

DIAMOND MOUNTAIN FIRE SAFE COUNCIL



Community Wildfire Protection Plan

June 28, 2020

A. Introduction

Diamond Mountain Fire Safe Council (“DMFSC”) is a community-led organization working to mobilize residents and businesses to protect their environment from catastrophic wildfire. The DMFSC was started in 2019 by three neighbors on Diamond Mountain Road. In its first year the DMFSC garnered strong neighborhood support and participation, and achieved the following accomplishments:

- Held two fire safety education meetings with more than 50 attendees at each meeting
- Launched the DMFSC website
- Developed a database (accessed through the website) to collect and securely retain property owner contact information and property profiles, and continued to increase the percentage of completed property profiles
- Delivered to local fire stations binders with relevant pre-plan information from the DMFSC database
- Expanded the original boundary of neighborhoods represented by the DMFSC to include additional neighborhoods to the north (Kortum Canyon) and to the south (Tucker Acres)
- Purchased and installed a Knox Box at the base of Diamond Mountain Road, which houses pre-plan information
- Installed green reflective property address signs on numerous properties, and continued that work into 2020
- Obtained a \$25,000 grant from Pacific Gas and Electric Company (“PG&E”) used to conduct fuel mitigation along the fire road connecting Diamond Mountain Road to Sharp Road
- Engaged forester Carol Rice to complete a DMFSC Risk Assessment
- Enlarged the working group from the initial core of three neighbors to ten persons, including leads for each of the neighborhoods

After its expansion from the original Diamond Mountain Road neighborhood, the DMFSC now represents neighborhoods in a geographic area of 3,764 acres, bordered on the north by Kortum Canyon Road, on the south by Bothe-Napa Valley state park, on the east by state Highway 29, and on the west by the Napa-Sonoma county border line. These neighborhoods represented by the DMFSC—referred to in this document as the “DMFSC area”—include 201 property parcels.

Because the DMFSC area is located in the interface between wildlands and developed areas, fire hazard is a special concern. Fires may spread from wildlands to homes, possibly damaging structures or even threatening lives. Conversely, wildlands are subject to increased ignition potential from elevated levels of human activities, and most fires in the coastal mountains are human-caused.

This Community Wildfire Protection Plan (CWPP) serves as a platform for recommendations for projects to minimize the threat from wildfire to life safety and damage to homes and natural resources. These recommendations include continuing work on the DMFSC's 2019 projects, as well as new projects for 2020 and beyond. The recommendations are based on a review of the terrain, weather, fuels, and fire history of the area, compared to the values at risk and likely scenarios of fire ignition and spread.

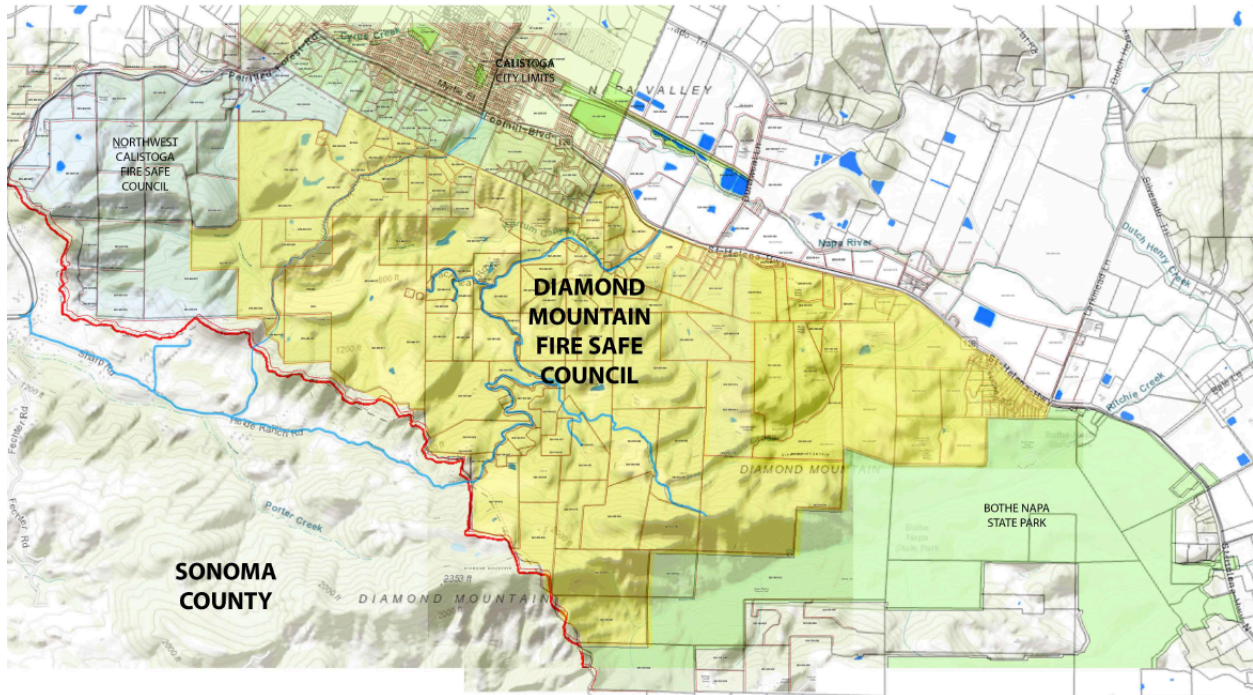


Figure 1a. Area of Interest – Diamond Mountain Fire Safe Council Community.

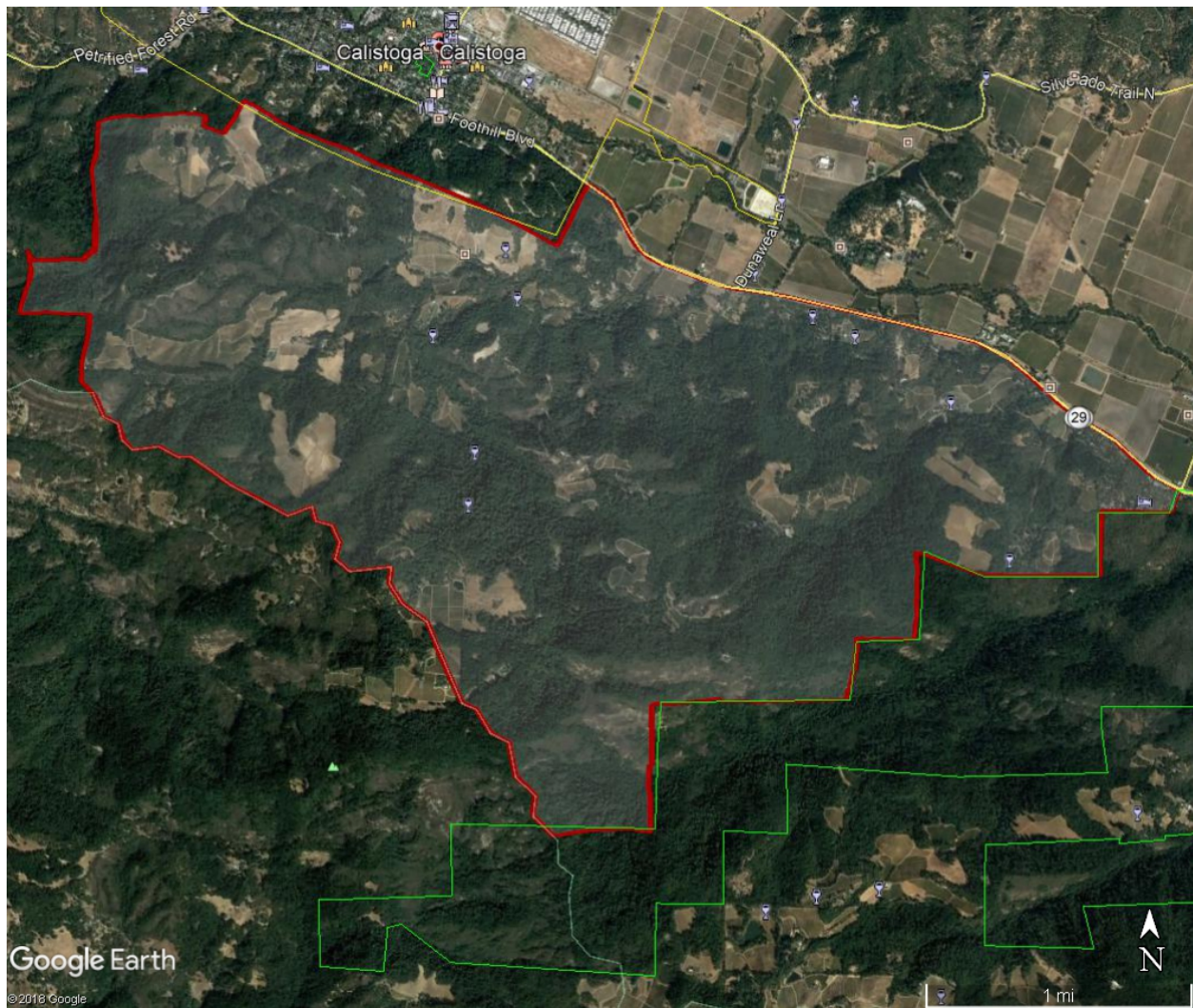


Figure 1b. Area of Interest – Diamond Mountain Fire Safe Council Community.

B. Values at Risk

The most important values at risk are life safety, then improvements to property (residences, wineries, and vineyards), then natural resources. Because all the evacuation routes are long and involve poor road conditions, the threat to human life is significant.

Residences in the Diamond Mountain Fire Safe Council are at high risk from wildfire. The presence of ignition-resistant construction is closely related to the age of the structures. Many structures are older, dating before the requirement for ignition-resistant construction; these homes are mostly made of wood. These residences often have wood porches and decks, but wood fences are a rarity. Although most of these homes have less flammable roofs, wood siding, decks, and unprotected vents make the buildings prone to ignition. Some of these older structures have been remodeled, and a few property owners have installed

personal fire suppression systems involving various water sprinkler strategies. Newer residential structures built after 1996 have features that prevent ignition, such as non-flammable roofs, double-paned windows, and stucco siding.

Wineries of varying sizes are located in the DMFSC area and constitute a value at risk. Larger wineries with permitted production of 50,000 cases per year include Castello di Amorosa and Schramsberg. Smaller wineries with permitted production between 5,000 and 15,000 cases include Checkerboard, Constant, Diamond Creek, and the former Von Strasser/Reverie property (now owned by New World China Land). Of the two largest wineries, Castello di Amorosa is ignition resistant due to its construction material and defensible space, whereas structures on the Schramsberg property are made of wood and are surrounded within a heavily vegetated canyon setting.

A number of vineyards of varying sizes are also located in the DMFSC area. While vineyards may moderate the fire behavior and increase survivability of nearby structures, wildfire also presents a risk to vineyards. Vineyards are at risk from smoke taint in the summer, when the possibility of a fire is highest. The edges of vineyards that abut wildlands are apt to be damaged; this is especially true where patches of brush and woodlands break up the vineyards.

An additional commercial value at risk is the Diamond Mountain Stables, located near the base of Diamond Mountain Road.

C. Topography

Topographic features—such as slope aspect (orientation with respect to sun and wind) and the overall form of the land—have a profound effect on fire behavior. Topography affects a wildfire's intensity, direction, and rate of spread. An area's topography also affects local winds, which are either “bent” or intensified by topographic features. Topographic features can also induce daily upslope and downslope winds. The speed, regularity, and direction of these winds (and other winds) directly influence the direction of wildfire spread and the shape of the flame front.

For example, fires burning on flat or gently sloping areas tend to burn more slowly and spread more horizontally than fires burning on steep slopes. This makes ridgetop positions more vulnerable than those at the bottom of a slope.

