

APPENDIX 7 – RISK ASSESSMENT

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7 RISK ASSESSMENT: IDENTIFYING AND EVALUATING ASSETS AT RISK

What are Assets at Risk? Assets at risk (also called values at risk) are those assets, either natural or man-made, that are at risk from wildfire. The following table contains the assets at risk¹ evaluated when developing the assets at risk for the Pioneer/Volcano Planning Unit.

Table 1 Assets at Risk categories

Public Issue Category	Location and ranking methodology
Public welfare	1) Watersheds that feed run of the river power plants, ranked based on plant capacity; 2) cells adjacent to reservoir based plants (Low rank); and 3) cells containing canals and flumes (High Rank)
Public safety, Public welfare	Watersheds with a history of problems or proper conditions for future problems, ranked based on affected downstream population
Environment	Watersheds ranked based on erosion potential
Public welfare	Watershed area up to 20 miles upstream from water storage facility, ranked based on water value and dead storage capacity of facility
Public health	1) Watershed area up to 20 miles upstream from water supply facility (High rank); 2) grid cells containing domestic water diversions, ranked based on number of connections; and 3) cells containing ditches that contribute to the water supply system (High rank)
Public welfare	Four mile view shed around Scenic Highways and 1/4 mile view shed around Wild and Scenic Rivers, ranked based on potential impacts to vegetation types (tree versus non-tree types)
Public welfare	Timberlands ranked based on value/susceptibility to damage
Public welfare	Rangeland ranked based on potential replacement feed cost by region/owner/vegetation type
Public health, Environment, Public welfare	Potential damages to health, materials, vegetation, and visibility; ranked based on vegetation type and air basin
Public welfare	Historic buildings ranked based on fire susceptibility
Public welfare	Unique recreation areas or areas with potential damage to facilities, ranked based on fire susceptibility
Public safety, Public welfare	Ranked based on housing density and fire susceptibility
Environment, Public welfare	Critical habitats and species locations based on input from California Department of Fish and Game and other collaborators
Public safety, Public welfare	Infrastructure for delivery of emergency and other critical services (e.g. repeater sites, transmission lines)
Environment	Ranked based on housing density and fire susceptibility

The 2008 Fire Plan for the Amador Eldorado Unit of CAL FIRE uses assets at risk to prioritize its projects in order to reduce suppression cost and reduce damage from wildfire. The following is from the Amador Eldorado Unit Fire Plan (2008).

“Knowledge of the type, magnitude, and location of assets at risk, is critical to fire protection planning. Given the limits on fire protection resources, these resources should be allocated, at least in part, based on the value of the assets at risk. Knowledge of assets at risk is also necessary to choose those projects, which will provide the greatest benefit for a given investment. Thus, as part of the overall fire plan process, assets were addressed at two levels. First, generalized assets at risk were estimated to indicate what areas contain high valued assets. Second, the input of collaborators further refined this assessment.”

“The areas with the highest combined asset values and fire risk were considered for projects, particularly where those projects would protect assets and reduce suppression costs should a fire start in the project area. Second, as potential projects were identified in these areas, they were subjected to an analysis of the degree to which the projects will reduce damage to assets and potential suppression costs.”

CAL FIRE uses weighted values to refine the risk assessment process further. The following table represents the weights (1-5), 1 being low and 5 being high. CAL FIRE applied these weights to compute the overall Asset Rank within the Unit.

Asset	Weight	Asset	Weight	Asset	Weight
Infrastructure	3	Timber	3	Storage (water)	3
Water Supply	4	Range	1	Fire-Flood	2
Historic	2	Soil	1	Air	4
Scenic	2	Hydroelectric	3	Recreation	2
Housing	5	Non-game Wildlife	1	Game (Wildlife)	1
Ecosystem	3				

CAL FIRE used USGS 7.5 topographical quadrant maps in their analysis. Each quad map was divided into grid cells, about 450 acres each. Each map yields 81 cells. CAL FIRE’s asset at risk analysis uses these cells. Each cell must be ranked as High, Medium, or Low based on potential impacts from a large fire event. Rankings are developed based on the potential physical fire effects as well as the human valuation of those effects. For example, for air quality the physical effects of a large fire in timberlands are higher than grasslands due to production of a larger volume of smoke. The valuation of this effect will differ based on the additional factor of how many people are potentially affected within specific air basins.

