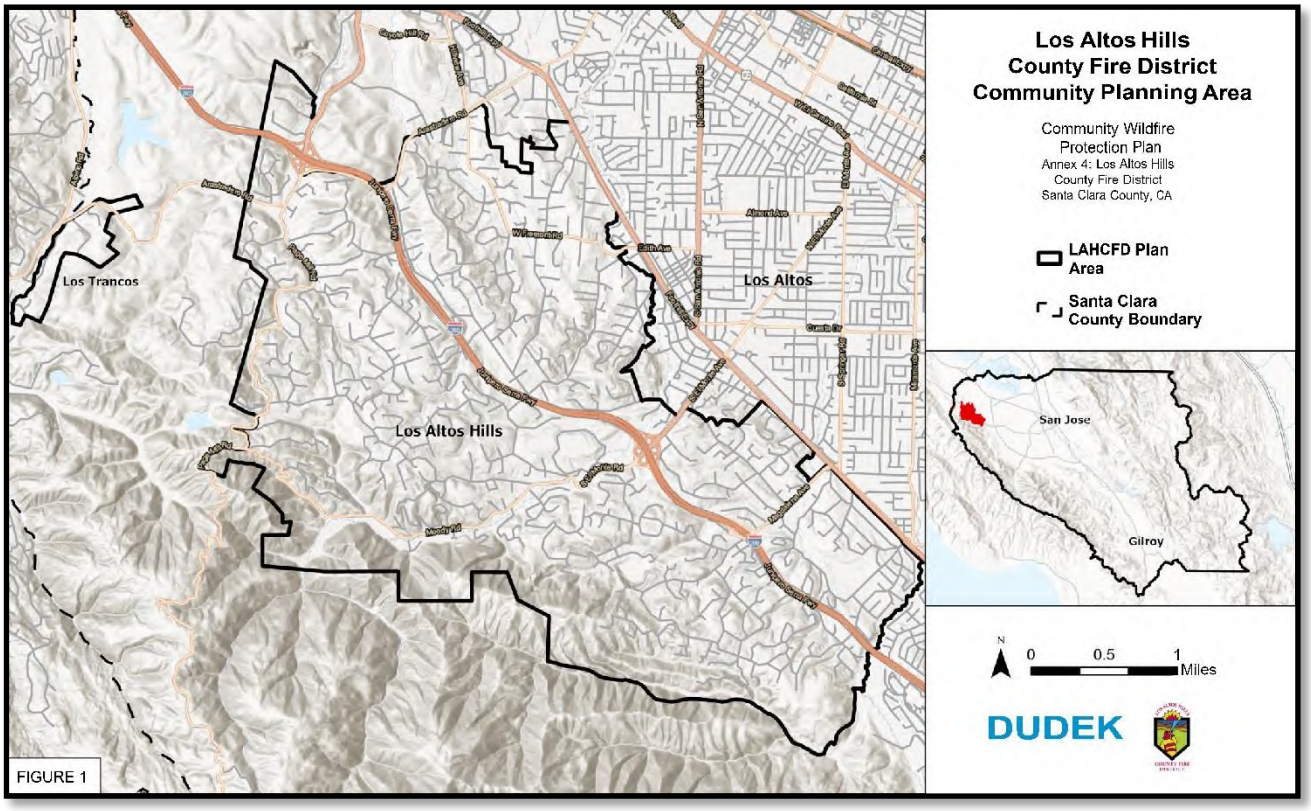
2023 Santa Clara County Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

NOVEMBER 2023



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LOS ALTOS HILLS COUNTY FIRE DISTRICT

Organization and Jurisdiction

The Los Altos Hills County Fire District (LAHCFD), by contract with the Santa Clara County Central Fire Protection District (SCCFD), provides fire suppression, emergency medical response, basic and technical rescue, hazardous materials mitigation, fire prevention, fire inspection and investigation, public education, domestic preparedness planning, and response to the Town of Los Altos Hills and the unincorporated areas in Santa Clara County known as Loyola, Los Trancos , and San Antonio Hills. Additionally, LAHCFD manages the various contracts, provides services for protection, prevention, building resilient communities and emergency preparedness.

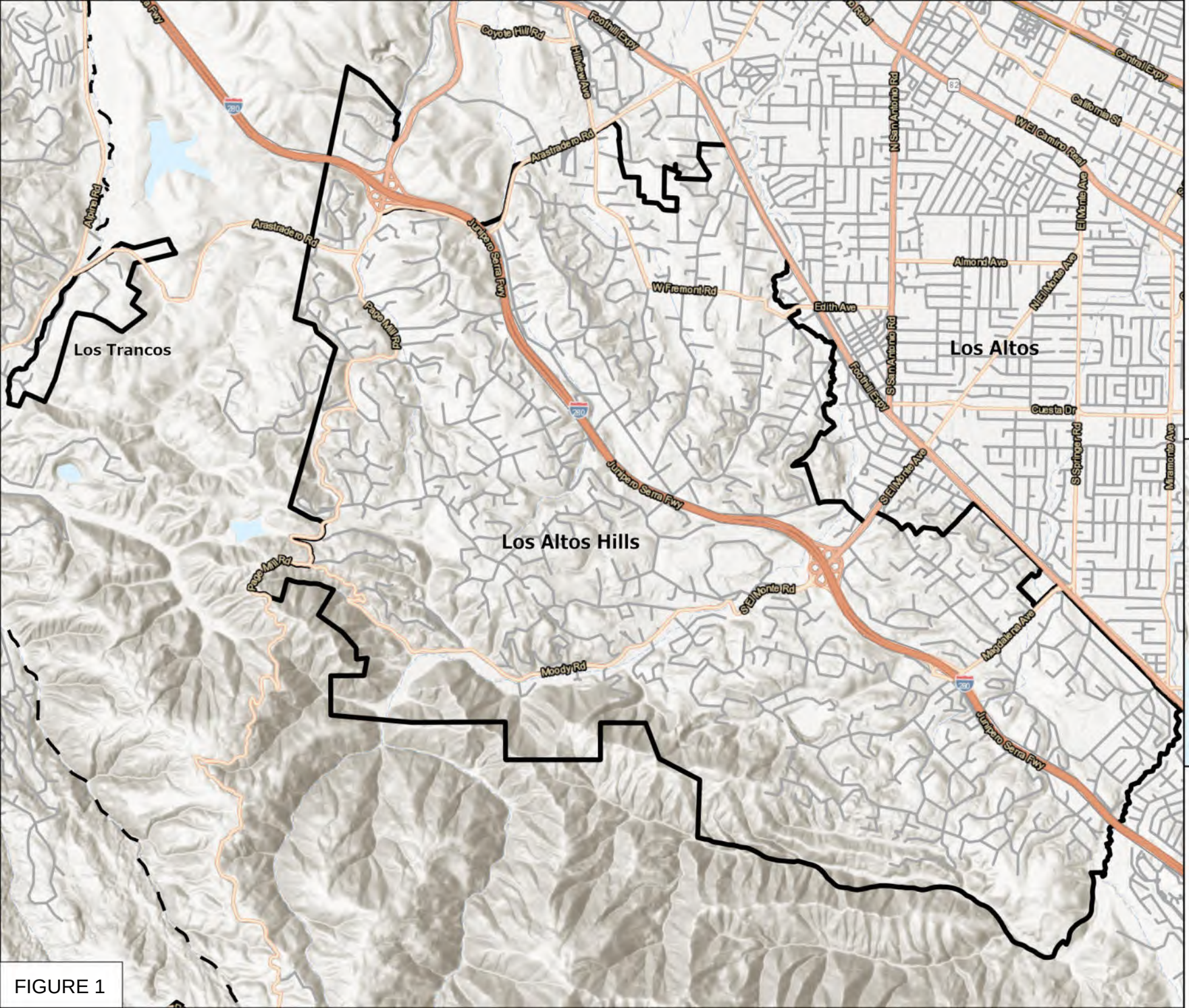
The LAHCFD planning area (Planning Area) covers a total of 11.5 square miles and includes the Town of Los Altos Hills (9 square miles) in addition to 2.5 square miles of unincorporated lands outside of the Town boundary (Figure 1). Most of the jurisdiction within the Planning Area is designated as Local Responsibility Area (LRA), where wildfire jurisdiction and responsibility rests with the LAHCFD and the Town of Los Altos Hills. The smaller unincorporated area of the District is designated State Responsibility Area (SRA) and, as such, the California Department of Forestry and Fire Protection (CAL FIRE) holds wildland fire protection jurisdiction and responsibility. State wildfire prevention codes, particularly defensible space codes (Public Resources Code 4290-91) apply in the unincorporated portion of the District.

The Planning Area is within the eastern foothills of the Santa Cruz Mountains with elevations ranging from 120 to 1,250 feet above mean sea level with the highest elevations located in the southern portion of the Planning Area. The Town of Los Altos Hills is unique in that it predominantly consists of low-density single family residential development with a minimum lot size of one acre. The community prioritizes protection of natural resources including open spaces, riparian areas, wildlife habitat, and heritage oak trees. Non-residential land uses include open spaces, public parks and recreational facilities, a network of roadside and off-road paths, and public and private institutions including schools, religious facilities, and government buildings. The Town's population as of 2020 was 8,489 and is predicted to grow to 9,400 by 2035.

LAHCFD is overseen by an appointed seven-member commission of residents representing the various areas of the District, each serving a term of four years. At least two commissioners must represent the unincorporated County area. The commission is appointed by the elected Santa Clara County Board of Supervisors. LAHCFD is funded by property taxes collected from within the District. This annex summarizes elements of the Fire District's 2023-2027 Strategic Plan and incorporates material content by reference.

Authority for land use decisions, fire/building code adoption, and building permitting processes for LAHCFD follows the underlying governmental boundary and is split between the Town of Los Altos Hills and the Santa Clara County Board of Supervisors.

LAHCFD is a Special District. It is a dependent District and is a component unit of the County of Santa Clara.



Los Altos Hills County Fire District Community Planning Area

Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

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FIGURE 1

Planning Team Participation

To update Annex 4, LAHCFD, engaged environmental services firm, Dudek, to develop a wildfire hazard map of the District using fine scale vegetation data, a community risk assessment broken up by Genasys Protect zones (previously named Zonehaven), and a map identifying priority areas for roadside fuels reduction along major evacuation/access routes. Dudek fire protection planning staff has also completed a field assessment to obtain information regarding community characteristics, fuels composition and distribution, hazard model ground truthing, and other features that may influence wildfire risks to the community.

Additionally, a District-wide community information meeting was co-hosted with the Santa Clara County Central Fire Protection District and the Town of Los Altos Hills on March 23, 2023. This meeting provided the opportunity for residents to receive information, review District maps and give input on projects and topics within Annex 4. LAHCFD held a subsequent community meeting on November 6, 2023 for review and additional questions and answer session for residents.

Risk-Hazard Summary

Los Altos Hills is identified as a community at risk by the California Office of the State Fire Marshal and is listed in the Federal Register as an at-risk community. The Planning Area has a complex wildfire environment that presents a significant risk to public safety and the built environment. The Planning Area experiences a Mediterranean climate, characterized by warm, dry summers and mild, wet winters. This climate is conducive to wildfire occurrence as vegetation is often driest during the warmer summer and fall months. The potential for extreme fire weather is also possible, notably during Diablo wind events which bring warm dry air and high wind speeds to the Bay Area. Vegetation within the Planning Area includes woodlands, shrublands, grasslands, and non-native urban vegetation associated with residential development. All of these vegetation types can facilitate wildfire spread. The Planning Area and adjacent lands feature hilly terrain, in some cases very steep slopes, which contributes to fire hazard. Fires can spread more rapidly uphill, and the presence of canyons or valleys can channel and intensify winds, further exacerbating wildfire risk. Steep slopes can also make firefighting efforts more challenging.

The Planning Area also includes an extensive wildland urban interface (WUI). The development pattern in the Planning Area (1-acre and greater lots) results in homes, roads, and other assets interspersed with vegetation with varying degrees of fuel loading. This means most of the community is exposed to areas where wildfires may occur. Large adjacent open space areas (primarily along the south-west edge of the Planning Area) expose the community to wildfires originating outside the Planning Area and burning toward it. Such fires may burn into the Planning Area. The 2020 CZU Lightning Complex Fire burned within 8 miles of the district's border. Live embers ignited spot fires within LAHCFD. Had weather conditions not changed, this fire could have burned into the Planning Area. Wildfire ignitions are also problematic, especially along roadways within and adjacent to the Planning Area (e.g., I-280, Foothill Expressway, El Monte Road). If not quickly suppressed, these ignitions could cause significant wildfire impacts to the community.

Most of the homes in the Planning Area include defensible space of at least 30 feet, though many fail to achieve defensible space treatment out to 100 feet from structures. A significant number of homes also include combustible decks and fencing that directly interface with flammable vegetation. In addition, there are homes in the Planning Area with wood shake roofs and wood siding. Each of these factors (limited defensible space and combustible building materials) increase wildfire susceptibility and risk.

Planning Area roadways also contribute to community wildfire risk. Roadside vegetation can be substantial, with mature vegetation often growing along roadsides. In many areas, roads are narrow, steep, and winding, therefore posing visibility and evacuation challenges during wildfire events. A significant number of dead-end

roads and narrow driveways are present within the Planning Area. Some properties are accessed via private roads that rely solely on one route for emergency evacuation and some lots have limited space for turning around, posing a potential risk of entrapment for emergency responders.

LAHCFD is actively addressing wildfire risk reduction in the Planning Area through various plans and programs. This CWPP Annex also identifies recommended actions that can be implemented to reduce wildfire risk to the community. These plans, programs, and actions are summarized below:

- **Community Programs:** Includes Fire Station staffing, open space fuels treatment, roadway vegetation management, and shaded fuel breaks for community protection.
- **Resident Programs:** Includes Home Ignition Zone (HIZ) assessments, FirewiseUSA implementation, support, defensible space chipping and debris removal, yard waste disposal, weed abatement, and defensible space assessments.
- **Community Education:** Includes fire and life safety and preparedness training programs including Be Ready, Be Prepared courses, Go-bag instruction and more.
- **Community Emergency Preparedness:** Includes personal emergency preparedness training for residents, support of Community Emergency Response Teams (CERT and teen CERT), maintaining disaster tools and emergency supplies, and utilization of Genasys Protect and AlertSCC for delivering critical emergency and evacuation information.
- **Funding and Staffing:** Includes staff funding, Battalion Chief position with 24/7 coverage, summer fire patrol service funding, seasonal operation of Station 8 during high fire season, purchase of water tender and aerial fire truck, and hydrant repair, additions and maintenance.

WUI Area Description

The wildland urban interface (WUI) is an area in which wildfire risk mitigation projects may be conducted to reduce wildland fire threats to communities at risk. The pattern of development and land use within the Planning Area creates conditions that can be described as either a wildland urban interface or a wildland urban intermix. Urban areas are predominantly built-up environments with little or no exposure to natural vegetative fuels. Such areas are located primarily to the east of I-280 (CAL FIRE 2019). The area where urban development abuts vegetative fuels would be characterized as a wildland urban interface (Interface or WUI). This condition exists where structures abut City parklands and open space. Areas where the density of housing units and structures is lower and/or the space between structures consists of vegetative fuels capable of propagating fire are more typically characterized as a wildland urban intermix (Intermix). This condition exists extensively throughout District, given the town's minimum parcel size of one acre, which allows for more vegetative fuels situated between structures. The wildland fire risk associated with Interface and Intermix areas includes propagation of fire via structure-to-structure fire spread, landscaping-to-structure fire spread, or ember intrusion. Advantages and disadvantages associated with Interface and Intermix areas are presented below.

Wildland Urban Interface

Advantages

- Community water supply systems in place
- Multiple homes accessed by a single road
- Emergency equipment protects multiple assets at once

Structures usually only exposed to flammable fuels on one side

Disadvantages

- High housing density
- Congested roads during emergencies
- Limited options if the community water systems fail

Wildland Urban Intermix

Advantages

- Low housing density

Diversity in water supply systems

Disadvantages

- Increased risk to firefighters
- Emergency equipment can only protect single assets
- Delayed emergency equipment response times due to:
    - Rural roads (single lane, windy, heavy fuel loading)
    - Long driveways
- Congested roads during emergencies
- Inconsistencies in water supply systems
- Structures surrounded by vegetation

WUI Area Defined

The Los Altos Hills County-designated WUI area is located in unincorporated Los Altos Hills. State wildland fire and defensible space laws apply outside Town limits, but not within the Town. The Town of Los Altos Hills has the authority to adopt wildland fire and defensible space regulations throughout the District.

Formal designation of WUI areas within the Town of Los Altos Hills was removed in 2016.

The Countywide CWPP provides maps of WUI areas within the County, including the Planning Area. Table 1 summarizes the coverage of these WUI areas for the Planning Area. The extent of these WUI areas is presented in Figure 2.1 in the Santa Clara County CWPP (SWCA 2023).

Table 1. Wildland Urban Interface Distribution in the LAHCFD Planning Area

WUI Designation	Acres	Percent of Planning Area
Interface	1,902	26%
Intermix	1,663	23%
Influence Zone[1]	1,517	21%
Non-WUI	2,419	30%

Source: Santa Clara County Fire Safe Council, 2023

Fire History

Wildfire Perimeters

Fire history is an important component of fire planning and can provide an understanding of a variety of factors related to fires, including frequency, type and behavior, most vulnerable community areas, and significant ignition sources, among others. One important use for this information is as a tool for pre-planning. It is advantageous to know which areas may have burned recently and therefore may provide a tactical defense position, what type of fire burned in the area, and how a fire may spread. CAL Fire's Fire and Resource Assessment Program (FRAP) summarizes fire perimeter data from the late 1800s to 2022, but which is incomplete due to the fact that it only includes fires over 10 acres in size and has incomplete perimeter data. According to this available wildfire perimeter data (CAL FIRE 2022), no previous wildfires have been mapped within the Planning Area. Regionally, two historic wildfires have burned within 5 miles of the area including the Leib Fire in 1968 which burned 1,328 acres to the west of the area near the community of Sky Londa, and the Stevens Fire in 2007 which burned 166 acres to the south of the area in Stevens Canyon (Figure 2).

In addition to these fires, two notable local fires include the following:

- **1985 Liddicoat Fire:** While not captured in CAL FIRE's fire history database, the Liddicoat Fire occurred in Los Altos Hills in July of 1985 near Arastradero Road west of the intersection with Page Mill Road. Driven by 100-degree temperatures and 15-25 mph wind speeds, the fire jumped from grass to eucalyptus trees and quickly traveled uphill into the neighborhood near Liddicoat Drive. The fire resulted in 150 acres burned, destroyed over a dozen homes, resulted in the death of four horses, two injured firefighters, and caused upwards of 15 million dollars in damages. The cause of the fire was later determined to be arson.
- **2020 CZU Lighting Complex Fire:** On August 16, 2020, the Bay Area experienced a lightning storm of unprecedented scale resulting in over 2,500 lighting strikes starting multiple wildfires which merged to become the CZU Lighting Complex. While lighting strikes were recorded within Los Altos Hills, no wildfires were started. The CZU Lighting Complex main fire continued to spread east towards Los Altos Hills, eventually coming to within 8 miles of the LAHCFD. Embers caused spot fires within LAHCFD. If not for a change in wind direction which slowed the fire's progression eastward, the fire could have easily burned into the Planning Area.

Wildfire Ignitions

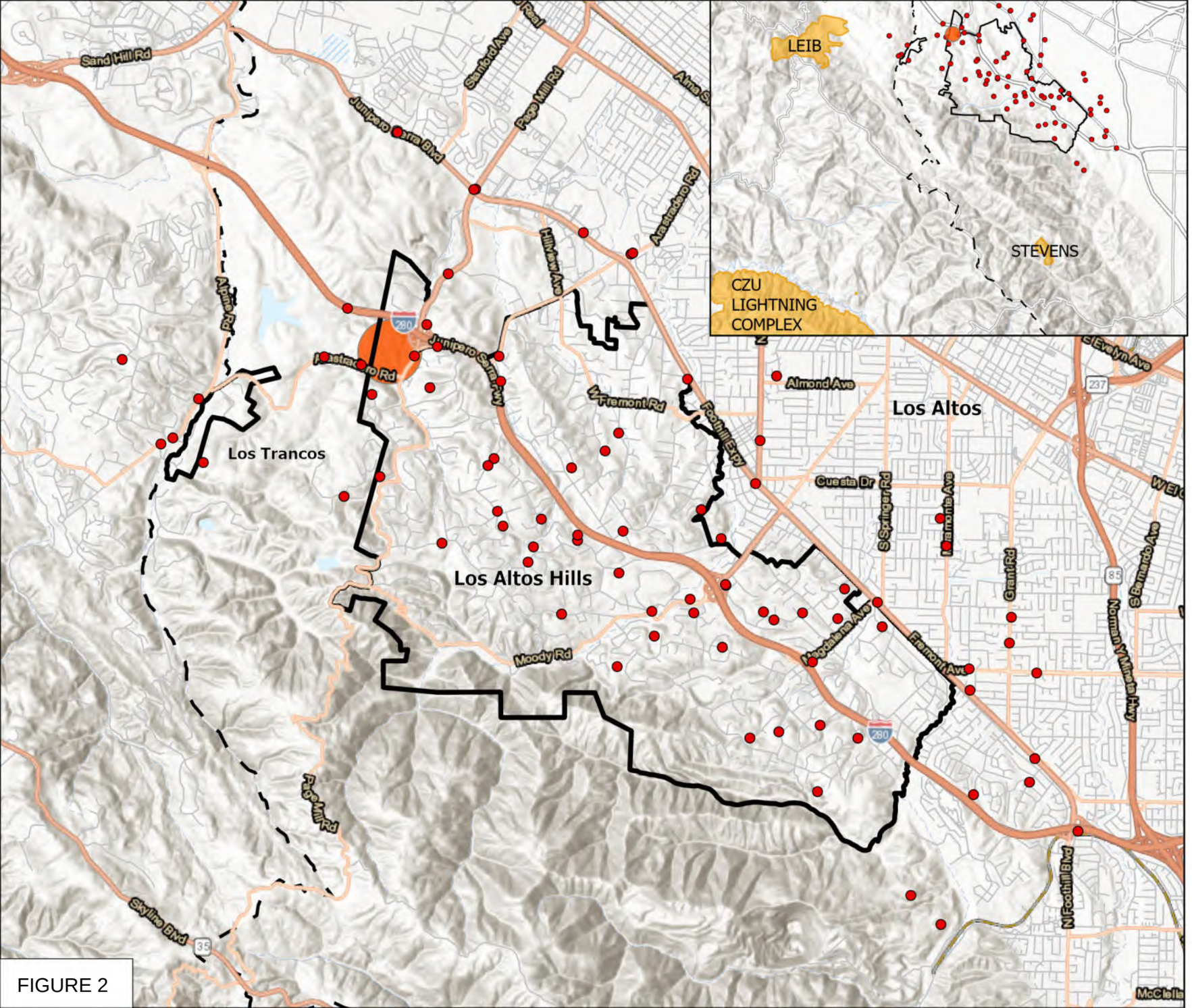
An analysis of wildfire ignition data can also help to understand where ignitions are occurring and inform wildfire mitigation project development. The Santa Clara County Central Fire Protection District (SCCFD) maintains a

[1] Wildfire Influence Zone is wildfire susceptible vegetation up to 1.5 miles from Wildland Urban Interface or Wildland Urban Intermix areas.

data set of wildland fire ignitions occurring throughout the Planning Area from 2018-2022. A total of 28 ignitions have been recorded over this period (LAHCFD 2023).

