

**ROLLING HILLS  
COMMUNITY WILDFIRE PROTECTION PLAN  
(CWPP)**



**V2020.1  
JULY 2020**

The City of Rolling Hills Community Wildfire Protection Plan was developed collaboratively among stakeholders including the community, the City of Rolling Hills, the Rolling Hills Community Association, the Los Angeles County Fire Department, and the Los Angeles Sheriff's Department. The plan includes a prioritized list of hazardous fuel reduction strategies and addresses measures that the community members can take to reduce structural ignitability. The undersigned have reviewed the Rolling Hills CWPP and accept this document as the final draft representing 2020.

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**CITY OF ROLLING HILLS  
COMMUNITY WILDFIRE PROTECTION PLAN (CWPP)  
JULY 2020**

**INTRODUCTION**

2018 was a year of destructive wildfires throughout California taking lives, destroying properties and prompting large-scale emergency evacuations. It was a stark reminder that all the land in Rolling Hills and the Palos Verdes Peninsula were determined as “Very High Fire Hazard Severity Zone” by the State of California Department of Forestry and Fire Protection. Recognizing its wildfire history, the City of Rolling Hills asked residents what actions should be taken to better prepare and protect lives in the event of a wildfire?



What is the greatest risk of wildfire for Rolling Hills? The residents responded fire fuel in the canyons. Is there more that the Rolling Hills Community Association and the City should be doing to protect lives and properties in the case of wildfires? The residents responded yes! Would the community be interested in receiving information on the best way to manage the vegetation in the canyons to prevent wildfires? The residents responded yes! How important is it for residents to manage fuel (e.g. trees, brush, etc.) on their property (including canyons located on private property)? The residents expressed, on a scale 1-100 with 100 being very important, 87. All of these efforts to reduce

vegetation are critical to our highest priority – protecting the lives of residents and their families.

Early 2019 marked the beginnings of a needed collaboration between the residents of Rolling Hills, the City of Rolling Hills, Rolling Hills Community Association (RHCA), Los Angeles County Fire Department and Los Angeles County Sheriff's Department (collectively referred to as First Responders). The four entities worked together throughout the year to formulate a Community Wildfire Protection Plan (CWPP). The CWPP for the City of Rolling Hills is an action plan to implement wildfire mitigation measures to address the community's greatest risks. Residents were offered opportunities to voice their opinions on ways to reduce wildfire threats to their lives and home and overall community. This was accomplished through a series of emergency preparation meetings with First Responders; residents were encouraged to participate in a Wildfire Mitigation survey and 25% of the residents of Rolling Hills submitted their comments. The on-going work and commitment of all four entities produced a prioritized plan that reflects the voices of residents and wildfire mitigation priorities for the City of Rolling Hills.

The plan is designed to be a living document, one that the community can refer to for action and as such, the conventional agency (City, RHCA, and First Responders) statistical data, environmental setting including fire history and the process to solicit the community's feedback on issues relating to wildfire concerns are all relegated to the Appendices of this plan. This plan starts with the tool box of mitigation measures identified for Rolling Hills and the plan discusses in detail potential evacuation scenarios. Many mitigation strategies were recommended and prioritized by Carol Rice, Fire Fuel Consultant, with the highest value being placed on 1) life safety; 2) structural protection; 3) natural resources and habitat. Finally, the plan lists the action items for the next three fiscal years and concludes with a schedule for periodic evaluation of the effectiveness of the actions performed and updates to the plan.

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### APPENDIX

Appendix A City Overview and Fire Environment

Appendix B Community Survey

Appendix C Wildland Res Mgt by Carol Rice, November 1, 2019

## **1.0 FIRE MITIGATION STRATEGIES FOR ROLLING HILLS**

Wildfire threat can be defined as the result of an analysis of potential fire behavior and the likelihood of fire to occur relative to the communities at risk. The Fire Department develops maps showing areas of significant fire hazards using fuels, terrain, weather, and other relevant factors. While the maps are useful in examining fire hazard, high risk areas can be further identified using local perspectives and priorities regarding communities at risk and areas of concern. Appendix A, City Overview and Fire Environment, provides information on the City and the wildfire threats.

Critical to the development of the CWPP was to obtain the input of the City's stakeholders, all the residents of Rolling Hills. It was decided the best vehicle to capture input of all residents was through a survey and augment seminars conducted with residents in 2018. The survey was a "grassroots" effort whereby Block Captains developed the survey, educated residents on the importance of their participation through Zone meetings and summarized the survey feedback. Block Captains provided feedback on potential solutions and mitigation strategies.

The Wildfire Mitigation survey was sent to approximately 1270 residents and the response rate was estimated at 25%. Appendix B, Community Survey, details areas of concerns and priorities as expressed by the residents.

Based on the community's expressed concerns, fire mitigation strategies for Rolling Hills were developed from a variety of sources. The Rolling Hills Community Association (RHCA) engaged Fire Fuel Consultant, Wildland Res Management Ms. Carol Rice to assess Rolling Hills and provide recommendations to the RHCA Board of Directors. The Wildland Res Management Report dated November 1, 2019 is included as Appendix C. The Los Angeles County Fire Department provided recommendations to the City of Rolling Hills on options to deal with vegetation management including the canyons. All recommendations provided by Wildland Res Management and LA Fire Department are prioritized with the highest value on 1) life safety; 2) structural protection; and 3) natural resources and habitat. Based on the feedback from the community survey, vegetation management was a most critical element for the residents. Feedback from all these resources was used to formulate the potential mitigation strategies detailed below.

### **1.1 Infrastructure hardening**

- Require that all structures have a class A roof by 2030.
- Consider changes to landscaping guidelines to comply with landscape recommendations to reduce structure ignitability
- Create incentive plan or identify special "preferred" contractors who will assist with approvals and installation/alterations to harden homes.



- Partner with manufacturers for demonstrations & to identify contractors of vents and equipment to harden homes.
- For a specific period of time (1 year) offer discounted permits or incentive for homeowners to make alterations to homes to harden (change out wood siding to hardy board, replace wood shingles, upgrade windows to dual pane, major landscape change)
- Feature homes that are compliant with standards in Rolling Hills Living magazine

## 1.2 Vegetation Management<sup>1</sup>

### Canyons

- **Fuel Management.** Consultant Carol Rice provided services to the RHCA in 2009 and the products of her work can be found on the City and RHCA websites. RHCA contracted again with Carol Rice in 2019 for a report recommending steps for the community to mitigate wildfire. Ms. Rice’s “Creating Fire Safe Canyons” guide includes 3 strategies for residents to manage fuel on their property, including area in canyons:
  - Shaded fuelbreak
  - Mosaic groupings
  - Shortened shrubs
- **Goats.** Goat grazing can be a cost effective, environmentally sound way to clear combustible vegetation and promote growth of native grasses and beneficial plants, particularly for large areas (10, to 100+ acres) and in steep or difficult terrain. Grazing can efficiently treat areas that are inaccessible or difficult to manage with mowers and weed eaters, areas where prescribed burns are inadvisable, and sensitive areas where the application of herbicides is not appropriate.
- **Control burns.** Los Angeles County Fire Department is dedicated to fire protection and wildfire prevention. One of the Los Angeles County Fire Department’s prevention programs is Vegetation Management (Title 14, California Code of Regulations, Chapter 9.8 Chaparral management, Sections 1560 to 1569.6). The Vegetation Management Program (VMP) is a cost-share program that focuses on the use of prescribed fire, and some mechanical means, for addressing wildland fire fuel hazards and other resource management issues. The use of prescribed fire mimics natural processes, restores fire to its historic role in wildland ecosystems and provides significant fire hazard reduction benefits that enhance public and firefight safety.

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<sup>1</sup> Recommendations by Consultant Carol Rice are included in this report to illustrate available wildfire mitigation strategies for Rolling Hills and in no way suggest that the strategies will be adopted by the Rolling Hills Community Association.

- **Invasive or noxious plants.** Consider the use of herbicide or the manual removal of invasive or noxious plants in the canyons: Arundo donax, bamboo-like plants and poison oak.

### **Fire Fuel Management Standards for individual properties**

Fire Fuel Consultant Carol Rice recommended the community adopt Fire Fuel Management Standards as a tool to teach homeowners about fire-wise vegetation management on their private property. The Los Angeles County Fire Department endorsed and supported this recommendation for the city. Ms. Rice also recommended individual property inspections be conducted to evaluate individual properties in comparison with the Fuel Management Standards with recommendations on how homeowners can meet vegetation management guidelines.

### **Roadside**

Based on the Wildland Res Management report, the following measures were recommended:

- Evaluate the Fire Code requirements for 10' roadside clearance for easy access and improved evacuation routes. Fire Code Section 325.10 defines clearance requirements.
- Remove all vegetation from area immediately adjacent to roadway and install surface that does not promote germination of weeds, i.e. decomposed granite or wood chips. Perform weed management in spring and summer (mowing, weed whacking). The RHCA does not use herbicides in the community except for noxious plants like poison oak.
- Eliminate fuel ladders by removing lower tree branches and limiting the height of shrubs under trees to prevent fire from moving into tree canopies 4-6' back from edge of roadway:
- Clear all vegetation within 3' around the base of a utility pole or fire hydrant. Non-exempt poles require 10' clearance. SCE is responsible for such clearance.
- Remove trees underneath power lines that have a mature height that could interfere with electrical wires or equipment. Always work through SCE for line clearance.
- Remove or cut back tree limbs that are within 8' of electrical wires. Always work through SCE for line clearance.
- Within the roadway easement, remove plants and volunteer trees identified by the fire department as highly flammable (pampas grass, juniper, palm trees, pine trees, eucalyptus trees). Prohibit new planting of these highly flammable plants by changing landscape guidelines.
- Encourage or require property owners to adhere to vegetation management within the boundaries of their property to meet the fuel management standards set by the County Fire Department for Very High Fire Hazard Areas and in limited areas, the Association standards for Fuel Management and RHCA landscaping

guidelines for new planting. The RHCA may require higher standards than the Fire Code.

- Rice's report also encouraged the development of a community fuel management standards to set measurable standards for vegetation management along roadsides within the RHCA road easements and other areas allowed in the CC&Rs. Recommended also is removing tree limbs hanging over roadways that are under 18' in height or as assessed by the fire department.

### **Bridle trails**

- Annual maintenance mowing and weed whacking along bridle trails.
- Periodic vegetation management such as abatement using brush hound, hedge trimmers or heavier equipment on an as-needed basis and as the budget permits.
- Manage vegetation to eliminate fuel ladders along bridle trails.
- Cut back blackberries and lift and separate plants that currently make up the dense brush in canyons (lemonade berry or toyon).
- Remove palm trees and other "high hazard" plants identified by LA Co. Fire
- Remove Arunda (bamboo like vegetation) from areas immediately adjacent to bridle trails
- Consider all means available for brush clearance, including but not limited to goats, or contract services

### **Invasive and highly flammable plants**

- Create a list identifying highly flammable plants and request that the governing bodies prohibit planting of these plants and create a plan for eradication or removal of such plants within the community. Create a list of desirable plants as an alternative for planting. Create or obtain funding for an incentive program for removal of such plants

## **1.3 Electric Power Lines**

Experts have said that despite the heavy costs, burying power lines in areas most susceptible to winds would provide a huge margin of safety in reducing fire risk for communities. Burying utility lines underground in sensitive areas is a potential mitigation strategy for Rolling Hills.

Southern California Edison (SCE) periodically has to replace its wood power poles as part of its ongoing maintenance program and installs new power poles as needed. SCE has recently started to install power poles constructed of a composite nonflammable material and will begin to wrap its wood power poles with a nonflammable material. Replacement occurs when SCE determines the need on a case by case basis.

## 1.4 Inspections and Enforcement

The City of Rolling Hills (City) enforces its nuisance codes (City Municipal Code Chapter 8.24 Abatement of Nuisance and Chapter 8.30 Fire Fuel Abatement) by City staff and the City Attorney.

The Fire Department has jurisdiction over property with structures and the Agricultural Commissioner has jurisdiction over the rest. The Fire Code enforcement, historically, has been limited to removing dead vegetation within 200 feet of residences even though the Fire Code also requires ten feet of clearance on each side of all roads and driveways. Fire Code Section 325.10 Roadway Clearance: "The fire code official may require removal and clearance of all flammable vegetation or other combustible growth for a minimum of 10' on each side of every roadway, whether public or private... This section shall not apply to single specimen trees, ornamental shrubbery, or cultivated ground cover such as green grass, ivy, succulents or similar plants used as ground cover, provided that they do not form a means of readily transmitting fire."

City nuisance code enforcement of Chapter 8.24 is rarely invoked. City nuisance code enforcement of Chapter 8.30 is actively enforced by a dedicated City code enforcement official. Said Chapter 8.30, however, is limited by its terms to dead vegetation of any kind, dead or alive tumbleweeds, and dead palm fronds on living palm trees located on the portion of the property that has a slope equal to or less than 50%.

The LA County Fire Department provides fire hazard reduction and safety guidelines to all property owners in Rolling Hills. After a mailed notice, the Fire Department and Agricultural Commissioner personnel conduct an annual inspection of all of the properties commencing June 1 for non-compliance with the Fire Code. Fire Department personnel do not have the right to enter through locked gates. Property owners may deny access, at which point, an inspection warrant must be secured. The property may be inspected if it can be seen from a public viewpoint.

The City code enforcement official conducts inspections year-round but can only do so from the roads and/or bridle trails unless given permission or obtaining a warrant.

SCE is responsible for power line clearance and non-exempt poles. The property owner is responsible for all other required clearance in the easement. SCE periodically inspects and reduces the height of trees and brush so they do not encroach into the area of the power lines.

## **2.0 EVACUATION STRATEGIES**

### **2.1 Community Preparedness and Education**

The Los Angeles County Fire Department, along with partnering agencies, stand ready to quickly respond to contain wildfires, utilizing firefighting resources from the air and ground to help protect people and property from wildfire.

Preparation and prevention go hand-in-hand. LA County Fire's Ready! Set! Go! Brochure is available for residents and was designed to provide critical information on creating defensible space around a home, retrofitting a home with fire-resistant materials, and informing how and when to safely evacuate well ahead of a wildfire. The City of Rolling Hills partners with the Fire Department to prepare and educate the community on the specifics contained in the Ready! Set! Go! Brochure through the Block Captain Program. A copy of the brochure can be obtained by calling LA County Fire Department Public Information Office at (323) 881-2411 or online at [http://fire.lacounty.gov/wp-content/uploads/2020/05/Ready-set-go\\_051420.pdf](http://fire.lacounty.gov/wp-content/uploads/2020/05/Ready-set-go_051420.pdf).

#### **2.1.1 Block Captain Program**

The City's volunteer Block Captains are a crucial liaison between residents, first responders and the City's Emergency Operation Center (EOC) in the event of a large-scale emergency. In this role, the Block Captains are committed to serving and assisting residents of Rolling Hills before, during and after a disaster.

The Block Captain program divides the city into 24 zones. Each zone has two to three Block Captains with other residents providing Block Captain support if needed. Each zone has an average of 50 homes.

The Block Captain's primary duties include:

- Meet the residents in their zone, greet new homeowners and explain the Rolling Hills Wildfire Community Protection Plan (CWPP) to them.
- Keep track of who is living within their zone by maintaining names, telephone, email addresses and other relevant information.
- Identify residents with special needs.
- Maintain their walkie-talkies to ensure they are charged and in good working condition.
- Attend bi-monthly Block Captain meetings.
- Attend and encourage residents to attend periodic training programs on wildfire mitigation and disaster planning.

- Conduct one to two meetings annually with residents in their zone to distribute, update and exchange information. Convey resident’s concerns to the Lead Block Captain or City Manager.
- Participate in annual emergency response drills.



In case of a wildfire or any type of disaster, the Block Captain’s first responsibility is to his/her safety and the safety of his/her family and home. Only if there is time, it is the Block Captain’s role to initiate pre-arranged procedures within their neighborhoods, including checking on and assisting special needs neighbors and, disseminating information received from the EOC.

Block Captains should be familiar with key documents contained in the “RH Block Captain Master Information File” including: Wildfire & Earthquake Checklists; the Wildfire & Earthquake Preparation and Evacuation Recommendations, and City emergency procedures. Block Captains play an important role in providing such information to residents about what to do in an emergency, in advance of an evacuation and in preparation for a disaster.

Each Block Captain is in charge of giving specific information summaries to emergency responders through the EOC about the state of residents in a Zone so their response to a disaster can be most effective and efficient.

Training programs will teach Block Captains about these responsibilities and teach other useful information, such as how to keep specific supplies accessible for when they are called to respond. They will be taught how to reach out to the residents in their Zone.

In short, a Block Captain is a lifesaving leader in times of citywide emergencies.

### **2.1.2 On-going communication and education**

Effective communication and education programs are essential to implement and to maintain a successful Community Wildfire Protection Plan (CWPP) and will keep residents involved. The Rolling Hills Wildfire Mitigation Survey identified ‘on-going communications and education’ as a critical factor in dealing with wildfire preparedness and evacuation issues.

The communication and education program will be jointly sponsored by the City of RH, the RHCA and support of the first responders and the Block Captains. The program will consist of but not be limited to the following items:

1. Rolling Hills Living Magazine in-depth articles on wildfire mitigation
2. Rolling Hill Newsletter and Rolling Hills Community Association News Letter – Meeting announcements, training class schedule, annual exercise schedule, demonstrations, new Block Captain announcement
3. Bi-monthly Block Captain meeting will discuss planning updates, information transfer, first responder inputs
4. One to two annual Block Captain Zone meetings with new and current residents to transfer emergency preparedness information, especially updates from first responders
5. City of Rolling Hills Website [www.rolling-hills.org](http://www.rolling-hills.org) has important information from items 1 thru 4
6. Workshops or seminars to include but not limited to:
  - a. How to create a defensible space on your property
  - b. How to harden your home
  - c. How to improve your landscape with more fire-resistant plants
  - d. How to inspect your home for fire hazards
  - e. Why high hazard plants should be removed
  - f. How to develop an evacuation plan for your family
  - g. How to sign up for the City’s “Notify me”, reverse 911 and subscribe to Alert Southbay.



7. An evaluation of equipment used by Block Captains during an emergency will facilitate communication with the City of Rolling Hills. The goal is to complete the evaluation by the end of 2020. (See section 2.2.2.2.) Equipment will be issued in advance of an emergency so Block Captains can communicate with the Emergency Operation Center (EOC) in the event of land line and cell phone failure.

The communication and education process will be continuously monitored to ensure effectiveness and efficiency by evaluating new tools and methods.

## **2.2 Evacuation during an Actual Emergency**

The Fire Department and the Sheriff's Department operate under the Unified Incident Command where representatives from each department and other relevant agencies will set up a command post near the incident to ensure all entities responding to the emergency are communicating. If appropriate and relevant, the City Manager of Rolling Hills will be invited to be at the command post and send information back to the City's Emergency Operations Center (EOC).

The Incident Command System (ICS) is a standardized, on-scene, all-hazard incident management concept. It is a management protocol originally designed in the 1970s for the Fire Service agencies in California and subsequently required through state legislation in 1993 as an element of the Standardized Emergency Management System (SEMS) to cover all California State agencies and its political subdivisions. In 2004, ICS was required to be implemented nationally as an element of the National Incident Management System (NIMS) through Presidential Directive (HSPD-5 & 8). ICS is based upon a flexible, scalable emergency response organization providing a common framework within which representatives may be drawn from multiple agencies that do not routinely work together, and ICS is designed to give standard response and operation procedures to reduce the problems and potential for miscommunication on such incidents.<sup>1</sup>

Responding specifically to wildfires, the Fire Department will take the lead in determining the appropriate response strategies including ordering evacuations. The Sheriff's Department will take orders from the Fire Department and support the Fire Department in their calls. As an example, if the Fire Department calls for evacuations citywide, the Sheriff's Department would assist in notifying residents by going to door to door, siren calls in a localized area, and or use available and operable media notifications such as the City's "notify me," and or Alert Southbay. The Sheriff's Department would also deploy personnel to assist with traffic control. Under a citywide evacuation order, to ensure safety, the Sheriff's Department would also manage the entries back into the community.



## **2.2.1 Evacuation Levels**

Depending on the condition of the wildfire, the Fire Department may call for the following:

- Citywide evacuation
- Partial evacuation – areas defined
- Shelter in place

In all scenarios, it is imperative that the community has a personal evacuation plan to refer to for expedient actions. It is also imperative that the community prepare for emergencies with a list of important phone numbers, critical items to take with when leaving, a location to go when forced to evacuate, several different routes to safety and flash lights, candles, canned food and water. The READY! SET! GO! brochure published by the Los Angeles County Fire Department is an essential emergency preparation booklet that includes how to prepare a personal Wildfire Action Plan including where and when to evacuate. Residents are asked to formulate a plan and rehearse that plan periodically so that it becomes second nature in the event of an emergency.

## **2.2.2 Communication during emergency events**

### **2.2.2.1 Emergency Operations Center (EOC)**

The City of Rolling Hills is currently drafting the Emergency Operations Plan (EOP) that will outline the operations of the Emergency Operations Center (EOC). The EOP will define when and how the EOC will be opened, the players that are a part of the EOC and the functions of each position in the EOC.

The EOC will operate using the Standardized Emergency Management System (SEMS) and National Incident Management System (NIMS). Employees of the City of Rolling Hills will be staffing the City's EOC including a member of the Rolling Hills Community Association. Employees of the City of Rolling Hills are required to take SEMS/NIMS training from the California Governor's Office of Emergency Services (CalOES). A division of CalOES called the California Specialized Training Institute (CSTI) provide training to local governments in California to have standardization in the way EOCs are operated in California and nationally. In the event that the employees of the City of Rolling Hills are unable to serve in the EOC during an emergency, staff members from other nearby cities can assist provided that they have received training from CSTI.

The EOC would be divided into the following sections with one or two people responsible for each of the sections:

- Intelligence
- Planning
- Logistics
- Operations
- Finance

Briefly, the EOC is a centralized location to receive reports from the field, response efforts are planned, operations personnel are deployed and expenditures are tracked. As an example, the First Responders could report that there are three fallen trees along the major arterial of the City blocking vehicular traffic. Upon receiving this report, the EOC could contact appropriate vendors to clear the trees from the road. Expenses relating to the clearing of the tree will be tracked for potential reimbursement through federal agencies or State agencies.

