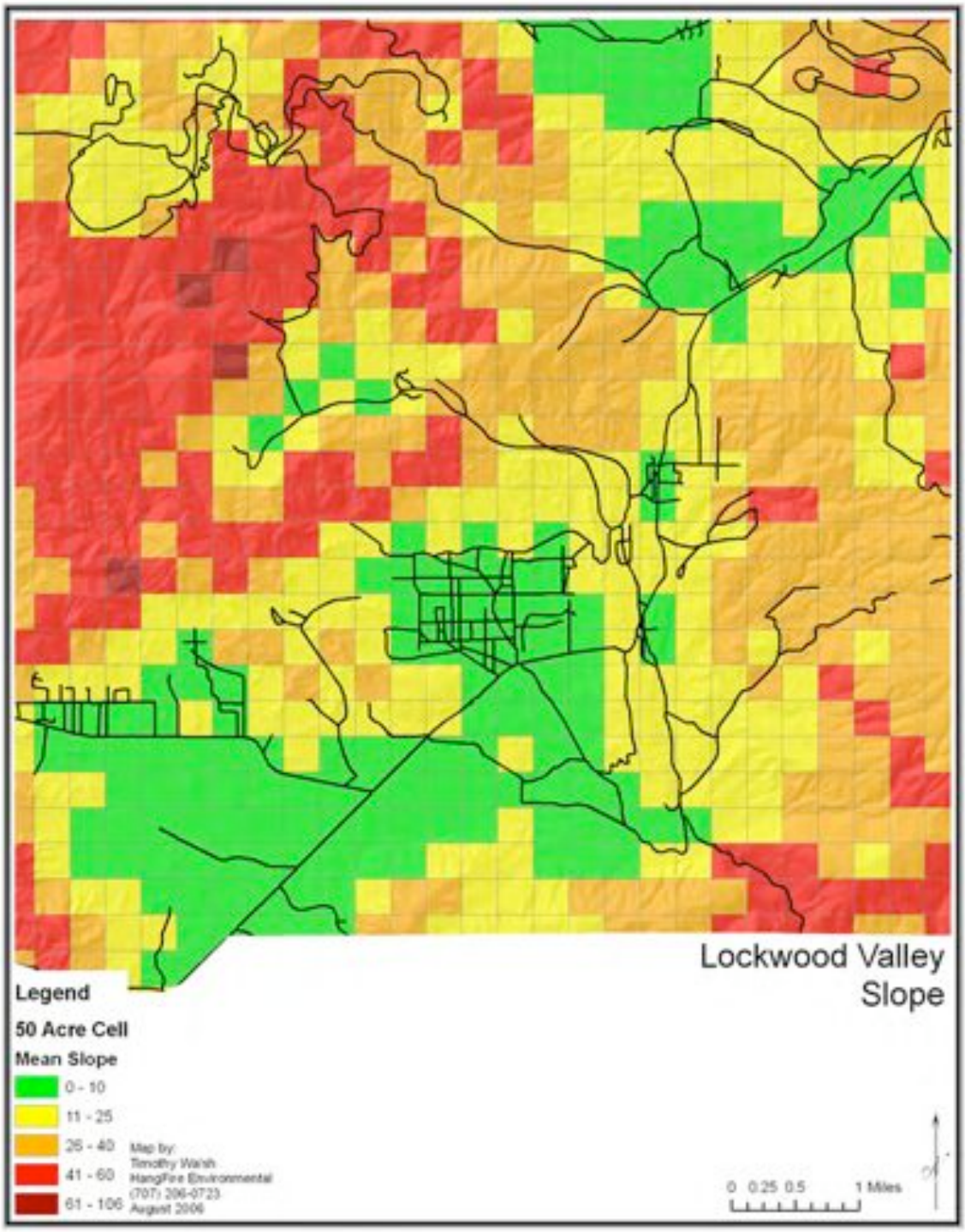
Lockwood Valley Road near Adams Trail
Seymour Canyon near Maple
Boy Scout Camp Road near Stewarts Trail

Many of the homes are situated on parcels five acres or larger that would require several fire engines for structure protection during a wildland urban interface fire (Map 35). Many of the homes are located off long driveways and roads. The Lockwood Valley has the greatest number of low and moderate rankings due to the moderate slopes and lower housing densities (Map 36).

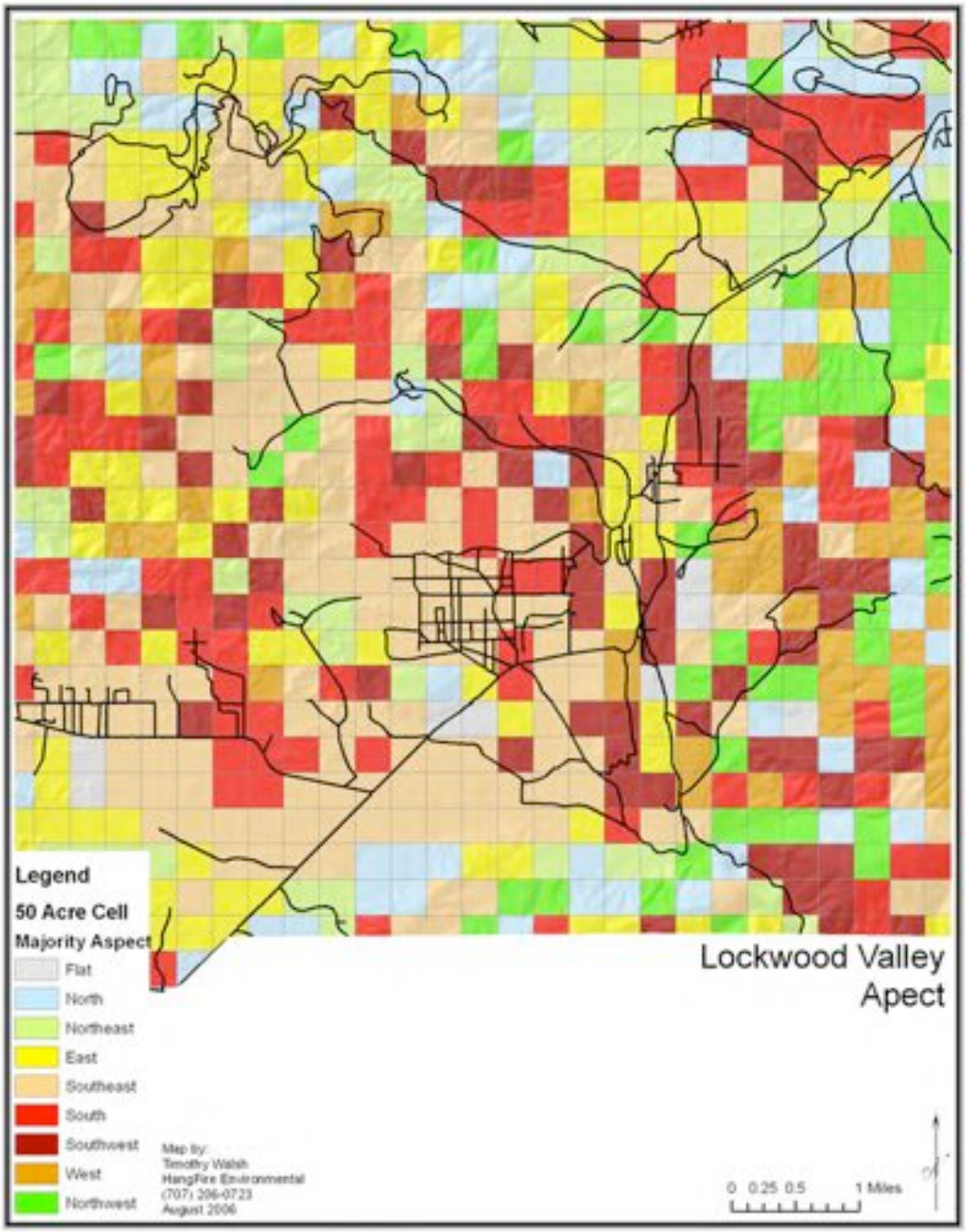
[10] A developed parcel is defined as one that has an improvement value of 5000 dollars listed in the Ventura County Parcel Database.



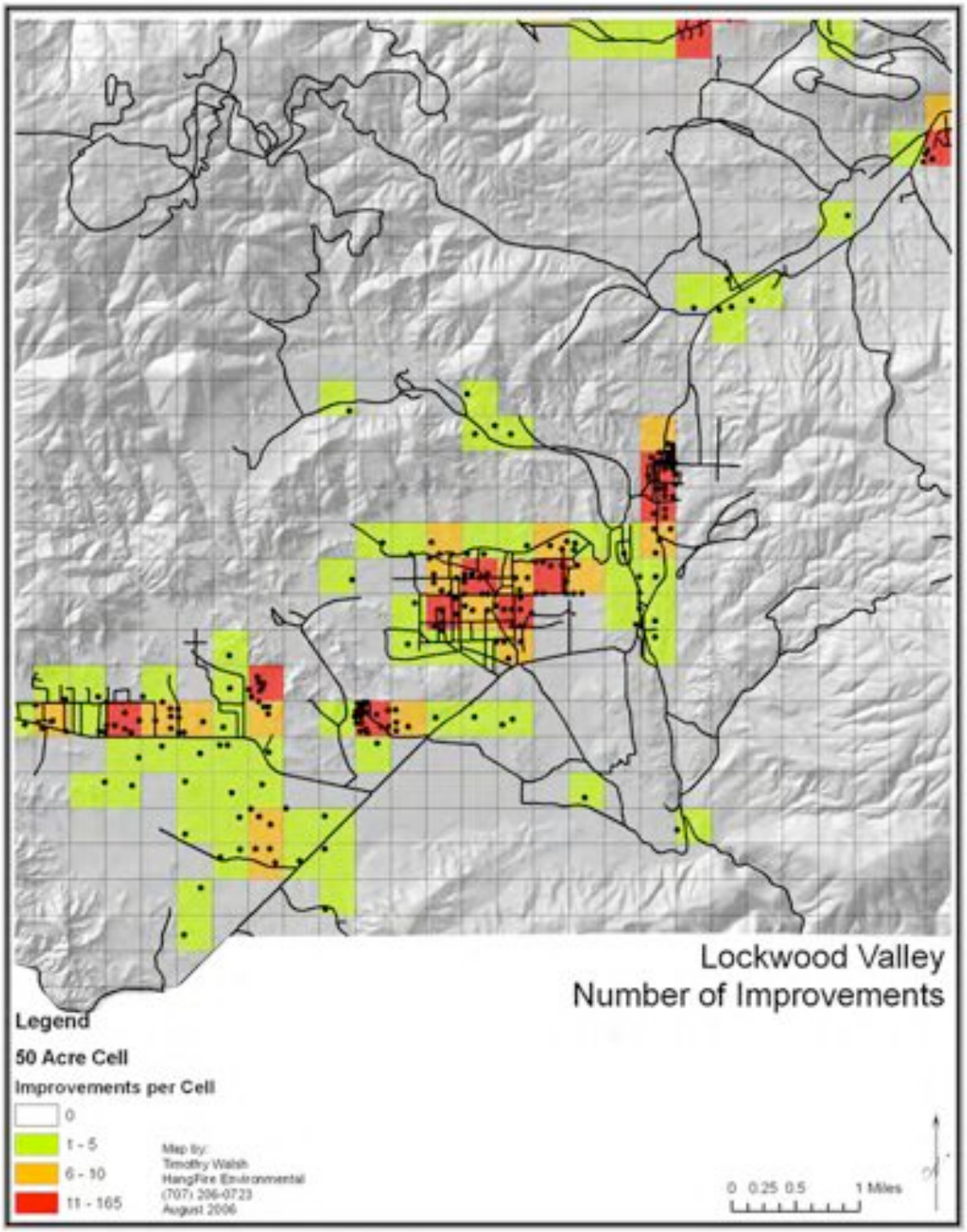
Map 32: Lockwood Valley



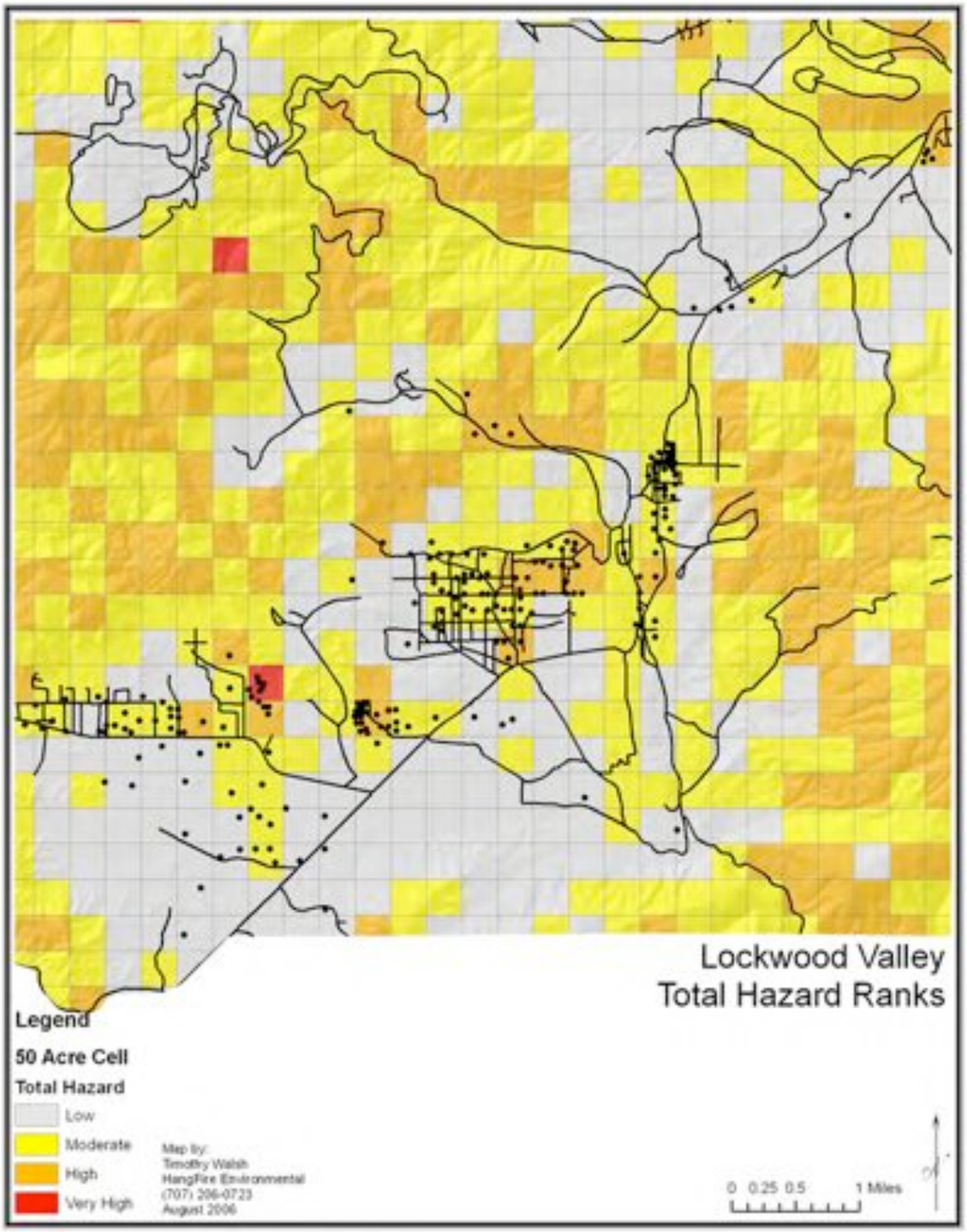
Map 33: The mean percentage of slope for each 50-acre cell in and around the Lockwood Valley.



Map 34: The majority aspect for each 50-acre cell in and around Lockwood Valley.



Map 35: The number of improvements within each 50-acre cell within the Lockwood Valley. The dots represent the center of each developed parcel with an improvement value of at least 5000 dollars.



Map 36: Total hazard ranks assigned to each 50-acre cell are a combination of the slope, aspect, and improvement ranks.

Structure Ignitability

The likelihood of a structure catching fire is dependent on several factors. The two biggest are defensible space and building materials. Obviously, the more space that is cleared of vegetation around a structure, the greater likelihood a house will survive a wildland fire. Structures built of fire safe material combined with defensible space may survive a wildland fire even without a fire engine protecting it. The construction material and building design can make the difference between a pile of ashes or a structure that will survive a wildfire.

Fortunately, Kern County is one of the first counties in the State to adopt a wildland urban interface code to insure that future building construction will be done in a fire safe manner. Unfortunately, this does not help the current or existing homes located in the Mt Pinos study area. Many of these homes are built with wood siding with open decks situated above steep slopes. Untreated wood roofs still exist within some neighborhoods that could threaten several surrounding homes.

During a wildland fire, wood shingle and shakes easily ignite and become airborne within the smoke column. The shape of these roofing materials makes them very aerodynamic allowing them to sail hundreds of feet or further. Other structural areas of vulnerability include second story balconies and open eaves. Both of these design features act as heat traps collecting hot air or embers from thermally rising air. Vents on the outside of the home allow embers to blow through them and ignite attic spaces. Until these deficiencies can be corrected, the only recommendation that may help these homes survive a wildland fire is large areas of defensible space. Unfortunately, the size of defensible space is often limited by property lines.

Figure 27: This dwelling in Pine Mountain Club not only has a wood roof but it is covered with pine needles making it very susceptible to a wildland ignition.

The ideal home would be built with a Class A or fire resistive roof covering such as slate, cement, or of asphalt composite. All exterior vents would have a tight mesh screen that will prevent embers from entering the confine space of the attic. Eaves along the roof line would be boxed in or closed off reducing the surface area available for an ember to be trapped. All windows would be double or triple pane to reduce radiant heat transfer. Windows would also have exterior metal shutters that could be pulled closed during a wildfire. The siding material would be of a non-combustible material such as stucco, block, or brick. All decks would be fully enclosed to prevent heat and flames from burning beneath them. Several people use lattice to enclose the opening under a deck. This treatment may make matters worse. Embers may blow into or next to the lattice that is generally made of small thickness wood. Most lattices are essentially kindling used as a building material.

Lastly, the ornamental vegetation should also provide a measure of protection. Many plants used for landscaping readily ignite and can compromise the home even with a low intensity fire. The Kern River Valley Fire Safe Council maintains a list of fire resistive plants[11] as well as the Ventura County Fire Department[12].

Figure 28: A new home in Frazier Park that utilizes many fire safe building materials. The roof is made of a Class A material that will resist ignition. The eaves are boxed in and the windows appeared to be multi-paned. The home is built with stucco that could stand direct flame impingement. Although the vegetation in the yard to the right appears to have been modified, the tree in the left could compromise the home due to the open construction of the stairway.

[11] Plant list can be requested from: Kern River Valley Fire Safe Council, P.O. Box 633, Kernville, Ca 93238

[12] http://fire.countyofventura.org/departmentservices/fireprevention/standards/standardsPDF%27s/Plant%20Reference%20Guide%202005.pdf

Ignition Management

Even if all of the factors are in place for a large damaging fire such as hot-dry weather, steep hillsides, and thick vegetation, an ignition must occur in order for a fire to take place. Throughout the study area, there have been 621 ignitions[13] from July 1981 through November 2005. The first analysis focuses on the number of fires per 50-acre cell. Each cell was assessed to count the number of ignitions (Map 37).

One of the best ways to prevent a fire from occurring is to determine cause. For example, if a fire is caused by power line failure, then maybe the other lines in the area need to be inspected. Or, if several fires in an area are started by children playing with matches, then a focused school fire prevention program may be necessary. The next assessment counted the types of ignitions within the study area (Map 38). Of the determined causes, vehicle fires are the leading cause of fires within the study area. This correlates with the high number of ignitions found along Interstate 5.

Table 39: Types and numbers of ignitions within the study area.

