

Firewise Communities / USA  
Community Assessment for the  
Plumas Eureka Estates Community



Photo 1-Plumas Eureka Estates and the Plumas Pines Golf Course

Plumas County, California

Summer 2015



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## **Forward**

Residents of the Plumas Eureka Estates community are concerned about the threat of wildfire to their community. They are working with local resources to become more fire safe so that when a wildfire occurs in their neighborhood they will be more prepared. Plumas Eureka Estates is a planned community located near the communities of Johnsville and Graeagle in southeastern Plumas County.

The community was developed in a forested area, the developers cleared large areas of the forest to create the golf course, building pads and the road system. In the areas where the ground was disturbed during the development of the community, there are now dense stands of conifer seedlings, there are numerous undeveloped lots and undeveloped forestland that surrounds the community making Plumas Eureka Estates a textbook example of the Wildland Urban Interface (WUI).

The potential for catastrophic wildland fire in the Plumas Eureka Estates is high; dense stands of conifers and brush are wide-spread, there are numerous homes that are built in the WUI. Many efforts have been made over the years to reduce hazards on both the residential scale as well as the landscape scale.

## **1. Introduction**

The Firewise Communities/USA program is designed to provide an effective management approach for preserving wildland living aesthetics. The program can be tailored for adoption by any community and/or neighborhood association that is committed to ensuring its citizens maximum protection from wildland fire. The following community assessment is intended as a resource to be used by residents of the Plumas Eureka Estates community in order to create a wildfire safety action plan. The plan developed from the information in this assessment should be implemented in a collaborative manner, and updated and modified annually or as needed.

Principal participants who assisted in the preparation of this assessment are:

### **Plumas Eureka Fire Department**

- Tom Forster, Fire Chief

### **Plumas County Office of Emergency Services**

- Sue McCourt, Fire Prevention Specialist

### **Plumas Eureka Estates Residents**

- Dave and Shirley Bauer
- Dave Stone
- Frank Shepard
- John Rowden

### **Plumas Pines Golf Course**

- Mark Callahan, Superintendent

### **Plumas County Fire Safe Council**

- Nils Lunder

### **CAL FIRE**

- Shane Vargas, Fire Prevention Captain
- Al Klem, Plumas County Area Forester

## **2. Definition of the Home Ignition Zone**

Plumas Eureka Estates is located in a wildfire environment. Wildfires will happen; fire exclusion is not an option, lightning accounts for many of the ignitions in the region as do human caused ignitions. The existing variables regarding wildfire are (a) where the wildfire will occur, (b) when it will occur, and (c) what the relevant conditions will be at that time. It is this last variable that homeowners can influence, and influence very strongly, by their actions before fire appears.

A house burns because of its relationship with its immediate surroundings, an area called the home ignition zone (HIZ). To avoid a home ignition, nearby fuels must be reduced or interrupted and combustible materials found on or around the home must be protected or eliminated. Homeowners do have the ability to significantly impact their home ignition zone in either a positive or negative manner. Relatively simple actions by the landowner will have a positive impact; inattention, procrastination or denial will have the opposite effect.

This assessment addresses the wildfire-related characteristics of the overall Plumas Eureka Estates Community. The assessment primarily examines the community's exposure to wildfire as it relates to ignition potential. The assessment does not focus on specific homes, but rather on the community as a whole. In doing so, it deals with widely applicable techniques of fuel interruption that alter or eliminate the natural path that a fire might take. Changing a fuel pathway is a relatively easy-to-accomplish task that homeowners can do, and one that can prevent a tragic structure loss. This is basically a strategy of separating combustible materials from the structure and reducing the volume of vegetation near structures to reduce fire intensity.

The assessment is based on community observations made during the spring of 2015. It addresses the relative ease or difficulty with which home ignitions could occur under severe wildfire conditions, and how those ignitions might be avoided with prudent preventative action. Plumas Eureka Estates residents can reduce their risk of home destruction during a wildfire by taking a few important steps within the home ignition zone, which includes the structure itself and an area extending outward about 100 to 200 feet, see figure 1 below.



Figure 1-Home Ignition Zone Diagram

By addressing community vulnerabilities in advance, residents will be able to substantially reduce their exposure to loss. Relatively small investments of time and effort will reap large rewards in wildfire safety.

While each home ignition zone is an independent entity that is managed by the owner of the individual property, the combined home ignition zones in a development can form either an invitation or a barrier to wildfire. This is further complicated by overlapping home ignition zones found on some Plumas Eureka Estates lots that results from relatively close proximity to neighboring structures. Embers produced by burning vegetation or structures on one lot can easily drift onto adjacent lots, and these can lead to new ignitions and spot fires.

Because of the high density of lots in the community, the development of a collective awareness regarding fuel reduction is as important as the need for individual property owners to protect their homes. It is critical to recognize that in the event of a major fire emergency, there simply will not be enough fire suppression resources to protect all, or even a majority of the homes in the area. Home survivability often comes down to the extent of fuel reduction work that was accomplished within the home ignition zone by either homeowners or their contractors before a fire starts.

### **3. Wildland fire characteristics that could threaten the Plumas Eureka Estates area**

Firefighters generally categorize fires into several basic types. Among those are wildland fires and structure fires; both of these are relevant to this assessment. A wildland fire is any non-structure fire that occurs in vegetation or natural fuels, while a structure fire primarily burns structural materials and building contents. These two fire types converge in the wildland-urban interface (WUI).

Fire intensity and the rate of spread depend on the fuel type and condition (live/dead), the weather conditions prior and during ignition, and the topography of that particular area. Generally the following relationships hold between the fire behavior and the fuel, weather and topography.

- Fine fuels ignite more easily and spread faster with higher intensities than coarser fuels. For any fuel type, the more fuel there is and the more continuous it is, the faster the fire spreads and the higher the fire intensity. Fine fuels take a shorter time to burn out than coarser fuels. Fine fuels have the most important impact on fire intensity as measured by flame lengths. Fine fuels are considered the primary carrier of fire in fire modeling.
- Weather conditions affect the moisture content of the dead and live vegetative fuels. Dead fine fuel moisture content is highly dependent on the relative humidity and the degree of sun exposure. The lower the relative humidity and the greater the sun exposure, the lower the fuel moisture content. Lower fuel moisture produces higher rates of spread and increased fire intensities.
- Wind speed significantly influences the rate of fire spread and fire intensity. The higher the wind speed, the greater the rate of spread and intensity.
- Topography greatly influences fire behavior. The aspect; or the given direction of exposure of the terrain has a strong relationship to fuel moisture. In addition to aspect, the configuration of the terrain such as narrow draws, saddles and other topographic features can influence fire spread and intensity. In general, south and southwest aspects tend to be warmer and drier. The steeper the slope, the quicker the fire spread upslope and intensify.



Embers or firebrands are produced from burning needles, leaves, bark, twigs and cones, when natural vegetation burns. Embers tend to be carried aloft by the superheated air of the fire and can then be carried long distances in advance of the actual flame front by even light winds. It is not uncommon to find glowing embers a mile ahead of the main fire.



Figure 2-Flying embers cause fires

If the conditions are right, thousands of embers can be produced in a relatively short time by even a modest wildland blaze. These tend to fly like incendiary snowflakes, eventually settling to the surface and even “drifting” to form small clumps. If they land on a combustible material, they can cause a new ignition even though the main fire is still a long distance away. This is the way that “spot fires” are ignited. This is also the primary threat to residences.

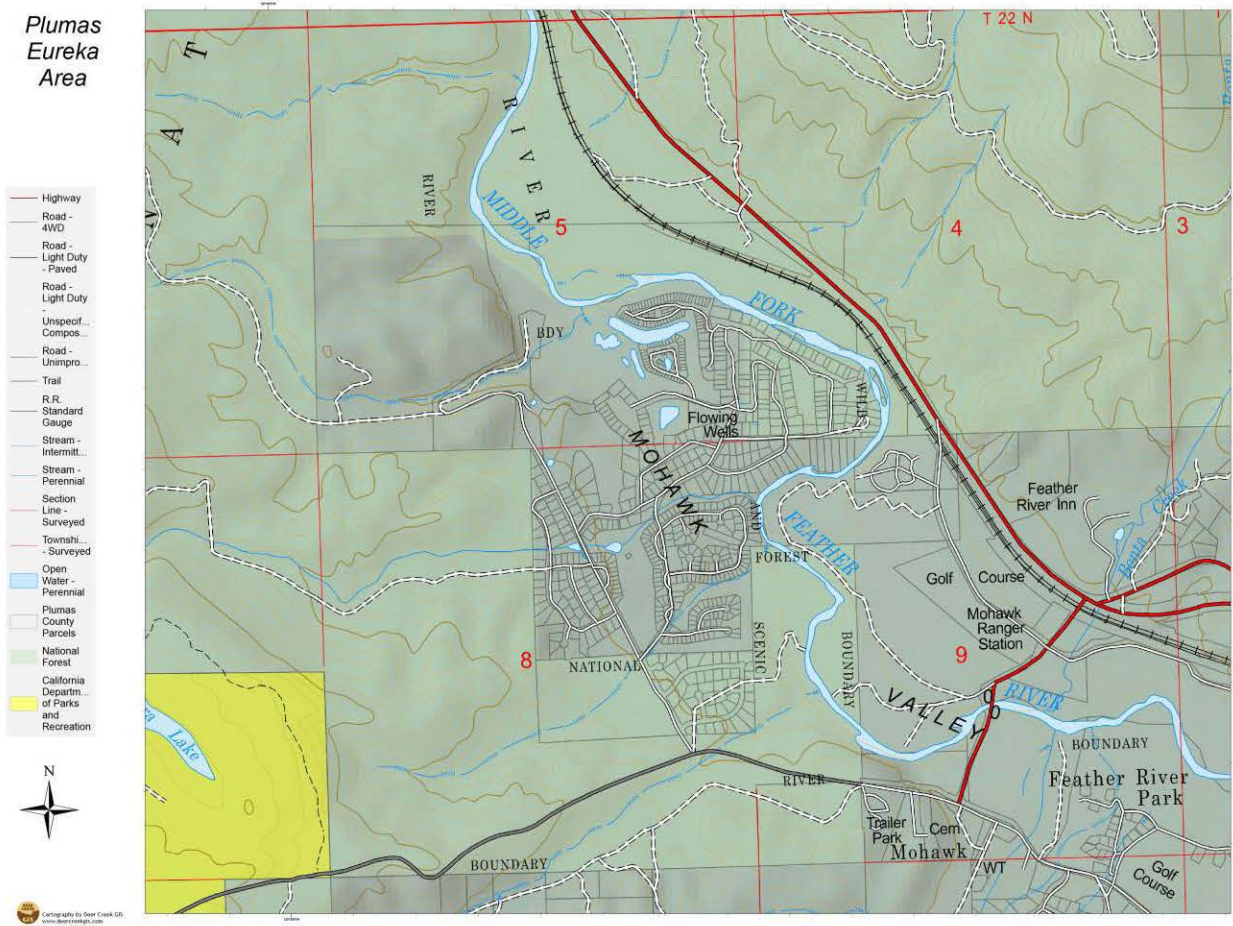
Fire modeling accomplished as part of the 2004 *Plumas County Hazardous Fuel Assessment and Strategy* indicated that fire behavior in the community and adjacent timber would be conducive to passive and active crown fire with some surface fire. Torching trees both increase fire intensity and become excellent generators of embers for spotting. Preventative actions taken on any treated properties in the area will reduce the potential intensity and ember production of an approaching fire. The community can still anticipate a severe “ember attack” during a wildland fire event in untreated stands both adjacent and within the community.