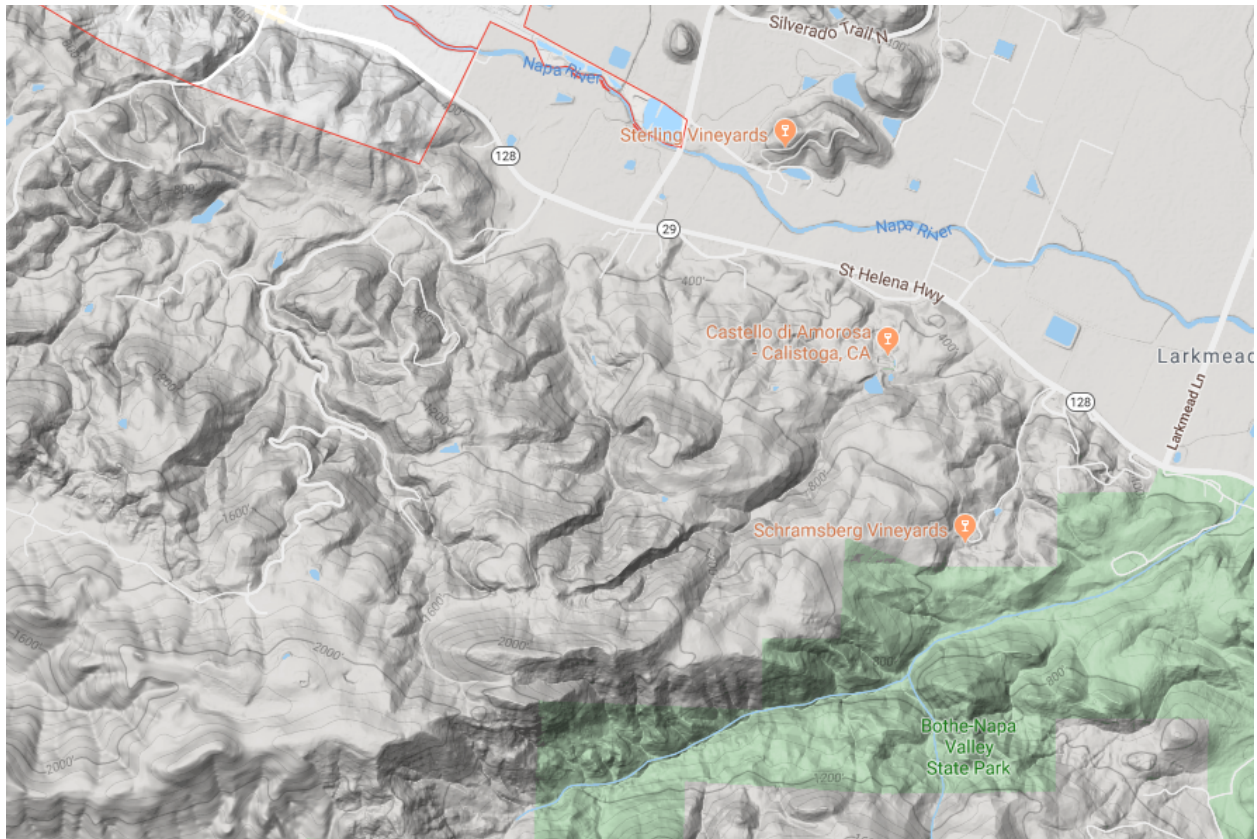


Figure 2. Topography and watershed delineation. From maps.google.com.

Diamond Mountain Fire Safe Council and its environs rise from the valley floor to the western county boundary along a high north–south trending ridge, from approximately 322 to 2150 feet in elevation. The topography is crenulated, with deep, narrow canyons. Most slopes are quite steep, but some broad plateaus are located and almost all have vineyards on them.

Orientation of the Canyons

- Kortum Canyon is an east–west running canyon.
- Diamond Mountain Canyon starts from the valley floor and rises to the southwest. It splits into two canyons, one running southwesterly and another southeasterly.
- Bothe–Napa Valley State Park straddles a long, pronounced east–west running canyon, with steep south–facing slopes leading to the top residences at the end of Diamond Mountain Road.
- Tucker Acres clings to the east–facing slope, but does not extend far west from the valley floor. Some short ravines exceed 100% slopes.

More details of the terrain follow in the discussion of weather.

D. Weather

Weather conditions significantly impact both the potential for ignition and the rate, intensity, and direction in which fires burn. The most important weather factors used to predict fire behavior are wind, temperature, and humidity.

Temperatures and Humidity

Summer days are usually comfortable; temperatures normally range from lows in the 40's to highs in the 90's, with an occasional high reaching a maximum of 105 degrees Fahrenheit. Humidity can drop to the single digits in the summer and fall.

Portions of the Diamond Mountain neighborhood lie in a relatively protected area and would be subject to occasional episodes of still, stagnant air formed by stationary highs during summer months. This overall weather pattern—characterized by continuous high temperatures and low relative humidity—enhances the possibilities of ignition, extreme fire behavior, and extreme resistance to fire control.

Winds

The most important influence on fire behavior is wind. Wind can greatly affect the rate of fire's spread and the output of a fire. Wind increases the flammability of fuels both by removing moisture through evaporation and by angling the flames so that they heat the fuels in the fire's path. The direction and velocity of winds can also control the direction and rate of the fire's spread. Winds can carry embers and firebrands downwind that can ignite spot fires ahead of the primary front. Gusty winds cause a fire to burn erratically and make it more difficult to contain.

Wind will tend to follow the pattern of least resistance and is therefore frequently deflected and divided by landforms. Canyon slopes produce pronounced daily up-canyon and down-slope winds caused by differential heating and cooling of air during the day. This occurs Napa Valley-wide and on a local scale.

Regional westerly winds are blocked by the ridge on the western county border; only the canyon that is located within the Napa State Park is oriented such that westerly winds would easily flow to the Napa Valley.

The winds that create the most severe fire danger typically blow from the east and north, usually in October. These winds—referred to as “Diablo winds”—bring low humidity and elevated fire danger, and can wreak havoc in the Napa Valley, causing fire to spread to the south. These winds are the same ones that blew during the largest fires in Napa history: the 1964 Hanley Fire; the 1981 Atlas Peak

Fire; and the 2017 Tubbs, Nuns, and Atlas Fires. These Diablo wind events generally last from 15 to 35 hours, but in 2000, 2003, 2005, 2017, 2018, 2019, these events in October and November lasted for five to 14 days. This type of wind could “push” a fire from the valley floor to the lower portions of the Diamond Mountain Fire Safe Council area.

The east-facing aspect of the Diamond Mountain Fire Safe Council and its placement above the vine-covered valley floor moderate its risk from the Diablo winds. This is because when these Diablo winds move upslope they slow down due to friction. So, communities on the western slopes are less at risk than communities on the east side of the Napa Valley during northeasterly wind episodes.

E. Vegetation

There are several types of vegetation in the Diamond Mountain neighborhood. These include:

- Oak Woodlands
- Coniferous Forests
- Brush
- Vineyards
- Landscaping

Each vegetation type burns differently, based on the amount of biomass available to burn, the distribution of biomass in the vegetation, as well as the moisture and oil content of the foliage and dead material. Four of these vegetation types have been mapped by the Napa County Watershed Information & Conservation Council (“WICC”) (see Figure 3). However, this mapping does not fully reflect the vegetation types found within the DMFSC area.

Oak Woodlands

According to the WICC, approximately a third of the vegetation is oak woodlands, which occur in fragments of about 20 to 60 acres in size.

Dense canopies, with little or no grass or shrubs under the canopies, typify woodlands. The tree canopy in the lower reaches of the drainages is dominated by coast live oak, but also includes California bay, madrone, California buckeye, Douglas fir and occasional pines.

Fire intensity, flame lengths, and scorch heights are usually low in oak woodlands. Slow-burning surface fires (approximately two feet per minute) are carried in the compact leaf litter layer. Low flame heights (less than one foot) are

the rule. Only under severe weather conditions involving high temperatures, low humidity, and high winds do the fuels pose fire hazards in this vegetation type.

Leisurely spread rates, combined with the relatively short flame lengths of the predicted fire behavior produce a manageable, moderate fire hazard.

However, when shrubs are allowed to develop under the hardwoods, these fuels would pose fire hazards under severe weather conditions, e.g., those conditions involving high temperatures, low humidity, and high winds. If the shrubs develop under oaks, torching is likely to occur because of the ladder fuels that allow a fire to burn from the shrub to the tree crowns. Foliage of both bay and coast live oak can be very flammable when fire reaches the crowns.

Coniferous Forests

Based on the WICC mapping, only a small strip running southwest from Castello di Amorosa is mapped as coniferous forests. However, Douglas fir, Redwood, and other coniferous forests are in fact common along Kortum Canyon Road and Diamond Mountain Road, in the canyons following Diamond Mountain Road, and within the oak woodlands.

These coniferous forests pose a moderate hazard under most conditions, but when hot, dry weather occurs, these forests burn with great intensity. Of all the vegetation types in the Diamond Mountain neighborhood, the dense coniferous forests are most likely to burn as a crown fire. The fire reaches tree crowns, and embers are distributed throughout adjacent areas (including vulnerable residential neighborhoods). Dead material from dying oaks increases fire intensity.

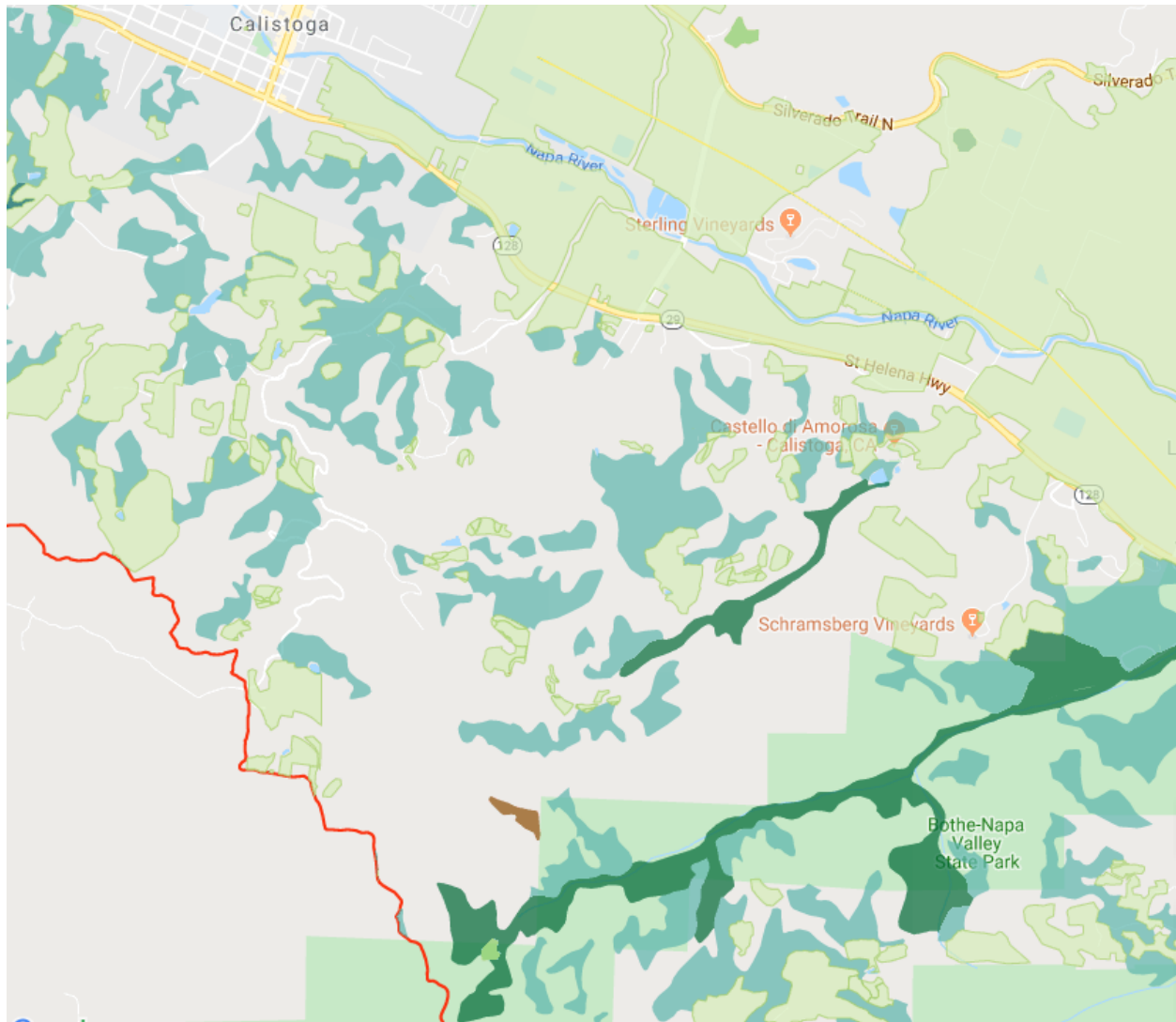


Figure 3. Distribution of vegetation types (per Napa County Watershed Information and Conservation Council, found @ <http://www.napawatersheds.org>).