Rolling Hills Community Association, having control over the easements including the trail and the roads, will play a critical part in the example outlined. The RHCA can deploy their own personnel to conduct the clearing work or engage vendors that they already have relationships with to assist the community in the time of need.

#### **2.2.2.2 Emergency communication methods with residents and Block Captains**

During an emergency, information is critical to deploy the needed resources. In the time of an emergency, Block Captains are expected to take care of their families and loved ones first. Only if Block Captains are able and available will they be encouraged to report field conditions to the City’s EOC, or to the City Hall. This communication can be done via working cell phones, land-lines, emails, text messages and or walkie-talkies. The City of Rolling Hills is currently evaluating 1) what infrastructure is needed to support emergency communications and 2) which equipment is needed for use by Block Captains and the City to communicate during emergencies. The goal is to have this project completed by the end of 2020. Once equipment is purchased and installed Block Captains should communicate efficiently by answering two questions in each communique:

- What do you have?
- What do you need?

#### **2.2.2.3 Notifying residents to prepare to evacuate**

The City of Rolling Hills has multiple ways to communicate with residents during an emergency:

- RH website - [www.rolling-hills.org](http://www.rolling-hills.org)
- Alert Southbay - emergency notifications
- local media
- email and phone communication

## 2.2.3 Potential evacuation routes

### 2.2.3.1 Main gate, Crest Road gate at Crenshaw and Eastfield gates

The number one and two priorities of first responders are life safety and property, in that order. First Responders will determine if an Evacuation Order is needed and will notify the City through the Incident Command Center.

If an Evacuation Order is issued by the Incident Command Center, residents will be alerted of an immediate threat to life and property that is within one to two hours. When the order is issued residents should evacuate through one of the main gates and the route chosen is dependent on the location of the fire activity route recommended by first responders.

LA County Sheriff and LA County Fire Department have identified potential evacuation routes, which included options for rapid egress from areas within the city threatened by a wildfire.

- Main Gate at Rolling Hills Road and Palos Verdes Drive North
- Crest Gate at Crest Road near Crenshaw Blvd
- Eastfield Gate at Eastfield Drive and Palos Verdes Drive East

Potential issues that may affect evacuation include:

- Residents may not have established evacuation preparedness plans.
- Residents may choose not to evacuate but to stay and defend their homes or decide to shelter in place until the fire danger passes. Some might change their mind late in the evacuation process forcing them to flee when conditions are at their worst. Without fully understanding the effects of their decisions, resident actions can jeopardize their life safety as well as that of firefighters and law enforcement personnel.
- Fallen trees or downed powers lines may block roads.
- Several streets within Rolling Hills are narrow and could quickly become congested with traffic.

First Responders do not want residents to use bridle trails as potential evacuation routes. In an extreme situation the use of trails as potential evacuation routes may be considered by First Responders on a “case by case” basis.

**IMPORTANT NOTE:** Wildfires are extremely fluid and complex. An evacuation route may become compromised due to fire activity. The Potential Evacuation Routes map provides suggested evacuation routes that are dependent on the location of the wildfire. It is recommended that residents practice preparing for and evacuating through their primary and secondary exit route.

### **2.2.3.2 Crest Road East Gate**

There is a fourth (4<sup>th</sup>) gate that is locked and closed located at the end of Crest Road East with no guards. There are several holders of the key to unlock the gate including:

- LA County Sheriff
- LA County Fire Department
- All RHCA Gatehouses
- RHCA Manager
- Maintenance Supervisor and Staff
- Gate Supervisor
- Architectural Supervisor

During a wildfire emergency the Crest Road East gate is considered by First Responders as an option for residents to use to exit the city. Residents should be informed in advance that Crest Road East is an option and is considered as a one-way exit from Rolling Hills into Rancho Palos Verdes towards Palos Verdes Drive East. Once the Crest Road East Gate is opened, residents will not be granted re-entry through this gate.

First Responders will determine if an Evacuation Warning and/or Evacuation Order is needed and will notify the City through the Incident Command Center.

During a wildfire emergency an Evacuation Warning may be issued by the Incident Command Center. Residents will be alerted of a potential threat to life and property that is more than two hours away. If the possibility exists that the gate will need to be opened a RHCA staff person will be stationed at the gate ready to open it.

An Evacuation Order may be issued by the Incident Command Center. Residents will be alerted of an immediate threat to life and property that is within one to two hours. RHCA staff person or another designee of the RHCA should be onsite to assist with traffic management if available.

Note: As of the publication date of this plan the RHCA Board of Directors approved the automation of the Crest Road East gate. The installation is scheduled to be completed in August 2020. It is expected that RHCA staff will be able to open the gate remotely upon receiving with an Evacuation Warning or Evacuation Order from First Responders.

### **2.2.3.3 Traffic Control**

In the event of an evacuation, the Sheriff's Department will maintain traffic control based on the level of closure established by the Fire Department. The five evacuation levels are as follows:

Level 1: Open to general public

Level 2: Open to critical-incident resources and all residents.

Level 3: Closed to all traffic except fire, law and critical resources e.g. public works, power, LASD volunteers, etc. Note: escorts may be needed.

Level 4: Closed to all traffic except fire-department and law-enforcement personnel.

Level 5: Closed to all traffic.

#### **2.2.3.4 Temporary Refuge Area(s)**

Temporary Refuge Area(s) have been recommended to be identified for the community of Rolling Hills by First Responders and consultant, Ms. Carol Rice. At the time of this publication areas have not been identified.

#### **2.2.4 Residents Who May Need Special Assistance in an Emergency**

Vulnerable populations have special needs that are critical to address during disasters such as wildfire. These populations may be less likely to respond to, cope with, recover from wildfire, and are less likely to get involved in wildfire mitigation activities. Age, physical, and mental limitations can restrict mobility making it more difficult to evacuate in a disaster. Language issues can result in communication barriers to evacuation or support services. 15% of survey respondents indicated that they or family members have special needs. 26% of survey respondents have neighbors with special needs or who may need assistance in an evacuation.

The RH Block Captains will identify special needs residents by canvassing their zones and working with the RH Seniors Committee on who they are, where they live and what assistance they may need. Ways to easily identify the homes of these residents is currently being evaluated. The Block Captains along with first responders can provide assistance to these residents in preparing, responding and recovering from a disaster.

Information on special needs residents will be saved on an encrypted server and only accessible by city staff and a Block Captain. A printout of special needs residents will only be distributed to the corresponding zone Block Captains.

#### **2.2.5 Large animal/horse evacuations**

Rolling Hills is considered an equestrian community. Emergency preparedness is important for all animals, but preparedness can be more difficult for large animals (e.g., horses) because of their size and special transportation needs. Evacuation of horses should occur as soon as an evacuation warning is issued. If owners are unprepared or wait until the last minute, they may have to leave their animals behind. The following provides information for pre-planning evacuation with large animals, including horses:

- Contact Los Angeles County Department of Animal Control Equine Response Team (LACDACERT) for evacuation information for large animals. LACDACERT has trained volunteers who are trained in the evacuation and sheltering of horses in wildfire events. LACDACERT has equipment and personnel available for large animal evacuation and billeting. All requests for emergency assistance are channeled through LA County Sheriff's Dispatch (911).
- Even though the County has assistance available, it is strongly encouraged for horse owners to make their own plan for emergency transportation and sheltering for horses. Many designated sheltering sites may become overcrowded or are far from Rolling Hills. Make plans now to house horses with friends, at a commercial stable, or other suitable location out of the danger area. Discuss plans with everyone in the family and keep the contact information and address of emergency animal shelters and driving directions in an emergency kit.
- Make a list of emergency contacts. Keep copies in vehicles or trailer as well as in the house.
- Take photographs and prepare a written description of each horse or other large animal(s). Put one set in a safe place and another set in an emergency kit.
- Have a halter and rope for each horse/large animal. Make sure halters are marked with contact information or write the information on a piece of duct tape and stick it on the halter. Reflective identification collars are available for purchase from Caballeros. If a horse has medical issues or special needs, record this information on a luggage tag and attach it to the halter.
- Microchip horses/large animals. This is an easy, inexpensive way to help identify animals.
- Have a three-day supply of feed and water (per large animal). This is particularly important if plans are to shelter in place but bring feed (and buckets) if evacuated. Make sure to include any medications the large animal(s) may need. Label all equipment.
- Teach your horses how to trailer. Spend time loading and unloading the animals so they are safe and willing to load, consider practicing loading during the day and night. Continue working with the large animals until you are confident that they will load.
- Keep trucks, trailers and vans well maintained and ready to move. Keep gas tanks full, check tire pressure, particularly during Red Flag Warning days.
- Horse owners who keep their horses on their property are encouraged to have an orange reflector, available from Caballeros, on their house sign to indicate that horses are on the property. If you evacuate your animals, remove or cover the reflector.
- Store non-perishable supplies in a portable container such as a clean trashcan, bucket or canvas duffle bag.

Potential issues with evacuating large animals and horses include panicked animals may behave unpredictably and may refuse to respond to normal handling approaches.

## 2.2.6 Re-entry back in to the Community

Re-entering an evacuated area requires as much forethought and planning as an evacuation order. The safety of residents and emergency responders is of the utmost concern and must drive the decision of when to repopulate. LA County Fire Department and LA County Sheriff's Department will determine when it is safe for residents, including those with special needs and large animals to move back into the area. Residents re-entering the city will depend upon the evacuation level. Note: Levels 3, 4 and 5 are closed the city to residents.

- Level 1: Open to general public
- Level 2: Open to critical-incident resources and all residents.
- Level 3: Closed to all traffic except fire, law and critical resources e.g. public works, power, LASD volunteers, etc. Note: escorts may be needed.
- Level 4: Closed to all traffic except fire-department and law-enforcement personnel.
- Level 5: Closed to all traffic.

### 3.0 ACTION PLAN

The plan below defines the actions needed to lessen the risk of wildfires and to address the community's greatest risks. The plan lists the action items for each of the four entities – City of Rolling Hills, RH Community Association, RH Residents, LA County Fire Department and LA County Sheriff's Department.

Action Plan (FY2020-2021 to FY2022-2023)	City	RHCA	Residents	LACFD	LASD
1 Block Captain Program - participate and support program	x	x	XX	x	x
2 Neighborhood zone meetings	x		XX	x	x
3 Emergency communication with residents	x	x	XX	x	x
4 Evacuation Exercise	XX	x	x	x	x
5 Workshops and seminars for residents	x	x	XX	x	x
6 Special needs population	x	x	XX		
7 Define communication standards with residents	XX	x	x		
8 Define refuge areas	x	x	x	XX	x
9 City Ordinance Enforcement	XX		x		
10 Fire Department Annual Inspection			x	XX	
11 Evacuation routes (roadside) vegetation management		XX	x	x	
12 Bridal trail vegetation management		XX	x		
13 Entry/Exit gates vegetation management		XX		x	
14 Fire Fuel Management in Preserve with Land Conservancy	XX			x	
15 Development of fire fuel management standards		XX	x	x	
16 City Ordinance to restrict planting of six high hazard plants per Ready! Set! Go! brochure	XX	x	x	x	
17 Motorize Crest Road East Gate		XX			
18 Utility undergrounding projects	XX	x	x		
19 Grants for fire fuel management in canyons	XX				
20 Controlled burns in canyons	x	x	x	XX	x

Legend:

XX Primary Responsibility

x Secondary Responsibility



## **Project Descriptions**

### **1. Block Captain Program**

This project will focus on the recruitment and the training of the Block Captain volunteers. Training programs will focus on teaching Block Captains about responsibilities and other useful information, such as how to keep specific supplies accessible for when they are called to respond.

The project will evaluate the best marketing materials to encourage recruitment, best training vehicles, including multi-media, and enhancements needed to the City's website to support the management of resident contact information while ensuring privacy and confidentiality.

Project Leads: Block Captain Leads and City of Rolling Hills working with First Responders and RHCA

Timing: 2020/2023

### **2. Neighborhood Zone Meetings**

The project will evaluate available educational materials and videos from the Los Angeles County Fire Department, which highlight priorities documented in the Ready! Set! Go! Brochure. The project will evaluate a cost-effective approach to video for replay on the city's website.

Project Leads: Block Captain Leads and City of Rolling Hills with First Responders

Timing: 2020/2023

### **3. Emergency Communication with Residents**

The City's volunteer Block Captains are a crucial liaison between residents in the 24 City zones, first responders and the City's Emergency Operation Center (EOC) in the event of a large-scale emergency. Block Captains have responsibilities in assisting residents of Rolling Hills before, during and after a disaster including:

- What to do in an emergency, in advance of an evacuation and in preparation for a disaster.
- During an emergency specific information will provided to emergency responders through the EOC about the state of residents in a Zone.

In the event that cell phones, landlines and/or email communications are compromised evaluate other equipment options, such as digital radios, satellite phones (with Push-to-

talk capability) or other viable options. Purchase equipment and provide training to Block Captains as necessary.

Project Leads: Block Captain Leads and City of Rolling Hills with First Responders and RHCA

Timing: 2020/2023

#### 4. Evacuation Exercise

It is important to periodically conduct a simulation exercise of an actual emergency evacuation with all entities involved during an emergency: First Responders, residents, City of Rolling Hills and the RHCA, including the gate staff. The goals of the exercise can include but are not limited to evacuation of residents and individuals with special needs, communication between the city's Emergency Operations Center and Block Captains, and traffic control. Assessment and "lessons learned" should be captured and shared.

Project Leads: Block Captain Leads and City of Rolling Hills with First Responders and RHCA

Timing: 2020/2023

#### 5. Workshops and Seminars for Residents

The project will evaluate available educational materials and local experts in wildfire mitigation who can conduct seminars and workshops for the 2000 residents in Rolling Hills. The project will evaluate a cost-effective approach to video seminars and workshops for replay on the city's website.

Project Leads: Block Captain Leads and City of Rolling Hills

Timing: 2020/2023

#### 6. Residents with Special Needs

This project will focus on the coordination needed between Block Captains and the RHCA Seniors Committee to identify residents who may have special needs during an emergency. This project will focus on teaching Block Captains how best to assist this group of residents, what useful information and/or supplies should be provided to this group, and what resources are available to them in the event of an emergency.

Project Leads: Block Captain Leads, RHCA and City of Rolling Hills

Timing: 2020/2023

7. Define communication standards with residents

This project will define the protocols for communicating for the City to communicate with Block Captains and for the Block Captains to communicate with residents during emergencies and wildfire events. This project will include the purchase of communication devices for relevant parties.

Project Leads: City staff

Timing: 2020/2021

8. Define refuge areas

This project requires the Fire Department and the Sheriff's Department to identify refuge areas within the limits of the City in the event of wildfire event.

Project Leads: Fire Department/Sheriff's Department

Timing: 2020/2021

9. City Ordinance Enforcement

This project requires city staff to enforce ordinances relating to wildfire mitigation including Chapter 8.30 Fire Fuel Abatement.

Project Leads: City staff

Timing: currently in progress and on-going

10. Fire Department annual inspections

The project requires the Fire Department Brush Clearance Unit to conduct inspection at all parcels within the city limits for compliance with 200' defensible space around structures.

Project Leads: Fire Department

Timing: currently in progress and on-going

11. Evacuation routes (roadside) vegetation management

This project requires fire fuel and vegetation management along three evacuation routes within the city: Portuguese Bend Road, Eastfield Drive, and Crest Road. Fire Code defines the standard for roadside clearance.

Project Leads: RHCA, residents

Timing: 2020

## 12. Bridle Trail Vegetation Management

This project requires RHCA contractors to thin out, remove or otherwise manage vegetation on and adjacent to bridle trails as outlined in the Fire Fuel management Standards to include the following:

- Thinning native chapparal
- Remove hazardous brush and weeds
- Remove lower limbs of trees to create a safe vertical clearance for equestrians and emergency vehicles
- Remove non-native species such as palm trees, castor beans, Arundo donax, and other highly flammable species
- Cut back vegetation to provide adequate horizontal clearance on bridle trails as identified in the Fuel Management Standards

Project Leads: RHCA maintenance staff

Timing: 2020/2023

## 13. Entry/exit gate vegetation management

RHCA Board has adopted a policy for roadsides along major roadways in the community to have vegetation cleaned up to 8' back from the edge of pavement, where practical. RHCA also performs periodic maintenance of roadside trees for safety purposes and to ensure there is 16' vertical clearance along roadways for emergency vehicles and evacuation.

Project Leads: RHCA maintenance staff

Timing: currently in progress, on-going

## 14. Fire Fuel management in the Preserve

This project requires the Palos Verdes Peninsula Land Conservancy to remove fire fuel in the Preserve annually. The City has funded two rounds of fuel removal between 2019 and 2020.

Project Leads: City and Land Conservancy

Timing: currently in progress, on-going

## 15. Development of fire fuel management standards

This project requires the development of fire fuel management standards for the residents and the community as a whole.

Project Lead: RHCA  
Timing: 2020

16. City Ordinance to restrict planting of six high hazard plants per Ready! Set! Go! brochure

In April 2020, the City Council considered restricting the planting of the six high hazard plants but decided not to take action. Instead, the City Council directed staff to discourage applicants seeks permits development or landscaping projects from planting the six high hazard plants. The City Council will reconsider taking action in the near future.

Project Lead: City  
Timing: 2021

17. Motorize Crest Road East Gate

See section 2.2.3.2 of this report.

Project Leads: RHCA  
Timing: 2020

18. Utility undergrounding projects

This project requires the undergrounding of overhead utilities within the city. The Eastfield Undergrounding Project is underway and undergrounding is tentatively scheduled for fall 2020. The city provides incentives for residents to form assessment districts for utility undergrounding projects. The city is developing a policy to incentivize single utility pole undergrounding.

Project leads: City  
Timing: currently in progress, on-going

19. Grants for fire fuel management in canyons

This project requires collaboration with property owners of the canyon areas and to find innovative ways to remove fire fuels in difficult to reach areas. Once identified, the City can pursue grant funds to implement the solution.

Project Leads: City and residents  
Timing: 2021

20. Controlled burns in canyons

This project requires collaboration with the Fire Department to determine areas within the City suitable for controlled burns.

Project Leads: Fire Department

Timing: 2023

## **4.0 MONITORING AND UPDATES**

### **4.1 Action Plan Performance Measures**

Performance measures will be develop in future versions of the CWPP.

### **4.2 CWPP updates**

The CWPP will be updated on an annual basis. Updates to document shall be noted at the beginning of the document identified by version number.

## **APPENDIX A CITY OVERVIEW AND FIRE ENVIRONEMNT**

### **A1. CITY OVERVIEW**

#### **A1.1 Information about the City**

The City of Rolling Hills (Rolling Hills) incorporated in 1957. Rolling Hills is 3.0 square miles and a gated community with private roads and three entry gates on the Palos Verdes Peninsula in the County of Los Angeles. Rolling Hills has a citizen population of 1,860 and 685 single-family one-story homes that are nestled in a rural equestrian community with no traffic lights. There are approximately 80 horses in Rolling Hills with 19 horse trailers. 90% of the housing units (600+) are owner occupied and less than 10% of the housing units are renter occupied. Rolling Hills homes are 20<sup>th</sup> century California ranch or Spanish haciendas located on large parcels.

As a gated community, Rolling Hills land use pattern was established in 1936 with the sale of parcels around hilly terrain and deep canyons. From its inception in 1936, Rolling Hills created and continues to maintain a residential community that conforms to its unique land form constraints. The City's minimum lot size requirements were established in recognition of some relevant physical constraints, which includes the following constraints:

1. Steeply sloping hillsides; Land movement hazards
2. Lack of urban infrastructure such as sewer
3. Danger of wildland fires
4. Sensitive animal habitats and species
5. Geological constraints
6. Fire safety constraints
7. Infrastructure constraints
8. Environmental constraints
9. Topographic constraints

In particular, unique features to mention is Rolling Hills geological and topographic constraints which are driven by expansive soil combined with ancient landslide which when it reactivates affects lands shift and landslides from time to time, which in turn imposes high repair cost for slope restoration work. A portion of the City is located on severe terrain comprised of steep hills and roads with slope elevations between 25 to 50 percent, deep canyons, and cliffs all surrounded with an abundance of native and non-native vegetation, makes it difficult to meet the zoning requirements for the production of housing development. Furthermore, the California Geological Survey has identified numerous liquefaction zones and areas within city limits that are subject to earthquake induced landslides.



Rolling Hills fire safety constraint is driven by the fact that in July 2008, all the land in Rolling Hills was determined “Very High Fire Hazard Severity Zone” by the State of California Department of Forestry and Fire Protection. As a result, more restrictive fire safety and landscape standards were adopted into Rolling Hills building code that resulted in higher design and building cost for all new housing development. Another constraint to note is that the Fire Department’s capability to address normal fire calls, not to mention, address wildfire crisis is limited due to its aging distribution water system that is managed by California Water Company.

On June 10, 2019, Rolling Hills City Council adopted the fiscal year 2019/20 budget. The budget serves as the City’s roadmap for allocating resources for the management of public programs and services, achieving city priorities and goals that serve residents and the public. The budget also represents the projections necessary for managing and monitoring annual revenue and expenditures in a fiscally responsible manner. For fiscal year 2019/20, Rolling Hills general fund budget projects \$2,278,300 in revenue and \$2,233,600 in expenditures. The overall financial position of the City’s General Fund remains strong with a projected year-end fund balance of \$4, 947,213 at June 30, 2020.

### **A1.2 Information about the Association**

The RHCA was established in 1936 by developer A.E. Hanson and the Palos Verdes Corporation to develop the community and to carry out their vision of a private, gated community made up of little ranches and family homes. The entire community is on private property and there is no public property inside the city. All roads are located on Association easements. Both the RHCA office and City Hall are located just outside the Main Gate at 1 & 2 Portuguese Bend Road, respectively.

Today, the RHCA’s primary purpose is to maintain the roads and other common areas of the community, uphold the architectural standards of the community, operate the gates and assist the members of the Board, committees and members of the community in upholding and maintaining the community's charm and appeal. RHCA’s primary functions include but are not limited to the following activities:

- Maintains files on all properties within Rolling Hills
- Reviews plans related to architectural features
- Maintains roadway & bridle trails
- Gate operations
- Controls easements
- Sells residence signs

RHCA places a high value on the privacy and rural character of the community created by the open space around each residence. This is achieved through both the regulation

of the size and style of buildings and the preservation of open easements that surround each property.

Other RHCA that warrant mentioning is through the deed restrictions. Every homeowner has granted control of easements on their property to the RHCA. These easements are used for roadways, bridle trails, utilities and drains. When they are not used for those purposes, easements should remain free of building, planting or other obstructions unless licensed by the RHCA.