In addition to SCCFD ignitions data, other wildland fire ignitions datasets were analyzed to identify previous ignition points within the Planning Area. The California Wildfire and Forest Resiliency Task Force provides a wildland fire ignitions dataset for the Central Coast Regional Area which includes all ignitions from 1992-2020 (Short 2022). These records were acquired from the reporting systems of federal, state, and local fire organizations. Additionally, the Wildland Fire Incident Locations dataset provided by the National Interagency Fire Center was evaluated (NIFC 2023). This dataset includes wildland ignitions from 2014-2021 for incidents reported to the Integrated Reporting of Wildland-Fire Information (IRWIN) system.

61 wildland fire ignitions have been recorded within 1 mile of the Planning Area. These are visually presented in Figure 2. Ignitions generally occur along major roadways and in vegetation proximate to residential developments.



Fire History

Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

Santa Clara County, CA

- **LAHCFD Plan Area**
- **Santa Clara County Boundary**
- **Historic Fire Incident (within 1.5 miles of LAHCFD)**
- **Liddicoat Fire Incident General Area**

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0 0.75 1.5 Miles

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FIGURE 2

Terrain

The district Planning Area is topographically diverse, including steep slopes and drainages, rolling hills, mountain peaks, and valleys (Figure 3). The region also features extremely irregular and diverse drainage patterns. Elevations range from roughly 120 feet in the lower portions to 1,250 feet in the south near notable peaks including Elephant Mountain and Ewing Hill. Notable canyons and associated drainages include Adobe Creek, Purisima Creek, Bannon Creek, Matadero Creek, Hale Creek, and Permanente Creek, which vary in their drainage directions. The diverse nature of these drainage patterns is likely to result in changes in local fire behavior depending on their orientation relative to wind direction. Wind speeds are likely to increase in canyons where wind and canyon directions align.

Terrain affects wildfire movement and spread. Steep terrain typically results in faster upslope fire spread due to the pre-heating of uphill vegetation. Flat areas typically result in slower fire spread when absent of windy conditions. Topographic features such as saddles, canyons, and chimneys (land formations that collect and funnel heated air upward along a slope) may form unique circulation conditions that concentrate winds and funnel or accelerate fire spread. For example, fire generally moves slower downslope than upslope. Terrain may also buffer, shelter, or redirect winds away from some areas based on canyons or formations on the landscape. Saddles occurring at the top of drainages or ridgelines may facilitate the migration of wildfire from one canyon to the next. Various terrain features can also influence fire behavior, as summarized in Table 2.

Table 2. Effects of Topographic Features on Fire Behavior

Topographic Feature	Effect
Narrow Canyon	Surface winds follow canyon direction, which may differ from the prevailing wind; wind eddies/strong upslope air movement expected, which may cause erratic fire behavior; radiant heat transfer between slopes facilitates spotting/ignition on opposite canyon side.
Wide Canyon	Prevailing wind direction not significantly altered; aspect significant contributor to fire behavior. Wide canyons are not as susceptible to cross-canyon spotting except in high winds.
Box Canyon/ Chute	Air is drawn in from canyon bottom; strong upslope drafts. No gaps or prominent saddles to let heated air escape. Fires starting at the canyon bottom can move upslope very rapidly due to a chimney-like preheating of the higher-level fuels and upslope winds.
Ridge	Fires may change direction when reaching ridge/canyon edge; strong air flows likely at ridge point; possibility for different wind directions on different sides of the ridge. Ridges experience more wind. Fires gain speed and intensity moving toward a ridge. Fires burning at a ridge can exhibit erratic fire behavior. Strong air flows can cause a whirling motion by the fire. As the wind crosses a ridge it usually has a leeward eddy where the wind rolls around and comes up the leeward side.
Saddle	Potential for rapid rates of fire spread; fires pushed through saddles faster during upslope runs. Winds can increase when blowing through saddles due to the funneling effect of the constricted pass. On the other side, winds will slow, but erratic winds potentially occur at the saddle due to eddies.

Sources: NFPA 2011; Teie 1994.

The narrow drainage and sub-drainage topographic features of the Santa Cruz mountains and foothills have the capability to funnel winds, increase wind speeds, erratically alter wind direction, facilitate fire spread, and promote extreme fire behavior. Terrain in the Planning Area is, therefore, capable of producing wind conditions that promote extreme wildfire behavior.

LAHCFD Topographic Map

Community Wildfire Protection Plan
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Santa Clara County, CA

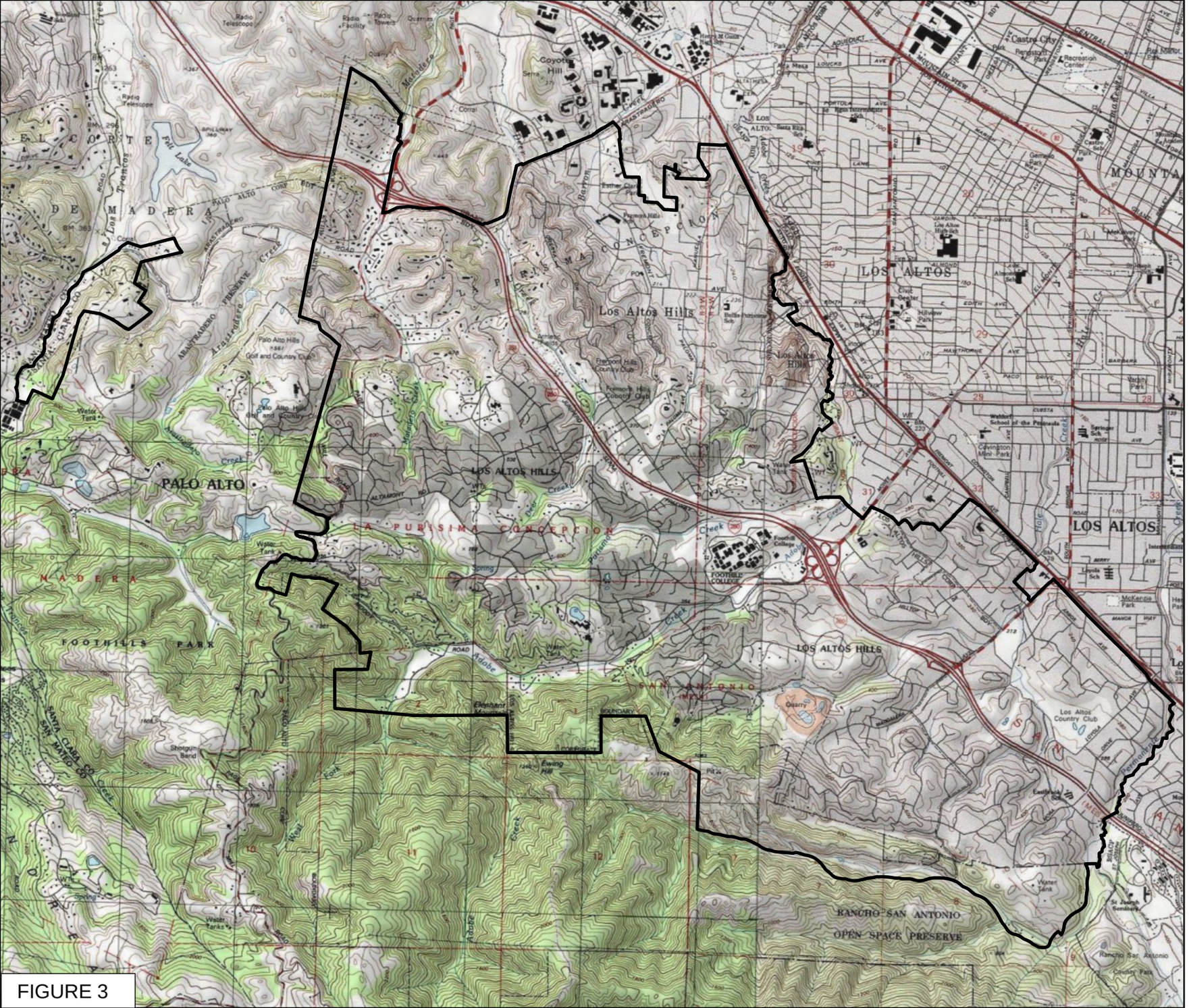


FIGURE 3

Climate

The district Planning Area has a Mediterranean climate, with most of the precipitation occurring in the winter season and little to no rainfall occurring from spring through fall. This area's climate is influenced by its proximity to the San Francisco Bay (Bay). This area is frequently under the influence of a seasonal, migratory, subtropical high-pressure cell known as the Pacific High (WRCC 2017a). Annual precipitation is around 18 inches, with February being the wettest month on average (Los Altos Hills Remote Automated Weather Station (RAWS) 043912, 2022). Live fuel moisture content, a measure of the relative mass of water and indicator of ignitability, for most vegetation in the Planning Area, reaches the driest point in the late summer, or early fall period. Fire season is generally during the summer and early fall months when the temperatures are highest, and fuels dry out.

Prevailing winds in the Planning Area blow from the northwest or west bringing cool moist air from the Pacific Ocean, but the presence of the Pacific Ocean causes a diurnal wind pattern known as the land/sea breeze system. During the day, onshore winds are from the northwest or west and travel from the Pacific Ocean up the hillslopes and canyons of the Santa Cruz mountains and foothills. At night, gentler offshore winds, derived from cooler air masses moving downslope, are from the east or northeast, and travel from inland areas towards the Planning Area. During the summer season, the diurnal winds can be slightly stronger than the winds during the winter season due to greater pressure gradient forces. Additionally, the topography of the Planning Area, situated in the foothills of the Santa Cruz Mountains, can create local variations in wind patterns. The mountains can act as a barrier or funnel for winds, influencing their direction and intensity. Local terrain features such as canyons and valleys can also impact wind flow and cause variations within the region.

The potential for extreme wind conditions also exists in the Planning Area due to the occurrence of Diablo Winds. This wind pattern typically occurs in the late summer and fall and brings hot and dry air from the northeast at high speeds. On average, the greater Bay Area region experiences 2.5 Diablo Wind events annually with highest frequencies observed in October (Fire Research Weather Laboratory 2019). As the winds descend from higher elevations in the east they compress and warm resulting in wind speeds of up to 70 mph on ridgetops. Local topography influences the magnitude of windspeeds, with higher velocities observed in canyons that align with the easterly wind direction. Diablo Winds exacerbate wildfire severity and often occur when fuel moisture content is lowest.

Micro-climates, the climate of a small, restricted area, also characterize the Planning Area due to significant variations in topography including elevation and aspect. Microclimate conditions can greatly affect fire hazard. Such conditions are often not captured in weather station datasets or recorded in easily referenced weather almanacs, but are usually well known to locals, land managers, and local agency fire personnel.

Hazardous Fuel Characteristics

The distribution of vegetation types in the Planning Area is summarized in Table 3 and presented in Figure 4.

Table 3. Vegetation Types in the Planning Area

Vegetation Community/Land Cover	Acres	Percent of Planning Area
Developed/Urban	2,154	29%
Herbaceous	510	7%
Shrub	332	5%
Evergreen Hardwood	2,251	30%
Deciduous Hardwood	305	4%
Riparian Forest	90	<1%
Non-native Forest and Woodland	1,647	22%

Table 3. Vegetation Types in the Planning Area (cont.)

Vegetation Community/Land Cover	Acres	Percent of Planning Area
Eucalyptus	31	<1%
Redwood/Douglas Fir	72	<1%
Agriculture	93	<1%
Water	15	<1%
Total	**7,500**	**100%**

Source: Tukman Geospatial 2023

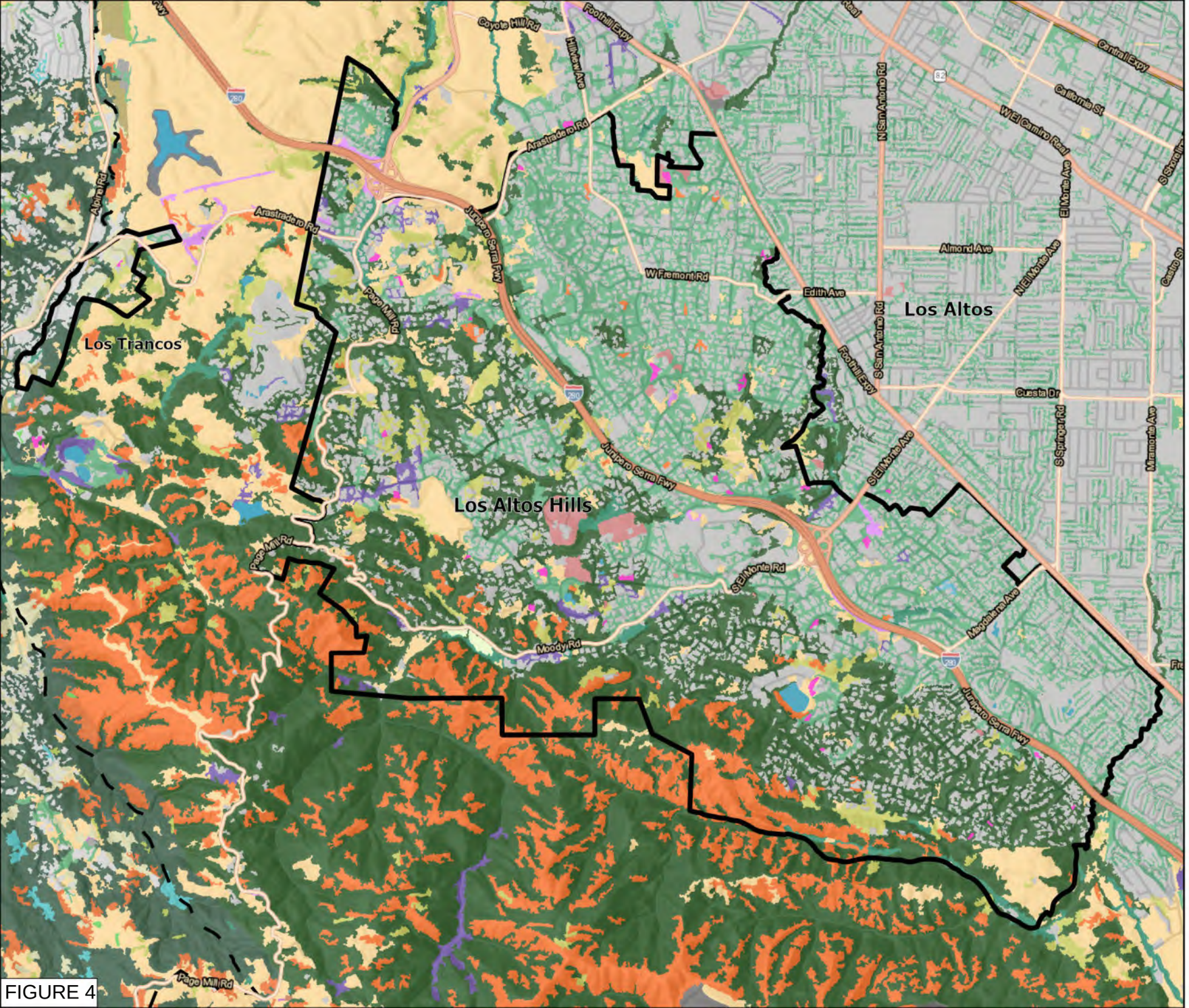
The following sections summarize vegetative fire hazard for the dominant vegetation types identified above, as well as those that present higher fire hazard conditions. Hazardous fuels include live and dead vegetation that exists in a condition that readily ignites; transmits fire to adjacent structures or ground, surface, or overstory vegetation; and/or is capable of supporting extreme fire behavior. All vegetation will burn; however, some plants exhibit characteristics that make them more flammable than others.[2] Flammability can be defined as a combination of ignitability, combustibility, and sustainability, where ignitability is the ease of or the delay of ignition, combustibility is the rapidity with which a fire burns, and sustainability is a measure of how well a fire will continue to burn with or without an external heat source (White and Zipperer 2010).

Plants that are less flammable have low surface-to-volume ratios, high moisture contents, and minimal dead material or debris, while those that are more flammable have high surface-to-volume ratios, exhibit low moisture contents, contain volatile oils, and have high levels of dead material or debris (Moritz and Svihra 1998; UCFPL 1997; UCCE 2016; White and Zipperer 2010). Plant condition and maintenance is also an important factor in flammability. Some plants that have more flammable characteristics can become less flammable if well maintained and irrigated, but can also be explosively flammable when poorly maintained, or situated on south-facing slopes, in windy areas, or in poor soils (Moritz and Svihra 1998). In general, most vegetation within the Planning Area is not regularly irrigated or maintained for the purposes of promoting overall plant health.

Forest pests, such as insects, fungi, other microbes, and vertebrates, are a natural component of California forests. Populations of pests are dynamic and fluctuate in response to climatic and environmental changes such as drought, stand density, fire, and other site disturbances. Healthy, vigorous trees are typically able to withstand pest attacks, when pest populations are at endemic levels. When stressors exist in forests (e.g., overstocking, shading, drought), tree vigor is reduced and tree susceptibility to pest attacks and infestations increases.

The Planning Area is also located within the Pitch Canker Zone of Infestation (CAL FIRE 1998) and the sudden oak death (SOD) Zone of Infestation (CAL FIRE 2005) and the “Regulated Area” for SOD as designated by the California Department of Food and Agriculture (CDFA). Additionally, other pests and diseases affecting native and non-native plants are regularly introduced to California. Presence of pests and disease can cause plant mortality if conditions are optimal for spread and persistence. Such pests and diseases can contribute to wildfire hazard in the long term by increasing dead surface fuel loads and hindering firefighting efforts.

[2] Highly flammable plants are also referred to as pyrophytes or pyrophytic.



Vegetation Communities

Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Vegetation Community

- Annual Cropland
- Barren and Sparesely Vegetated
- Deciduous Hardwood
- Developed
- Eucalyptus
- Evergreen Hardwood
- Freshwater Wetland
- Herbaceous
- Non-native Forest and Woodland
- Non-native Shrub
- Nursery or Ornamental Horticulture Area
- Orchard or Grove
- Pine/Cypress
- Redwood/Doug Fir
- Riparian Forest
- Riparian Shrub
- Shrub
- Vineyard
- Water

N

0 0.5 1 Miles

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LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 4

Developed/Urban

Developed/Urban areas are also commonly observed, representing 29% of the Planning Area. These are areas where human development is greater than 0.2 acres, including structures, roadways, irrigated lawns, and other urban areas. Vegetation in developed/urban areas often represents maintained landscaping or interspersed ornamental or native trees and shrubs.

Exhibit 1. Non-native urban vegetation including pines and hedge rows.

The characteristics and presence of urban vegetation significantly impact the potential for wildfires and their spread within urban environments. The type, density, and condition of vegetation in urban areas influence the availability of fuel for fires. When urban areas contain dense and highly flammable vegetation like dry grasses, shrubs with volatile oils, or trees with combustible foliage, the risk of fires igniting and spreading rapidly increases. Additionally, the accumulation of dead leaves, branches, and plant debris contributes to fuel loads and elevates fire hazard. Urban vegetation also influences the ignition and spotting potential of wildfires. Wind-carried embers and burning debris can ignite new fires in urban areas, especially when highly flammable vegetation is near structures. This raises the risk of embers landing on or near buildings, leading to fire spread within urban areas and an increased likelihood of structure ignitions.

Strategic management of urban vegetation can serve as a protective buffer, limiting the extent of wildfire spread. By ensuring well-maintained green spaces, properly spaced and pruned trees, and the intentional use of fire-resistant plants, defensible space can be created. This defensible space acts as a barrier, safeguarding structures from nearby flammable vegetation. The choice of plants also significantly influences the wildfire hazard associated with urban vegetation. Different plant species and their maintenance levels determine their fire resistance. While no plant is entirely fireproof, certain characteristics greatly diminish the risk of wildfire hazard:

- Leaves have a high moisture content
- Little dead material is present, and the plant does not accumulate dry and dead material within the plant
- Sap and resin content is low
- The plant does not produce a significant amount of leaf litter

In contrast, certain urban species possess features that increase their ignitability. These include the accumulation of fine, dry, or dead material within the plant and the presence of volatile organic compounds which can increase fire intensity. Hazardous urban plant species include juniper, Italian cypress, pine, and eucalyptus.

More information on fire resilient landscaping can be found here:

https://www.lahcfd.org/preparing-for-emergencies/make-your-home-garden-more-fire-resilient-resources/

Exhibit 2. Native urban vegetation dominated by coast live oak trees and maintained understory.

Exhibit 3. Non-native urban vegetation including pines, eucalyptus, and pepper trees.

Herbaceous

Herbaceous vegetation covers roughly 7% of the Planning Area and is largely represented by annual grasslands. Herbaceous plant species have non-woody stems and generally complete their life cycle in a single growing season. Invasive grasses, forbs, and noxious weeds may also be a component of herbaceous vegetation types. Trees and shrubs may also be present in this vegetation type; however, absolute tree and shrub cover is less than 10%.

Grasses are fine fuels that are loosely compacted with a low fuel load.[3] Grasses have a high surface-area-to-volume ratio, requiring less heat to remove fuel moisture and raise the fuel to ignition temperature. They are also subject to early seasonal drying in late spring and early summer. Live fuel moisture content in grasses typically reaches its low point in early summer, and grasses begin to cure soon after. Due to these characteristics, grasses have the potential for a high rate of spread, rapid ignition, and facilitation of extreme fire behavior. Grasses are the vegetation type in the Planning Area with the highest risk for wildfire ignition. Their low overall fuel loads typically result in faster moving fires with lower flame lengths and heat output. Untreated grasses can help spread a fire into other adjacent surface fuel types (e.g., shrubs) or facilitate surface to crown fire[4] transition where they exist beneath tree canopies.

Exhibit 4. Herbaceous grassland vegetation at the Byrne Preserve (left) and Rancho San Antonio County Park (right).

Shrub

Shrub vegetation covers 5% of the Planning Area and is comprised of a broad range of species. Areas of shrub vegetation are dominated by understory vegetation with minimal tree cover (< 10%). Shrub vegetation types in the Planning Area are typically classified as chaparral or coastal scrub types. Shrub vegetation is most commonly observed on south facing slopes and is the dominant vegetation type along the Planning Area's southern boundary.

Shrub-dominated fuels in the Planning Area are represented by the chaparral and coastal scrub vegetation types. These vegetation types are most common on south facing slopes within the Planning Area at higher elevations. Both chaparral and coastal scrub vegetation types may include scattered and widely spaced trees,

3 The amount of available and potentially combustible material, usually expressed as tons per acre (NWCG 2022).
4 A crown fire is a forest fire that advances, often at great speed, from tree top to tree top.

small patches of grass/herbaceous vegetation, or grass/herbaceous vegetation occurring beneath shrub canopies, although shrubs are the dominant cover.

Chaparral

Chaparral is found primarily on south facing slopes and is the dominant vegetation type within the steeper terrain present along the southern boundary of the Planning Area. Chaparral is considered a moderately fine fuel that is loosely compacted and has a moderate to high fuel load, depending on age. Chaparral has a high surface-area-to-volume ratio, requiring less heat to remove fuel moisture and raise the fuel to ignition temperature. Chaparral is subject to early seasonal drying in the late spring and early summer but does not fully cure in the way that grasses do. The live fuel moisture content reaches its low point in the late summer and early fall months. Dead fuels consist mainly of 1-hour and 10-hour fuel sizes, or twigs and small stems ranging from 0.25 inches to 1 inch in diameter. Chaparral has the potential for a high rate of spread, rapid ignition, and extreme fire behavior given its high content of volatile organic compounds.

Exhibit 5. Chaparral vegetation located on a south facing hillslope adjacent to Page Mill Road.

Fire regime of chaparral communities is mostly stand-replacing crown fires. Fire frequency interval is moderate and ranges depending on the dominate species. Fire return intervals can range from 33 to 125 years (USFS 2023b). Mature chaparral stands are more flammable compared to younger chaparral stands. Older chaparral stands are more flammable due to their ability to accumulate more dead material. As noted, chaparral 30 years and older presents a greater hazard due to accumulation of dead material within shrub canopies.