Fire Cause	Number of Ignitions	Total Acres by Cause
Undetermined	136	3,545
Lightning	75	3,784
Campfire	38	47
Smoking	31	18
Debris Burning	18	17
Arson	29	75
Equipment Use	50	1133
Playing with Fire	55	100
Miscellaneous	63	1109
Vehicle	110	6,538
Powerline	16	2,311
Total	**621**	**18,677**

[13] Based on the best available data. Some ignitions may have been omitted due to the absence of spatial or tabular data.

Map 37: Number of Ignitions within each 50-acre cell. The trend is normal with higher ignition rates occurring with increases in population and following major transportation corridors.

Map 38: Cause of ignitions within the study area. With the exception of lightning, the majority of the fires are located in the high population areas and transportation corridors.

Recommendations

The following recommendations are based on the previous assessment. As with any planning document, an alternative to any recommendation is to take no action. If this is the chosen alternative, it is only a matter of time before this choice proves dangerous or deadly.

The recommendations are based on the priority of protection of life, then property. The recommendations will be listed in priority but it should be understood that many other factors could influence whether a recommendation is implemented and in what order. Factors such as acceptance from the community, funding, and environmental issues can significantly alter if and when a recommendation is implemented.

Evacuation

Telephone Emergency Notification System

The Mt. Pinos Communities Fire Safe Council should work with other local agencies to implement a telephone emergency notification system to warn homeowners of the need to evacuate. These systems are also referred to as reverse 911 systems. During a wildfire, the notification system can deliver large volumes of phone calls quickly using multiple phone dialers. Residents can be given specific instructions during an evacuation such as what evacuation route to use and what evacuation center to utilize.

There are two ways to implement the notification system. A phone dialing system can be purchased or contracted with a service provider. A purchased system gives more control, but requires sufficient phone lines, equipment and on site technical knowledge to keep your system operational. If the message broadcasting system is used for more than just emergencies, such as broadcasting prescribed burn information, then it may be easier to justify a system purchase over contracted service.

Contracting emergency broadcasting service requires less up front capital for equipment and can provide a faster emergency broadcast response if your provider has the resources available. System redundancy is available as well as centralized and experienced technical assistance.

There are several different dialing systems available as well as service providers. Prices vary on technical complexity, the number of notifications needed, the number of phone lines utilized, and the desired dialing speed (100 versus 1000 notifications per minute).

There are several companies that sell telephone dialing systems as well as services that provide emergency notification. To learn more about the systems as well as additional pricing, please enter, “Telephone Emergency Notification

System" into an internet browser. The following companies[14] specialize in phone dialers and notification services:

Database Systems Corporation
1118 East Missouri Avenue
Phoenix, AZ 85014
(602)265-5968

Talking Technology International, Inc.
6558 Lucas Avenue, Suite 301
Oakland, CA 94611
(510) 339-8275

National Notification Network
505 N. Brand Blvd., Suite 700
Glendale, CA 91203
(818) 239-3898

Siren Warning System

The Mt Pinos Communities Fire Safe Council should work with local neighborhoods and agencies to install emergency warning sirens to notify residents of an evacuation. These systems should be used in concert with the telephone notification system to warn people that are working outside and may not hear or have access to a telephone. The warning siren will need to be tested on a regular basis to ensure operation. Sirens should have the capability to be triggered using emergency responder radios so responders could activate the siren from the field. Sirens should also be able to produce a public address to notify residents which direction to evacuate. Lastly, sirens should be installed on a building with emergency power backup. Generators should be purchased for these facilities to provide a backup power supply. The following companies[15] specialize in emergency siren systems:

BayComm, Inc.
PO Box 3696
Greenville, DE 19807
(302) 254-8100
http://www.warningsirens.com/

Whelen Engineering Company, Inc.
Public and Industrial Warning Products
Route 145, Winthrop Rd.
Chester, CT 06412
(800)63SIREN/(860)526-9504

[14] This is not an endorsement of a specific brand or product.
[15] This is not an endorsement of a specific brand or product.

Fuel Modification

Create a Fire Defense Perimeter around the Communities

Within the communities, a landscape fuels strategy aimed at modifying fire behavior across a broad area will be utilized to reduce the size and severity of large wildland fires. The goal will be to compartmentalize the study area with the aim of keeping fires within each compartment.

Wildland Urban Interface Zones

There are three zones that comprise the wildland urban interface (WUI). The area where structures are located is the Defense Zone. If a fire occurs or burns into this zone, structure loss is likely without quick aggressive structure protection. To delineate the Defense Zone, developed parcels were buffered 500 feet. The next zone comprises a one-quarter mile buffer around the Defense Zone known as the Threat Zone. This zone needs specific and intense management and treatments. Planned treatments will reduce the spread and intensity of fire developing or moving through these areas, which pose a direct threat to the Defense Zone. Physical removal of biomass coupled with prescribed fire applications are key management actions required to reduce risks in the Threat Zone. Beyond this buffer is the Wildland Zone (Map 39).

The goals of the fuel reduction strategies are simple:

Design fuel modification to provide a buffer between developed areas and wildlands.

Design and distribute treatments to increase the efficiency of firefighting efforts and reduce risks to firefighters, the public, facilities, structures, and natural resources.

Utilize planned prescribed burns as strategically placed area treatments.

KCFD, USFS and the local communities have performed fuel reduction strategies that will have a direct benefit to the property owners. These strategies include fuel breaks, roadside brush thinning, and prescribed burns. Many more treatments need to be implemented and organized to reduce the threat to the constituents of the Mt Pinos study area.

The Defense Zone

Defensible Space

Homeowners need to provide defensible space around their structures. Kern and Ventura County Fire Departments inspect properties to ensure that they comply with Public Resource Code (PRC) 4291[16]. PRC 4291 provides the regulation for defensible space around homes and other fire safety rules. Those homes that fail to comply are sent a notice for follow-up that can eventually end up with a citation for failure to comply.

Figure 29: This home within the study area has provided defensible space by reducing the fuel load and irrigating the soil below the structure.

As of January 2005, the code was modified changing the defensible space requirement from 30 feet to 100 feet of clearance in mountainous areas.

[16] Due to the recent changes in PRC 4291, it is included as Appendix A.

Map 39: Wildland Urban Interface Zones- The Defense Zone was delineated by creating a 500-foot buffer around the developed parcels. The green dots are the center of developed parcels. The Threat Zone is a one quarter mile buffer around the Defense Zone. Areas beyond the Threat Zone compose the Wildland Zone.

Chipper Days

A successful fuel reduction strategy that makes the neighborhood fuel reduction more cost effective and less labor intensive are Chipper Days. Neighbors cut hazardous brush from around their dwellings and drive it to a central location. Chipper days have been successfully implemented in Pinon Pines, Cuddy Valley and Frazier Park. Residents of communities brought cut vegetation to a collection site at the central location. Members of Crew 82 of the Kern County Fire Department chipped the brush. After chipping, residents were allowed to load the chips for landscaping. It is recommended that this same practice be implemented in Lebec, Lake of the Woods, and Lockwood Valley.

Modify Vegetation Prior to New Construction

Homes are very vulnerable to ignition during the construction phase. Also, once a home is built, homeowners are less likely to conform to defensible space requirements if they don't want to. Kern and Ventura Counties should adopt and enforce a new ordinance that requires residents to provide defensible space prior to new construction. Prior to new construction, the resident should provide a minimum of 100 feet of defensible space around the footprint of the structure or to the property line. The property should be inspected by the local engine company. If the property has the required defensible space, a compliance certificate will be issued. This step should occur prior to a building permit being issued.

Figure 30: This home under construction in Pine Mt. Club is vulnerable to a wildfire. Notice the lack of clearance in the vegetation that makes defending this structure nearly impossible.

Landscaping Standards

It is recommended that Kern and Ventura Counties adopt an ordinance that prohibits highly combustible plants, such as juniper, for landscaping foliage in the mountainous areas. Several homeowners plant ornamental vegetation that threatens their homes during a wildland fire. Juniper is widely used for landscaping throughout the Mt Pinos study area. Due to the oils found in this plant, it burns with very high intensity. Another practice seen throughout the study area is the planting of trees in a windrow of either property boundaries or lining driveways. It appears that in several cases, the homeowner stops watering the trees and one or more dies. This results in one or multiple dead trees usually near a structure that could threaten the structure or those owned by neighbors. It is recommended that all dead trees are removed.

Also, some homeowners clear brush from their property and allow piles to decompose. They may have the intention to burn them but many piles are allowed to stay in place for several years. During fire season, these piles could threaten nearby structures and burn with very high intensities.

Figure 31: This home in Lake of the Woods would prove difficult to protect during a fast moving wildfire. The owners have chosen to use juniper to landscape and it is placed next to and under a wooden deck. The home is covered with wood shakes that burn readily and may spread fire throughout the area once they separate from the roof assembly.

Create a Fire Safe Demonstration Garden

Several areas throughout the nation have created fire safe demonstration gardens to assist property owners with landscaping decisions. One of the best places to put a garden would be Fire Station 57 in Frazier Park. The front of the station is landscaped with juniper plants that are highly combustible. This area could be used to plant ornamentals that are drought tolerant and fire resistant. The Kern River Valley Fire Safe Council has developed a fire safe plant list that could assist with plant decision although a local nursery should be consulted due to the higher elevations found in Frazier Park.

Figure 32: The area covered in juniper left of the driveway at Fire Station 57 would be an excellent place for a fire safe garden.

The fire station is located at the end of Mt. Pinos Way which is one of the busier streets through the community. The area for consideration is also small which should minimize cost for this project. After a landscape design is implemented, one or two small signs should be placed near the garden to explain to the public how landscape design can significantly reduce or prevent wildfire damage to homes and property. The garden should be designed to show how landscaping can be fire safe, water efficient and beautiful all in one plan.

Enforcement of Address Posting and Address Standards Codes

During a major fire, emergency responders will be coming from all over the state and possibly the nation. Finding an address quickly can make the difference between life and death. While driving throughout the study area, it becomes obvious that the posting of address numbers is done by individual preference.

From a professional firefighter standpoint, the most confusing aspect of finding a structure is locating the address on a home. Often the address is missing, painted the same color as the home, or is behind overgrown vegetation. Another issue that leads to confusion that result in longer emergency response times are signs with multiple addresses at the end of a long driveway, especially if each home doesn't have a corresponding address posted.

Figure 33: Example of an address sign posted in Pine Mt. Club that is ready to fall of the telephone pole. Besides the poor mounting, two of the numbers are missing from the sign that make finding the address difficult.

In some communities through California, some fire districts have codified the type, color, and placement of addresses. When driving through these communities, emergency response equipment can quickly find addresses, even when the emergency responders are from out of the area. All addresses should be posted with a standard sign. Once a standard address format is adopted, standardized mapbooks should be provided to all local fire protection agencies.

Address signs should have all letters, numbers, and symbols created using a minimum four inch letter with a one half inch stroke. The signs should be reflectorized with a contrasting background color.

The advantage of this recommendation is the protection of property is considerably easier by an emergency responder. Not only does this recommendation provide quicker response during a wildfire, but more often during a medical emergency.

The disadvantage of this recommendation is the cost and the perception that signs posted on the street are ugly. Having an agency telling homeowners how, where, and what to do is also unpopular. The cost can be handled by different

approaches. One approach is to charge residents for address signs which will also cover the installation. Another approach may be to obtain funding though a grant.

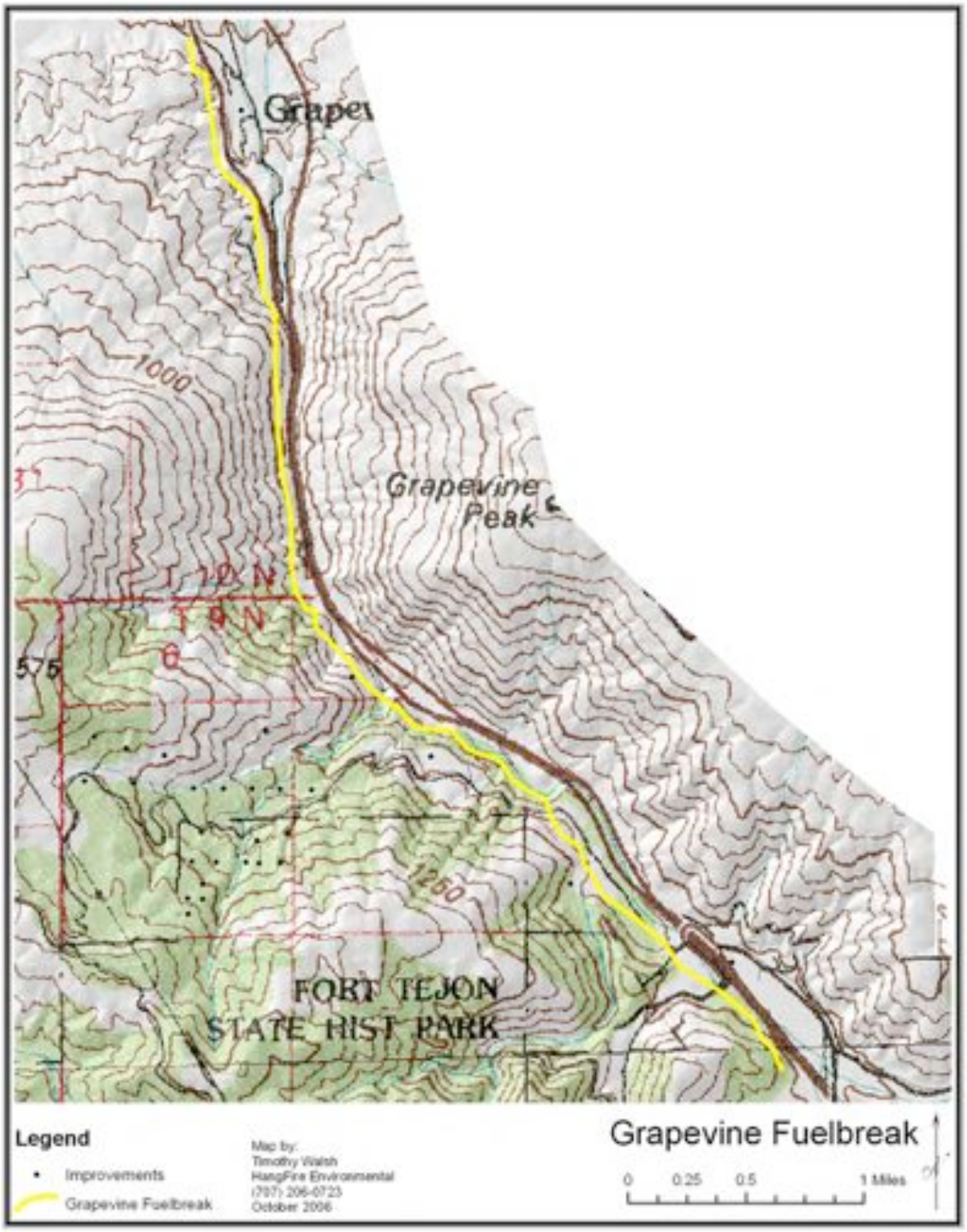
Grapevine Fuelbreak

Interstate 5 from the base of the Grapevine in the north to the southern boundary of the study area has the highest number of ignitions within the study area. The communities of Digier Canyon, Los Padres Estates, and Lebec all parallel the freeway. All of them are situated among grass covered slopes where fire burns very quickly due to wind and topography. Vehicles ignite fires from overheating, hot catalytic converters, or hot brakes. When they pull into an area covered by dry grass, an ignition occurs.

The Kern County Fire Department (KCFD) actively builds a fuelbreak that parallels the west side of the Interstate. Although the Arco Fire burned 695 acres and burned over the fuelbreak, it has stopped several fires that have started along the freeway. KCFD's Fuel Crew 82 constructs the fuelbreak by scraping a 10 foot section of vegetation down to mineral earth. The second step is to trim the grass on both sides of the break using a string trimmer resulting in a 20-30 foot fuelbreak. It should be noted that the grass trimming on the fuelbreak was not completed when the Arco Fire ignited. The fire may have stopped or slowed if this additional fuel modification was completed prior to the fire.

Figure 34: The Arco Fire seen burning on the west side of Interstate 5 with the fuelbreak seen on the right.

Fires will continue to plague this area due to the steep grades, dry vegetation, and mechanical failure. It is recommended that the department continue this fuelbreak work to reduce fire spread from ignitions near the highway (Map 40). Another approach to curtail the high number of ignitions on this roadway would to install a fire prevention sign warning people of the hazards of parking their hot vehicles near dry grass. Obviously, this will not prevent fires from ignitions caused by vehicle fires but may prevent those accidental ignitions from hot brakes and overheating. Again, under the wrong conditions, these accidental ignitions could provide the spark necessary for a very large and damaging fire.



Map 40: Although the yellow line represents the extent of the Grapevine Fuelbreak, it should be noted that it is not a continuous linear break. There are areas that are too steep to safely construct handline because rocks could fall onto the freeway or crewmembers could fall off the side of the hill during construction.

Frazier Park Fuel Management Strategy

North

The community of Frazier Park is divided in half by Frazier Mt. Park Road. The North side of the community has both benefits and negative aspects concerning location. It has a higher amount of south facing hillsides that are dryer with lower fuel moistures. These lower fuel moistures allow vegetation to ignite more readily and burn with higher intensities. On a positive note, there are two large washes on the west and east sides of the community that support lower fuel loading. These areas are mostly void of any trees, are comparatively less steep, and are covered with grass and sagebrush.

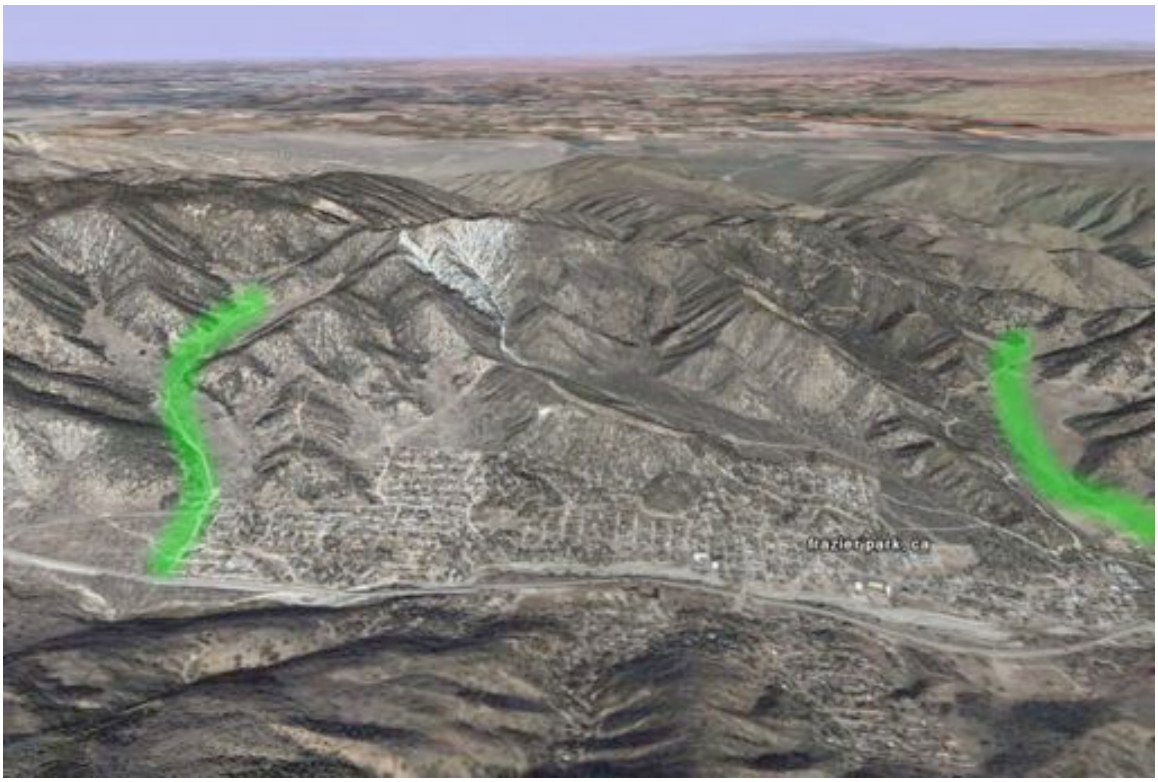


Figure 35: This 3D Model of Frazier Park shows the area of lighter vegetation and flatter topography (shown highlighted in green) on both the east and west sides of Frazier Park. The Scott Fire of 2006 was actually stopped in this natural fuelbreak on the west side or left in the image.

