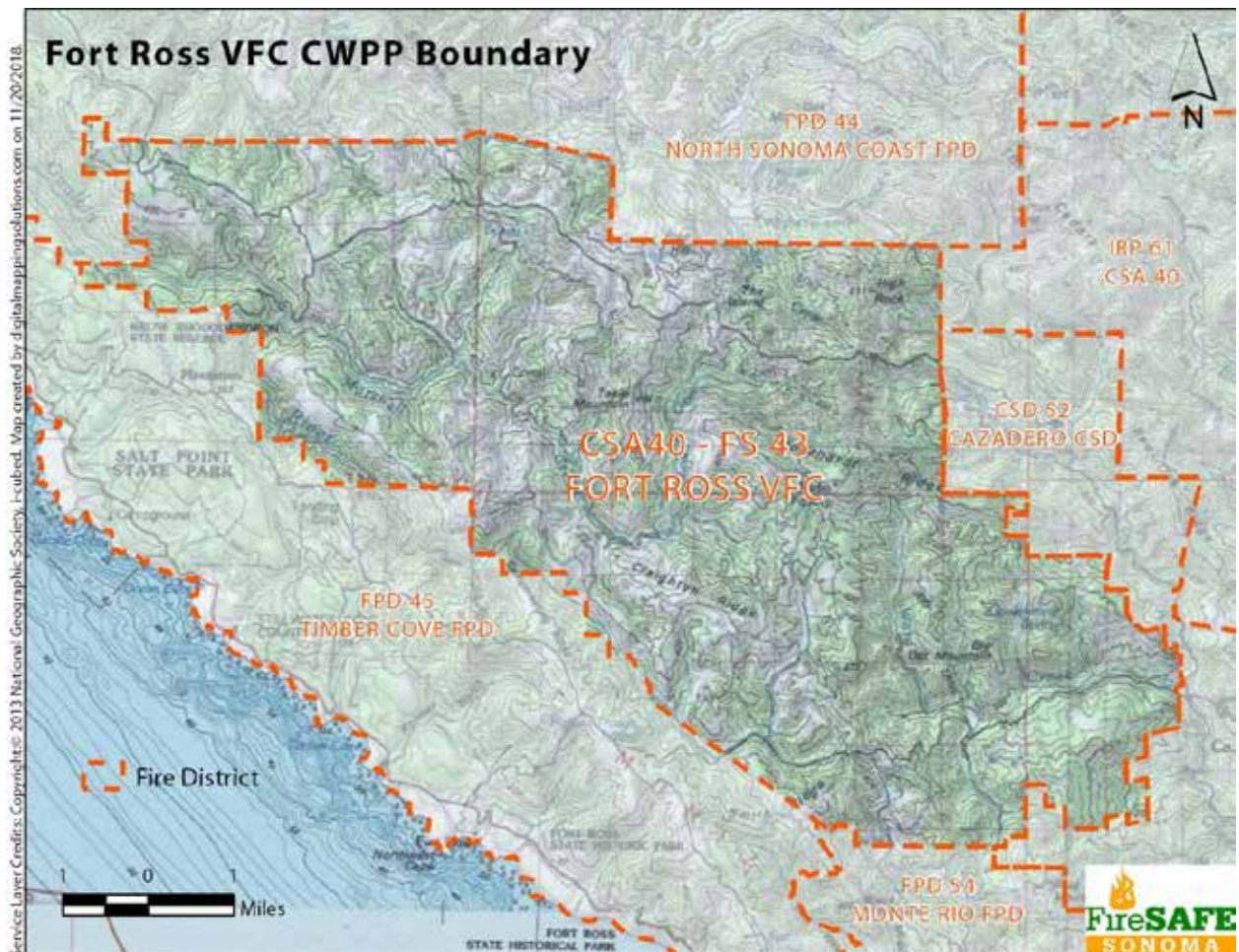


Fort Ross Fire Service Area Community Wildfire Protection Plan (CWPP)



March, 2019

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Disclaimer

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view(s) of any governmental agency, organization, corporation, or individual with which the authors may be affiliated.

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. This Community Wildfire Protection Plan (the Plan) is a work in progress. Various changes are anticipated throughout the Plan over the next several years.

Readers are urged to consult with their own agencies having jurisdiction regarding the use or implementation of this Plan, as well as their own legal counsel on matters of concern.

While the publisher and authors have used their best efforts in preparing this Plan, they make no representations or warranties with respect to the accuracy or completeness of the contents and specifically disclaim any implied warranties of merchantability or fitness for a particular purpose. No warranty may be created or extended by receiving this publication. The advice and strategies contained herein may not be suitable for your specific situation. The publisher, sponsors, and authors shall not be liable for any loss of profit or any other damages, including but not limited to, special incidental and/or consequential damages.

This Plan is not to be construed as indicative of project “activity” as defined under the “Community Guide to the California Environmental Quality Act, Chapter Three; Projects Subject to CEQA.” Because the Fort Ross Fire Service Area CWPP does not legally commit any public agency to a specific course of action or conduct, it is thus not a project subject to CEQA or NEPA.

However, if and once grant funding is received from state or federal agencies and prior to work performed pursuant to the CWPP, or prior to issuance of discretionary permits or other entitlements by any public agencies to which CEQA or NEPA may apply, the lead agency must consider whether the proposed activity is a project under CEQA or NEPA. If the lead agency makes a determination that the proposed activity is a project subject to CEQA or NEPA, the lead agency must perform environmental review pursuant to CEQA or NEPA.

Executive Summary

A Community Wildfire Protection Plan (CWPP), created by the federal Healthy Forests Restoration Act of 2003, has three requirements: 1) it is to be developed collaboratively with input from fire agencies and the community; 2) it is to identify and prioritize treatment areas and mitigation strategies and treatments; and 3) it is to recommend measures to reduce the ignitability of structures.

This CWPP provides a general overview and assessment of wildfire risks to the Fort Ross Fire Service Area community, using the federal CWPP requirements and the Sonoma County CWPP. Working with this information with fire agencies, landowners, and other interested community stakeholders, a set of priority project actions were developed to increase fire resiliency. These actions are intended to reduce the potential loss of human life, property, and natural and cultural resources due to wildfire. This CWPP will also help groups or agencies collaborate and seek funding for these wildfire risk reduction projects.

The boundary for this CWPP is the Fort Ross Fire Service Area, served by the Fort Ross Volunteer Fire Company (FRVFC). Risk for large, uncontrolled wildfire is significant here, and comes with risk of loss of life, homes, property, and environmental and community values. The community meetings and dialog that were integral to developing this CWPP were an excellent opportunity to raise awareness about wildfire issues and preparedness in the community and foster focused discussion about what we can do to reduce risks.

Community Profile

Land and Parcels: This is a 55-square mile Wildland Urban Intermix (WUI) community. There are 195 improved parcels and 278 unimproved parcels. Average parcel size of improved parcels is 74.29 acres and unimproved parcels is 74.51 acres. Virtually all of the land is privately held. The area is characterized by steep slopes and narrow valleys. Highest elevation is 2,322 feet, the lowest is 1,011 feet, and average elevation is 1,013 feet.

Fire Services: The area is served by the Fort Ross Volunteer Fire Company, with CAL FIRE having primary responsibility for firefighting operations for wildland fires. In addition to CAL FIRE, mutual aid for the area comes from three all-volunteer fire departments: Cazadero Community Service District, Timber Cove Fire Protect District, and North Coast Fire Protection District. All local volunteer fire agencies are experiencing difficulties in recruiting volunteers, especially younger members.