Coastal Scrub

Coastal scrub vegetation is generally associated with annual grasslands and oak woodlands and can tolerate drier conditions than these associated habitats. Coastal scrub vegetation is commonly interspersed with chaparral vegetation, most commonly on south facing slopes. Coastal scrub is considered a moderately fine fuel that is loosely compacted with a moderate fuel load. Coastal scrub has a high surface area-to-volume ratio, requiring less heat to remove fuel moisture and raise fuel to ignition temperature. It is subject to early seasonal drying in the late spring and early summer but does not fully cure in the way

Exhibit 6. Coastal scrub vegetation adjacent to Ravensbury Avenue.

that grasses do. Compared to chaparral, coastal scrub tends to have a lower content of VOCs. The live fuel moisture content reaches its low point in the late summer and early fall months. Dead fuels consist mainly of 1-hour and 10-hour fuel sizes, or twigs and small stems ranging from 0.25 inches to 1 inch in diameter. Coastal scrub has potential for a high rate of spread, rapid ignition, and extreme fire behavior.

Evergreen Hardwood

Evergreen hardwood vegetation is the most common vegetation type present, covering 30% of the Planning Area. Evergreen hardwoods are areas where tree cover is extensive and dominated by native evergreen species. Coast live oak and California bay laurel trees represent the majority of tree species present in this vegetation type. This vegetation type would be classified primarily as coastal oak woodland.

These woodlands support a rich biodiversity of plant and animal species. Open understory areas provide ample sunlight, allowing a diverse array of herbaceous plants, grasses, and wildflowers to thrive. California native grasses like purple needlegrass (*Nassella pulchra*) and blue wildrye (*Elymus glaucus*) are commonly found in oak woodlands. Hardwoods themselves provide valuable habitat for numerous wildlife species. Birds such as acorn woodpeckers, western bluebirds, and oak titmice rely on the acorns for food and the trees for nesting cavities. Mammals like deer, squirrels, and rodents also depend on the acorns as a significant food source. Historically, evergreen hardwoods were an integral part of the cultural and ecological landscape of California. Indigenous peoples managed these ecosystems through practices such as controlled burning and selective harvesting of acorns, which shaped the composition and health of the woodlands.

As noted, the evergreen hardwood vegetation type would be classified primarily as coastal oak woodland. Oak woodlands are found throughout the Planning Area often within drainages and canyons and along north-facing slopes and comprised primarily of coast live oak (*Quercus agrifolia*) in addition to other tree species such as California bay laurel (*Umbellularia californica*), madrone (*Arbutus menziesii*), California sycamore (*Platanus racemosa*) and California buckeye (*Aesculus californica*). Oak stands are composed of fuel structures ranging from fine to heavy. In closed canopy stands, a sparse understory of grass, leaves, twigs, branches, and bark litter may be present. In open stands, the understory may include grass, shrubs, leaves, twigs, branches, and bark litter. Fuel buildup typically occurs very slowly in oak woodland stands in California (USFS 2023a), and litter forms a thick, compacted mat resulting in very low surface fuel loads. In closed-canopy oak woodlands, understory fuel loads are low. The reduction of fire as an ecosystem process in oak woodlands, however, allows for an accumulation of fuels that had previously been consumed during regular, low-intensity fires. This can cause a build-up of woody vegetation in the understory, including significant increases in dead and downed woody material and ladder fuels connecting ground vegetation to tree canopies. As a result, some oak woodlands are more susceptible to severe, crown-consuming fires (McCreary 2004).

Oak trees are highly flame-resistant because the leaves do not readily catch fire. Fires in oak stands tend to smolder in the duff and consume surface fuels without generating enough heat to carry fire into the oak canopy (USFS 2023a). Oaks also do not spread fire crown-to-crown readily like many conifers (Sonoma Veg Map 2018). However, other species present within oak woodlands including California bay laurel are less flame resistant due to highly flammable foliage which possesses volatile organic compounds (VOCs) that can affect the fire's heat release rate, flame height, and duration, potentially influencing fire behavior and severity. Immature California bay laurel trees are often more hazardous due to frequently resprouting in shrub form with lower ignition resistance and the capacity to serve as ladder fuels.

Oak woodland litter does little to facilitate fire spread because it has a low surface-area-to-volume ratio and requires high heat levels to remove fuel moisture and raise the fuel to ignition temperature. Oak woodland litter is subject to seasonal drying in the late summer and early fall months, but fog drip, solar shading, and the windbreak provided by oak canopies can sustain high fuel moisture content in the summer when fog is present. Oaks have a low content of volatile organic compounds, and the lack of highly combustible oils further reduces the fire hazard associated with oaks and oak woodlands.

Exhibit 7. Evergreen hardwood vegetation with high fuel loading. Dominant species present include Coast live oak and California bay laurel.

Exhibit 8. Evergreen hardwood vegetation along hiking trail in Rancho San Antonio Open Space.

Dead fuels consist of 1-hour[5] (litter and duff smaller than 0.25 inches in diameter), 10-hour (twigs and small stems 0.25 inches to 1 inch in diameter), 100-hour (branches 1 inch to 3 inches in diameter), and 1,000-hour (large stems and branches greater than 3 inches in diameter) sizes. Oak woodlands are mostly lacking in features that promote fire spread, but weather and topography have a strong influence on fire behavior. Given extreme fire weather and steep terrain, oak woodlands have the potential for a moderate rate of spread, torching and crown fire, and extreme fire behavior, especially those with higher surface fuel loads and ladder fuels. Fire behavior in oak woodlands and forests is typically much less intense than wildfires burning in chaparral and coastal scrub communities. Low, compacted leaf litter understory, canopy shading of ground fuels, and wind velocity reduction from tree canopies significantly reduce the intensity and spread rates of surface fires in oak woodlands. The transition from ground to canopy fire increases fire intensity, spotting, and tree mortality potential.

Riparian Forest

Riparian vegetation covers 1% of the Planning Area and is concentrated within drainages. Riparian forest species include willows (*Salix* spp.), white alder (*Alnus rhombifolia*), bigleaf maple (*Acer macrophyllum*), and red alder (*Alnus rubra*). Larger areas of riparian forest are located along Matadero Creek, Adobe Creek, Permanente Creek, Hale Creek, and other riparian areas.

[5] Fuel moisture in these fuels can change within 1 hour according to environmental factors (e.g., temperature, humidity, shade).

Riparian woodlands have a low fire hazard as their high moisture levels limit ignition potential and minimize the potential for wildfire spread. The vegetation within riparian woodlands responds slowly to changes in temperature and moisture, and significant surface shading from tree canopies limits fuel moisture loss. Surface fuels are relatively low in riparian woodlands; however, storm-related high-water streamflow can deposit debris and contribute to fuel buildup as it dries out later in the season. During severe weather conditions or during periods of prolonged drought, high fuel loads can result in high intensity burning. Riparian areas with abundant fuel can result in elevated burn intensities, potentially enabling fires to propagate through the process of "wick" up or down drainages, thereby contributing to fire spread. (Fire Science Digest 2015).

Non-Native Forest Woodlands

Non-native forest woodlands cover 22% of the Planning Area. Vegetation in these areas is dominated by non-native tree species. These woodlands typically consist of introduced tree species that have been planted or have naturally established themselves in the region. Common species include blue gum eucalyptus, coast redwood, and other ornamental species. Non-native forest woodlands are generally observed near development areas including near homes and along roadsides. Discussion of eucalyptus and redwood are provided in the sections below.

Eucalyptus

The Planning Area contains dispersed areas where larger, continuous Eucalyptus stands can be found. These locations include stretches along I-280 near Page Mill Road, Maria Lane and Oak Park Court, as well as near Sant Nicholas School between Miraloma Way and El Monte Avenue. Additionally, smaller groupings of eucalyptus **trees are frequently seen within the non-native forests spread across the Planning Area.**

Of the non-native trees present in the Planning Area, eucalyptus present the greatest hazard. Eucalyptus stands are composed of fuel structures ranging from fine to heavy, and may include an understory of grass, brush, eucalyptus seedlings, saplings, and small trees, and eucalyptus leaf, twig, branch and bark litter. Eucalyptus litter is generally moderately compacted with heavy to very heavy fuel loads; fuel loads in eucalyptus stands can reach between 45 and 100 tons per acre (Agee et al. 1973). Fuel buildup in blue gum eucalyptus stands is very rapid, exceeding that of other tree species, and its litter (dead leaves and debris) is especially flammable (Agee et al. 1973; NPS 2006; Wolf and DiTomaso 2016). Fuel reduction programs in eucalyptus stands are typically recommended to maintain low fuel load levels (USFS 2013).

The leaves of blue gum eucalyptus may be moderately resistant to combustion under some circumstances (Dickinson and Kirkpatrick 1985); however, these trees are considered highly flammable as the bark catches fire readily and deciduous bark streamers and lichen epiphytes tend to carry fire into the canopy, which tends to produce embers that can be carried by strong winds. These flying embers are carried downwind and result in the development of spot fires that have ignited in receptive fuel beds in advance of the fire's leading edge (Ashton 1981; USFS 2015). Peeling bark is typical of many other eucalyptus species and contributes to ground-based fuels (litter) when it falls. Peeling bark is also retained for a period of time on tree trunks, where it can facilitate ground to canopy fire transition (ladder fuel). Eucalyptus litter has a moderate surface area to volume ratio, requiring moderate heat to remove fuel moisture and raise fuel to ignition temperature. Eucalyptus litter is subject to seasonal drying in the late summer and fall, but fog drip, solar shading, and windbreaks provided by the eucalyptus canopy can sustain high fuel moisture content in the summer when fog is present.

A recent analysis of the 2017 wildfires in Sonoma County (Sonoma Veg Map 2018) emphasized eucalyptus fire hazard potential. In this analysis, crown fire was observed to have fully consumed eucalyptus stand canopies, with less damage occurring in adjacent non-eucalyptus forest types. Data resulting from this study also revealed that of eucalyptus stands that burned in the three fires (Nuns, Tubbs, and Pocket Fires), 64% had canopy

damage in the 80-100% range, indicating near or full tree crown consumption by fire. Canopy damage in the 80-100% range was lower for other forest types (22% for oak, 47% for redwood, 8% for riparian, and 37% for California bay), with the exception of Monterey pine (*Pinus radiata*) stands, 100% of which had canopy damage in the 80-100% range. This document recommends stand thinning and understory (ladder) fuel treatment to reduce fire hazard in retained eucalyptus stands.

Like other hazardous species, eucalyptus also has a higher content of VOCs. Eucalyptus leaves produce a volatile (Gabbert 2014), highly combustible oil, and flammable gasses may be released from trees at very high temperatures, further increasing fire hazard (Gross 2013). The live fuel moisture content reaches its low point in the late summer and early fall months. Dead fuels consist of 1-hour (litter and duff < 0.25 inches in diameter), 10-hour (twigs and small stems 0.25 inches to 1 inch in diameter), 100-hour (branches 1 inch to 3 inches in diameter), and 1,000-hour (large stems and branches > 3 inches in diameter) sizes. Features that promote fire spread include heavy litter fall, flammable oils in the foliage, and open crowns bearing pendulous (i.e., downward hanging) branches, which encourage maximum updraft (USFS 2015). Given average weather conditions and terrain, eucalyptus has potential for a high rate of spread, torching and crown fire, and extreme fire behavior.

Blue gum eucalyptus trees were responsible for the extreme wildfire behavior during the 1985 Liddicoat Fire which destroyed roughly a dozen structures within the Planning Area.

Redwood/Douglas Fir

Redwoods are often present in non-native woodlands throughout communities and are a commonly planted urban forest species. Small isolated natural stands are also present, most commonly within drainages. Redwood stands are composed of fuel structures ranging from fine to heavy including a sparse understory vegetation typically consisting of ferns, grasses, leaves, twigs, branches, and bark litter. Bark and leaf litter tend to accumulate slowly beneath redwood trees, resulting in low fuel loads. Redwood litter is generally heavily compacted with a moderate fuel load reaching up to 100 tons per acre. Fuel buildup occurs very slowly in redwood stands in California (USFS 2015). Redwood is highly flame resistant, and the leaves do not catch fire readily. Fires tend to smolder in the duff and consume surface fuels without generating enough heat to carry fire into the canopy (USFS 2015).

Redwood litter does little to facilitate the spread of fire. It has a low surface area-to-volume ratio and requires high heat to remove fuel moisture and raise fuel to ignition temperature. Redwood litter is subject to seasonal drying in the late summer and early fall months, but fog drip, solar shading, and windbreak provided by the redwood canopy can sustain high fuel moisture content throughout the year. Redwood has a low content of VOCs and lacks highly combustible oils, which further reduces the fire hazard associated with redwood.

Dead fuels consist of 1-hour (litter and duff < 0.25 inches in diameter), 10-hour (twigs and small stems 0.25 inches to 1 inch in diameter), 100-hour (branches 1 inch to 3 inches in diameter), and 1,000-hour (large stems and branches > 3 inches in diameter) sizes. Redwood stands are mostly lacking in features that promote fire spread, but weather and topography have a strong influence on fire behavior. Given extreme fire weather and steep terrain, redwood has potential for a moderate rate of spread, torching and crown fire, and extreme fire behavior.

Agriculture

Agricultural areas comprise less than 1% of the LAHCFD and include areas of row crops, vineyards, orchards, and groves. Agricultural practices in the District generally include small-scale family-owned operations. Fuel hazard in agricultural areas is generally considered low due to high fuel moistures from frequent irrigation and low fuel loading. Ground cover is generally maintained often exposing bare soil. However, unmaintained

agricultural areas may pose greater hazard from higher flame lengths associated with accumulated ground fuels in agricultural areas, or from ignition of the crops themselves due to an absence of maintenance or irrigation.

Neighborhood and Structural Characteristics

The foothills that comprise the majority of Planning Area are characterized by steep, windy and narrow roads that pose potential ingress and egress problems for emergency response and evacuations. Some areas may be subject to slow response times for emergency response due to narrow road conditions and congestion. There are many private roads with poor maintenance that would hinder access by large emergency apparatus. Many properties are accessed by private roads that are limited to one means of emergency egress during an evacuation. Some properties have minimal turnaround space, posing a concern to emergency responders due to potential entrapment. There are a number of dead-end roads and narrow driveways, for example Moody Court, where the SCCFD has been working with the road association to provide possible mitigation measures (e.g., clearing of roadside brush). There are a number of narrow bridges to access homes, but rated bridges are mandatory.

Roadside vegetation is abundant throughout the Planning Area and tree limbs and canopies often exist over private and public roads. Private property line setbacks from public roadways are minimal. Therefore, LAHCFD must achieve cooperation from private landowners prior to conducting roadside fuels reduction on private lands.

Most homes have moderate defensible space (at least 30 feet) but some homes do not meet the highly recommended 70- to 100-foot space. Structures in the incorporated areas are required to have 30 feet of defensible space. Structures in the unincorporated areas are required to have 100 feet of defensible space. Most homes have non-combustible siding, but the majority have combustible decks and fencing that come into contact with wildland fuels. Some older homes have wood shake roofs and siding which put the property and neighborhood at risk. Some subdivisions (e.g., San Antonio Hills) are managed by homeowner associations (HOAs) that provide a conduit for fire prevention and public education and outreach messages regarding structural ignitability and defensible space. A number of recently built structures, compliant with California Building Code Chapter 7A, are interspersed with older properties.

Many homes are located upslope from thick shrub vegetation with continuous canopies. Some homes are on steep slopes with minimal set-back from the top of slope. Reduced structure setbacks from top of slope expose buildings to more radiant heat, and potentially direct flame impingement, from an approaching wildfire. Topography is a concern due to the influence steep slopes have on potential fire behavior. Vegetation, either natural or ornamental, is abundant within most communities. Varying levels of vegetation maintenance occur on private properties. Electrical utilities are almost exclusively provided through overhead lines, representing potential ignition sources for fires when accompanied by high winds and fire conditions. Additionally, Public Safety Power Shutoffs (PSPSs) may affect the Planning Area during periods of severe fire weather. These PSPSs reduce the potential for utility line-originated fires but leave residents without power for potentially extended periods. Portions of the Planning Area have been subject to PSPSs, and the area is identified as being more likely to be affected by a PSPS (PG&E 2023). Water is available throughout much of the area through a network of hydrants (more details in the next section – Emergency Response Capabilities).

Exhibit 9. Home situated uphill from hazardous shrub vegetation with minimal setback from the slope.

Exhibit 10. Wood constructed home along Moody Drive.

Exhibit 11. Narrow and steep private road accessing multiple homes.

Exhibit 12. Wood shake roof on home along Altamont Road.

Exhibit 13. Narrow private road with dense roadside vegetation.

Exhibit 14. Home surrounded by hazardous vegetation and steep terrain near Page Mill Road.

Emergency Response Capacity

LAHCFD contracts its fire suppression, prevention, emergency medical response, apparatus, and equipment from SCCFD. The contracted services provide 24/7 coverage by three shifts, each of at least one company of four firefighters and a Battalion Chief. SCCFD personnel and operations are based at the LAHCFD El Monte Fire Station located at 12355 El Monte Road on the campus of Foothill College. Fire Station locations are presented in Figure 5.
The contracted terms for the fire and emergency medical services are for the LAHCFD jurisdiction that includes the Town of Los Altos Hills, and the City of Los Altos. The contracted agreement governs the coordinated operations of three Fire Stations, shown as CNT-74, CNT-75, CNT-76. Fire Station Locations are presented in Figure 5. Based on resource availability, all of these stations respond to emergencies in the LAHCFD plan area and mutual aid is also available from other CNT units and the City of Palo Alto.

In addition, LAHCFD, SCCFD and the City of Palo Alto formed an agreement to operate Palo Alto Fire Station 8 during the high fire season. Station 8 firefighter and medical response personnel are funded by LAHCFD. Services, apparatus and equipment are provided by SCCFD and City of Palo Alto on a rotation schedule.

The Local Agency Formation Commission of Santa Clara County (LAFCO) 2023 Countywide Fire Service Review analyzed the emergency response performance for the LAHCFD jurisdiction. The report stated that LAHCFD has a much larger area, a smaller percentage of the incidents, and a lower population density compared to the overall SCCFD service area. It is also on the northern border of the service area, which reduces the total concentration of units. This creates a situation where its 90th percentile performance is worse than SCCFD overall (page 446 of the final redline report).

Section 9-26 states, LAHCFD (through SCCFD) provides an adequate level of services based on the latest ISO rating and staffing levels. However, SCCFD does not meet its adopted response time benchmarks, based on call type and severity, in any category within the LAHCFD service area. In Section 9-12, The District indicated plans to use the reserve funds for future fire facility replacement, solutions to reduce the longer response times, and utilization of the district parcel.

Present and probable need for public facilities and services in the area, Section 9-23, states, the area within LAHCFD is projected to have a cumulative growth rate of 14% between 2020 and 2035, or 0.88% annually and 5% cumulatively between 2035 and 2050, or 0.32% annually, indicating a likely analogous increase in demand for fire and emergency medical services.

As a result of the projected 14% cumulative growth rate in LAHCFD population and the current longer response times for fire and emergency medical services, LAHCFD is assessing the feasibility of building a new fire station on its vacant District parcel that has proximity to the I-280 corridor and to the northern section of LAHCFD.

Fire Response

As noted, the majority of the Planning Area is designated as Local Responsibility Area (LRA), where wildfire jurisdiction and responsibility rests with the LAHCFD and is satisfied through the contracted services from SCCFD. The smaller unincorporated area of the District is designated State Responsibility Area (SRA), where wildfire jurisdiction and responsibility rests with CAL FIRE. CAL FIRE provides response in the SRA and in mutual threat zones, including ground and air crews, and SCCFD coordinates response as needed from neighboring jurisdictions under Mutual Aid agreements. The following summarizes responsibility area designations:

- **Federal Responsibility Area (FRA):** A term specific to California, designating areas where the federal government is responsible for fire response efforts. These areas include land under federal ownership (CA GOPR 2020).
- **Local Responsibility Area (LRA):** A term specific to California, designating areas where the local government is responsible for wildfire protection. The LRA includes incorporated cities, cultivated

agricultural land, and portions of the desert. LRA fire protection is typically provided by city fire departments, fire protection districts, counties, and by CAL FIRE under contract to local government (CA GOPR 2020).

- **State Responsibility Area (SRA):** A term specific to California, designating areas where the state has financial responsibility for wildland fire protection. Incorporated cities and land under federal ownership are not included in the SRA. Land under federal ownership is in the federal responsibility area (CA GOPR 2020).

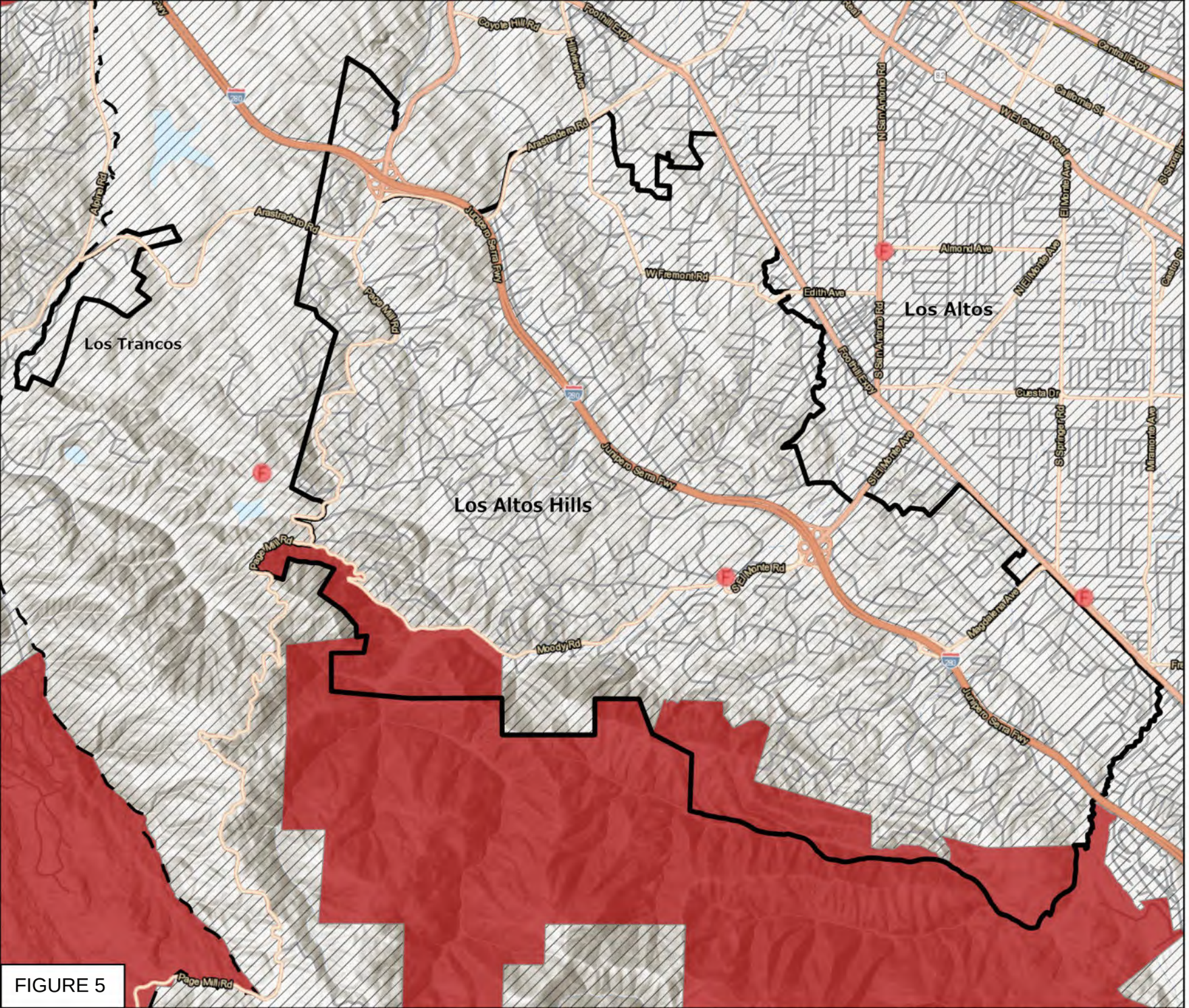
Table 4 summarizes the extent of LRA and SRA for the Planning Area.