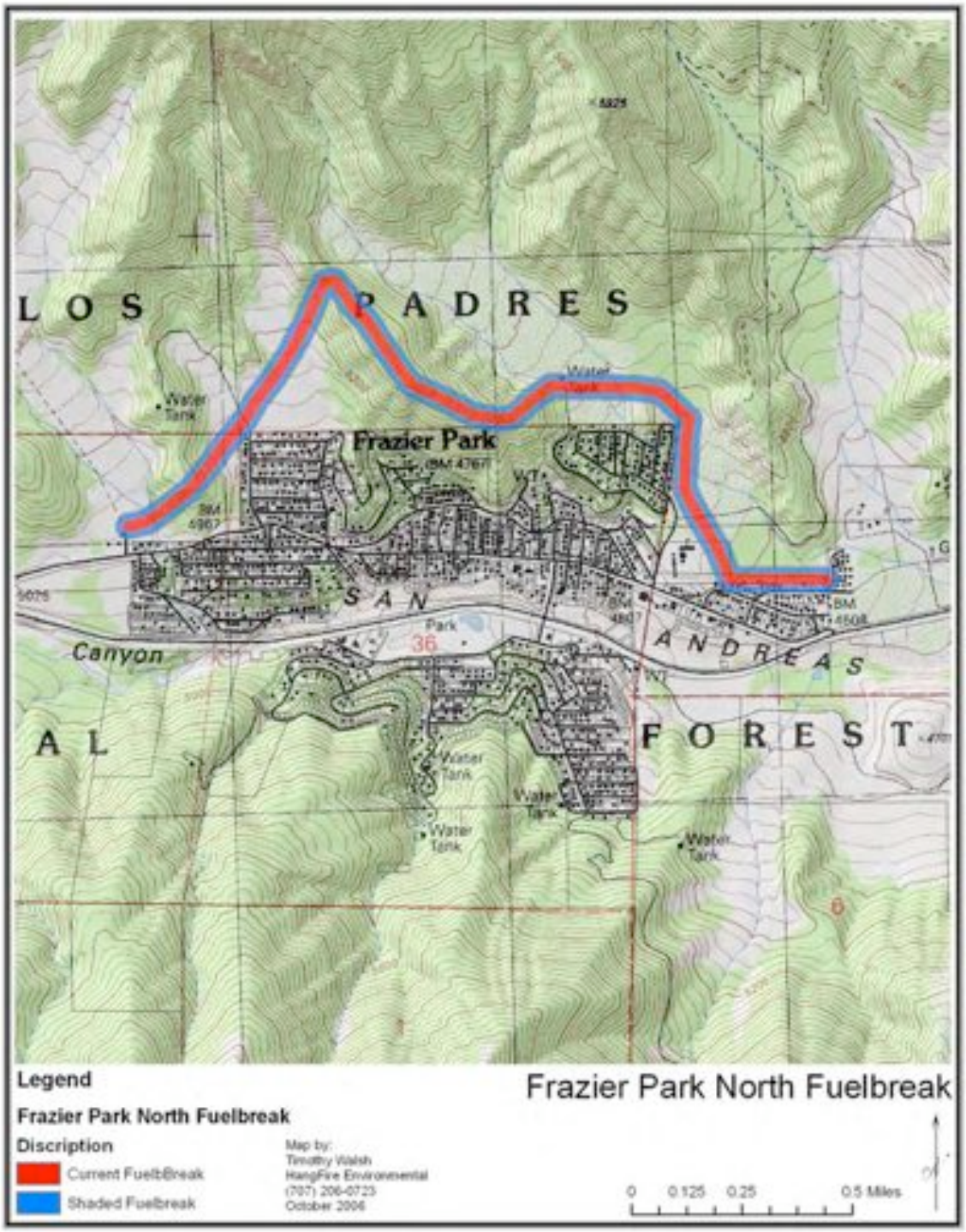
The community is surrounded by land managed by the Forest Service. The USFS has built a fuelbreak around the northern portion of the community attempting to provide protection from a wildfire. The fuelbreak is up to 150 feet wide in some areas. Although this break is seen by some people as an ugly scar, if it is ever needed, it will allow firefighters an area to anchor their strategies to slow or stop a fire.

It is recommended that the fuelbreak be widened to 300 feet creating a shaded fuelbreak along the edges of the current break (Map 41).

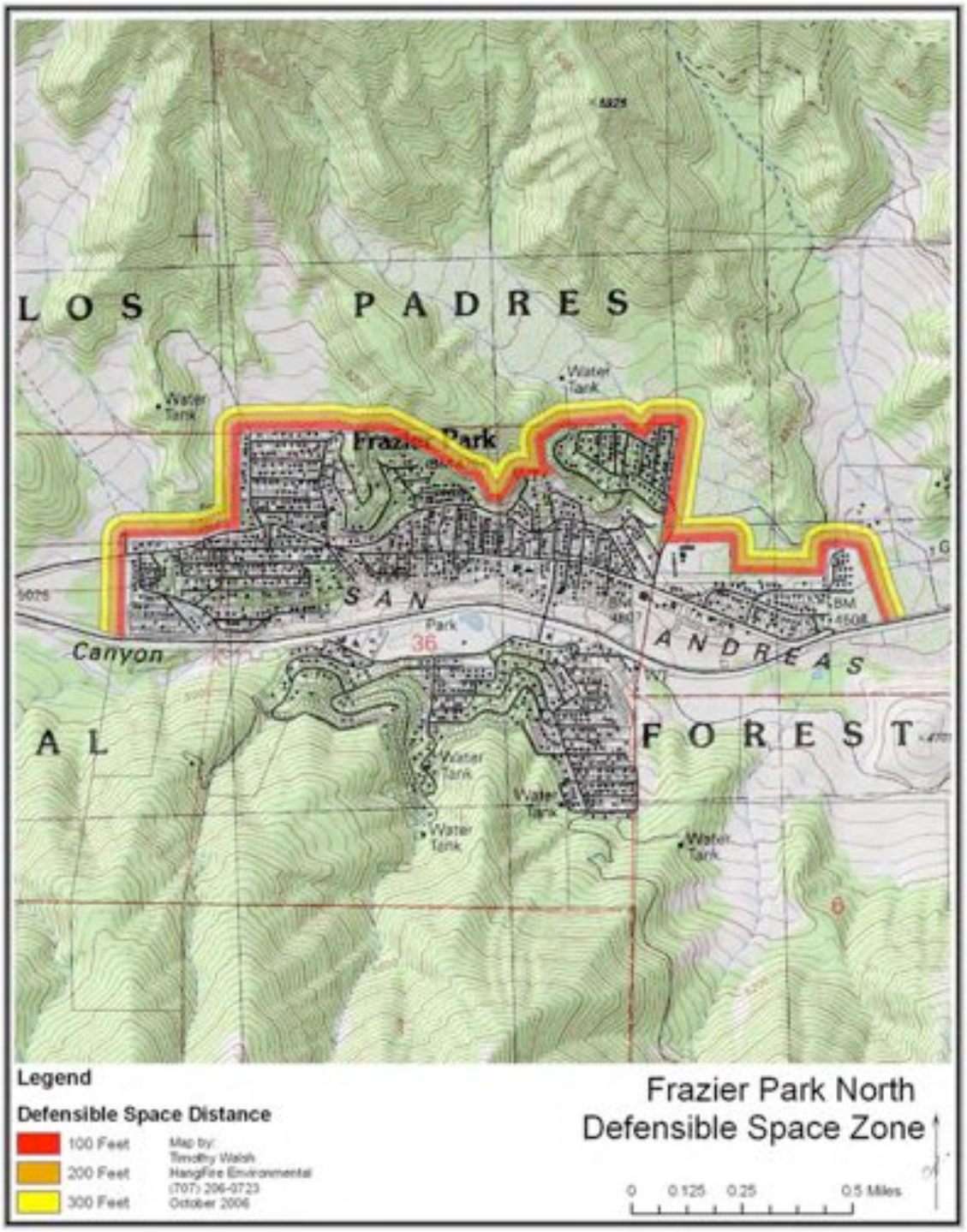
A shaded fuelbreak is created by altering surface fuels, increasing the height to the base of the live crown, and opening the canopy by removing trees and brush. A shaded fuelbreak will be less noticeable from a distance and will blend in with the forest better than the current break. Trees and brush that remain on site should represent a diversity of age and size class. All cut material should be masticated, shredded, or piled and burned.

Figure 36: The current fuelbreak that surrounds the northern portion of Frazier Park as seen from the air. The break begins just above Frazier Park School and transverses west tying into an area of reduced fuels.

The Public Resource Code states that all landowners need to provide 100 feet of defensible space around their homes. Unfortunately, several lots in Frazier Park border Forest Service land making the defensible space requirements impossible to meet. It is recommended that the USFS work to allow treatment of vegetation within 100-300 feet of dwellings and/or occupied structures to reduce the fire intensity during a wildland fire (Map 42). In some areas, the aforementioned shaded fuelbreak and defensible space will occupy the same area as seen in Figure 36.



Map 41: Proposed modification to the Frazier Park North Fuelbreak



Map 42: Proposed defensible space zone around the northern perimeter of Frazier Park. It is approximately 15,000 feet of fuel modification.

Although a lot of fuel modification has been accomplished around the northern portion of Frazier Park, some of it could actually jeopardize the community in its current state. In the area of San Carlos Trail north of the school, brush was cut and piles were built. The piles were left in place and not burned prior to fire season. If a fire threatened the community from the east, such as the Scott Fire did from the west, the piles would have been difficult to suppress. They burn with very high intensity and cast embers in the direction of the prevailing wind. It is recommended that all piles be burned or removed prior to next fire season.

Figure 37: Brush piles can be seen from the aerial photo bordering the homes near San Carlos Trail and Hemming Way. The inset shows the piles of dried brush throughout the area.

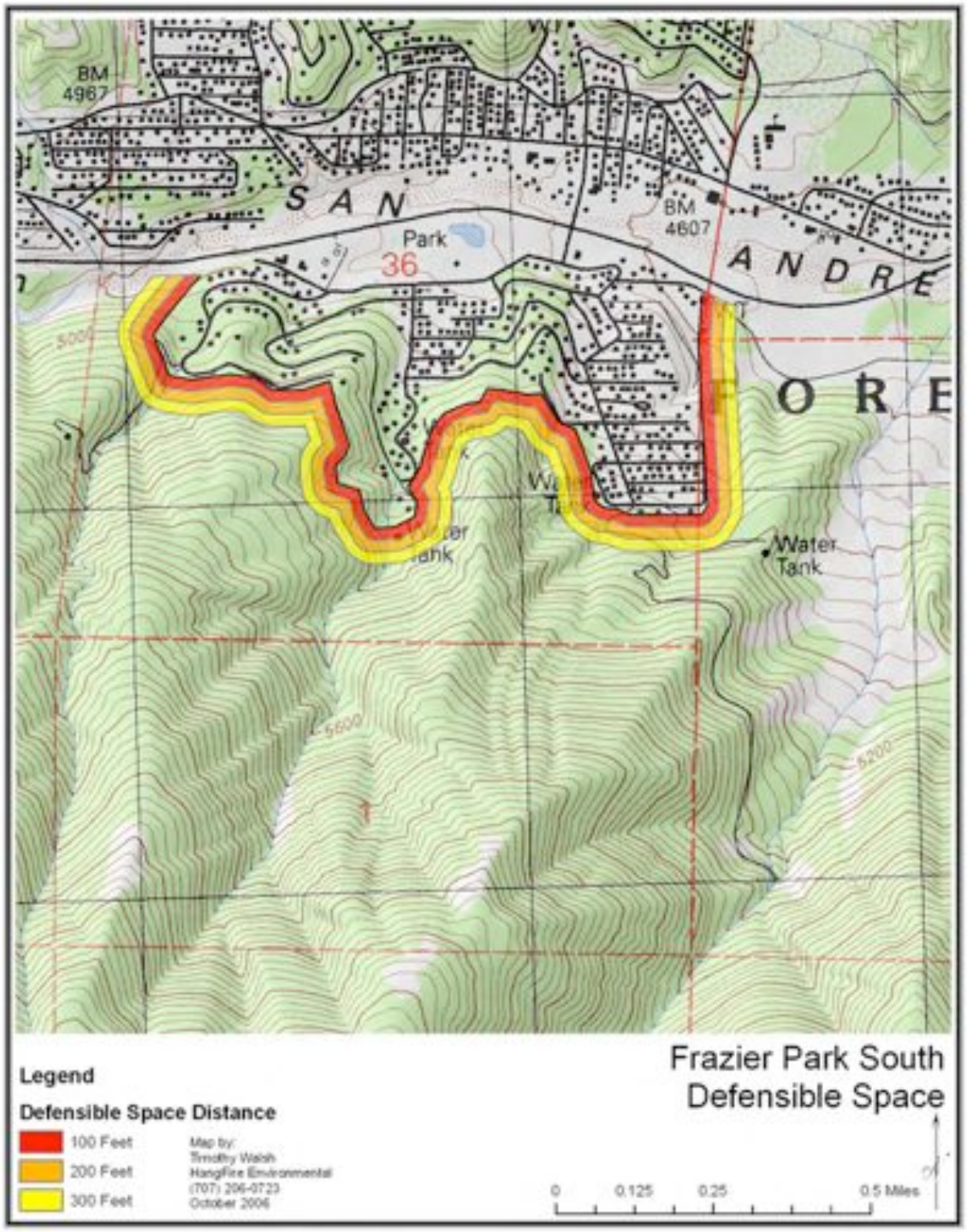
South

The area south of Frazier Mountain Park Road has fewer homes than the north. There are approximately 370 homes in the south compared to over 960 in the north. The hillsides are much steeper but are mostly north, northeast, or northwest facing. These cooler slopes support heavier fuel loads but usually have higher fuel moistures as well. There are large areas of private land behind the homes found in the southern portion. With the exception of the homes near Terminal Trail and Idaho Trail, most of the property is in private ownership.

The Kern County Fire Department has actively been working to reduce fuel loading around the community. Crew 82 has built breaks around most of the southern portion of the community and is continuing to work on them. It is recommended that this defensible space zone be improved and maintained for a distance of 100-300 feet (Map 43). Unfortunately, sagebrush grows quickly anywhere the ground has been disturbed making maintenance of this fuel reduction repetitive and costly. Another challenge of building a fuelbreak in this area is rolling rocks from the very steep terrain. Some brush should be left in place to slow and stop debris from rolling into homes at the bottom of the slope.

Figure 38: Fuel reduction work near South End Road that provides defensible space for structures found just outside of the image to the right. Notice the brush left in place to stop rolling rocks from damaging structures at the base of the slope.

Figure 39: The sagebrush grows very quickly after fuelbreak work is complete making maintenance an ongoing and costly issue.



Map 43: Proposed defensible space zone around the southern perimeter of Frazier Park. It is approximately 10,000 feet of fuel modification.

Fuel modification was created around the southern perimeter of Frazier Park during the Day Fire. This area should be maintained as part of the defensible space around the community.

Frazier Park Strategic Fire Plan

Many of the roads in Frazier Park are very narrow, unpaved, and lack adequate parking space. Water sources may be known to local firefighters but what about those responding from out of the area? Do they know which roads fire apparatus can drive past one another?

During a wildland fire, residents may flee the area in a near panic. While residents evacuate, narrow roads can lead to traffic bottlenecks. If residents are evacuating as fire engines are trying to make access, one or the other could become trapped. It is recommended that the Kern County Fire Department create a strategic plan for Frazier Park. It should include recommended access and egress routes for both fire suppression resources and residents.

Figure 40: A typical "Trail" in Frazier Park. The word "Trail" is used for "Road" in the street naming convention. It is very accurate as some of the roads look more like trails.

The plan should also identify some of the roads that should be paved or widened by clearing vegetation. These primary escape routes may need designated parking areas for the residents. Although this is not popular with the residents, it could prove to make the difference between life and death. The plan should include water sources, hydrant locations, and hydrant flow. Finally, the plan should include detailed street maps with each address well marked. Target hazards should be identified such as wood roofs and bridges with low load limits.

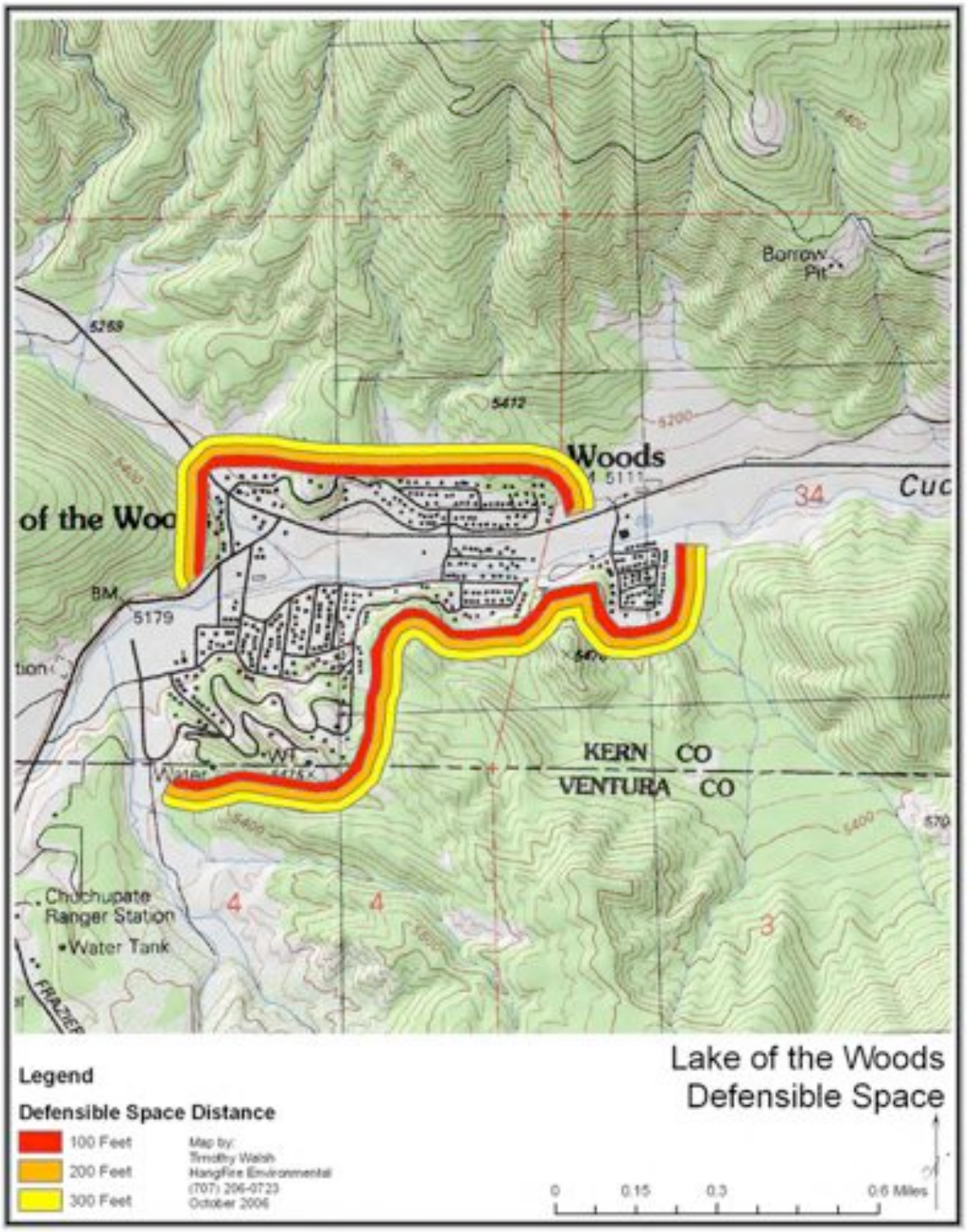
Lake of the Woods Fuel Management Strategy

The Lake of the Woods is a community broken into three areas. To the east is a mobile home park. In the center is a small housing tract that is situated on both sides of Frazier Mountain Park Road framed by Border Street and Lakewood Place. The western portion of the community wraps the corner of Lockwood Valley Road. A past fire scar breaks up the vegetation between the mobile home park and the center section. The community is surround by Forest Service land.