Homes in the area were largely built before WUI building codes, and many need to retrofit vulnerable elements to better resist wildfire ignition. Likewise, many property owners need to reduce vegetation near homes to comply with defensible space standards.

Residents: Approximate population is 417, with the majority of residents living on one of three 40-acre minimum subdivisions. Slightly over half of residents are full time. Like most of rural Sonoma County, the local population is aging; older people are at higher risk during any emergency, and many find it challenging to do the physical labor necessary to maintain vegetation near homes. While residents are generally aware of wildfire risks, there is concern about how much many individuals are truly prepared for a wildfire, making continuing outreach and education a priority.

Wildland fuels are characterized by a mixture of oak-grasslands, fir-dominant forest, with some redwood. Tanoak is a very common tree in the area, with some very dense stands, especially in areas impacted by the 1978 Creighton Ridge Fire. Tanoak has been greatly impacted by mortality from Sudden Oak Death, and surface and aerial fuel build up is a significant concern. Thousands of pines and other conifers were planted subsequent to the 1978 Creighton Ridge Fire and forty years later add considerable fuel density in some areas. There has been little large-scale fuels reduction in the area since the 1978 fire, and fuels buildup is a significant concern for all local residents and first responders.

Weather: The area is characterized by significant winter rainfall, with totals of 60-80 inches common. Summers, however, are hot and dry. With an average elevation of more than 1,000 feet, the area is generally above the fog (which in lower elevations can beneficially raise fuel moisture and cool temperatures). Typically, there is little or no rainfall from late spring until late fall.

Fire History: Since the 1950s, there have been 22 fires (average acreage 2,184 acres) in the direct project area and in neighboring jurisdictions. The last major fire within the project area was the 10,761-acre Creighton Ridge Fire in 1978.

Fire Hazard Severity Zone (FHSZ): "A measure of the likelihood of an area burning and how it burns," CAL FIRE's Fire Resource Assessment Program (FRAP) identifies the following FHSZs:

FHSZ	Acres	Percent
Moderate	1345.25	3.85%
High	32,847.83	94.10%
Very High	715.35	2.05%
Total Acres	34,908.43	

Access/Egress: The area is served by five paved roads, with the vast majority of homes accessed from private, long, narrow, dirt access roads. Both the primary roads and the secondary roads will present life safety risks in the event of evacuation, and will make firefighter access challenging. There is significant overgrown vegetation on roadsides, especially on the private roads.

Emergency Notifications and Communications: Increasingly, local residents are abandoning landline phones for cellular service, despite the fact that cellular service in the area is by and large unavailable except through the internet. This may make emergency notification problematic. The **Fort Ross Emergency Preparedness Committee** is actively engaged in forming neighborhood communications groups, but emergency notification remains a concern.

Assets at Risk: In priority order, Lives, Property, and the Environment. Any large wildfire will pose significant risk to all three priority assets. Economic losses will be devastating to the local community. Agricultural enterprises including vineyards, wineries, and cattle and sheep ranches are also at risk.

Risk Reduction Priorities

Our project priorities were organized into three primary hazard categories: Life Safety, Vegetation Management, and the Built Environment. Projects were suggested by community members and address risks in all three categories. Strategies include education and community outreach, fuels management, structural hardening, improving signage and road infrastructure issues, and robust risk analysis and planning. Projects can be seen in the Project Priority List (Appendix B), which will be periodically updated in the future to reflect progress and changing priorities.

Conclusion

The intensity and devastation of the October 2017 fires was a wake-up call for this community. The CWPP sets the foundation for actionable projects which will help the community plan and prepare for wildfires and other emergencies, and make the homes and landscapes more resilient. The goal of these projects is to protect life, property, and the cultural and natural resources of the watersheds.

CWPP Planning Group Members

The following Fire Agency Personnel have been integral to the CWPP:

- **Fort Ross Volunteer Fire Company:** Chief Steve Ginesi
- **CAL FIRE:** Division Prevention Chief Ben Nicholls, Battalion Chief Marshall Turbeville
- **Sonoma County Fire:** Fire Marshal James Williams
- **Fire Safe Sonoma:** Roberta MacIntyre, President; Caerleon Safford, Executive Coordinator

The following Community Groups have been integral to the CWPP:

- **Coast Ridge Community Forest:** Judy Rosales, Executive Director
- **Fort Ross Community Disaster Preparedness Group:** Gayle Alexander
- **Homeowners Associations and Community Groups:** Gualala Ranch HOA, Navarro Ranch HOA, Seaview Ranch Road Association
- The **Coastal Hills Community Project (CHCP)** distributed meeting notices and community outreach information to the vast majority of residents

In addition, **many community members** have participated in planning meetings and contributed local knowledge and resources

This project was one of three CWPPs made possible by a CAL FIRE SRA Prevention Grant. We sincerely thank CAL FIRE for the project and their invaluable contributions to this project.



Photo 1: Northeast from Creighton Ridge



Photo 2: CWPP Community Meeting, December 2, 2018, at Padmasambhava Peace Institute (aka Black Mountain Preserve)

Mutual Agreement Page
Fort Ross Community Wildfire Protection Plan

The Fort Ross Fire Service Area Community Wildfire Protection Plan was developed in accordance with the guidelines set forth by the Healthy Forests Restoration Act.

This Community Wildfire Protection Plan:

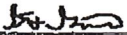
1. Was collaboratively developed. Interested parties in the region of this CWPP have been consulted.
2. Identifies and prioritizes areas for hazardous fuels reduction treatments and recommends the types and methods of treatment to reduce the wildfire threat to values at risk in the area.
3. Recommends measures to reduce the ignitability of structures throughout the area addressed by the plan.

The following representatives of the entities required for CWPP approval mutually agree with and approve the contents of this Community Wildfire Protection Plan:



Lynda Hopkins
Supervisor, Sonoma County District 5

3/15/19
Date



Steve Ginesi (Mar 12, 2019)

Steve Ginesi
Chief, Fort Ross Volunteer Fire Department

03/12/19

Date



Shana Jones (Mar 13, 2019)

Shana Jones
Unit Chief, CAL FIRE Sonoma-Lake-Napa

03/13/19

Date



James Williams (Mar 13, 2019)