Plumas Eureka Estates is located within the Plumas Eureka Community Service District. The Plumas-Eureka Fire Department was formally established in 1981 to provide local fire protection to its residents. If a structure fire occurs within Plumas Eureka Estates, the Plumas Eureka Fire Department would respond immediately with additional support from the Graeagle Fire Department. In regards to wildland fires, Plumas Eureka Estates lies within what is referred to as a State Responsibility Areas (SRA). In SRA areas, wildland fire response is the primary responsibility of CAL FIRE. The U.S. Forest Service is responsible for wildland fires on the SRA land in this part of Plumas County under the CFMA Land Swap Agreement. The Plumas Eureka Fire District has agreements with the U.S. Forest Service to assist in the protection of these SRA lands. The U.S. Forest Service would be the lead agency for wildland fires in Plumas Eureka Estates.

*For purposes of this assessment, there are two viable scenarios for a severe wildland fire event, a) would be a major blaze in untreated forestlands west of the Plumas Eureka Estates community producing large quantities of windblown embers, and b) a lightning strike without precipitation and the rapid onset of downdrafts. Subsequent spot fires, torching trees or burning structures in the interiors of the development could produce additional quantities of embers, contributing to further ignition potential and suppression difficulty.*

## 4. Site Description

This portion of the report describes certain elements of the community of Plumas Eureka Estates as it relates to fire issues.



Map 1-Regional map of the Plumas Eureka Estates area

Plumas Eureka Estates is located in southeastern Plumas County near the communities of Graeagle and Portola; the community is a subdivision that covers approximately four square miles and has 500 homes and 675 lots. Reno is approximately 75 minutes to the southeast and Truckee is approximately 70 minutes to the south. County Road A-14, also known as the Johnsville Road passes just south of the community and State Route 70 is approximately 1 mile north of the community.

### 4.1 Demographics

The 2010 United States Census reported that Plumas Eureka had a population of 339 living in 167

households. The population density was 85.2 people per square mile (32.9/km<sup>2</sup>). There were 523 housing units at an average density of 131.4 per square mile (50.7/km<sup>2</sup>), of which 136 (81.4%) were owner-occupied, and 31 (18.6%) were occupied by renters. The homeowner vacancy rate was 13.8%; the rental vacancy rate was 50.0%. 267 people (78.8% of the population) lived in owner-occupied housing units and 72 people (21.2%) lived in rental housing units.

## **4.2 Topography and Vegetation**

Plumas Eureka Estates is situated within a canyon that was carved by the Middle Fork Feather River. Much of the land on which the community was built lies on relatively level to gently sloping ground. The lowest gradient areas within the community are where the golf course has been built. The golf course creates an irrigated, internal fuel break for the community. There are densely forested lands around the development, some of the smaller properties are owned by individuals, the majority of land surrounding the community are large pieces of Federal lands that are managed by the United States Forest Service, the State of California owns land near the community as well (Please see Map 2 on Page 18).

The community receives diurnal winds associated with the movement of air currents along the canyon of the Middle Fork Feather River, these winds commonly blow from the north to northwest during the day and then reverse and blow from the south to southeast in the evenings. These daily wind currents suggest that the most likely spread of a wildland fire would be from the south or west to the north or northeast. Historically, Plumas County has had a high incidence of lightning fires. Ignitions from a lightning fire can spread in any direction under the influence of downdrafts during thunderstorms.



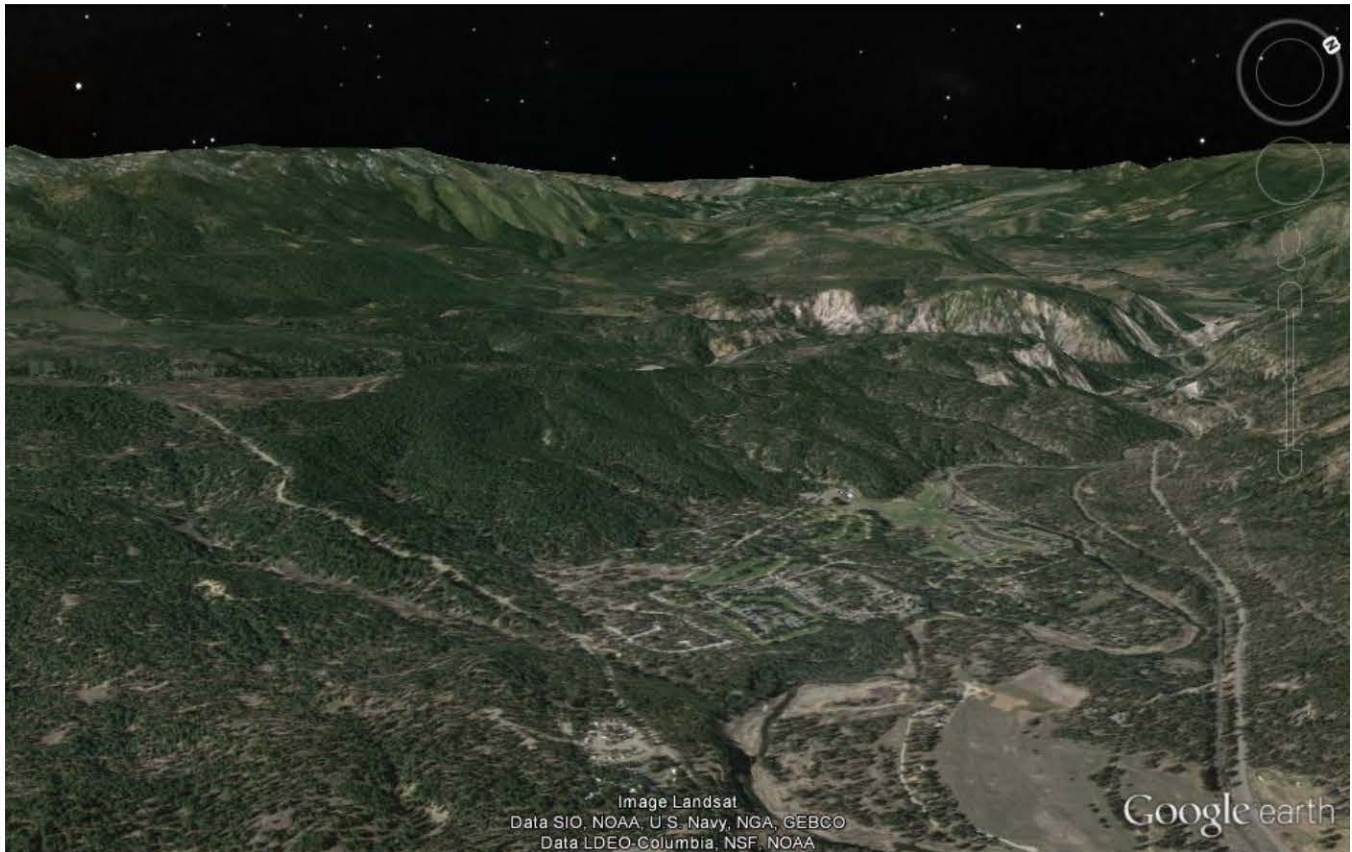


Figure 3-Aerial View of Plumas Eureka Estates

The vegetation on properties surrounding Plumas Eureka Estates is typical of conifer dominated forests of the Sierra Nevada/Cascade region of northeastern California. These forests are host to Jeffery, Ponderosa and Sugar Pine, Incense Cedar, Douglas Fir and White Fir. Many of the forest lands surrounding the community could use some level of fuels reduction work. The main areas of concern include the forest lands along the river corridor; the forest in the Madora Creek watershed and the private land that lies west of the driving range near the river.

Within the community there are a variety of trees. Some of the conifers are well spaced and pose a very low risk of a fire traveling from crown to crown. However, throughout the community many trees are in need of thinning from below in order to improve the vertical separation from surface fuels; these areas are mostly where small trees have grown closely together. These areas require hand thinning in order to increase the horizontal separation between neighboring trees.



Without this work, a ground fire has the potential to enter the forest canopy and cause the fire to increase its rate of spread and ember generation. Please see the vertical and horizontal clearance diagrams below for a visual sense of the desired separation between plant specimens.