The potential physical effects of a large fire also include a susceptibility component for assets such as structures, historic buildings, or recreation that involve specific sites within a cell. For example, the ranking procedure for structures involves a valuation component based on the number of housing units within a grid cell as well as a susceptibility component, or exposure. The exposure measure includes site-specific factors near housing such as vegetation clearance, roof type, and accessibility.

This CCWPP used the CAL FIRE Assets at Risk analysis to identify the relative wildfire risk. However, where CAL FIRE’s method does not provide the neighborhood-by-neighborhood

assessment needed for this document, this section identifies risks at a more localized, neighborhood level (See Plate 15 -Total Assets at Risk Map on next page).

7.1 ASSETS AT RISK IN PIONEER/VOLCANO PLANNING UNIT

Three fire scenarios create the potential for significant destruction of manmade improvements, infrastructure, and key elements of the ecosystem. These scenarios are:

1. *Fires occurring during foehn wind events (wind driving fires)*
2. *Fires occurring in drainages during normal summer fire weather pattern (wind and terrain driven fires)*
3. *Fires occurring in areas of heavy fuel accumulations (wind and fuel driven fires)*

WIND DRIVEN WILDFIRES (FOEHN)

The risk to manmade improvements and the ecosystem can be broadly categorized by types of wildfire events. The first and potentially most devastating is the historic large wildfire in Amador County. Historic records starting in 1900 show these fires occurring every twenty years to thirty years.

Figure 1- Large fire (foehn wind driven) occurrence in Amador County

Year	Size in Acres	Fire Name
1917	10,057	Unnamed
1924	8,948	Pi Pi – Indian Diggings
1961	34,964	Rancheria
1981	14,125	Miess
2004	16,983	Power

Burn patterns of almost all historic large wildfires indicate they occurred during a relatively rare weather event called a foehn² wind (See detailed description in Appendix 3 - Fire Behavior). The last large wildfire in the Pioneer/Volcano Planning Unit occurred in 1924 (Pi Pi – Indian Diggings Fire). The most recent fire in Amador County affected by a foehn wind event was the Power Fire in 2004. This fire was started during the normal summer weather pattern and was declared contained two days later³. Four days after the Power Fire started, a foehn wind event developed producing down slope winds in excess of 30 mile per hour. The affect of this wind event can be clearly seen in the fire perimeter map on the next page.

Fires burning east of the Pioneer/Volcano Planning Unit during foehn wind events pose a serious threat to assets in both the Pioneer/Volcano and Upcountry Planning Units. There-

fore, the development of this plan is closely coordinated with the development of the High Country Community Wildfire Protection Plan (currently being written). Many of the recommended mitigation measures in both plans that address foehn driven fires will be the same.

Historic fire records indicate numerous large wildfires with burn patterns indicating the direction of travel was from east to west. The latest fire following this pattern was the Power Fire (16,800 acres 2004, see Plate 16 –Power Fire). Fires like the Power Fire pose the greatest wildfire risk to the Pioneer/Volcano Planning Unit, especially to the largest concentration of structures lying in the eastern half of the unit.

Several significant fuel reduction projects are currently developed, being developed, or planned for development in the Upcountry CWPP that directly contributes to mitigating the potential losses within the Pioneer/Volcano Planning Unit. These projects and others, collectively referred to as the “*Cooperative Fire Defense System*”, are large-scale fuel modification projects undertaken by government and private industry.