James Williams
Assistant Chief, Sonoma County Fire Prevention

03/13/19

Date

Roberta MacIntyre

Roberta MacIntyre
President, Fire Safe Sonoma

3/12/19

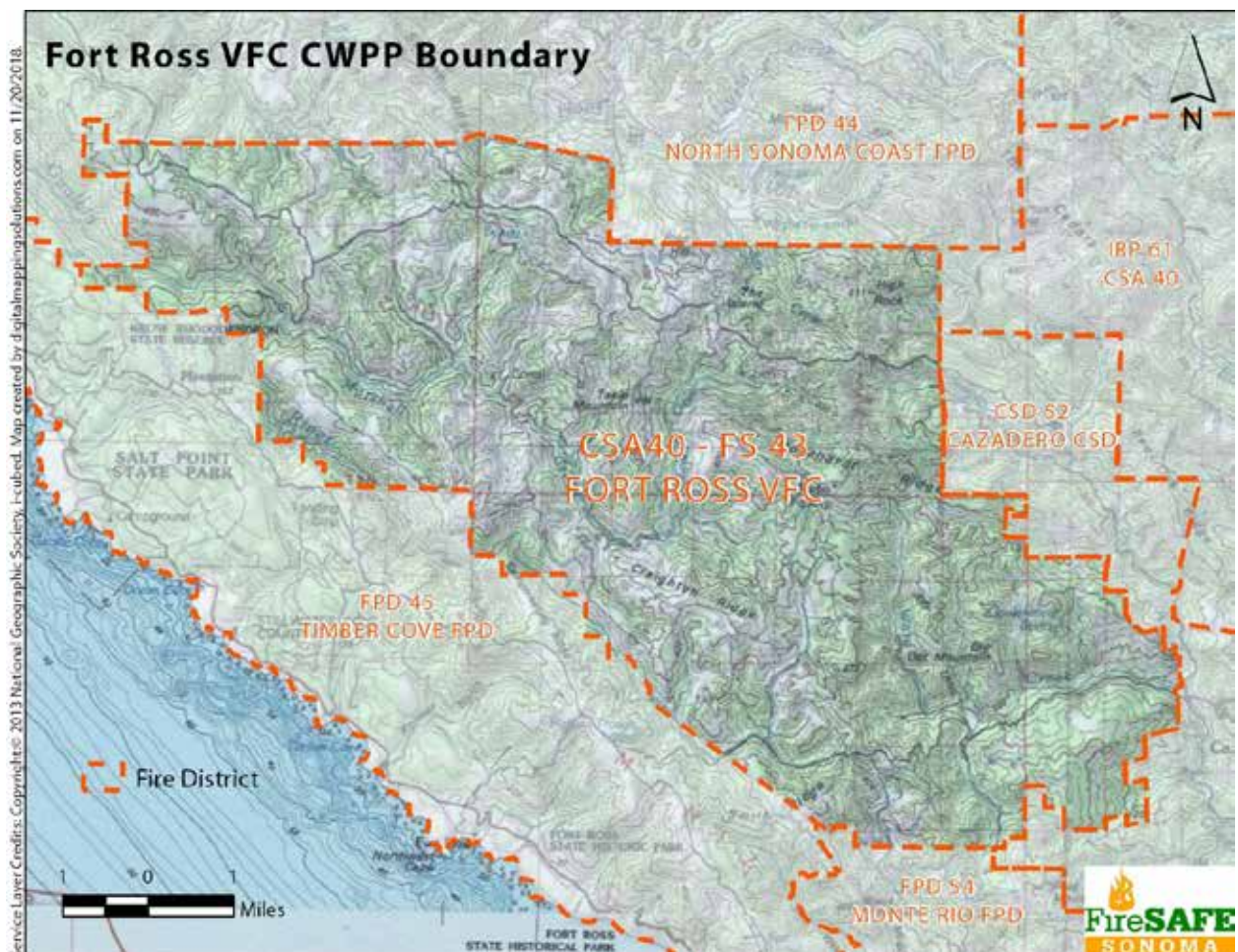
Date

Fort Ross Fire Service Area

Community Wildfire Protection Plan

Location and Community Boundaries

The boundaries of this Community Wildfire Protection Plan (CWPP) are formed by the Fort Ross Fire Service Area, served by the Fort Ross Volunteer Fire Company (FRVFC). Located in northwest Sonoma County, the area comprises the areas accessed by Fort Ross Road and King Ridge Road, with a small percentage of the area accessed by Hauser Bridge Road. The area can be accessed from the east on Cazadero Highway, and on the west from State Highway One. The project area does not extend to the shores of the Pacific Ocean, but is entirely in the Coast Ridges that parallel the ocean. The highest elevation is 2,322 feet; the lowest is 1,011 feet, average elevation 1,013.

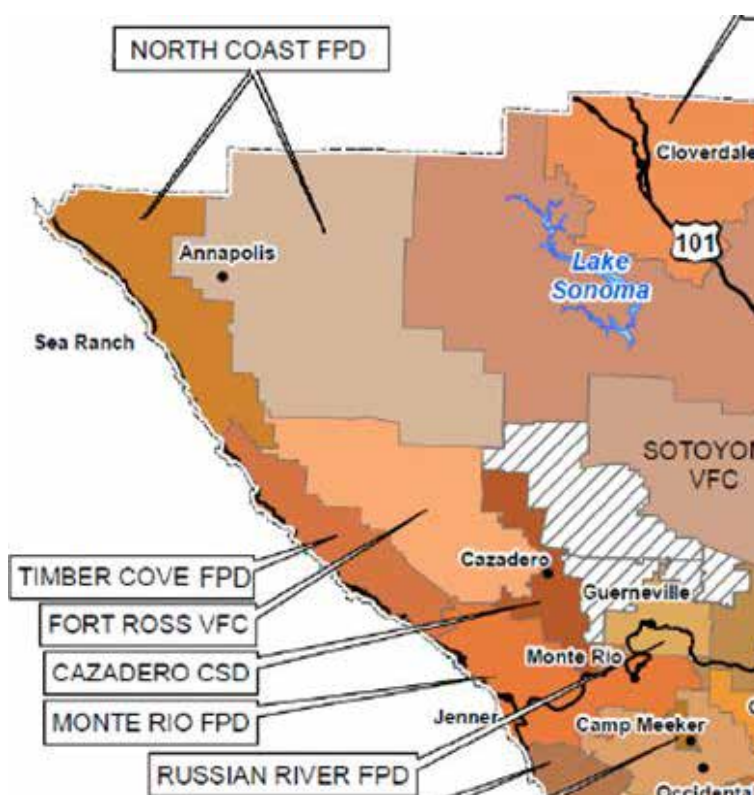


Map 1: Fort Ross VFC Fire Service Area and CWPP Project Area. See larger map in Appendix C.

Fire Department Service Areas

At the time of writing (fall–winter 2018-19), the Fort Ross Volunteer Fire Company serves the project area for all emergency response including medical aid, fires, hazardous materials, and community emergencies large and small. While the VFC is often first at scene at fires in the area, since this is a State Responsibility Area (SRA), CAL FIRE has primary responsibility for command and firefighting operations for wildland fires and fires that pose a threat of spreading into the wildland. CAL FIRE assumes command and responsibility for wildland fires as soon as they arrive at scene. Additionally, CAL FIRE has automatic aid agreements and designated Mutual Threat Zones within Sonoma County. These agreements provide for services, including responses to structure and wildland fires, traffic accidents, rescues and medical aids.

Several neighboring volunteer fire departments provide mutual or automatic aid to incidents within the Fort Ross Fire Service area. Timber Cove Fire Protection District is located on the western border, and Cazadero Community Service District is on the east, North Sonoma Coast Fire Protection District to the north, and Monte Rio Fire Protection District to the south. All of these fire districts are staffed by volunteers. Neighboring departments send responders into the area for any calls—medical, fire or emergency—that require additional resources. Likewise, Fort Ross VFC will respond to calls in neighboring districts, automatically in the event of fire, or upon request of the incident commander.



Map 2: Fort Ross VFC Fire Service Area and surrounding Fire Districts and Community Service Areas

At the time of writing, there are considerable changes taking place in fire department organization across the county. The Fort Ross VFC, long a part of Sonoma County Fire and Emergency Services, will soon be absorbed into Cazadero and Timber Cove Fire Departments. This is part of a county-wide attempt to consolidate services and reduce the number of small fire departments so that services can be administered more efficiently, while maintaining a high level of service to the public.

Volunteer fire departments are facing significant challenges to attract enough volunteers. The communities are aging, a demographic reflected in local VFC volunteers. Many residents work outside of the area and are unavailable to respond to calls during the day. Funding adequate to purchase and maintain fire apparatus, communications equipment, firefighter supplies, etc. is a constant challenge.