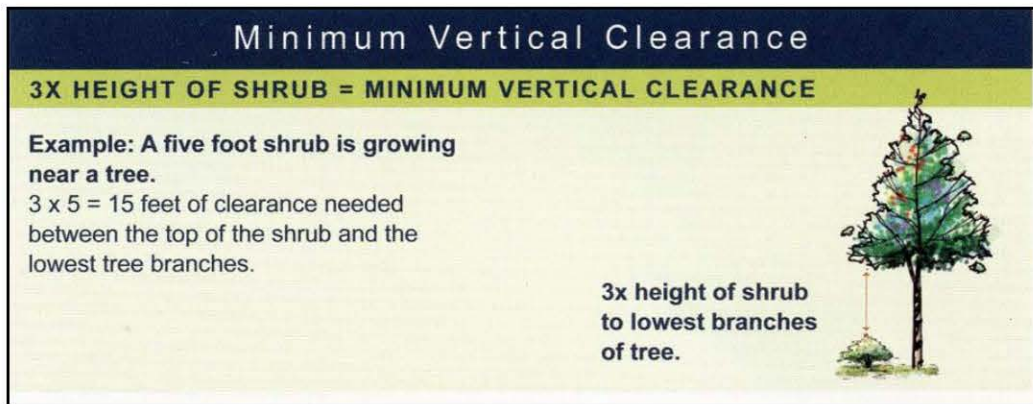


Figure 4-Vertical Clearance information

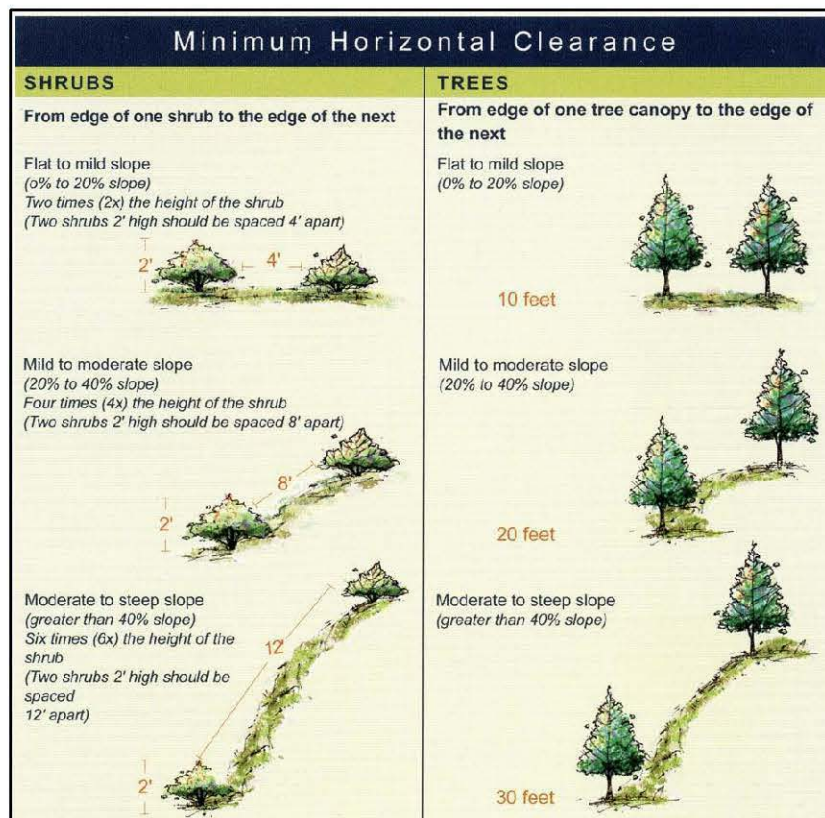


Figure 5-Horizontal Separation information



Photo 2-Thinning forest stands will increase horizontal separation will reduce fuel continuity

### 4.3 Wildfire History

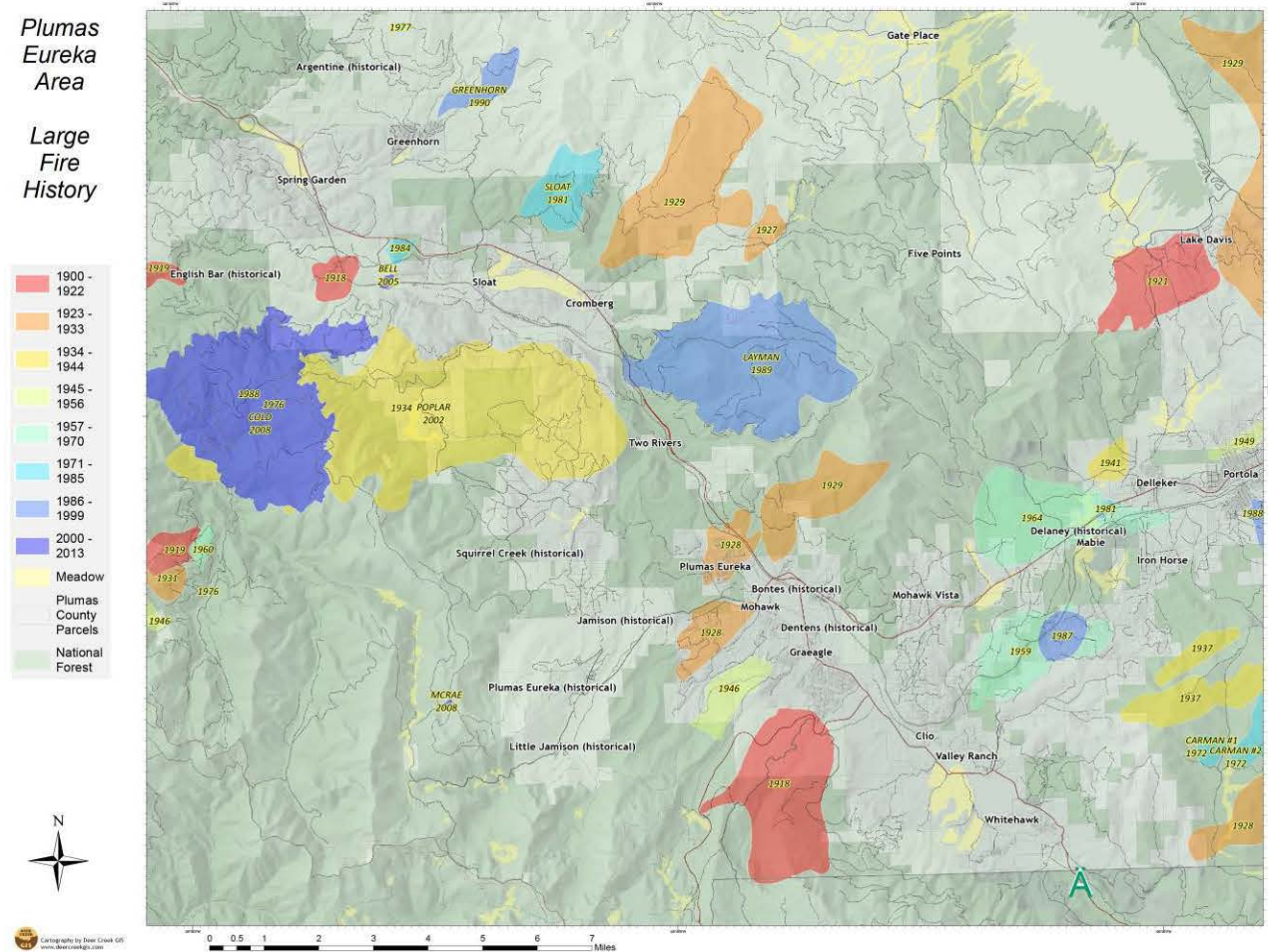
Fires in the area were more frequent prior to European settlement resulting in more open stands of mature trees. Historically, fires burned through the area every 11-15 years, clearing low growing brush and vegetation, consuming forest litter, dead trees and thinning out seedlings. Today, past forest practices and fire suppression on wildland fires have resulted in more overgrown forests.

Regionally, wildland fires occur between May and October although during dry years it is not uncommon for fires to occur as early as March and as late as November. Wildland fires are not a new threat to the Plumas Eureka Estates community, numerous fires have occurred in the area including large fires in 1928, 1929, 1934, 1946, 1954, 1976, 1988, 2002, 2008.