The *Cooperative Fire Defense System* is a series of fuel management zones on federal and private forestlands designed to provide fire control points in key areas. These fuel management zones are either fuelbreaks or Strategically Placed Area Treatments (SPLAT's, See Plates 17).

Regardless of the type of fuel treatment, the ultimate purpose is to slow the westward advance of fires during foehn wind conditions.

WIND AND TERRAIN DRIVEN FIRES

The normal summer winds come from the southwest. These winds push upslope following major river canyons and branching into lesser drainages as they go. These canyons and side drainages form natural chimneys that favor the rapid spread of wildfires. When fuel accumulations within these natural chimneys are unnaturally high, fire behavior can become very erratic and intense. The steeper the slope on the sides of drainages, the faster a wildfire spreads upslope. Developments located along ridge tops above river and stream drainages are directly threatened by wildfires in drainages. Most major drainages are orientated on an east to west axis. Fires starting during normal summer winds tend to be pushed upslope following the drainages. Even where no wind exists, fires will follow the terrain moving from lower elevation toward high elevations.

The west slope of the Sierra is vulnerable to terrain and wind driven fire. Numerous fires following this pattern have occurred in the central Sierras in recent history. In 2001, the Darby Fire (see Plate 18) started in the Stanislaus River Canyon near the Stanislaus Powerhouse. It rapidly spread upslope along the river canyon. The canyon walls are steepest on the Tuolumne side of the river. Thus, the greatest area burned was in Tuolumne County.

Structures located on ridges where the associated drainages are steep are vulnerable to wildfires similar to the Darby Fire. Fortunately, many of the same mitigation measures for foehn driven wildfires apply to this wildfire scenario. The primary mitigation measures are

managing fuels in drainages to reduce erratic, extreme fire behavior and parcel-by-parcel defensible space within subdivisions.

FUEL DRIVEN WILDFIRES

Fuel driven fires occur where heavy fuel accumulations increase the intensity of a wildfire. Terrain and wind also influenced fuel driven fires. In this type of wildfire, the primary agent contributing to the fire's spread is the fuel. These types of wildfires can cause a great deal of damage.

Normally, these fires are short in duration. Reduction of fuel volumes in and around structures and other assets is the best protection against these fires.

7.1.1 STRUCTURES AND OTHER DEVELOPMENT ASSETS

The eastern half of the Pioneer/Volcano Planning Unit contains the highest concentration of structures within Amador County. Most of the area is zoned R1, R1A, R2, R2A, R3, and RE.⁴ The County of Amador is currently updating its General Plan. All versions of zoning for the new plan increase the residential zoning within the Pioneer/Volcano Planning Unit (See Plate 19, Housing Density.)

Commercial areas exist in Buckhorn, Pioneer, and the Red Corral area. These areas are at risk from large wildfires, particularly foehn wind driven fires.

All of the Planning Unit is within the Wildland/Urban Interface (WUI). Concurrent with the development of this plan a similar plan is being developed for the area east of the Pioneer/Volcano Planning Unit. The Upcountry Community Wildfire Protection Plan identified the area along its western border as a significant wildfire threat to development along highway 88 and beyond. The Pioneer/Volcano Conservation and Community Wildfire Protection Plan also identified the same threat. Both plans delineate two areas - the threat⁵ zone and the defense zone⁶. The defense zone borders the eastern edge of the Pioneer/Volcano Planning Unit. Because wildfire does not respect administrative boundaries, it is vital that the recommended mitigation measures in each plan be consistent. Therefore, many mitigation measures proposed in this plan will mirror those in the Upcountry Community Wildfire Protection Plan.

The lands within the defense and threat zones are primarily managed for timber production. These lands are likely to remain as managed forestlands for many years. Therefore, this area is a place where landscape scale fuel management projects can be constructed and persist over time.

Additionally, both this plan and the Upcountry CWPP identify two areas requiring intense treatment designed to protect densely developed areas along Highway 88 and Shake Ridge Road in the Pioneer/Volcano Planning Unit. Both plans refer to these areas as the Antelope Creek Threat and Defense Zones.