While our local volunteers continue to do an outstanding job, there are significant concerns about how well volunteers will continue to be able to serve our communities into the future. Being a volunteer requires a significant time commitment. Training standards keep increasing the number of hours required for volunteers to stay active. Call volume is increasing every year, adding to the stress and time commitment. More and more, people buying property in the area do not plan to live here full time, and are not likely to be able to volunteer. These issues will continue to be problematic into the future.

Parcel Data

Fort Ross Fire Service Area CWPP PARCEL DATA*	
TOTAL ACRES:	35,200
TOTAL NUMBER of PARCELS	473
Parcels with structures ("Improved")	
Total number improved	195
Average size of improved parcels	74.79 acres
Number of improved parcels more than 30 acres	174 (88%)
Average size of improved parcels more than 30 acres	82.50
Average size improved parcels less than 30 acres	12.12 acres
Number of structures	729
Vacant parcels (without structures, "Unimproved")	
Total number	278
Average size of vacant parcels	74.51
Approximate Population**	417
<i>*Based on Sonoma County Assessor's data</i>	
<i>** Based on 2.4 people per parcel with structures</i>	

Table 1: Fort Ross Fire Service Area parcel information

Land Ownership

Virtually all of the land within the project area is privately held, with the exception of 17 parcels owned by the County of Sonoma and one parcel owned by the State of California. Primary land uses are residential, vineyards, cannabis cultivation, and ranching.

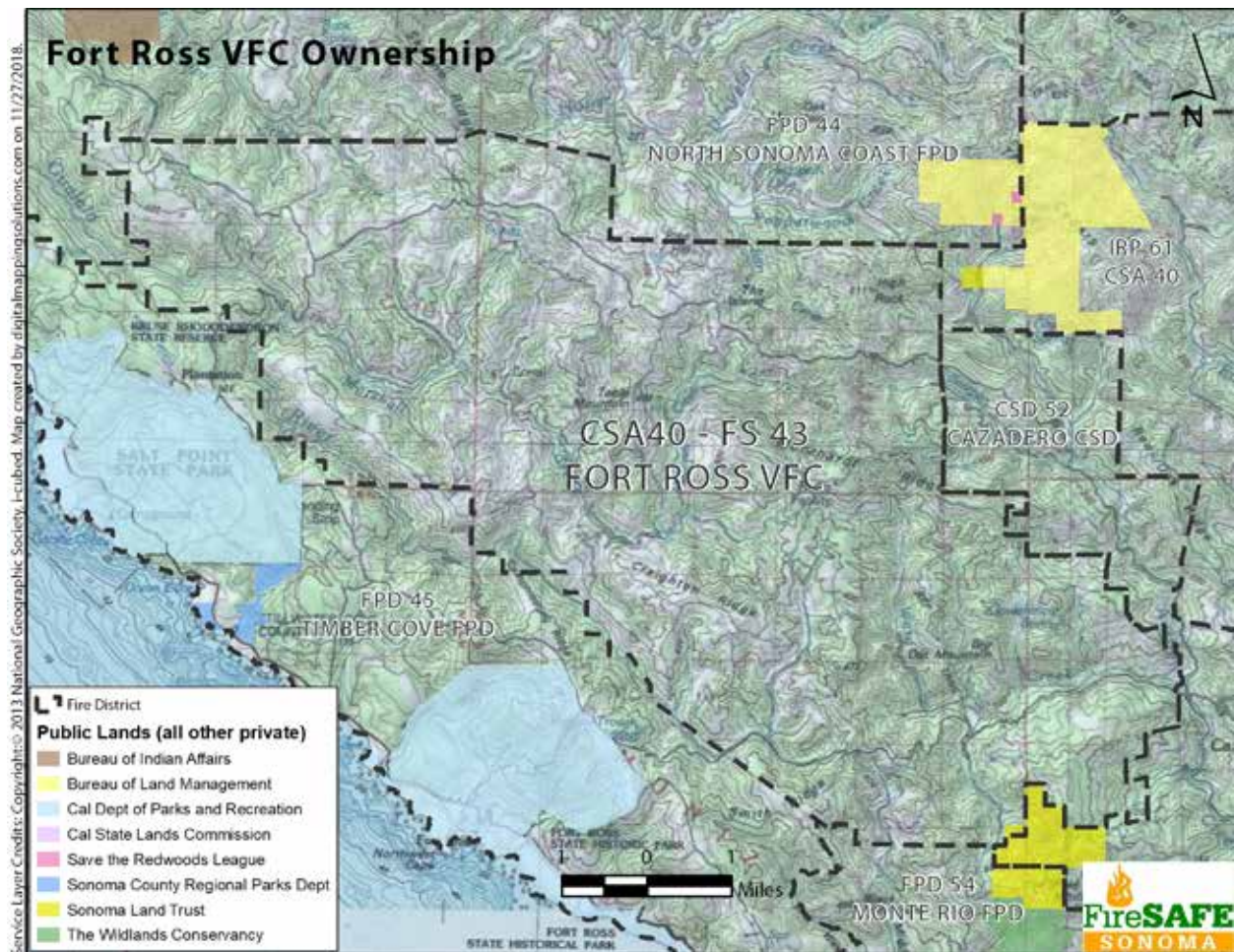
There are three residential subdivisions (40-acre minimum parcel size), which are where the majority of the population resides. Two subdivisions, Navarro Ranch and Gualala Ranch, have active Homeowners Associations (HOA) with Community Covenants and Restrictions (CC&Rs). Seaview Ranch does not have a HOA or CC&Rs, but does have a road association to coordinate road maintenance. These three subdivisions were developed in the late 1960s and early 1970s, as baby boomers looked for means to get “back to the land.” Though there are some commercial vineyards and olive orchards within in the subdivisions, the majority of parcels are residential.

CC&Rs provide for vegetation management within a 30-foot easement, and Gualala Ranch does annual mowing and trimming along common roadways. Most residents do not have the resources to maintain their 40-acre forested parcels, so fuels have built up in these areas. The Coast Ridge Community Forest group has been actively connecting landowners with resources for forest management, but there is significant need for home hardening, defensible space, and wildland fuels management throughout the subdivisions.

Marijuana cultivation, both permitted and non-permitted, seems to be increasing across the area, and causing some concern due to increased traffic on narrow roads, water use, possible environmental concerns, and fire danger due to equipment and newcomers who may not have sufficient awareness of fire risks.

Outside of the subdivisions, there are scattered parcels in individual ownership, primarily residential or vineyards, and several large ranches of several hundred acres. Ranchers in the area have a combination of cattle, sheep, and grapes.

Homes in the area are spread out across the landscape, with the vast majority located on the dirt roads that cross the area. Evacuation will be first complicated by the distance that people must travel to reach one of three paved access roads that lead out of the area. However, even the paved roads are very narrow, with no or minimal shoulders, and limited pullouts. In a fast moving fire this will present significant risks for incoming fire apparatus and evacuating residents. Maintaining roadside clearance on both privately and publicly maintained roads is of critical importance.



Map 3: Land Ownership: See larger map in Appendix C

Demographics

- The population in the project area is aging, which is also true in rural areas throughout the county. The aging population is a significant concern from a life safety perspective because of the high percentage of older people who died in recent fire events.
- Primarily English speaking, with some Spanish-speaking residents.
- Population in the area is estimated at 417, with some seasonal fluctuation due to agricultural labor and part time residents, who may spend more time here during the summer months.
- Income varies greatly across the project area. Those with higher income are typically more capable of taking care of vegetation and structural retrofit than those on limited or fixed incomes.