## Plumas Eureka Area

## Large Fire History

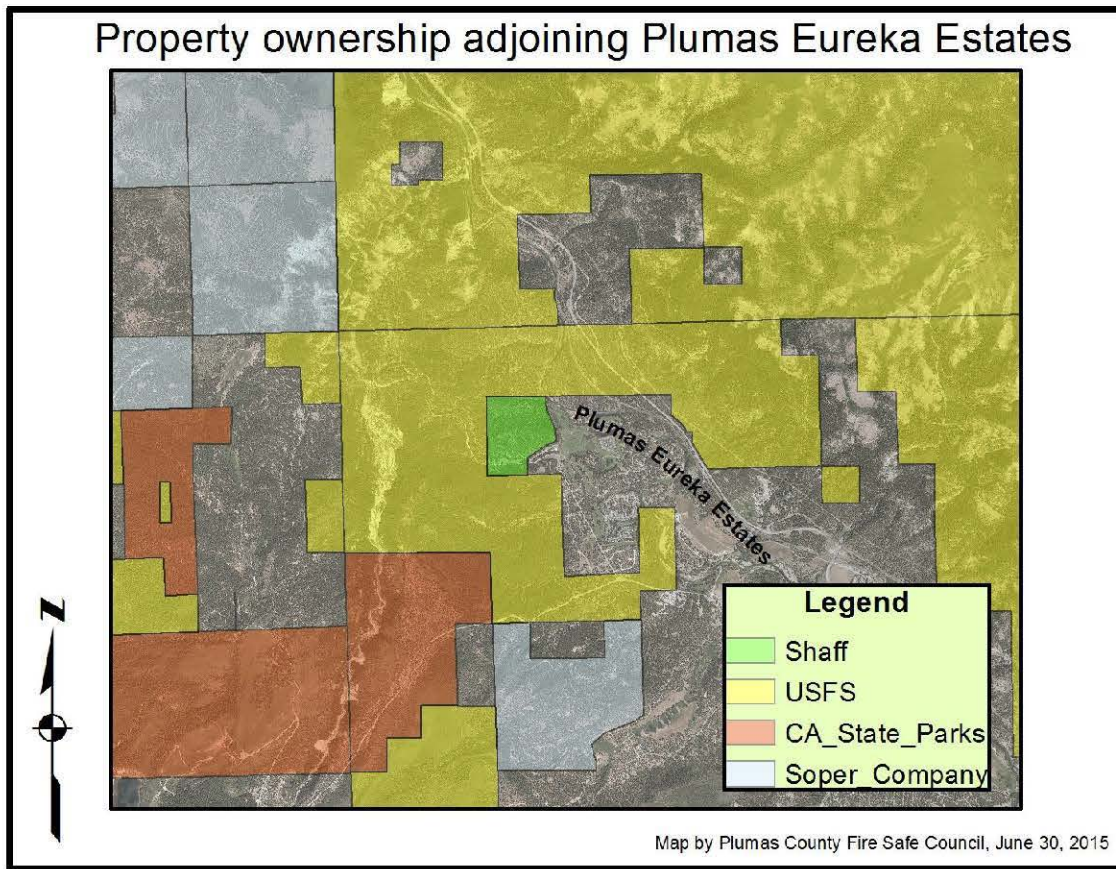


Map 2-Fire History of the Plumas Eureka area

### 4.4 Local Fuels Reduction Efforts

The community is surrounded by both private and public forest lands, many of which consist of dense, over-crowded vegetation. Many of these forests are over stocked with conifer trees and have been adversely affected by the absence of wildfire over the past 100 years. If wildfire were to occur on many of these forested lands at this time they would be prone to rapid spread.

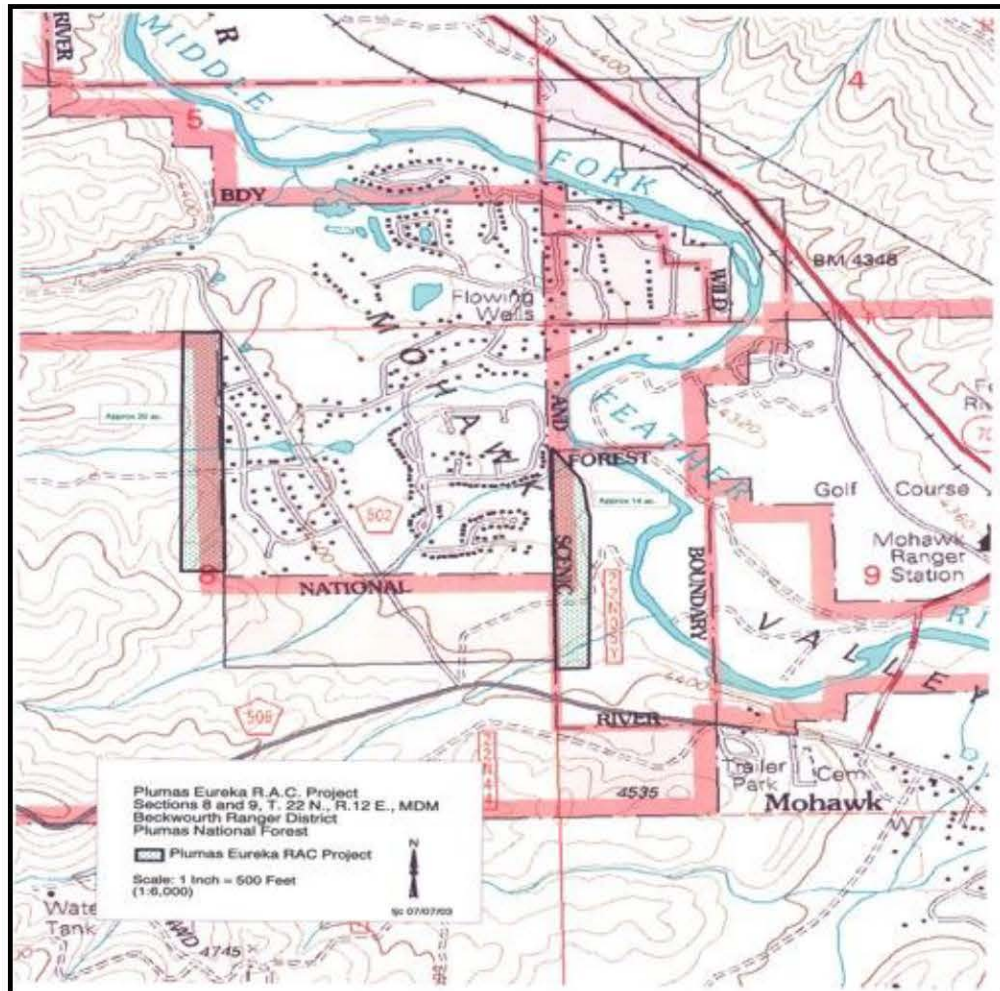
Torching and crown fires would likely occur due to the fuel that has been allowed to accumulate over time. Such an event would provide considerable potential for home ignition due to flying embers and debris.



**Map 3-Large properties adjacent to the Plumas Eureka community**

Fuel treatments on adjacent private and public lands have and will continue to occur. The Plumas County Fire Safe Council worked to develop and implement a fuels reduction project along the west side of the Plumas Eureka Estates community in 2003-2004. That project came about because the community approached the Council for assistance in working with the USFS to thin forest fuels on public lands adjacent to the community. The result of this project was the treatment of approximately 50 acres of public lands; the treatment included the removal of small trees (<9" diameter at breast height), brush and dead vegetation around the community (see Map 4 below).





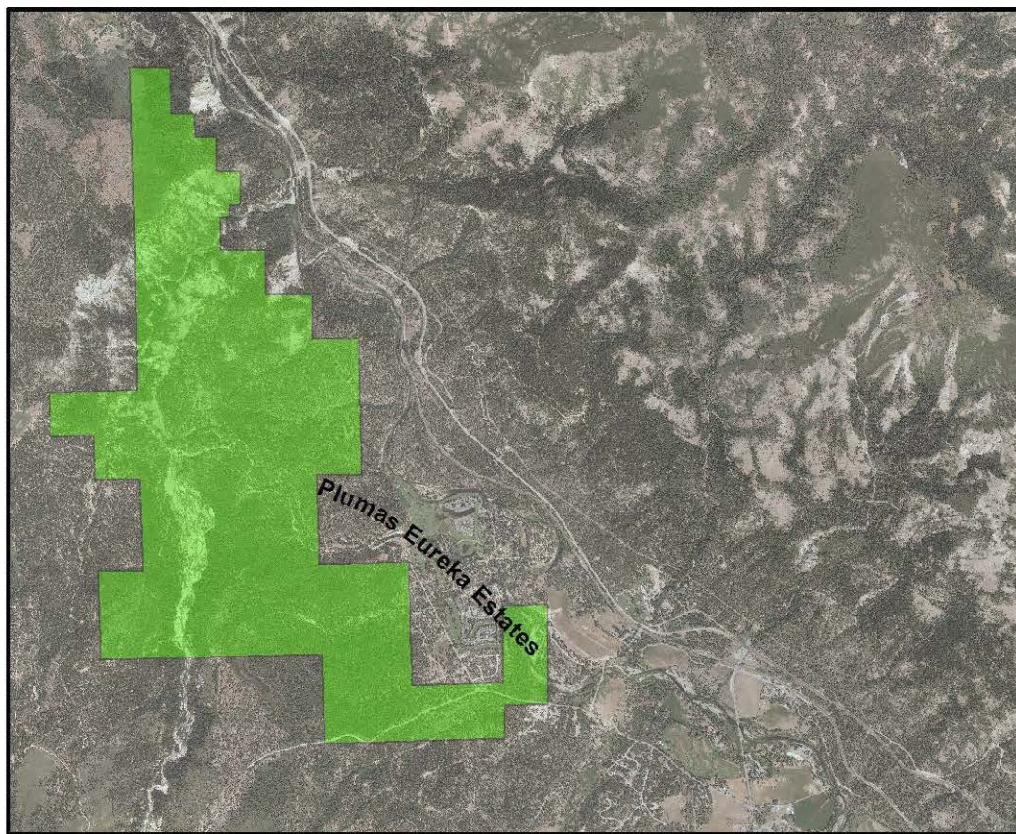
**Map 4-Plumas Eureka Fuels Reduction project information**

No forest products were sold as a result of the project, crews hand thinned, piled and burned, or cut into fire wood that was made available to the community. Funds for this project were secured by the Plumas County Fire Safe Council; the Council also oversaw the project. Crews from the USFS performed the work.

Currently the Beckwourth Ranger District of the Plumas National Forest is developing a large project that will provide fuels treatment on federal lands adjacent to the Plumas Eureka Estates. The project is being surveyed for species occurrences and suitable habitat during the summer of 2015; timber stands are being inventoried and tree densities are being determined. The USFS will be conducting numerous outreach efforts during 2015. They are planning for a decision on the project in 2016 with implementation starting in 2017. These treatments will reduce crowding and remove some of the fuel base within the project area. See map of proposed project below.



## Area of planned USFS Fuels Reduction Project



Map by Plumas County Fire Safe Council, June 30, 2015

**Map 5-Proposed USFS HFR project**

It is recommended that members of the Plumas Eureka Estates Firewise committee reach out to all neighboring landowners to develop a long term management plan for the Plumas Eureka area in order to increase the resilience of those lands to wildfire.