Blue-green = Oak woodland

Green = Coniferous forest

Light green = Vineyards

Brown = Brush

Brush

A very small patch of vegetation is mapped as brush per the WICC, in the southwest portion of the DMFSC. However, more acreage was observed as brush when conducting on-site observations. These unmapped areas were along the South Fork of Diamond Mountain Road.

Brush produces severe fire behavior, with flames longer than 20 feet in length. Intense, fast-spreading fires in chaparral burn the foliage as well as the live and dead fine woody material in the brush crowns. The foliage is highly flammable

and dead woody material in the stands significantly contribute to increased fire intensity.

This fuel type constitutes the highest hazard. Direct attack is not possible, and containment efforts would need to rely on backfiring or suppression strategies other than line building because the perimeter of the fire is likely to grow faster than a line could be built. In addition, spotting is likely in chaparral which will present even more challenges to suppression efforts.

Vineyards

Although roughly one-third to one-half of the land in the Diamond Mountain Fire Safe Council is mapped as vineyards according to the WICC, other sources suggest that this mapping overstates the acreage of vineyards. For example, a recent survey of vineyard acreage within the Diamond Mountain AVA found that 600 of the 5,000 acres within the AVA (12%) are planted as vineyards. Another study found that there are 40 parcels zoned as containing vineyard within the DMFSC area, with roughly 500 acres planted; this represents approximately 13% of the total acreage within the DMFSC area.

Some of the larger vineyards within the DMFSC area are located—

- West and north of Tucker Acres (Schramsberg)
- In the Castello di Amorosa
- North of lower Diamond Mountain Road (Diamond Creek, former Von Strasser/Reverie)
- Top of Diamond Mountain Road (Constant)
- North of Kortum Canyon (Jackson Family)
- South of Kortum Canyon, west of Pacheteau (Sterling)
- East of Diamond Mountain Road South Fork (Checkerboard)

Fires are usually benign in vineyards. The biomass is concentrated in live vines, with a mowed or bare soil surface. A fire can spread quickly through the vineyard where a ground cover exists, but this situation is rare. Vineyards were instrumental in stopping the Howell Mountain Fire in 1977, and formed the edges of fires in the Tubbs, Nunns, and Kincade Fires, but were part of the contagion in the Cavedale Fire in Sonoma in 1996. Vineyards often have access roads on the perimeter and within the interior, further aiding containment.

Landscaping

Small patches of the DMFSC area were mapped as urban, which indicates the low-density pattern of development. The largest urban patch is 17 acres.

Landscaped areas—being closest to homes—may make the greatest impact on survivability of a house during a fire arising in wildlands. Landscaped areas are (1) moist, and thus will not burn; (2) contain large amounts of fuel, which will burn with great intensity; or (3) are landscaped with fire resistant plants, and only burn slowly with little heat release.

While research results regarding fire resistance of landscape plants are meager, several important generalities have surfaced. First, the overall volume of biomass, as well as the spacing and design of the garden, is more critical than the species selected. Horizontal spaces between planting masses and the house are important components of a fire safe landscape. Similarly, vertical spacing between tree branches, shrubs, ground cover and the structure (particularly windows) are also part of a well-designed garden.

Maintenance of landscaped areas is necessary to remove dead material and to maintain vertical and horizontal spaces. Neglect of landscape maintenance can lead to a significant worsening of the fire hazard closest to the structure.

Luckily, landscaping in the Diamond Mountain Fire Safe Council is generally consistent with fire safety principles. A few residences in each neighborhood have abundant vegetation that can endanger adjacent and nearby residents if they are within a few hundred feet of each other.

F. Predicted Fire Behavior

Flame lengths are expected to be long because of the combination of heavy fuels, especially in the chaparral, and in especially dry conditions in the redwood forests. Where a well-developed understory is present under the oak canopies, fires are also expected to burn with high intensity.

Fires can also be expected to burn fast when they are propelled by dry grass and chaparral. Vineyards can moderate both the fire intensity and fire spread, but would not provide good suppression opportunities for safe evacuation because few abut the road.

The distribution within an area of expected flame lengths can be predicted using public domain software and data. FlamMap was used to model fire behavior using a nationwide dataset called LandFire.

Predicted Flame Lengths

Long flame lengths can be expected in coniferous and oak forests where understory is present. Vineyards and areas of well-maintained defensible space can be expected to burn with low intensity even under the most extreme conditions. Flame length most directly relates to the ability of a firefighter to

safely attack a fire—flames longer than eight feet prevent safe, effective direct attack. Flame length is also most closely related to structural damage—the higher the flame length, the more likely a structure loss.

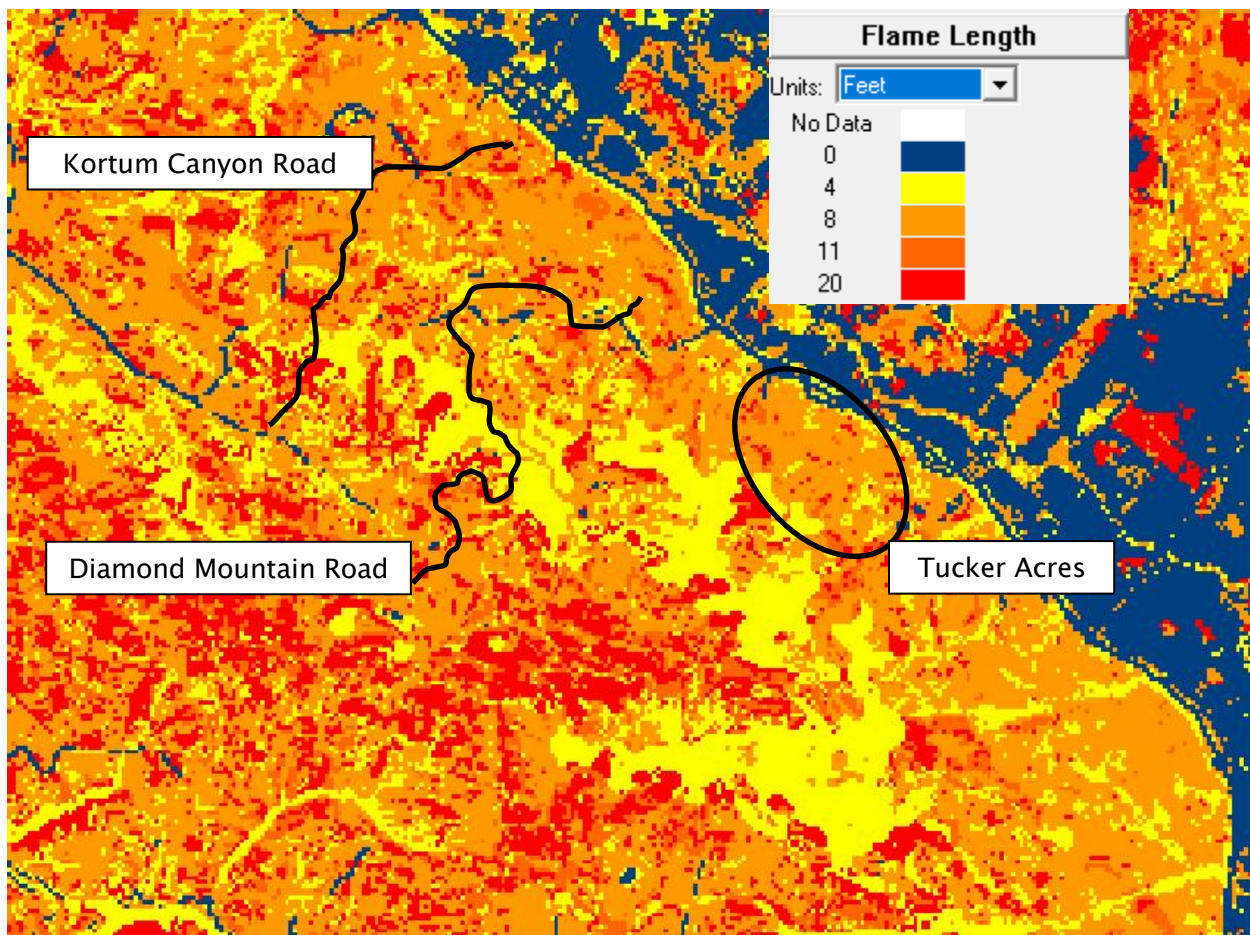


Figure 4. Predicted flame lengths using LandFire data of slope fuels and extreme weather.