Number of Homes

- Approximately 174
- Full Time/Part Time Residents: Just over half of the parcels with homes on them have full-time residents.
- Visitors:

- King Ridge and Fort Ross roads have become very popular roads for bicycles. On most summer weekends local residents share the narrow roads with bicyclists, with the largest impact from large-scale bicycle events that route through the area. These events, which can bring thousands of bicyclists within a span of five hours, can cause roadway congestion and response delays.
- Padmasambhava Peace Institute (PPI), also known as Black Mountain Preserve, hosts a variety of workshops and events throughout the year, each of which can bring 50 or more participants. PPI generously hosts Fort Ross VFC Station 4 on the property.

Community Organizations

- **Fort Ross Volunteer Fire Company**
- **Navarro Ranch Association HOA, Gualala Ranch Association HOA**
 - Both HOAs hold regular meetings and have CC&Rs
- **Seaview Ranch:** No formal association, no CC&Rs
- **Coast Ridge Community Forest:** The Coast Ridge Community Forest is made up of residents of the Coastal Hills of western Sonoma County. The community first came together in 1978 to restore lands after the Creighton Ridge fire. In 2009, the Coast Ridge Community Forest was formed to work collaboratively across community boundaries to address forest health in an era of climate change.
- **Fort Ross Emergency Preparedness Committee “Neighborhood Pods”:** Loosely based on CERT/COPE, the Fort Ross VFC and local residents created an emergency preparedness system several years ago. “Pods” of three to six households form one foundation for the community’s disaster preparedness, although different neighborhoods vary greatly in their participation rates. Whether it’s fire, earthquake, or an intense storm, being in an active Pod means shared mutual assistance. Each Pod is committed to being highly alert during Red Flag Days as well as winter’s heavy rains with the risks of flooding and landslides. The Pods also form the basic unit for an emergency phone tree. The phone tree is used to notify residents about fires, evacuation, or other emergency information. Many in the community have scanners and some residents are ham radio operators who help to receive and pass on vital information.
- **Internet/E-mail alerts:** Black Mountain Communications, a local internet service provider, blasts timely email updates, called AlertUs, on all local emergencies. Coastal Hills Community Project (CHCP) is a community-wide email listserve which is widely subscribed to for information about all local events, as well as emergency info. CHCP carries the AlertUs emergency notifications from Black Mountain Communications.
- **Aging in Place:** Formed to help local elders stay in their homes safely, the group meets monthly to address issues such as emergency preparedness, help for those who need it, and to provide information about how to stay safe in a rural environment.

Wildland Urban Intermix (WUI) Condition

The Fort Ross Fire Service Area is designated as a Wildland Urban Intermix, or WUI. This plan uses the term Wildland Urban Intermix as defined in the Federal Register (66:751, 2001) report on WUI communities at risk from fire (USDA & USDI, 2001) as follows:

*The **Intermix** Community exists where structures are scattered throughout a wildland area. There is no clear line of demarcation, wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres. Fire protection districts funded by various taxing authorities normally provide life and property fire protection and may also have wildland fire protection responsibilities. An alternative definition of intermix community emphasizes a population density of between 28-250 people per square mile.*

Climate

Sonoma County is characterized by a Mediterranean climate, with a rainy, cool season typically lasting from November through April and dry, warm conditions the rest of the year. Strong northeasterly winds are common in the late summer and fall months and pose the greatest wildfire risks. The October 2017 Sonoma Complex Fires took place during severe northeast wind conditions.

Climate conditions are changing around the globe. Based on USGS data, between 1911 and 2000, average maximum temperatures in the North Bay Region (Sonoma, Marin, and Napa Counties) had already increased approximately 1.0°F while average minimum temperatures have increased approximately 1.7°F ([Climate Change in the North Bay](#), North Bay Climate Adaptation Initiative [NBCAI], 2013).

Localized climate projections suggest that climate is likely to become increasingly arid with shorter winters and longer, hotter, drier summers. Rainfall is predicted to come in more intense rain events, rather than spread out over the wet season. Winter rainfall in the Fort Ross Fire Service Area averages 60 to 80 inches, among the highest in California.

Sonoma County and California in general experienced severe drought between 2011 and 2015. The 2013-14 water-year was the third driest for the state in 119 years (NOAA 2016). Regional climate predictions differ in terms of trends in overall precipitation. However, most models predict that weather will be more variable, with drought and floods becoming more common and more intense. If, as predicted, rain comes in shorter and more intense events, drought stress on soils and plants is expected to increase even in years of heavier rainfall. NBCAI's estimates that measures of drought stress on soils in late summer will increase 11-22% in the North Bay by the end of the century. Climate change will pose increasing challenges to natural

systems as water becomes scarcer and flooding, fire, and plant diseases become more common. This could have a dramatic effect on fire fuels in our forested areas.

The following monthly temperature data are taken from the Oak Ridge Remote Automatic Weather Station, located just north of the CWPP area, at similar elevation. While the area is characterized by multiple microclimates, this data is very similar to our area.

	Mean Wind Speed	Mean Wind Direction	Maximum Wind Gust	Average Air Temperature					Average Relative Humidity			Precipitat ion
Date	mph	Deg	mph	Deg F					%			in
mm/yyyy	Ave.	Vector Ave.	Max.	Ave.	Ave. Daily Max.	Max.	Ave. Daily Min.	Min.	Ave.	Max.	Min.	Total
Sep-16	7.207	333.3	36	68.49	79	93	60.17	44	45.38	100	9	0
Oct-16	8.333	199.9	49	56.81	63.55	85	51.39	44	76.17	100	8	8.86
Nov-16	6.368	210.2	45	52.76	58.7	74	47.9	39	77.66	100	28	6.88
Dec-16	8.132	346.1	52	46.44	52.16	68	41.23	31	67.83	100	8	7.5
Jan-17	8.079	181.8	76	45.2	51.03	67	40.77	31	77.98	100	7	18.75
Feb-17	10.48	191.3	69	47.67	53.5	69	43.54	31	72.79	100	0	17.5
Mar-17	7.302	299.6	47	51.92	59.32	75	46.03	33	47.6	100	0	5.56
Apr-17	8.063	294.1	56	51.38	60.17	79	44.23	35	68.5	100	3	5.21
May-17	7.091	322.7	39	60.01	70	85	51	39	59.61	100	18	0.21
Jun-17	7.774	329.5	35	66.43	78.7	98	55.9	42	55.99	100	17	0.5
Jul-17	6.215	325.9	35	73.55	84.84	99	63.48	48	40.34	99	6	0
Aug-17	5.074	323.4	26	73.82	82.84	98	65.26	52	44.32	100	5	0
Sep-17	6.638	326.6	33	69.41	78.8	107	61.4	45	47.42	100	7	0.19
Oct-17	6.3	341.4	35	65.05	74.55	91	57.45	43	38	100	8	0.7
Nov-17	6.831	194	51	51.55	57.3	71	46.8	37	78.94	100	7	7.54
Dec-17	5.148	27.34	36	54.59	60.81	75	49.32	35	42.34	100	4	0.34
Jan-18	6.621	152.8	39	51.01	56.16	71	46.29	36	75.1	100	4	9.47
Feb-18	7.144	340.3	36	51.1	59.14	77	44.25	28	49.91	100	9	1.07
Mar-18	7.098	182.5	46	48.94	55.58	76	43.39	32	72.06	100	3	7.19
Apr-18	6.538	305.8	37	52.21	60.47	77	44.9	35	68.08	100	6	6.44
May-18	6.68	317.8	32	56.49	67.16	89	47.58	41	70.29	100	17	0.27
Jun-18	8.143	329.4	35	66.23	79.9	94	53.97	44	50.05	100	12	0.01
Jul-18	6.11	325.1	28	73.43	83.97	100	64.55	46	42.04	99	12	0
Aug-18	6.03	318.2	30	69.03	79.29	95	60.35	47	51.94	100	8	0.03
Sep-18	6.885	332.4	30	67.07	78.43	88	58.43	48	46.55	100	9	0.33
Oct-18	5.75	351.2	29	62.21	70.45	80	55.58	45	54.55	99	8	1.66
Nov-18	6.138	110.9	43	59.75	65.96	81	54.5	45	39.31	100	3	4.66