Figure 41: A past fire scar indicates how close fires can come to the community of Lake of the Woods. This fire scar actually provides an area of reduced fuel loading and should be incorporated into a fuel treatment zone around the entire area.

It is recommended that the Forest Service work to allow defensible space around the community creating a 300 foot buffer of shaded fuelbreak. Where the fuelbreak crosses private land, the land owners should also participate with the recommend fuel treatment. The first 100 feet should have the most aggressive fuel modification meeting the Public Resource Code requirements. Within the last 200 feet, the treatment should be a shaded fuelbreak where crews concentrate on thinning out the smaller diameter trees (less than six inches in diameter), remove dense underbrush, and prune lower limbs of the large diameter trees. All dead trees and brush should be removed. Brush and limbs that are removed should be piled by the crews and burned during the winter months, or chipped on site. Smaller trees should be utilized for other projects such as fencing, firewood, pulpwood, or cogeneration fuel.

The fuelbreak is approximately 7500 feet in length south of Frazier Mountain Park Road and 5200 feet north of the road (Map 44). This zone of pretreated fuels is likely to provide firefighters opportunities to quickly construct fireline, or apply a backfire with a good chance of success, since fire intensities in the fuel treatment area would be greatly reduced.



Map 44: Proposed Lake of the Woods Defensible Space Project

Pinon Pines Fuel Management Strategy

The community of Pinon Pines is an island surrounded by light flashy fuel types such as grass or grass with a sagebrush component. Unfortunately, within the island, there are very heavy fuel types with dwellings intermixed. There are approximately 250 homes located in Pinon Pines. The greatest threat is from a fire coming from the east or north where the hillsides are steeper.

Figure 42: An aerial view of Pinon Pines from the northeast shows that the area is an island of heavy fuel surrounded by grasslands.

The Kern County Fire Department has been constructing fuelbreaks in the community to reduce the fuel loading and increase the height of limbs of the trees. The fuelbreak system has been designed to break up the large areas of conifers resulting in smaller blocks of fuels.

Figure 43: This is an example of the fuelbreak built by the Kern County Fire Department that has removed brush from the understory and also removed the lower limbs of the trees.

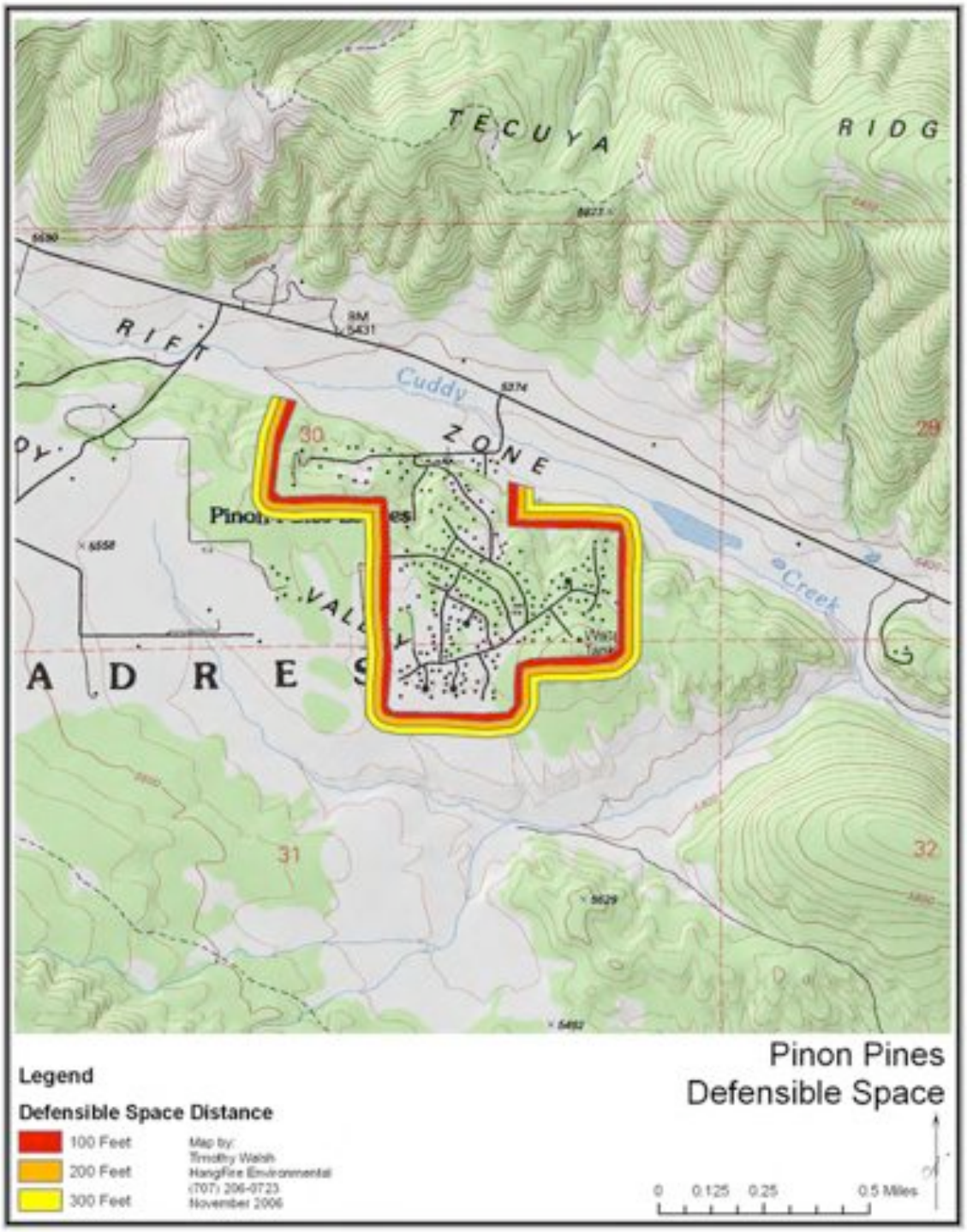
It is recommended that the Kern County Fire Department continue to work in cooperation with private landowners to provide defensible space around the community. The end result should be a 300 foot shaded fuelbreak around the

community. The first 100 feet should have the most aggressive fuel modification meeting the Public Resource Code requirements. Within the last 200 feet, the treatment should be a shaded fuelbreak where crews concentrate on thinning out the smaller diameter trees, remove dense underbrush, and prune lower limbs of the large diameter trees. All dead trees and brush should be removed. Brush and limbs that are removed should be piled by the crews and burned during the winter months, or chipped on site. Smaller trees should be utilized for other projects such as fencing, firewood, pulpwood, or cogeneration fuel.

The fuelbreak is approximately 12,500 feet long (Map 45). Previous work performed by the Kern County Fire Department should be utilized as part of this project. There are areas where the fuel is naturally less dense and where less work will be required. When fuel is removed, the newly created burn piles should be burned prior to fire season or the material should be chipped on site.

This zone of pretreated fuels is likely to provide firefighters opportunities to quickly construct fireline, or apply a backfire with a good chance of success, since fire intensities in the fuelbreak would be greatly reduced.

Figure 44: The green arrow shows the area where the Kern County Fire Department has been working with landowners to reduce the fuel loading resulting in a fuelbreak in western Pinon Pines. The fuel modification breaks up continuous fuels and ties into areas of lighter fuel loading to the north and south.



Map 45: Proposed Pinon Pines Defensible Space Project. Some work has already been completed.

Cuddy Valley Fuel Management Strategy

There are approximately 90 dwellings in the Cuddy Valley. A vast majority of them are situated on flat parcels over five acres in size covered with lighter fuels such as grass and sagebrush. The areas with highest risk within the Cuddy Valley are those parcels that border USFS property to the southwest. In this area, homes are situated in heavier timber with grass and brush understory. Beyond this area to the west, the landownership changes from private to federal ownership. Within the Forest Service land, there are seven organized camps within the heavier types.

Figure 45: The large arc through the center of the picture is Mt. Pinos Road. Homes found to the left of the arc at the west end of Cuddy Valley have the greatest risk due to the timber and slope found in this area.

The USFS has proposed a project to protect not only the organized camps but also the homes in western Cuddy Valley. The *Organizational Camps Project Proposed Action* states*:*

"The desired condition for forest, shrub, and plantations stands is to create fuel conditions that result in a low intensity surface fire in the event of a wildfire ignition. This would facilitate the protection of the organizational camps and adjacent residences. The project is also designed to create vegetative stand conditions that promote a healthy and vigorous forest stand that is irregular uneven-aged, multi-sized, and with a variety of species. To

meet the project objectives and push the current condition toward the desired future condition, treatment needs are to reduce standing dead and live fuels, reduce ladder fuels, and break up the continuity of small to medium-sized trees and shrubs in all plant communities.

Midstory and understory trees would be mostly Jeffery pine and occasional pinyon pine, black oak, and white fir. Treatments in the naturally forested areas would focus on creating open stands, with widely spaced overstory trees, widely-spaced small patches. Shrubs, small trees, and ground vegetation is dominated by herbaceous plants. The stands' surface and ladder fuels would be at low enough levels that crowning, torching, and other severe fire behavior would not likely occur during a wildfire. In shrub stands, shrub coverage and continuity would also be reduced to about 55-70 percent of current levels."

The proposed actions will be performed on 700 acres (Map 46) and include[17]:

"Thin smaller/younger Jeffrey pine, pinyon pine, and white fir adjacent to larger trees to reduce inter tree competition, and decrease ladder fuels (*fuels which provide vertical continuity between surface and crown fuels)* to reduce fire intensities during a wildfire. These activities will occur both in natural stands and plantations.

Some thinning of established Jeffery pine plantations as well as naturally developed Jeffery pine would also take place. Plantations of existing Jeffery pines would be thinned to about 100 sq. ft. of Basal Area (BA), leaving about 200 trees per acre.

Stands of naturally occurring Jeffery/pinyon pine/white fir would be thinned to carry about 100-140 sq. ft. of basal area (BA) to favor California Black Oak. All trees larger than 30 inches dbh would remain on site (unless a safety hazard).

Slash would be treated with conventional methods such as hand piling, prescription fire, or chipping,. Site preparation for planting would also be accomplished with prescribed fire. Planting of tree seedlings may be done to enhance species diversity, provide structural diversity, and fill in slash disposal or burn created openings.

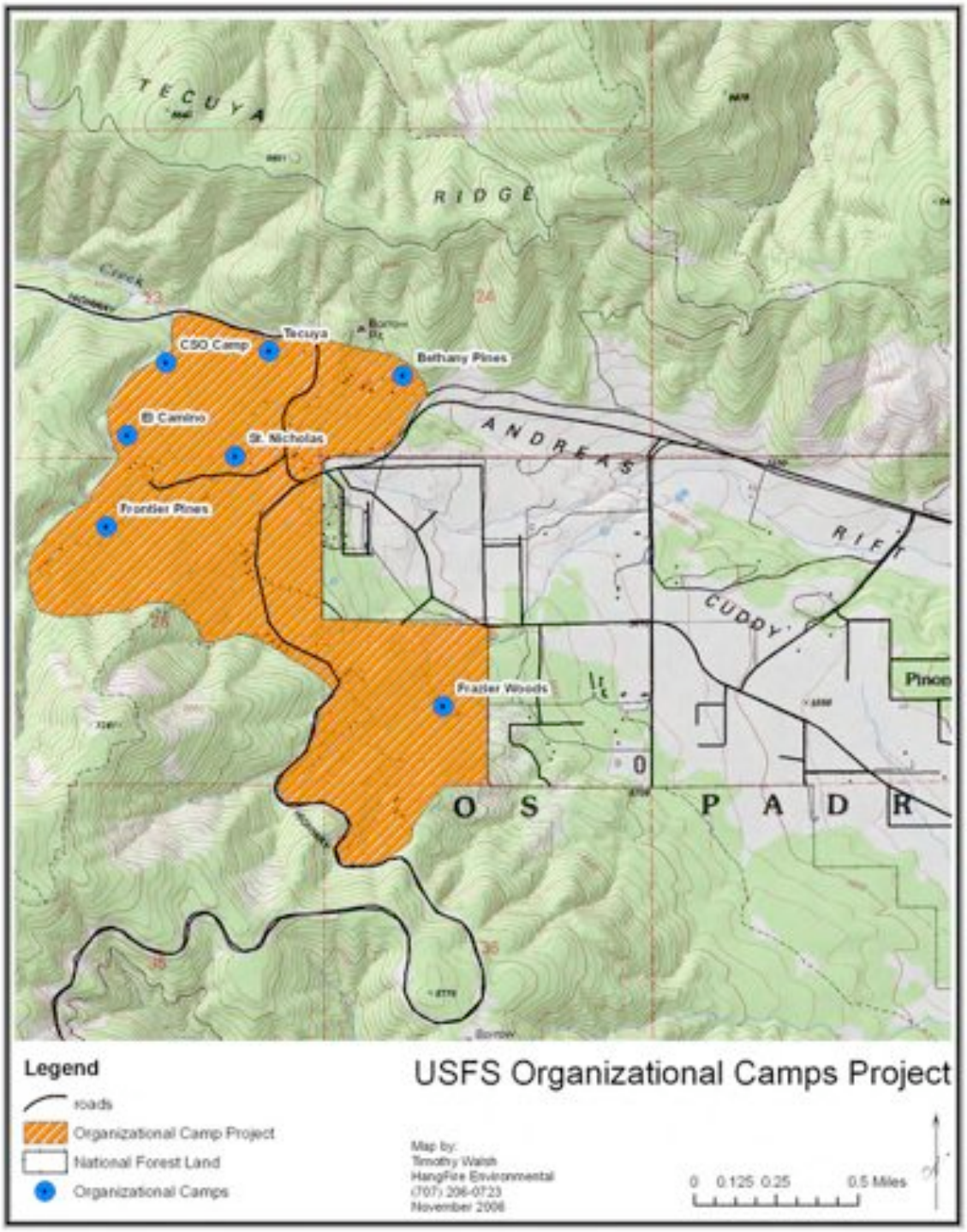
Approximately 25 acres of sagebrush may be treated with a masticator or hand treatments.

Broadcast burning may take place within the project area once treatment activities are completed or to maintain a desired condition.

Where needed, thinning and pruning to control mistletoe will be performed."

This zone of pretreated fuels is likely to provide firefighters opportunities to quickly construct fireline, or apply a backfire with a good chance of success, since fire intensities in the fuelbreak would be greatly reduced.

[17] Some contents removed for brevity. Please see complete ***Organizational Camps Project Proposed Action*** at http://www.fs.fed.us/r5/lospadres/documents/healthy-forests/hf-org-camps-scope.pdf



Map 46: Proposed Cuddy Valley Organizational Camps Project.

McGill-Mt. Pinos Fuel Management Strategy

There are large parcels of forested land between Cuddy Valley and Pine Mountain Club managed by the USFS. The next proposed project by the USFS does not abut any homes but does break-up this large piece of land and reduce the heavy continuous fuels between the two communities (Map 47). There are also three campgrounds within the project area that will benefit from this proposed treatment.

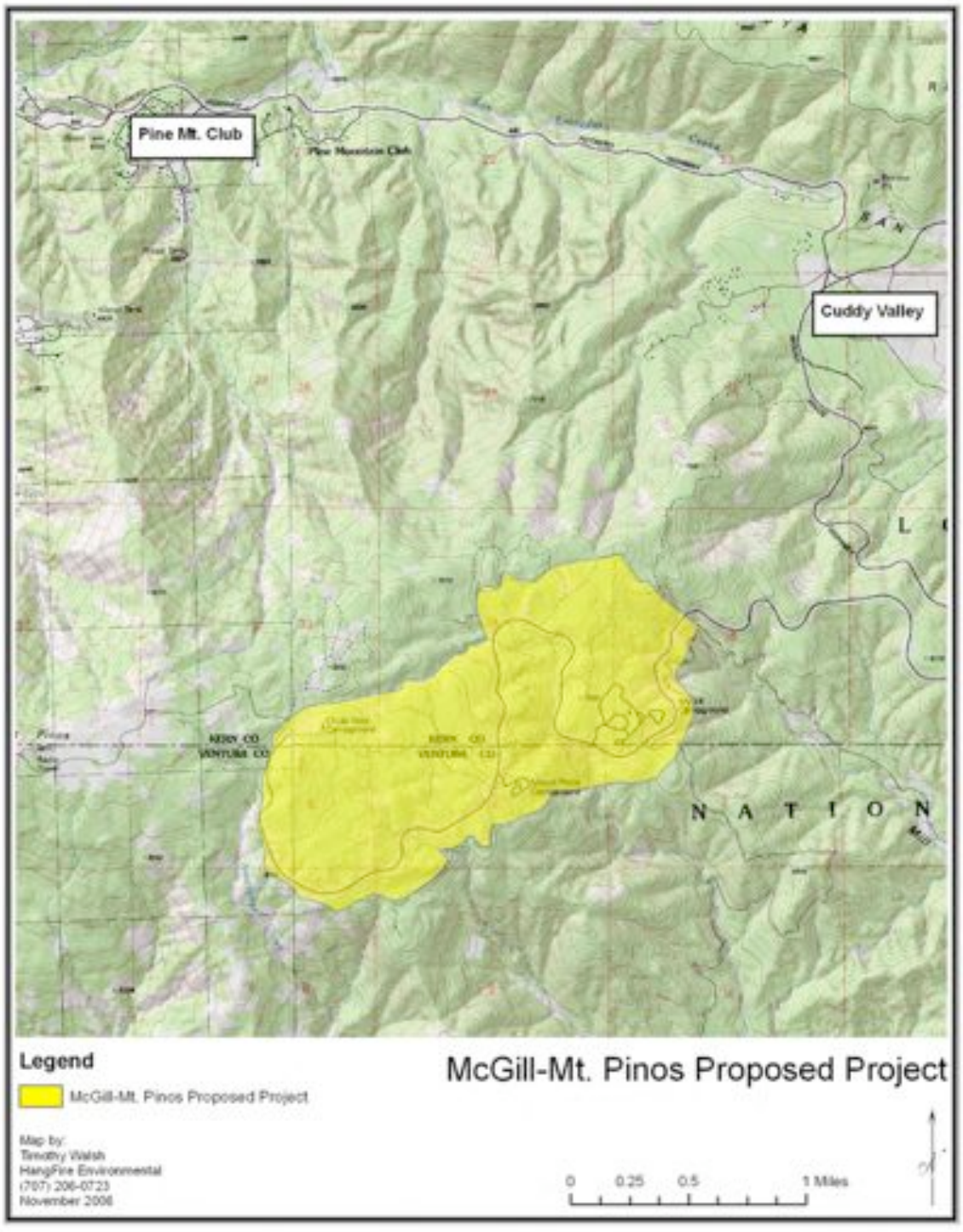
The McGill-Mt. Pinos Project Proposed Action[18] (MMPPPA) states. "*The McGill-Mt. Pinos Project would reduce stand densities, ladder and ground fuels to create a desired condition of a healthy Jeffery pine forest with a low fire hazard. The purpose of this project is to maintain health of the mature conifers, reduce the risk of mortality due to insects, disease, and catastrophic fire, protect high value recreation areas, and preserve old growth pine stands. The project is approximately 1,010 acres in size.*"

The MMPPPA[19] continues to define the specific treatment prescriptions as:

> *"Thin smaller/younger Jeffrey pine, pinyon pine, and white fir adjacent to larger trees to reduce inter tree competition, and decrease ladder fuels (fuels which provide vertical continuity between surface and crown fuels) to reduce fire intensities during a wildfire.*
> *Stands of naturally occurring Jeffery/pinyon pine/white fir would be thinned to carry about 100-140 sq. ft. of basal area (BA) to favor California Black Oak. All trees larger than 30 inches dbh would remain on site (unless a safety hazard).*
> *Slash would be treated with conventional methods such as hand piling, prescription fire, or chipping.*
> *Any trees greater than 4" dbh to be removed would be felled and limbed, and where feasible, concentrated and made available for forest products/campground firewood. In other areas the felled trees would be limbed, concentrated and/or scattered followed by a combination of jackpot burning/pile burning/broadcast burning. Where feasible, forest products such as fuel wood or Christmas trees would be made available to the public.*
> *Broadcast burning may take place within the project area once treatment activities are completed or to maintain a desired condition.*
> *If natural regeneration is inadequate to meet the silvicultural objectives due to insect/disease losses or loss of species diversity, inter-planting of native seedlings of the Jeffrey pine forest type would occur.*
> *Where needed, thinning and pruning to control mistletoe will be performed."*

[18] Some contents removed for brevity. Please see complete McGill-Mt. Pinos Project Proposed Action at http://www.fs.fed.us/r5/lospadres/documents/hf-mcgill.pdf

[19] Some of the specific treatments removed for brevity. Please see the complete report for details.