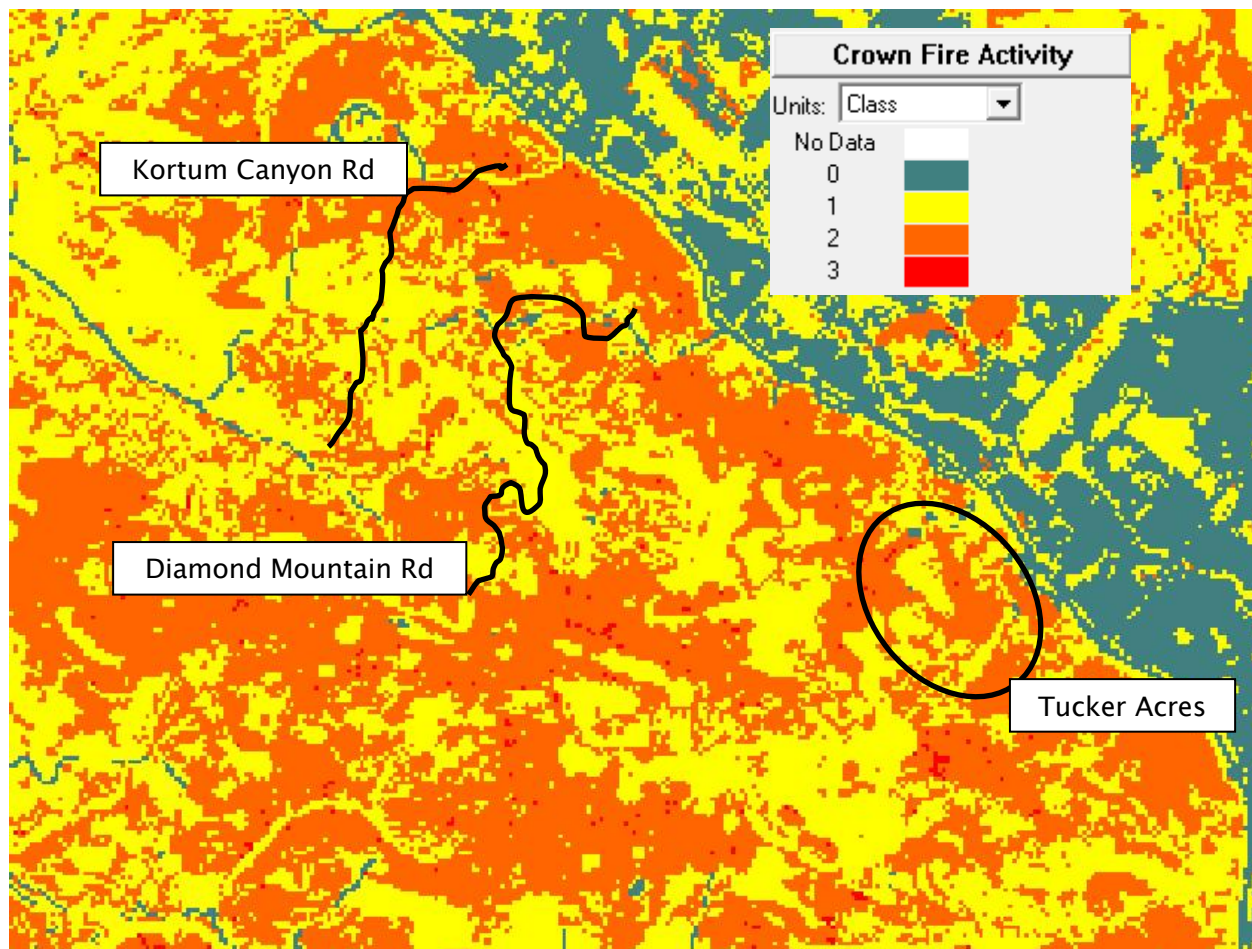


Figure 5. Predicted crown fire activity using Landfire data of slope fuels and extreme weather. 0 = no fire, 1 = surface fire, 2 = torching, 3 = crown fire spread.

While both the coniferous and oak forests can torch, hardwoods are less likely to have fire reaching to the tree crowns, unless vegetation is burning underneath. Crowning potential is crucial because when fires spread into crowns thousands of embers are produced and lofted into ignitable fuels, often overwhelming fire suppression personnel.

Very few areas are predicted to have fire spread within the tree canopy (tree-to-tree), which is actually pretty rare and virtually un-heard of in hardwoods. Areas with higher density of coniferous forests are most at risk to torching and to crown fires.

G. Fire History of the Area

There is no recorded fire history in the DMFSC area, and thus fuels have accumulated for decades.

The Napa Valley has a recurring history of large fires (more than 10,000 acres in size), which typically burn for several days. The typical period between such large fires is approximately 20–30 years. Like much of California, fires in Napa County are almost entirely caused by human-caused accidental ignitions.

In the past, fires did not involve large numbers of structures because of the historic rural nature of Napa County; however, structures are now a common concern whenever wildland fires of any size occur.

Northern Napa County has experienced devastating wildfires in recent years. Most recently, in 2019 the 77,758 acre Kincade Fire burned relatively close to the DMFSC area, up to Petrified Forest Road. The 2017 Tubbs Fire was the nearest fire that approached the DMFSC area, causing the area to be evacuated. The Valley Fire in 2015 burned more 60,000 acres, destroying several hundred structures in Lake and Napa County and causing one fatality. The Butts Canyon Fire in 2014 burned 4,300 acres on the northern Napa County border.

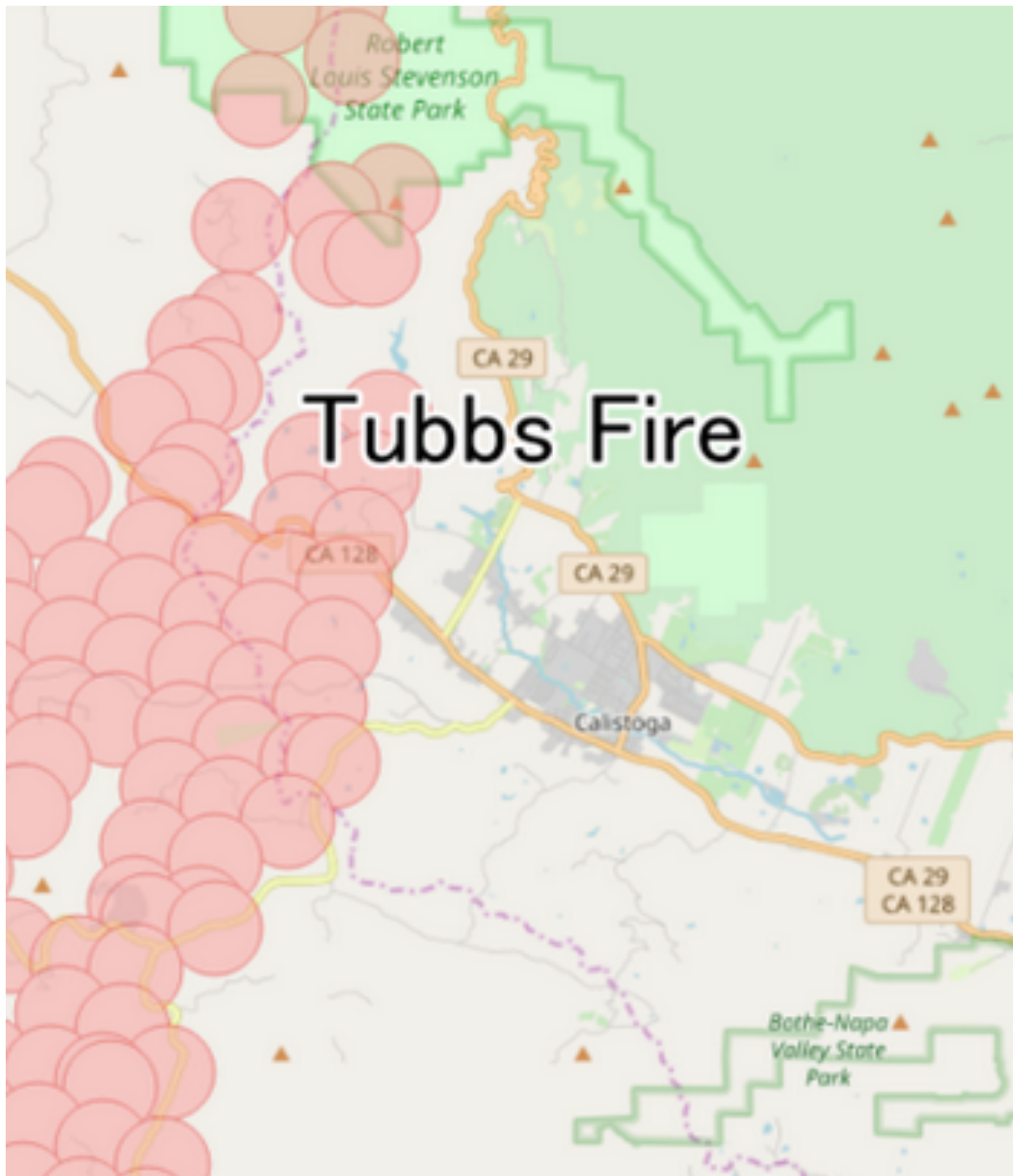


Figure 6. Location of Tubbs Fire in relation to Diamond Mountain Fire Safe Council.
From https://fsapps.nwcg.gov/afm/data_viirs/fireptdata/viirsfire_2017_conus_last7.htm.

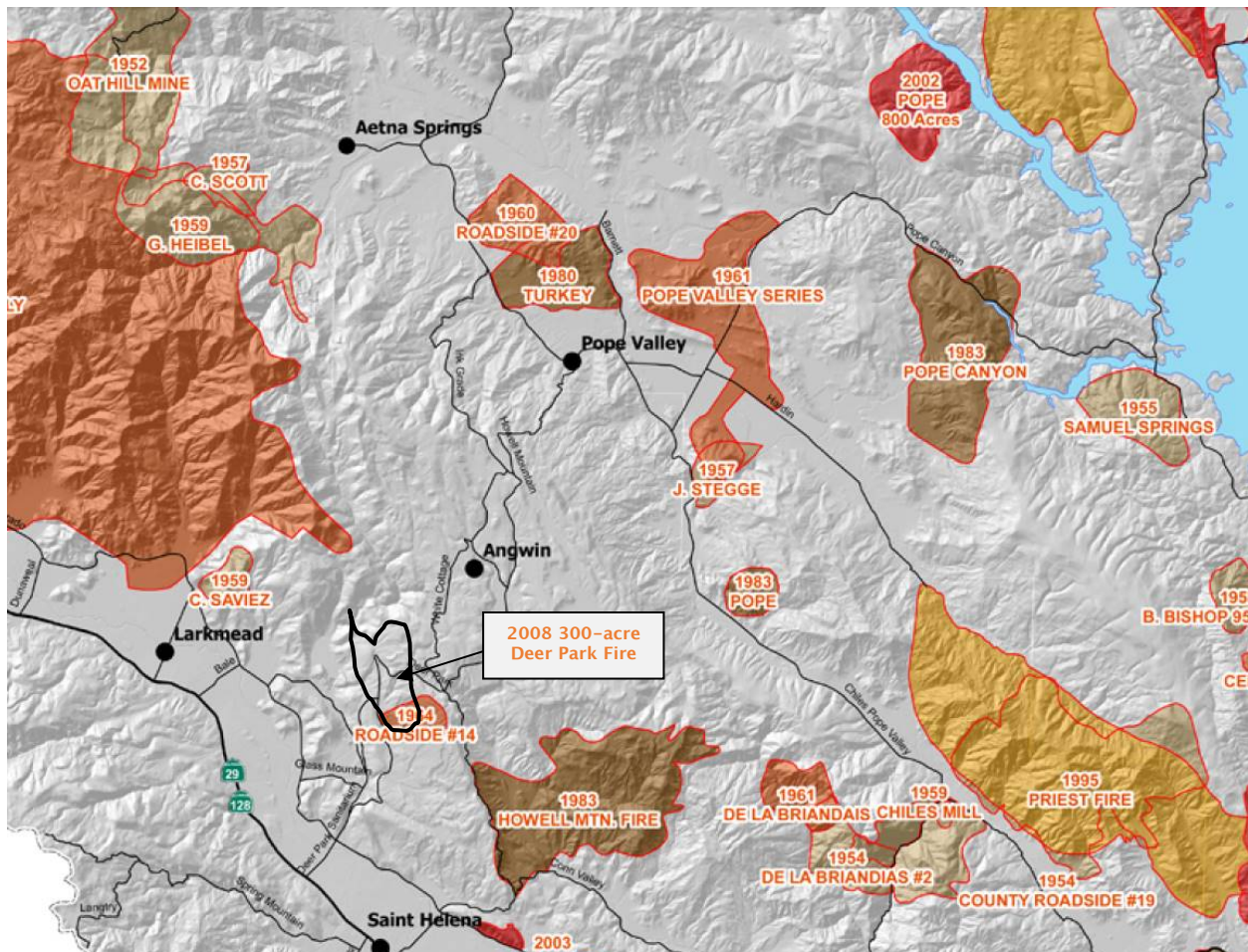


Figure 7. Areas of fires burning in Napa Valley until 2017.

From http://www.mtveederfiresafe.org/pdfs/Napa_Fire_History_large.pdf.