### **A1.3 Information about the Residents**

Rolling Hills has a city population of 1,860 residents, 645 households, and 554 families that reside in 685 housing units within the City.

Rolling Hills has a sizable senior population of 513 (27.6%) residents that are 65 years or older. Since Rolling Hills is considered an equestrian community, a large percentage of landowners are also horse owners that engage in horse training, horse care, and horseback riding as part of their quality of life.

Rolling Hills landscape does have a lot of vegetation that requires residents to maintain. Rolling Hills does have an ordinance on dead vegetation that requires every person who owns or is in possession of any property, place or area within the boundaries of the City, shall at his or her own expense, maintain the property, place or area free from any dead or alive tumbleweed or dead tree, shrub, palm frond or other plant. Any dead or alive tumbleweed or dead tree, shrub, palm frond or other plant located on any property in the City is hereby declared to be a public nuisance. In addition, RHCA by laws impose deed restrictions that require residents to trim or removal trees and shrubs to acceptable levels and that do not create a public health concern and/or become a fire safety violation. Finally, LA County Ordinance that require vegetation removal and that places fuel mitigation plans near existing structures and natural habitats such as trees, shrubs and other vegetation that may be vulnerable to the spreading of brush fire.

### **A1.4 Information about the First Responders**

#### **A1.4.1 Los Angeles County Fire Department**

The Los Angeles County Fire Department provides all hazard emergency response services to approximately 4.1 million residents and businesses throughout 58 cities and the incorporated areas of Los Angeles County. The agency provides service to over 2,300 square miles of diverse geography and demographics and approximately 1.23 million housing units. With a 2017/2018 budget of \$1.2 billion, Los Angeles County Fire Department employs approximately 4,700 employees<sup>2</sup>.

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<sup>2</sup> After Action Review of the Woolsey Fire Incident, County of Los Angeles, October 23, 2019 presented by Citygate Associates, LLC Public Safety Services

The Department is made of three major functional areas: Emergency Operations, Business Operations, and the Leadership and Professional Standards Bureau. Emergency Operations is the arm of the Department responsible for leading and directing emergency response personnel. Emergency Operations is further divided into three geographic Bureaus: North Operations Bureau, Central Operations Bureau, and East Bureau. The three geographically divided operations bureaus of LA County Fire serve 58 cities and unincorporated communities with 22 battalions and nine divisions. An Assistant Chief commands each division and three shift Battalion Chiefs command each battalion. A Community Services Liaison (CSL) and a Secretary support each of the nine Assistant Fire Chiefs. The CSL represents the Department at community and civic events.

Rolling Hills participates in the fire district served by the Los Angeles County Fire Department. The fire district assesses the residents of Rolling Hills community through the property tax roll annually. The City of Rolling Hills is served by Fire Station 56. Fire Station 56 is under Battalion 14 serving Lomita, Palos Verdes Peninsula, and Catalina Island. Battalion 14 is a part of Division 1.

#### **A1.4.2 Los Angeles County Sheriff's Department**

The Los Angeles County Sheriff's Department employs approximately 18,000 employees including 10,000 sworn and 8,000 non-sworn personnel. The Department is organized into three primary operational areas: Custody Operations, Patrol Operations and Countywide Operations. The Department has approximately \$3.2 billion budget. Within Patrol Operations, the Los Angeles County Sheriff's Department provides service from 23 patrol stations throughout the County. The Lomita Sheriff's Station at 26123 Narbonne Avenue is located in the City of Lomita serves cities of Rancho Palos Verdes, Rolling Hills, Rolling Hills Estates, Lomita, and pockets of unincorporated areas of Los Angeles County. The Lomita Sheriff's Station is led by a Captain of the Sheriff's Department.

By law, the County Sheriff's Department is the mutual aid coordinator for law enforcement in Los Angeles County. To manage operations and resources more efficiently, the 88 cities of Los Angeles County are divided into eight geographical areas: A through H. To ensure continuity of operations, the County Sheriff's Department and mutual aid partners update mutual aid agreements annually<sup>1</sup>. The Peninsula Cities including the City of Rolling Hills is located in Area G.

The City of Rolling Hills contracts with the Los Angeles County Sheriff's Department for law enforcement. Rolling Hills share the contract with Rancho Palos Verdes and Rolling Hills Estates.

## **A2. FIRE ENVIRONMENT**

### **A2.1 Topography**

Rolling Hills unique topography features places the City at risk from damage and wildfire. Rolling Hills is primarily made up of many steep hillsides with high elevations, landslide hazards, dense vegetation, narrow asphalted private roads, and canyons adjacent to the Palos Verdes Peninsula and the Pacific Ocean. Other features include expansive soils and geological hazard conditions that place constraints on existing housing stock and any potential for new development within the City.

Rolling Hills Terrain is comprised of several large and steep canyons that limit and challenge vegetation management and present conditions where a fire can quickly travels up and downslope to nearby homes. The alignment of the canyons makes them more at risk from winds of different directions. LA County Fire has categorized the canyons in the following way:

Canyons that would be at higher risk during northeast winds:

1. Georgeff Canyon
2. Purple Canyon
3. Willow Canyon
4. Sepulveda Canyon
5. Blackwater Canyon
6. John's Canyon
7. Agua Magna Canyon

Canyons that would be at risk from fires driven by winds coming from the southwest are:

1. Paint Brush Canyon
2. Portuguese Canyon
3. Altamira Canyon
4. Forrestal Canyon

RH lot layout and size places the City at risk from fire. The large lot sizes provide opportunities for dense vegetation to grown between homes, in contrast to smaller lots which are largely occupied with building structures. Some lots span long slopes in steep canyons while others are smaller lots on flatter terrain. The placement of homes within the lots also contribute to their vulnerability as they are often located at the top of slopes which preheated fuels beneath them can burn intensely.

RH provides importing hiking and equestrian access, but are also areas of high fuel load with little access available for management. These lands are interspersed between

privately held lots which provides in many locations, places where fire can easily travel between and to structures. Furthermore, trails between lots can provide either an area of low fuel, or thus more opportunities for fire containment, or can be areas of high fuel volume as privacy hedges, and thus exacerbate fire spread.

Additionally, most of Rolling Hills population live on smaller branch roads and because this is a gated community, access is restricted which hampers egress during a time of emergency.

## **A2.2 Fire History**

Fires on the Palos Verdes Peninsula have crossed city lines, including Rolling Hills and Rancho Palos Verdes. The Daily Breeze summarized three major fires on the Peninsula on November 7, 2014. Some excerpts are included below:

*“The blaze started about 2:30 pm on Friday, June 22, 1973. Before it was tamed at 1 a.m. on Saturday, June 23, it had charred about 925 acres, burned 12 homes to the ground, damaged at least 10 others and caused an estimated \$2 million in property losses. Somewhat miraculously, no one was seriously injured or killed in the conflagration.*

*Black smoke filled the skies, and hundreds of sightseers clogged nearby roads, including Crenshaw and Hawthorne Boulevards and Highridge, Crest and Crestridge Roads, in an attempt to view the blaze. Luckily, no one was hurt, especially in the early hours of the blaze when bystanders went right up to the edge of the fire area, before perimeters had been established.*

*Houses were destroyed on Cinch Ring, Wrangler, Paint Brush Canyon and Running Brand roads. Three more houses were destroyed as the fire reached the Portuguese Bend area. Three houses at 100 Vanderlip Drive were destroyed.*

*The most recent major brush fire in the South Bay began on Thursday night, Aug. 27, 2009, at the upper ends of Narcissa and Peppertree drives, in the gated Portuguese Bend community near the [Portuguese Bend Nature Preserve](#) (now part of the Palos Verdes Nature Preserve) just north of the Trump National Golf Club.*

*It burned 230 acres of brush, threatened dozens of homes and forced 1,200 area residents to evacuate.*

*No homes were lost and no injuries to residents or firefighters were reported. Its cause was unknown, though it was speculated that an electrical problem at a utility pole in the area may have been the source.*

*165 of the 230 acres charred in the blaze were part of the relatively new Nature Preserve, which was created in 2005.*

*An earlier fire on July 13, 2005 burned 212 acres of land near Del Cero Park on the Palos Verdes Peninsula, but no homes were lost."*

### **A2.3 Ignition History**

There has not been significant ignition history in the Rolling Hills Community. The threat of past fires has come from the Conservancy in Rancho Palos Verdes to the south. The Los Angeles County Fire Department has been very efficient in keeping ignitions in the community very small, and holding property damage to a minimum.

## **APPENDIX B COMMUNITY SURVEY**

### **B1 Process of Conducting Survey**

Critical to the development of the RH's CWPP was to obtain the input of the City's stakeholders, all the residents of Rolling Hills. It was decided that the best vehicle to capture input of all the residents was through a survey. Block Captains would assist in developing the survey, educating residents on the importance of their participation and summarizing the feedback. Block Captains would assist with the development of potential solutions and mitigation strategies.

A small group of residents joined representatives from the City of RH, RHCA and Block Captains - Caballeros, Women's Club, Seniors Club, Tennis Club and developed (35) survey questions. Early notifications of the survey included Block Captains explaining to residents in their zone the purpose of the survey and how the feedback would be analyzed to specify how RH might approach reducing the risk of wildfire.

The Wildfire Mitigation Survey was emailed mid-October, 2019 to all RH residents who provided email addresses to either the RHCA or the RH City. For residents who did not have email addresses hard-copy surveys were available at both the RH City Hall and the RHCA.

The survey was emailed to 1272 RH residents, which included a small number of duplicates and non-residents (contractors and real estate agents). The survey was open for one month and multiple announcements were made at neighborhood Zone meetings throughout October and in the City and RHCA newsletters. Paper copies were made available at City Hall for those residents who did not have email addresses.

258 surveys were completed and submitted by the deadline of November 15, 2019 including all hand-written surveys. Based upon the Rolling Hills profile and elimination of duplicates and non-residents it was estimated the response rate was 25%.

### **B2 Survey Data**

RH City Staff summarized each survey question utilizing absolute numbers, percentages, graphs and pie charts.

It should be noted that three questions, numbers 14, 29 and 32 were "open ended" questions where participants made comments. The Lead Block Captains analyzed the comments made in the open-ended questions and grouped similar comments into major categories.

### **B3 Insights from Surveys**

The survey provided valuable information regarding:

- the best communication vehicles currently used by residents
- the best social media platforms residents currently use
- the public alert systems currently used by residents
- the degree to which residents want more education and training on emergency preparedness
- the role of first responders.
- the number of residents who have special needs or have family members or neighbors with special needs

The City of RH, the RHCA, and First Responders will use the information to guide what content will be developed and how to communicate with residents.

Lead Block Captains were tasked with the preliminary analysis and reviewed the survey results both qualitatively and quantitatively. They grouped survey answers and comments into similar categories. They reviewed their analytical approach with a marketing consultant with expertise in surveys and marketing research who validated the process and provided some additional grouping suggestions.

Note: Some of the issues raised by residents occur in multiple categories. An example is the concern of the closed Crest Road East gate was raised in both traffic congestion and evacuation routes.

A summary of stakeholder input on wildfire mitigation strategies is below:

- 1) Residents want more communication, education and training from the City, RHCA and First Responders. The need for communication with residents during an emergency is a major concern. Residents are anxious and want information on: traffic congestion during an evacuation, limited exits routes, excessive and unmanaged growth on private properties, easements and in canyons.
- 2) Residents want better enforcement and compliance to existing ordinances and regulations from both the City, RHCA and Fire Department.
- 3) Residents are concerned that traffic congestion, bottlenecks will occur just outside of RH exits. Residents view congestion and inadequate traffic control will impede and slow evacuation from the city. Many residents want access to alternate routes and question how the Crest Road East Gate will be opened in the event of an emergency evacuation.



- 4) Residents question the adequacy of three main exits of the city as the main evacuation routes. They are concerned about narrow roads, especially Eastfield Drive, the fuel along the exit routes and what happens if a tree or car impedes or prevents evacuation. They want the City of RH and RHCA to proactively identify alternate evacuation routes (unlocking Crest Road East gate or connecting dead-end streets). Residents want help in defining individual evacuation plans and routes.
- 5) Residents want actions taken to reduce fuel and excessive vegetation on private properties. Residents want hazardous plants and trees removed from easements. Residents want easements along exit routes to be cleared regularly. Dead vegetation and unkempt properties are ranked moderate to high as greatest risk of wildfire.
- 6) Excessive fuel located in canyons and outside of the RH City limits are perceived by residents as the greatest risk of wildfire. Residents perceive unattended fuel growth in canyons will threaten lives and their properties.
- 7) Residents with special needs are a small but vulnerable group and may need special support during an emergency or disaster. The elderly may need help in keeping their property safe from wildfire.
- 8) A small number of residents want utilities moved underground as above-the-ground power lines present a major risk to residents during a fire.

**APPENDIX C  
WILDLAND RES MGT REPORT BY CAROL RICE  
NOVEMBER 1, 2019**

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November 1, 2019

Kristen Raig, Manager  
Rolling Hills Community Association  
#1 Portuguese Bend Road  
Rolling Hills, CA 90274

*Via email to Kristen Raig, kraig@rhca.net*

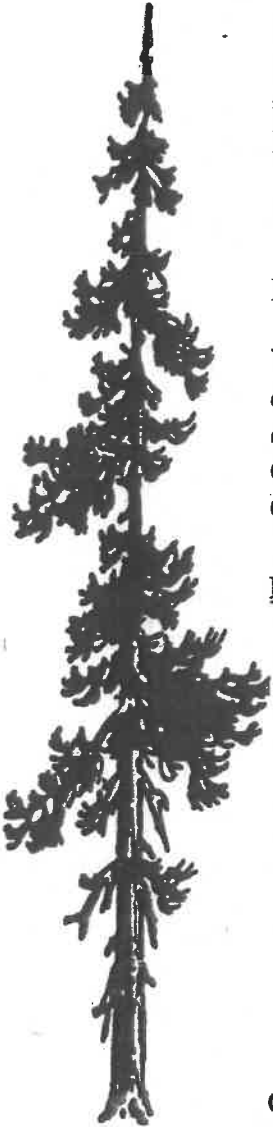
Dear Ms. Raig:

Wildland Res Mgt was commissioned to prepare a set of recommendations that focus on reducing wildland fire hazards on the southern boundary and to update exit plans on east and west sides of the Rolling Hills Community Association in Rolling Hills, California, and to present these findings and recommendations to the Rolling Hills Community Association Board of Directors.

RHCA is looking for the following work products from the consultant:

1. An overall community assessment identifying the areas of highest risk.
2. A plan for individual homeowners on how to reduce fire fuel on their property, including slopes and mature growth in canyons.
3. Recommendations programs to educate or incentivize homeowners to reduce fire fuel and harden homes against fire.
4. Recommend policies the RHCA can adopt to discourage or remove invasive or highly flammable plants and trees.
5. Evaluate community areas (roads, bridle trails, parks and riding rings) and recommend actions to RHCA can take to reduce fire risk.
6. A vegetation management plan for the southern boundary of the community where Rolling Hills and Land Conservancy meet. This could involve work on one or both sides of the boundary.

Carol Rice visited the site on September 19 and 20, 2019, to assess conditions in order to develop the set of recommendations. The following report details the observations of existing conditions, and provides recommendations and answers to the questions and requests above.



# 1. Assessment of Site and Risk

## SITE ASSESSMENT

RHCA is fortunate to have lush vegetation and attractive homes, which makes it a desirable place to live. However, there are several features that combine to make the community at risk from damage from wildfire.

### Terrain

Several large, steep canyons exist within the community. These canyons limit/challenge vegetation management, and present conditions where a fire quickly travels up and downslope to nearby homes.

The alignment of the canyons makes them more at risk from winds of different directions. The LACoFD categorized the canyons in the following way:

Canyons that would be at higher risk during northeast winds:

1. Georgeff Canyon
2. Purple Canyon
3. Willow Canyon
4. Sepulveda Canyon
5. Blackwater Canyon
6. John's Canyon
7. Agua Magna Canyon

Canyons that would be risk from fires driven by winds coming from the southwest are:

1. Paint Brush canyon
2. Portuguese Canyon
3. Altamira Canyon
4. Forrestal Canyon

### Lot layout and size

The large lots common in RHCA provide opportunities for lush vegetation to grow between homes, in contrast to smaller lots which are largely occupied with buildings. Some lots span long slopes in steep canyons while others are smaller lots on flatter terrain.

The placement of homes within the lots also contribute to their vulnerability as they are often located at the top of slopes, which pre-heated fuels beneath them burn intensely.

Commonly-held lands provide important hiking and equestrian access, but are also areas of high fuel load with little access available for management. These lands are interspersed between privately-held lots, which provides, in many locations, places where fire can easily travel between and to structures.

The RHCA trails between lots can provide either an area of low fuel, and thus more opportunities for fire containment, or can be areas of high fuel volume as privacy hedges, and thus exacerbate fire spread.

### Access

RHCA is fortunate to have a few wide "spine" roads in the form of Crest Road, Portuguese Rd., and Eastfield Rd. In addition, the wide right-of-way held by the RHCA allows for easy access and egress.

These roads are at least 20-feet wide, and the ROW is another 20-feet, which could potentially, provide a 60-ft wide evacuation route (not proposed).

These roads are moderately steep, and have curvature well within codes; all are accessible by any type of fire response vehicle.

The branch roads are smaller, and while all except one have adequate turn-around space, sometimes have grades that are steeper than currently allowed for new construction, and present challenges for access for some larger fire response vehicles because of the steepness, road width, turning radius.

Unfortunately, most of the RHCA population lives on these smaller branch roads. Because this is a gated community, access is restricted, which hampers egress during a time of emergency.

### **Vegetation**

Vegetation within 100-ft of structures is generally compliant with fire department standards, but in many instances have high volumes of vegetative fuel in the form of landscaping and hedges.

Canyons are heavily vegetation with shrubs and trees in lower elevations.

Areas of highly flammable species – both trees and shrubs - present particular issues. Areas of pines and eucalyptus with flaking bark increase the risk. Smooth-barked eucalyptus is not as much of a concern because of the more fire-safe branching habit and bark that does not loft.

## **RISK ASSESSMENT**

Risk is based on values placed on possible outcomes. Risk will be viewed through highest value being placed on:

1. Life safety, therefore evacuation and access for emergency responders
2. Structure protection, especially residences and facilities providing vital infrastructure
3. Natural resources, for example slopes that provide soil-holding capacity, yards that offer improved aesthetics and bridle trails that host wildlife habitat

With that in mind, the areas that are most important to reduce risk are those areas adjacent to major roads. The first treatments target roadside vegetation, including trees that could fall across the road, and vegetation that could burn with such intensity that passage could be precluded. Nearby slopes of natural vegetation, and in some locations, landscaping, should be managed with an eye towards safe passage during evacuation.

The roads that serve the highest population are the next high priority.

To minimize risk of structure ignition the most effective actions are to create an ignition structure itself, then immediately adjacent to. Flammable wood roofs are the biggest concern. Replacing old vents with ember-resistant vents are in important retrofit that is easily performed. The further away from the structure, the less direct impact treatment has on potential structure damage. Actions to bolster structure protection are largely the responsibility of individual landowners, with support and assistance of adjacent landowners (especially if the landowner is the RHCA).

Actions to protect natural resources is important for slope stability, and because these may offer locations for fire containment in places where structures are not immediately threatened. Most of the large lots with natural vegetation lead to structures with no access below structures. Prior to taking action in the mid-slope locations, the LACoFD should be consulted regarding their potential use.

The RHCA, City and LaCoFD should work together to develop a wildfire management plan that would include

- Potential containment locations, so that these locations can be prioritized for maintenance and additional desired containment locations can receive treatment
- Temporary refuge areas so that the locations can be communicated to residents, and the areas can be prioritized for treatment and possible expansion
- Triggers for phased evacuation under a variety of scenarios, learning from the 2019 Sonoma County evacuation experience
- Future equipment, vehicle purchases, or water supply enhancements to bolster wildfire emergency response

As part of this wildfire management plan, RHCA should identify a Resource Advisor to work with the Agency Liaison between RHCA and the Incident Commander. This individual should have deep knowledge of RHCA facilities and community, and be certified as a Resource Advisor under the Incident Command Systems.

RHCA should review this wildfire management plan annually in the field with local firefighting staff so that the personnel involved know the locations, personnel and scenarios mentioned in the plan.

### **Conclusion**

The area has varied risks and vulnerabilities. Some areas have been well-tended, with little wildland fire safety concerns, and the entire community has the potential be more fire-safe through focusing on structure ignition-resistant construction and retrofitting, vegetation management immediately surrounding each lot, broader canyon management, and improved evacuation and access features.

Projects and programs should be aimed at the following goals (not prioritized):

1. Ignition prevention, through education on fire-safety behaviors and making fuels (both structural and vegetative) less ignitable.
2. Fire containment, through strategic vegetation management that would support pre-defined (pre-planned) potential locations to stop the wildfire
3. Fire response support, through providing adequate detection and reporting and awareness programs, water supply, vehicle and equipment, and training, of both citizens and fire response agencies
4. Evacuation and sheltering in place options. This would entail increasing structure survivability, and defensible space, vegetation along evacuation that would not block the road, and creation and maintenance of temporary refuge areas.

Recommended actions in all locations should support attainment of these goals.

## **2. Plan for Individual homeowners on how to reduce fire fuel on their property**

Los Angeles County Fire Department has fire codes that all homeowners must comply with. The defensible space forms offer general guidance on how to create and maintain defensible space. However, it is suggested that RHCA adopt a set of fire fuel management standards for its service area (including its common areas), and then require homeowners to develop a lot-specific plan that identifies for each lot the specific treatments and post-treatment conditions that would exist.

This program could be phased in by starting with new construction, and those lots where a significant remodeling project has been undertaken. Lots that have been sold could also be a trigger for the development of a site-specific plan. In this scenario, a local landscape designer or landscape contractor could provide services under contract, with each plan having a life of 5-8 years.

A site-specific fuel management plan would address canyon management. The consultant would work with the landowner regarding treatments, phasing, costs, and priorities. Options include the use of grazing animals, establishment of orchards/groves, or horse pasture.