Table 4. Jurisdictional Responsibility Areas in the LAHCFD Planning Area

Vegetation Community/Land Cover	Acres	Percent of Planning Area
Local Responsibility Area (LRA)	6,789	90%
State Responsibility Area (SRA)	714	10%
Federal Responsibility Area (FRA)	0%	0%
Total	**7,503**	**100%**

Source: CAL FIRE 2022

Water in the District is provided by two purveyors, Purissima Hills Water District (PHWD) and Cal Water Service (CWS). LAHCFD owns, repairs and makes needed additions the 552 hydrants in the PHWD operating area and CWS owns and maintains the hydrants in its territory. LAHCFD has provided funds to assist the water districts in ensuring adequate firefighting water flow through water main upgrading, standby generator installation, hydrant upgrading, and seismic strengthening of water tanks. In addition, LAHCFD provides fuel management activities, including the monitoring and enforcement of weed and brush abatement, monthly defensible space, brush chipping, monthly yard debris drop-off, and evacuation route roadside vegetation management and strategic fuel break planning.



Jurisdictional Responsibility Areas

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Jurisdictional Responsibility Area

LRA

SRA

Fire Station

N

0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 5

Public Education and Outreach Programs

LAHCFD provides a variety of programs that benefit District residents and the greater region. These programs are summarized below. LAHCFD Programs are governed by the LAHCFD Board of Commissioners and are provided to residents and the public in an effort to support the LAHCFD's mission. This mission is to protect lives and property from fires, natural disasters, and hazardous material incidents and for the prevention of fires through protection, prevention and education programs. More information can be found at:

https://www.lahcfd.org/programs-for-residents/.

Community Programs

Community-focused programs benefit the entire community, regardless of resident participation. Resident participation can enhance the scale and effectiveness of these programs and LAHCFD encourages participation. Examples of Community Programs include Fire Station 8 staffing, goat grazing the Byrne Preserve, vegetation management along critical roadways, and shaded fuel break planning and implementation. Information about current and past Community Programs can be found at:

https://www.lahcfd.org/community-projects/.

LAHCFD also encourages community participation in the NFPA Firewise USA® program. This national program teaches community members to prepare structures to withstand embers and prevent flames and surface fires from igniting buildings and immediate surroundings. More information about this program in Los Altos Hills can be found at:

https://www.lahcfd.org/programs-for-residents/firewise-usa/.

Resident Programs

Resident-focused programs require residents to proactively participate in making their structures and properties more fire resilient. These programs also indirectly benefit the greater community. The following summarizes current Resident Programs:

- Home Ignition Zone (HIZ) Assessment Program: Residents can receive an evaluation of their property's potential ignition sites. More information at:

  https://www.lahcfd.org/hiz-program/.

- Defensible Space Brush Chipping and Debris Removal Program: Residents can use this program to reduce the quantity of flammable yard waste. This service provides no-cost curbside chipping for participants who clear brush, bring it curbside and register for chipping services. More information at:

  https://www.lahcfd.org/programs-for-residents/dsbc-program/.

- Defensible Space Fuel Reduction Monthly Drop Off Program: Residents can use this program to discard yard waste associated with fuel reduction efforts. More information at:

  https://www.lahcfd.org/programs-for-residents/yard-waste-drop-off/.

- Weed Abatement: In conjunction with SCCFD staff and the County Weed Abatement program, LAHCFD Board of Commissioners ensure compliance with applicable Fire Code regulations. More information at:

  https://www.lahcfd.org/programs-for-residents/weed-abatement-program/.

- Vegetation Management: Residents are encouraged to implement and maintain defensible space around their homes and other buildings. More information at:

  https://www.lahcfd.org/programs-for-residents/vegetation-management/.

Community Education Programs

SCCFD offers comprehensive fire and life safety and preparedness training programs available within Los Altos Hills. More information at:

https://www.sccfd.org/education-and-preparedness-overview/.

Community Emergency Preparedness

LAHCFD provides leadership and funding for emergency preparedness training for community , develops and manages Adult and Teen Community Emergency Response Teams (CERT) and academies , collaborates neighborhood network program, and provision and maintenance of disaster tools and emergency supplies. All programs are regionalized with surrounding area agencies. More information at:

https://www.lahcfd.org/learn-about-cert/.

Genasys Protect and AlertSCC

Santa Clara County adopted Genasys Protect (formerly Zonehaven) to provide specific, timely and accurate information regarding evacuations. Genasys Protect divides geographic regions into smaller zones, based on several factors, and is accessible online. There are 24 Genasys Protect zones in the Planning Area. AlertSCC is Santa Clara County's Emergency Alert System. Genasys Protect and AlertSCC are official government sources. AlertSCC evacuation orders are given by individual zones. Genasys Protect maps show evacuation orders directly posted by AlertSCC.

More information can be found at:

Genasys Protect: bit.ly/Genasys ProtectAware

AlertSCC: bit.ly/AlertSCC_Signup

Funding and Staffing

LAHCFD funds programs to increase summer fire patrol service, provides funding for a year-round additional Battalion Chief staffed at the El Monte Fire Station, replaces, adds and maintains fire hydrants within the Purissima Water District, and collaborates to provide training classes, workshops and community meetings in partnership with the SCCFD, Town of Los Altos Hills and other program providers.

LAHCFD also provides an Emergency Services Manager (ESM) who provides management, leadership and organization of the Adult and Teen CERT Programs. CERTs are a team of volunteers available to be deployed in event of emergency, earthquake, or wildfire and available to assist with after-incident recovery efforts. The ESM also organizes volunteers who provide communication support in event of emergency. These resident volunteer teams meet, learn, train and drill together as a service to their community.

Social Vulnerabilities

Vulnerable populations are those people who are more likely to be affected by wildfire since they lack access to resources, experience cultural and institutional barriers, have limited mobility, and/or have compromised physical health. Vulnerability to wildfire is based on one's ability to affect their exposure and susceptibility to wildfire. For example, individuals with limited mobility have greater difficulty evacuating or fleeing a wildfire event. Individuals with cultural, physical, or financial barriers to performing necessary home mitigation measures cannot easily reduce their susceptibility to property damage from a wildfire (USFS 2023c

Policies, Regulations, Ordinances, and Codes

Los Altos Hills Municipal Code

The Los Altos Hills Municipal Code outlines various requirements for minimizing wildfire risk associated with vegetation management, building construction, fire prevention, landscaping, and site development.

Title 4 (Public Safety)

Chapter 2 (Fire Prevention) of Title 4 outlines numerous fire prevention regulations, including those associated with smoking, spark arrestors, outdoor fires, vegetation clearance, fire roads and fire breaks, and water sources, amongst others. This chapter also identifies liability, enforcement, and violation (penalty) responsibilities.

Title 8 (Building Regulations)

Chapter 1.8 (California Fire Code) of Title 8 adopts the 2022 California Fire Code, Part 9, Title 24 of the California Code of Regulations, a portion of the California Building Standards Code, and the 2021 International Fire Code, including Appendix B (Fire Flow Requirements), Appendix C (Fire Hydrant Locations) and Appendix O (Temporary Haunted Houses).

Title 10 (Zoning and Site Development)

Chapter 2 (Site Development), Article 8 (Landscaping) of Title 10 identifies landscape maintenance standards. Specifically, requirements for removal of dead plants and combustible brush and maintenance of vertical clearance over driveways, public pathways, and public rights-of-way.

Title 12 (Parks and Recreation)

Chapter 2 (Trees, Shrubs, and Plants) of Title 12 identifies public nuisances, which include dead, diseased, infested, or dying trees proximate to streets, vegetation that interferes with street improvements, vegetation extending into streets, vegetation interfering with hydrants, trees infected with or potentially infected with pests/disease, vegetation that interferes with roadway visibility, and weed or noxious plants.

CAL FIRE Fire Hazard Severity Zones

The CAL FIRE Fire Hazard Severity Zone (FHSZ) system is a science-based system where severity zones are defined based on vegetation, topography, and weather (temperature, humidity, and wind), and represent the likelihood of an area burning over a 30- to 50-year time period without considering modifications such as fuel reduction efforts. CAL FIRE maintains FHSZ data for the entire state. There are three classes of fire hazard severity ratings within FHSZs: Moderate, High, and Very High (CA GOPR 2020).

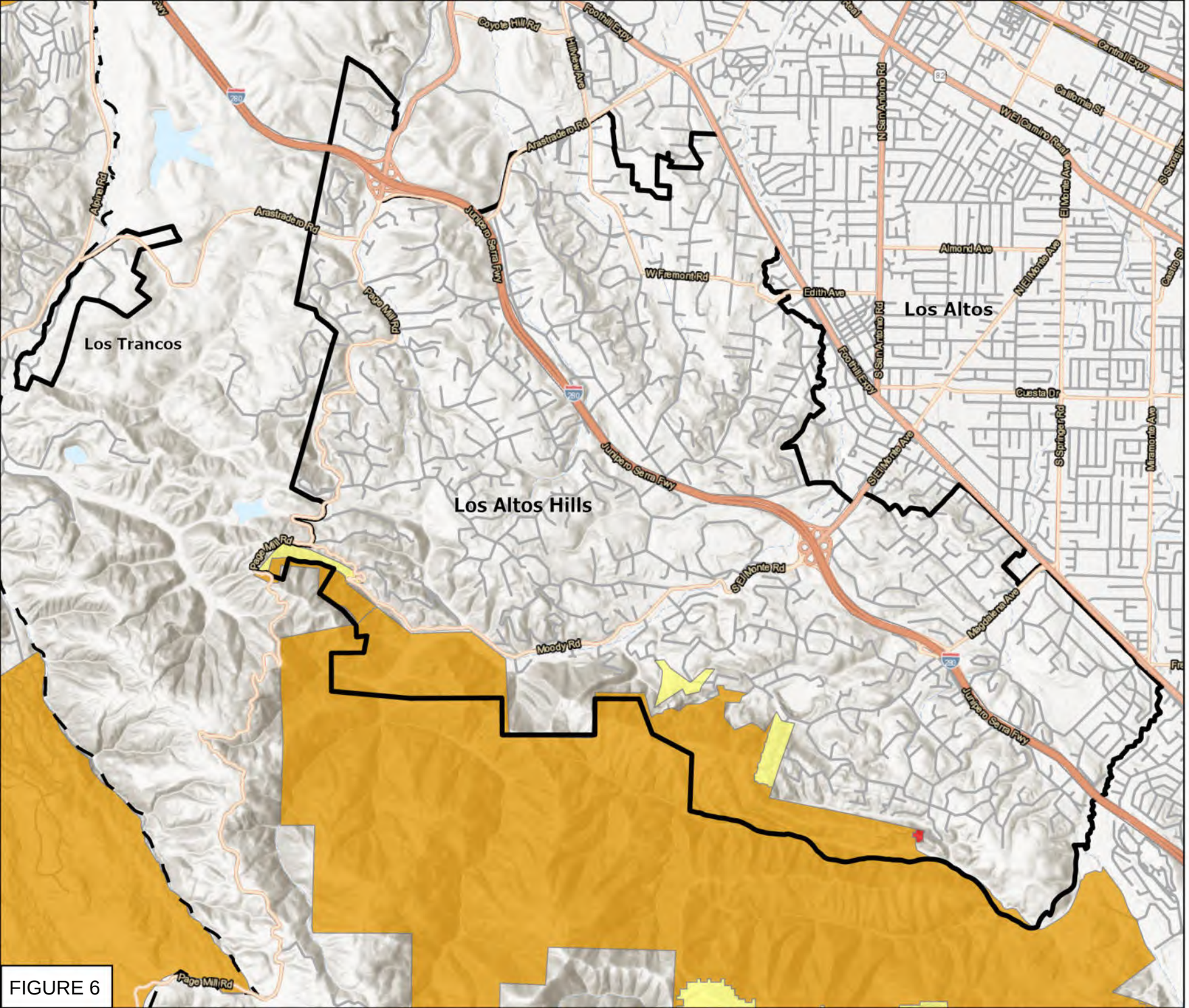
No FHSZs have been adopted for LRA portions of the Planning Area. FHSZs have been identified for the SRA portion of the Planning Area. FHSZs for the SRA areas in the southern region Planning Area are quantified in Table 5. Their extent is depicted in Figure 6.

Table 5. SRA Fire Hazard Severity Zones for the LAHCFD Planning Area

FHSZ Classification	Acres	Percent of Planning Area
Moderate	68.6	11%
High	551.5	89%
Very High	2.1	<1%
Total	**622.2**	**100%**

Source: CAL FIRE, 2007

CAL FIRE is currently in the process of updating the Statewide FHSZ maps for SRA. Following the public comment period and map finalization, the LRA remapping will be conducted. While not finalized, the draft SRA FHSZ maps show an increase in the area mapped as High or Very High FHSZ in the Planning Area.



Fire Hazard Severity Zones

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Fire Hazard Severity Zone

- **Moderate SRA**
- **High SRA**
- **Very High SRA**

N

0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 6

Risk-Hazard Assessment

A regionally specific wildfire hazard and risk assessment was conducted for the Planning Area to supplement the existing countywide risk assessment (Tukman 2022). This assessment incorporated additional inputs that are believed to represent wildfire hazard specifically for the Planning Area.

Wildfire Hazard Assessment

The wildfire hazard assessment sought to identify areas of concern and priority areas for wildfire risk mitigation efforts. The hazard model relies on 8 spatial input datasets, 5 of which are related to wildfire intensity, and 3 related to wildfire probability. The input datasets were each scaled from 0-3 to reflect the range of influence on wildfire hazard. For example, areas experiencing flame lengths greater than 11 feet would be scaled at 3, whereas non-burnable areas would be scaled at 0. Each input value was then assigned a weighting value of 1-4 to account for the input's relative influence on wildfire hazard, with some inputs (i.e., flame length) influencing wildfire hazard more than others (i.e., Proximity to WUI Buildings). Overall wildfire hazard was calculated at a 5-meter raster environment. The diagram in Exhibit 15 depicts the framework for calculating wildfire hazard.

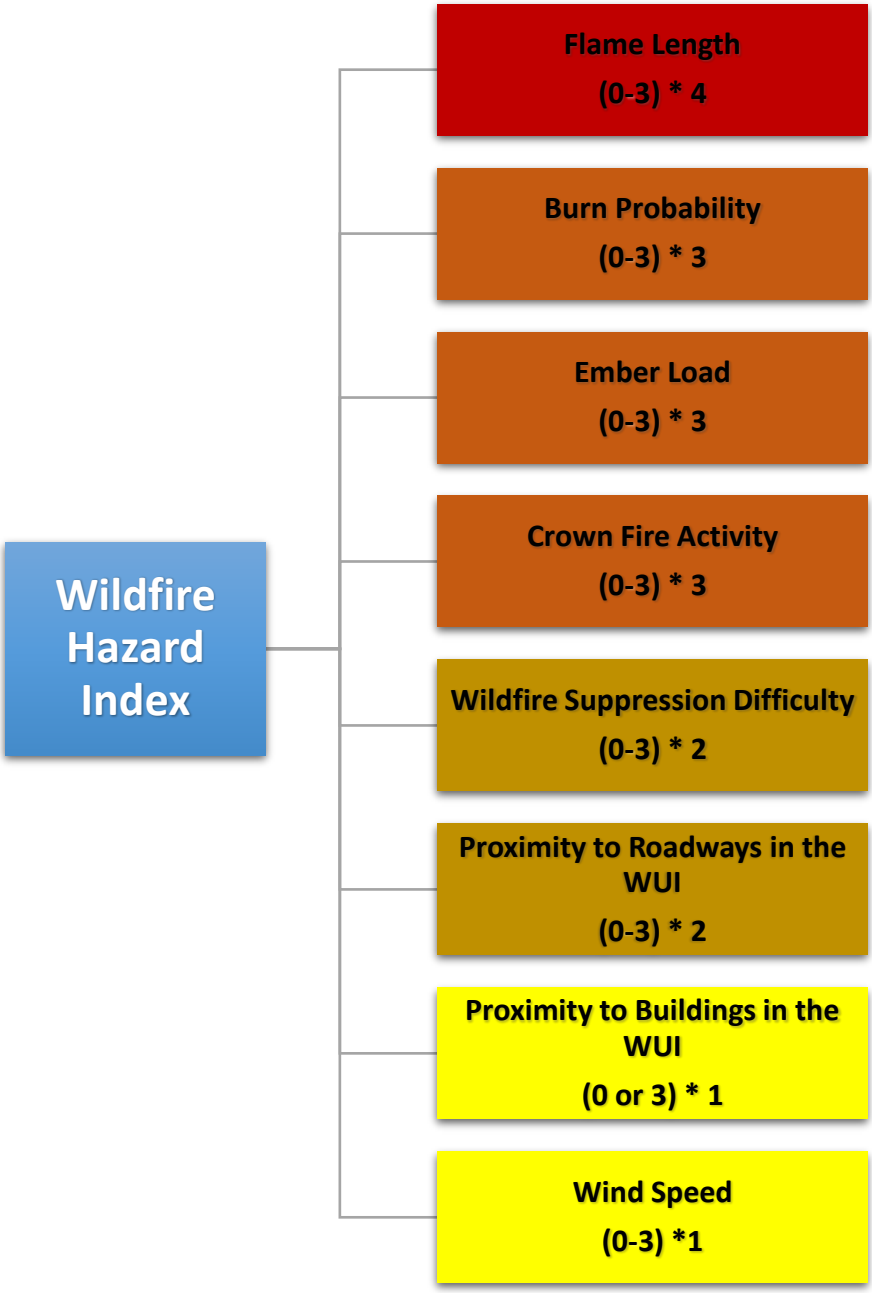


Exhibit 15. Wildfire hazard index calculation framework diagram.

The maximum hazard value observed within the Planning Area was 60, with a minimum value of 2. The total range of observed hazard values were binned into 5 classes including Very low, Low, Moderate, High, and Very High using the natural breaks classification method in ArcGIS Pro. The wildfire hazard classification value breaks provided are below in Table 6.

Table 6. Overall Wildfire Hazard Classification Values

Hazard Score	Classification
2-12	Very Low
>12-21	Low
>21-30	Moderate
>30-39	High
>39-60	Very High

Flame Length

Fire behavior characteristics are an essential component in understanding fire risk. Flame length—the length of the flame of a spreading surface fire within the flaming front—is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews et. al. 2008). Although it is a somewhat subjective and nonscientific measure of fire behavior, it is imperative to fireline personnel when evaluating Fireline intensity and is worth considering as a vital wildfire variable (Rothermel 1993).

Table 7. Fire Behavior Interpretation

Flame Length	Fireline Intensity	Interpretation
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 feet to 8 feet	100–500 BTU/ft/s	Fires are too intense for a direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 feet to 11 feet	500–1,000 BTU/ft/s	Fires may present serious control problems—torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1,000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at the head of fire are ineffective.

Source: Roussopoulos and Johnson 1975.
Note: BTU/ft/s = British thermal units per foot per second.

The FlamMap fire behavior modelling software was utilized to model flame lengths throughout the Planning Area. FlamMap relies on a landscape file comprised of 8 inputs including slope, aspect, elevation, fuel model, canopy base height, canopy bulk density, canopy height, and canopy density, in addition to weather and fuel moisture inputs. The 2020 5-meter resolution landscape file generated by Tukman Geospatial was employed to model flame length. The fuel models incorporated into this dataset provide a detailed depiction of fuel conditions within the landscape provide a high-resolution depiction of fire behavior. For a more comprehensive technical report detailing the methods employed to create the fuel models and to access the fuel models themselves, please refer to the provided links.

Full Report: https://fuelsmapping.com/santa_cruz_clara_fuels_full_report

Datasheet: https://vegmap.press/scc_scz_5_meter_fuel_model_datasheet

The Fire Family Plus software was utilized to determine the weather and fuel moisture inputs to represent 97th percentile weather conditions in the Planning Area. Weather data was obtained from local Remote Automated Weather Stations (RAWS) including the Los Altos RAWS (043912) and the Palo Alto Foothills RAWS (043910). A special interest group (SIG) was created from both stations to incorporate weather data from multiple stations, both assigned a weighting based on their proximity to the Planning Area. Table 8 summarizes the weather and fuel moisture inputs below.

Table 8. FlamMap Weather and Fuels Moisture Inputs.

Input	Value
Time Period	August 15- November 15 (2002-2017)
Los Altos RAWS 043912 SIG Weighting	75%
Palo Alto RAWS 043910 SIG Weighting	25%
Wind Speed	32 mph
Default Wind Azimuth	50 degrees
Wind Flow Type	Gridded
1 hr Fuel Moisture	2
10 hr Fuel Moisture	3
100 hr Fuel Moisture	8
Herbaceous Fuel Moisture	29
Woody Fuel Moisture	59
Foliar Moisture Content	90%
Crown Fire Calculation Method	Scott and Reinhardt, 2011

Flame length values were scaled according to the standard hauling chart provided in Table 9. A weighting factor of 4 was assigned, as flame length is highly representative of wildfire intensity and hazard.

Table 9. Flame Length Classification

Flame Length	Scaled Value
Under 4 feet	0
4 feet to 8 feet	1
8 feet to 11 feet	2
Over 11 feet	3

Landscape Burn Probability

Burn Probability represents the likelihood that a given location would burn considering the model inputs used. Burn probability is related to the size of fires that occur on a given landscape, where larger fires produce higher burn probabilities than smaller fires and is a function of wildfire spread rate and wildfire duration. FlamMap was also used to model landscape burn probability throughout the Planning Area. FlamMap quantifies burn probability by simulating thousands of random ignitions across the landscape. Areas that experience frequent wildfires are assigned high burn probability values, whereas areas that do not facilitate wildfire ignition and spread are assigned low values. Areas with high burn probability are often associated with larger open spaces with high fuels continuity, meaning natural vegetation is contiguous and there are limited barriers to wildfire spread. In contrast, areas with lower burn probabilities are often associated with urban areas or small open space “islands”. The distribution of non-burnable fuels associated with urban areas impedes wildfire spread. Model inputs for the burn probability assessment relied on those provided in Table 8, in addition to the inputs provided below in Table 10.

Table 10. Landscape Burn Probability Assessment Inputs

Input	Value
Spotting Probability	30%
Number of Random Ignitions	10,000
Maximum Simulation Time	5 hours
Resolution of Calculations	30 meters
Minimum Travel Path Interval	500 meters
Spotting Delay	0 minutes
Lateral Search Depth	6 meters
Vertical Search Depth	4 meters

The total range of burn probabilities was scaled into four classes (0-3) using natural breaks distribution method in ArcGIS Pro. A weighting factor of 3 was chosen for this input as burn probability heavily quantifies where wildfires are likely to occur.