Map 47: Proposed McGill-Mt. Pinos Project.

Pine Mountain Club Fuel Management Strategy

Pine Mountain Club (PMC) is a very isolated community located 17 miles from Interstate 5. There are approximately 1660 developed parcels within the community. The community is enveloped by land owned by the Pine Mountain Club Property Owners Association (PMCPOA). Beyond the PMCPOA lands to the south is the Chumash Wilderness (Map 48).

Forest Service Recommendations

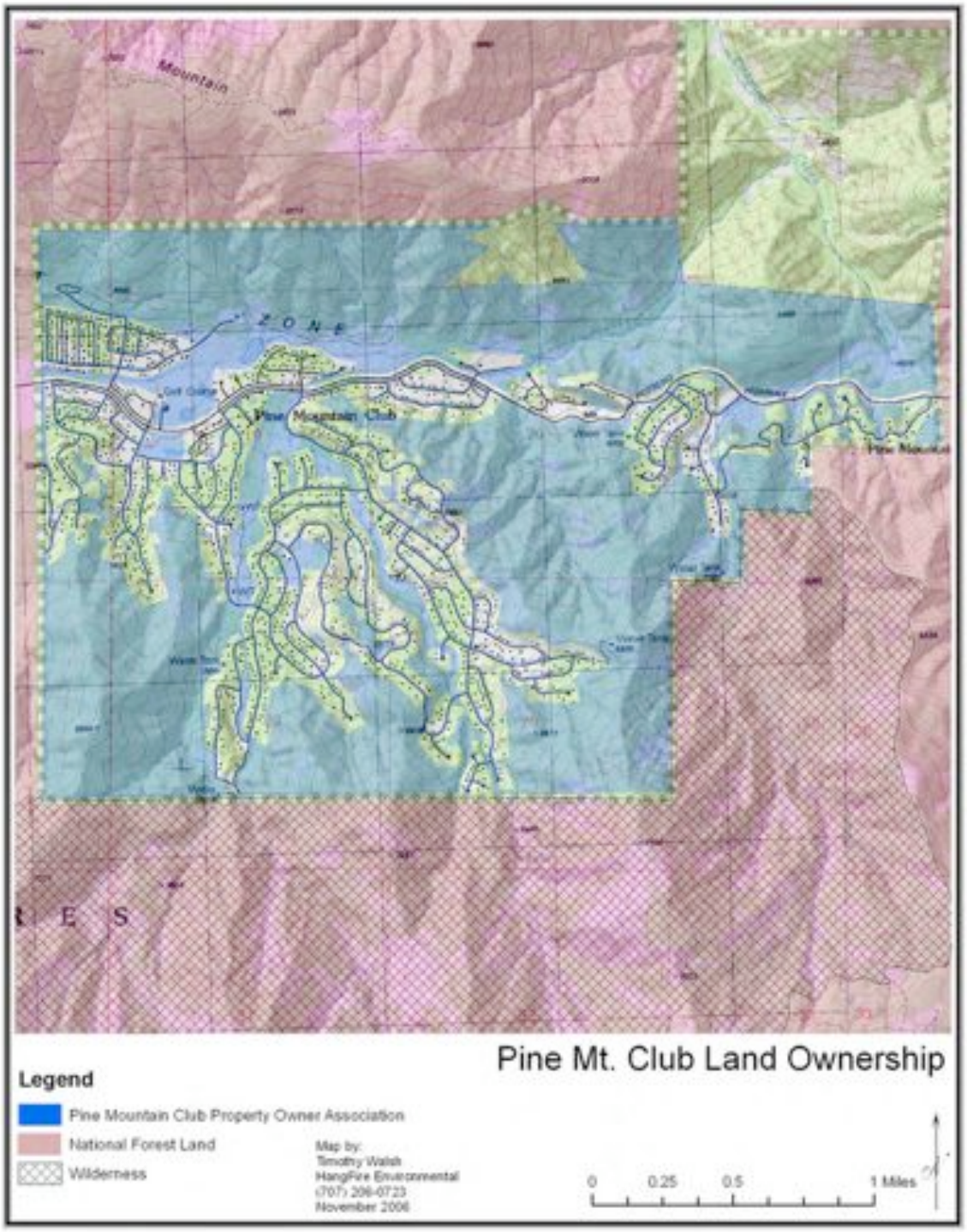
As stated previously, vegetation management is difficult to implement on federally designated wilderness areas. Therefore, to implement fuel management strategies in a timely manner, they should be performed on privately owned property or USFS lands that are not designated wilderness[20]. The USFS has proposed a series of vegetation management projects under the title, "Pine Mountain Club Project."

Figure 46: The challenges of protecting Pine Mt. Club from a wildland fire become obvious in the photo. Heavy fuel types, steep terrain, and several dwellings with limited access combine to create a community at risk.

The USFS's Pine Mountain Club Environmental Assessment (PMCPEA)[21] states: *"Vegetation treatments are proposed on a total of approximately 1,865 acres*

[20] One of the proposed projects clips a corner of wilderness. It will be up to the respective stakeholders to determine if the project can be implemented.

[21] The PMCPEA can be viewed at http://www.fs.fed.us/r5/lospadres/documents/healthy-forests/pmc-final-ea.pdf



Map 48: The land ownership surrounding Pine Mt. Club portrays the large amount of land owned by the PMCPOA. It also shows the limitations of fuel management strategies along the southern borders due to the wilderness area.

adjacent to Pine Mountain Club community. Of the project area, an estimated 495 acres would be hand thinned and prescription underburned. Within the project area two shaded fuel breaks up to 500 feet wide and totaling 170 acres

would be created through a combination of mechanical and hand thinning. Three additional areas totaling 1,170 acres would be thinned to address overstocking and mistletoe infection concerns, followed with prescription burning. An additional 30 acres would receive brush treatment to improve deer habitat…

Existing and activity fuels would be removed or reduced through a variety of means. Small scale underburning would be conducted to complete or maintain the desired condition. Existing fuels would be piled for burning or stands would be underburned following thinning. Ladder fuels, tops and limbs and excess large fuels would be removed or burned on site."

There are seven treatment units within the Pine Mt. Club project area. Treatments should be completed over a period of five to ten years. Besides mechanical thinning, a masticator would be used on some brush species to reduce the depth of fuels, reducing fire behavior. Table 40 summarizes the proposed treatments by treatment block.

Table 40: USFS Pine Mountain Club Project Names, Block Designator and Acreage.

Name	Treatment Block	Acres
Campo Alto Thin	A	495
Ridge Fuel Break	B	70
Camp Condor Safety Zone	C	25
North Mill Potrero Road	D	870
Footslope Thin	E	275
Fuel Break	F	100
Footslope Brushfield	G	30

The following are excerpts from the PMCPEA that summarize each of the seven treatments:

"Block A - Campo Alto Thin (495 Acres)"
"The primary treatment activity would include broadcast burning to maintain a healthy and mature Jeffrey pine forest. Understory thinning of trees 12 inches diameter and below is proposed to prepare for the underburning by reducing tree crown densities, tree competition, addressing dwarf mistletoe infections, ladder fuels, and favoring the existing large Jeffrey pine. Incidental selective thinning of trees between 12 and 30 inches diameter may occur to reduce overall stand density to approximately 100 trees per acre less than 30 inches diameter. Trees between 12 and 30 inches diameter would be removed based upon trees specific locations relative to desired retention trees (larger diameter trees). All trees larger than 30 inches diameter would remain on site (unless a hazard tree). To

maintain desired densities, successive treatments would be required at about 10 year intervals to maintain healthy stocking levels. Irregular uneven-aged stand structure would be emphasized and maintained.

With chainsaws, trees would be felled and limbed, and where feasible concentrated to be made available for forest products/campground firewood. In other areas the felled trees would be limbed, concentrated and/or scattered followed by a combination of pile burning/broadcast burning. No tree felling is proposed within the campground perimeter, but some broadcast burning may overlap into the campground. Uneven-aged stand structure would be emphasized and maintained. Where feasible, forest products such as fuel wood or Christmas trees would be made available to the public."

"Block B - Ridge Fuel Break (70 Acres)"
"A shaded fuel break approximately 500' wide is proposed to rearrange and reduce existing ladder and ground fuels to provide for low intensity fire behaviors, and to allow for increased options during wildfire suppression activities to reduce fire severity. With chainsaws, selective thinning would remove individual trees in all diameter classes less than 30 inches diameter, and brush would be felled, limbed, piled and burned. Incidental removal of trees between 12 and 30 inches would occur based upon desired crown closure of 40 percent or less. Irregular uneven-aged stand structure would be emphasized and maintained."

The design of this fuelbreak should be changed to take advantage of work that has been performed on private land at Camp Condor. There is a fuelbreak that begins on flat land and proceeds southwesterly towards a peak above Camp Condor at 7255 feet. The fuelbreak is obvious on the USGS map (Figure 47) as well as from the air (Figure 52).

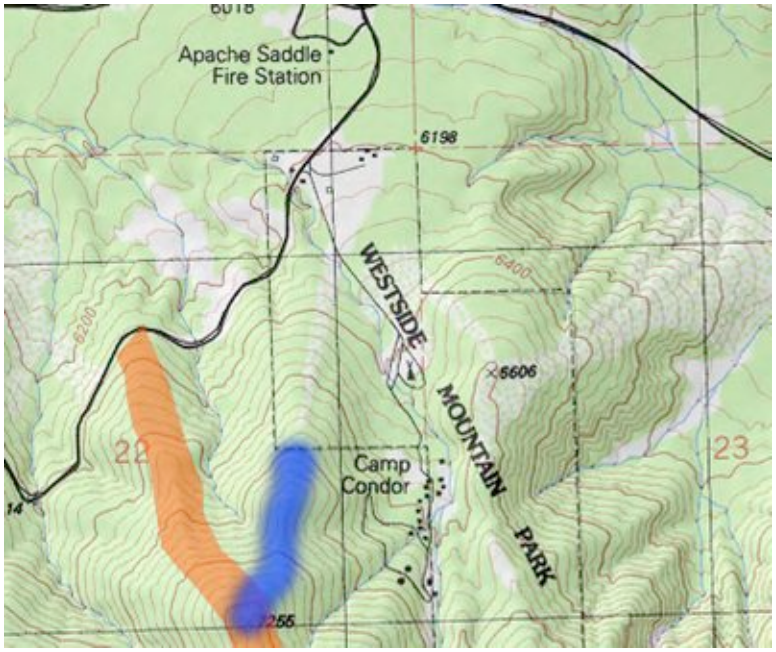


Figure 47: The original fuelbreak design is shown in orange. The USFS should consider a design change that takes advantage of work already in place. Map 49 shows the entire fuelbreak.

By changing the location of the proposed fuelbreak, the USFS could partner with the Kern County Fire Department to reduce the size, construction cost, and habitat disturbance needed to implement the fuelbreak. One consideration is that Camp Condor may not want a break that is 500 feet in width. It is recommended that both parties meet and agree on a size and design.

"Block C – Camp Condor Safety Zone (25 Acres)"
"Selective thinning with chainsaws of trees in all diameter classes less than 30 inches is proposed to reduce tree densities, address dwarf mistletoe infections, reduce ladder fuels and remove brush alongside the SW perimeters adjacent to the non federal land similar to activities planned to occur on the non federal land. Overall residual stand density would be approximately 100 trees per acre. Incidental removal of trees between 12 and 30 inches would occur based upon tree specific locations relative to desired retention trees (larger diameter trees). Mechanical equipment (masticator/tree skidder) could be utilized for harvesting and removing material. Where feasible, forest products would be made available. There would be some use of designated travel ways off Forest system roads for limited operating periods under Forest Service supervision in Block C to allow gathering of wood products. In other areas the felled trees and brush would be limbed, concentrated and/or scattered followed by a combination of pile burning/broadcast burning. Irregular uneven-aged stand structure would be emphasized and maintained."

"Block D – North Mill Potrero Road (870 Acres)"
"Tree densities would be reduced by selective thinning with chainsaws, removing excess trees in each diameter class less than 30 inches diameter to approximately 100 trees per acre. All trees larger than 30 inches diameter would remain on site (unless a hazard tree). The trees to be removed would be those in each diameter class that are excess to maintaining an uneven-age structure. Carrying this level of stocking would necessitate repeat visits to the site at about 10 year intervals to maintain healthy stocking levels. Irregular uneven-aged stand structure would be emphasized and maintained. Chainsaws would be used for pruning of mistletoe infected trees and thinning. The felled trees and brush would be limbed, concentrated and/or scattered, followed by a combination of pile burning/broadcast burning. A masticator may be used to treat brush and scrub oak in the west portion of the treatment block. To maintain the health of the mature sage brush flat in the east portion of the block, the sage brush flat will not be treated except for hand thinning of encroaching trees less than 12 inches in diameter and lopping and scattering of slash. Where feasible forest products and campground firewood would be made available to the public. There would be some use of designated travel ways off Forest system roads for limited operating periods under Forest Service supervision in Block D to allow gathering of wood products."

"Block E – Footslope Thin (275 Acres)"
"Tree densities would be reduced by selective thinning with chainsaws, removing excess trees in each diameter class to meet approximately 100 trees per acre less than 30 inches diameter. All trees larger than 30 inches diameter would remain on site (unless a hazard tree). The trees to be removed would be those in each diameter class that are excess to maintaining an uneven-age structure. Carrying this level of stocking would necessitate repeat visits to the site at about 10 year intervals to maintain healthy stocking levels. Irregular uneven-aged stand structure would be emphasized and maintained.

In addition, felling and removal of some of the dead and dying trees of all sizes/ages would be proposed. Where feasible concentrated material would be made available for forest products to the public. In other areas the felled trees would be limbed, concentrated and/or scattered followed by a combination of pile burning/broadcast burning."

"Block F – PMC Fuel Break (100 Acres)"
"A shaded fuel break approximately 500' wide is proposed to reduce existing ladder and ground fuels to provide for low intensity fire behaviors, and to allow for increased options during wildfire suppression activities to reduce fire severity. Irregular uneven-aged stand structure would be emphasized and maintained.

Dwarf mistletoe infected trees would be treated by pruning or removal. Chainsaws would be used to selective thin the conifer component, removing individual trees in all diameter classes less than 30 inches diameter. Incidental removal of trees between 12 and 30 inches would occur based upon tree specific locations relative to desired crown closure of 40 percent or less. A masticator and chainsaws would be used to treat the brush component. Trees would be felled by chainsaw, limbed, piled and burned. Where feasible, forest products would be made available. There would be some use of designated travel ways off Forest system roads for limited operating periods under Forest Service supervision in Block F to allow gathering of wood products."

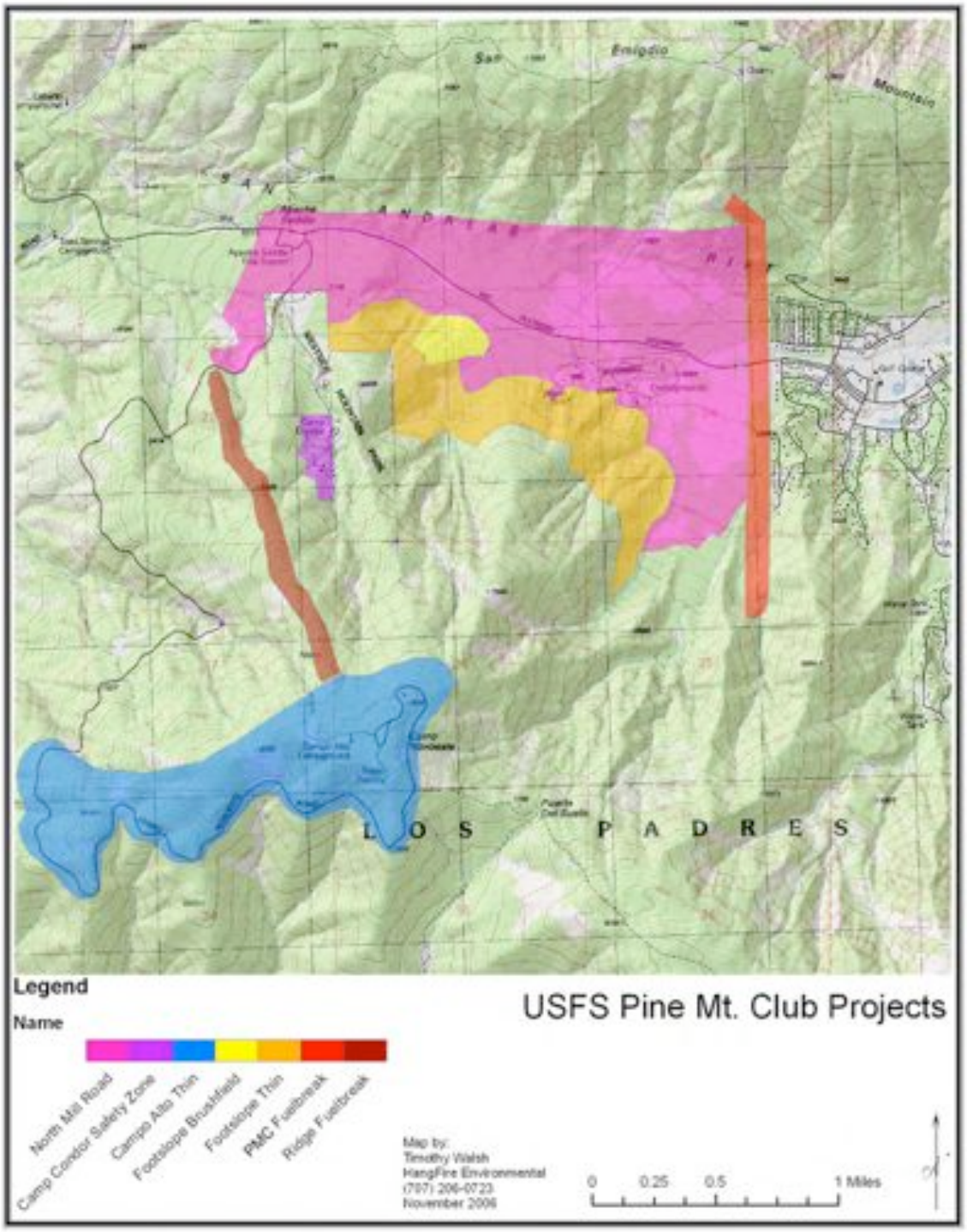
"Block G – Footslope Brushfield (30 Acres)"
"Deer habitat improvement is proposed to stimulate growth, create a mosaic of vegetative conditions, and reduce decadent (dead or dying due to age) plants. Cutting up to 30% of the brush is proposed with chainsaws followed by burning of cut material when cured, and/or a masticator. No trees would be removed in this treatment."