Please refer to a sample set of Fuel Management Standards

Please refer to a sample Site-specific Fuel Management Plan

### 3. Programs to educate and incentivize homeowners

There currently is no shortage of educational material regarding how to reduce a structure's vulnerability through the creation of defensible space and ignition-resistant construction and retrofitting ideas. However, most material is not tailored to conditions in the RHCA, and many assume it doesn't apply to them. The City of Rolling Hills and RHCA developed educational material using site-specific images and conditions in 2010, and offered a fire-centric presentation at its annual meeting. It is recommended that existing material be canvassed and adopted, or changed slightly to best suit the residents of RHCA and then adopted. For example:

- The Grass published a newsletter that had a column that offered actions to take every month.
- CAL Fire's Ready-Set-Go program has a suite of helpful websites and printed material that inform residents about specific actions to take at appropriate times to reduce ignitions, prepare defensible space, retrofit structures, and make preparations for evacuation.
- The California FireSafe Council has additional information.
- The programs that builds community awareness in Fire Learning Network are ready for use
- The FireWise program has multiple success stories applicable to RHCA

Another program would be to find that various interests that intersect with wildland fire safety and provide information that those venues. Here are a few examples: The potential use of fire-resistant native plants in the garden could be program targeting those who appreciate native plants. Please see attached a spreadsheet describing "Friend or Foes" for fire-resistant landscaping. Organizations that promote wildlife could host a program that addresses how management for fire safety is compatible with wildlife. When topics of water conservation arise, a program could be presented that touts fire-safe landscaping as water-friendly. Insurance coverage, costs, and methods to mitigate the possible loss of coverage are particularly timely and intersect with the desire to reduce fire hazard on a community scale; this topic can be addressed in newsletters and presentations by insurance and fire protection professionals. If RHCA decides to adopt community-wide fuel management standards, RHCA and City should contact local insurance brokers and inform them of site-wide plans/standards and actions (if approved) and encourage them to write new policies. This strategy has been quite effective in Monterey County.

Currently the California Native Plant Society is giving away small oak trees at no cost; these fire-resistant plants could be part of an incentive program for those who remove shrubs, or those who participate in a fire-fuel removal program (such as removing Arundo). Because these seedlings are so small, they are not suitable for incentives for removal of larger trees.

A series of demonstration lots could be effective means of communicating the benefits of treatments. Ideally some in high priority areas, or next to PV Land Conservancy, for example. Demonstration areas should be sprinkled throughout neighborhoods in order to avoid appearance of favoritism. Tours of these lots could reinforce the sense of community, with a possible social event at the end to bring all participants together, when a summary short talk could be offered.

Another program could be to create a challenge within the community street by street for defensible space, based on 100% compliance, cubic yards of material removed, installation of reflective 4-inch strike address signs, or other metric. The winner would receive recognition at the RHCA Annual meeting, or other incentives like 5 ember-resistant vents.

Include Friend or Foe file, PPTs from 2010 presentations



#### **4. Policies to discourage or remove invasive or highly flammable plants and trees**

As part of RHCA-wide fuel management standards, specific plants should be prohibited due to the vulnerability of the site. These are plants that have been tested in laboratories and shown in numerous wildfires to promote the spread of fire and to burn intensely, thereby making structures more vulnerable.

These include

- Stringy-barked eucalyptus species (blue gum, particularly)
- Long-leafed pine trees (e.g., Monterey pine, Canary Island pine)
- Juniper
- Palm trees

A survey of trees within 100-ft of the road should identify those that have the potential for falling or blocking the road when burning, and those trees should be removed. Similarly, trees that are too tall near powerlines should also be removed rather than repeatedly pruned; the removal would decrease maintenance costs and reduce the risk of potential ignition.

Phasing of removal: Those locations on RHCA-owned lands should be targeted for retrofitting, with removal of trees that are structurally unsound or unhealthy first. When those trees with a near-immediate threat have been addressed, systematic removal of trees that pose a high risk should be tackled along primarily evacuation routes: Crest Rd., Portuguese Bend, Eastfield Dr. and within striking distance of above-ground powerlines.

Flammable shrubs, and voluminous weeds (such as Arundo) are the next highest priority for removal and could be targeted for incentive and educational programs. The California Native Plant Society and the California Invasive Plant Council both have worthwhile brochures and more detailed manuals that can be distributed at no or little cost. In addition, the LACoFD has also determined a set of plants that promote wildfire and prohibit those. A small inventory of these materials should be kept at the RHCA office. The local Resource Conservation District provides consulting services at no cost to large landowners regarding best practices, including reduction of pest plants and soil erosion prevention.

As part of the design review of new construction, a landscape plan review should be included, to determine if prohibited trees and plants are present. This landscape plan review would also be an appropriate time to determine if the design is consistent with Fuel Management Standards, or if future retrofitting would be a burden to make it consistent.

## **5. Recommend actions for RHCA community areas**

The community of Rolling Hills is fortunate to have lands held by the RHCA, especially lands that are located in strategic locations in terms of wildland fire safety.

- The right of way lands provide areas that could facilitate evacuation
- The common areas could provide some areas of temporary refuge
- The bridle trails between lots facilitate emergency response access behind homes.
- Bridle trails with potential vehicular access can also provide quick response on a brush rig to fuels in canyons below structures.

Each type of area is associated with a different goal, and thus a different treatment type.

### **Bridle Trails as possible firebreaks**

Bridle trails are not viable fuelbreaks, since they are mostly mid-slope or downslope. It is not likely that they would be used by the LACoFD due to firefighter safety concerns.

However, some of these trails, such as Si's Trail, offer possible access. In order to leverage these trails into firefighting access several additional actions are recommended, include the installation of water bars and berms to stabilize the roadbed and minimize erosion. Deposition of chips may be a suitable erosion prevention treatment at the same time as providing a debris disposal solution. It is recommended the RHCA inventory its trails with an eye toward which could be upgraded to be access for fire department by a 4wd brush rig.

Should the RHCA work with the LACoFD in preparation of a wildfire management plan, the possible use of the bridle trails as fuelbreaks and access routes can be discussed. It could be possible that if a short-wheel-based smaller brush rig were in the fire department inventory these bridle trails could be an asset for fire suppression.

Current work with a masticator with a brush cutter an articulated arm is an effective and efficient, necessary treatment and should be continued.

Where possible bridle trails should connect with paved roads rather than be dead-ends. For example, the bridle trail at the end of BuggyWhip could be connected to another cul-de-sac.

### **Road Easements**

The roadside easements may be the most important asset RHCA has to support evacuation efforts. As mentioned previously in this document the property near the roads should be maintained in such a manner to allow for passage during a wildfire. This would entail a substantial tree assessment and management program, coupled with roadside vegetation management. Surface fuel volume (vegetation up to 12 feet in height) should be minimized, and compliance with Fuel Management Standards should be an emphasis.

Where roadways are narrow, RHCA should install pullouts; should funding become available, widening a few stretches of the roadway should be considered. A survey of the locations where

this strategy is most important should be conducted, however, a candidate is Eastfield Rd. because it serves a large population and is narrow and windy.

### **Possible Temporary Refuge Areas**

The use of temporary refuge areas surfaced as a way to reduce congestion, and to provide a safe location for those waiting for congestion to be reduced. Some areas of low volume vegetation that are owned by RHCA are large enough to be considered temporary refuge areas. These include the area by the intersection of Crest Rd and Portuguese Bend Rd., or Storm Hill. The equestrian center is not large enough, nor easily accessible by vehicles, however, this location horses may be suitable for evacuation of horses. Not all areas that are temporary refuge area are owned by the RHCA (e.g. the local school, or the church that was used as an Emergency Operations Center).

All suitable or possible temporary refuge areas should be identified so that they can be reviewed with the LACoFD. If any are agreed-upon, these locations should be maintained to be as large as possible, with minimum fuel volume. In locations where fences constrain the boundary, methods to remove fencing during an emergency should be considered. In other locations, vegetation on nearby areas should be cut to minimize fuel volume in order to reduce the heat felt by those harboring in the refuge area.

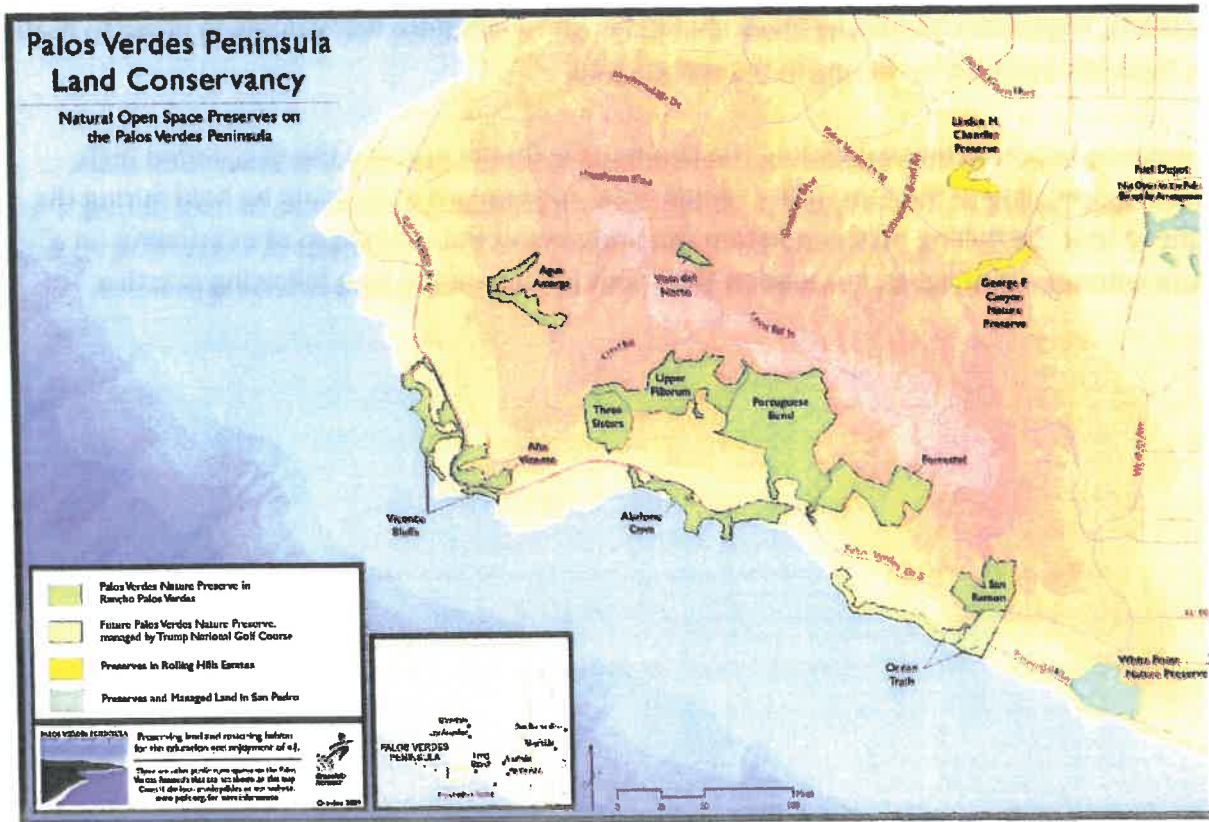
In order to reinforce these decision, the community should practice the evacuation plan, including traveling to the temporary refuge area. Subsequent drills could be held during the night so that the Rolling Hills population can understand the challenges of evacuating on a route without street lights. Evacuation drills with horses should be a following practice.

## 6. Vegetation Management Plan for Rolling Hills-Land Conservancy

Because of past fire history, and the current potential for fire spread to Rolling Hills during windy conditions, consider asking PV Land Trust to close land during Red Flag days, and/or limit them to docent-led trips.

The boundary between Rolling Hills and the Land Conservancy is not an appropriate location for fuelbreaks, or fire containment. The RHCA and Land Conservancy should jointly discuss suitable containment locations with the LACoFD, then jointly fund the actions to ensure continued maintenance.

Additional vegetation management to target highly flammable vegetation types can be broached with the Land Conservancy, with projects based on the location of the vegetation types.



# FUEL MANAGEMENT STANDARDS

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## A. Purpose and Content

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The purpose of this document is to establish updated standards for the implementation of vegetation management to provide defensible space around homes, and safe access/egress along driveways and roads within the Rolling Hills Community Association (RHCA), consistent with the requirements contained in two sections of the California Public Resources Code 4291, included by reference as **Exhibit A**. The RHCA Fuel Management Standards (FMS) provide broad standards that guide the development and implementation of Lot-Specific Fuel Management Plans (Lot-Specific Plans) which are prepared for each private Lot in the RHCA. These standards are intended to provide landowners with the ability to create robust defensible space around homes and other structures while maintaining the natural and aesthetic values.

By applying these standards consistently throughout the community, we intend to achieve a more fire-resistant and defensible community while also sustaining a healthy and fire-resilient natural landscape. It is important to note, however, that proper design and implementation of defensible space, including through the application of these Standards, does not guarantee fire protection in the event of a wildfire. The intended audiences for this document include insurance carriers, residential design teams, resource agencies, fuel management consultants, City staff, RHCA staff and landowners.

Vegetation management is only one of several critical strategies for reducing fire risk. Others include home and infrastructure design location and placement, landscaping, fire response systems, and other elements of community design. The RHCA takes an integrated approach to fire safety that robustly meets and often exceeds State standards.

The objective of the California Building Code (CBC) within the Wildland-Urban Interface Fire Area is to establish minimum standards for materials and material assemblies and provide a reasonable level of exterior wildfire exposure protection for new home construction. The use of ignition resistant materials and design to resist the intrusion of flame or burning embers projected by a vegetation fire (wildfire exposure) will prove to be the most prudent effort within the RHCA to try and mitigate the losses resulting from wildland fires.

An additional protective measure is maintaining defensible space around structures. Defensible space is created by continually maintaining the natural vegetation and landscaping around homes and other structures, with three specific objectives:

- (1) preventing flame lengths from exceeding a height of 2 feet within 30 feet of structures,
- (2) reducing a fire's ability to climb into the tree canopy, and
- (3) providing safe egress by residents and ingress by emergency personnel.

Native vegetation can be retained around structures as part of a robust fuel management plan, provided appropriate treatments are applied, consistent with the RHCA FMS and lot-specific recommendations.

Mowing grass reduces its capacity to carry fire, limits the spread of a fire, and reduces the flame lengths. Reducing shrub height and creating shrub groupings lessens the fuel volume and continuity, reduces fire intensity, and slows the spread of fire. Preserving mature trees provides shade and can reduce shrub and perennial weed expansion, while pruning lower tree branches and removing shrubs, weed stalks and vines under trees prevents fire from spreading into the tree canopy where firebrands are produced and distributed. Preventing or removing dense stands of woody weeds such as French broom is an essential part of fuel management in all treatment areas.

The vegetation treatment recommendations in this document are organized within Fuel Management Zones, delineated by factors such as existing vegetation types, distance from structures, and site topography. Within each Fuel Management Zone, treatments are designed to achieve sufficient defensible space utilizing the best current fire safety and vegetation management practices, consistent with the California Board of Forestry and Fire Protection's Strategic Plan for California (revised in 2016), current State fuel management standards, conservation easements and local, state and federal regulations.

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## **B. Roles and Responsibilities**

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Specific roles related to the creation and implementation of fuel management plans are as follows:

1. **Landowners** are solely responsible for creating defensible space for their homes, through development of a Lot-Specific Plan consistent with these Standards and ensuring that the Plans are correctly implemented.
2. **The RHCA** contributes to the development of the FMS and implements it along roadsides, bridle paths, and other RHCA lands in proximity to community/utility infrastructure.
3. **Los Angeles County Fire Department (LACoFD)** reviews, contributes to and approves the FMS and, when requested, receives a copy of each fully executed Lot-Specific Plan, described below. The LACoFD will perform annual site inspections to ensure implementation of and compliance with the Lot-Specific Plans, and may be accompanied by RHCA staff.

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## **C. Lot-Specific Fuel Management Plans (Structures and Driveways)**

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Landowners are encouraged to mow grasslands and manage weeds within their unbuilt Lots on an annual basis, as this enhances access during future design and construction activities and may provide other benefits.

Once construction of a home begins, all fuel management must be conducted under the guidance of a Lot-Specific Fuel Management Plan. It is the landowner's responsibility to engage a qualified consultant with expertise in wildlands fuel management to draft a Lot-Specific Fuel Management Plan. Beginning this process early in the design phase is highly encouraged.

### **Initial Fire Risk Assessment and Design Considerations.**

1. An Initial Fire Risk Assessment is required, to allow landowners and design teams to understand and incorporate lot-specific risk factors and considerations and ensure structure design and siting is responsive to lot-specific fire hazards and constraints. This Assessment shall include:

- a. A brief description of the existing lot-specific fire hazards due to natural factors such as unique topography, prevailing winds, and existing vegetation conditions, as well as anthropogenic factors such as nearby roads or structures.
  - b. A brief description of the existing or proposed infrastructure and uses on the subject Lot, including structures, landscaping, driveways, roads, equestrian facilities and previous vegetation modifications, if any.
  - c. A set of maps accurately depicting predicted flame lengths within the fuel management treatment areas which covers the entire Lot and portions of adjacent Lots as needed to place the fire risk of structures in context with adjacent environmental conditions. Maps shall be produced that depict the pre-treatment conditions of the property and adjacent ownerships as needed to understand fire risk factors of the Lot.
2. The use of ignition-resistant materials and design in structures will help resist the intrusion of flame or burning embers projected by a vegetation fire, and is a critical element of a coordinated approach to avoid and/or mitigate losses resulting from wildland fires.

**Lot-Specific Fuel Management Plan.** Prior to receiving occupancy approval, an approved Lot-Specific Fuel Management Plan (Lot-Specific Plan) must be completed. As described below, each Lot-Specific Plan must include the following seven elements:

1. A description of the existing sensitive habitat and/or known cultural resources present within the Fuel Management Areas.
2. A description of the existing lot-specific fire hazards due to natural factors such as unique topography, prevailing winds, and existing vegetation conditions, as well as anthropogenic factors such as nearby roads or structures.
3. A description of the existing/approved infrastructure and uses on the subject Lot, including structures, landscaping, driveways, roads, equestrian facilities and previous vegetation modifications, if any.
4. A set of maps accurately depicting predicted flame lengths within the fuel management treatment areas which covers the entire Lot and portions of adjacent lots as needed to place the fire risk of structures in context with adjacent environmental conditions. Flame length analyses should use FlamMap as a predictive software with fuel moistures consistent with CAL FIRE criteria used to determine fire hazard severity zones: 3% for 1 hour fuels, 4% for 10- hour fuels, 5% for 100- hr fuels, and using 70% for woody foliar fuels. Fuel types should be consistent with the publicly available Landfire, using its most recent update. Maps shall be produced for both pre-treatment and anticipated post-treatment conditions.
5. A map depicting the fuel management area on an aerial-photo base-map which details the locations of the lot-specific fuel management zones in a manner that illustrates the locations of different vegetation treatments required in the plan.



6. A list of lot-specific treatment requirements within each fuel management zone, consistent with these Standards. When necessary to ensure defensible space in response to lot-specific site conditions, Lot-Specific Plans may require vegetation treatments that go beyond these standards, such as shorter mowing heights or broader treatment areas.
7. A list of lot-specific recommendations for implementing treatments, including sufficient information to provide clear instructions to contractors performing the fuel management work, including the locations and special requirements of any known sensitive habitat or cultural features.
8. Photos that document fuel types present on the Lot and current vegetation condition, as well as images needed to support specific treatment recommendations (for example, depicting sensitive habitat to be retained).

In some cases, Lot-Specific Plans will identify sensitive resource areas which require special treatment and will need to be marked prior to implementation year.

Each Lot-Specific Plan shall be considered current for five years, unless significant changes to the site occur (such as a heavy weed infestation or significant die-back of trees or woody shrubs).

When a plan update is needed, it is the responsibility of the landowner to engage a qualified consultant to update the Lot-Specific Plan.

## **D. Fuel Management Zones**

The RHCA supports a diversity of plant communities, topographic relief and microclimates. The development of Lot-Specific Plans ensures that these elements are addressed in the creation of defensible space for each home and safe access/egress. The following vegetation treatments are required within the Fuel Management Zones described in this section, as required, to create sufficient defensible space. Fuel treatments for areas in proximity to all structures include the Non-combustible Zone, the Landscaping Zone, and the Driveway Zone. The type(s) of plant communities present in and around each residential Lot influences the management actions required. For the purposes of this section, 'Fuel Management Zones' are categorized according to proximity to structures and the presence of **six** general plant community types: landscaping, grasslands, chaparral, coastal scrub, as noted below.

In circumstances where slope, vegetation cover, building materials of existing homes, or other circumstances beyond the control of the landowner are called out in the Lot-Specific Plan, the width of the relevant Fuel Management Zone may be expanded to address increased risk factors. In such cases, strategies other than vegetation removal should also be considered and incorporated to the extent feasible.

	<b>Fuel Management Zone:</b>	<b>Zone Area:</b>
1	Non-Combustible Zone	5 feet from structures
2	Landscaping Zone	entire landscaped area
3	Driveway Zone	15 to 30 feet from pavement



4	Grassland Zone	30 feet from structures
6	Chaparral Zone	200 feet from structures
7	Coastal Scrub Zone	200 feet from structures
10	Riparian / Wetland Zone	

### **1. Non-Combustible Zone – to a distance of 5 feet from structures**

*A non-combustible zone should be maintained within in a 5-foot buffer around structures.*

Hardscape surfaces (such as patios, gravel, and bare soil), and consistently moist landscape materials (such as lawn and succulent herbaceous plants) are examples of non-combustible surfaces. Wood mulch is not considered non-combustible. Landscape architects are encouraged to make liberal use hardscaping within 5 feet of structures. Care should be taken in the design phase to ensure there is adequate room for such treatments.

### **2. Landscaping Zone – within entire landscaped area**

*Approved landscaping must be designed and maintained to minimize flammability.*

Ornamental landscaping often results in large amounts of shrubby flammable vegetation being planted near structures. Many commonly used landscape plants, such as conifers, flammable woody shrubs, and tall ornamental grasses, should be avoided because they may create a fire threat to a home that would otherwise be fire safe. All plant material that is removed from the landscaping must be composted or removed and disposed of properly.

The spacing between landscaping plants and volume of landscaping biomass should mimic the Oak Woodland Zone, and landscape areas should be maintained according to the recommendations in the Oak Woodland Zone (see below).

### **3. Driveway Zone – 15 to 30 feet from edge of driveway pavement**

*Safe ingress and egress must be maintained along the driveway.*

The Driveway Zone is important to allow for safe passage and to provide a location where firefighter resources can travel and engage in fire response. The treatments required correspond to vegetation type.