Ember Load

Ember load quantifies the relative number of airborne embers that may fall onto an area from a nearby wildfire. Ember load relates to spotting distance, which quantifies the distance airborne embers may travel from their source. Spotting distance was modelled in FlamMap using MAXSPOT output which quantifies the maximum travel distance of embers originating from a crown fire. Model inputs resembled those provided in Table 8. FlamMap only generates spotting potential where crown fires occur (e.g., in oak woodlands), so this analysis does not account for spotting generated in a fire burning in shrub or herbaceous vegetation. FlamMap outputs generate a point data set coded with the maximum spotting distance. This data set was then buffered to create a spotting potential layer comprised of many overlapping circles, where the buffer radius equaled the maximum spotting distance. Areas with greater overlap represent areas likely to experience a greater ember load. It should be noted that the buffering exercise represented a circular area around each spotting point, which is not a completely accurate representation of upwind spotting distances, as embers are likely to travel in the downwind direction only (the modeling scenario used a Diablo wind event). However, this analysis does give an estimate of potential fire hazard associated with spotting (embers) in the Planning Area. It should be also mentioned that for ignition to occur, embers from torching trees must land in a receptive fuel bed, which may resemble receptive vegetation or structures (wood roofs, exposed vents, etc.) This is an important consideration when evaluating structural vulnerabilities and identifying projects to reduce structural ignitability.

The total range of ember load scaled into 4 classes (0-3) using the natural breaks classification method in ArcGIS Pro. A weighting factor of 3 was chosen for this input.

Crown Fire Type

Crown fire occurs through the combustion of canopy (crown) vegetation. Crown fire is commonly associated with extreme fire behavior and leads to considerable wildfire hazard and suppression challenges. Crown fires may be unpredictable and can spread fires at rapid rates. A further description of crown fire is provided below.

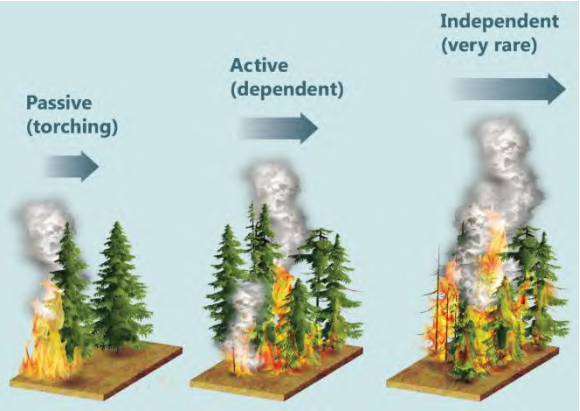


Exhibit 16. Types of crown fire.

- **Surface Fire**: A surface burning fire with low flame lengths (usually less than 1 meter) that does not result in significant movement into understory or overstory vegetation (NWCG 2022).
- **Crown Fire**: A fire that has burned upward from the ground and into the tree canopy. There are three types of crown fires:
    - **Passive Crown Fire**: A crown fire in which individual or small groups of trees torch out, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fires encompass a wide range of crown fire behavior, from the occasional torching of an isolated tree to a nearly active crown fire. Also called torching (Scott and Reinhardt 2001).
    - **Active Crown Fire**: A crown fire in which the entire fuel complex becomes involved, but the crowning phase remains dependent on heat released from the surface fuels for continued spread. Also called running and continuous crown fire (Scott and Reinhardt 2001).
    - **Independent Crown Fire:** A crown fire that spreads without the aid of a supporting surface fire (Scott and Reinhardt 2001).

Crown fire in the Planning Area was modelled using the Crown Fire Activity output in FLAMMAP based on the inputs provided in Table 8. Model outputs were scaled as provided in Table 11, and a weighting value of 3 was assigned to this input.

Table 11. Crown Fire Classification

Input	Classification
Non-Burnable	0
Surface Fire	1
Passive Crown Fire	2
Active Crown Fire	3

Wildfire Suppression Difficulty

The dataset for wildfire suppression difficulty was obtained from Pyrologix and the USDA Forest Service's Contemporary Wildfire Hazard Across California (USFS 2019). Wildfire suppression difficulty quantifies relative fire suppression effort based on a variety of factors including topography, fuel type, fire behavior under extreme fire weather, Fireline production rates in different fuel types using hand tools, and access (distance from roads, trails). This dataset classifies wildfire suppression difficulty on a scale from 1-10. Values were reclassified according to the following breaks. A weighting factor of 2 was assigned for this input.

Table 12. Wildfire Suppression Difficulty Classification

Original Range	Classification
1-2	0
3-5	1
6-8	2
9-10	3

Proximity to Roads in Wildland Urban Interface

Roadside ignitions account for most human-caused wildfire ignitions in California (Morrison 2007). Therefore, vegetation in close proximity to roadways can be considered at a higher risk of ignitions. Roadway data for the Planning Area was obtained from the Santa Clara County Impervious Surfaces map created by Tukman Geospatial. Buffers were applied to roadways at 50-, 150-, 250-, and 500-foot distances. Only roadways within the Wildland Urban Interface (WUI) were included in this analysis. WUI data was obtained from the Santa Clara County Fire Safe Council (2023). Within these buffer areas, non-vegetated areas were not included as they are not at risk from roadside ignitions. Proximity to roadways in the Wildland Urban Interface was scaled into the following values. A weighting factor of 2 was assigned to this input.

Table 13. Proximity to Roads in the WUI Classification

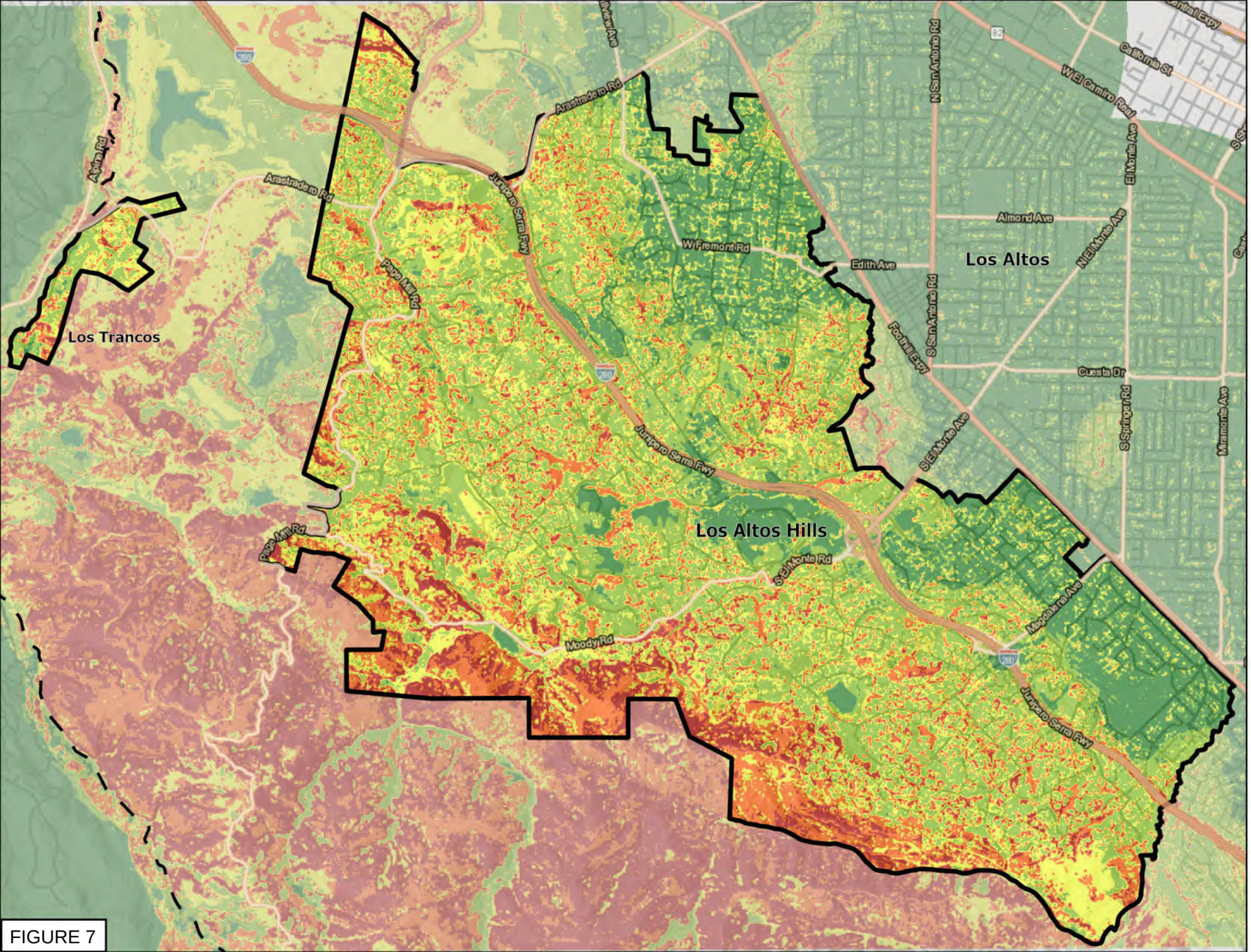
Original Range	Classification
> 250-500	0
> 150-250	1
> 50-150	2
0-50	3

Proximity to Buildings in Wildland Urban Interface

Areas surrounding buildings in the WUI may be at greater risk for ignitions due to structure fires transitioning into adjacent wildlands, or from other human activities including outdoor cooking, bonfires, or children playing with fire. Building data was obtained from the Santa Clara County Impervious Surfaces map created by Tukman Geospatial. Areas 200 feet of WUI buildings with vegetation present were assigned a value of 3. Areas outside of this 200-foot buffer were assigned a value of 0. A weighting factor of 1 was chosen for this input.

Wind Speed

Areas with higher wind speeds are likely to experience more intense fire behavior. As provided in Table 2, topography greatly influences wind characteristics including speed and direction. For example, the highest wind speeds are often observed at ridge tops or at the mouth of narrow canyons in alignment with the prevailing wind direction. Variability in wind speed throughout the Planning Area was determined using the Wind Ninja software embedded within FLAMMAP. Wind Ninja accounts for changes in wind speed based on topographical features including slope, elevation, and aspect. Topography inputs were derived from the 2020 5-meter resolution landscape file generated by Tukman Geospatial (Tukman Geospatial 2022). A baseline wind speed of 32 degrees at a direction of 50 degrees was incorporated into the model. The total range of modelled wind speeds was classified into four classes (0-3) using the natural breaks classification method in ArcGIS Pro. A weighting factor of 1 was chosen for this input.



Wildfire Hazard Index

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Wildfire Hazard Index

- **Very Low**
- **Low**
- **Moderate**
- **High**
- **Very High**

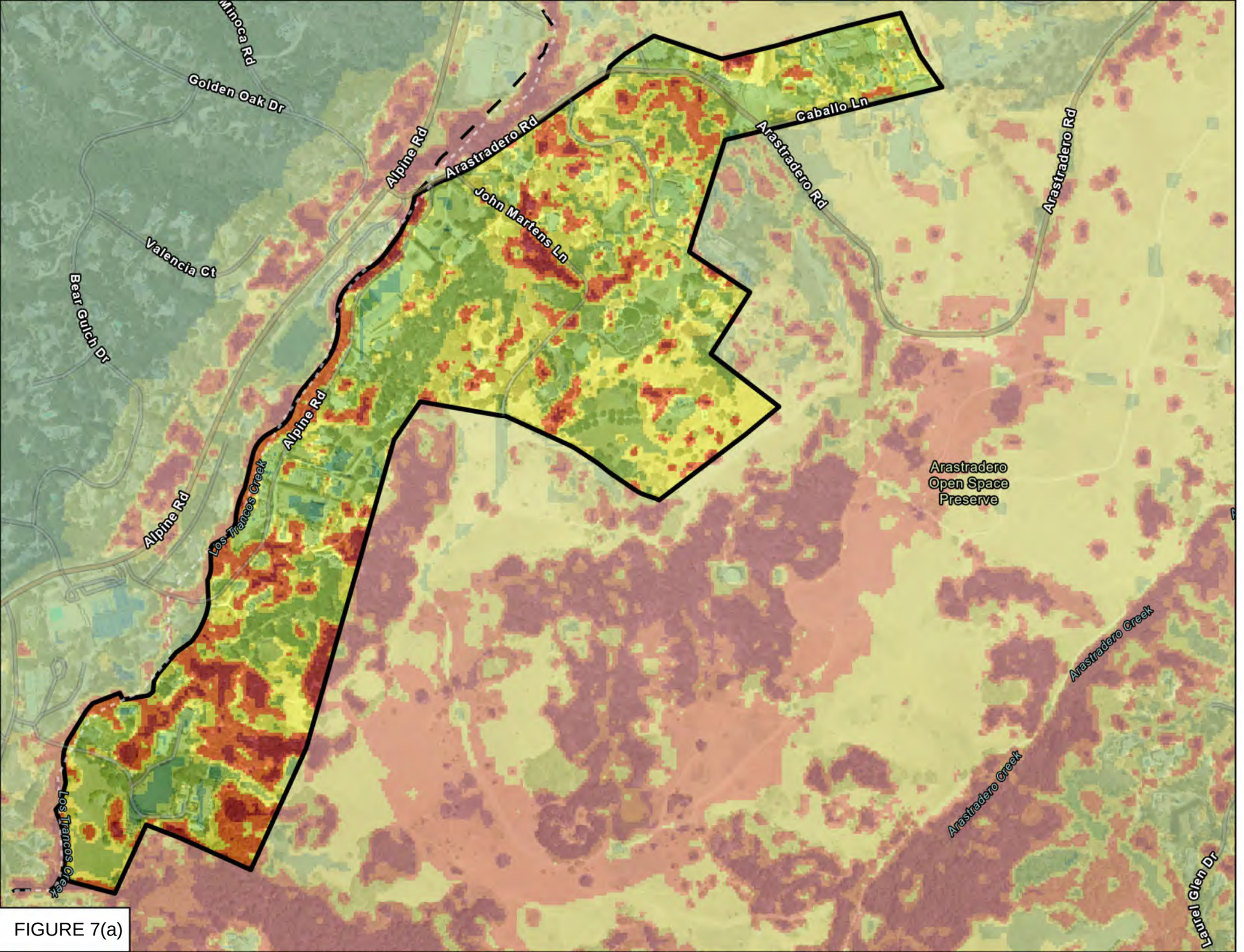
N

0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 7



Wildfire Hazard Index

Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Wildfire Hazard Index

- Very Low
- Low
- Moderate
- High
- Very High

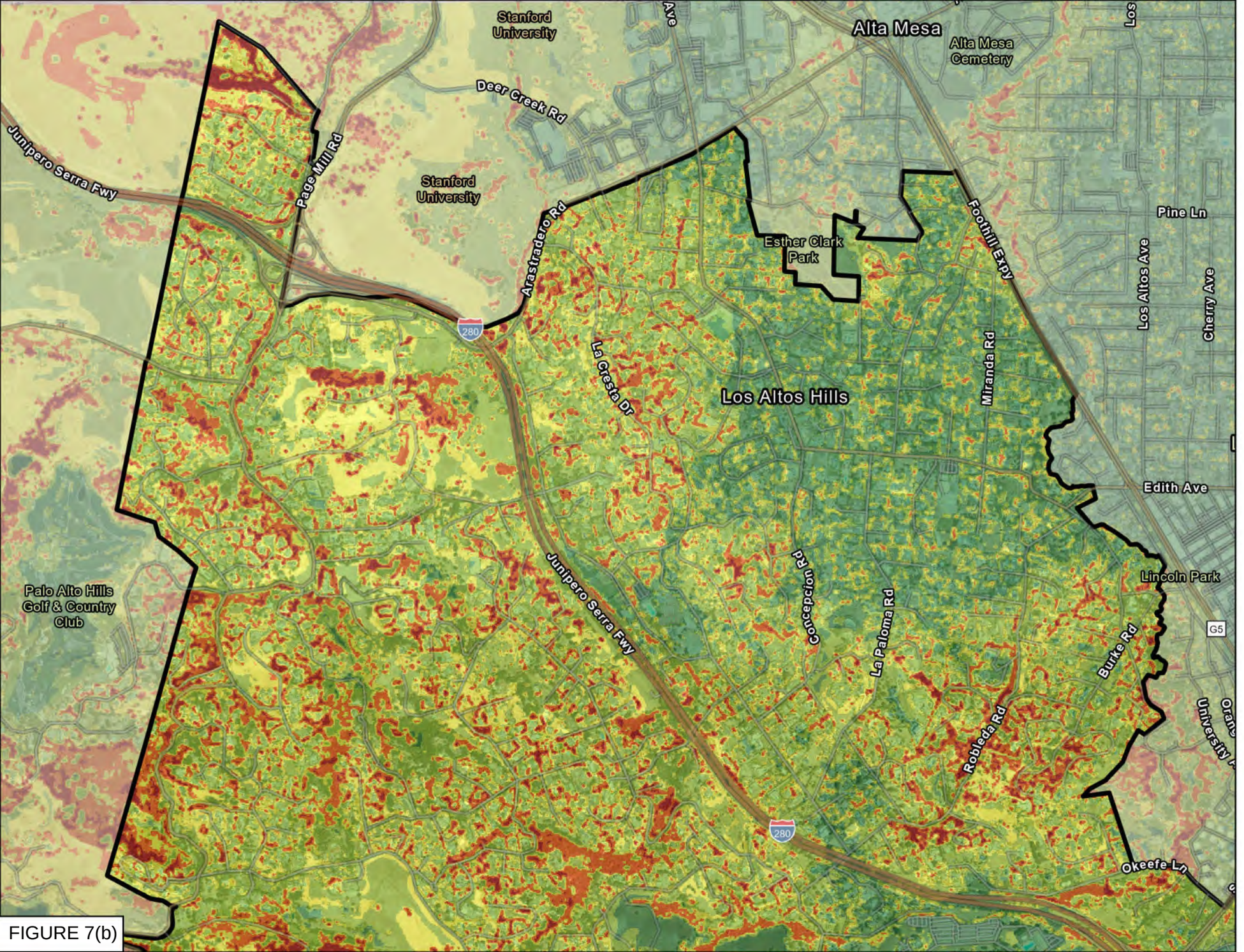
N

0 0.1 0.2 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 7(a)



Wildfire Hazard Index

Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Wildfire Hazard Index

- Very Low
- Low
- Moderate
- High
- Very High

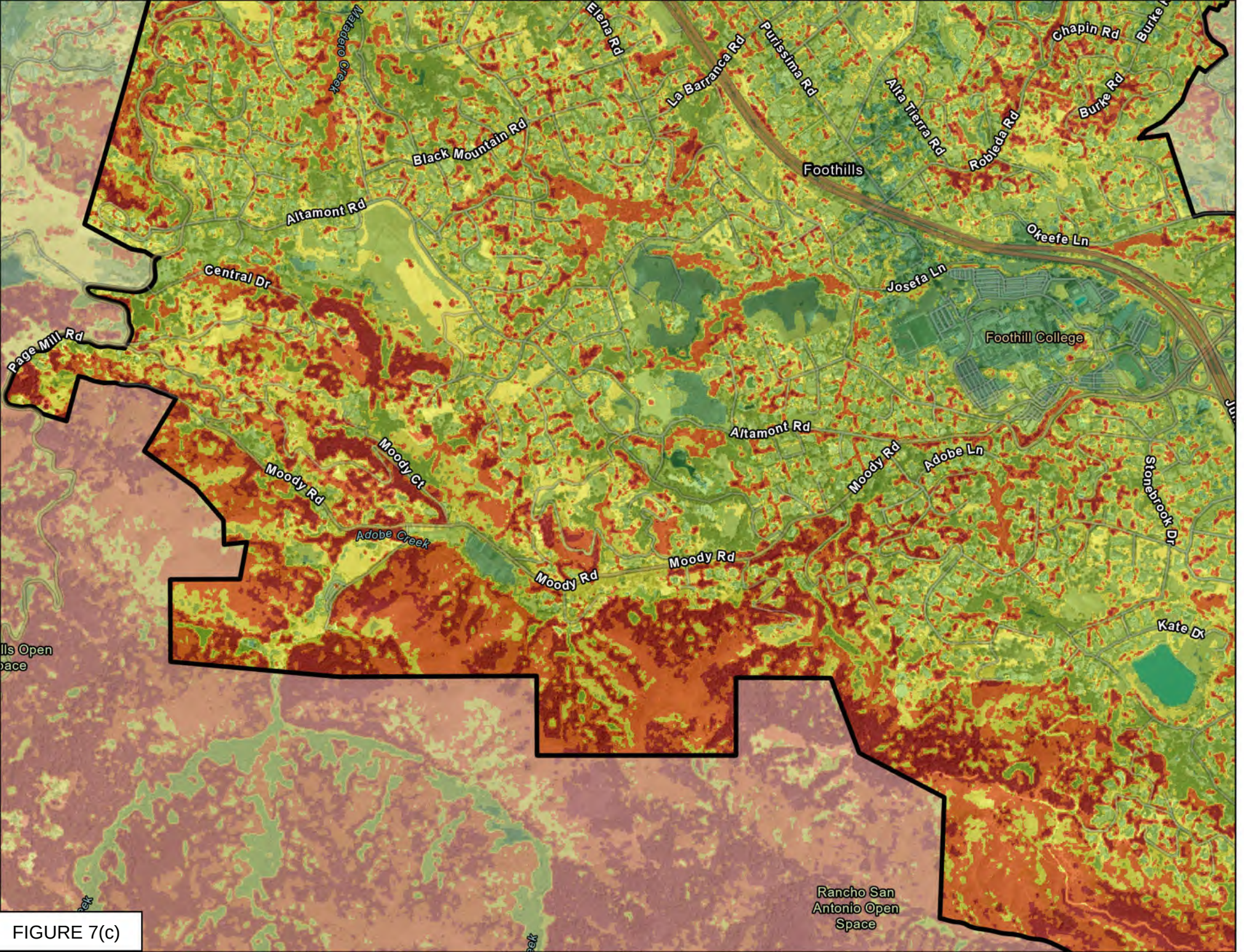
N

0 0.28 0.55 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 7(b)



Wildfire Hazard Index

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Wildfire Hazard Index

- Very Low
- Low
- Moderate
- High
- Very High

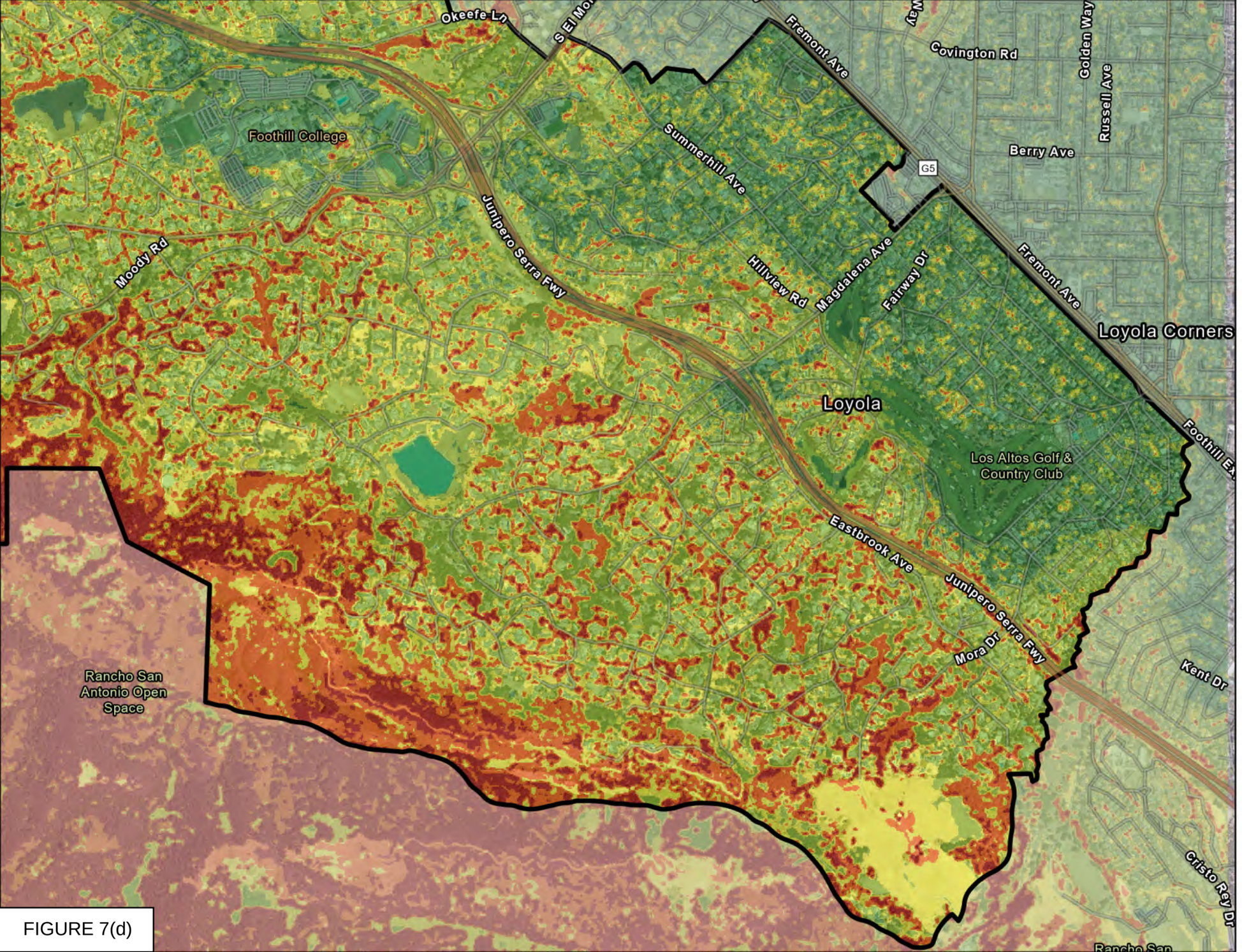
N

0 0.25 0.5 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 7(c)



Wildfire Hazard Index

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Wildfire Hazard Index

- Very Low
- Low
- Moderate
- High
- Very High

N

0 0.28 0.55 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 7(d)

Los Altos Hills Community Area Risk Assessment

Community hazard assessments include ratings of community conditions compared to best practices for WUI fire mitigation. Community Hazard ratings include consideration of applicable state codes, local ordinances, and recognized best practices guidelines.