The cause of more than 99% of the fires in Napa County is human activity. Almost one-third of the fires were caused by equipment use, such as workers abating weeds for fire hazard reduction which accidentally cause fires. Vehicles caused 17% of the fires; arson caused 3%. Other causes such as smoking, electrical power lines, and debris burning caused the remaining fires. Historically, 80% of wildland fires in California have started within 10 feet from a road.

H. Access

Access to, from, and within the Diamond Mountain Fire Safe Council is a serious concern. All neighborhoods within the Fire Safe Council are accessed by Highway 29. All roads within the Fire Safe Council lead down to Highway 29. Thus, congestion on this two-lane road is expected to be significant during an evacuation.

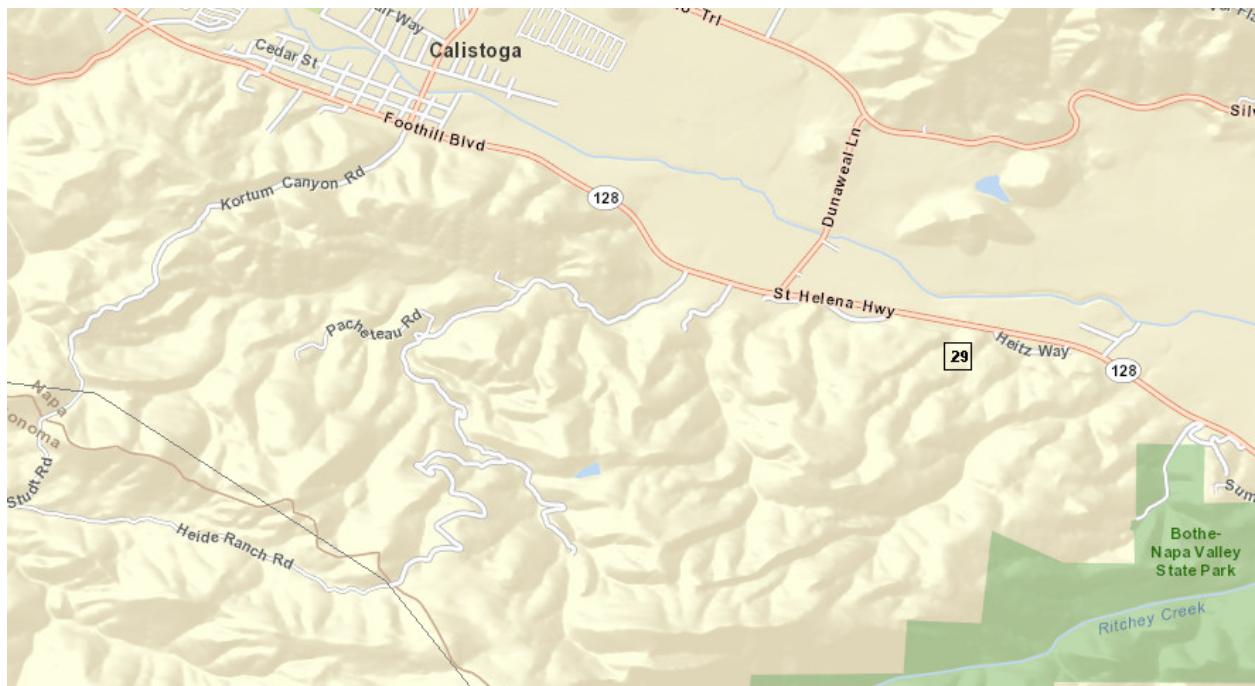
Access in all neighborhoods is challenged by topography. Most lengths of the road are barely two lanes with no shoulders. Pavement (road surface) is generally in good shape. Some curves are simultaneously sharp and steep.

Tucker Acres neighborhood is an arc with two ways leading in and out to Highway 29. Diamond Mountain Road is a long road that connects to Sonoma County via a connector road that crosses private property to Sharp Road, which can serve as another route out in an emergency. Unfortunately, the Sharp Road connector is rocky, poorly drained, and prone to erosion. It is also fairly steep, and traverses through unmanaged vegetation to Calistoga Road.

Kortum Canyon Road leads west to its end and also connects to Sharp Road, albeit further north. The road is passable by most 2WD vehicles.

Driveways in all neighborhoods are generally long. Some residences are served by long shared driveways behind locked gates. Locked gates are common and can further delay emergency response. Locked gates also discourage/prevent inspection by local fire authorities.

Regardless of the condition of the roadbed, access can be blocked by its roadside vegetation. Trees can fall and block passage, or vegetation can burn with such intensity that emergency response and evacuation cannot occur.



*Figure 8. Access and terrain of Diamond Mountain Fire Safe Council.
From maps.google.com.*

Most roads have abundant roadside vegetation. This vegetation could block the road while burning, and afterwards as trees fall (a common event during a fire). Roadside vegetation has been maintained throughout many lengths of roads; however, one blockage would be significant.

I. Hazard Ranking

The vast majority of DMFSC area neighborhoods are categorized as Very High Fire Hazard Severity. The bottom few parcels on Diamond Mountain Road west of Highway 29 are categorized as Moderate Fire Hazard Severity. The bottom few parcels of Kortum Canyon Road are designated by the City of Calistoga as Very High Fire Hazard. Tucker Acres is categorized as Moderate Fire Hazard Severity.

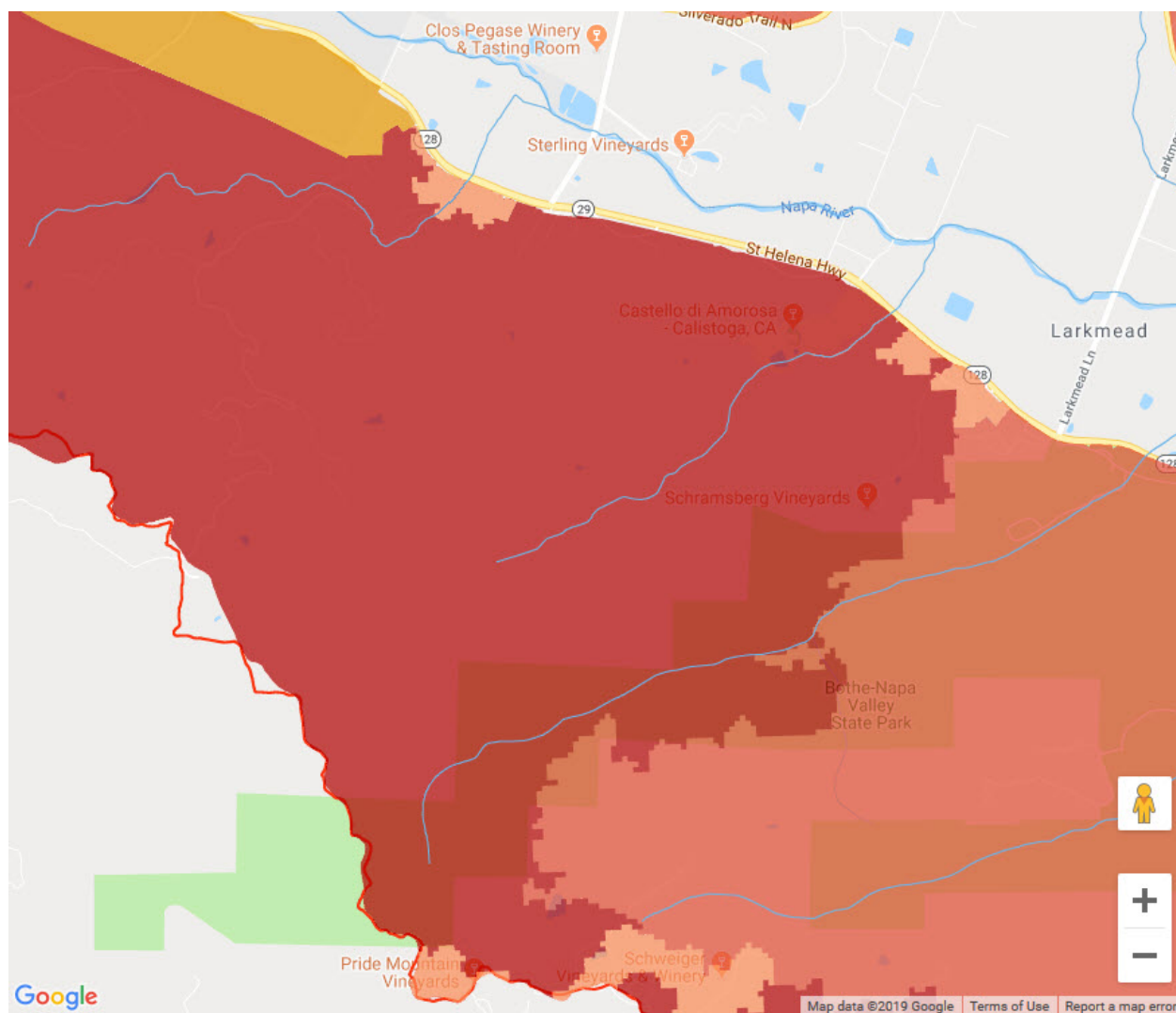


Figure 9. Distribution of areas of high fire hazard. Peach is Moderate, dark red is Very High. Yellow is Local Response Area, Very High fire hazard. From <http://www.napawatersheds.org>.

J. Land Use Distribution & Neighborhoods

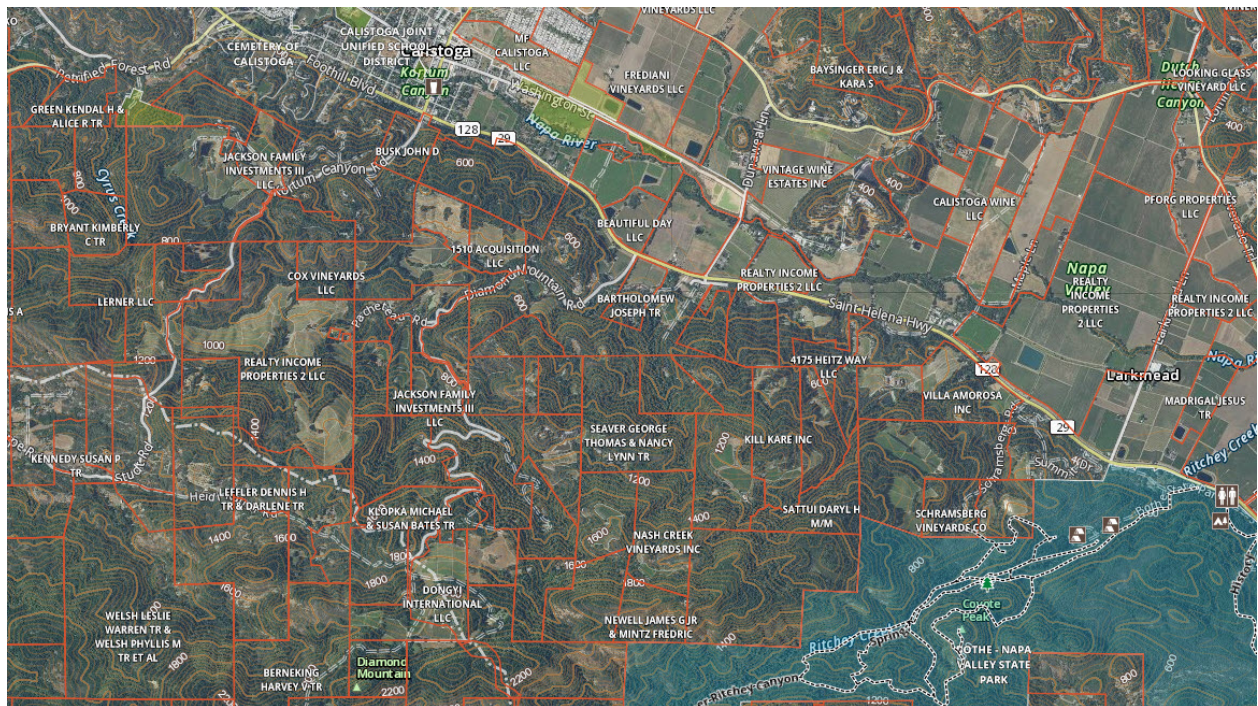
1. Land Use & Ownership

Residential development within the DMFSC area is typically located on large lots following the winding road network. There is also a commercial component within the DMFSC area, including tasting rooms, wineries, and stables. Vineyards in the DMFSC area—comprising 12–13% of the acreage—are especially significant because they change the vegetative fuels, are associated with high values at risk, and are located in what can become strategic containment locations. Vineyards are sometimes located among residences, while some are found in newly developed large lots on the edge of the community.