The Threat Zone is that area of the Antelope Creek drainage where a wildfire creates a direct threat to assets located on the eastern edge of the Pioneer/Volcano Planning Unit. The Defense Zone is that portion of the Antelope Creek drainage where fuel management efforts are concentrated to provide direct protection to structures within the planning unit, (See Plate 20, Threat and Defense Zones).

7.1.2 INFRASTRUCTURE ASSETS

POWER GENERATION AND WATER INFRASTRUCTURES

Water is one of Amador County's most valuable natural resource. Intense wildfire can cause significant erosion of soils within the burn area. Known as the "*Fire Flood Sequence*", this erosion can cause significant downstream damage to infrastructure such as water treatment plants, power generation facilities, spawning grounds, and other assets. The post-fire flood potential is greatest within the drainages especially in the Mokelumne River drainage (High risk). The remaining area is rated mostly moderate with some low risk areas, (See Plate 21- Post Fire Erosion Potential).

Important power and water infrastructures are located in and adjacent to the Pioneer/Volcano Planning Unit. Pacific Gas & Electric's Tiger Creek Power Plant and the associated Tiger Creek Afterbay are located near the confluence of Antelope Creek and the Mokelumne River. This is the primary source for the Central Amador Water Project (CAWP) system, the Amador Water System (AWS), and the PG&E Tiger Creek Powerhouse system. Water supplied from rainfall and snowmelt is stored in Tiger Creek Afterbay and gravity feeds to the PG&E Tiger Creek Powerhouse Memcor Plant. There it is treated and serves the PG&E Conference Center.

Water from the Tiger Creek Afterbay is also pumped to the Buckhorn Water Treatment Plant where it is treated and ready for use by residents and businesses in Pine Grove, Pine Acres, Sunset Heights, Fairway Pines, Jackson Pines, Pioneer, Gayla Manor, Ranch House Estates, Pine Park East, Toma Lane, Sierra Highlands, Silver Lake Pines, Ridgeway Pines, Rabb Park, and Mace Meadows.

Water from the Mokelumne River is also stored in Lake Tabeaud and conveyed to the Tanner Water Treatment Plant where it is treated for use by the customers of Jackson, Sutter Creek, Amador City, and Drytown. The Lone Pipeline transports raw water from the Tanner Reservoir to the Lone Water Treatment Plant where it is treated for use by customers of Lone. Additionally, the Mokelumne River is a major source of water to over 1.5 million people in the East Bay area. Wildfires that create significant erosion in the Mokelumne watershed can adversely affect the quality of water to all users.

The South Fork of the Consumnes River is the northern border of the Pioneer/Volcano Planning Unit. The Consumnes River makes up about six percent of the water rights and maximum supply available to local water purveyors. River Pines PUD and the City of Plymouth hold water rights on the Consumnes River and its tributaries.

COMMUNICATIONS INFRASTRUCTURE

Volcano Telephone Company has thirty remotes scattered throughout the Planning Unit. Many of these facilities control the generation of ring tones. If any of these are damaged by wildfire, the ability to use the Reverse 911 system or to use local phone trees to notify citizens of the wildfire could be compromised and WI FI would be compromised. Additionally, Volcano shares a cell phone tower with a major cell phone provider. This tower is located on eastern edge of the Planning Unit. Finally, the Volcano Phone Company operates a WI FI site that provides a means for the company to communicate repair and other information with its main office.