Table 2: Weather Data for September 2016 to November 2018

The Built Environment

Homes should be thought of as one of the most critical fuel components. Although we naturally worry about the dense vegetation that surrounds us, houses and outbuildings are themselves fuel, and are highly susceptible to ignition from embers, direct flame contact from nearby fuels, or radiant heat from burning vegetation or nearby structures. Most homes in the area were built before Wildland Urban Interface building codes took effect, and most have vulnerable elements (such as old or non-Class A rated roofs, attic or foundation vents that allow for ember intrusion, wooden decks and attachments, and siding) that will increase potential for ignition.

Intensive education and outreach will help residents understand the importance of retrofitting vulnerable elements for increased ignition resistance, as well as the necessity of clearing any dry vegetation on and near their buildings.

Additionally, many homes do not have defensible space adequate for this high-risk area. The good news is that the typical large parcel size means that most residents *do* have sufficient space to create the required 100 feet of defensible space, and are not vulnerable to house-to-house ignitions that have characterized recent Northern California wildfires. The bad news is that many residents, for a variety of reasons including physical ability, age, cost, and lack of awareness, don't maintain adequate defensible space.

It is critically important that homeowners take the initiative both to create and maintain adequate defensible space and to harden their homes against wildfire ignition. Please see Appendix D, *Creating Wildfire Adapted Homes and Landscapes*, for specific guidelines about home hardening and defensible space.

Homeowners Insurance: While many local property owners do have insurance, there are a significant number of properties which are not insured. Insurance costs in this area are typically very high, increasingly so following recent wildfires. For many local residents, obtaining coverage is cost prohibitive. Consequently, the next big fire is likely to have catastrophic economic effects. This should serve as additional motivation for residents to undertake the effort and cost to mitigate those factors within their control (home hardening and defensible space).

Access / Egress and Evacuation

Any serious fire in the area will be greatly complicated by narrow roads, limited access, and confusing or missing signage. These components pose significant risks to life safety for both evacuating residents and incoming firefighters in the event of a large uncontrolled wildfire. In addition, slow response times from incoming emergency services can be expected. Some of these factors (such as road layout) don't have easy solutions, but it is extremely important to work on the elements that *can* be mitigated (roadside vegetation, clear signage, safer bridges, locked gates) to make the entire community better prepared to survive wildfire. Ongoing efforts to increase community-wide planning for wildfire and other emergencies have helped, although past participation and buy-in has been limited. But the 2017 and 2018 fires have greatly increased awareness and a sense of urgency. Continued and sustained emergency planning activities and increased community involvement will increase life safety for all.

Road Infrastructure: The area is served primarily by five county-maintained paved roads: Fort Ross Road, Bohan-Dillon Road, King Ridge Road, Hauser Bridge Road, and Tin Barn Road. Each of these roads is narrow (in some places single lane), has steep slopes, few turn-arounds and

pull-outs, limited visibility due to plentiful blind curves, and significant roadside vegetation. Most houses are accessed by a series of privately maintained secondary dirt roads, which are one-way-in-one-way-out. Here too, these secondary roads are extremely narrow with limited turn-arounds and pull-outs, steep grades, and blind curves.

Bridges: Dozens of wooden bridges were destroyed by the 2017 Sonoma Complex Fire, leaving residents cut off for evacuation, rescue, or suppression efforts. Additionally, because of safety concerns, many first responders will not cross unrated bridges with heavy fire apparatus. In this area there are numerous non-conforming bridges on secondary roads and driveways. Residents need to consider the risks and mitigation strategies for unrated bridges.

Vegetation: Residents need to maintain vegetation clearance on their access roads and driveways so that they can be safely used during any emergency incident.

Signage: While many local roads have been signed, many more remained un-signed. Even more homes do not have house numbers clearly identified. It is urgently necessary to clearly mark street names and address numbers with reflective metal signs.

This issue is complicated by problems with addressing in the area as a whole. A great many addresses here are based off the nearest paved access roads, yet most homes are located on a network of named dirt roads far from the pavement. This issue makes it difficult for first responders to know exactly where any particular incident is taking place. For example, an emergency call for an incident on Bohan-Dillon Road may be as much as 30 minutes and four roads away from the assessor's address. While local firefighters have diligently worked to associate and map parcel addresses, there are still gaps in the data. Firefighters from outside of the area can be expected to experience considerable difficulties in navigating the area as a whole or finding specific addresses.

It is crucial that local residents, both individually and in neighborhood groups, work together for comprehensive and complete signage for all houses and roads. 80% of Fire Company calls are for medical emergencies, wherein seconds can count. It is in residents' best interest that first responders can easily find them in an emergency—not only in fires, but for medical crises.

Gates: The Fort Ross VFC has made locks available to many landowners, but there are still many gates that do not provide easy access for emergency services. Owners of properties with gated roads need outreach and incentives to replace existing locks with fire department locks or KnoxBox access locks. Residents with locked gates can contact the FRVFC to get a lock free or by donation.

Emergency Notification and Alerts

Landline and Cellular Phone Communications: The local landline phone system has been owned and operated by a variety of vendors over the years (currently Frontier). As is true in many rural areas, the total number of phones is low, so providing landline services to the area is not economically viable for the provider. Consequently, maintenance of the lines has been a continuing issue over the years, with frequent phone outages and problems, some of which have lasted for multiple days or weeks. Phone outages are a significant concern for emergency services providers; residents cannot use the phone to access 911, and likewise mass emergency alerts cannot be delivered to residents.

Power outages in an emergency are a problem for the many people who use a cordless phone. One important safety tip is to keep a corded (non-wireless) landline phone on hand. They will work regardless of power outages.

Cell phone service is very limited in the area, with most phones viable only from high elevations. Despite the lack of service, many local residents have opted to not have a landline, and use cell boosters or internet for cell phone coverage. This leaves residents vulnerable when the internet goes down, or cell towers lose power. Additionally, while landline phone numbers are automatically uploaded into Sonoma County's emergency alert service, [SoCoAlert](#), cell phones numbers must be added into the system by the resident. We encourage readers to follow the link above to register their phones!

Emergency notifications in the event of a fast-moving wildfire are a significant concern. This concern is magnified by issues caused by limited road infrastructure for evacuation. Recent incidents in Northern California have exposed vulnerabilities in how emergency alerts are delivered to residents. Additionally, wildfires are now moving so fast that there can be very limited time to launch notifications or allow for residents to safely evacuate.

Alternative alerting systems, such as developing a local mass phone and email alerts, are being considered. However, ultimately, all such systems will rely on functional phone and internet systems. Since any event is likely to quickly damage infrastructure, the likelihood of being able to contact local residents is not great. Local residents are encouraged to become licensed ham radio operators, and many have.