Figure 48: Pine Mt. Club looking from the west to the east with Mill Potrero Road running through the center of the photograph. The area in the foreground is part of the USFS treatment blocks.

Although all of these projects treat only land west of PMC, it still provides an area of treated fuel. It is recommended that these projects are implemented over the next five to ten years concentrating on the blocks closest to the community.

On the east side of the community, the USFS created an area of reduced fuel known as the Pine Mountain Club East Defensible Fuel Profile Zone. The area is approximately 0.8 miles in length and was implemented three years ago. This fuelbreak parallels Yellowstone Drive and focused on thinning small trees, removing the ladder fuels, and removal of dead woody material.

Figure 49: The defensible space profile zone found in the area of Yellowstone Drive in eastern Pine Mt. Club.



Map 49: The proposed USFS Pine Mt. Club Projects

Private Land Recommendations Camp Condor

The Kern County Fire Department has also implemented fuel management strategies in and around Pine Mt. Club. One success story is the work performed at the Charter School and Camp Condor. This project cleared the understory and thinned the trees around the school and camp. Hundreds of pinon pines were removed around the school and others had the ladder fuels removed.

Figure 50: The fuel modification project around the Charter School that thinned pinon pines and chipped them on site. By chipping the material, the mulch slows growth of ground fuels.

Within Camp Condor, several dead trees were removed and more were thinned to reduce the fuel loading. There are two fuelbreaks on opposing ridges above the camp. One of the fuelbreaks ties into an old fire scar providing a large area of reduced fuel. Maintenance is recommended for these fuelbreaks to take advantage of the work that has been previously performed.

Figure 51: Fire scar above Camp Condor provides a large area of low fuel loading.

Figure 52: This image shows many different fuel modification strategies. In the center of the photo, the thinning around the Charter School can been seen. In the center of the photo, a fuelbreak runs up a ridge and ties into an old fire scar. Lastly, there is a fuelbreak in the upper right of the photo that continues upslope and stops. This fuelbreak should continue across USFS land and tie into a proposed fuelbreak in Block B of the Pine Mt. Club Project discussed earlier in this plan.

Pine Mountain Club Property Owners Association

There are two fuel management recommendations for lands owned by the Pine Mountain Club Property Owners Association (PMCPOA). They are both aimed at reducing the amount of vegetation throughout the community. The first is to continue to reduce the amount of vegetation within the common areas throughout the community. One of the hardest issues for vegetation management is to get the landowners to agree that a strategy should be implemented. On PMCPOA lands, there is only one owner. This advantage gives the association a great deal of latitude to protect their property.

Through the PMCPOA's approval process for new construction, wood is the building material of choice. According to PMCPOA members interviewed, a stucco house would never be approved for construction. With this preference to building homes with materials that burn, it should be no surprise if and when a large loss fire occurs. With this statement in mind, everything possible should be

done to reduce the fuel loading that surrounds the homes and compartmentalize the vegetation into smaller units (Map50).

Some projects have been completed within the common areas while others need to be maintained or implemented. Within the units, crews should concentrate on thinning out the smaller diameter trees, remove dense underbrush, and prune lower limbs of the large diameter trees. All dead trees and brush should be removed. Brush and limbs that are removed should be piled by the crews and burned during the winter months, or chipped on site. Fuel reduction should occur within the following common areas:

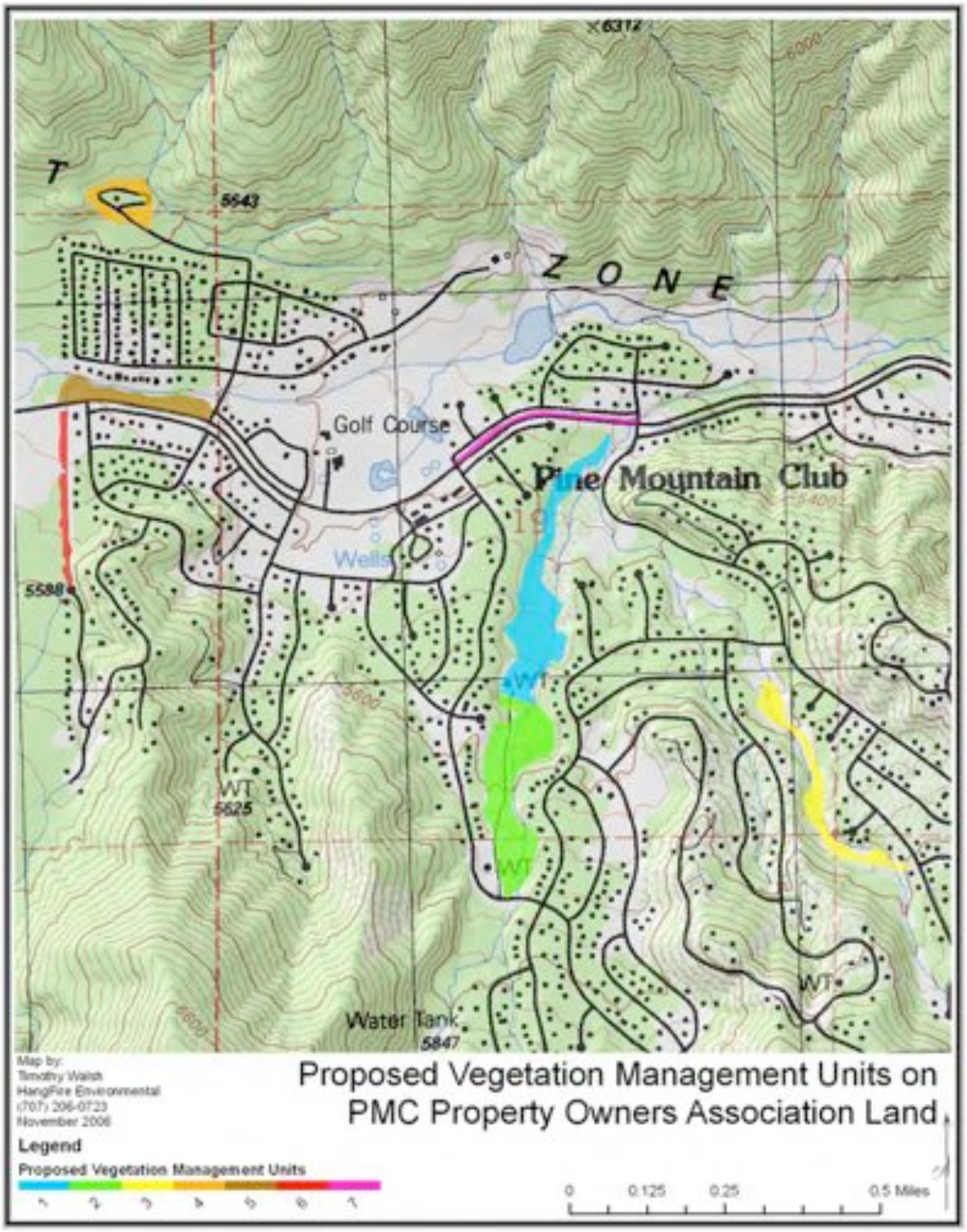
Table 41: Vegetation management unit locations and acres

Unit #	Location	Areas
1	Between Freeman Dr. and Alpen Ct.	12
2	Between Freeman Dr. and Bernina Dr.	13
3	Between Zermatt Dr. and Linden Dr.	5
4	Around the circle at the north end of Artic Dr.	3
5	North of Mil Potrero Rd. and west of Artic Dr.	4
6	Fernwood Dr. north to Mil Potrero Rd.	2
7	Along Mil Potrero Rd. between Freeman Dr. and Woodland Dr.	2

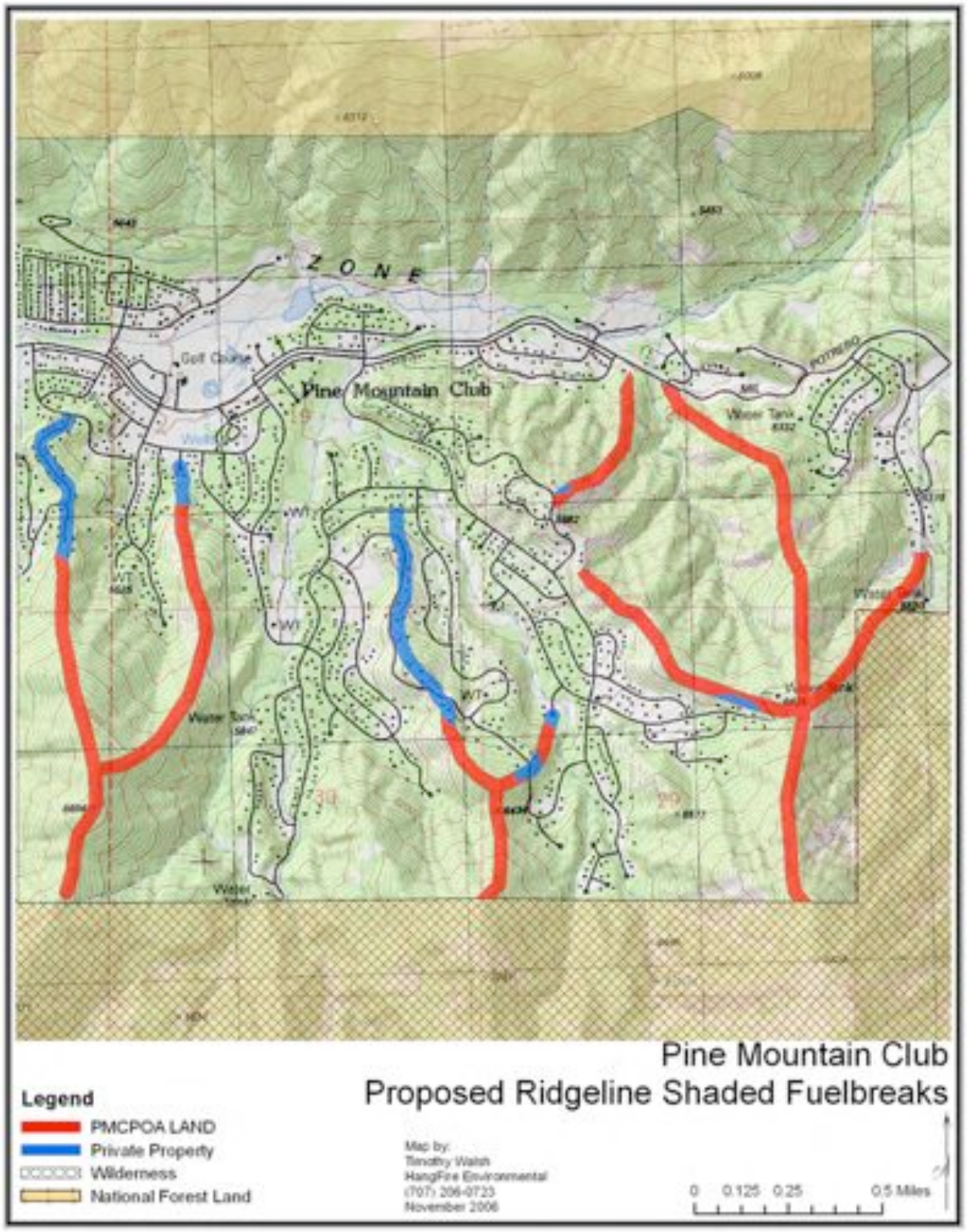
Beyond the common areas, strategic ridgelines have been delineated to create a shaded fuelbreak network (Map 51). All but one of the fuelbreaks start at the upper elevations of the wilderness area boundary. They continue to the north and fork down spur ridges until they tie into roads within the community. The upper elevation of the fuelbreaks are situated on PMCPOA lands. As the fuelbreaks progress downhill, they tie into private property taking advantage of the 100 foot clearance each home needs per the Public Resource Code.

The 200 foot wide shaded fuelbreak will reduce existing ladder and ground fuels to provide for low intensity fire behavior, and to allow for increased options during wildfire suppression activities. The breaks should be 100 feet on each side of the ridge. Irregular uneven-aged stand structure would be emphasized and maintained.

Dwarf mistletoe infected trees would be treated by pruning or removal. Chainsaws would be used to selectively thin the conifer component, removing individual trees in all diameter classes less than 30 inches. Incidental removal of trees between 12 and 30 inches would occur based upon tree specific locations relative to desired crown closure of 40 percent or less. Chainsaws would be used to treat the brush component and fall trees that should be limbed, piled and burned. Another alternative is chipping the biomass if it is more cost effective. Where feasible, forest products should be made available.



Map 50: Proposed projects on Pine Mt. Club Property Owners Association Lands



Map 51: Proposed ridgeline shaded fuelbreaks in Pine Mountain Club. When the fuelbreaks cross onto private property, the 100 feet of defensible space provided by each landowner could be incorporated into the fuelbreak network.

Frazier Mountain Fuel Management Strategies

The next project is a USFS proposal to break up large areas of continuous fuels that could also protect different assets. The proposed Frazier Mountain Project is designed to treat 2850 acres of vegetation that breaks up the fuels south of Frazier Park and southeast of Lake of the Woods (Map 52). Besides the communities, other assets include a plantation, a radio communication site, a fire lookout built in 1941, seven summer residents, and a campground. This project could slow a fire moving from Frazier Park, under a north wind, from moving into Lockwood Valley. The *Frazier Mountain Project Proposed Action*[22] provides the following details concerning the project:

"Block A - 455 Acres"

"Vegetation management emphasis in Block A would be to grow and maintain a healthy pinyon pine forest. Cultural activities would be designed to accelerate existing pinyon pine tree growth and development by removing competition around individual trees. Additional Jeffery pine and pinyon pine trees would be planted where needed for stocking and diversity needs. The project would reduce risk by reducing fuel loading on the area. The primary treatment activity would include cultural activities to maintain a healthy pinyon pine vegetation component, while planting additional Jeffery pine for a nurse crop and to develop species diversity. Additional pinyon pine may be planted throughout the area as well. This activity would take place on 108 acres.

Figure 53: The Frazier Mt. Lookout was built in 1941 and has become dilapidated. In its current condition, it is very susceptible to an ignition from a wildfire. Windows are broken and holes are open in the wooden exterior. There was a piece of burned wood found on the ground that looked as if someone was trying to start a fire.

[22] Some of the details have been removed for brevity. Please see the entire document at http://www.fs.fed.us/r5/lospadres/documents/frazier-mtn-proj2-25-05.pdf

Some thinning (51 acres) of established Jeffery/pinyon pine in plantations as well as naturally developed Jeffery pine would also take place. Plantations of existing Jeffery/pinyon pine would be thinned to about 100 sq. ft. of Basal Area (BA), leaving about 200 trees per acre. Stands of naturally occurring Jeffery/pinyon pine (27 acres) would be thinned to carry about 100-140 sq.ft. of basal area (BA). All trees larger than 30 inches dbh would remain on site (unless a safety factor), but are not included in the calculated stand structure curves.

Slash would be treated with conventional methods such as hand piling, prescription fire, or by mastication. Site preparation for planting would also be accomplished with this activity. Planting of tree seedlings would be done to enhance species diversity, provide a nurse crop for pinyon pine seedlings, provide structural diversity, and fill in slash disposal or burn created openings. Any larger trees to be removed would be felled and limbed, and where feasible, concentrated and made available for forest products/campground firewood. In other areas the felled trees would be limbed, concentrated and/or scattered followed by a combination of jackpot burning/pile burning/broadcast burning. Irregular uneven-aged stand structure would be emphasized and maintained. Where feasible, forest products such as fuel wood or Christmas trees would be made available to the public."

"Block B - 560 Acres"
"Block B would emphasize vegetative management to maintain a healthy large tree component of irregular uneven-aged trees dominated by Jeffery pine, while reducing fire risk to the area. The area has numerous plantations that are in need of cultural work to reduce stocking and improve growing conditions. Some of these plantations were established in the 1960's following a 1947 wildfire. Stand conditions are now such that fuel treatments and stocking reduction is needed in these stands to insure healthy, vigorous growth. Additional planting of Jeffery pine, white fir and black oak trees would be done where needed for stocking and diversity needs. This area also contains the Chuchupate Campground, which would be at risk in a wildfire.

The proposal includes reducing tree densities by thinning in Jeffrey pine stands occurring naturally as well as plantations, and some reforestation of previously burned areas. Thinning of 233 acres of established Jeffery pine in established plantations would take place. Planting of tree seedlings would be done to enhance species diversity, provide structural diversity, and fill in slash disposal or burn created openings.

Slash developed with this project would be treated by a variety of methods, including burning, chainsaws and a masticator. Where feasible, forest products such as fuel wood or Christmas trees would be made available to the public. In some locations the felled trees and brush would be limbed, concentrated and/or

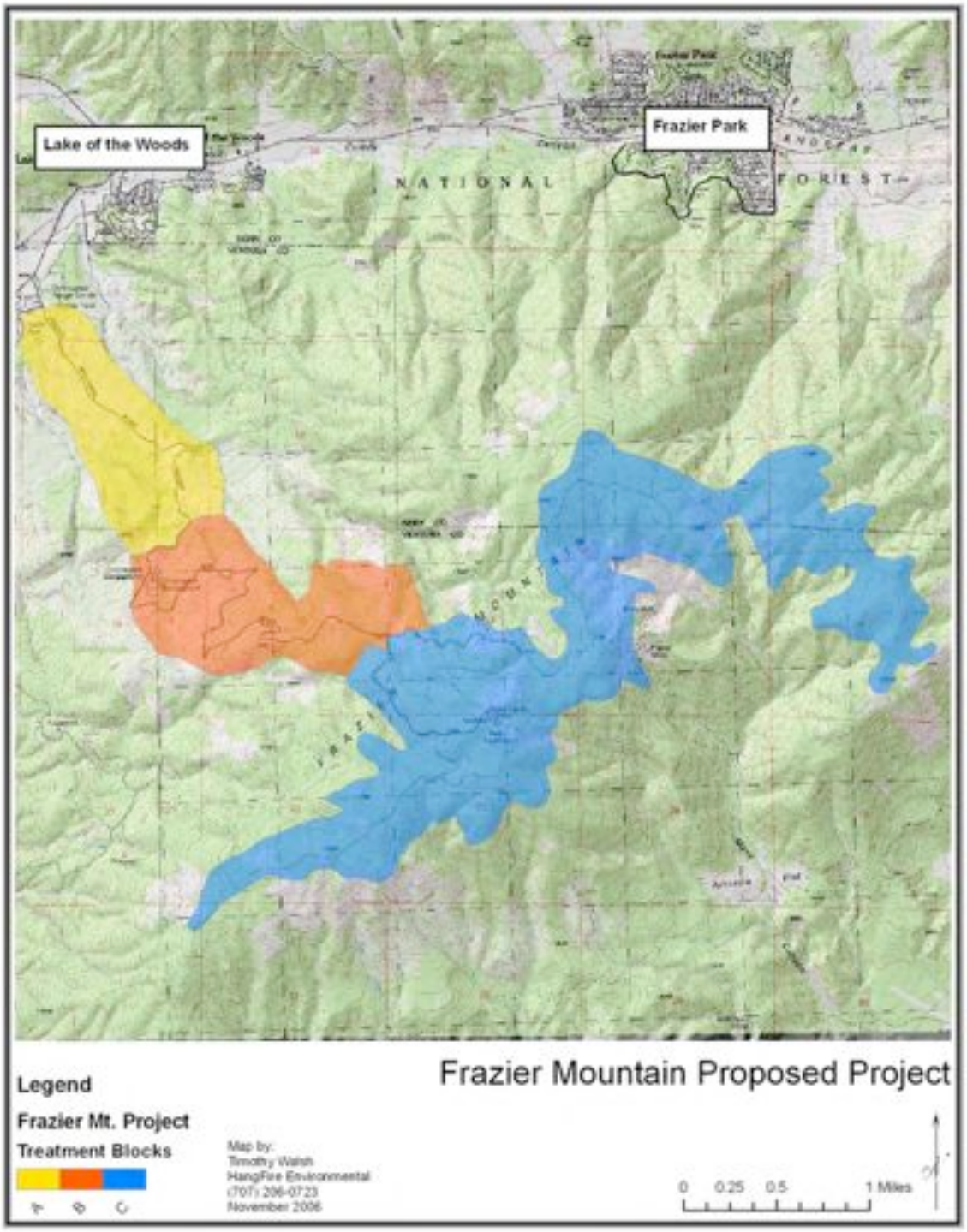
scattered, followed by a combination of jackpot burning/pile burning/broadcast burning. Site preparation for planting would also be accomplished with the slash disposal activity. Irregular uneven-aged stand structure would be emphasized and maintained."