The National Fire Protection Association Standard 1144 (NFPA 1144) defines WUI hazards and risks at the community and parcel level. This plan utilizes components of NFPA 1144, California laws and local ordinances to evaluate neighborhood WUI hazard and risk. California PRC 4290 and 4291 sections address WUI community design and defensible space standards.

A community risk assessment was conducted in 2019 to reflect average risk to communities for the Planning Area. The NFPA 1144 community risk assessment completed for the Los Altos Hills Community assigned the WUI community a risk rating of High with a score of 88 (<40= low, >40 = moderate, >70 = High, >112 = Extreme, shown in Table 4.1). Factors that contributed to the risk are illustrated below. Averages are taken across the community for each of these parameters. Note that the elimination of the WUI map by the Town of Los Altos Hills does not change the basis for assessing fire risk and development of subsequent fire mitigation measures.

Table 14. Community Area Risk Assessment for the Planning Area

Parameter	Condition	Rating
Access	Two roads in and out	+/-
	Narrow road width	-
	Surfaced road with greater than 5% grade	+
	Poor fire access, dead end spurs, lack turnaround	-
	Street signs are present, some are non-reflective	+/-
Vegetation	Adjacent fuels: Medium	+/-
	Defensible space: >30 feet, <70 feet around structure	+/-
Topography within 300 feet of structure	21%–30 %	-
Topographic features	Moderate to high concern	+/-
History of high fire occurrence	Moderate	+/-
Severe fire weather potential	Low	+
Separation of adjacent structures	Good separation	+/-
Roofing assembly	Class C	-
Building construction	Combustible siding and deck	-
	Building set back <30 feet to slope	-
Available fire protection	Water: hydrants present with variable pressure	+
	Response: Station <5 miles from structure	+
	Internal sprinklers: none	-
Utilities	One above and one below ground	+/-
Risk Rating- High (88)		

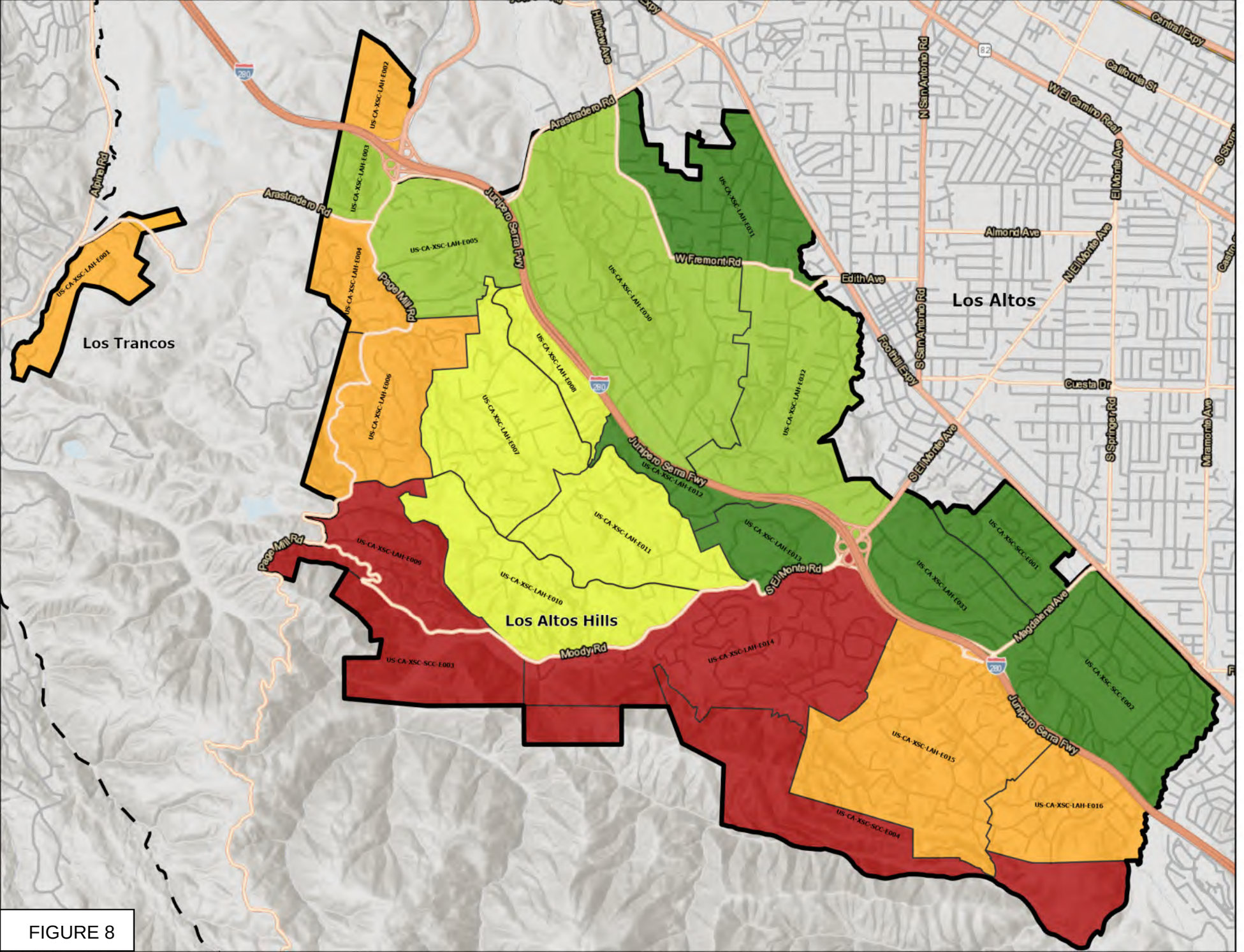
Community Risk Assessment by Genasys Protect Zones (formerly Zonehaven)

To provide a spatial assessment of community wildfire risk, the Planning Area was divided into segments based on Genasys Protect boundaries. Genasys Protect is a newly emerging evacuation planning software which defines geographically defined evacuation zone boundaries. Local emergency planners work in partnership with Genasys Protect to establish zones. In times of emergencies, first responders rely on this program to assist them in making crucial decisions regarding the necessity, timing, and specific areas for issuing evacuation orders or warnings.

In total, 24 Genasys Protect Zones comprise the Planning Area. Community wildfire risk for each zone was determined through determining the proportional area of High and Very High hazard areas as pictured in Figure 8. It was assumed that zones with greater proportional areas of High and Very High hazard also correspond to higher risk areas due to increased community exposure to wildfire. While this assessment does not include the long list of community risk factors as listed in Table 15, it provides a general representation of community area wildfire risk based on nearby wildfire hazard. Wildfire risk for each Zone was classified according to the class breaks provided below in Table 15, and the community area wildfire risk map is presented graphically in Figure 8.

Table 15. Community Area Wildfire Risk Rating Classification

Proportion of High/Very High Hazard Areas within Genasys Protect Zone	Classification
<5%	Very Low
>5-10%	Low
>10-15%	Moderate
>15-20%	High
>20%	Very High



Community Wildfire Risk

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Community Wildfire Risk by Zonehaven Zone

- **Very Low (<5%)**
- **Low (<10%)**
- **Moderate (<15%)**
- **High (< 20%)**
- **Very High (>20%)**

N

0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 8

Critical Infrastructure and Community Values at Risk

Community values at risk may also be referred to as Highly Valued Resources or Assets (HVRAs). Highly Valued Resources and Assets (HVRAs) include natural resources or human-made assets. Human-made assets including critical infrastructure such as electric power supply lines, substations, communication towers, and natural gas lines, are essential to supply residents and businesses with services that are in some cases critical to health and life safety. In many parts of the study area, electric power is needed to provide heating and lighting. Wildfire is a significant threat to the electric utility supply. Other valued community assets may include cultural and historic sites and buildings, critical facilities such as fire stations, hospitals, and schools, among others. HVRAs may pass through multiple jurisdictional areas and therefore wildfire risk mitigation efforts may rely on collaboration between LAHCFD and adjacent landowners (ex. Midpeninsula Open Space District, City of Palo Alto Open Space, City of Los Altos, Stanford University, etc.).

Natural HVRAs include natural resources that may be positively or negatively impacted by fire. Ecosystems within the Planning Area are considered fire adapted, meaning the ecosystem has evolved to depend on periodic wildfires as a crucial ecological process. These ecosystems have developed unique adaptations to thrive and regenerate in the presence of fire. In fire-adapted ecosystems, wildfire may play a vital role in maintaining biodiversity, nutrient cycling, and overall ecosystem health. However, high severity wildfires, which are characterized by intense heat and extensive damage, can lead to more severe and long-lasting impacts. In certain ecosystems, high severity fires can result in the complete destruction of vegetation in an area. Fire-sensitive plant species may struggle to recover or may be unable to regenerate after such intense fires. This can lead to a loss of plant diversity and changes in the composition of plant communities, as some species may be unable to reestablish themselves. The LAHCFD Plan Area includes multiple protected open spaces and preserves that experience high use by local residents and visitors. It is expected that destructive wildfires within these protected areas would greatly limit recreational use and public enjoyment.

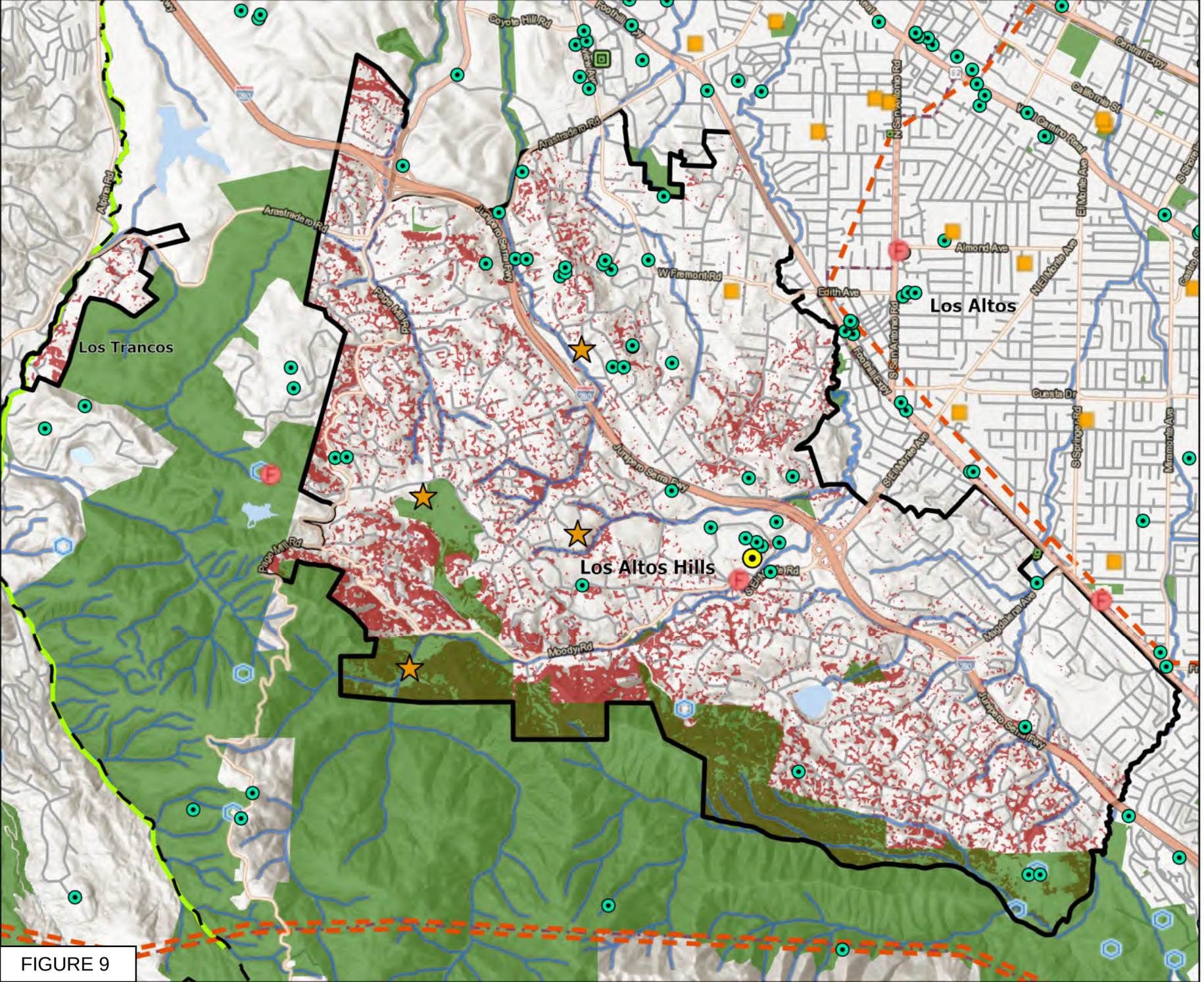
High severity wildfires can result in negative impacts to watersheds. Watersheds need to be protected and maintained from catastrophic wildfire damage to prevent erosion, sedimentation, and water contamination (Taylor et al. 1993). The loss of riparian vegetation degrades important functions which protect water resources, water quality, and aquatic habitats. Riparian vegetation functions to provide stream bank stability; create wildlife habitat, reduce erosion, buffer streams to improve water quality, shade streams and lower water temperatures, and provide a source of large woody debris important for certain species. These important ecosystem services may be completely lost until riparian vegetation recovers over time. Long-term issues resulting from damage to watersheds would be increased run off, poor soil retention, and decreased water quality.

Critical infrastructure and community values at risk data was obtained from the countywide CWPP critical infrastructure, Cultural HVRAs, Socioeconomic HVRAs, and Natural HVRAs datasets. Additional HVRAs locations were also added to include additional locations specific to the LAHCFD Plan Area. HVRAs were overlayed with the Wildfire Hazard Index to identify HVRAs located in close proximity to areas classifies as High or Very High Hazard as provided in Figure 9. Identifying assets at higher risk from wildfires allows for the strategic implementation of mitigation projects (i.e., fuels reduction, structural hardening, etc.) aimed at mitigating the potential loss or damage of valued assets. Critical infrastructure and HVRA's within close proximity (100 feet) of High or Very High Hazard areas is provided in Table 16.

Table 16. HVRAs in Close Proximity to High and Very High Hazard Areas in the LAHCFD

HVRA	Name
Critical Infrastructure and Facilities	
Water Tanks	3 Total
Communication Towers	35 Total
Substations	Loyola Substation
Socioeconomic HVRAs	
Fire Stations	Station CNT-74
	Station PAF-68 (just outside LAHCFD Plan Area)
Cultural HVRAs	
Buildings of Significance	Hidden Villa
	Westwind Barn
	Taaffe House
Natural HVRAs	
City of Los Altos Hills Open Space	Saddle Mountain OSP
	Byrne Preserve
	Hidden Villa Preserve
	Central Drive OSP
	Murietta Ridge OSP
	Rhuus Ridge OSP
	O'Keefe Lane OSP
	Juan Prado Mesa OSP
	Esther Clark Park
	Shoup Park
City of Los Altos*	Redwood Grove Nature Preserve
City of Palo Alto Open Space*	Arastradero Preserve
Stanford University*	Matadero/Deer Creek Easement
Midpeninsula Open Space Protected areas	Rancho San Antonio Preserve
	Foothills Preserve
Riparian Areas	305 Total Acres
Steelhead Critical Habitat	~ 1 mile of Los Trancos Creek

Source: SWCA 2023
Note*: HVRA exists along the boundary of LAHCFD which may result in cooperative management efforts



Highly Valued Resources, Assets, and Critical Infrastructure

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

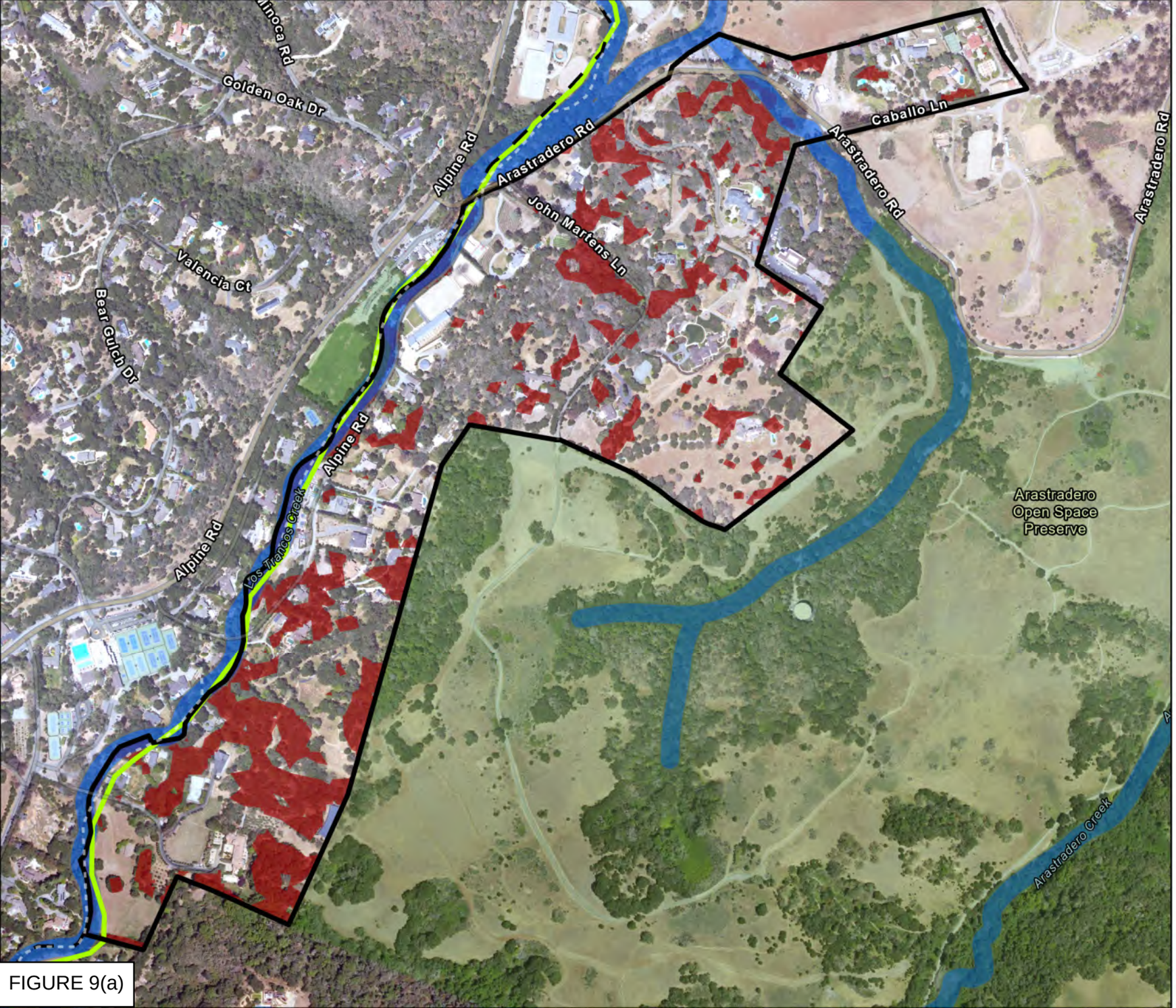
- LAHCFD Plan Area
- Santa Clara County Boundary
- High / Very High Wildfire Hazard
- Substation
- Power Plant
- Water Tank
- Powerline
- Transmission Line
- Fire Station
- Substation
- Power Plant
- School
- Building of Significance
- College
- Communication Tower
- Riparian Areas
- Water Bodies
- Steelhead Critical Habitat
- Protected Area

N
0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 9



Highly Valued Resources, Assets, and Critical Infrastructure

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

- **LAHCFD Plan Area**
- **Santa Clara County Boundary**
- **High / Very High Wildfire Hazard**
- **Riparian Areas**
- **Steelhead Critical Habitat**
- **Protected Area**