### **4.5 Fire Response**

Plumas Eureka Estates is protected by the Plumas Eureka Fire Department; they have mutual aid agreements with other local fire agencies. The Plumas Eureka Fire Station is located within the community, at that station there are two Type 1 engines, one Type 3 engine and one Type 4 rescue vehicle. The department has 9 volunteer firefighters.

## **4.6 Plumas Eureka Water System**

The Plumas Eureka Estates community is served by both ground water wells and from a surface water diversion from Jamison Creek. The water system is owned and operated by the Plumas Eureka Estates Community Services District (PECSD); Frank Motzkus serves as the CSD manager, Frank works for the PECSD Board of Directors.

There are two primary groundwater wells that serve the drinking water needs of the community. A diversion from Jamison Creek transports water that is used to supply irrigation water for the 18-hole golf course at Plumas Eureka Estates. The groundwater wells supply one 400,000 and one 190,000 gallon storage tank for a total of 590,000 gallons of water storage. From these tanks, water is distributed by a main line network that consists of 8 inch and 6 inch diameter pipe. This network serves both residences and the fire hydrant system.

All hydrants are supplied by either 6 inch or 8 inch diameter water lines. There are approximately 58 hydrants within the Plumas Eureka Estates community; the hydrants flow between 800 g.p.m and 1000 g.p.m. More detailed flow analysis data for the hydrants can be found in a hydraulic flow model that was done by Shaw Engineering.

All new residential structures are required to be equipped with internal fire suppression systems (sprinklers) in accordance with state law.

### **Recommendations:**

- Ensure that the water delivery system is inspected on a routine basis and that the water supply provides adequate volumes and pressure of water for fire suppression activities.
- Establish a minimum storage volume in the community water tanks. Establish guidelines and procedures to ensure that a minimum amount of water is held in the tanks at all times.
- Ensure that the Community Service District monitors the tanks to ensure that the volume is maintained at all times.

- Thinning around the community water storage tanks should be a high priority. Currently there is a dense cluster of trees surrounding the tanks, if a wildfire were to burn through the area; these trees could increase the probability of damage to the water infrastructure there (see photo below)

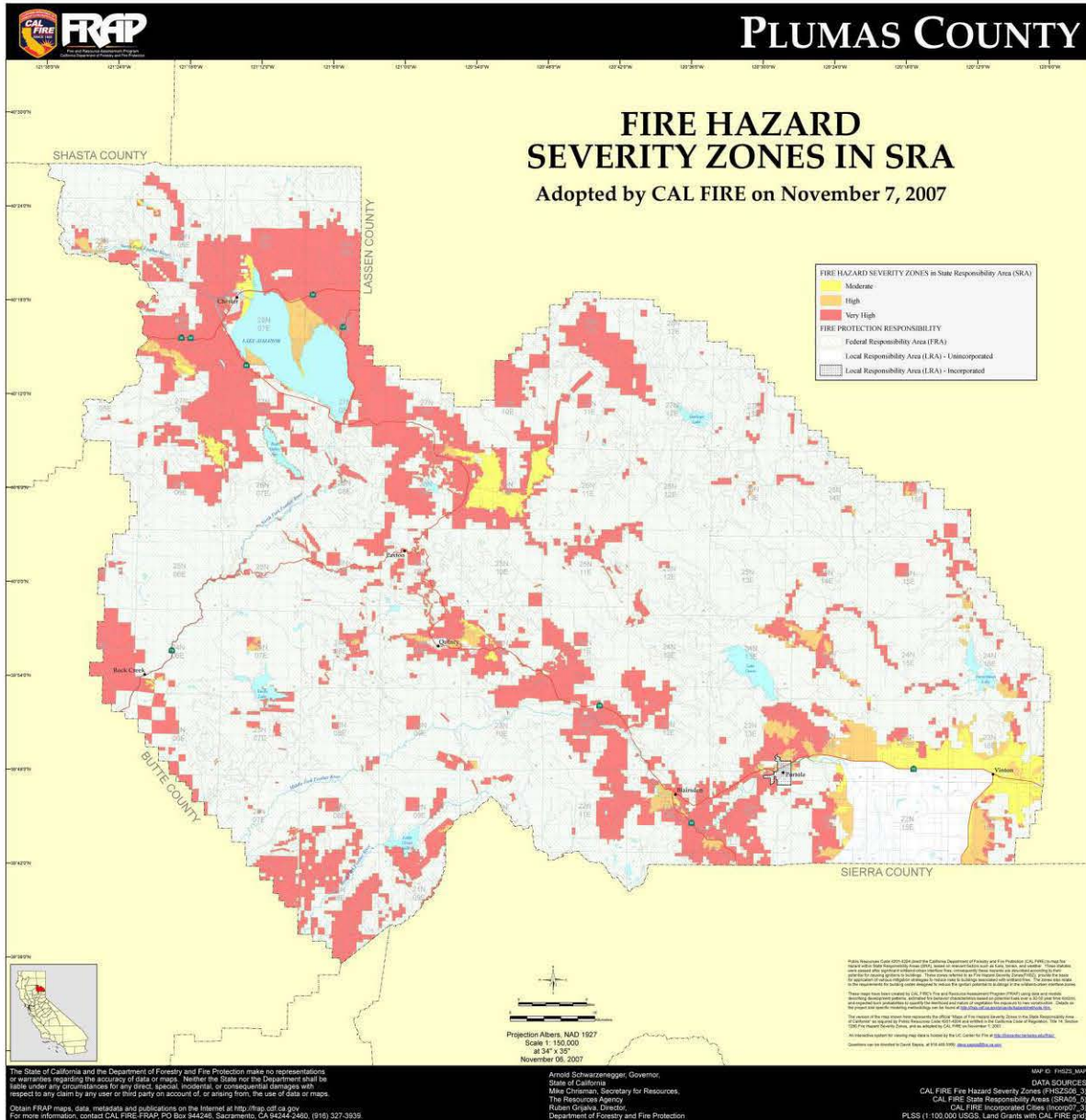


**Photo 3-Dense vegetation surrounding the community water storage tank**

#### **4.7 Cal Fire Fire Hazard Severity Zone Rating**

Periodically, CAL FIRE reviews and updates its statewide assessment of general fire hazards within and near the State Responsibility Areas (SRAs). This assessment generates fire hazard severity zone ratings (FHSZ). The 2008 CAL FIRE Fire Hazard Severity Zone (FHSZ) map for the region rates all of the Plumas Eureka Estates area as “High” fire hazard area.





Map 6-CAL FIRE Fire Hazard Severity

## 4.8 ISO Fire Rating

The Insurance Services Office, Inc. (ISO) is the principal supplier of statistical, actuarial and underwriting information for the property insurance industry. ISO fire insurance ratings serve as an industry standard, a foundation upon which most insurers build their coverage programs.

Their ratings are based on several factors including:

- The quality of the fire department
- The water supply and hydrant system

- Communication and dispatching systems
- Building codes
- Property inspection programs

ISO ratings range from 1 to 10, with 1 being perfect. Since the ISO insurance companies set insurance premium rates, the lower the ISO fire rating, the lower the premium use ratings. The ISO for the Plumas Eureka Fire District is **4/4Y**.

## **5. Assessment Process**

- A team approach was taken in preparing this assessment of fire hazards and risks at Plumas Eureka Estates. Relevant background data was initially collected and distributed for review by the several team members identified in the introduction to this document. That group then met on May 12, 2015. Team members involved with the assessment were Nils Lunder, Coordinator of the Plumas County Fire Safe Council; Sue McCourt, Fire Prevention Specialist, Plumas County Office of Emergency Services; Plumas Eureka Estates residents Dave and Shirley Bauer, Dave Stone, Frank Shepard and John Rowden; Tom Forster, Fire Chief, Plumas Eureka Fire Department; Al Klem and Shane Vargas, CAL FIRE; Mark Callahan, Superintendent, Plumas Pines Golf Course.

This group met at Plumas Eureka Estates and discussed the Firewise Communities USA program and how Firewise could benefit the Plumas Eureka Estates community. After a discussion of the processes involved with becoming recognized as a Firewise Community, we set off into the community to conduct a visual review from a roadside perspective.





Photo 4-Members of the team during the Firewise Community Assessment

Numerous properties were visited during this process. Observations were made at those properties including both positive and negative attributes; those observations can be found in subsequent sections. The compiled information was used as the group developed recommendations for mitigation actions. This was a collaborative process where draft materials were circulated, reviewed, and revised based on inputs from the group.

## 6. Important Considerations

The Firewise Communities/USA program seeks to create a sustainable balance that will allow communities to live safely while maintaining environmental harmony in a WUI setting. Homeowners already balance their decisions about fire protection measures against their desire for certain flammable components on their properties. It is important for them to understand the implications of the choices they are making. These choices directly relate to the ignitability of their home ignition zones during a wildfire.

**The three most important considerations to provide a safer community are:**

1. All residents have proper defensible space on their property.
2. All properties should be treated to ensure that a full 100 feet of defensible space is maintained around all structures.
3. The community should seek treatment and maintenance of all vacant parcels to achieve a fire resilient condition that will reduce the potential for tree torching and ember production within the community during a wildfire.

## **7. Observations and Recommendations**

### **7.1 Positive Community Attributes:**

- Many of the homes in Plumas Eureka Estates have been built in the past 30+ years; those newer homes are more compliant with current building codes
- Portions of the community have underground power.
- The community has an active fire department.
- The community is served by fire hydrants and there is a functioning water system that has capacity to store 590,000 gallons of water.
- The Plumas Eureka Preservation Society (PEPS) is an active local organization that works throughout the community; they have an active pine needle collection service that assists landowners to dispose of pine needles; additionally, they maintain three public gardens on vacant properties in the community.
- There are a number of excellent examples within the community of Firewise homes and properties.
- There are mutual aid agreements in place with numerous local fire protection districts that will respond if a wild fire threatens the community.
- Fuels reduction projects have occurred on neighboring lands.
- There is a community burn pile that accepts materials generated from yard clean up and maintenance.