- a. Grassland, and the understory of all trees should be mowed within 15 feet from the pavement edges, according to the recommendations in the Grassland Zone.
- b. All Chaparral and Coastal Scrub, vegetation should be treated to 30 feet from the pavement edge, according to their respective recommendations.
- c. All tree branches extending over driveway surfaces should be pruned to ensure 15 feet of vertical clearance. Whenever possible, healthy overhanging branches higher than 15 feet should be left in place to shade driveway areas and thereby reduce weed and understory growth. Each Lot has accessibility to a fire hydrant located within 1,000 feet of a residence, and a hammerhead or other safe turnaround for fire equipment access. Vegetation around

these facilities must be maintained as needed to ensure visibility and access, and all vegetation must be cleared or mowed to a height of not greater than 4 inches within three feet of each fire hydrant.

#### **4. Grassland Fuel Management Zone, areas, to a distance of 30 feet from structures**

*Grassland zones must be mowed at least once annually in late spring or early summer.*

Because grasslands dry and become flammable at the start of every summer, grassland areas will need annual attention, typically by mowing prior to the beginning of each summer. By mowing in late spring, native grasses and wildflowers are retained and may contribute in a lower-hazard condition. Woody weed species such as French broom, poison hemlock and thistles must be completely removed annually.

- a. Grassland areas should be mowed in early summer, consistent with Public Resources Code 4291. Maintaining a grass height of 4 inches to prevent soil erosion and dust is recommended, unless further height reduction is determined to be necessary in a Lot-Specific Plan.
- b. To promote native perennial grasses and wildflower stands which are less flammable and require less water, it is best to avoid mowing more frequently than every 60 days. Ideal mowing time is shortly after natives have set seed, and may require a delayed mowing schedule in wetter years to maintain their density.
- c. Trees growing within the Grassland Zone should be treated according to the recommendations made in the Savanna Zone.
- d. Coyote bush and other shrub species growing within the grassland zone, may be removed to maintain open herbaceous grasslands as part of an approved Lot-Specific Plan.

#### **5. Open Canopy/ Savanna Zone – to a distance of 150 feet from structures**

*Grass under trees must be mowed annually, and small-diameter lower tree branches must be pruned.*

Savannas consist of scattered oaks growing within a grassy understory, and both trees and grass should be maintained to provide a vertical separation between the ground and the tree canopy. According to fire behavior predictions, many areas of oak savanna are expected to produce flame lengths less than 4 feet before treatment. Mowing grass under and around trees reduces fire intensity and rate of spread of fire to an acceptable level, and diminishes the possibility that fire can climb into tree canopy. Pruning the small lower tree branches, as noted below, will reduce the possibility fire can spread into the tree crowns. Woody weed species such as French broom, poison hemlock and thistles must be completely removed annually.

##### ***Prescriptions for grass mowing:***

- a. Within 30 feet of structures, all grassland areas should be mowed in early summer to a height of four inches, according to the recommendations in the Grassland Zone.
- b. Within 100 feet of structures, all grass growing under trees, out to 6 feet beyond the driplines of trees, should be mowed in early summer to a height of not greater than four inches.

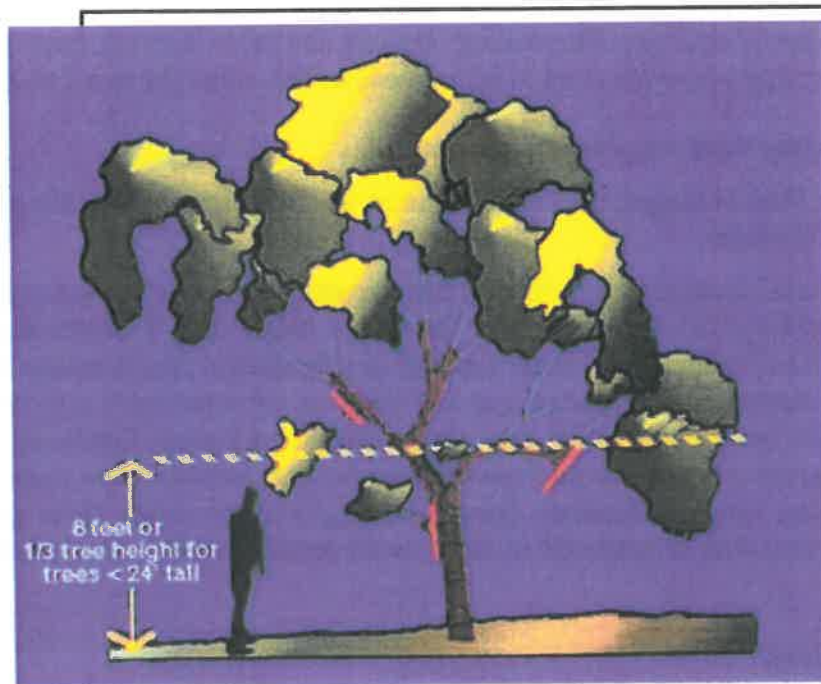
- c. Within 30-100 feet of structures (depending on slope and other factors), grass growing in the open, away from trees, does not need to be mowed, unless called for in a Lot-Specific Plan.

***Prescriptions for removing dead wood on the ground:***

- a. Throughout the Fuel Management Zones, remove all dead branches on the ground smaller than 6-8 inches diameter.
- b. Large dead material located within the fuel management zone may be removed or relocated as recommended by a Lot-Specific Plan. Dead logs larger than 8 inches in diameter may remain on the site if isolated from dead material that is smaller than 4 inches in diameter, if not under a tree canopy, or if moved at least 100 feet from the structure. Large woody material by itself does not ignite readily and does not produce long flames. Retaining these features in open areas serves a beneficial purpose of retaining soil moisture and supports important wildlife, including native pollinators. Once dead logs become rotted through and friable, they should be removed or scattered in the general area to avoid a concentration of lighter fuels.

***Prescriptions for tree pruning:***

- a. All branches, living or dead, less than 3 inches diameter in width and less than either 8 feet from the ground or three times the height of any understory shrubs whichever is greater, shall be removed (Figure 1).
- b. Living branches that are greater than 3 inches in diameter but lower than 8 feet in height can be retained, provided that the area within the drip-line of trees is maintained. Oaks with live limbs resting on the ground need not be removed, but all ground debris around and beneath the limbs must be removed to reduce fire risk.
- c. Dead limbs less than 8 feet in height shall be removed in all cases. Additional dead limbs or overhanging structures, as well as those determined to be a hazard, may be included for removal in Lot-Specific Plans.
- d. In landscaped areas, healthy tree branches less than 3 inches in diameter or 8 inches diameter if split or diseased, should be removed to provide vertical clearance of 3 times the height of the understory plants, or 8 feet above understory plants, whichever is greater.
- e. For trees shorter than 24 inches in height, remove lower 1/3 of branches smaller than 3 inches in diameter, or alternatively, treat as a shrub grouping.
- f. Once initial pruning is accomplished, tree pruning is likely to be needed infrequently, on an interval of about once every 3 to 5 years.
- g. Do not thin or prune the tree canopy, as this will promote more understory shrub growth as well as lower parts of the tree, and will result in increased risk that fire will spread to the tree canopy.



**Figure 1.**  
 Create vertical spacing under lower tree branches, by removing small tree branches from the bottom 8 feet of the tree, or from the bottom one-third of the

tree, whichever is less.

## 6. Chaparral Zone – to a distance of 200 feet

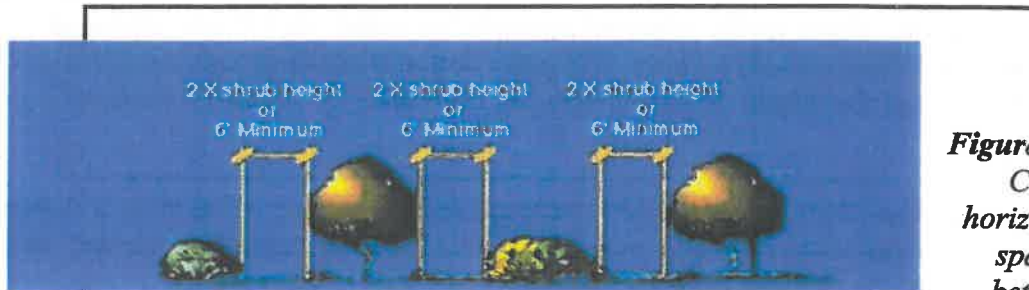
*All shrubs within chaparral must be thinned or mowed within 200 feet of structures.*

Chaparral, composed of broad-leaved shrubs and bushes that form dense thickets, is an important habitat type. This habitat type burns with great intensity and poses a high fire hazard to adjacent structures. When mowed or burned, woody shrubs in this habitat type re-sprout from the root system and require regular treatment to manage fire risk. In this vegetation type, defensible space is created by maintaining well-spaced chaparral shrubs that are short-stature, with succulent young vegetation, and no dead branches. Stands of shrubs within this Zone should be managed annually to ensure they are not allowed to grow above 2.5 ft height (usually 5 years or less) before being re-treated.

- In open areas away from trees, individual plants or small groupings of shrubs may be retained if reduced to discontinuous groups of shorter, younger, more succulent shrubs. Ensure the distance between groups of shrubs is at least 2 times the height of the shrub patch (see Figure 3). Retain less-flammable desirable shrubs, such as ceanothus, currant, coffeeberry, native rose, and sticky monkey flower, particularly where needed to stabilize slopes or prevent soil erosion.
- All other shrubs within 200 feet of structures should be mowed, or cut, at ground level. Site topography and vegetation will determine whether the treatments can be “feathered” at the edges, and whether it can be conducted with machinery or by hand crews.
- In all cases, remove chamise, a highly flammable dense-growing native (*Adenostoma fasciculatum*), under tree canopies. Where chamise is found outside of tree canopies, mow

chamise at ground level, or create shrub groupings, according the recommendations in the Coastal Scrub Zone. If other shrub species are present with the chamise, retain them at the expense of the chamise.

- d. All healthy trees within the 200-foot Chaparral Zone should be retained. As trees increase within the chaparral, they provide a long-term reduction in shrub cover and fire hazard.
- e. Trees growing within chaparral should be encouraged by removing shrubs from within a zone around the tree (Figure 2):
  - When the tree is shorter than 6 feet high, all shrubs should be removed from within a distance of 3 feet from the tree's drip line.
  - When a tree is taller than 6 feet high, all shrubs should be removed from within a distance of 6 feet from the tree's drip line.



**Figure 2.**  
*Create horizontal spacing between*

*trees and shrubs, by removing shrubs from around trees within a radius that extends 3 feet from the tree's drip line. For trees taller than 6 feet, remove shrubs within a distance of 6 feet from the tree's drip line.*

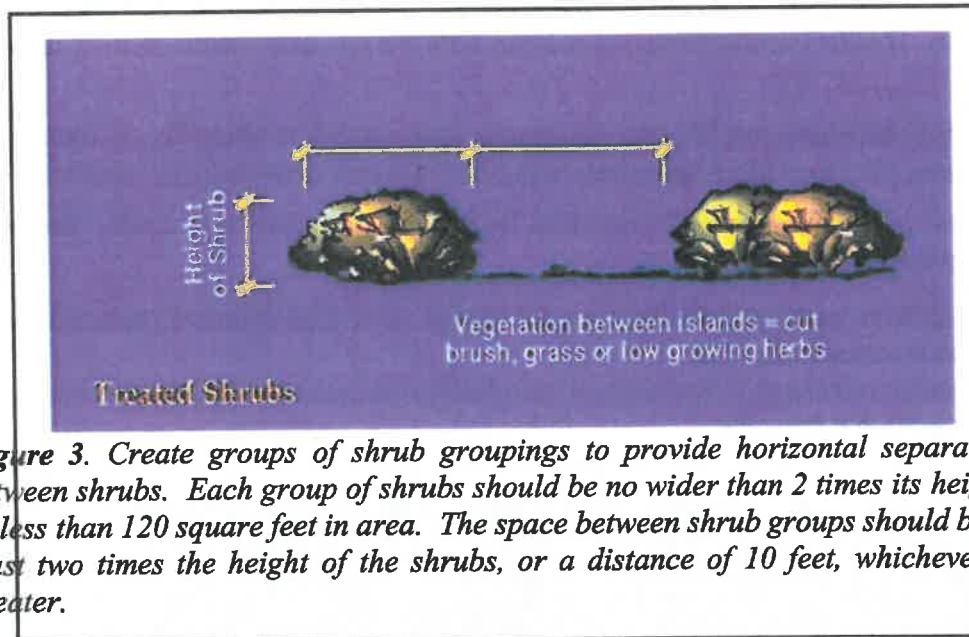
## **7. Coastal Scrub Zone – to a distance of 200 feet**

*All shrubs within coastal scrub must be thinned or mowed within 200 feet of structures.*

Like chaparral, coastal scrub is an important habitat type. Coastal scrub is comprised of a diverse mixture of native shrub species including coyote bush, native sage, blackberry, coffeeberry, and poison oak. Like most chaparral shrubs, shrub species growing within coastal scrub habitat will stump-sprout vigorously when mowed or burned, so coastal scrub zones will need to be retreated on a regular basis.

- a. In open areas away from trees, between 30 feet and 200 feet of structures, change the pattern into discontinuous groups of shorter, younger, more succulent shrubs and ensure the distance between groups of shrubs is at least 2 times the height of the shrub patch (see Figure 3).





**Figure 3.** Create groups of shrub groupings to provide horizontal separation between shrubs. Each group of shrubs should be no wider than 2 times its height, or less than 120 square feet in area. The space between shrub groups should be at least two times the height of the shrubs, or a distance of 10 feet, whichever is greater.

- b. In coyote brush dominated stands, if other shrub species are present, retain them at the expense of coyote brush. Retain less-flammable desirable shrubs, such as ceanothus, currant, coffeeberry, native rose, and sticky monkey flower.
- c. It is not necessary to eliminate coyote brush within the fuel management zone. Instead, change the pattern into discontinuous groups of shorter, younger, more succulent shrubs. If native bunch grasses are present, promote these grassland conditions through permanent removal of encroaching brush species.
- d. Remove all dead branches from less-flammable desirable shrubs, such as ceanothus, currant, coffeeberry, native rose, and sticky monkey flower.
- e. All healthy trees within the 200-foot Coastal Scrub Zone should be retained. As trees increase within the chaparral, they provide a long-term reduction in shrub cover and fire hazard.
- f. Trees growing within coastal scrub zones should be encouraged by removing shrubs from within an area around the tree as shown below (Figure 2, above):
  - a. When the tree is shorter than 6 feet high, all shrubs should be removed from within a distance of 3 feet from the tree's drip line.
  - b. When a tree is taller than 6 feet high, all shrubs should be removed from within a distance of 6 feet from tree crown edge.

## 8. Oak Woodland Zone – to a distance of 150 feet

*Understory plants must be kept short, and small lower tree branches must be removed.*

The understory of oak woodland habitat includes shade tolerant shrubs and grasslands. The goal of this standard is to maintain an existing oak woodland with a short-statured understory of herbaceous plants and shrubs, and a tree canopy at least 8 feet above the ground. An initial treatment will be required

to prune smaller branches of trees up to 8 feet above the ground and to reduce density and stature of understory shrubs. After the initial treatment, annual maintenance will be needed to cut back shrub sprouts in order to maintain a maximum height of 2.5 feet.

***Prescriptions for understory maintenance:***

- a. Within 30 feet from structures, at the beginning of each summer, ensure that the herbaceous understory is maintained at a maximum height of 4 inches.
- b. Understory vegetation should not be completely removed. Instead, selectively remove flammable species like coyote bush, and prune-back and remove dead branches from less-flammable desirable species such as coffeeberry, currant and wild rose.
- c. Native understory shrubs are to be kept free of dead branches and no more than 2.5 feet in height.
- d. Leaf litter depth should be kept to no greater than 4 inches.

***Prescriptions for tree pruning:***

- a. All branches, living or dead, less than 3 inches diameter in width and less than either 8 feet from the ground or three times the height of any understory shrubs whichever is greater, shall be removed (Figure 1).
- b. Living branches that are greater than 3 inches in diameter but lower than 8 feet in height can be retained, provided that the area within the drip-line of trees is maintained. Oaks with live limbs resting on the ground need not be removed, but all ground debris around and beneath the limbs must be removed to reduce fire risk.
- c. Dead limbs less than 8 feet in height shall be removed in all cases. Additional dead limbs or overhanging structures, as well as those determined to be a hazard, may be included for removal in Lot-Specific Plans.
- d. In landscaped areas, healthy tree branches less than 3 inches in diameter or 8 inches diameter if split or diseased, should be removed to provide vertical clearance of 3 times the height of the understory plants, or 8 feet above understory plants, whichever is greater.
- e. For trees shorter than 24 inches in height, remove lower 1/3 of branches smaller than 3 inches in diameter, or alternatively, treat as a shrub grouping.
- f. Once initial pruning is accomplished, tree pruning is likely to be needed infrequently, on an interval of about once every 3 to 5 years.
- g. Do not thin or prune the tree canopy, as this will promote more understory shrub growth as well as lower parts of the tree, and will result in increased risk that fire will spread to the tree canopy.

# **Exhibit A**

*PCR 4291*



**LOT-SPECIFIC FUEL MANAGEMENT PLAN**

**AUGUST 5, 2019**



**DOCUMENT PREPARED:**

**LOT XXX FUEL MANAGEMENT PLAN**

**STREET ADDRESS; APN: XXX-XXX-XXX**

**PREPARED BY FIRE ECOLOGIST, LANDSCAPE  
CONTRACTOR, OR QUALIFIED CONSULTANT**

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## LOT XXXFUEL MANAGEMENT PLAN

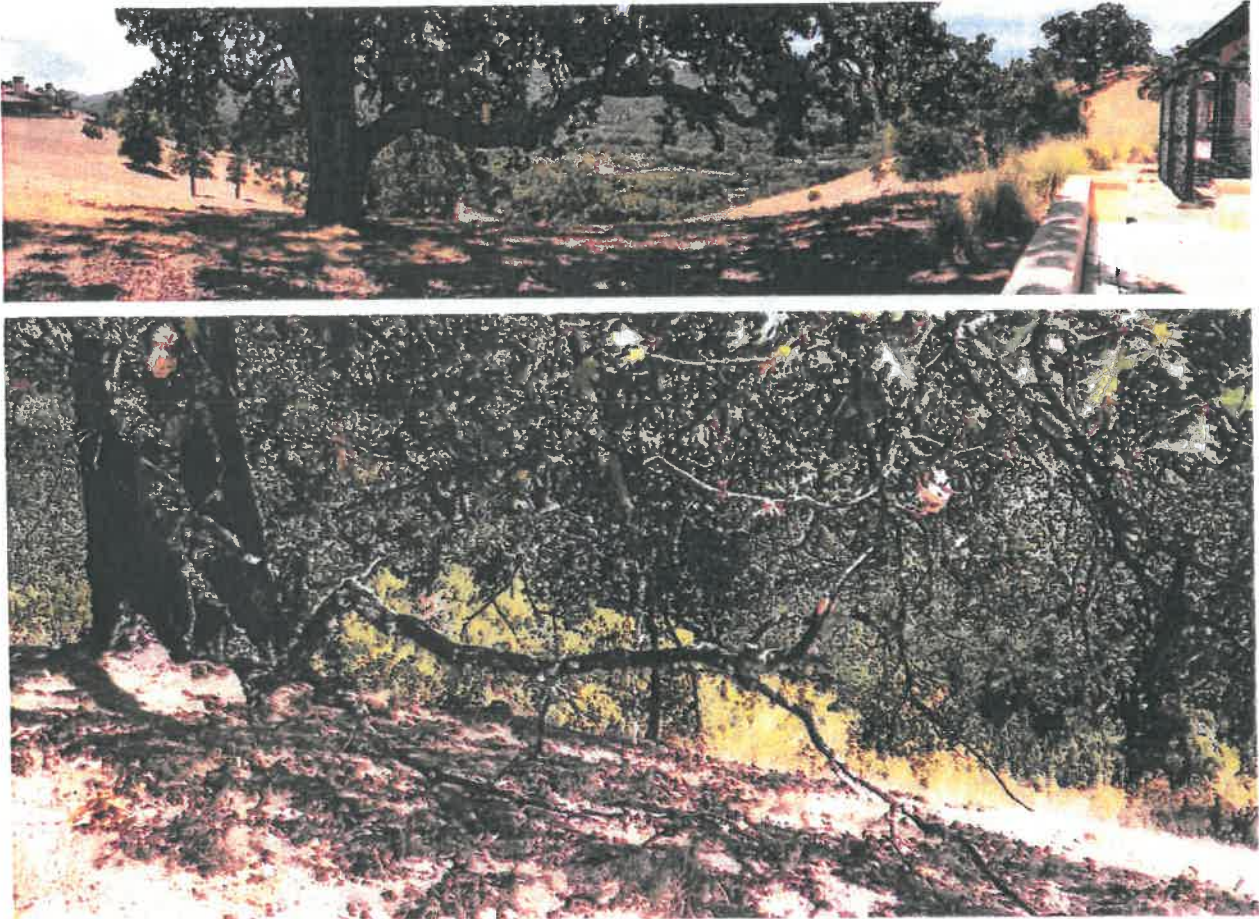
### PURPOSES

This Lot-Specific Fuel Management Plan ("Plan") has been prepared by, Fire Ecoloist for the homeowners. The purposes of this Plan are to guide the implementation of vegetation management and to provide for the Owner sufficient defensible space and fire safety around the home and structure on Lot XXX; as required by California Public Resources Code 4291, while still maintaining the natural and aesthetic values of the RHCA. This plan is to implement the vegetation treatments outlined in the Fuel Management attached hereto and incorporated by reference herein.

It is important to note that the creation of a Lot-Specific Fuel Management Plan and subsequent implementation of the prescribed treatments found below do not guarantee that the property will be 100% fire-safe, but it will improve fire-fighter safety and lessen potential structural damage.

## CURRENT CONDITIONS

Through an analysis of aerial imagery and during a site visit on July 25, 2019 the following conditions were observed by CONSULTANT.



**FIGURE 1 PHOTOS OF TYPICAL VEGETATION; UPPER PHOTO SHOWS LANDS SOUTHWEST OF STRUCTURE AND LOWER PHOTO SHOWS LANDS NORTH OF STRUCTURE**

### STRUCTURES

There are several structures on site; these include a main residence, a detached garage, a guest house, and a caretaker residence. All structures are concentrated on the southern portion of the lot. Combined, these buildings represent roughly 12% of the 1.8-acre lot. Hardscaping surrounds most of the buildings.