SCHOOLS

Pioneer Elementary School is located along Highway 88 east of the community of Pioneer. The fuels near the school and its construction make it unlikely that this facility would be threatened by wildfire except in the most extreme conditions (see Buckhorn Risk Survey)

LPG STORAGE

Kamps Propane is located on Highway 88 ¼ mile east of Highway 26. The fuels and the fact that this facility is surrounded by wide roads make it unlikely that this facility would be threatened by wildfire except in the most extreme conditions (see Williams tract Area Risk Survey)

PG&E POWER TRANSMISSION LINES

Pacific Gas and Electric (PG&E) maintains high voltage power transmission lines that bisect the southern portion of the Planning Unit. Smoke, heat, and errant fire retardant drops from air tankers can disrupt power service for short period. PG &E's distribution lines are more vulnerable to damage from wildfire. These lines are mounted on wooden poles with wooden cross arms. It is common for power lines of this type to suffer extensive damage during wildfires. With the exception of the Sherwood Forest area and a few isolated structures, virtually all residences and businesses are served by these power distribution facilities.

7.1.3 CULTURAL ASSETS

Several local cultural assets exist but are generally not at risk from fire. See the Volcano and Buckhorn risk assessments.

Molly Joyce Park

Pioneer Park

Historic buildings in Volcano

Masonic Caves in Volcano

7.1.4 NATURAL ASSETS

One of the major reasons for living in the Pioneer/Volcano Planning Unit is the beauty of the environment. Large wildfires, such as the Power and Rancheria Creek fires, can cause near complete destruction of the viewshed⁷. Renewal of the forest following large destructive wildfires takes many years.

Wildlife habitat and rare flora and fauna are often destroyed by wildfire. The central Sierra is home to many species. These include:

- California buckeyes, *Aesculus californica*
- Manzanita shrubs, *Arctostaphylos* spp.
- The Acorn Woodpecker, *Melanerpes formicivorus*
- Western Rattlesnake, *Crotalis viridis*
- Common King Snake, *Lampropeltis getulus*
- California Ground Squirrel, *Citellus beecheyi*
- Mule Deer, *Odocoileus hemionus*
- Ponderosa pine, *Pinus ponderosa*
- Jeffrey pine, *Pinus jeffreyi*
- Incense Cedar, *Calcedrus decurrens*
- Sugar Pine, *Pinus lambertianna*
- Douglas fir, *Pseudotsuga menziesii*
- Black Oaks, *Quercus kelloggii*
- Western Gray Squirrel, *Sciurus griseus*
- Black Bears, *Ursus americanus*
- Black-headed Grosbeak, *Pheucticus melanocephalus*
- Dark-eyed Junco, *Junco hyemalis*
- Stellar Jay, *Cyanositta stelleri*
- Red Hills soap root, *Chlorogalum grandiflorum* (present in planning unit)

There are at least 1,300 vascular plant species in the Sierra Nevada, along with numerous bryophytes⁸ and lichens. There are at least 450 species of vertebrate animals. One hundred and thirty-five plant species in the Sierra Nevada have status as Threatened, Endangered, or Sensitive⁹.

7.1.5 CONFLICTS BETWEEN NATURAL ASSETS AND HUMAN OCCUPATION

The Pioneer/Volcano Planning Unit is the most at risk area of Amador County¹⁰. This determination of risk is based on the large numbers of homes and businesses present and:

1. Fuels types range from thick stands of mixed conifer and Ponderosa pine to areas of oak woodland interspersed with brush and meadowlands on the westerly part of the unit. Ponderosa pine mixed conifer forests (Fuel Model 10) tend to have frequent, reoccurring fire. Where fuel accumulations exceed historic norms, wildfires in Fuel Model 10 will burn with high intensity.
2. Fuel loads are very heavy in many areas. These unnatural fuel accumulations are often found within or bordering human developments and pose a serious threat the both the ecosystem and human activity.
3. Four large topographical features create the potential for large damaging wildfires. These are the South Fork of the Consumnes River, the Mokelumne River, Ashland Creek, and Antelope Creek. All of these drainages are orientated in such a way that they create natural chimneys for fire to travel from west to east during the summertime prevailing southwesterly winds. While the large fire history for this area indicates large fires occur during a different weather pattern, the combination of terrain, fuel accumulations, and proximity of structures throughout the entire planning unit make this area vulnerable for significant losses during relatively small fires (50-500 acres).