**Photo 5-Community burn pile at Dynamite Hill**

## **7.2 Plumas Eureka Estates Roads System:**

A majority of the roads in the Plumas Eureka Estates subdivision are paved and have been designed to accommodate fire protection vehicles. Many of the roads are marked with street signs. The placement and height of signage is inconsistent throughout the community. Some of the roads in the community were built in the 1930s and are quite narrow.





Photo 6-Example of a Plumas Eureka Estates intersection

**Recommendations:**

- The community should replace all existing non-reflective street signs with reflective sign materials.
- The community should ensure that all residences install and maintain reflective address signage in such a way that ensures that first responders will be able to navigate within the community at night and identify homes.
- The community may consider working with Plumas County department of Public Works to adopting known sign standards in order to ensure consistency within Plumas Eureka Estates. California Manual of Traffic Control Devices (MUTCD) states that the minimum sign height is 5 feet to the bottom of the first sign panel. In the case of street name signs, the MUTCD recommends seven feet to accommodate a stop sign if needed. All new sign installations should be on a 2" square fireproof metal signpost. Road signs that are obstructed by tree and/or shrubbery should be cleared of these or other obstructions.

### **7.3 Access to structures**

It is important that emergency services personnel have access to residences. Fire engines need to be able to get into the driveway and access all sides of the home in order to provide structure protection.

#### **Recommendations:**

- Residents should be informed of the importance of access to homes by emergency responders.
- Items preventing access to the structure should be relocated or removed.
- Residents should maintain vegetation clearances and maintain landscape vegetation in order to ensure access routes to structures.

### **7.4 Driveways**

All driveways within the community should have reflective signs at the street and should be accessible by emergency responders.

#### **Recommendations:**

- Efforts should be made to ensure driveways are kept free of obstacles that could block the way for emergency response vehicles.
- Efforts should also be made to ensure that signs and driveways are maintained.
- Consistent house numbering along roads at driveways is extremely beneficial to responding emergency service providers (visible & reflectorized).
- With respect to driveways, the community should make sure that future construction within Plumas Eureka Estates complies with State Public Resources Code 4290.
  - 10 foot minimum width
  - 15 foot minimum vertical clearance
  - Maximum slope of 16%
  - Minimum radius of turns to allow fire engine access

### **Items that increase risks to community safety**

Areas identified as a concern or for improvement



## 7.5 Structures & Defensible Space



Figure 6-Defensible Space diagram

- While Defensible Space in the “Lean Clean, Green Zone” (0-30 feet) was present on many residences, there still exists a need for fine-tuning. There were some homes observed within the community where grass and forest litter accumulations were present right up to the structures.
- Many homes lacked adequate treatment in what is referred to as the “Reduced Fuel Zone” (30-100 feet). Treatment of 100 feet around all structures would reduce the acres of untreated fuels, provide additional protection to all homes and improve the survivability of

structures within the community.



Photo 7-Example of a home that is in need of fuel reduction work

- During the community assessment we observed numerous large conifer trees that were in need of pruning, thinning or removal.
- Some homes had roofs and gutters that had accumulated needles and other forest debris.





Photo 8-Accumulated debris in the valley of a roof in Plumas Eureka Estates



- Some homes were observed with highly flammable ornamental vegetation immediately adjacent to structures, decks or along driveways. This can increase risk of structure ignitions and also create additional hazards for emergency responders, if ignited; these types of ornamental vegetation could become a barrier for emergency responders to access the home.



**Photo 9-Juniper along a driveway in Plumas Eureka Estates**

- Some of the decks were skirted by decorative lattice with accumulations of vegetation or pine needles, these fuels increase the ignition potential of a structure.



**Photo 10-Lattice beneath a deck**

**Recommendations:** A number of informational pamphlets on defensible space are available to address the issues identified above. By understanding fire behavior, residents will have a better understanding of why defensible space is essential and why California has laws (Public Resources Code 4291 see appendix B) requiring treatment to 100 feet.

- Homeowners should work to create a fuel free zone approximately 5 feet around their home free of grass and forest litter accumulations.
- Prune and thin trees near your home.
- Work to maintain a reduced fuel zone 100 feet around all structures.
- Remove accumulated forest materials from roofs, gutters and around the home.
- Do not plant ornamental vegetation that is flammable within 15 feet of your home; refrain from planting conifers next to homes and structures.
- Lattice screening should have clearance from ignitable materials. Also, never store materials beneath a deck. It is a good idea to install 1/8" steel screen behind the lattice in order to create a barrier for embers to access the under deck area.
- Vent screens- it is recommended that these openings have 1/8" steel screens installed for protection from flying embers.

## 7.6 Propane tanks and generators



Photo 11-A propane tank dwarfed by a cedar tree

Propane tanks pose a potential risk to homes in Plumas Eureka Estates. Due to the extremely flammable nature of propane, great care should be taken by landowners to ensure that they manage their propane supply system in such a way that reduces the potential for a propane leak to develop, or for a ground fire to impact the tank area.

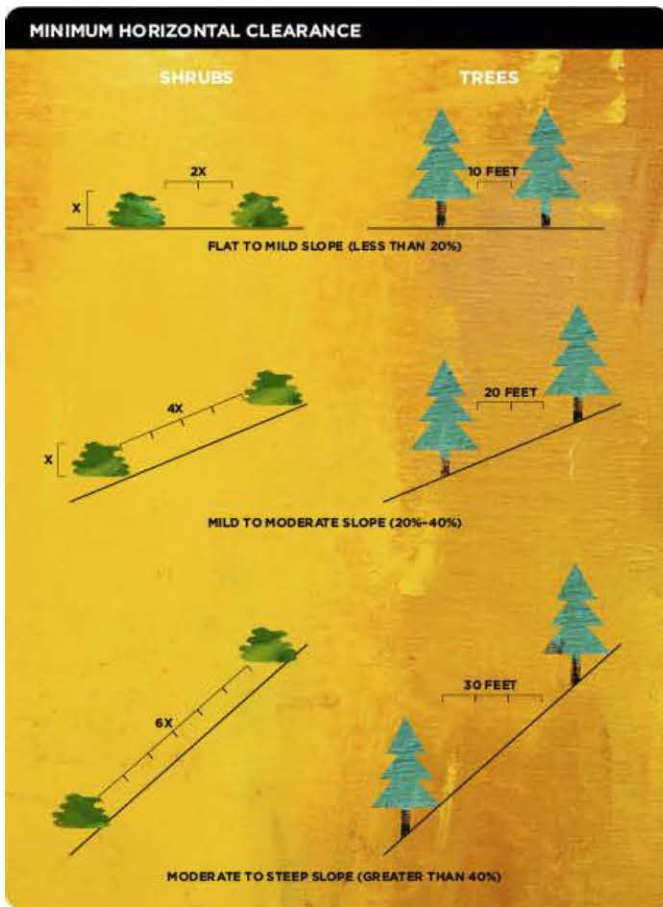
**Recommendations:**

- *Propane tank regulators:* A number of pressure regulators were observed next to propane tanks directly beneath trees; these have the potential to be damaged from falling snow, ice, or limbs. This can cause propane leaks that have the potential to cause explosions or structure fires in the winter.
- *Backup generators:* We recommend that backup generators are referenced at the main power box in case of an emergency; this will ensure that emergency responders are aware of the system.
  - These generators should have an emergency shut off located outside of the building that can be easily accessible by fire personnel. In case of a structure fire, one of the first actions that happen is to shut off power to the building. This action, in turn, usually activates the backup generator. Fire responders need to have the ability to ensure that all power is off to a structure.

## **7.8 Vegetation beyond the home ignition zone**

Vegetation that exists on undeveloped lots within the community is not covered by State Public Resource Code-4291 but that vegetation is a significant concern for the Plumas Eureka Estates community. Undeveloped lots are susceptible to ember ignitions with the threat of multiple spot fires occurring within the community in the event of a wildfire. The main concern in Plumas Eureka Estates is the dense growth of young conifers. Please see the diagram below to get a sense of how home owners can remove some vegetation and still receive the benefits that are derived from ground covering vegetation: cover for the soil, erosion prevention, protection for animals, aesthetics and biodiversity.





With shrubs that exist on relatively mild slopes in the community, we recommend that the distance between individual specimens is approximately two times the height of those shrubs.

On slopes between 20-40%, that separation should be four times the height of the shrubs. And on slopes greater than 40%, we recommend that the distance between shrubs is six times the height of the shrubs.

Homeowners at Plumas Eureka Estates should work to ensure that there is separation between the individual shrubs.

Figure 7-Vegetation spacing information

**Recommendations:** Efforts should be made to educate homeowners and vacant lot owners about the benefits of defensible space.

- Elimination of “ladder fuels” - fuels bridging the gap between the surface and lower tree limbs.
- Removal of additional lower branches as needed.
- General tree thinning to reduce fuel volume and maintain forest health.
- Thinning or removal of new brush growth.
- Thinning or removal of new seedlings or saplings.

- Removal of accumulating surface litter or debris.
- Removal of debris piles.
- The community should coordinate with the United States Forest Service (USFS), the Plumas Eureka State Park, the owners of the golf course, and other private landowners to develop coordinated hazardous fuels reduction projects that improve the overall fire safety of the Plumas Eureka area. Reducing the volume of hazardous fuels within and surrounding the community will greatly reduce the potential for a catastrophic wildfire to ravage these areas.



Photo 12-Example of accumulated fuels near the golf course maintenance building

- Fuels reduction and debris removal should take place near the community burn piles at Dynamite Hill. This will reduce the potential for escaped fire during community burn days.





Photo 13-Small conifers at Dynamite Hill burn area

## **Additional Considerations:**

### **Power and Communication Infrastructure**

Portions of Plumas Eureka Estates are serviced by underground utilities. Other portions of the community are serviced by overhead power lines.