### LOCATION

Lot XXX is located in the southern portion of RHCA, south of the equestrian center, on Buggywhip Lane. The property boundary to the north constrains the fuel treatment in oak/shrub woodland; an agreement with adjacent landowners (Lot XXX) should be reached that would allow implementation of the full width of the treatment areas per the approved Fuel Management Standards.

Lot xx abuts nine residential parcels: Lots xx, yy and zz. Statement regarding adjacency to roads, or large canyons.



The property can be accessed via this road or that road. The nearest fire station is within The Preserve at the Corporate Yard and is approximately XX miles away on this road (approximately less than a 5 to 10-minute response time). There is also the fire station of the Gate House, which is 10 miles away (with an approximate 25-minute response time).

Outside RHCA, two stations are available for response. These include the [Another Fire Department] at 8455 Somewhere Road. Also, the Different Fire Protection District station at XXX Road in Palos Verde is 14 miles away with an expected response time of 35 minutes



FIGURE 2 AERIAL MAP OF LOT XXX..

#### ROADS OR TRAILS

Lot XXX is accessed using XX Road. To exit, travel southeast on the private driveway until driveway meets YY Rd.

The driveway to the residence is relatively long at XXX feet. However, it traverses a gentle grade, does not cross any other lots, and does not pose a hindrance to access or maintenance.



**FIGURE 3 PHOTOS OF LOT XXXS DRIVEWAY**

#### TERRAIN

The lot sits atop a gentle ridge rising above several of the Golf Course fairways and overlooking an industrial pond. The entire lot is best characterized by rolling terrain, with an elevation range of 1,500ft to 1,690 ft. The heads of two, small drainages define the eastern portion of the lot, while another drainage borders the southwestern edge of the parcel. The lot is primarily south facing. The terrain does not restrict fuel management.

The predominate wind comes from the northwest, up canyon from the golf course, but because the site is atop a knoll/ridge, winds may also flow up from the southwest. Because of the lot's relatively high elevation, winds preceding a northern storm could present a problem.

appinsolutions.com on 2/25/2019. Document Name: Lot 47 Topographic Overview.

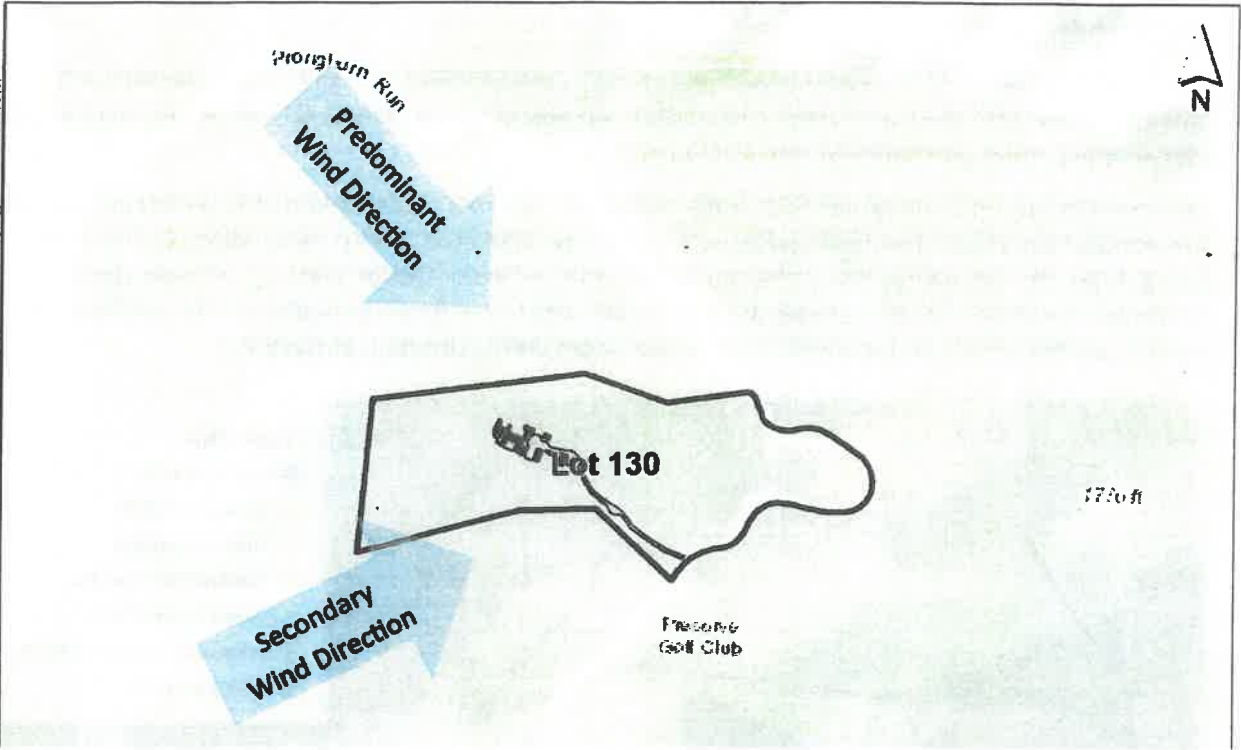


FIGURE 4 TOPOGRAPHIC MAP OF LOT XXX. LARGE BLUE ARROWS INDICATE WIND FLOWS AROUND LOT XXX, WHICH ARE INFLUENCED BY TERRAIN.



VEGETATION

There are three vegetation types mapped on Lot XXX: a mix of Valley Oak and Coast Live Oak (VoClo), California Black Oak (Cbo), and Valley Oak (VaOa). All vegetation types extend into the surrounding lots until meeting either grasslands or the Golf Course.

Site observations note the property is comprised of an open oak savanna with little understory and an oak woodland north of the building site, with a shrubby understory that is developing on this north-facing slope. On the rolling hills on the south and west portion of the lot there is currently good separation between the tree canopy and grassy fuel, which is a fire safe condition. The northern and eastern portion of the lot has steep oak-covered slopes with a shrubby understory.

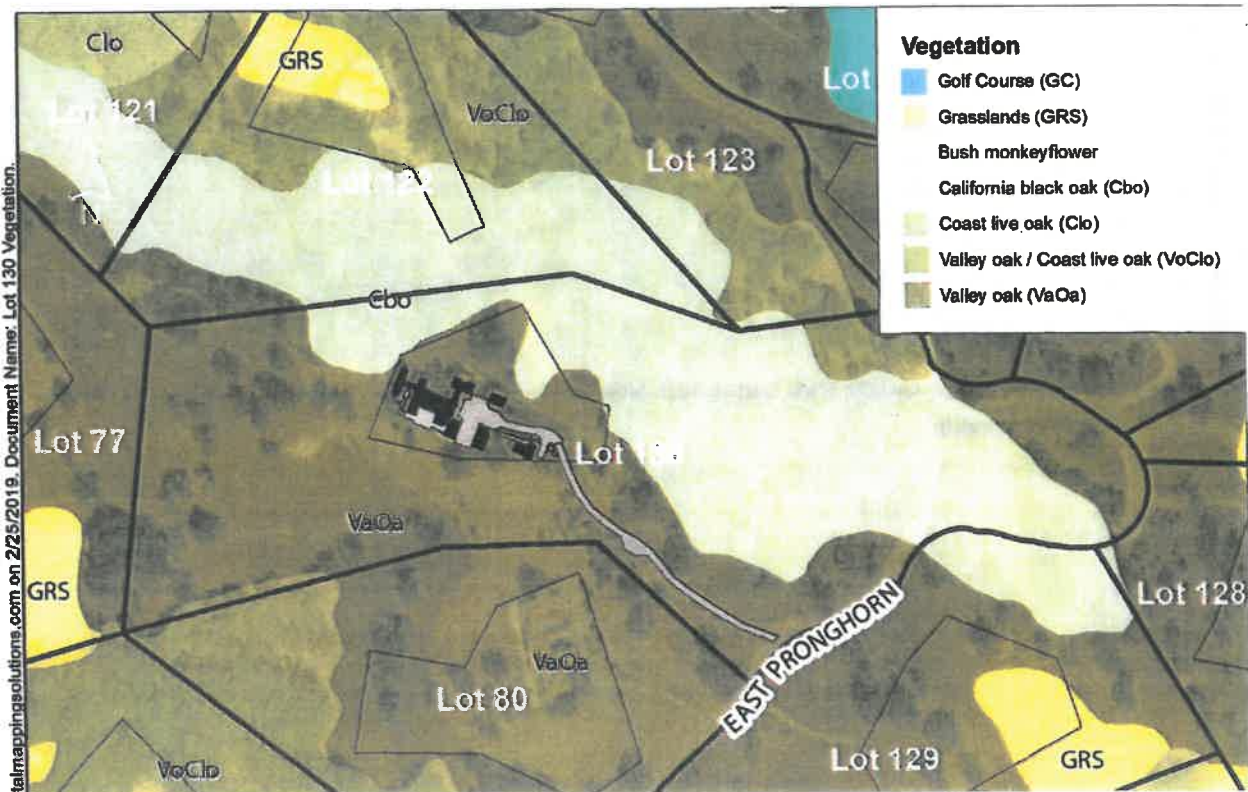


FIGURE 5 VEGETATION MAP OF LOT XXX.



## FIRE HAZARD

The vegetative fuels are comprised of annual grass and oak woodland; these fuel types produce fires that are usually non-threatening when the grass and shrubby fuels are maintained. Because of the open nature of these vegetation types, fire behavior can be expected to be relatively low if shrubs have not become dense and tall. If a well-developed understory is present fire behavior can be anticipated to be challenging.

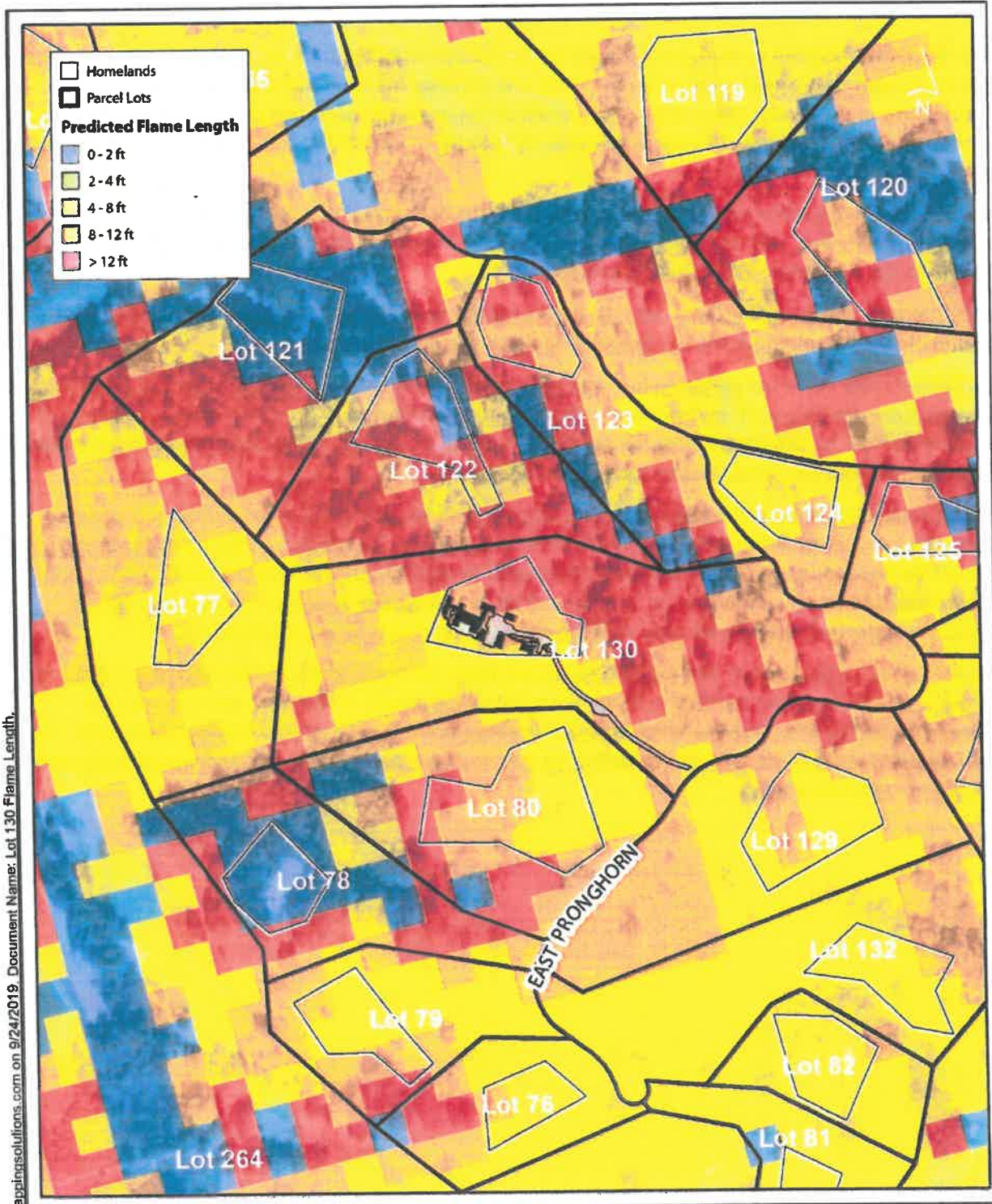
For Lot XXX, fire behavior modeling indicates under current conditions, a wildfire on the property would burn fairly hot; with flame lengths above 4 feet in the south and west, and much higher flame lengths to the north-east along the main ridgeline.

With that said, the modeling does not take into consideration current management practices which include mowing throughout the lot; emolliating these predicted results.

Fire spread rates in annual grass can be quite fast. With maintenance of mowed or grazed grass around the structures the threat of fire from this vegetation type is reduced to acceptable levels because of the width of low-hazard fuels below the structure. Wherever mowing or grazing has occurred, minimal flame lengths and very slow rates of spread can be expected.

If a fire were to develop in the oak woodland, longer flame lengths could be produced and possibly cause the trees to torch the oak and threaten the structures on the property. Fuel management on the site will be needed to maintain a low level of understory shrubby growth and low dead debris on the forest floor, and to prune the bottom branches of trees to limit the possibility of torching. This is especially important in those wooded areas to the north and east of the structures.

The worst-case scenario may be a big fire advancing from the north to northwest because if there is a strong wind also from the northeast, there would be an alignment of the wind and fire with the topography on Lot XXX. Because of its exposed location, fire behavior may be conflagrated, with swirling winds and erratic spread. However, the golf course is north of Lot XXX and would likely stop the fire or lessen its effects.



### Predicted Flame Lengths

FIGURE 6 MAP OF PREDICTED FLAME LENGTHS ON LOT XXX (WITHOUT TREATMENT).

## FUEL MANAGEMENT

If the treatments described below are implemented, two-foot flames are expected throughout Lot XXX. Fuels that produce a two-foot flame length and prevent ember production are the result of fuel mitigation treatments in five zones of varying actions and distances from the structure, based on existing vegetation and terrain in and around Lot XXX. In each zone, the distance is constrained by the distance to the property boundary; in no case does this fuel management plan authorize the landowner to take fuel management actions beyond the property boundary. However, if the recommended distance for fuel maintenance exceeds a parcel's boundaries, the owner is encouraged to contact the Conservancy and reach an agreement with adjacent landowners to fully comply with Fuel Management Standards.

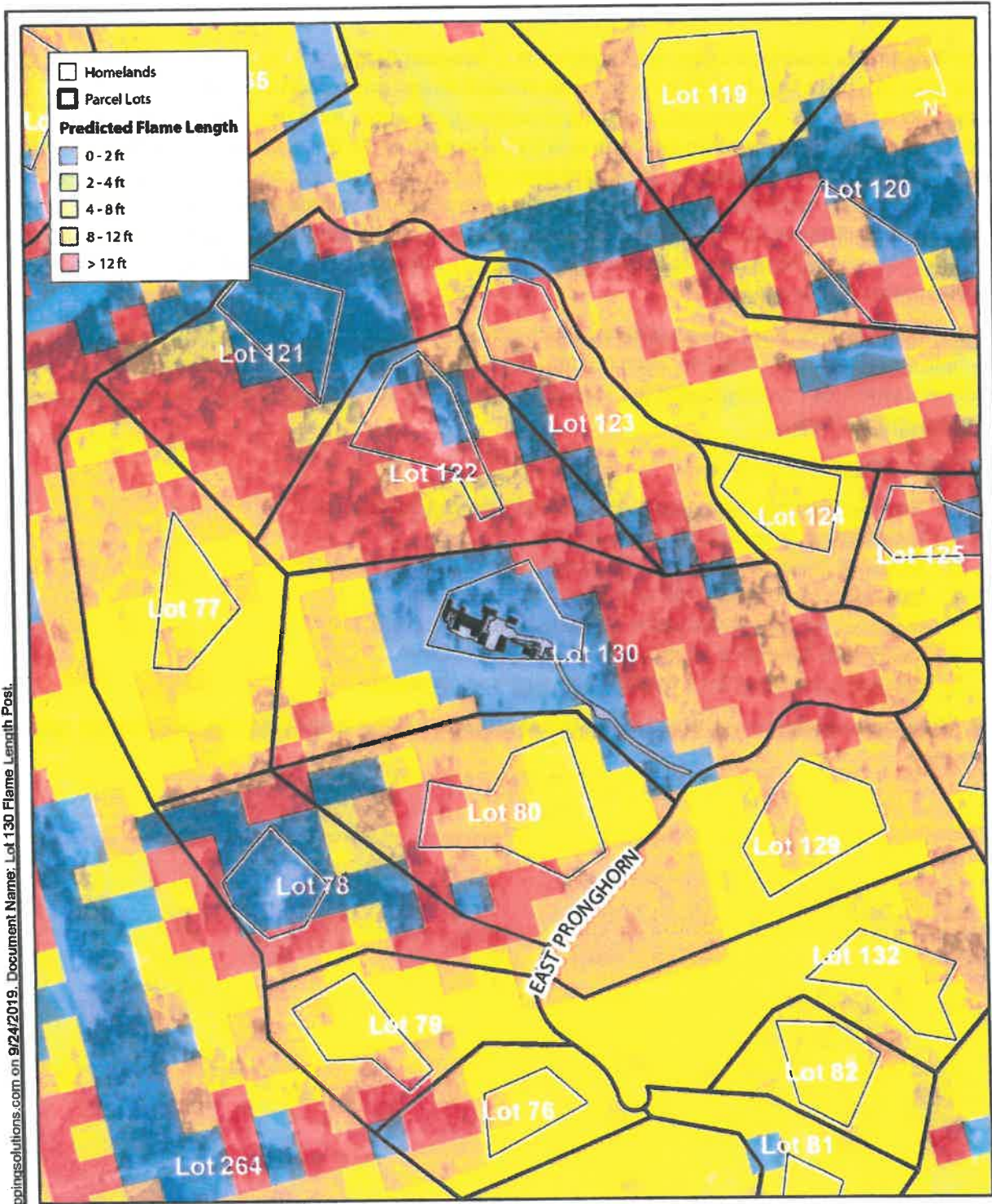
Each zone has a unique set of standards by which compliance will be gauged. Treatments in each zone are fully described in the Fuel Management Standards and repeated here. Unless specified here, treatments must be consistent with the Standards. ***Exceptions and additional actions are noted in bold, underlined italics.***

The fuel management zones are:

1. Non-combustible Zone, for a width of 5 feet from structure
2. Landscaping Zone, per landscaping plans
3. Driveway Zone, for a width of 15 feet from edge of pavement
4. Grassland Zone, for a width of 30 feet from structure
5. Oak Savanna Zone, for a width of 150 feet from structure
6. Oak/Shrub Zone for a width of 200 feet from structure
7. Coastal Scrub Zone, for a width of ***150 feet*** from structure

The following two pages show the post-treatment predicted flame lengths and the fuel management zone map.





### Predicted Flame Lengths (Post Treatment)

FIGURE 7 MAP OF PREDICTED FLAME LENGTHS ON LOT XXX (WITH TREATMENT).



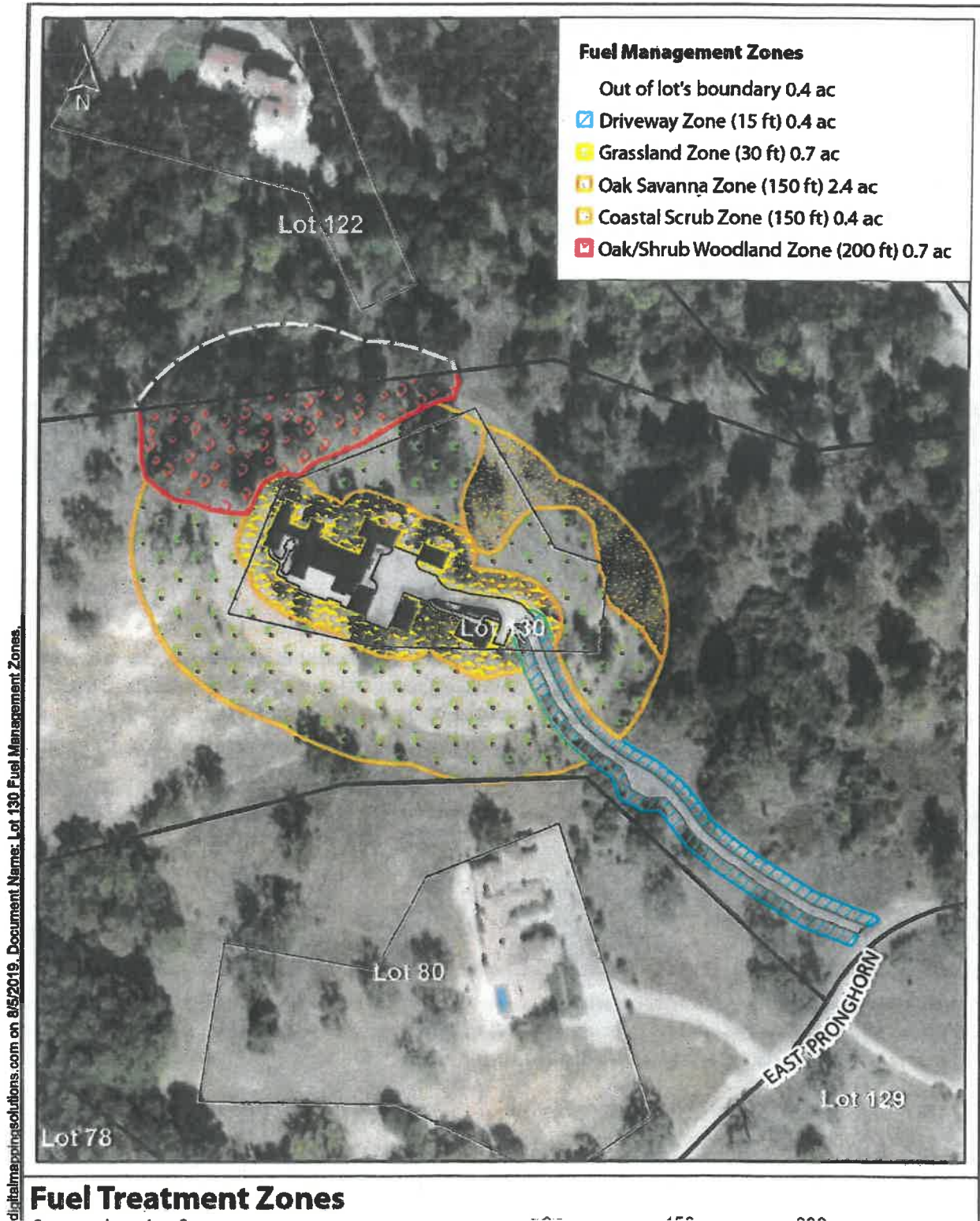


FIGURE 8 FUEL MANAGEMENT MAP WITH ZONES DELINEATED.