"Block C - 1888 Acres"
"Vegetation management in Block C would emphasize thinning in naturally existing, older stands to favor irregular uneven-aged stand structure while reducing fuel loading of the site. Tree removal would be by individual tree selection and small group selection. The resultant post treatment vegetation would be multi-aged and sized, with multi species, but predominately Jeffery pine. Younger plantation thinning and some reforestation of brush site would also occur in this area. The area also contains some openings, which would be reforested to meet stand structure, and species diversity needs.

The proposal includes reducing tree densities by thinning in Jeffrey pine stands occurring naturally as well as plantations. Thinning of 370 acres of Jeffery pine in established plantations would take place. Plantations of existing Jeffery pine would be thinned to about 100 sq. ft. of Basal Area (BA), leaving about 200 trees per acre.

Thinning of overstocked natural stands (1019 acres) of Jeffery pine would occur as well. All trees larger than 30 inches dbh would remain on site (unless a safety factor), but are not included in the calculated stand structure curves.

Slash developed with this project would be treated by a variety of methods, including chainsaws and a masticator. Where feasible, forest products such as fuel wood or Christmas trees would be made available to the public. In some locations the felled trees and brush would be limbed, concentrated and/or scattered, followed by a combination of jackpot burning/pile burning/broadcast burning. Site preparation for planting would also be accomplished with the slash disposal activity. Some openings would be reforested to meet stand structure needs where natural regeneration is not adequate. Planting of tree seedlings would be done to enhance species diversity, provide structural diversity, and fill in slash disposal or burn created openings."



Map 52: The proposed USFS Frazier Mountain Projects

Ventura County Communities Fuel Management Strategy

The biggest community within Ventura County found in the study area is Lockwood Valley. Lockwood Valley is an island of privately owned land surrounded by land managed by the Forest Service. There are approximately 220 private dwellings in the valley. The Day Fire burned the entire southern area of Lockwood Valley and sadly homes were destroyed. Now that the fire is extinguished, the one consolation it provides is a large buffer of reduced fuel loading in the southern portion of the valley (Map 53).

One of the best defenses the rest of the community can provide is adequate defensible space as outlined in the Public Resource Code. Although the USFS owns several parcels of land within the valley, it would be difficult to connect the dots without several private landowners agreeing to participate in a large vegetation management project.

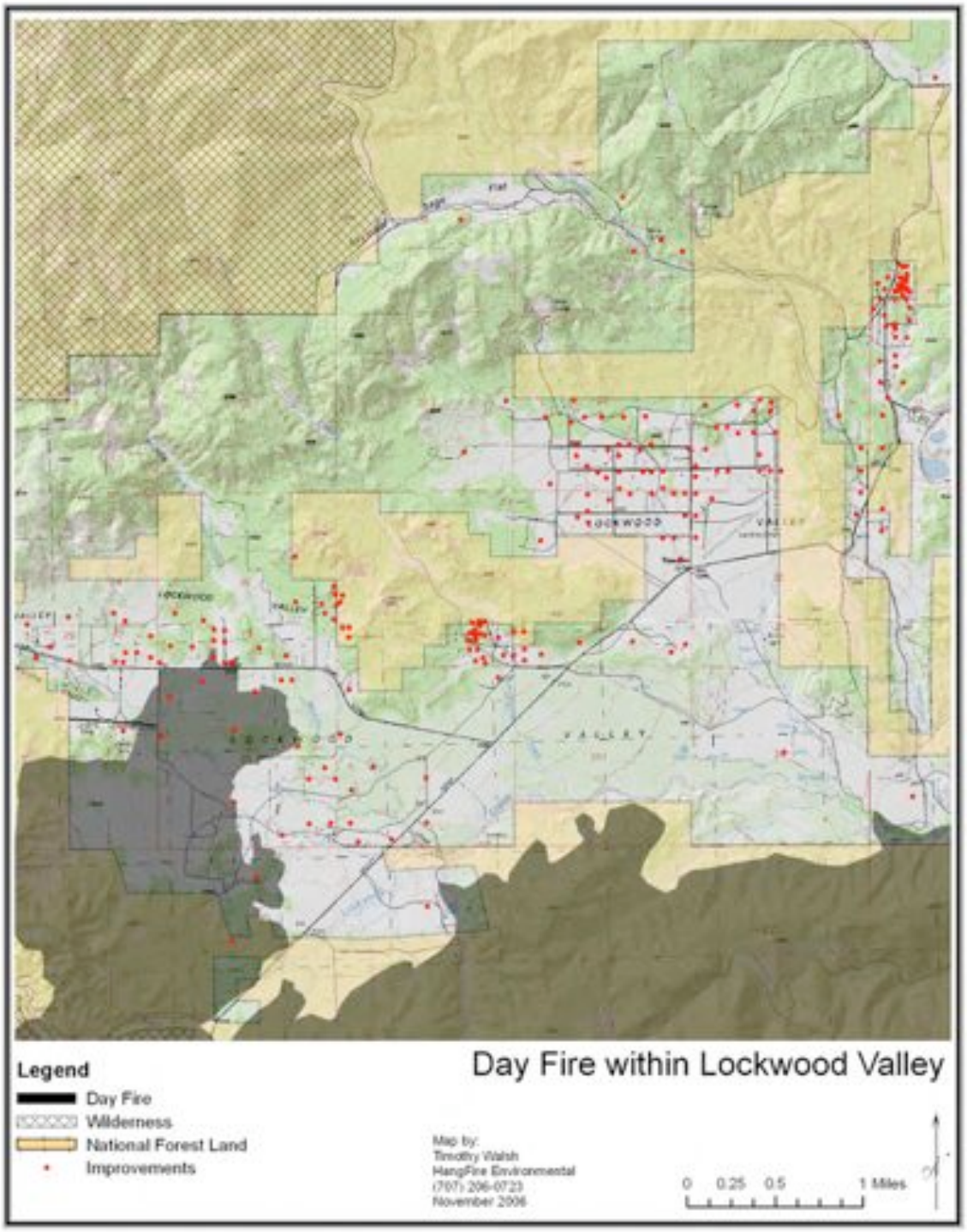
A community that didn't show up in the assessment[23] as a very high wildland fire hazard but certainly has serious concerns is Camp Scheideck. Camp Scheideck is located approximately three miles east of State Highway 33 on Lockwood Valley Road. The community has approximately 20-25 dwellings ranging from single family homes to trailers. The dwellings are located in the bottom of a bowl which is covered in chaparral. Beyond the residences, the road continues to the south to Reyes Creek Campground. The Forest Service's Los Padres Forest, specifically the Sespe Wilderness, borders the community to the south. Non-wilderness land managed by the USFS also borders the community to the east.

The owner of Camp Scheideck has cleared brush from behind the homes but a larger distance is necessary. It is recommended that the 100 feet of defensible space is provided behind the homes (Map 54). A fuelbreak around the community is also recommended to reduce the chances of a wildfire from spreading into the community or into the forest. Some of this work has been performed already. A fuelbreak has been cut through the brush southwest of the community. All of the land within the fuelbreak system is owned by a single private owner or the USFS. The proposed fuelbreak crosses wilderness land It will be up to the respective stakeholders to determine if the project can be implemented.

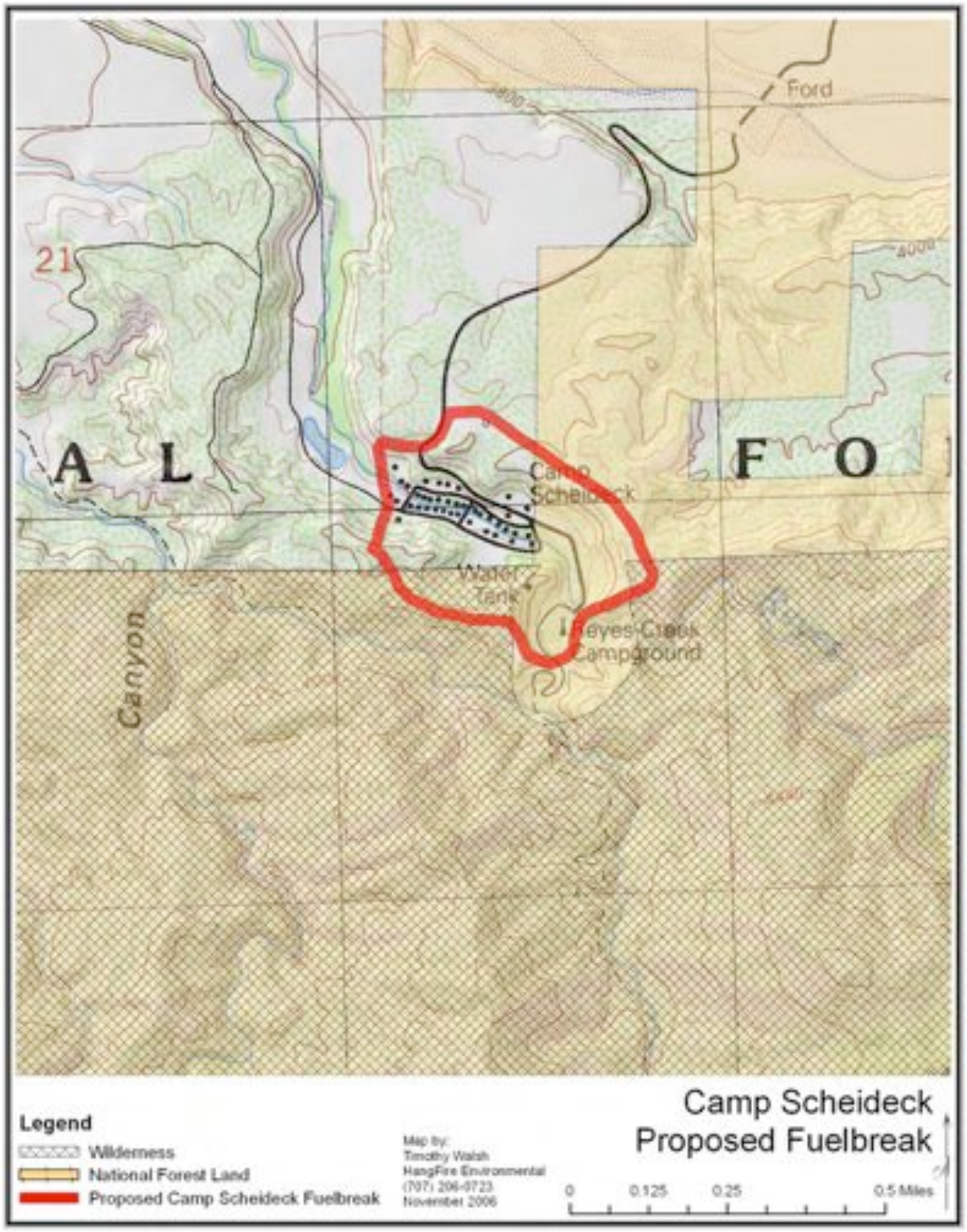
[23] Camp Sheideck did not show up as a high risk area because the parcel map only indicates one dwelling on the parcel versus the 20-25 as indicated by the number of mailboxes.

Figure 54: Looking down into Camp Scheideck indicates that the dwellings are located at the bottom of a bowl along Reyes Creek. There have been some attempts at reducing the threat of a wildfire as seen by the fuelbreak in the lower left of the community.

Figure 55: The fuel reduction performed behind the homes in Camp Scheideck.



Map 53: The Day Fire burned around the entire southern boundary of Lockwood Valley.



Map 54: Camp Scheideck Proposed Fuelbreak

Install Helicopter Dip Tanks

One of the greatest assets found within the Mt. Pinos Communities is the fire fighting helicopter located at USFS Ranger District Office at Chuchupate. This helicopter is much more efficient with water nearby. Dip tanks are tanks that are open on the top and are attached to a large water main for quick filling. During a wildland fire, helicopters hover over the tanks and fill their buckets or tanks with water. Once filled, the water is then dropped on fires assisting with extinguishment.

Figure 56. The metal dip tank that is partially underground used to fill helicopters during a wildland fire. The tank is pumped with a valve attached to a water main for fast filling.

Kern County Fire Department (KCFD) has been instrumental in installing dip tanks throughout the county. The community of Frazier Park has one pond at the county park that may be used for dipping but it would require law enforcement to close the area for safety reasons. Also, during a fire near or in the community, multiple dip sites are advantageous and safer for helicopter operations.

One location sited by KCFD's Pilot Scott Beck for a dip tank was on the north side of Frazier Park. There is a water tank near the fuelbreak that could be plumbed for a dip tank. This location is advantageous because the area has already been defined as an area to stop a fire. The fuel reduction combined with water dropping helicopters could slow or stop a fire prior to significant asset damage. This location would also prevent helicopters from flying over the community and Frazier Mountain Park Road during water dropping operations.

Figure 57. Helicopters are lined up over the dip tank found in Mountain Meadows during the High Fire of 2005.

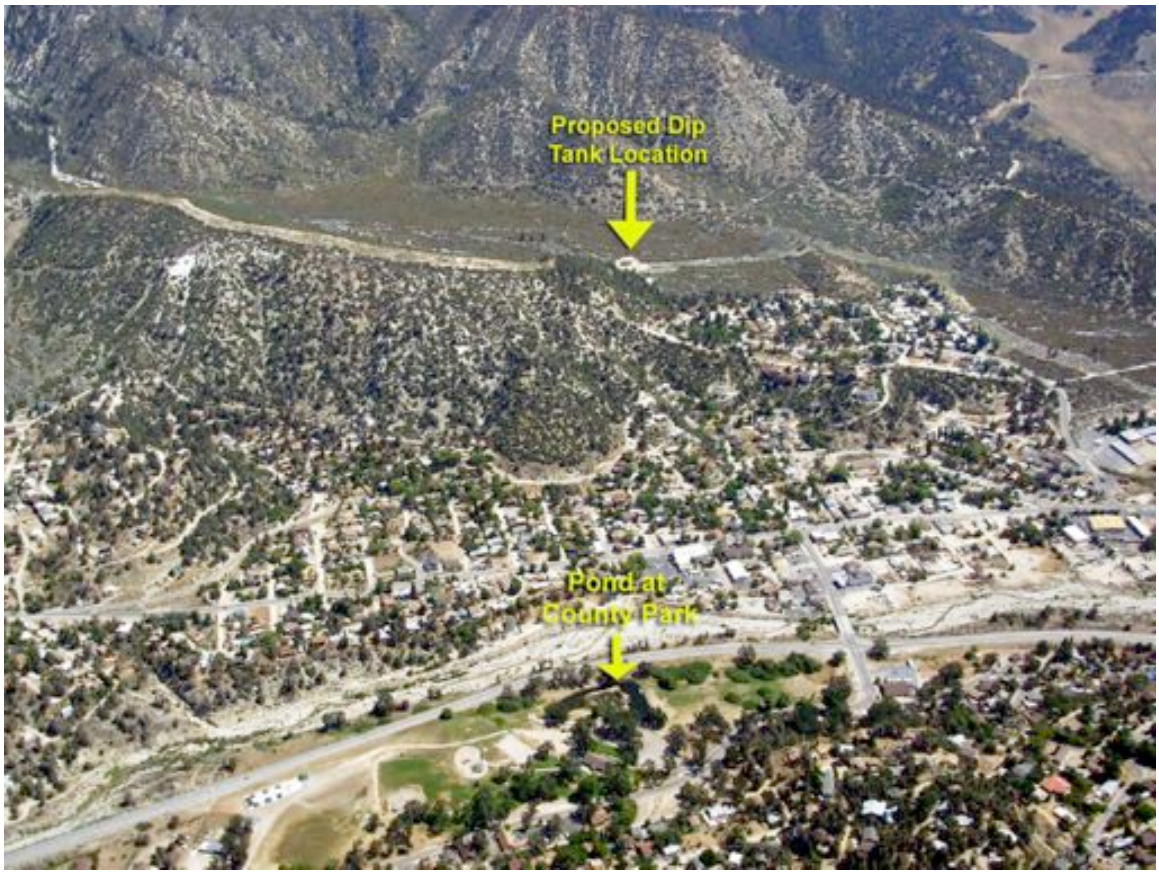


Figure 58: A small pond can be seen in the lower center of the photo. Helicopters would need to fly over the community and hover next to the busiest road in the town to utilize this pond for water during a wildfire. The proposed dip tank site is north of the community next to the water tank.

Fund a Crew within the Mt. Pinos Ranger District

It is recommended that the United Stated Forest Service fund a crew within the Mt. Pinos Ranger District to perform vegetation management and also as a fire suppression resource. Currently, there are crews stationed in Santa Barbara, Ojai, Arroyo Grande, and Fort Hunter Liggett within the Los Padres National Forest. None of these crews can efficiently perform vegetation management within the Mt. Pinos Ranger District.

Kern County has a 12 person handcrew stationed at Lebec that has successfully implemented vegetation management within the fire safe study area. For the Forest Service to implement several of the aforementioned projects, they will need to start a new crew, move a handcrew, or use contractors. The downfall of contractors is that many of them are not qualified to fight fire when the need arises. There are more than enough assets found within or near the district to justify a handcrew. If the 2006 fire season taught us anything, it is that the area will burn!

Project Planning Issues

Several issues can slow or stop a proposed project. One issue that has surfaced in the past is environmental or cultural sensitive areas within the proposed fire safe projects. Environmental sensitive areas are those that have a threatened or listed endangered species. By law, these areas must be protected from further threatening the habitat that supports the species being either flora or fauna. Cultural sensitive areas are those that have been surveyed for artifacts. Most artifacts found are those of Native Americans that inhabited an area.

Environmentally sensitive areas are identified by assessing the California Natural Diversity Database (CNDDB) maintained by the California Department of Fish and Game (CDFG). The CNDDB is a program that inventories the status and locations of rare plants and animals in California. The CDFG tries to keep the CNDDB as current and up-to-date as possible given their capabilities and resources. However, they cannot and do not portray the CNDDB as an exhaustive and comprehensive inventory of all rare species and natural communities statewide. Field verification for the presence or absence of sensitive species is an important obligation.

Detailed planning will be required with all stakeholders prior to project implementation. This approach will identify sensitive issues and hopefully collaborative solutions.

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Before any project is implemented, legal council is recommended to review all planning documents for impacts not included in this plan including CEQA and NEPA compliance. All updates to the plan are the responsibility of the Mt. Pinos Communities Fire Safe Council.

Appendix A Funding Mechanisms

Bureau of Land Management (BLM) Community Assistance

Funds are available to assist with hazardous fuels treatments, community wildfire protection planning and education addressing wildfire safety and hazard risk reduction within the wildland-urban interface (WUI). Treatments should be focused on Federal BLM lands and/or non-Federal lands and aimed toward protecting communities at risk (CAR) and resource values identified within a Community Wildfire Protection Plan (CWPP) and/or Community Fire Plans with an interdisciplinary and interagency collaborative process. Projects designated on Federal BLM lands should be developed in close coordination with the BLM field unit manager.