#### **Recommendations:**

--*Underground*: Periodically, vegetation should be cleared around all underground utility infrastructure including power vaults and other above ground infrastructure. This will allow better access to these structures for future maintenance and operation of the system.

--*Above ground*: The PE CSD should coordinate with the utility provider (Plumas Sierra Rural Electric Cooperative) to assess areas that are serviced by overhead power lines in order to identify and treat any vegetation that could fall onto those lines. In areas that are not the responsibility of the utility provider, the PE CSD should work with landowners to ensure that vegetation is managed in order to reduce the potential of falling debris damaging power lines.

### **Roadside Thinning and Vegetation maintenance**



The major road that passes near the community (County Road A-14) is a potential source of wildfire ignition. This road receives considerable traffic including many vehicles that are travelling to the nearby Plumas Eureka State Park.

**Recommendation:** Plumas Eureka Estates residents are encouraged to work with the Plumas National Forest and the Plumas County Department of Public Works to inspect and maintain vegetation along County Road A-14 in such a way that minimizes the potential for wildfire ignition. This includes the removal of both excess living and dead vegetation and ladder fuels. This area could be a good target for a community chipping effort. If possible, residents of Plumas Eureka Estates should engage with the PNF and the County to identify collaborative opportunities to reduce fuels along County Road A-14.

### **Suggested Wildfire Evacuation Route Map**

Plumas Eureka Estates does have a wildfire evacuation route map for residents and fire responses agencies.

**Recommendation:** Work with Plumas County OES to improve and update the existing map using models from other communities in Plumas County. See Appendix A.

## 8. Successful Firewise Modifications

When adequately prepared, a house can likely withstand a wildfire without the intervention of the fire service. Further, a house and its surrounding community can be both Firewise and compatible with the area's ecosystem. The Firewise Communities/USA program is designed to enable communities to achieve a high level of protection against WUI fire loss even as a sustainable ecosystem balance is maintained.

The homeowner and the community as a whole must focus attention on the home ignition zone and eliminate the fire's potential relationship with the house. This can be accomplished by disconnecting the house from high and/or low-intensity fire that could occur around it. The following photographs were taken in Plumas Eureka Estates and are examples of good Firewise practices.

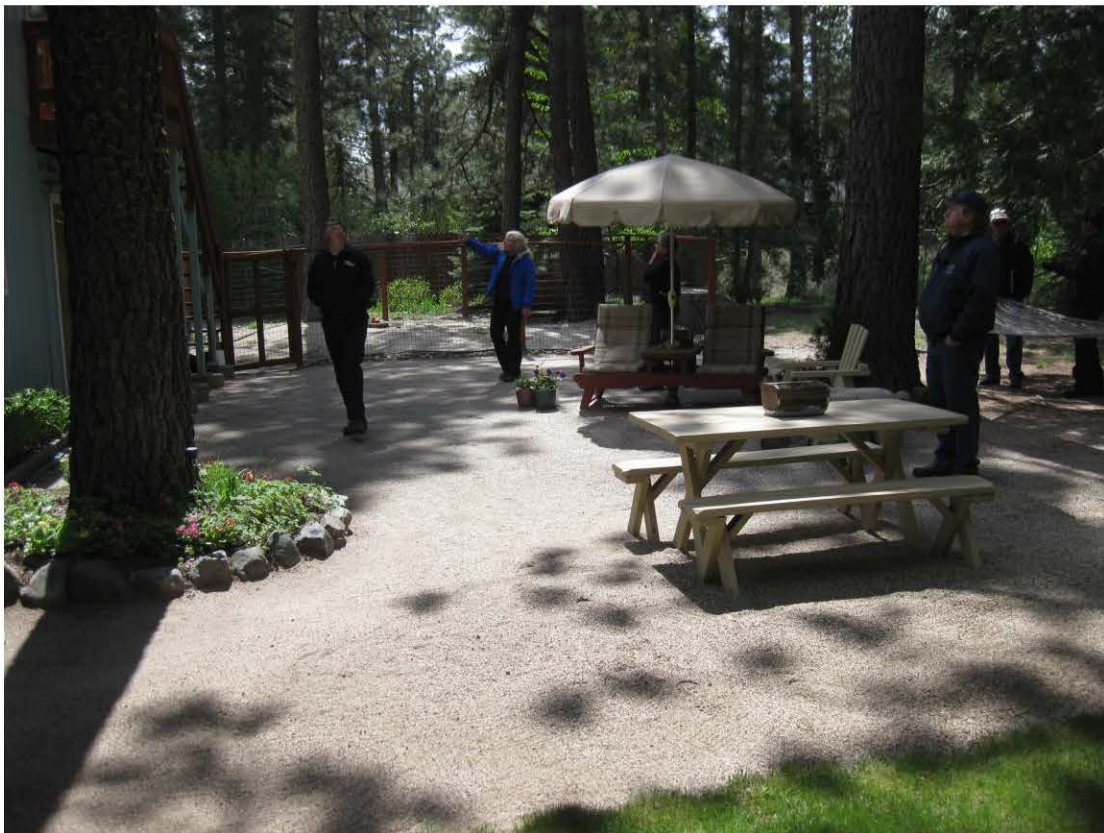


Photo 14-A home in Plumas Eureka Estates, note the well maintained yard



Photo 15-A well maintained home

## 9. Next Steps

This Assessment is a first step in a longer process leading to improved wildfire safety in the community.

Following a review and approval of the contents of the assessment and its recommendations by the Plumas Eureka Estates Firewise Committee, that committee should contact the current California Fire Safe Council Firewise representative to submit an application to be a nationally recognized Firewise Community: <http://www.cafiresafecouncil.org/contact-us/cfsc-staff/>

Assuming the Plumas Eureka Estates community seeks to achieve national Firewise Communities/USA recognized status, it will integrate the following standards into its plan of action:

- Assemble a local Firewise board, task force, committee, commission or department that maintains the Firewise Community program and status. Ensure that this group has sufficient participation and capacity to function.



- Complete and submit this assessment and create a plan that identifies agreed-upon, achievable local solutions.
- Invest a minimum of \$2.00 annually per capita in the Plumas Eureka Estates Firewise Communities/USA program. (Work done by municipal employees or volunteers, using municipal or other equipment, can be included, as can state/federal grants dedicated to that purpose.)
- Plan and promote a Plumas Eureka Estates Firewise Communities/USA Day during the year that is dedicated to a local Firewise project. Use this project activity day as a way to engage landowners and to illustrate what the Plumas Eureka Estates Firewise effort is all about.
- Submit an annual report to Firewise Communities/USA. This report documents continuing participation in the program. The report will include photos and descriptions of Firewise activities; it will document the accomplishments of the Firewise efforts and will also document the total number of volunteer hours that have been spent to accomplish these tasks. A very important element of the Firewise effort is the careful recording of these hours.

## **10. Additional Key Points**

### **Threat of embers during a wildfire**

Residents need to be conscious of keeping high-intensity fire more than 100 feet from their homes and work to maintain their homes in preparation for an eventual ember blizzard. It is important that landowners work to ensure that there are no opportunities for fire to contact the structures that exist on the property, this includes firebrands. The assessment team recommends the establishment of a 'fire free zone', allowing no fire to burn within ten feet of a house by removing fuels located there. All efforts should be made to eliminate the potential for a fire to burn near a structure. Remember, while wildfire cannot be eliminated from a property, work can be done to remove fuels near structures; these efforts will reduce fire intensity within the home ignition zone.



**Photo 16-Firewood should not be stored near fuel tanks**



**Photo 17-Homes with wood siding are more vulnerable to ignition**

Plumas Eureka Estates homeowners are reminded that the presence or absence of street signs, clearly defined home addresses, and community infrastructure do not keep a house from igniting. Proper attention and active maintenance of home ignition zones does. Homeowners are encouraged to identify the things that will ignite their homes and address those.

## **Fire Prevention Information Availability**

A variety of information sheets, pamphlets, brochures and video materials are available to property owners at the Plumas Eureka Estates. Information is available at the Plumas Eureka Fire Stations, via the Internet and by contacting the Plumas County Fire Safe Council or CAL FIRE. Fire prevention and parcel cleanup information is available on the Firewise Communities/USA website (<http://www.firewise.org>), the Plumas County Fire Safe Council website (<http://www.plumasfiresafe.org>), the California Department of Forestry and Fire Protection (CAL FIRE) website (<http://www.fire.ca.gov>) and the Plumas Eureka Community Services District website (<http://pecsd.org>).

Information on community fuel reduction projects, community chipping programs and programs that assist senior and disabled residents is available from the Plumas County Fire Safe Council. The USFS Beckwourth Ranger District located in nearby Blairsden has information available regarding defensible space.

## **Backyard Debris Burning and Forest Fire Restrictions**

Escaped debris burns are the number one cause of human caused wildfires in Plumas County. Burn Permits are required from May 1 until the beginning of the State burn ban. During dry years, burning may be limited or banned entirely within State burn ban. Contact the USFS Beckwourth Ranger District in Blairsden for burn permits. The Plumas Eureka CSD and the USFS organizations are also a resource for burn safety information on debris burning. Many escaped debris burns occur during the time burn permits are not required.

The adjacent National Forest Lands are subject to certain restrictions, aimed in large part at reducing ignition hazards there during fire season. When fire restrictions are enacted, campfires are prohibited except in designated campgrounds. Motor vehicle travel is restricted to designated roads only; off road travel is not allowed. During the driest portion of the annual fire season, woodcutting and smoking are severely limited.



## 11. Existing Fire Plans and Assessments

Formal documentation for the region has been addressed by the Plumas County Fire Safe Council, which published the more comprehensive:

- 2004 *“Plumas County Hazardous Fuel Assessment and Strategy”*
- 2013 *“Plumas County Community Wildfire Protection Plan”* (CWPP).