There is a small portion of the fuel treatment falling into an adjacent lot (Lot 122). It was also noted during the site visit that dense vegetation on Lot 122 could pose a threat to the structures on Lot XXX.

For reference, here are the fuel management standards for the zones on Lot XXX.

**NON-COMBUSTIBLE ZONE – TO A DISTANCE OF 5 FEET**

*A non-combustible zone should be maintained within in a 5-foot buffer around structures.*

Hardscape surfaces (such as patios, gravel, and bare soil), and landscape materials (such as lawn and succulent herbaceous plants) are examples of non-combustible surfaces. Wood mulch is not considered non-combustible. Landscape architects are encouraged to make liberal use hardscaping within 5 feet of structures. Care should be taken in the design phase to ensure there is adequate room within the lot for such treatments.

Firewood currently near the house should be moved more than 5 feet from structures and enclosed.

**In addition, where Mugo pine or other woody landscaping exists near vents, trim lower branches to a 2-3 foot height up from the ground when they are within 5 feet of a foundation vent.**



**FIGURE 9 OVERALL, LOT XXX MAKES USE OF EXTENSIVE HARDSCAPING IN AND AROUND STRUCTURES. DUE TO HOME CONSTRUCTION THAT INCLUDES STUCCO WITHOUT WEEP SCREENING, THERE IS NO NEED FOR A NON-COMBUSTIBLE ZONE. HOWEVER, ALL MULCH WILL NEED TO BE REMOVED WITHIN 5 FEET OF FOUNDATION VENTS.**



**FIGURE 10 WINDOWS ARE A WEAK POINT IN STRUCTURE HARDENING; TRIM MATCHED, LARGE SHRUBS (LEFT PHOTO) 5 FEET AWAY FROM WALL AND WINDOWS. TRIM HERITAGE OAK IN COURTYARD NORTH OF HOUSE 5 FEET FROM ROOFLINE TO KEEP TREE FROM DAMAGING ROOF/GUTTER (RIGHT PHOTO ).**





**FIGURE 11 BECAUSE IT IS AN EMBER TRAP (AS EVIDENCED BY CURRENT LEAF BUILD-UP), CLEAR AWAY COMBUSTIBLE MATERIAL FROM COVERED STORAGE ENTRY.**

**LANDSCAPING ZONE – WITHIN ENTIRE LANDSCAPED AREA**

*Approved landscaping must be designed and maintained to minimize flammability.*

Ornamental landscaping often results in large amounts of shrubby flammable vegetation being planted near structures. Many commonly used landscape plants, such as conifers, flammable woody shrubs, and tall ornamental grasses, should be avoided because they may create a fire threat to a home that would otherwise be fire safe. All plant material that is removed from the landscaping must be composted removed and disposed of properly. In no case can material from the Landscaping Zone be left and must be processed if it will remain. The spacing between landscaping plants and volume of landscaping biomass should mimic the Oak Woodland Zone, and landscape areas should be maintained according to the recommendations in the Oak Woodland Zone (see below).

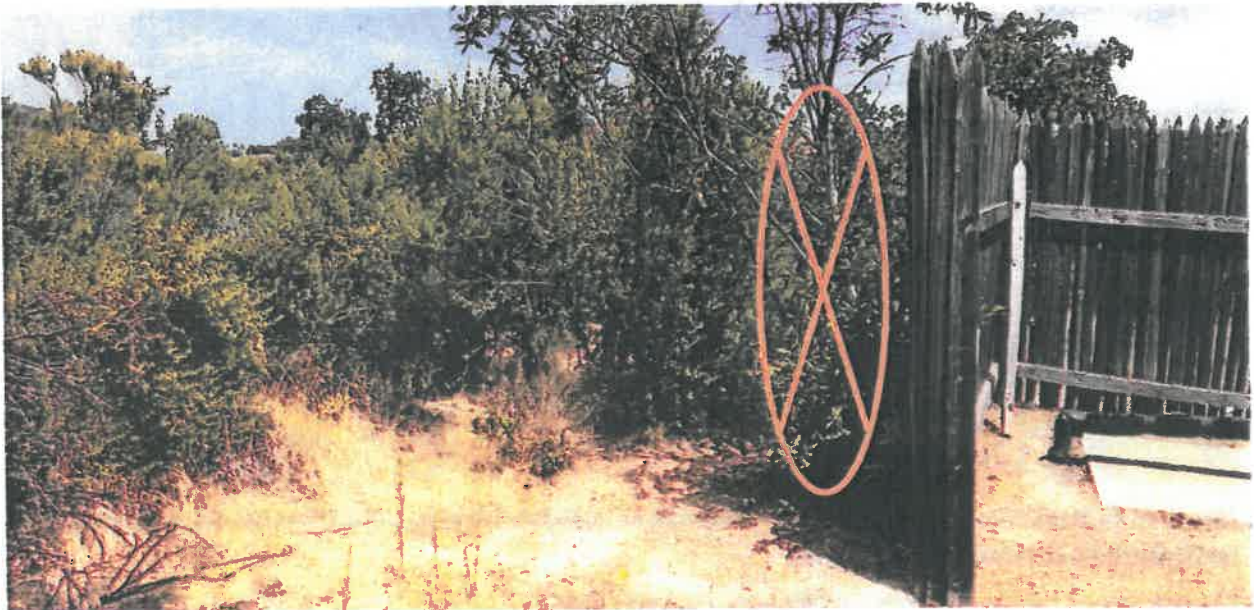


**FIGURE 12 EXAMPLES ON LOT XXX OF GOOD LANDSCAPING CHOICES OF LOW FUEL VOLUME AND ADEQUATE SPACING BETWEEN PLANTS ALONG WITH HARDSCAPING TO PREVENT IGNITION FROM EMBERS**

**DRIVEWAY ZONE – 15 FEET FROM EDGE OF DRIVEWAY PAVEMENT**

*Safe ingress and egress must be maintained along the driveway.*

The Driveway Zone is important to allow for safe passage and to provide a location where firefighter resources can travel and engage in fire response. The treatments required correspond to vegetation type.

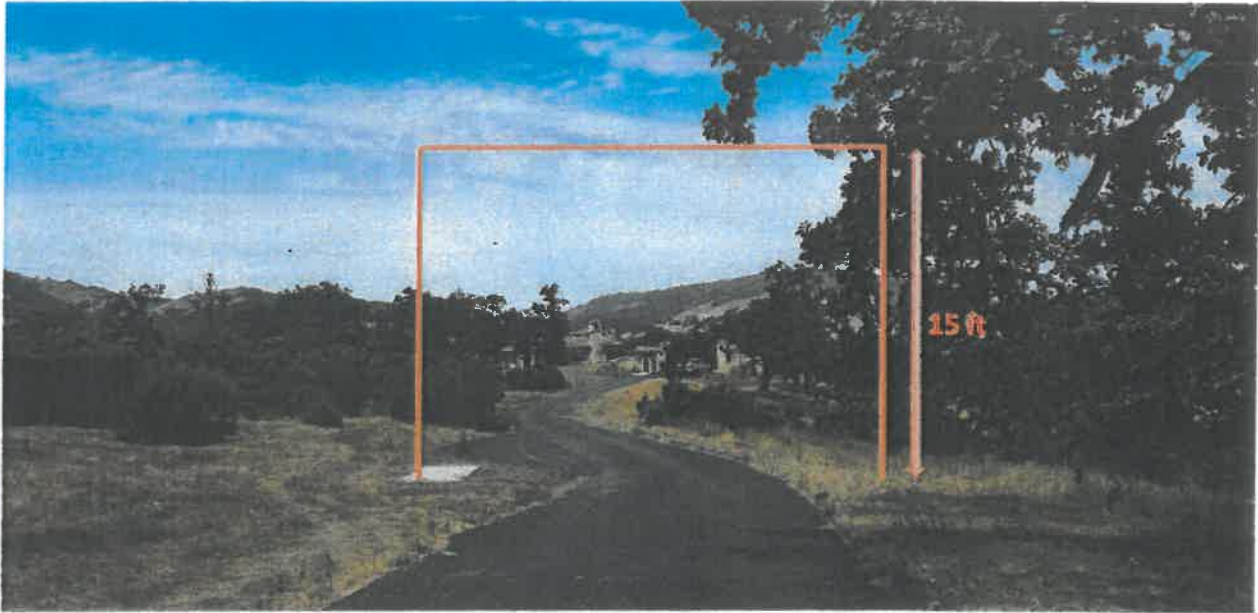


**FIGURE 13 TRIM AND CLEAR AWAY VEGETATION AWAY FROM WOODEN STRUCTURE NEAR DRIVEWAY**

- a. Grassland, and the understory of all Oak Savanna, and Oak Woodland vegetation should be mowed within 15 feet from the pavement edges, according to the recommendations in the Grassland Zone.
- b. All Chaparral, Coastal Scrub, and Oak/Shrub Woodland vegetation should be treated to 30 feet from the pavement edge, according to their respective recommendations.
- c. All tree branches extending over driveway surfaces should be pruned to ensure 15 of vertical clearance. Whenever possible, healthy overhanging branches higher than 15 feet should be left in place to shade driveway areas and thereby reduce weed and understory growth.
- d. Every residential structure shall have a dedicated fire hydrant and a hammerhead or other safe turnaround for fire equipment access. Vegetation around these facilities must be maintained as needed to ensure visibility and access, vegetation must be cleared three feet around fire hydrant.

A minimum 3-foot radius from each fire hydrant shall be free of vegetation.





**FIGURE 14 BE SURE TO CLEAR OVERHANGING BRANCHES ABOVE DRIVEWAY UP TO 15 FEET**

**GRASSLAND ZONE – TO A DISTANCE OF 30 FEET FROM STRUCTURES**

*Grassland zones must be mowed at least once annually in late spring or early summer.*

Because grasslands dry and become flammable at the start of every summer, grassland areas will need annual attention, typically by mowing prior to the beginning of each summer. By mowing in late spring, native grasses and wildflowers are retained and may contribute in a lower-hazard condition. Woody weed species such as French broom, poison hemlock and thistles must be completely removed annually.

- a. Within 30 feet from structures, all annual grassland areas should be mowed in early summer to maintain a minimum height of 4 inches during the summer.
- b. Native perennial grasses and wildflower stands should not be mowed more frequently than 60 days, ideally shortly after they have set seed. This may require a delayed mowing schedule in wetter years to maintain their density. Consult with the Conservancy staff as needed.
- c. Trees growing within the Grassland Zone should be treated according to the recommendations made in the Oak Woodland Zone.
- d. Coyote bush, and a number of other shrub species, growing within the grassland zone, may be removed to maintain open herbaceous grasslands as part of an approved Lot-Specific Plan.



**FIGURE 15 CURRENTLY, MOWING IN OPENLANDS BETWEEN LOT XXX AND NEIGHBOR TO SOUTHEAST IS WIDER THAN NEEDED BUT IS MAINTAINED AT THE REQUIRED 4 INCHES IN HEIGHT**

**OAK SAVANNA ZONE – TO A DISTANCE OF 150 FEET**

*Grass under trees must be mowed annually, and small-diameter lower tree branches must be pruned.*

Oak savannas consist of scattered oaks growing within a grassy understory, and both trees and grass should be maintained to provide a vertical separation between the ground and the tree canopy. According to fire behavior predictions, many areas of oak savanna are expected to produce flame lengths less than 4 feet before treatment. Mowing grass under and around trees reduces fire intensity and rate of spread of fire to an acceptable level, and diminishes the possibility that fire can climb into tree canopy. Pruning the small lower tree branches, as noted below, will reduce the possibility fire can spread into the tree crowns. Woody weed species such as French broom, poison hemlock and thistles must be completely removed annually.

***Prescriptions for grass mowing:***

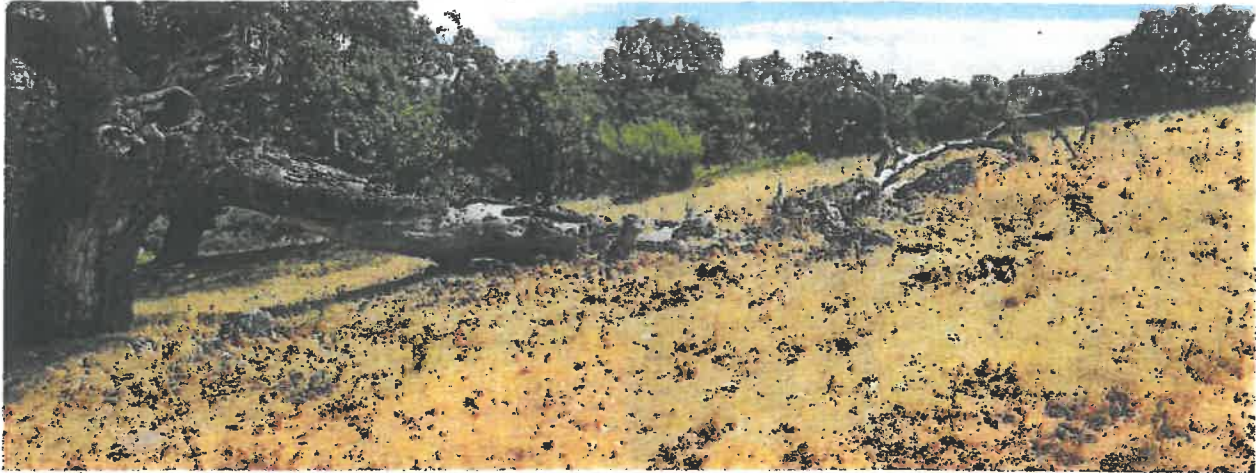
- a. Within 30 feet of structures, all grassland areas should be mowed in early summer to a height of four inches, according to the recommendations in the Grassland Zone.
- b. Within 100 feet of structures, all grass growing under trees, out to 6 feet beyond the driplines of trees, should be mowed in early summer to a height of four inches.
- c. Within 30-100 feet of structures (depending on slope and other factors), grass growing in the open, away from trees, does not need to be mowed.

***Prescriptions for removing dead wood on the ground:***

- a. Throughout the Fuel Management Zones, removal all dead branches on the ground smaller than 6-inch diameter.
- b. Large dead material located within the fuel management zone may be removed or relocated as recommended by a Lot-Specific Plan. Dead limbs larger than 8 inches in diameter, in the Fuel Management Zones within the Openlands, should remain on the site if isolated from dead material that is smaller than 4-inches in diameter, if not under a tree canopy, or if moved at least 100 feet from the structure. Large woody material by itself does not ignite readily and



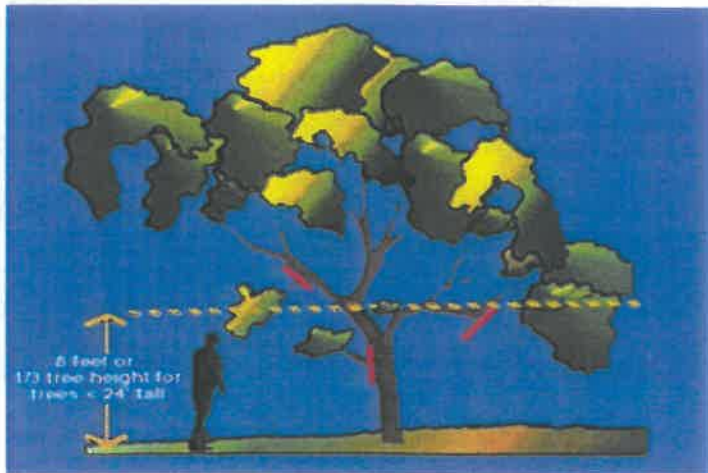
does not produce long flames. Retaining these features in open areas serves a beneficial purpose of retaining soil moisture and supports important wildlife, including native pollinators. Once dead logs become rotted through and friable, they should be removed or scattered in the general area to avoid a concentration of lighter fuels.



**FIGURE 16 LARGE DEAD LOGS MAY REMAIN IF LOCATED OUTSIDE THE TREE CANOPY. GRASS SHOULD BE MOWED UNDER THE TREE CANOPY AND AROUND THE DEAD LOGS TO LIMIT IGNITION POTENTIAL. IN THIS CASE, THE WOODY MATERIAL ON THE LEFT SHOULD REMAIN, THE MATERIAL ON THE RIGHT SHOULD BE REMOVED.**

***Prescriptions for tree pruning:***

- a. All branches, living or dead, less than 3 inches diameter in width and less than either 8 feet from the ground or three times the height of any understory shrubs whichever is greater, shall be removed (Figure 17).
- b. Living branches that are greater than 3 inches in diameter but lower than 8 feet in height can be retained, provided that the area within the drip-line of trees is maintained Oaks with live limbs resting on the ground need not be removed, but all ground debris around and beneath the limbs must be removed to reduce fire risk.
- c. Dead limbs less than 8 feet in height shall be removed.
- d. In landscaped areas, healthy tree branches less than 3 inches in diameter or 8 inches diameter if split or diseased, should be removed to provide vertical clearance of 3 times the height of the understory plants, or 8 feet above understory plants, whichever is greater.



**FIGURE 17 CREATE VERTICAL SPACING UNDER LOWER TREE BRANCHES BY REMOVING SMALL TREE BRANCHES FROM THE BOTTOM 8 FT OF THE TREE OR FROM THE BOTTOM ONE-THIRD OF THE TREE, WHICHEVER IS LESS.**

- e. For trees shorter than 24 inches in height, remove lower 1/3 of branches smaller than 3 inches in diameter, or alternatively, treat as a shrub grouping.
- f. Once initial pruning is accomplished, tree pruning is likely to be needed infrequently, on an interval of about once every 3 to 5 years.
- g. Do not thin or prune the tree canopy, as this will promote more understory shrub growth as well as lower parts of the tree, and will result in increased risk that fire will spread to the tree canopy.
- h. Sometimes small trees may need to be cut to the ground in order to achieve the separation of the ground level from the tree canopy, or because mowing equipment cannot avoid the small trees.
- i.



**FIGURE 18 TRIM BOTH VALLEY AND BLACK OAKS PER STANDARDS NORTH OF STRUCTURE; SUGGEST TRIMMING TO JOINTS**



**FIGURE 19 CLUMP OF COAST LIVE OAKS TO SOUTHWEST OF STRUCTURE SHOULD BE TRIMMED (FOR THE FIRST TIME) OF LOWER THIRD OF TOTAL HEIGHT OF TREE**

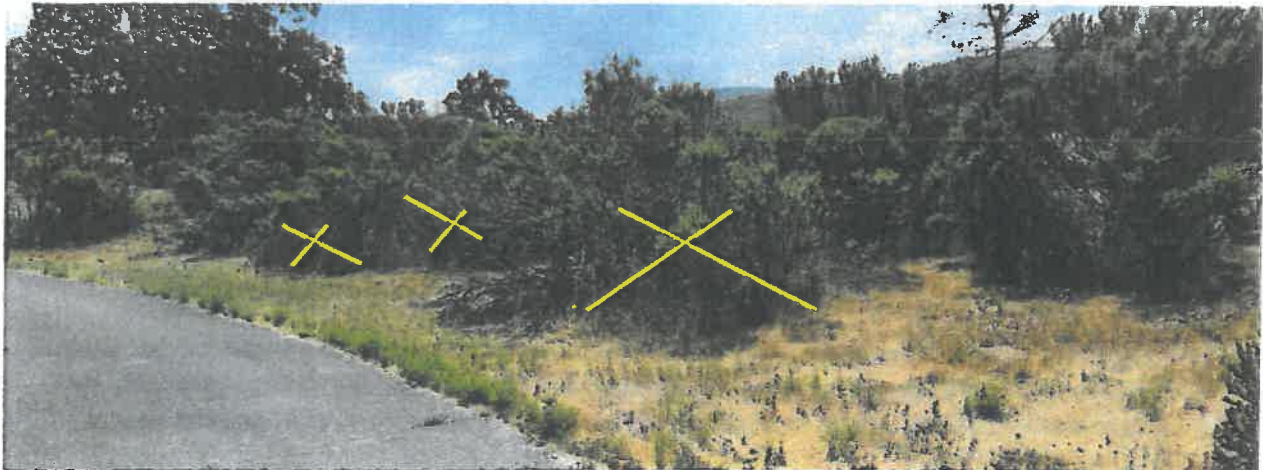
COASTAL SCRUB ZONE – TO A DISTANCE OF 150 FEET (EXCEPTION)

*All shrubs within coastal scrub must be thinned or mowed within **150** feet of structures.*

Like chaparral, coastal scrub is an important habitat type. Coastal scrub is comprised of a diverse mixture of native shrub species including coyote bush, native sage, blackberry, coffeeberry, and poison

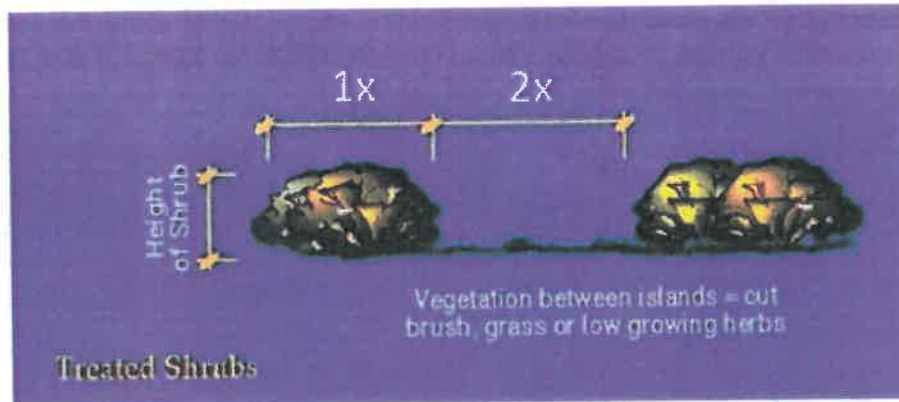


oak. Like most chaparral shrubs, shrub species growing within coastal scrub habitat will stump-sprout vigorously when mowed or burned, so coastal scrub zones will need to be retreated on a regular basis.