Grant selections will be prioritized, but not necessarily eliminated, by the following criteria:

- Treatments and outreach and education activities targeting areas identified within a CWPP and/or Community Fire Plans with an interdisciplinary and interagency collaborative process.
  - Treatments protecting a community at risk and collaborated with BLM (combined fuel breaks, etc) or treatments adjacent to BLM land
    - Adjacent means within the WUI adjacent to BLM land or where a wildland fire will threaten BLM land.
    - WUI boundaries and definitions are identified within a CWPP or default to 1.5 miles under the Healthy Forests Restoration Act.
  - Mechanical treatments that make biomass available to help off-set cost or stimulate local economies. (The Goal is for 25% of BLM's mechanical treatments to include biomass).
- Developing a CWPP which focuses on CARs adjacent to BLM land and incorporating BLM projects.
  - Developing a CWPP at a county-wide or watershed level
- Outreach and education activities within areas that are identified in a CWPP, but may not necessarily be outlined within the plan.
- Collaborative CWPPs and/or projects with well-leveraged dollars and aimed at a landscape/watershed level protection and or county-wide projects.

The BLM uses the clearinghouse for planning purposes to select projects for the upcoming federal fiscal year. This means that the project will be funded if adequate funds are made available in the next federal fiscal year (FFY). Federal fiscal years begin Oct. 1. For example, the 2008 federal fiscal year begins Oct. 1, 2007.

Applicants should be able to complete projects within an 18-month grant term. If funded, applicants will be asked to report specific accomplishments, such as acres treated, and provide before, during and after photos. Achieving and

reporting accomplishments is critical to BLM's ability to continue funding this grant program.

Cost share/match: 90/10, which means that the grant can account for 90% of the project's cost. The other 10% of the project's cost must come from non-federal sources, and can include cash and/or third-party in-kind.

It is unclear at this time how much funding will be available during the next FFY.

Total value of projects selected for funding in FFY 2006: $1.5 million.

Average size of grant selected for funding in FFY 2006: $60,000.

Total value of projects selected for funding in FFY 2007: $3.1 million.

Average size of grant selected for funding in FFY 2007: $70,000.

USDA Forest Service Community Protection (CP)

Funds are available to assist with hazardous fuel removal projects on non-Federal land adjacent to Forest Service prescribed burn projects planned within the next three years. Private land projects must reduce hazardous fuel; community fire planning, purchase of vehicles or heavy equipment such as tub grinders and other expensive items will not be funded.

The Forest Service recommends that applicants coordinate design of projects with their local forest.

The Forest Service uses the clearinghouse to select projects for the current federal fiscal year. Applicants should be able to complete projects within an 18-month grant term.

There is no cost-sharing/matching requirement, although match is encouraged.

It is unclear at this time how much funding will be available during this FFY 2007.

Total value of projects selected for funding in FFY 2005: $2.5 million.

Average size of grants in FFY 2005: $78,000.

Total value of projects selected for funding in FFY 2006: $1.2 million

Average size of grants in FFY 2006: $102, 000

USDA Forest Service State Fire Assistance (SFA)
Funds are available for cost share treatments with Fire Safe Councils statewide for both hazardous fuel reduction on state and private land in high-hazard areas and for development of Community Wildfire Protection Plans.

Hazardous fuel reduction can include the purchase of needed supplies and equipment (such as chainsaws, personal protective equipment, chippers, hand tools, etc.).

Information and education projects or purchase of vehicles or heavy equipment such as tub grinders and other expensive assets will not be funded (suggest rental or lease of these items).

It is unclear at this time how much funding will be available during this FFY 2007.

Total value of projects selected for funding in FFY 2005: $890,000

Average size of grants in FFY 2005: $136,000

Total value of projects selected for funding in FFY 2006: $4.2 million.

Average size of grants in FFY 2006: $67,000

U.S. Fish and Wildlife Service (USFWS) Community Assistance/WUI
Funds are available to assist with hazardous fuels treatments, community fire planning and education addressing wildfire safety in the wildland-urban interface (WUI). These funds are to be used on non-Federal lands to better protect lives, communities, and ecosystems from the risk of high-intensity wildland fire. FWS desires collaborative projects within communities which are adjacent to National Wildlife Refuges, and recommends that applicants coordinate project design with their local Refuge fire staffs.

> All projects funded through the USFWS must be identified through collaboration as described in the 10-year Comprehensive Strategy Implementation Plan
> The purchase of real property such as vehicles or heavy equipment (tub grinders, chippers) or other expensive items will not be funded.
> The development of community infrastructure, construction, increasing suppression resources, or enhancing facilities will not be funded.
> Projects identifying new permanent roads or infrastructure and the use of herbicides or pesticides will be eliminated.
> Mechanical treatments should be limited to 1,000 acres in size.
> Projects which are likely to affect federally listed endangered species or critical habitat for those species should be identified in the grant proposal. Refer to http://www.fws.gov/cno/es/default.cfm for the federally listed species within your project area.

Grant selections will be prioritized, but not necessarily eliminated, by the following criteria:

- Treatments, outreach and education activities identified within a CWPP. These treatments must be protecting a community, collaborated with USFWS (combined fuel breaks, etc), and adjacent to USFWS land.
- Developing a CWPP which focuses on communities adjacent to FWS land and incorporating FWS projects. These CWPPs can be at a county-wide or watershed level.
- Treatments, outreach, and education activities not identified within a CWPP but are planned in conjunction with USFWS fire staff which reduce the hazardous fuel within 1 ¨ö mile of a WUI boundary and are adjacent to USFWS lands.
- Treatments which are not within a CWPP, but are within 1 ¨ö mile of a WUI boundary and will improve the habitat for endangered species.

The USFWS uses the clearinghouse for planning purposes to select projects for the upcoming federal fiscal year. This means that the project will be funded if adequate funds are made available in the next federal fiscal year (FFY). It is unclear at this time how much funding will be available during the next FFY.

Applicants should be able to complete projects within an 18-month grant term. If funded, applicants will be asked to report specific accomplishments, such as acres treated, and provide before, during and after photos. Achieving and reporting accomplishments is critical to USFWS's ability to continue funding this grant program.

Total value of projects selected for funding in FFY 2007: $110,000

National Fire Plan Funding For Community Protection in California

In California, agencies have pooled their National Fire Plan funding into a one-stop shop to help simplify the process of finding and applying for grants which improve California 's community wildfire preparedness. This one-stop shop is located on the internet and hosted by the California Fire Safe Council (FSC).

Rural Fire Assistance (RFA)

The Rural Fire Assistance grant program is designed to support the fire protection capabilities of rural and volunteer fire departments that typically fight fires near or on Department of the Interior (DOI) lands. With an annual appropriated budget for the RFA program, the DOI offers awards up to $20,000 to be dedicated to training, equipment purchases, and fire prevention work on a cost-shared basis. DOI lands are administered by one of the following four agencies: Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS).

California RFA Contacts

Agency	Name	Phone	E-Mail
Bureau of Land Management	Jane Arteaga Craig Barnes	916-978-4436 916-978-4433	Jarteaga@ca.blm.gov cbarnes@ca.blm.gov
Bureau of Indian Affairs	Yvonne Jones	916-978-6118	mail364914@pop.net
Fish and Wildlife Service	Bruce Babb	503-231-6234	Bruce_Babb@fws.gov
National Park Service	Bob Appling	360-696-7540	Bob_Appling@nps.gov

State Fire Assistance (SFA)
The State Fire Assistance program assists state forestry agencies in wildfire response coordination and delivery, compliance with the national safety and training standards that ensure state and local crew deployment to federal fires and other emergency situations, hazard assessments, fuels treatment projects, and public education efforts.

California SFA Contacts

Agency	Name	Phone	E-Mail
US Forest Service	Dennis Orbus	916-364-2851	dorbus@fs.fed.us
California Department of Forestry and Fire Protection	Karen Mayer	916-653-6179	Karen.Mayer@fire.ca.gov
California Department of Forestry and Fire Protection	Tom Hoffman	916-653-7472	tom.hoffman@fire.ca.gov

Volunteer Fire Assistance (VFA)
The Volunteer Fire Assistance program, formerly known as the Rural Community Fire Protection program, is administered by state forestry agencies through 50-50 cost-sharing grants to local fire departments in rural communities. The program's main goal is to provide federal financial, technical, and other assistance in the organization, training, and equipping of fire departments in rural areas with a population of 10,000 or less.

California VFA Contacts

Agency	Name	Phone	E-Mail
US Forest Service	Dennis Orbus	916-364-2851	dorbus@fs.fed.us
California Department of Forestry and Fire Protection	Karen Mayer	916-653-6179	Karen.Mayer@fire.ca.gov

California Forest Stewardship Program

Additional information on cost-share and assistance programs for a variety of forestry projects (in addition to fire and fuels reduction) is available in a directory produced by UC Cooperative Extension Forestry. You may access the directory on the California Forest Stewardship Program website or request it by phone from the Forest Stewardship Helpline at 1-800-738-TREE.

Appendix B-Public Resource Code 4291

A person that owns, leases, controls, operates, or maintains 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, shall at all times do all of the following:

(a) Maintain around and adjacent to the building or structure a firebreak made by removing and clearing away, for a distance of not less than 30 feet on each side of the building or structure or to the property line, whichever is nearer, all flammable vegetation or other combustible growth. This subdivision does not apply to single specimens of trees, ornamental shrubbery, or similar plants that are used as ground cover, if they do not form a means of rapidly transmitting fire from the native growth to any building or structure.

(b) Maintain around and adjacent to the building or structure additional fire protection or firebreak made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from the building or structure or to the property line or at a greater distance if required by state law, or local ordinance, rule, or regulation. This section does not prevent an insurance company that insures a building or structure from requiring the owner of the building or structure to maintain a firebreak of more than 100 feet around the building or structure. Grass and other vegetation located more than 30 feet from the building or structure and less than 18 inches in height above the ground may be maintained where necessary to stabilize the soil and prevent erosion.

(c) Remove that portion of any tree that extends within 10 feet of the outlet of a chimney or stovepipe.

(d) Maintain any tree adjacent to or overhanging a building free of dead or dying wood.

(e) Maintain the roof of a structure free of leaves, needles, or other dead vegetative growth.

(f) Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to a fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

(g) Prior to constructing a new building or structure or rebuilding a building or structure damaged by a fire in such an area, the construction or rebuilding of which requires a building permit, the owner shall obtain a certification from the local building official that the dwelling or structure, as proposed to be built, complies with all applicable state and local building standards, including those described in subdivision (b) of Section 51189 of the Government Code, and shall provide a copy of the certification, upon request, to the insurer providing course of construction insurance coverage for the building or structure. Upon completion of the construction or rebuilding, the owner shall obtain from the local building official, a copy of the final inspection report that demonstrates that the dwelling or structure was constructed in compliance with all applicable state and local building standards, including those described in subdivision (b) of Section 51189 of the Government Code, and shall provide a copy of the report, upon

request, to the property insurance carrier that insures the dwelling or structure.

(h) Except as provided in Section 18930 of the Health and Safety Code, the director may adopt regulations exempting structures with exteriors constructed entirely of nonflammable materials, or conditioned upon the contents and composition of same, he or she may vary the requirements respecting the removing or clearing away of flammable vegetation or other combustible growth with respect to the area surrounding those structures.

No exemption or variance shall apply unless and until the occupant thereof, or if there is not an occupant, the owner thereof, files with the department, in a form as the director shall prescribe, a written consent to the inspection of the interior and contents of the structure to ascertain whether this section and the regulations adopted under this section are complied with at all times.

(i) The director may authorize the removal of vegetation that is not consistent with the standards of this section. The director may prescribe a procedure for the removal of that vegetation and make the expense a lien upon the building, structure, or grounds, in the same manner that is applicable to a legislative body under Section 51186 of the Government Code.

(j) As used in this section, "person" means a private individual, organization, partnership, limited liability company, or corporation.

4291.1. (a) Notwithstanding Section 4021, a violation of Section 4291 is an infraction punishable by a fine of not less than one hundred dollars ($100), nor more than five hundred dollars ($500). If a person is convicted of a second violation of Section 4291 within five years, that person shall be punished by a fine of not less than two hundred fifty dollars ($250), nor more than five hundred dollars ($500). If a person is convicted of a third violation of Section 4291 within five years, that person is guilty of a misdemeanor and shall be punished by a fine of not less than five hundred dollars ($500). If a person is convicted of a third violation of Section 4291 within five years, the department may perform or contract for the performance of work necessary to comply with Section 4291 and may bill the person convicted for the costs incurred, in which case the person convicted, upon payment of those costs, shall not be required to pay the fine. If a person convicted of a violation of Section 4291 is granted probation, the court shall impose as a term or condition of probation, in addition to any other term or condition of probation, that the person pay at least the minimum fine prescribed in this section.

(b) If a person convicted of a violation of Section 4291 produces in court verification prior to imposition of a fine by the court, that the condition resulting in the citation no longer exists, the court may reduce the fine imposed for the violation of Section 4291 to fifty dollars ($50).

Appendix C-Plan Updates

This section of the Plan is provided for future updates. As projects are completed, or new projects are added, they should be documented in this section. Annually the Mt. Pinos Communities Fire Safe Council should reevaluate the plan to note accomplishments and to make sure that the proposed projects are still relevant. As development continues, other areas could become a higher priority for vegetation management. Also, a large unforeseen fire could provide an area of treated fuels changing the scope of this plan.

PROJECT NAME	DATE	REMARKS

Frazier Park Vegetation Management Plan

Project Name	Project Number	Location & Size	Type of Treatment	Agency	Priority Level	Structure Protected	Implementation Date
Frazier Park Community fuel break	FP-1	Community Fuel break around the North and South sides of the community	Hand cut and chip/ Pile Burning	KRN/ FSC/ USFS	H	Yes	Project was started in 2004 and was completed in 2006
Teycua Ridge Fuel Break	FP-2	Ridgeline fuel break that follows the ridgeline above Frazier Park-Pine Mountain 300 ft wide for 12 miles unknown	Mastication (ASV) Dozer crush pile and burn /Hand cut and chip/ Pile Burning	KRN/ FSC/ USFS	H	Yes	Outyear should be established in 5 years

KRN- Kern County Fire

FP- Frazier Park

FSC- Fire Safe Council
ASV- All Surface Vehicle
FS-Forest Service

Cuddy Valley Vegetation Management Plan

Project Name	Project Number	Location & Size	Type of Treatment	Agency	Priority Level	Structure Protected	Implementation Date
Cuddy Valley Road Brushing	CV-1	Road Brushing project 7.5 miles 30 ac.	Hand cut and chip. ASV	KRN/ FSC	H	Yes	Outyear should be established in 5 years
Organizational Camp defensible space	CV-2	Community chipper project to include a Camp to Camp chipper project to encourage and assist homeowners with adequate defensible space	Chipping of hazardous vegetation from in and around the organizational camps	KRN/ FSC	H	Yes	Outyear should be established in 5 years

KRN- Kern County Fire
CV- Cuddy Valley
FSC- Fire Safe Council
ASV- All Surface Vehicle

Pinon Pines Vegetation Management Plan

Project Name	Project Number	Location & Size	Type of Treatment	Agency	Priority Level	Structure Protected	Implementation Date
Pinon Pines Community Fuel Break	PI-1	Around the community of Pinon Pines. 32 ac	Hand cut and chip/Pile Burning	KRN/ FSC	H	Yes	Established in 2006
Pinon Pines Community Fuel Break Extension	PI-2	Around the community of Pinon Pines. 27 ac	Hand cut and chip/Pile Burning	KRN/ FSC	H	Yes	2010 Project
Pinon Pines Fuel reduction project	PI-3	Community chipper project to include a house to house chipper project to encourage and assist homeowners with adequate defensible space	Chipping of hazardous vegetation from in and around the community	KRN/ FSC	H	Yes	This project should be an ongoing event through out the year to reduce the vegetation build up in the community

KRN- Kern County Fire

PI- Pinon Pines

FSC- Fire Safe Council

ASV- All Surface Vehicle

Lake of the Woods Vegetation Management Plan

Project Name	Project Number	Location & Size	Type of Treatment	Agency	Priority Level	Structure Protected	Implementation Date
Lake of the Woods Community Fuel Break	LOW-1	Community defensible fuel break around the community 35ac	Hand cut and chip. ASV	KRN/ FSC/ FS	H	Yes	2008
Lake of the Woods Community Fuel reduction	LOW-2	Community chipper project to include a House to House chipper project to encourage and assist homeowners with adequate defensible space	Chipping of hazardous vegetation from in and around the organizational camps	KRN/ FSC	H	Yes	Outyear should be established in 5 years

KRN- Kern County Fire

LOW- Lake of the Woods

FSC- Fire Safe Council

ASV- All Surface Vehicle

FS-Forest Service

Pine Mtn Club Vegetation Management Plan

Project Name	Project Number	Location & Size	Type of Treatment	Agency	Priority Level	Structure Protected	Implementation Date
PMC open space common areas	PM-1	Fuels Reduction Work in and around the community in the non developed lands	Grazing with Goats Mechanical (ASV) Hand Thinning	PMC	M	Yes	It is suggested that it be implemented as soon as possible within 5 years.
PMC Escape Route	PM-2	Roadside fuel reduction along Mil Potrero Hwy. To provide residents and emergency equipment safe access and egress to the community. It is the primary road in and out of the community. 5 miles 50' feet of treatment on both sides of the road	Hand (cut and chip) Mechanical (ASV)	KRN/ PMC	H	Yes	2011
San Emigido Fuels Reduction	PM-3	Fuels reduction project in and around the San Emigido drainage where it intersects with Mil Potrero Hwy. Total project is 66 ac. Split into 2 phases	Fuels reduction work Chainsaw cut and chip Mastication (ASV) Grazing utilizing Goats	KRN/ PMC/ FSC	H	Yes	It is suggested that project be implemented within 5 years
Camp Condor Escape Route & Ridge line Fuel Break	PM-4	Roadside fuel reduction work and the re-establishment of the old ridgeline fuelbreak	Mastication (ASV) Handwork (cut & Chip)	KRN/ Kern County Parks / FSC	H	Yes	Project is complete

Continued							
Project Name	**Project Number**	**Location & Size**	**Type of Treatment**	**Agency**	**Priority Level**	**Structure Protected**	**Implementation Date**
PMC Chipper Project	PM-5	Community chipper project to include a house to house chipper project to encourage and assist homeowners with adequate defensible space	Chipping of hazardous vegetation from in and around the community	PMC/ KRN /FSC	H	Yes	This project should be an ongoing event through out the year to reduce the vegetation build up in the community
Pine Mtn. Club Timber Harvest Plan	PM-6	Develop a strategic plan to properly manage the forested lands within Pine Mountain Club and reduce fuel loading and increase forest health	Commercial Logging	PMC	H	Yes	Should be implemented within a 5-10 year time frame
PMC Ridgeline Fuel Breaks	PM-7	Ridgeline Fuel Breaks on all the ridges through out the community A 40 B 32 C 44 D 18 E 31 F 29	Hand (cut and chip) Mechanical (ASV)	PMC/ KRN/ FSC	H	Yes	Planned to start in the 2010 and should continue within a 10-15 year time frame. With priority being establishment on the west and east ends of the community

KRN- Kern County Fire

PMC- Pine Mountain Club

FSC- Fire Safe Council

THP - Timber Harvest Plan

ASV- All Surface Vehicle

Lebec Vegetation Management Plan

Project Name	Project Number	Location & Size	Type of Treatment	Agency	Priority Level	Structure Protected	Implementation Date
Diegier Canyon Escape Route	LE-1	Road Brushing project 2.5 miles along Diegier Canyon Rd. 15ac	Hand cut and chip	KRN/ FSC	H	Yes	Project is proposed for 2011
Lebec Oaks Community Fuel Break	LE-2	Community fuelbreak around Lebec Oaks 27 ac	Hand cut and chip	KRN/ FSC	H	Yes	Outyear should be established in 5 years
LP Estates Escape route	LE-3	Road brushing in the community of LP Estates	Fuels reduction work Chainsaw cut and chip	KRN/ FSC	H	Yes	Outyear should be established in 5 years

KRN- Kern County Fire

LE- Lebec

FSC- Fire Safe Council

ASV- All Surface Vehicle