Undeveloped wildlands abut the DMFSC area on the south and western sides. Land to the south of the DMFSC area is unlikely to be developed, as it is owned by the California Department of Parks and Recreation (“DPR”). However, all other lands are privately held, and to the extent permitted by Napa County’s regulations and planning process, these properties could potentially change land use. If changes in land use convert wildlands to residences and/or vineyards, both would likely improve the fire safety of the area (assuming new residential construction incorporates ignition resistant practices and landscaping is maintained).

Most parcels are large enough that the landowners can influence fire behavior to protect their structures; structures are rarely within 100 feet of the neighboring parcel. The exception to this is Tucker Acres, where lots are narrow and one neighbor's action will influence the risk of fire to another neighbor.

Large landowners that abut residential properties, such as Schramsberg and Castello di Amorosa, typically have managers that maintain a relatively fire-safe condition on adjacent lands. However, the California State Parks has a distinctly different mission for its lands, and does not manage for the fire safety of adjacent landowners. The residents of Tucker Acres who have structures nearer than 100 feet from Napa Bothe State Park should contact the DPR to request a fuel modification zone on DPR property to protect a non-DPR facility if all mitigations on the facility owner’s property have proven to be inadequate. Department policy on fuel modification is designed to minimize damage to natural and cultural resources (DOM Section 1105.6).



2. Neighborhood Characteristics

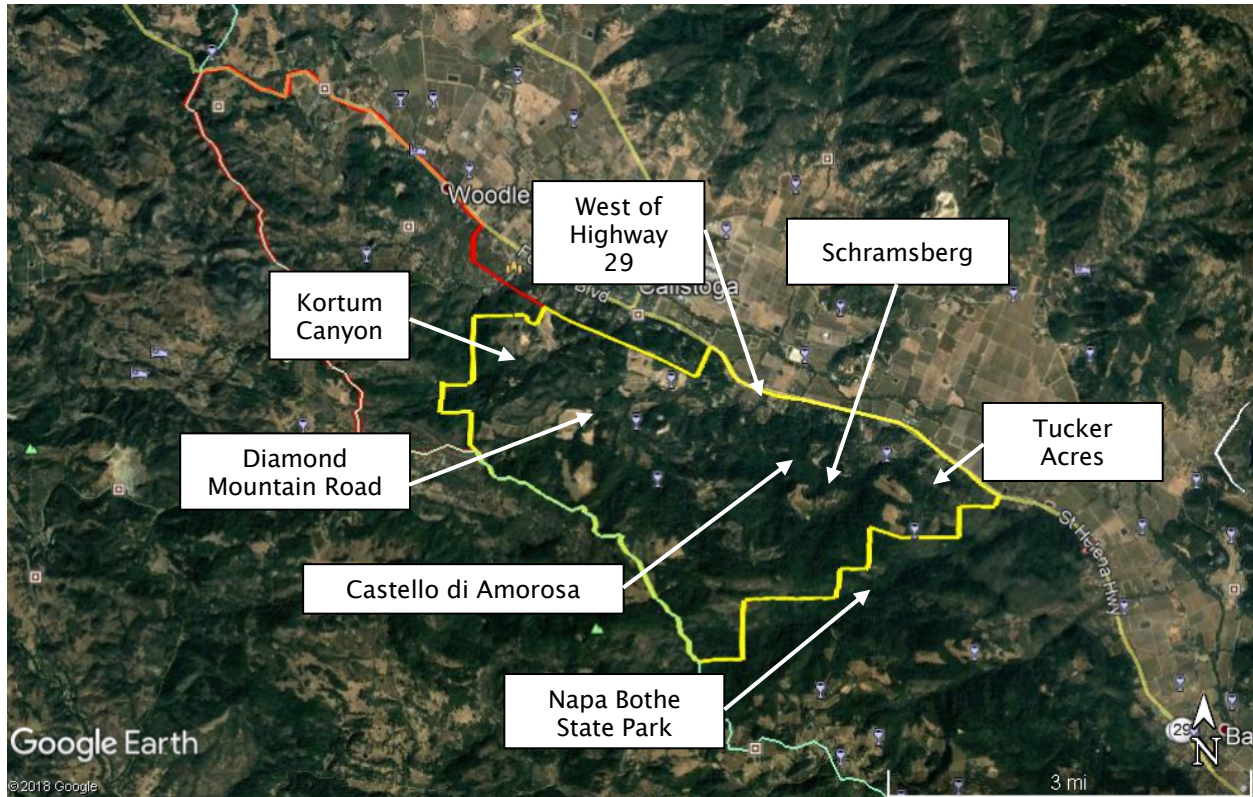


Figure 11. Neighborhoods within the Diamond Mountain Fire Safe Council.

This analysis delineated six neighborhoods based on the development pattern (lot size, street width, age of construction, land use) and roadways. These neighborhoods are:

1. Kortum Canyon
2. Diamond Mountain Road (Upper and Lower)
3. Tucker Acres
4. Schramsberg
5. Castello di Amorosa
6. West of Highway 29

The text in each subsection below describes the characteristics of each neighborhood that relate to fire safety, and identifies potential projects for Napa FireWise that are unique to each neighborhood. Section K of this CWPP ("Recommended Projects") further details these potential projects as well as those that impact multiple neighborhoods.

Neighborhood #1: Kortum Canyon

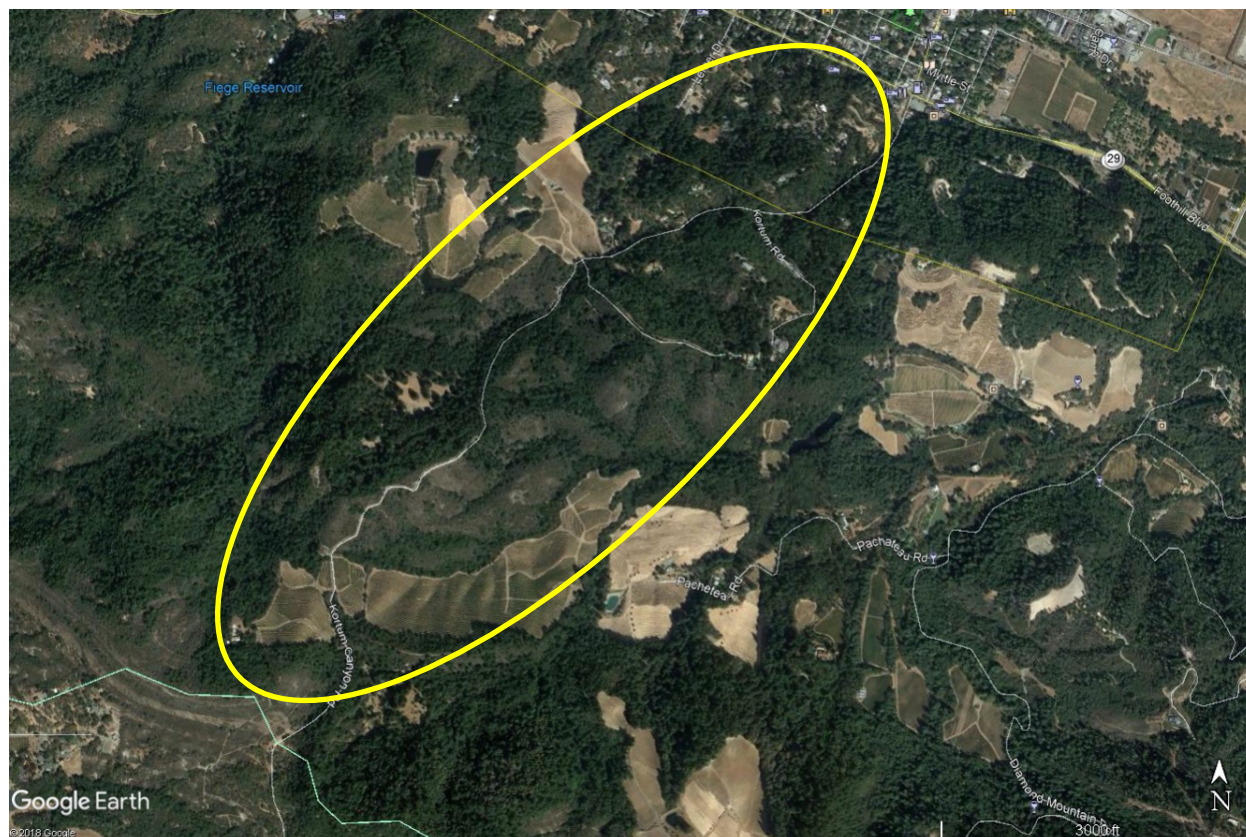


Figure 12. Kortum Canyon Vicinity.

Access: This neighborhood is served by one long road, with a spur to the south. Long driveways are the rule, except for a few on the southern spur. Some residences are accessed via shared driveways. About half have locked gates. The main road is two lanes but has no turnouts; this is problematic at the eastern portion of the road, where there are steep drop-offs in narrow oak-forested canyons. Kortum Canyon Road ends in the commercial district of the City of Calistoga, which is likely to be congested and could block exits during evacuation events.

Terrain: The east-west running canyon is steepest at the lower portions, with more flat, rolling hills further west. Northeast winds are likely to travel quickly up Kortum Canyon.

Defensible space conditions: Some residential yards are exemplary. Most residents are in compliance with fire safety regulations regarding defensible space.

Pattern of development and how it relates to fire safety: This neighborhood consists of approximately 20 structures in residential parcels ranging from one to 20 acres in size, with smaller parcels located on the western portion of the neighborhood. Each parcel is large enough to influence fire behavior around the structure. Vineyard parcels range from 40 to 120 acres, large enough for possible emergency refuge areas.

Adjacent fuels: Vegetation beyond 100 feet from structures is either vineyards or Douglas fir forest with varying levels of understory trees and shrubs. The vineyards comprise a fire safe condition, whereas the Douglas fir forests could fuel an intense fire under extreme weather conditions.

Unusual wind conditions, cause, likely spread: Kortum Canyon is aligned with northeast winds, and would like funnel dry winds, embers and heat up the canyon to the west.

Possible projects for Napa FireWise: This neighborhood would benefit from working to provide alternative access, both to the west to Sharp Road and to the north to Lerner Road. Both would avoid the intersection of Kortum Canyon Road and Highway 29.

Access would also be improved by widening areas for turnouts wherever possible. There is an ample turnout at the intersection of Kortum Road and Kortum Canyon Road. The foot of many driveways could similarly be expanded. This is especially important on the lower portion of Kortum Canyon Road.

Linking Kortum Canyon Road to Lerner Road could be possible with minor grading and agreement between neighbors.

Recognizing that evacuation to a safe situation in the midst of a fire may be challenging—if not impossible—it is recommended that residents educate themselves about possible locations for taking emergency refuge if necessary. The interior of a large vineyard, such as on the Jackson property, would be suitable for such a refuge.

Neighborhood #2: Diamond Mountain Road



Figure 13. Lower Diamond Mountain Road.