**FIGURE 20 EAST OF STRUCTURE, APPLY COASTAL SCRUB ZONE TREATMENT WITH AN EXCEPTION BEING TO NARROW THE WIDTH OF TREATMENT TO 150 FEET, NOT THE 200-FOOT STANDARD. THIS IS JUSTIFIED BECAUSE OF THE RELATIVELY FLAT TERRAIN AND GRASS FUELS NEAREST TO THE STRUCTURES. REMOVE COYOTE BUSH PLANTS THAT HAVE THE MOST DEAD MATERIAL TO REACH A GOAL OF 30% COVER OF COYOTE BUSH, 70% GRASS.**

- a. In open areas away from trees, within 200 feet of structures, change the pattern into discontinuous groups of shorter, younger, more succulent shrubs and ensure the distance between groups of shrubs is at least 2 times the height of the shrub patch (see Figure 20).
- b. In coyote brush dominated stands, if other shrub species are present, retain them at the expense of coyote brush. Retain less-flammable desirable shrubs, such as ceanothus, currant, coffee berry, current, native rose, and sticky monkey flower.
- c. It is not necessary to eliminate coyote brush within the fuel management zone. Instead, change the pattern into discontinuous groups of shorter, younger, more succulent shrubs. If native bunch grasses are present, consult with the Conservancy regarding restoring grassland conditions through permanent removal of encroaching brush species.
- d. Remove all dead branches from less-flammable desirable shrubs, such as ceanothus, currant, coffee berry, current, native rose, and sticky monkey flower.
- e. All healthy trees within the 200-foot Coastal Scrub Zone should be retained. As trees increase within the chaparral, they provide a long-term reduction in shrub cover and fire hazard.
- f. Trees growing within coastal scrub zones should be encouraged by removing shrubs from within an area around the tree as shown below (Figure 2, above):
  - When the tree is shorter than 6 feet high, all shrubs should be removed from within a distance of 3 feet from the tree's drip line.
  - When a tree is taller than 6 feet high, all shrubs should be removed from within a distance of 6 feet from tree crown edge.



**FIGURE 21 CREATE GROUPS OF SHRUB GROUPINGS TO PROVIDE HORIZONTAL SEPARATION BETWEEN SHRUBS. EACH GROUP OF SHRUBS SHOULD BE NO WIDER THAN 2 TIMES ITS HEIGHT, OR LESS THAN 120 SQUARE FEET IN AREA. THE SPACE BETWEEN SHRUB GROUPS SHOULD BE AT LEAST TWO TIMES THE HEIGHT OF THE SHRUBS, OR A DISTANCE OF 10 FEET, WHICHEVER IS GREATER.**

OAK-SHRUB WOODLAND ZONE – TO A DISTANCE OF 150 FEET

*Understory plants must be kept short, and small lower tree branches must be removed.*

The goal of the following treatment is to facilitate the conversion from a transitional woodland / shrubland vegetation type, into a more fire-safe oak woodland with an understory consisting of grass, herb or other low-growing fire resistant plants. Native understory shrubs are acceptable, if maintained to a maximum height of 2.5 feet, and if kept free of dead branches. Once the conversion has been made to a stable oak woodland, little vegetation treatment will be necessary other than the normal treatments for the Oak Woodland Zone. Woody non-native weeds such as French broom should be vigorously suppressed.

***Prescriptions for understory maintenance:***

- a. Understory vegetation should not be completely removed. Instead, selectively remove all French broom and flammable native species like coyote bush, and prune-back and remove dead branches from less-flammable desirable species such as coffee berry and wild rose.
- b. Within 30 feet of structures, at the end of each spring mow grass according to the Grassland Zone.
- c. Remove chamise, a highly flammable dense-growing native (*Adenostoma fasciculatum*), under tree canopies. Where chamise is found outside of tree canopies, mow chamise at ground level, or create shrub groupings, according the recommendations in the per the Coastal Scrub Zone. If other shrub species are present with the chamise, retain them at the expense of the chamise.

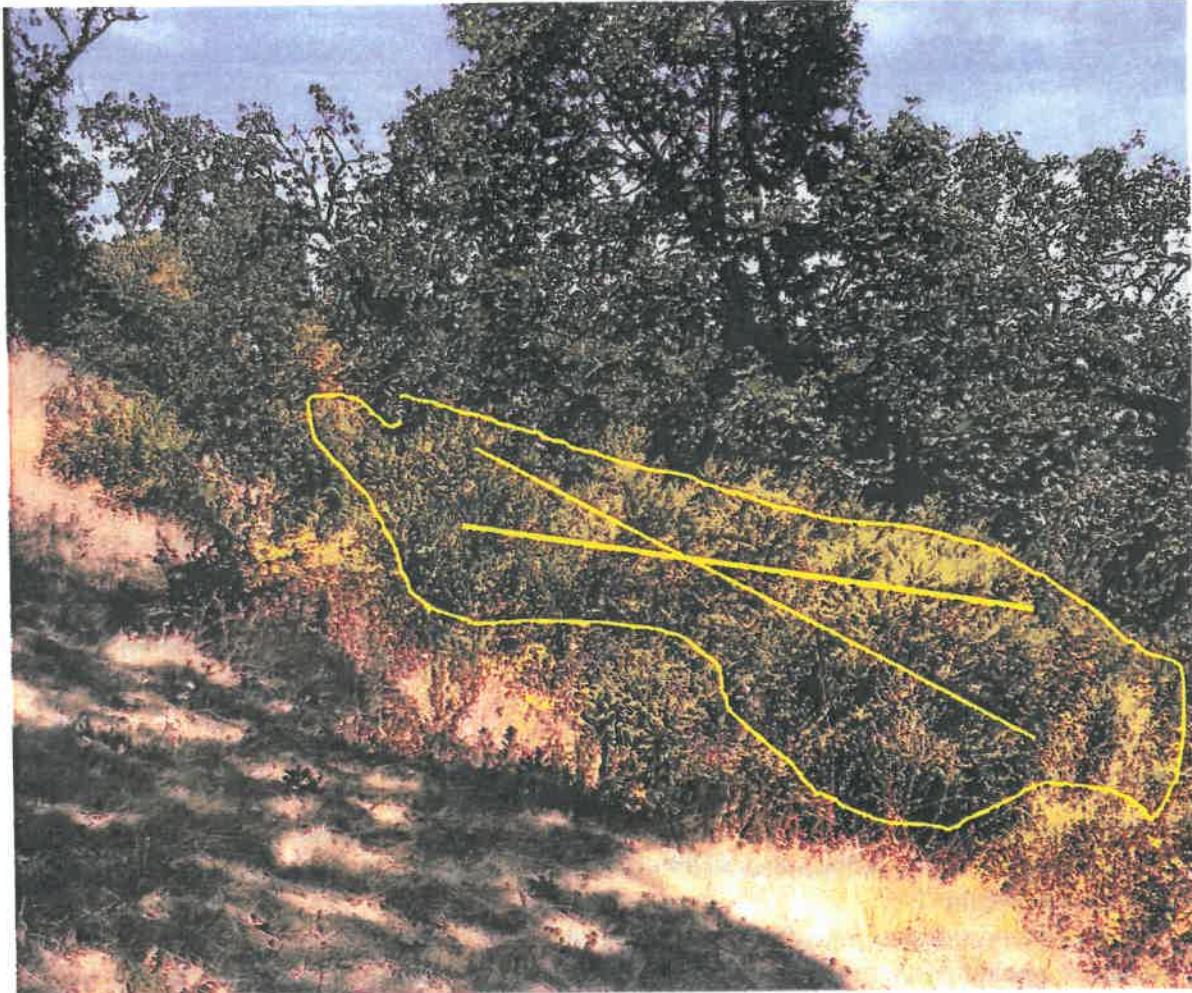


**FIGURE 22 REMOVE SHRUBS UNDER TREES AT THE EDGE OF THE OAK SAVANNA AND OAK SHRUB WOODLAND. PRUNE LOWER BRANCHES TO 8 FT OR THE LOWER THIRD OF THE TREE HEIGHT.**

***Prescriptions for tree pruning:***

- a. All branches, living or dead, less than 3 inches diameter in width and less than either 8 feet from the ground or three times the height of any understory shrubs whichever is greater, shall be removed (Figure 17).
- b. Living branches that are greater than 3 inches in diameter but lower than 8 feet in height can be retained, provided that the area within the drip-line of trees is maintained. Oaks with live limbs resting on the ground need not be removed, but all ground debris around and beneath the limbs must be removed to reduce fire risk.
- c. Dead limbs less than 8 feet in height shall be removed.
- d. In landscaped areas, healthy tree branches less than 3 inches in diameter or 8 inches diameter if split or diseased, should be removed to provide vertical clearance of 3 times the height of the understory plants, or 8 feet above understory plants, whichever is greater.
- e. For trees shorter than 24 inches in height, remove lower 1/3 of branches smaller than 3 inches in diameter, or alternatively, treat as a shrub grouping.
- f. Once initial pruning is accomplished, tree pruning is likely to be needed infrequently, on an interval of about once every 3 to 5 years.
- g. Do not thin or prune the tree canopy, as this will promote more understory shrub growth as well as lower parts of the tree, and will result in increased risk that fire will spread to the tree canopy.
- h. Sometimes small trees may need to be cut to the ground in order to achieve the separation of the ground level from the tree canopy, or because mowing equipment cannot avoid the small trees.



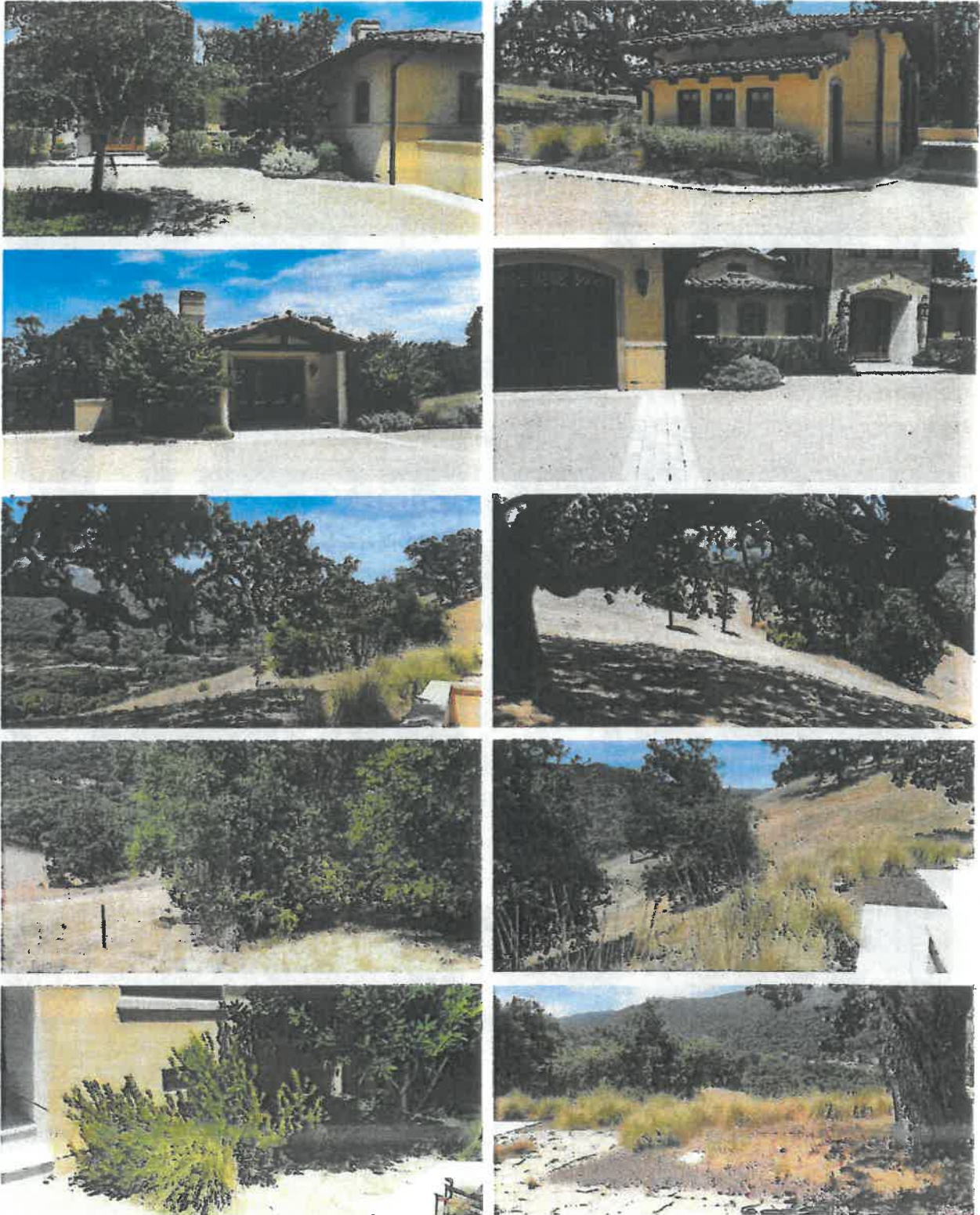


**FIGURE 23 APPLY OAK-SHRUB WOODLAND STANDARDS ON VEGETATION NORTHWEST OF STRUCTURE FOR 200-FT. REMOVE SHRUBS UNDER TREES ON A PERIODIC BASIS (EVERY 5 YEARS). WORK WITH ADJACENT NEIGHBOR TO OBTAIN AUTHORITY TO CONDUCT WORK OUTSIDE PROPERTY BOUNDARY.**

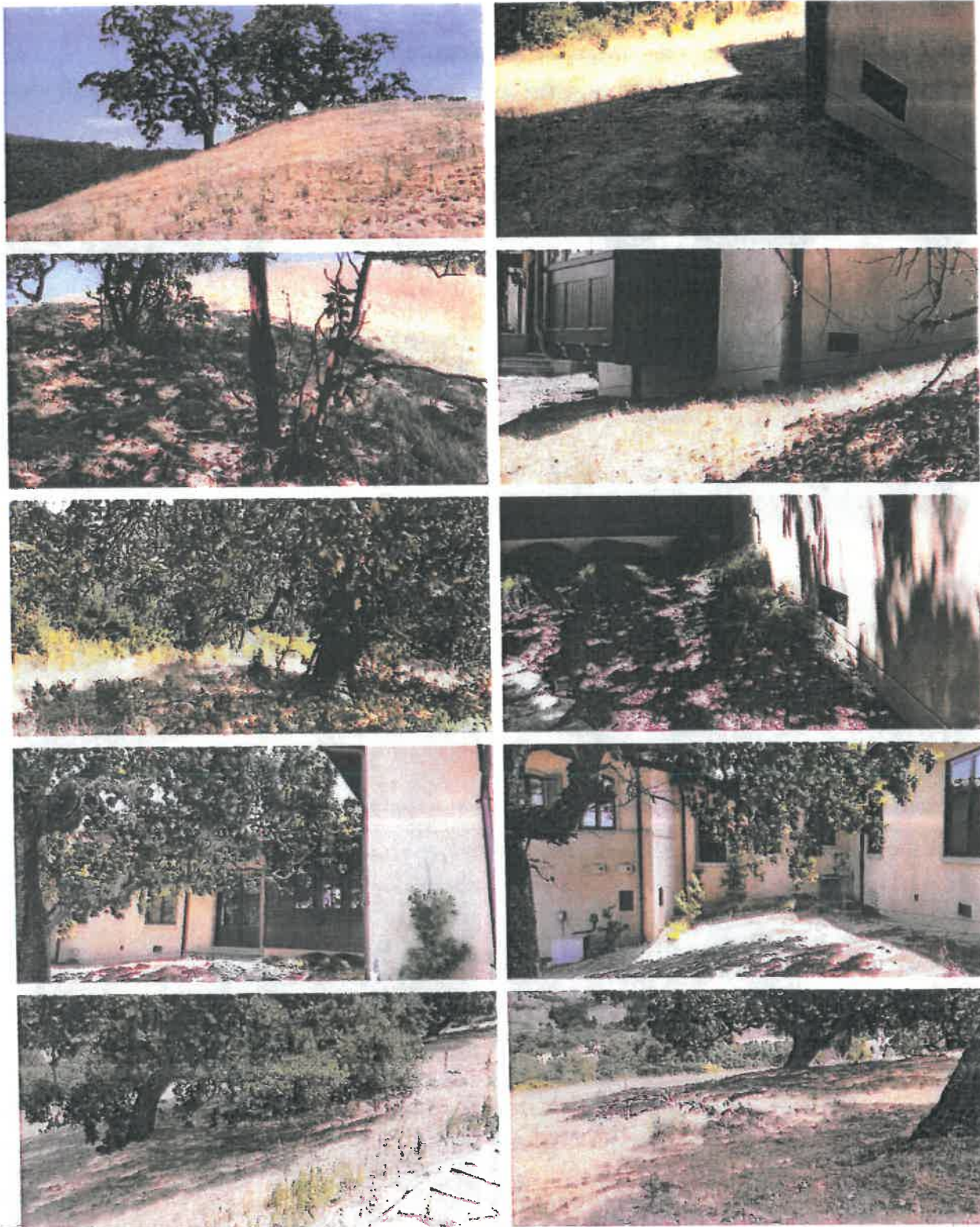


PHOTOS OF LOT XXX

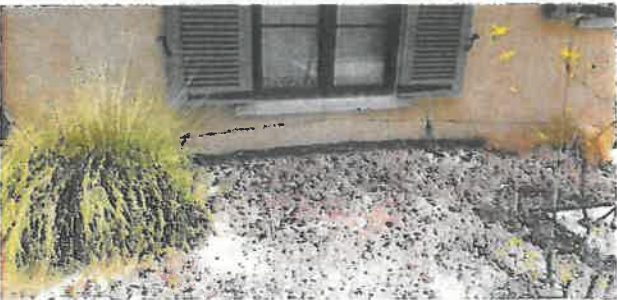
Other photos taken during site visit provided here as a record of conditions:













Example

## Friend or Foe?

Characteristics of a Selection of Common Landscape Plants

### Friend Characteristics

Botanical Name	Common Name	Form	Mature Size (height by width)	Low total volume	Form (restricts air flow)	Leaf (low surface to volume)	Little Dead Material	High moisture leaves/ stem	Mineral content
<i>Arbutus unedo</i>	strawberry tree	Shrub/ Small Tree	X-25' x equal spread			X	X		
<i>Arbutus menziesii</i>	Madroño-marina hybrid	Shrub/ Small Tree	4-8' x equal spread	X			X	X	
<i>Quercus agrifolia</i>	Coast live oak	Large Tree							
<i>Cercis occidentalis</i>	western redbud	Shrub/ Small Tree	10-25' x equal spread			X	X	X	X
<i>Feljoa sellowiana</i>	pineapple guava	Shrub	4-12' x equal spread			X	X	X	
<i>Ribes sanguineum</i>	flowering currant	Shrub	climbs to 20'	X			X	X	
<i>Rosa banksiae</i>	Lady Banks rose	Shrub	climbs to 20'	X			X	X	
<i>Agapanthus africanus</i>	lily of the Nile	Perennial	2' x 2'	X			X	X	
<i>Achillea</i>	yarrow	Perennial	4-5 x 1-2'	X			X	X	
<i>Diates bicolor</i>	fornight lily	Perennial	3-4' x equal	X			X	X	
<i>Centaurea cineraria</i>	dusty miller	Perennial	1-2' x equal	X			X	X	X
<i>Gazania hybrids</i>	gazania	Groundcover	6 inch x 2'	X			X	X	
<i>Passiflora alata</i>	passion vine	Vine	climbs to 20-30'		X		X	X	

### Foe Characteristics

Botanical Name	Common Name	Form	Mature Size (height by width)	High total volume	Form (optimum air flow)	Leaf (high surface to volume)	Lots of Dead Material	Low moisture leaves/ stem	High Oil content
<i>Eucalyptus calendulensis</i>	blue gum eucalyptus	Tree	150-200'	X	X	X	X	X	X
<i>Pinus radiata</i>	Moterey pine	Tree	80-100'	X	X	X	X	X	X
<i>Acacia melanoxylon</i>	black acacia	Tree	40' x 20'	X	X	X	X	X	
<i>Arctostaphylos manzanita</i>	manzanita	Shrub/ Small Tree	6-20' x 4-10'	X			X	X	
<i>Baccharis pillularis</i>	dwarf coyote brush	Shrub	X' by 9'	X	X	X	X	X	
'Pigeon Point'	hopsed bush	Shrub	12-15' x 6-8'	X	X	X	X	X	
<i>Dodonaea purpurea</i>	broom	Shrub	6-8' x 5-6'	X	X	X	X	X	
<i>Genista and Cytisus spp</i>	Juniper	Shrub/ ground cover	12"-15' x same	X	X	X	X	X	X
<i>Juniperus spp</i>	flax	Perennial	9-12' x 10'	X	X	X	X	X	
<i>Phormium tenax</i>	golden bamboo	Glant grass	6-20' x 4-6'	X	X	X	X	X	
<i>Bambusa aurea</i>	fountain grass	Glant grass	X-4' x 4-76'	X	X	X	X	X	
<i>Pennisetum</i>	Algerian Ivy	Ground cover	climbs	X	X	X	X	X	
<i>Hedra canariensis</i>	rosemary	Ground cover	2-6' x 4-8'	X	X	X	X	X	X
<i>Rosmarinus officinalis</i>									