Two of these drainages, Ashland Creek and Antelope Creek, are of special concern. Ashland Creek, where it lies below communities on the west side of Highway 88 contains unusually heavy accumulation of forest fuels, both dead and live. This makes homes and business in some subdivisions vulnerable to damage from wildfires originating in Ashland Creek (terrain and fuel driven fires). Some older subdivisions are at greater risk because of the number of vacant and large lots of unmanaged fuels within the interior of these subdivisions.

4. Historically, large fires in mid to upper Amador County occur on a northeast or east wind. These foehn winds occur periodically during the fire season. Wildfire occurring during foehn winds poses the greatest wildfire threat to the Pioneer/Volcano Planning Unit. However, even relatively small wildland fire, regardless of weather pattern, can cause significant loss of structures.
5. The fuel condition class for most of the Pioneer/Volcano Planning Unit is Condition Class III (See Appendix 3 for detail description of condition class). Condition class is a representation of the divergence from the historical fire regime. The description of Condition Class III is *high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)*.
6. Many subdivisions were created before current fire safe development standards. These developments lack water for fire fighting, two lane roads and/or all season roads, adequate road and address signage, and adequate separation of homes from each other. All these create the potential for large-scale loss of manmade improvements.

7. The high number of homes and other structures affect firefighting strategy and tactics in a manner that increases the potential damage to the ecosystem. The primary strategy of wildfire control is to gain perimeter control. However, wildfires occurring in highly populated areas divert large numbers of fire fighting resources to structure protection. Resources assigned to structure protection are taken away from the primary firefighting objective and this diversion can significantly increase the size and severity of a wildfire.
8. There is a threat to infrastructure (phone, water, electrical generation, etc.) from wildfire.
9. Recent history in other areas clearly demonstrates the potential for loss of life from wildfires. Fifteen people, including a firefighter, were killed in the Cedar Fire (2003), San Diego. This fire occurred during a Santa Ana (foehn) wind. One hundred and seventy-three perished during the 2009 Black Saturday fires in the Australian State of Victoria.

As part of this planning process, a new reverse 911 database was created. This database allows the county to notify residents to evacuate well ahead of an approaching wildfire. It is very important that citizens obey the order to evacuate. Early evacuation of residents from the fire area is the best way to avoid loss of life.

7.2 ASSESSING RISKS IN PIONEER/VOLCANO PLANNING UNIT

Risk assessment was neighborhood based. Neighborhoods were defined roughly by established subdivision boundaries but were at times expanded to include a larger area. The process for assessing risk required detailed onsite analysis of neighborhoods, followed by an analysis of fuel loading using 2009 satellite imagery. Using the satellite imagery fuel loading for each area was mapped. Detailed descriptions of the each risk assessment including maps are included in Background D.

7.3 SUMMARIZING RISKS IN THE PIONEER/VOLCANO PLANNING UNIT

Based on the assets at risk analysis done in Appendices 4, 5, 6 and Background D, the following table documents assets and associated risks.