There are sirens located in two locations, but complex topography in the Fort Ross Fire Service Area limits how many people can hear these sirens, and residents have to know what sirens mean. Additionally, their use may cause additional risks because sirens cannot be directed so that evacuations proceed in a manner that considers areas at highest risk nor takes into account traffic flow on narrow roads. In a fast-moving wildfire, notification is anticipated to be a significant and life threatening problem.

One thing that can help is for residents to buy scanners that will allow them to listen to fire service traffic. It takes practice to be able to understand scanner traffic, so it is helpful to listen frequently.

Fire Environment

Wildland fire risk factors in Sonoma County include dense fuels buildup within and near residential areas, steep topography, fire history, and dry windy fall weather, as well as limited egress and access roads. This potential for disaster turned into reality October 8 through October 31, 2017, when the Tubbs, Nuns, and Pocket fires, and several smaller fires, together known as the Sonoma Complex Fire, burned 110,000 acres in Sonoma County, destroyed nearly 7,000 structures and claimed 24 lives. During the Sonoma Complex more than 100,000 residents were evacuated and 950 fire departments aided in response. The tragic loss of life and homes, and subsequent harm to the Sonoma County economy, will continue to impact the area for decades. This event clearly indicates the potential for large, uncontrollable fires.

Notably, the Sonoma Complex Fire's ranking as the most destructive fire in California history stood for only one year, when the Camp Fire in Butte County in November 2018 far eclipsed those catastrophic losses. Recent wildfire incidents in California and across the west indicate that fires are becoming larger and more intense, destroying more homes, and causing more life loss. Looking at fire behavior in previous decades likely underestimates how fires will burn here in the future.

Wildfire behavior is based on three primary factors: topography, weather, and fuel. The three elements are called the "fire triangle." Ultimately, fire behavior is directly related to the severity of conditions of each of these three factors on any given day. If there is only one leg of the fire triangle present—say the fire starts on a steep slope where it can make a rapid uphill run, but the weather is not hot, dry, or windy and fuels are moderate—firefighters should have a good chance to stop the fire. Worst case scenario is when all three elements of the fire triangle are present, e.g., a fire starts on a steep slope on a hot, dry, windy day, in heavy dry fuel. These are the conditions in which there is the potential for fire behavior that will be very difficult or impossible for firefighters to contain.

The Fort Ross Fire Service Area is vulnerable to all three elements. The topography is steep. High annual rainfall not only encourages dense vegetation growth area-wide, it also means that the landscape is characterized by drainages that flow during winter rains. During the dry season, fire can use these drainages, known by firefighters as "chimneys," to make rapid runs upslope. We should think of fire behavior as opposite to how water flows: fire goes fast uphill, using the same topographic features that water uses to flow downhill.

Despite being near the Pacific Ocean, daily temperatures during fire season are high, often with low relative humidity. With an average elevation of 1,011, much of the area is above coastal fog, and does not experience the nighttime cooling common at lower elevations. Likewise, while temperatures along the coast are typically well below 80° during most of the fire season, our temperatures often run 10 to 30 degrees higher: average daytime high is 76°. Onshore winds are common as the cooler air along the coast is drawn inland by hotter temperatures there. Seasonal northeast wind events (also known as Diablo or Santa Ana Winds), are common during summer and fall, and represent the greatest increased risk of uncontrollable wildfire.

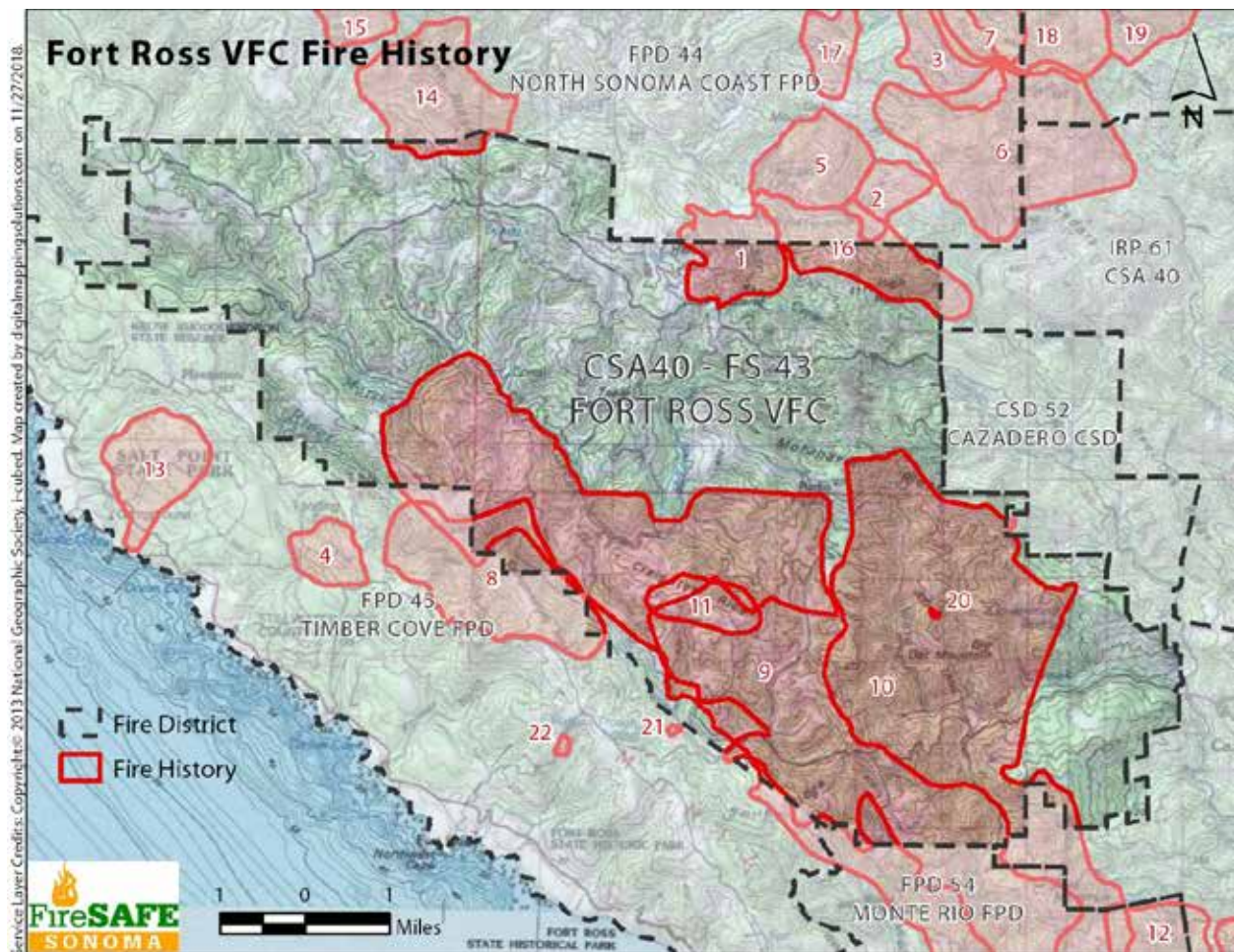
In general, the Fort Ross Fire Service Area is a vastly different fire environment than even 10 years ago. Since fire suppression has largely been successful over the past decades vegetation is thick. Tree mortality, especially Sudden Oak Death, has left a legacy of dead and dying trees. No large-scale fuels treatment has been accomplished since the Creighton Ridge Fire in 1978, and regrowth tends to be dense. Additionally, subsequent to the Creighton Ridge Fire, thousands of conifers were planted across the area. There is been little or no maintenance of those pine plantations, so today they represent a significant additional hazard in many areas. Finally, there are more homes spread across the landscape, many with inadequate defensible space and vulnerable construction. As we move toward a future characterized by more and higher intensity fires, it is increasingly important for homeowners to take responsibility for their homes and property.