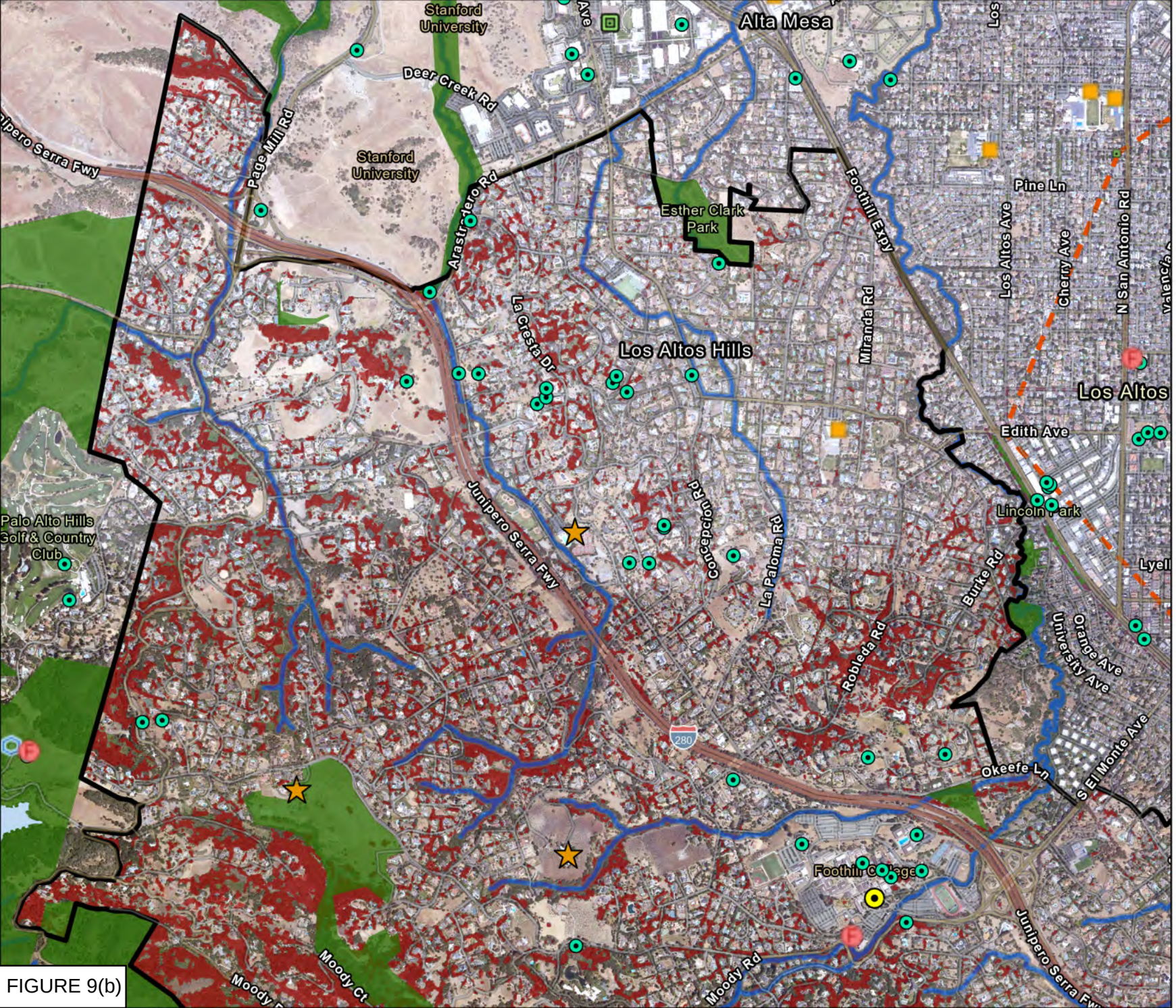
N

0 0.1 0.2 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 9(a)



Highly Valued Resources, Assets, and Critical Infrastructure

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

- LAHCFD Plan Area
- Santa Clara County Boundary
- High / Very High Wildfire Hazard
- Substation
- Power Plant
- Water Tank
- Powerline
- Transmission Line
- Fire Station
- Substation
- Power Plant
- School
- Building of Significance
- College
- Communication Tower
- Riparian Areas
- Water Bodies
- Protected Area

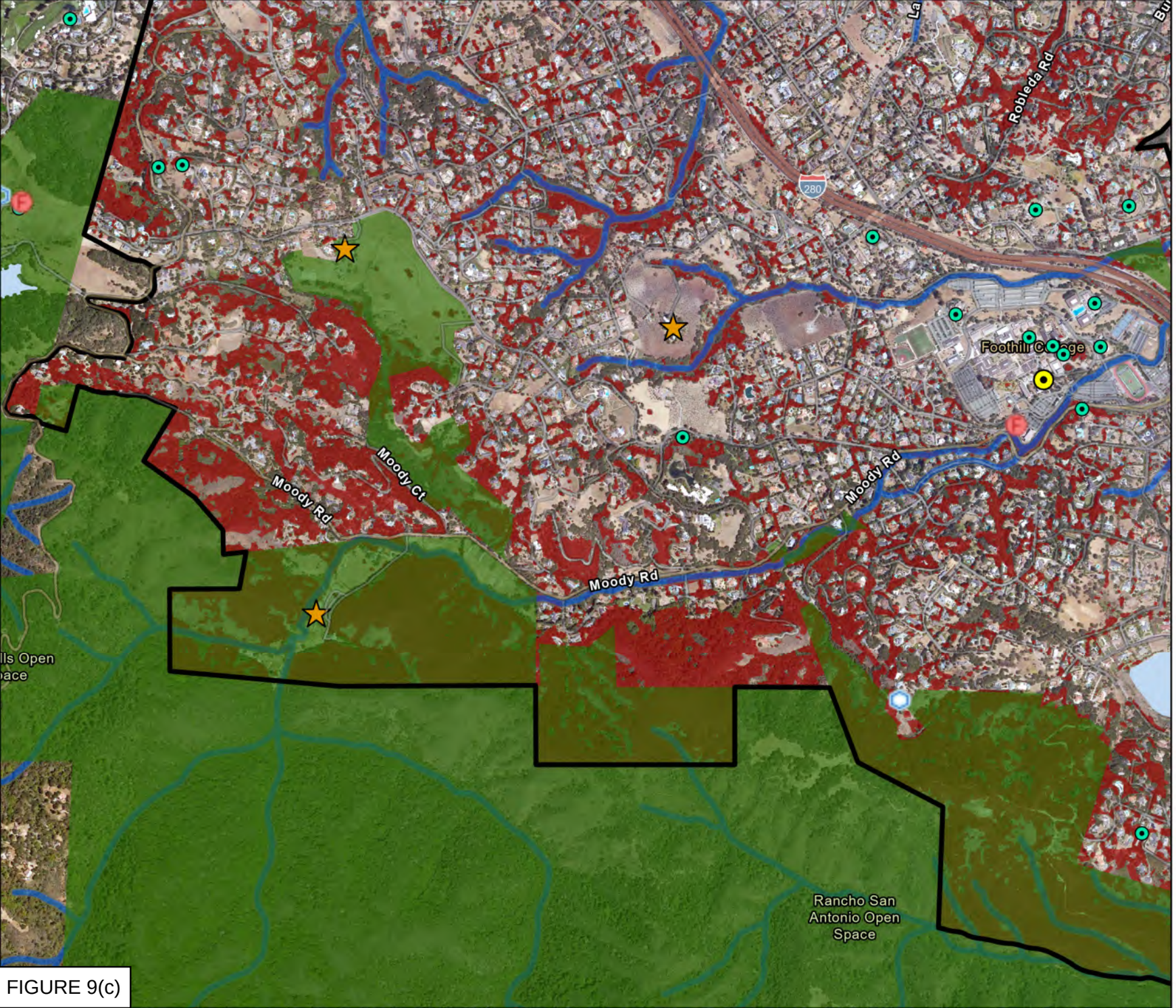
N

0 0.33 0.65 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 9(b)



Highly Valued Resources, Assets, and Critical Infrastructure

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

- LAHCFD Plan Area
- Santa Clara County Boundary
- High / Very High Wildfire Hazard
- Water Tank
- Fire Station
- Building of Significance
- College
- Communication Tower
- Riparian Areas
- Water Bodies
- Protected Area

N

0 0.28 0.55 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 9(c)

Highly Valued Resources, Assets, and Critical Infrastructure

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

- LAHCFD Plan Area
- Santa Clara County Boundary
- High / Very High Wildfire Hazard
- Substation
- Water Tank
- Powerline
- Transmission Line
- Fire Station
- Substation
- School
- College
- Communication Tower
- Riparian Areas
- Water Bodies
- Protected Area

N

0 0.28 0.55 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 9(d)

Mitigation Projects and Prioritizations

Wildfire risk mitigation projects have been identified in Table 17. These prioritized projects are intended to meet the goals outlined in the LAHCFD Strategic Plan. The Strategic Plan for 2023-2027 includes goals related to prevention, protection, and resiliency, preparedness, infrastructure, and sustainability. The following sections identify recommended vegetation treatment and maintenance standards for project in the Planning Area.

Vegetation Management Standards

This section provides vegetation treatment standards and maintenance intervals for fuels reduction activities with the Planning Area according to dominant vegetation type. The guidelines presented are intended to reduce fire hazard by rearranging and maintaining the spatial distribution of fuels. During annual work plan development, LAHCFD will identify the appropriate vegetation management technique for a given area such that the treatment standards identified below can be achieved. As noted, the application of vegetation management techniques will be influenced by site features (e.g., slope, access, treatment area size) and the condition of vegetation at the time of field inspection.

The maintenance interval serves as a general guide for conducting vegetation management maintenance. The exact frequency will depend on annual rainfall, invasive species establishment, pathogens, plant mortality, and other conditions that may influence vegetation characteristics.

LACHFD Continues to expand its utilization of technology including drone imaginary and telemetry cross referenced with ground truthing to monitor the above referenced variables. This advanced monitoring help achieve the optimal vegetation management schedule to keep hazardous fuels within acceptable volumes.

Grass/Herbaceous

In grass-dominated vegetation types, management is intended to reduce vegetation height (e.g., mowing, grazing) resulting in a shorter and more compact surface fuel layer that is less ignitable and less likely to sustain fire spread. Implemented beneath shrub or tree canopies, such treatments also minimize the potential for surface-to-crown fire transition. Management is also intended to maintain low fuel volume in the land areas between shrub- and tree-dominated vegetation types. The following management standards apply to grass/herbaceous fuels:

- Treat grasses (annual and perennial), weeds, and thistles such that heights do not exceed 4 inches. Avoid removal to mineral soil to minimize erosion.
- Cut grass may be left on the ground surface to protect soil as long as it does not exceed 4 inches in height.
- All dead or dying ground cover, vines, or other surface vegetation should be removed or chipped and spread on site.
- All dead twigs, branches, or limbs from overstory shrubs and/or trees should be removed or treated (e.g., chipped) and spread as a ground cover (mulch) on site.
- All mulch or chipped material should be spread to a depth not to exceed 3 inches.
- All material removed from the site should be properly disposed of per local regulation.

- For the Byrne Preserve, grazing should be conducted according to the optimal residual dry matter levels should be determined by overall management objectives, such as suppression of weeds, fuel load reduction, or minimizing erosion potential.

Maintenance Cycle:

- Annually or twice annually

Preferred Treatment Technique:

- Biological (Byrne Preserve) i.e., herbivory.
- Mechanical
- Chemical

Brush/Scrub

In shrub-dominated vegetation types, management is intended to reduce surface fuel loading and flame lengths and slow fire spread by increasing the horizontal spacing between retained shrubs. In areas beneath trees, management is also intended to increase the vertical spacing between shrub and tree canopies to reduce the potential for surface to crown fire transition. Removal or treatment (e.g., chipping) of dead material from shrub-dominated types also reduces dead fuels loads, can assist in reaching spacing standards, and helps minimize the growth of highly ignitable grass/herbaceous vegetation. The following management standards apply to brush/scrub fuels:

- Remove or treat dead and dying plants.
- Individual shrub crowns should be horizontally separated from adjacent shrubs, shrub groupings, or trees by at least two times the height of the shrub crown. Groupings of shrubs should not exceed 8 feet in diameter.
- Where brush/scrub is located within the dripline of an individual, isolated tree or small tree grouping, the vertical separation between the top of the shrub and the lowest tree branch should be at least three times the height of the shrub crown or 10 feet, whichever is greater.
- To minimize soil erosion potential, removed shrubs should be cut at or near the ground surface and root systems left intact.
- All vegetative material from brush/scrub treatment should be removed or treated (e.g., chipped) and spread on site.
- All chipped material should be spread to a depth no greater than 3 inches.

All material removed from the site should be properly disposed of per local regulation.

Maintenance Cycle:

- Every 3 to 4 years

Preferred Treatment Technique:

- Hand Labor
- Mechanical

Tree/Woodland

In tree-dominated vegetation types, management is intended to remove fuel ladders by increasing the vertical spacing between surface fuels (shrubs, grasses, small trees) and tree canopies to reduce the potential for surface to crown fire transition. Creating more fire-resilient woodlands involves reducing surface fuels and ladder fuels (i.e., fuel that can facilitate fire spread from ground fuels into tree crowns). As noted by Nunamaker et al. (2007), surface and ladder fuels should have the highest priority for management to reduce fire intensity, rate of spread, and crown fire potential. Active crown fires are initiated with torching but are ultimately sustained by the density of the overstory crowns. Reduction in potential surface fire behavior plus an increase in canopy base height minimizes torching potential (Agee and Skinner 2005). The following management standards apply to tree/woodland vegetation:

- Remove or treat dead, dying, and prohibited trees.
- Prioritize retention of other healthy native understory components as long as they do not create fire ladders.
- Trees should be pruned to remove limbs located less than 10 feet above the ground surface.
- Where brush/scrub is located within the dripline of a tree, the vertical separation between the top of the retained shrubs and the lowest tree branch should be at least three times the height of the retained shrub crown or 10 feet, whichever is greater.
- Portions of tree crowns above roads should be pruned to maintain 14 feet of vertical clearance above the road surface.
- All chipped material should be spread to a depth no greater than 3 inches. Keep chip piles at least 5 feet from oak tree trunks.
- To minimize soil erosion potential, stumps from removed trees should be left intact, with stump heights not exceeding 3 inches (as measured from the uphill side).
- Native vegetative material from tree removal or trimming should be removed or treated (e.g., chipped) and spread on site (where necessary for erosion control, logs no smaller than 8 inches in diameter [small end] may be retained on the soil surface).
- All material removed from the site should be properly disposed of per local regulation.

The following management standards apply to eucalyptus trees and stands:

- Thin eucalyptus stands to reach an average density of 10 to 16 trees per 1,000 square feet. Prioritize retention of healthy trees and remove trees with trunk diameters measuring less than 8 inches.
- Where small trees, shrubs, or grasses exist beneath tree canopies (surface fuels), the vertical separation between the top of surface fuels and the lowest tree branch should be at least three times the height of the surface fuels or 10 feet, whichever is greater. Where duff, mulch, or bare soil exists beneath tree canopies, provide at least 8 feet of vertical clearance between the lowest tree branch and the duff/mulch/soil surface.
- Remove loose/stringy bark from retained individual eucalyptus trees up to a height of 10 feet to minimize crown fire transition.
- Implement treatment techniques to control sprout growth from cut stumps.

- Maintain duff layer at a depth no greater than 3 inches.
- Eucalyptus debris (e.g., chips, branches, and leaves) should be kept out of native vegetation types.
- Large eucalyptus branches or logs (no smaller than 8 inches in diameter [small end]) may be retained on the soil surface for erosion control purposes, provided they are placed outside the drip line of retained trees; do not result in a heavy accumulation of logs on site; will not roll down slopes into drainages; and do not pose a safety or fire hazard.
- All material removed from the site should be properly disposed of per local regulation.

The following management standards apply to riparian areas as further described in Appendix A:

- Prioritize removal or treatment of nonnative invasive species over native species.
- Focus on removing native shrubs only if they serve as ladder fuels and pose a clear and evident fire risk.
- Preferably, employ manual methods in riparian corridors. Use hand tools for vegetation removal whenever possible to minimize soil impacts, but limited machinery may be utilized if it aligns with habitat and fire management objectives.

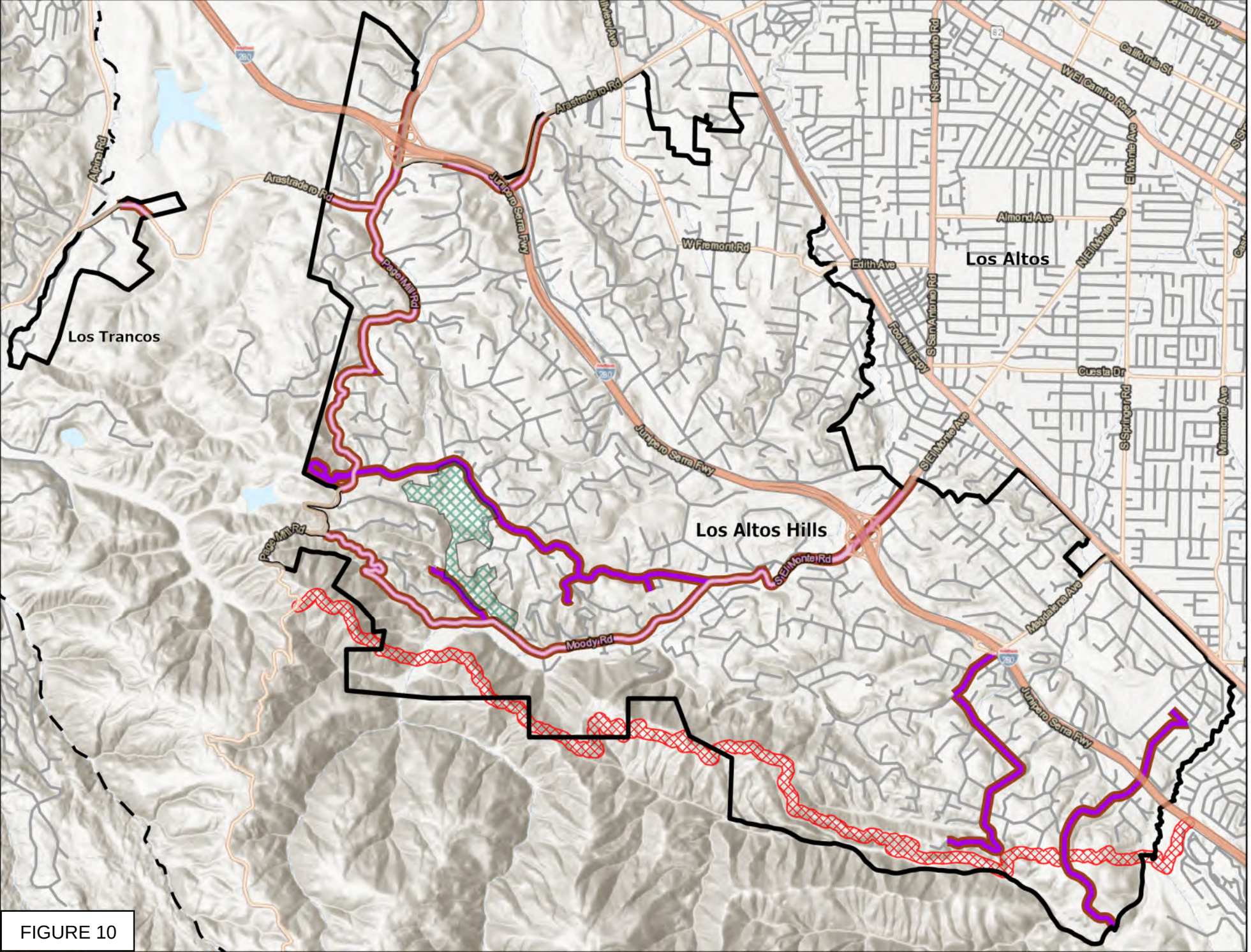
Note: riparian areas may require permitting or agency authorization prior to conducting work. Permitting and/or authorization needs should be confirmed on a project basis.

Maintenance Cycle:

- Every 2 to 5 years

Preferred Treatment Technique:

- Hand Labor
- Mechanical



LAHCFD Vegetation Management Project Areas

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

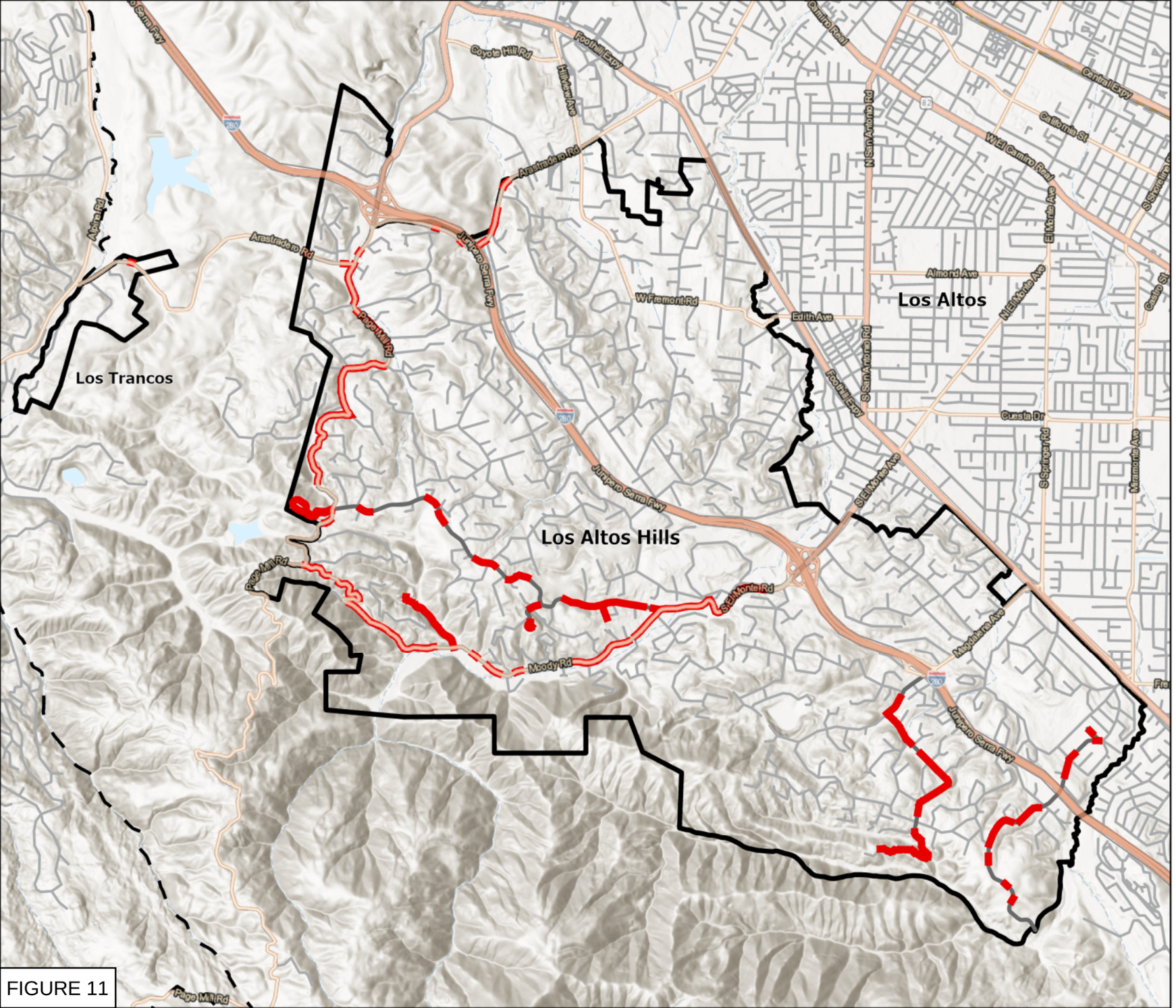
- LAHCFD Plan Area
- Santa Clara County Boundary
- Byrne Preserve Grazing Management
- Evacuation Route Roadside Fuels Reduction
- Community Strategic Fuel Brea (Planned)

N
0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 10



Evacuation Route Fuels Reduction Priority Areas

Community Wildfire Protection Plan

Annex 4: Los Altos Hills County Fire District

Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Evacuation Route Fuels Reduction Priority Areas

Highest Priority

N

0 0.5 1 Miles

DUDEK

LOS ALTOS HILLS COUNTY FIRE DISTRICT

FIGURE 11

Table 17 Recommendations to Create Resilient Landscapes (Fuel Treatments)