These two documents are available online at the Plumas County Fire Safe Council website (<http://www.plumasfiresafe.org>) and the Plumas Eureka Community Services District website (<http://pecsd.org>).

# Appendices

## Appendix A

### ***2015 Plumas Eureka Estates Wildland Fire Suggested Emergency Evacuation Route Map***

This map is being prepared and will be inserted here once completed and approved by the Plumas County Sheriff's Office.



## Appendix B

### *California State Law*

California state law regarding the establishment and maintenance of “defensible space” is found in Public Resources Code (PRC) Section 4291. The actual text of that section, which was updated in 2005, is found below. The California Department of Forestry and Fire Protection (CAL FIRE) is responsible for enforcement of PRC 4291. CAL FIRE has also prepared practical guidelines for implementation of “defensible space” in various kinds of settings; these are summarized in a brochure that is found online at:

[http://www.fire.ca.gov/CDFBOFDB/pdfs/Copyof4291finalguidelines9\\_29\\_06.pdf](http://www.fire.ca.gov/CDFBOFDB/pdfs/Copyof4291finalguidelines9_29_06.pdf)

#### CALIFORNIA PUBLIC RESOURCES CODE SECTION 4291

4291. (a) A person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material, shall at all times do all of the following:

(1) Maintain defensible space no greater than 100 feet from each side of the structure, but not beyond the property line unless allowed by state law, local ordinance, or regulation and as provided in paragraph (2). The amount of fuel modification necessary shall take into account the flammability of the structure as affected by building material, building standards, location, and type of vegetation. Fuels shall be maintained in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure. This paragraph does not apply to single specimens of trees or other vegetation that are well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a structure or from a structure to other nearby vegetation. The intensity of fuels management may vary within the 100-foot perimeter of the structure, the most intense being within the first 30 feet around the structure. Consistent with fuels management objectives, steps should be taken to minimize erosion.

(2) A greater distance than that required under paragraph (1) may be required by state law, local

ordinance, rule, or regulation. Clearance beyond the property line may only be required if the state law, local ordinance, rule, or regulation includes findings that such a clearing is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structure, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to the structure. Clearance on adjacent property shall only be conducted following written consent by the adjacent landowner.

(3) An insurance company that insures an occupied dwelling or occupied structure may require a greater distance than that required under paragraph (1) if a fire expert, designated by the director, provides findings that such a clearing is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structure, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to the structure. The greater distance may not be beyond the property line unless allowed by state law, local ordinance, rule, or regulation.

(4) Remove that portion of any tree that extends within 10 feet of the outlet of a chimney or stovepipe. (5) Maintain any tree, shrub, or other plant adjacent to or overhanging a building free of dead or dying wood. (6) Maintain the roof of a structure free of leaves, needles, or other vegetative materials.

(7) (a) Prior to constructing a new building or structure or rebuilding a building or structure damaged by a fire in an area subject to this section, 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.

(b) A person is not required under this section to manage fuels on land if that person does not have the legal right to manage fuels, nor is a person required to enter upon or to alter property that is owned by any other person without the consent of the owner of the property.

(c) (1) Except as provided in Section 18930 of the Health and Safety Code, the director may adopt regulations exempting a structure with an exterior constructed entirely of nonflammable materials, or, conditioned upon the contents and composition of the structure, the director 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.

(2) An exemption or variance under paragraph (1) shall not apply unless and until the occupant of the structure, or if there is not an occupant, the owner of the structure, 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.

(d) 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.

(e) The Department of Forestry and Fire Protection shall develop, periodically update, and post on its Internet Web site a guidance document on fuels management pursuant to this chapter. Guidance shall include, but not be limited to, regionally appropriate vegetation management suggestions that preserve and restore native species, minimize erosion, minimize water consumption, and permit trees near homes for shade, aesthetics, and habitat; and suggestions to minimize or eliminate the risk of flammability of non-vegetative sources of combustion such as woodpiles, propane tanks, wood decks, and outdoor lawn furniture.

(f) 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).

4291.3. Subject to any other applicable provision of law, a state or local fire official, at his or her discretion, may authorize an owner of property, or his or her agent, to construct a firebreak, or implement appropriate vegetation management techniques, to ensure that defensible space is adequate for the protection of a hospital, adult residential care facility, school, aboveground storage tank, hazardous materials facility, or similar facility on the property. The firebreak may be for a radius of up to 300 feet from the facility, or to the property line, whichever distance is shorter.

## Appendix C—

### 1299 California Code of Regulations Fire Hazard Reduction around Buildings and Structures

#### § 1299. Defensible Space. [Repealed]

##### § 1299.01. Purpose.

The intent of this regulation is to provide guidance for implementation of Public Resources Code Section 4291 to improve safety for fire fighters defending a home as well as increase the survivability of a “Building or Structure” as defined, that exists in grass, brush, and forest covered lands within the designated State Responsibility Area (SRA) of California.

##### § 1299.02. Definitions.

The following definitions apply to this article:

(a) Defensible space. The buffer that landowners are required to create on their property between a “Building or Structure” and the plants, brush and trees or other items surrounding the “Building or Structure” that could ignite in the event of a fire.

(b) Building or Structure. Anything constructed that is designed or intended for support, enclosure, shelter, or protection of persons, animals, or property, having a permanent roof that is supported by walls or posts that connect to, or rest on the ground.

(c) Outbuilding. Buildings or structures that are less than one hundred-twenty (120) square feet in size and not used for human habitation. For purposes of this Section, an “Outbuilding” is not a “Building or Structure” as defined in subsection (b) above.

##### § 1299.03. Requirements.

Defensible space is required to be maintained at all times, whenever flammable vegetative conditions exist. One hundred feet (100 ft.) of defensible space clearance shall be maintained in two distinct “Zones” as follows: “Zone 1” extends thirty feet (30 ft.) out from each “Building or Structure,” or to the property line, whichever comes first; “Zone 2” extends from thirty feet (30 ft.) to one hundred feet (100 ft.) from each “Building or Structure,” but not beyond the property line. The vegetation treatment requirements for Zone 1 are more restrictive than for Zone 2, as provided in (a) and (b) below. The Department of Forestry and Fire Protection’s “Property Inspection Guide, 2000 version, April 2000,” provides additional guidance on vegetation treatment

within Zone 1 and Zone 2, but is not mandatory and is not intended as a substitute for these regulations. This publication may be found on the Department of Forestry and Fire Protection (CAL FIRE) website at: [http://cdfdata.fire.ca.gov/fire\\_er/fpp\\_engineering\\_view?guide\\_id\\_=8](http://cdfdata.fire.ca.gov/fire_er/fpp_engineering_view?guide_id_=8)

(a) Zone 1 Requirements:

(1) Remove all dead or dying grass, plants, shrubs, trees, branches, leaves, weeds, and pine needles from the Zone whether such vegetation occurs in yard areas around the "Building or Structure," on the roof or rain gutters of the "Building or Structure," or any other location within the Zone.

(2) Remove dead tree or shrub branches that overhang roofs, below or adjacent to windows, or which are adjacent to wall surfaces, and keep all branches a minimum of ten feet (10 ft.) away from chimney and stovepipe outlets.

(3) Relocate exposed firewood piles outside of Zone 1 unless they are completely covered in a fire resistant material.

(4) Remove flammable vegetation and items that could catch fire which are adjacent to or under combustible decks, balconies and stairs.

(b) Zone 2 Requirements:

(1) In this zone create horizontal and vertical spacing among shrubs and trees using the "Fuel Separation" method, the "Continuous Tree Canopy" method or a combination of both to achieve defensible space clearance requirements. Further guidance regarding these methods is contained in the State Board of Forestry and Fire Protection's, "General Guidelines for Creating Defensible Space, February 8, 2006," incorporated herein by reference, and the "Property Inspection Guide" referenced elsewhere in this regulation. The "General Guidelines for Creating Defensible Space" may be found on the Board's website at:  
[http://www.fire.ca.gov/CDFBOFDB/pdfs/Copyof4291finalguidelines\\_9\\_2\\_9\\_06.pdf](http://www.fire.ca.gov/CDFBOFDB/pdfs/Copyof4291finalguidelines_9_2_9_06.pdf).

(2) In both the Fuel Separation and Continuous Tree Canopy methods the following standards apply:

(A) Dead and dying woody surface fuels and aerial fuels shall be removed. Loose surface litter, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches, shall be permitted to a maximum depth of three inches (3 in.).

(B) Cut annual grasses and forbs down to a maximum height of four inches (4 in.).

(C) All exposed wood piles must have a minimum of ten feet (10 ft.) of clearance, down to bare mineral soil, in all directions.

(c) For both Zones 1 and 2:



(1) "Outbuildings" and Liquid Propane Gas (LPG) storage tanks shall have the following minimum clearance: ten feet (10 ft.) of clearance to bare mineral soil and no flammable vegetation for an additional ten feet (10 ft.) around their exterior.

(2) Protect water quality. Do not clear vegetation to bare mineral soil and avoid the use of heavy equipment in and around streams and seasonal drainages. Vegetation removal can cause soil erosion, especially on steep slopes. Keep soil disturbance to a minimum on steep slopes.

**§ 1299.04. Additional Clearance.**

(a) An insurance company that insures an occupied "Building or Structure" may require additional clearance beyond that required under § 1299.03 only if a fire expert designated by the Director provides findings that the clearing is necessary.

(b) Within the intent of the regulations, a fire expert designated by the Director may require more than one hundred feet (100 ft.) of defensible space. A fire expert cannot require additional defensible space clearance beyond the property line.

(c) Further guidance to property owners on implementation of this regulation is contained in the "General Guidelines for Creating Defensible Space" and the "Property Inspection Guide," both of which are referenced elsewhere in this regulation.

**§ 1299.05. Alternative Methods.**

The provisions of these regulations are not intended to exclude alternative methods not specifically prescribed by these regulations. A fire expert designated by the Director may approve alternative practices which provide for the same practical effects as those stated in these regulations.