7.3.1 DEVELOPING COMMUNITY PRIORITIES

Figure 2. Assets and Associated Risks¹¹¹²

Assets and Risks						
Community, Structure, or Area at Risk	Fuel Hazard	Risk of Wildfire Occurrence	Structural Ignitability	Firefighting Capability	Risk Survey Rating Score	Overall Risk
Lower Rabb Park	Extreme	High	High	Low	159	Extreme
Sierra Pines Wandering Hills Area	Extreme	High	High	Low	149	Extreme
Van De Hei Ranch Area	Extreme	High	High	Low	144	Extreme
Amador Pines Unit 1	Extreme	High	High	Low	142	Extreme
Woodland Hills Area	Extreme	High	High	Low	142	Extreme
Amador Pines Units 2&5	High	High	High	Low	140	Very High
Sherwood Forest	Medium	High	High	Low	128	Very High
Silver Lake Pines/Sierra Highlands	High	High	High	High	115	Very High
Sugar Pine Dr Area	High	High	High	High	112	Very High
Carson Pass Pines	High	High	Medium	Low	110	Very High
Williams Tract Area	High	High	Medium	Medium	109	Very High
Upper Rabb Park	Extreme	High	High	High	107	Very High
Buckhorn Area	High	High	High	High	101	Very High
Carson Drive Area	High	High	Medium	Medium	83	High
Black Prince Area	Medium	High	Medium	Low	82	High
Mace Meadows Area	Medium	High	High	High	77	High
Consumnes River and infrastructure	High	High	—	—	—	High
Mokelumne River and infrastructure	High	High	—	—	—	High
Volcano	Medium	High	High	High	72	Medium

Figure 3 – Assets, Risks, and Priorities¹³

Priorities				
Community, Structure, or Area	Overall Risk	Community Value	Cultural Value	Overall Priority
Amador Pine Unit 1	Extreme	High	High	High
Lower Rabb Park	Extreme	High	High	High
Mokelumne River and infrastructure	Extreme	High	High	High
Sierra Pines/Wandering Hill Area	Extreme	High	High	High
Upper Rabb Park	Extreme	High	High	High
Van de Hei Area	Extreme	High	High	High
Woodland Hill Area	Extreme	High	High	High
Consumes River and infrastructure	Extreme	High	High	High
Amador Pines Units 2 & 5	Very High	High	High	High
Buckhorn Area	Very High	High	High	High
Carson Pass Pines Area	Very High	High	High	High
Silver Lake Pines/Sierra Highlands	Very High	High	High	High
Sugar Pine Drive Area	Very High	High	High	High
Sherwood Area	Very High	High	High	High
Williams Tract Area	Very High	High	High	Medium
Black Prince Area	High	High	High	Medium
Mace Meadows Area	High	High	High	Medium
Carson Drive Area	High	High	High	Medium
Volcano	Medium	High	High	Medium

¹ These are the assets at risk enumerated in the California Fire Plan

² Foehn Winds: the name comes from a German local wind. Alternately called Santa Ana, devil winds, or sundowners

³ Contain a fire: a fuelbreak around the fire has been completed. The fuelbreak may include natural barriers or manually, and/or mechanically constructed line.

⁴ R1 Single family residential district; R1A Single family residential and agricultural district; R2 Low density multiple family residential district; R2A Single family (2 acre minimum) residential district; R3 High density multiple family residential district; RE residential estates district

⁵ The threat zone is the area where fires threaten homes and businesses within the wildland/Urban interface.

⁶ The defense zone is the area within the threat zone where fire defenses such as fuelbreaks are placed to protect man-made assets within the wildland/Urban interface.

⁷ A viewshed is an area of land, water, or other environmental element that is visible to the human eye from a fixed vantage point.

⁸ Bryophytes are all embryophytes ('land plants') that are non-vascular:^[1] they have tissues and enclosed reproductive systems, but they lack vascular tissue that circulates liquids.^[2] They neither have flowers nor produce seeds, reproducing via spores.

⁹ "Appendix C, Assessments of Individual Species: Vascular Plants, Bryophytes, and Fungi". *SNFPA Final Supplemental Environmental Impact Statement*. January 2004. <http://www.fs.fed.us/r5/snfpa/final-seis/vol1/appendix-c/assessments/vpbf/index.html>.

¹⁰ Amador County Generic Community Wildfire Protection Plan, Part II, 2004

¹¹ This table comes from Step 5a of the CFA Simplified CWPP Template, p. 5, cafirealliance.org/cwpp/.

¹² Low risk < 50; moderate risk 50-74; high risk 75-99; very high risk 100-120; extreme risk > 120

¹³ This table from step 5b of the CFA Simplified CWPP Template, p. 6