Figure 14. Upper Diamond Mountain Road.

Access: Diamond Mountain Road is an extremely long (3.7 miles), steep road (an average of 8% grade) that is 1.5 – 2 lanes, with sharp curves, few turn-outs, and steep drop-offs. There are four hairpin turns that would preclude easy access by emergency response vehicles and would definitely prohibit simultaneous emergency access and evacuation. Long driveways service residential parcels behind locked gates. Access is bolstered by perimeter and interior vineyard roads within the vineyards located throughout the neighborhood. These roads connect parcels away from Diamond Mountain Road. Some vineyard roads are in better condition than many stretches of Diamond Mountain Road.

Diamond Mountain Road splits in two locations—to Pacheteau Road lower down, then into the South Fork and North Fork of Diamond Mountain Road further up. At the top, Diamond Mountain Road connects to Sharp Road on an informal basis, crossing private property. Unfortunately, the Sharp Road connector is dirt, fairly steep, and traverses through unmanaged vegetation to Calistoga Road.

A few locations on Diamond Mountain Road are accessed by an unrated bridge.

All access information is placed in a Knox Box with a key accessible by firefighters at the base of Diamond Mountain.

Terrain: The terrain on Diamond Mountain is consistently steep, generally crenulated, with a few plateaus. The elevation of the community near the valley floor is 345, rising to 1,782 feet at the county line near the top of Diamond Mountain.

The slope faces northeast, with two major drainages on the top half of the slope. The drainages are steep-sided, which challenges vegetation management.

Unfortunately, these canyons are also aligned with wind directions during a northeasterly Diablo wind. Under these conditions, an ignition at lower elevation would burn faster in these canyons and fan to side slopes on the upper part of the community.

Defensible space conditions: Most landowners have done exemplary jobs of creating and maintaining defensible space. Address signs compliant with CAL FIRE guidelines are often installed at the driveway/roadway intersection; some have identified fire suppression support features.

Pattern of development and how it relates to fire safety: This neighborhood consists of approximately 50 parcels; the daytime population (and traffic) is higher due to a large number of vineyard workers. The daily commute traffic on difficult access roads increases the possibility of ignition.

The large lots support vineyards, a stable, forests, and big yards. Structures are a mixture of old and new construction—a mix of ignition resistant and vulnerable features.

Adjacent fuels: Redwood forests and oak woodlands pose a potential for crown fires and ember distribution; they also constitute a falling hazard along nearly the entirety of Diamond Mountain Road. On the other hand, the vineyards interspersed in the neighborhood act as a buffer from fire within the neighborhood and between the structures. The greatest flame lengths can be expected from the unmanaged chaparral.

Unusual wind conditions, cause, likely spread: Car accidents are a likely cause of ignition along Diamond Mountain Road.

Daily up-canyon and down-canyon winds are likely to affect fire spread (especially up-canyon winds in the morning). Normally westerly winds will hit the top of the plateau, and can flow unimpeded along Ritchey Canyon in the Napa Bothe State Park. Any fire in the Napa Bothe State Park can be expected to spread to the southern end of the Diamond Mountain neighborhood.

Possible projects for Napa FireWise: Recognizing that evacuation to a safe situation in the midst of a fire may be challenging—if not impossible—it is

recommended that residents educate themselves about possible locations for taking emergency refuge if necessary. The interior of a large vineyard along Diamond Mountain Road could be suitable for such a refuge.

Access would also be improved by widening areas for turnouts wherever possible. The foot of many driveways could similarly be expanded. This is especially important on the upper portion of Diamond Mountain Road.

Diamond Mountain neighborhood should lobby the County of Napa to remove hazardous trees along the roadside, or alternatively, support a project undertaken by DMFSC to remove hazardous trees.

Neighborhood #3: Tucker Acres

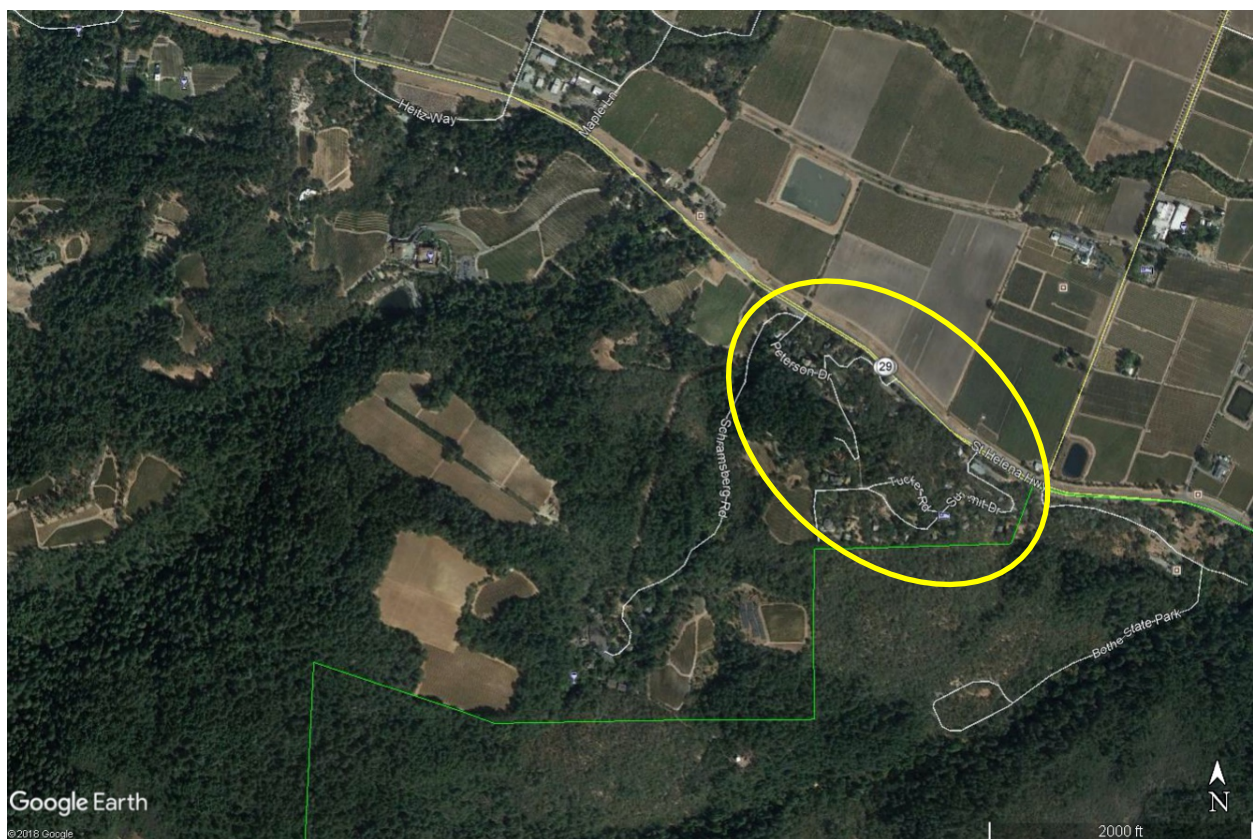


Figure 15. Tucker Acres Neighborhood.

Access: All roads lead down to Highway 29. The Tucker Acres neighborhood roads form an arc with two ways leading in and out to Highway 29. Almost all homes are situated close to the road, with short steep driveways.

The names of the roads change, but the neighborhood has done a good job of marking the change.

Terrain: While the roads and structures are relatively gentle slopes, the edges of the neighborhood are defined by steep slopes falling down to Ritchey Creek and its tributaries.

Defensible space conditions: Many lots are well tended, with few exceptions. Most landowners are actively reducing fuel loads around both the roadways/driveways and structures. However, large back yards on the southern portion of Tucker Acres grade into wildlands and abut the State Park below. A few lots have bamboo as privacy screens; this is an easily ignited, highly flammable landscaping choice. The Tucker Farm Center is in need of work for it to be compliant with defensible space regulations.

Pattern of development and how it relates to fire safety: While this is the smallest neighborhood, it has the greatest population, at 53 lots and 35 residences. Because most of the homes were built several decades ago, they are mostly comprised of wood siding, with wood decks. All have non-combustible roofs, and many have been remodeled to include ignition resistant features such as double-paned windows and covered vents. New structures were built for ignition resistant construction as required. The Tucker Farm Center is a large ignitable building.

Adjacent fuels: Vineyards provide a safe buffer to the northeast, but the surrounding unmanaged shrublands and woodlands pose significant threat to the neighborhood.

Unusual wind conditions, cause, likely spread: In the event of a fire with winds from the south and west, the sharp and deep canyon south of Tucker Acres would funnel heat from the fire to this neighborhood. In addition, roadside ignitions on Highway 29 are a potential cause of wildfire.

Possible projects for Napa FireWise: Tucker Acres could expand evacuation options by connecting through existing vineyard roads and/or improving connections with minor grading.

The residents of Tucker Acres with structures nearer than 100 feet from Napa Bothe State Park should contact the California State Parks to request a fuel modification zone on DPR property to protect a non-DPR facility if all mitigations on the facility owner's property have proven to be inadequate. Department policy on fuel modification is designed to minimize damage to natural and cultural resources (DOM Section 1105.6).

Even more obvious signage regarding the road name change and addresses along the road is a worthwhile project. Green CAL FIRE signs for street names and addresses should be installed at driveway-road intersections. In a related project,

Tucker Acres could install a Knox Box accessible by firefighters with all access information at the base of Tucker Road

Treatments to create a shaded fuel break west of Tucker Acres on the vineyards and wildlands would be a boon to the safety of that neighborhood.

Educational materials and presentations regarding fire-resistant landscaping and retrofit options would be an additional project suited for Tucker Acres.

Neighborhood #4: Schramsberg Road



Figure 16. Vicinity of the Schramsberg Neighborhood.

Access: Access to the winery and vineyards is provided via a narrow winding road. Two other dirt roads leave the main compound and lead to areas potentially safe to shelter in place. There is no other easy access to main compound from off site.

Terrain: Access and the main facility are near the bottom of a drainage with high humidity. The riparian area adjacent to the creek limits fuel management. Most of the property has a northern exposure with some exposed eastern and western slopes. Slopes are not steep below the buildings, with a maximum of 20% drop into the riparian area. Slopes above are gentle in some areas, but reach 40% on west side of compound area

Defensible space conditions: The inner area is well-vegetated with irrigated landscape species, and also has large and small blue gum eucalyptus, as well as both planted and container palm trees.

Pattern of development and how it relates to fire safety: The site consists of numerous buildings and appurtenances confined to about five acres in the center of a 217-acre parcel. All buildings (some historical) have wooden siding and composite roofs within a compound with good mobility and parking. The parcel is approximately 180 acres, and forms the western boundary of Tucker Acres. As such, the management of this property directly influences the fire safety of this neighborhood, especially if a fire spreads from the west with a westerly wind.

Adjacent fuels: Dense brush is located in some areas with eucalyptus in others. Forested area is hardwood woodland being overtopped by Douglas fir overstory. Substantial ladder fuels are present with large dead fuels in abundance.

Unusual wind conditions, cause, likely spread: There are localized upslope, up canyon winds in the afternoons as the land heats. Westerly winds usually prevail in the afternoons but local land features influence direction.

The traffic and visitors, as well as winery operations (involving machineries) are a heightened ignition risk.

Power poles following the roadway may be an additional ignition risk.

Possible projects for Napa FireWise: Working with Tucker Acres, agreements allowing residents to travel west to the vineyards would be a valuable project.

Additional roadside treatments to support evacuation of visitors and workers is also advised, to respond to the risk of ignition from both traffic and power poles.

Treatments to create a shaded fuel break west of Tucker Acres is a boon to the safety of that neighborhood.