Project ID & Name	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
Strategic Goal: #1 Prevention, Protection, Resiliency										
Chart of Services: Community-Focused Integrated Hazardous Fuel Reduction (IHFR) Programs										
LAH RL1 Community Strategic Fuel Breaks	Planning stage	H	Ongoing	Collaborate with regional partners to create and maintain community strategic fuel breaks within the LAHCFD boundaries to protect LAHCFD residents and residents in neighboring jurisdictions. If completed, the CSFBs will, where feasible, be a continuous line of various fuel treatments and vegetation reductions that may incorporate trails, roads, ridges, hardened private properties, and other natural topographic features. Fuel break will abut neighboring jurisdictions' hazardous vegetation treatment projects.	**Project 1**: Southern District CSFB: The strategic line will be approximately 5.5 miles long, creating an east-west fuel break starting at Interstate 280, near Rancho San Antonio Open Space Preserve, (Midpen and Santa Clara County Parks) and running west across Midpen land and Palo Alto Foothills Park ending at Page Mill Road. **Project 2**: Create a north/south fuel break along I280 from Permanente Creek/Rancho San Antonio area (just north of the Foothill Expressway ramp) running north to Page Mill Road.	County Parks, MPOSD, City of Palo Alto, Palo Alto Parks, Hidden Villa, private residents, Open Space Authority, State Highway Agency, Caltrans	Install community strategic fuel breaks. The objective is to accomplish a large-scale treatment meant for connectivity utilizing current fire science research and principles and vegetation management best practices. • Coordinate with neighboring jurisdictions • Complete planning and preparations • Analyze appropriate CEQA compliance options.	Protect life and property by reducing the spread of high-severity wildfires and improving access for emergency vehicles.	A regular maintenance schedule should be implemented to ensure clearance levels are maintained and remain effective. Regular maintenance is needed to ensure the fuel breaks remains clear of vegetation. Monitor for erosion and invasive species.	LAHCFD
LAH RL2 Evacuation Routes	Ongoing	H	Ongoing	Continue and expand collaborating with regional partners and adjacent jurisdictions on evacuation route hardening efforts to create a network of safer roadways for motorist egress and first responder ingress.	Page Mill Road, Mora Drive-Ravensbury Avenue, Arastradero Rd, Altamont Rd, Moody Road- El Monte Road, Magdalena-Summerhilll Rds Robleda-Burke Aves LAHCFD continues to evaluate other potential Evacuation Routes.	County Roads and Airport, Town of LAH, private landowners,	Continue to evaluate the risk to communities and add new evacuation routes to the District's project plan. Continue to maintain previously completed evacuation routes. Increase participation of private property owners through the Right of Entry (ROE) permits. • Complete planning and preparations for additional evacuation routes. • Maintain completed evacuation routes.	Reduce fuel loading around roads and highways to ensure the safe passage of vehicles in the event of an evacuation and reduce the frequency and severity of unplanned ignitions from vehicles and other ignition sources.	A regular maintenance schedule has been implemented to ensure clearance levels are maintained and remain effective.	LAHCFD
LAH RL3 Goat Grazing	Annual maintenance cycle	H	Annual	Expand prescribed goat grazing in open space areas.	LAHCFD and bordering jurisdictions	Byrne Preserve/ LAHCFD Town of LAH PHWD	Continue to utilize prescribed grazing in Byrne Preserve and seek other locations to expand prescriptive herbivory.	Reduce risk to life and structures through defensible space in open space lands.	A regular maintenance schedule has been implemented to ensure clearance levels are maintained and remain effective.	LAHCFD and partner jurisdictions

Project ID & Name	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
LAH RL4 UAS Telemetry	Ongoing	H	Ongoing	Continue and expand the use of UAS telemetry to evaluate fuel types in hard-to-access areas. Monitor projects' regrowth, vegetation regime change, pathogens, to plan maintenance frequency and project work plan.	LAHCFD	LAHCFD	Continue to work in conjunction with contractor to expand options and uses for telemetry. Make data-driven decisions when prioritizing projects and scope of work. Capture before and after sequences, measurements and metrics for analysis and continuous program improvements	Telemetry identification and analysis of hazards, infrastructure, species, vegetation density and risks associated with fuels and topography. These methods may work well to evaluate fuel treatments' efficacy and breaks. Method also supports maintenance schedule analysis through vegetation moisture monitoring, annual rainfall variance, pathogen monitoring i.e. SOD and invasive species succession.	Periodic new UAS flights to update data sets including before and after projects documentation, annual maintenance vegetation regrowth tracking and volumetrics on all projects.	LAHCFD
Strategic Goal: #1 Prevention, Protection, Resiliency										
Chart of Services: Prevention and Protection Programs – Community Outreach & Education (COE) and Communication										
LAH RL5 Residential programs	In progress and ongoing	H	Ongoing	Continue to support and increase parcel-level reduction in fuels and increased home hardening efforts by residents. Partner with residents to reduce vegetation on private parcels. District chips and disposes (DSBC) of biomass produced by residential property defensible space hygiene and maintenance.	LAHCFD	Private residences	Continue efforts to support and increase participation in District-provided programs that reduce hazardous fuels and educate residents on the benefits of hardening their homes. • Continue and expand DSBC program, • Continue and expand Home Ignition Zone (HIZ) assessments, and • Expand HIZ rebate program and continue to explore methods of incentivizing residents to participate.	Reduce loss of life and structures through defensible space.	Continue to evaluate effectiveness of the program and scale to fit needs of the community.	LAHCFD
Strategic Goal: #2 - Preparedness										
Chart of Services: Prevention and Protection Programs – Community Outreach & Education (COE) and Communication										
LAH RL6 Firewise USA	In progress and ongoing	H	Ongoing	Continue to support and mobilize community-level participation in Firewise USA program to increase community participation, provide outreach and education in programs that support home hardening and, fuels reduction efforts.	LAHCFD	LAHCFD, Contractors, Firewise, USA	Continue efforts to increase participation in District-provided programs that reduce hazardous fuels and educate residents to harden their homes. • Continue to support and expand Firewise communities.	Continue to encourage residents to utilize the District's existing integrated hazardous fuels reduction programs. These programs include Home Ignition Zone (HIZ) assessments and the HIZ rebate program, Defensible Space Brush Chipping and Debris Removal (DSBC), and the Right of Entry (ROE) process during community-level projects to encourage residents to participate. Continue to build and support Firewise Communities.	Continue to evaluate the effectiveness of programs regularly. Continue to seek effective methods for increasing participation.	LAHCFD

Table 18. Recommendations for Creating Fire-Adapted Communities (Public Education and Reducing Structural Ignitability (Ignitions)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
Strategic Goal: #1 Prevention, Protection, Resiliency										
Chart of Services: Residential-Focused Integrated Hazardous Fuel Reduction (IHFR) Programs										
LAH FAC1 Home Ignition Zone (HIZ) Assessments	In progress and ongoing	H	Ongoing	Educate and incentivize residents via HIZ (Home Ignition Zone) assessments and rebate program.	LAHCFD	LAHCFD in Partnership with Contract Agency, Private residences	Through education and outreach. Continue efforts to increase participation in District-provided programs that reduce hazardous fuels and help residents harden their homes.	Increase participation in parcel-level defensible space efforts designed to reduce loss of life and structure. Residents' efforts should increase insurance renewals and decrease cancellations.	Continue to evaluate the effectiveness of programs regularly. Continue to seek effective methods for increasing participation.	LAHCFD
Strategic Goal: #2 Preparedness										
Chart of Services: Prevention and Protection Programs – Community Outreach & Education (COE) and Communication										
LAH FAC 2 Firewise Communities	In progress and ongoing	H	Ongoing	Continue to support and develop Firewise Communities	LAHCFD	LAHCFD Firewise, USA	Continue to support existing communities with resources and assistance with the process. Increase participation through education and outreach.	Increase participation in community-level Firewise techniques. The program enables communities to increase preparedness and self-reliance in times of large-scale disaster.	Evaluate community progress towards Firewise recognition every year.	LAHCFD
LAH FAC3 COE and Communication	In progress and ongoing	H	Ongoing	Continue to increase wildfire awareness through outreach efforts.	LAHCFD Local partners	LAHCFD	Continue and expand awareness and education to residents in the following areas: • Social media outreach, • Short informational videos and FAQ videos, • District newsletter and other publications, • Events, and • Expand the capability and accessibility of the District website, including improving access to legacy documents.	Prepare and educate communities for resiliency and emergency preparedness before a disaster occurs.	Continue to evaluate the effectiveness of outreach efforts on a biannual basis.	LAHCFD
Strategic Goal: #1 Prevention, Protection, Resiliency										
Chart of Services: Residential-Focused Integrated Hazardous Fuel Reduction (IHFR) Programs; Prevention and Protection Programs – Santa Clara County Central Fire Protrection District, Community Outreach & Education (COE) and Communication										
LAH FAC4 Encourage, educate, and support resident compliance with laws, codes, and ordinances.	In progress and ongoing	M	Ongoing	Educate and support compliance with education and outreach to support varying wildfire prevention rules including defensible space and home hardening standards applicable to property owners.	LAHCFD	Santa Clara County Central Fire Department, Town of Los Altos Hills	Promote defensible space and home hardening standards: • Encourage new homes/structures to be made with non-combustible materials (i.e., encourage structural hardening). • Educate and encourage compliance with the 30-100 feet of defensible space around structures. • Clean and maintain ingress/egress routes. • Seek to develop two ways out of a community. • Continue educating homeowners on tangible actions to mitigate their wildfire hazards and risk. • Support "Life Safety First" campaign.	Reduce loss of life and structures through defensible space and property hygiene and maintenance education and outreach programs.	Annual program evaluation and updates as necessary. Consider supporting updates to the LAH Town building code, where needed.	LAHCFD

Table 19. Recommendations for Safe and Effective Wildfire Response

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
Strategic Goal: #1 Prevention, Protection, Resiliency										
Chart of Services: Community-Focused Integrated Hazardous Fuel Reduction (IHFR) Programs; Prevention and Protection Programs- Evacuation/Relocation										
LAH FR1 Pre-plans for Temporary Refuge Areas (TRAs) along Evacuation Routes	Planning stages with regional partners	M	Within 1 year	Work with County and local partners to develop WUI Pre-Plans with evacuation routes identifying temporary refuge areas on a standardized format.	LAHCFD	LAHCFD SCCFD	Utilize Genasys/Zonehaven software. Ground truth Genasys/Zonehaven information. Develop partnerships and MOUs for use of TRA land and facilities.	Notify citizens of evacuation plans expeditiously.	Vegetation management projects maintenance before peak wildfire season.	Grants: LAHCFD
Strategic Goal: #1 Prevention, Protection, Resiliency										
Chart of Services: Prevention and Protection Programs										
LAH FR2 Vulnerable population registry	Upcoming	M	Ongoing	Cooperate with County efforts to identify and catalog populations with disabilities or access needs during evacuations.	LAHCFD	Santa Clara County Office of Emergency Management	Registry populated by individual citizens.	Assist in the safe evacuation of vulnerable populations. Aligns with the following plans: • Santa Clara County Operational Area Hazard Mitigation Plan (2017) • Strategic Visioning Plan (EOP) (2022)	Yearly evaluation of egress and ingress needs**. y.**	Grants: LAHCFD
Strategic Goals: #1 Prevention, Protection, Resiliency; #2 Preparedness										
Chart of Services: Prevention and Protection Programs – Emergency Access Roads; Community Outreach & Education (COE) and Communication										
LAH FR4 Fire Access Roads vegetation mitigation	Early planning stages with regional partners	M	Within 1 year	Fire access road planning, GIS mapping, easement analysis, development of strategies	LAHCFD	LAHCFD SCCFD	Assess existing private access roads and harden where appropriate. Coordinate efforts with SCCFD.	Improve the efficiency and safety of evacuations.	Add to maintenance schedule	LAHCFD

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
LAH FR5 Evacuation Arrows	Upcoming	M	Ongoing	In alignment with County efforts, establish new evacuation arrow markers in neighborhoods	LAHCFD Santa Clara County Town of LAH	Santa Clara County Office of Emergency Management	Provide resources or sign compliance with CA rules and community placement.	Improve the efficiency and safety of evacuations. Aligns with the following plans: • Santa Clara County Operational Area Hazard Mitigation Plan (2017) • Strategic Visioning Plan (EOP) (2022)	TBD	LAHCFD
Strategic Goal: #2 Preparedness										
Chart of Services: Prevention and Protection Programs – Community Outreach & Education (COE) and Communication										
LAH FR6 House numbers	Upcoming	M	Ongoing	4-inch Reflective house numbers	LAHCFD	LAHCFD SCCFD	Encourage residents to install 4-inch reflective house numbers for emergency responders to locate homes	Improve the efficiency and decrease response time of Santa Clara County Fire		LAHCFD
Strategic Goal: #2 Preparedness										
Chart of Services: Prevention and Protection Programs – Public Alert & Warning										
LAH FR7 Early Warning Fire detection devices	Upcoming	H	Ongoing	Participate with County and SCCFD to support a Countywide early warning fire detection system.	Countywide	Santa Clara County Office of Emergency Management, SCCFD	Determine costs, upkeep, and operational capacity of an early warning fire detection system. Consider feasibility of evolving early warning fire detection technologies and support the efforts of SCCFD to determine feasibility for use in the LAHCFD WUI terrain.	Improve early detection of new wildfire ignitions in Santa Clara County and specifically in LAHCFD.	Yearly testing and maintenance before peak wildfire season.	LAHCFD
Strategic Goal: #3 Infrastructure										
Chart of Services: Prevention and Protection Programs- Water Systems (Hydrants, Valves, & Laterals)										
LAH FR8 Fire Hydrants	Ongoing	H	Ongoing	Install, repair, relocate, add, maintain LAHCFD-owned fire hydrants within the PHWD water system	LAHCFD Purissima Hills Water District California Water Service (Cal Water)	Purissima Hills Water District (Water) LAHCFD (Hydrants)	Own, repair, relocate, replace, and add as needed to the 500+ existing hydrants. Repair hydrant strikes promptly. Participate in road maintenance projects when hydrants need servicing for new road conditions. Coordinate with Cal Water on the placement of new and relocated fire hydrants.	Firefighting response will be improved if water is more readily available or closest locations could be identified on a GIS map. Aligns with the following plans: • Santa Clara County Operational Area Hazard Mitigation Plan (2017)	Purissima Hills Water District (Water) LAHCFD (Hydrants) Cal Water	LAHCFD, Purissima Water District Cal Water

Table 20. Recommended Monitoring Strategies

Strategy	Task/Tool	Lead	Remarks
Accountability to residents, and progress tracking	Continue to provide monthly updates and reports to LAHCFD Board of Fire Commissioners and the public. Staff also provide semiannual reports. All meeting information is made available to the public via the District website, agendas and in-person and videos of the Commission meetings.	LAHCFD Staff	Provides accountability and a mechanism for staff to measure progress, success and continuous improvements of programs and projects.
Project tracking system	On-line web app to track hazardous fuels projects spatially, integrating wildfire risk layer to show progress towards wildfire hazard and risk reduction. Web app would include attribute tables that outline project details	District and vendors	Interactive tool will be easily updated and identify areas that require additional efforts
Photographic and video record (documents pre- and post-fuels reduction work, evacuation routes, workshops, classes, field trips, changes in open space, treatment type, etc.)	Establish field global positioning system (GPS) location; photo points of cardinal directions; keep photos protected in archival location	District and vendors	Relatively low cost; repeatable over time; used for programs and tracking objectives
Track number of acres treated (by fuel type, treatment method)	GPS/GIS/fire behavior prediction system	District and vendors	Evaluating costs, potential fire behavior
Number of home ignition zones/defensible space treated to reduce structural ignitability	HIZ assessment tracking provided by SCCFSC	LAHCFD SCCFSC	Evaluate effectiveness of HIZ program outreach and continue to improve efforts
Number of homeowner contacts (brochures, flyers, posters, etc.)	Visits, phone	LAHCFD Community Outreach and Education Team	Evaluate objectives and effectiveness of outreach on a semiannual basis

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APPENDIX A

Riparian Area Vegetation Management Guidance

Riparian areas are the zones of land adjacent to bodies of water, such as rivers, streams, and lakes. These areas are characterized by their unique hydrologic and ecological features and provide important habitat for a variety of plant and animal species. Riparian areas are typically characterized by high soil moisture, cooler temperatures, and plant productivity and as a result, support a wide range of vegetation, including trees, shrubs, and grasses (Ilhardt et al 2000). The vegetation in these areas helps to stabilize streambanks and protect against erosion, while also providing shade and cooling the water for aquatic species (Abernethy & Rutherford 1999).

These areas also play an important role in water quality, as they can act as a filter for pollutants and sediment, helping to improve water quality downstream. Riparian areas are also important for human use, providing recreational opportunities such as fishing, boating, and wildlife viewing.

In the Los Altos Hills Plan Area, riparian areas often resemble intermittent streams, meaning flowing water is present only for certain periods throughout the year. Perennial and ephemeral streams are also present throughout the plan area resulting in an abundance of riparian areas.

Generally, wildfire behavior in riparian areas in less severe to due higher fuel moistures and relative humidity (Dwire, & Kauffman 2003). However, high fuel loads in riparian areas can lead to extreme wildfire behavior (high flame lengths, crown fires) during periods of dryness. Dry fuels in riparian areas can contribute to rapid wildfire spread up or down drainages. Fuels treatments have been proven to effectively reduce wildfire intensity in riparian areas (Fire Science Digest, 2015).

Fuels treatment activities in riparian habitat should be designed to avoid loss of riparian habitat function. To minimize impacts in these areas, the following should be considered when conducting fuels treatment activities. Prior to conducting fuels treatment in riparian areas, appropriate environmental review will need to be completed and necessary agency permits obtained.

General

- Preserve native riparian vegetation in a diverse and well-distributed stand, similar to the pre-treatment conditions.
- Prioritize removal or treatment of nonnative invasive species over native species.
- Avoid fuels treatments along perennial streams, unless a clear and obvious wildfire hazard is present. If treatments are conducted, take even greater precautions to mitigate harm to sensitive species.
- Avoid removing vegetation that provides stream shading and regulates stream temperatures.
- Preferably, employ manual methods in riparian corridors. Use hand tools for vegetation removal whenever possible to minimize soil impacts, but limited machinery may be utilized if it aligns with habitat and fire management objectives.

- Focus on removing abnormal fuel loads (e.g., dead or dying vegetation), trimming or limbing woody species to reduce ladder fuels, and selectively thinning vegetation to restore healthy riparian stand densities.

Trees

- Aim to retain at least 75 percent of the upper canopy.
- Prioritize the management of dead and dying trees. Standing dead trees (snags) in riparian corridors can provide valuable habitat and may be retained after assessing the overall fire risk. When disposing of diseased vegetation, such as that infected with sudden oak death or pine pitch canker, take precautions to prevent disease spread. Consultation with a qualified professional is recommended for best practices.

Shrubs

- Retain at least 50 percent of the understory canopy of native riparian vegetation within the riparian habitat boundaries.
- Focus on removing shrubs that serve as ladder fuels unless they pose a clear and evident fire risk.

Herbaceous

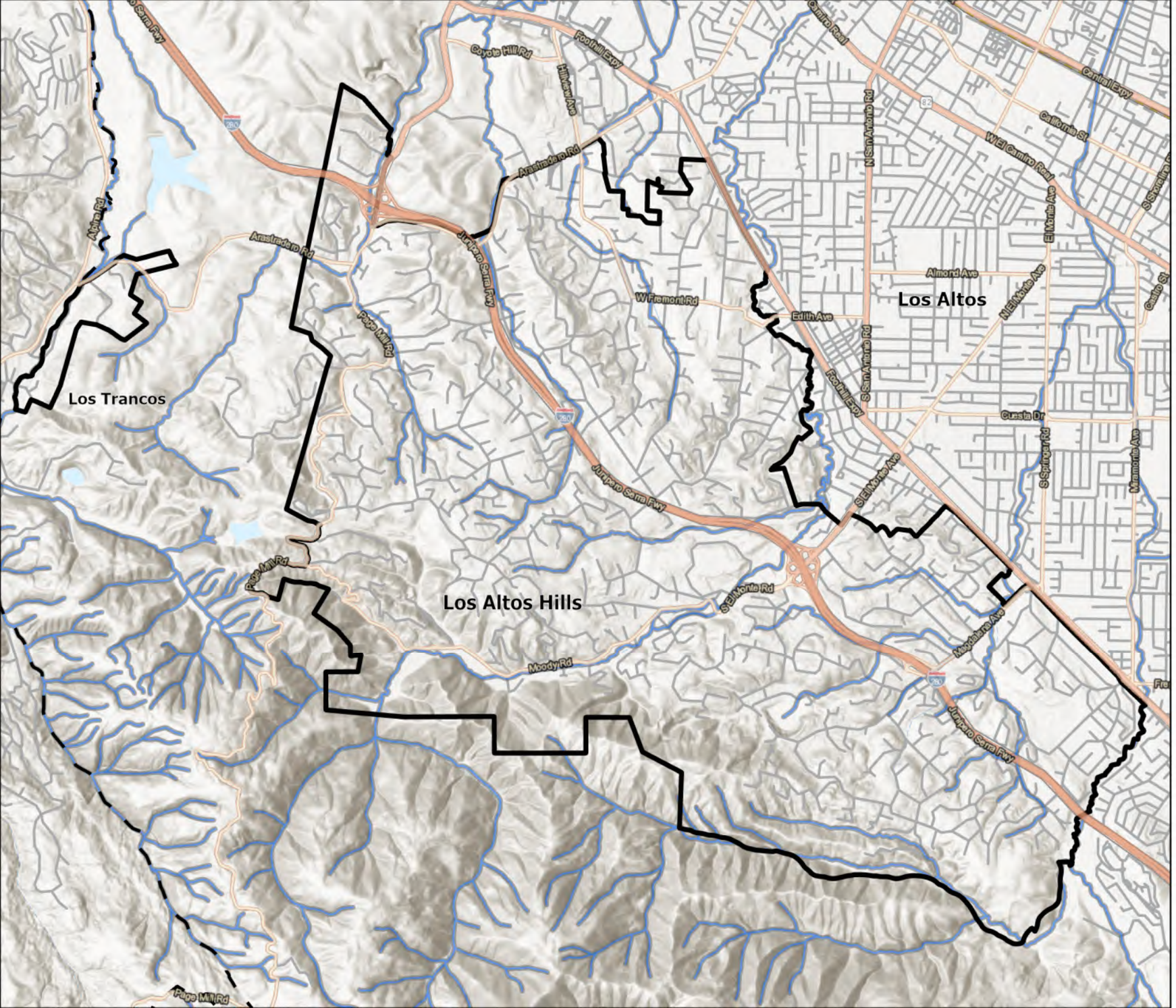
- Target nonnative annual grasses and invasive herbaceous plants. Native perennial grasses and forb species generally do not require vegetation management unless a clear and obvious fire risk is present.

Biological Protection

- Conduct vegetation management activities in a manner that safeguards riparian habitat and water quality, including the preservation of tree canopies that provide shade to the channel.
- Avoid harming or removing rare, special status, or listed plants unless managed in a way that does not cause permanent damage. Consult with a qualified professional to ensure the proposed fuel treatment efforts do not impact these species.
- Avoid removing vegetation that could reduce stream shading and increase stream temperatures. Preferably, utilize manual methods in riparian corridors, with limited machinery used only when necessary to achieve habitat and fire management objectives.
- Conduct vegetation removal outside the bird nesting season (typically February 1 to August 15) or implement measures to protect nesting birds. This involves conducting field surveys by qualified biologists before starting work and implementing avoidance buffers as necessary.
- Remove debris jams that may occur during treatments (fallen trees) that obstruct the channel.

Erosion and Stream Sedimentation Control Measures

- Perform work in riparian areas only when they are dry.
- Minimize soil compaction to the greatest extent possible. Limit the use of heavy equipment within the riparian corridor for vegetation removal and prefer less disruptive mechanical removal methods (e.g., hand treatments, lop and scatter treatment of slash). Avoid constructing new roads as a result of fuel reduction operations and take precautions in unstable areas.



Riparian Areas

Community Wildfire Protection Plan
Annex 4: Los Altos Hills County Fire District
Santa Clara County, CA

LAHCFD Plan Area

Santa Clara County Boundary

Riparian Areas

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LOS ALTOS HILLS COUNTY FIRE DISTRICT

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