Neighborhood #5: Castello di Amorosa



Figure 17. Vicinity of Castello di Amorosa.

Access: One wide road provides access to the Castello facility. The grade is not excessive and easily handles two-way traffic. A spur road within a couple hundred of feet from Highway 29 leads to an operation center. Operational roads on the perimeter of the vineyards provide additional emergency access.

Terrain: The terrain is not challenging; vineyards cover the more gentle slopes, while forested land is steeper. Southeast of the vineyards, Nash Creek flows to the valley floor.

Defensible space conditions: Defensible space is admirable. Italian Cypress trees lining the roadway is the only highly ignitable landscaping observed.

Pattern of development and how it relates to fire safety: This large tourist destination includes a winery and parking. The structure is quite ignition resistant.

Adjacent fuels: Vineyards straddle the main road on the topographic knoll while Douglas fir forests cover the north-facing slopes south of the structures and vineyards.

Unusual wind conditions, cause, likely spread: No particular exposure.

Possible projects for Napa FireWise: No particular projects are identified.

Neighborhood #6: West of Highway 29

Access: Short streets, including Quail Mountain Lane, W Dunaweal Lane, Azalea Springs Way, and Heitz Way lead off Highway 29. Each serve four to six parcels that are at the toe of Diamond Mountain. Driveways tend to be shorter. These residences face less severe access challenges getting to Highway 29, but would face the same congestion on Highway 29 during an evacuation. Almost all parcels are reached through a locked gate.

Terrain: Terrain is generally moderate, with shallow canyons among the wooded slopes.

Defensible space conditions: Properties further up the hill tend to have greater defensible space, while those properties near Highway 29 retain vegetation for privacy.

Vegetation beyond 100 feet from parcels is a mixture of oak woodland, Douglas fir and vineyards. Vineyards comprise roughly a third of the land in this neighborhood.

Possible projects for Napa FireWise: No particular projects are identified.

K. Recommended Projects

In December of 2019, forester Carol Rice completed a Community FireWise Evaluation for the DMFSC. In that Evaluation, 13 projects were recommended to enhance fire safety. Some of the recommended projects span multiple neighborhoods within the DMFSC area. These projects include installation of compliant signs, widening roads in places to create turnouts, establishing alternative evacuation routes, implementing a communication system, identifying emergency refuge areas for residents along the main roads, and increasing education about fire safe landscaping and retrofitting options. Other recommended projects focus more specifically on one or more of the individual neighborhoods. (The Castello di Amorosa and West of Highway 29 neighborhoods do not have a project located in their boundaries.)

The DMFSC convened a well-attended neighborhood meeting on February 29, 2020. At that meeting, Ms. Rice delivered a presentation about the FireWise Evaluation and its 13 recommended projects. Following the presentation, more than 60 attendees voted on prioritization of the proposed projects.

After the February 29 meeting, the scope and description of the 13 projects evolved based on input from various stakeholders. Also, an additional project was recommended. The following charts describe each of the 14 currently recommended projects, including the primary goals of each project. Identified goals include assisting evacuation and emergency response access, reducing ignition potential, reducing property damage, and assisting fire containment. Most projects are aimed at helping evacuation and emergency response access and supporting fire containment. The description of each project includes the prioritization number for the most similar project based on the community's voting on the 13 originally recommended projects.

Project #1		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Educate residents about the need to identify locations suitable for emergency refuge in the event evacuation becomes difficult or impossible		X				Kortum Canyon, Diamond Mountain
Area	Selected vineyards adjacent to Kortum Canyon Road, Diamond Mountain Road					
Goal	Individual residents should identify nearby places of refuge in the event evacuation routes are blocked					
Actions	DMFSC to regularly remind residents to know their neighborhood and identify their own places of refuge					
Participants	DMFSC and residents					
Schedule	Now, any time					
Community Priority	Priority #9					

Project #2		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Install Knox Box facilities at base of roads, using Diamond Mountain as an example		X		X	X	All
Area	At base of Kortum Canyon Road, Tucker Road					Kortum Canyon, Tucker Acres
Goal	Facilitate the work of emergency responders by providing information about properties in the DMFSC area					
Actions	DMFSC to purchase Knox Box and deliver information to Napa County Fire Department					
Participants	Willing members of Kortum Canyon and Tucker Acres neighborhood					
Schedule	Now, any time					
Community Priority	Priority #8					

Project #3		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Develop alternative routes for evacuation: Improve road from Kortum Canyon to Sharp Road		X		X	X	Kortum Canyon
Area	Intersection of Kortum Canyon Road and Sharp Road					
Goal	Provide improved access for emergency responders, and enable Kortum Canyon residents to evacuate safely					
Actions	Obtain funds from Napa County Public Works, grants, or other sources to improve connector between Sharp Road and Kortum Canyon Road					
Participants	Willing members of Fire Safe Council					
Schedule	Now, any time					
Community Priority	Priority #6					

Project #4		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Develop alternative routes for evacuation: Extend road from Kortum Canyon to Lerner Road		X		X	X	Kortum Canyon
Area	Ranch road from 350 Kortum Canyon Road to western end of Lerner Road					
Goal	Provide improved access for emergency responders, and enable Kortum Canyon residents to evacuate safely					
Actions	Obtain property owners' agreements, as well as funding from grants or other sources, to re-grade existing ranch roads					
Participants	Property owners, +/- vendors for machinery					
Schedule	Best in the fall, OK anytime but avoiding nesting season and red flag days					
Community Priority	Priority #5					

Project #5		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Develop alternative routes for evacuation: Obtain approval for use of vineyard roads in emergency		X		X	X	Kortum Canyon, Diamond Mountain, Tucker Acres, Schramsberg
Area	Selected vineyards along Kortum Canyon Road, Diamond Mountain Road, and in Schramsberg vineyards					
Goal	Enable passage of evacuees and emergency vehicles without using main road					
Actions	DMFSC to approach vineyard owners to gain approval and liabilities releases, discuss maximum capacity, exact location, additional fuel reduction work that could be advised					
Participants	Vineyard owners, DMFSC					
Schedule	Now, any time					
Community Priority	Priority #4					

Project #6		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Develop alternative routes for evacuation: Obtain approval for use of vineyard roads in emergency		X		X	X	Tucker Acres, Schramsberg
Area	Selected vineyards in Schramsberg vineyards					
Goal	Enable passage of evacuees and emergency vehicles without using main road					
Actions	DMFSC to approach vineyard owners to gain approval and liabilities releases, discuss maximum capacity, exact location, additional fuel reduction work advised					
Participants	Tucker Acres, Schramsberg					
Schedule	Now, any time					
Community Priority	Priority #13					

Project #7		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Remove hazard trees along roads		X	X	X	X	Kortum Canyon, Diamond Mountain, Tucker Acres, Schramsberg
Area	Roadsides in all DMFSC area neighborhoods					
Goal	Reduce risk that emergency responder access and evacuation routes are blocked by fallen trees					
Actions	Encourage vegetation management by Napa County, but in the absence of County funding, obtain grants or other sources of funding for vegetation management and removal of hazard trees along roads					
Participants	Willing members of DMFSC					
Schedule	Now, any time					
Community Priority	Priority #1					

Project #8		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Call 'em All/Nixle Sign-up		X				All
Area	Throughout DMFSC					
Goal	Alert community members of emergencies, and communicate disconcerting non-emergencies					
Actions	Obtain phone numbers of volunteers, subscribe to service					
Participants	Every resident					
Schedule	Now, any time					
Community Priority	Priority #11					

Project #9		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Create shaded fuel break south of Tucker Acres		X		X	X	Tucker Acres
Area	Southern border of Tucker Acres					
Goal	Calm fire behavior adjacent to structures					
Actions	Request permit from California State Parks and perform approved fuel management on State Parks lands					
Participants	Selected parcel owners of Tucker Acres					
Schedule	Best in the fall, OK anytime but avoiding nesting season and red flag days					
Community Priority	Priority #2					

Project #10		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Expand roadside turnouts		X		X	X	Kortum Canyon, Diamond Mountain
Area	Bottom half of Kortum Canyon Road, wherever possible on Diamond Mountain Road					
Goal	Provide opportunities for simultaneous evacuation and emergency response, and/or passage past disabled vehicles during evacuation					
Actions	Work with Napa County on priority to re-grade these roads with turnouts per the Countywide road improvement plan; if County funding is unavailable, obtain grants or other source of funding					
Participants	Property owners, +/- vendors for machinery					
Schedule	Best in the fall, OK anytime but avoiding nesting season and red flag days					
Community Priority	Priority #3					

Project #11		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Schramsberg Road Roadside Treatments		X	X	X	X	Jensen
Area	30-ft both sides of Schramsberg Road					
Goal	Enable passage of evacuees and emergency vehicles					
Actions	In wildlands, chip all dead material, remove (cut, pull and/or spray) understory shrubs, prune lower branches of trees					
Participants	Hand crews (CDC), property owners, +/- vendors for machinery					
Schedule	Best in the fall, OK anytime but avoiding nesting season and red flag days					
Community Priority	Priority #10					

Project #12		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Hold educational presentations or provide educational materials regarding defensible space, fire-resistant landscaping choices, and retrofit options			X	X	X	All
Area	Throughout DMFSC					
Goal	Guide vegetation to be more fire-safe (see also Project #13), provide residents with resources for more ignition-resistant structures					
Actions	Identify residents' information gaps, gather already existing material, organize material, publish					
Participants	1-3 volunteers					
Schedule	Now, any time					
Community Priority	Priority #12					

Project #13		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Shift forest species composition to woodland from conifer			X	X	X	All
Area	Wildland areas with conifers					
Goal	Modify fuel characteristics of forest to burn with less intensity					
Actions	Develop an area-wide forest treatment plan using available high resolution data; plant oak trees (with funding from NCRS), thin Douglas fir trees					
Participants	Private landowners, private contractors, volunteers					
Schedule	Plant oaks in early winter when soil is saturated, thin trees best in fall, but anytime, avoiding nesting season and high fire danger					
Community Priority	Priority #7					

Project #14		Help Evacuation, Access	Reduce Ignitions	Reduce Property Damage	Assist Containment	Neighborhood(s)
Develop alternative routes for evacuation: Improve private road connecting Diamond Mountain Road to Sharp Road, install access control gates & signs		X		X	X	Upper Diamond Mountain Road
Area	Southeastern end of Sharp Road extension where it intersects Diamond Mountain Road					
Goal	Provide improved access for emergency responders, enable Diamond Mountain Road residents to evacuate safely, and allow simultaneous emergency response and evacuation					
Actions	Re-grade existing private road, install (unlocked) access control gates and signs to protect privacy and property rights of private landowners; in June 2020 CalFire graded and widened the road, and improved drainage; other work is to be funded through grants					
Participants	Property owners, +/- vendors for machinery					
Schedule	Best in the fall, OK anytime but avoiding nesting season and red flag days					
Community Priority	Priority: Immediate					

L. Approval Signatures

The Diamond Mountain Community Wildfire Protection Plan was developed collaboratively and in consultation with interested parties, including Napa Communities Firewise Foundation, CAL FIRE, and the residents of the DMFSC area community.

The Plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends other types and methods of treatments that will protect the DMFSC area community.

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

Agreed: _____ Date: _____
Diane Dillon, Supervisor,
Napa County District 3

Agreed: _____ Date: _____
JC Greenberg, Fire Marshal's Office,
Napa County Fire Department

Agreed: _____ Date: _____
Geoff Belyea, Napa County Fire Chief

Agreed: _____ Date: _____
Christopher Thompson, President,
Napa Communities Firewise Foundation

Agreed: _____ Date: _____
Jerry Newell, Diamond Mountain Fire Safe Council
admin@diamondmountainfiresafe.org
www.diamondmountainfiresafe.org