Fire History

Northwestern Sonoma County and the Fort Ross Fire Service Area has experienced numerous large fires. Most notably, the 1978 Creighton Ridge Fire burned 10,761 acres and 64 homes and buildings. Started by a spark from a lawn mower, the fire burned for four days in hot windy conditions before weather conditions changed and firefighters were able to control the fire.

Within this area, the three most common causes of wildland fires are equipment use (such as mowers), vehicle fires spreading into wildland fuels near roadways, and electrical transmission.

Prior to the 1978 Creighton Ridge fire, several fires burned in the steep terrain and heavy fuels (see Map 4 and its key). It can be expected that fire will return to the landscape in the future. Fire intensity, size, rate of spread, and loss of homes and life have been increasing exponentially in California in recent years. We should assume that, if a fire starts on a day with high winds, low relative humidity, and high temperatures, fire behavior will be much more intense than in the past with much higher potential for significant loss of lives, homes, and natural resources.



Map 4: Fort Ross Fire Service Area Fire History: Larger Map in Appendix C.

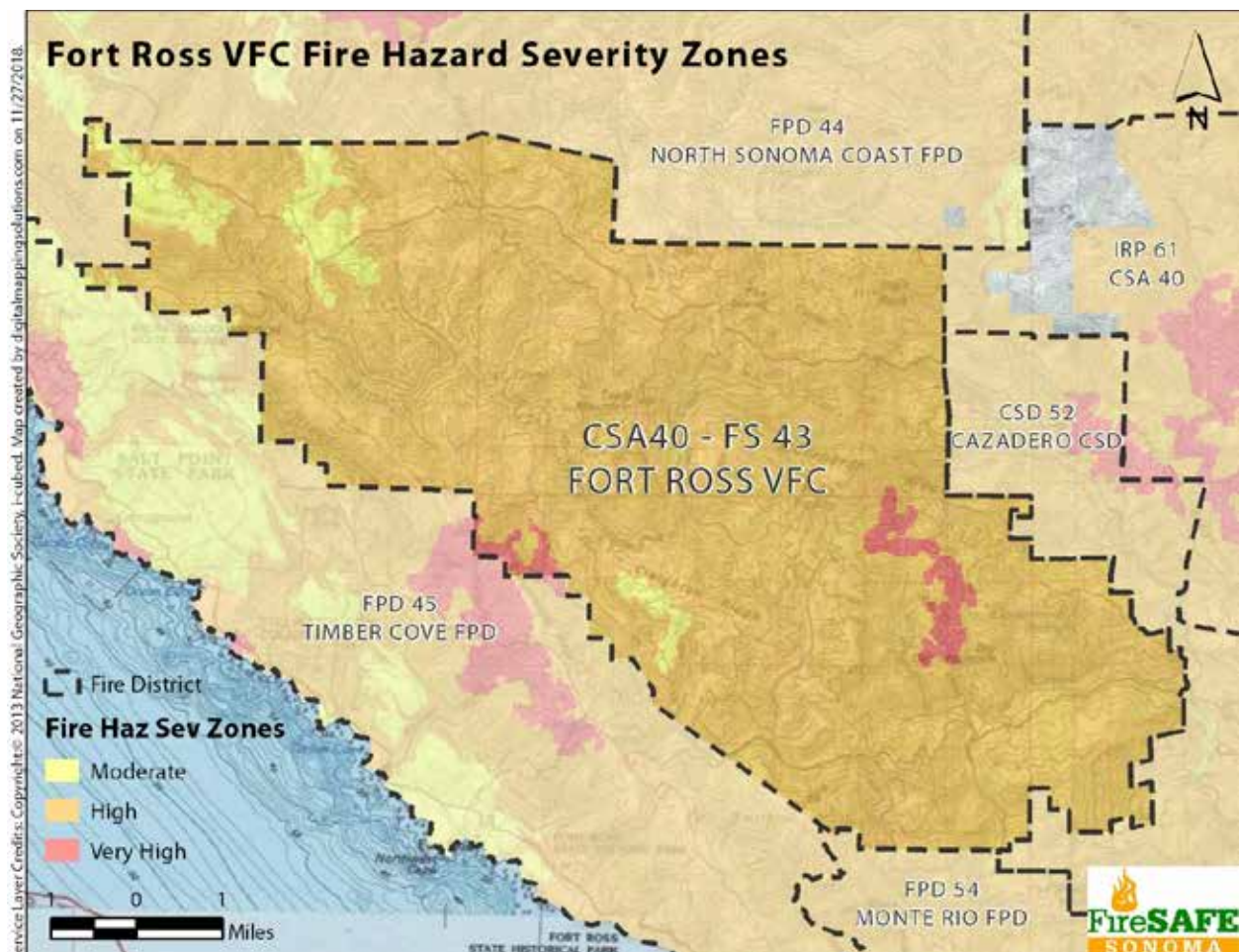
ID	YEAR	ALARM DATE	FIRE NAME	GIS ACRES
1	1952	9/1/1952	HEDGPETH	675.84
2	1959	11/25/1959	V. RICHARDSON	332.32
3	1959	6/23/1959	HOLLOW TREE	2,051.29
4	1957			324.49
5	1973			718.87
6	1960			2,374.87
7	1960		LAS LOMAS	1,827.95
8	1953		CHARLES	1,785.54
9	1954	7/28/1954	CHARLES	10,590.50
10	1978	8/9/1978	CREIGHTON RIDGE	10,761.30
11	1954			399.05
12	1965	9/17/1965	P.G.&E. #6	7,225.61
13	1993		GERSTLE	766.05
14	1960			1,199.45
15	1959			2,898.36
16	1945			1,042.82
17	1943			321.28
18	1948			1,045.85
19	1945			1,670.89
20	2008	6/17/2008	NIESTRATH BlueJay	3.16

21	2013	9/25/2013	BOHAN	7.91
22	2017	10/7/2017	FORT	18.28

Fire Hazard Severity Zone: The Fort Ross CWPP project area is in CAL FIRE's Fire Resource Assessment Program (FRAP). FRAP defines Fire Hazard "as a measure of the likelihood of an area burning and how it burns (intensity, speed and embers produced)." The following table lists the percentages of Fire Hazard Severity Zones (FHSZ) within the Fort Ross Fire Service Area.

FHSZ	Acres	Percent
Moderate	1345.25	3.85%
High	32,847.83	94.10%
Very High	715.35	2.05%
Total Acres	34,908.43	

Table 3: Fire Hazard Severity Zones for Fort Ross Fire Service Area



Map 5: Fire Hazard Severity Zones. See Appendix C for larger map.

Vegetation

Wildfire is a natural part of California's ecology. For more than 10,000 years, Native American tribes used low intensity fire for a variety of reasons, including increasing food production and making harvest easier. Native people used fire very frequently; fire history studies conducted at Jackson Demonstration State Forest and in Annapolis State Park concluded that fire return intervals in redwood and redwood/Douglas-fir forest types ranged from 6 to 20 years. Fire use in oak-grasslands is estimated to have been even more frequent, with most areas burning every 5 years. Fire was used so often and for so long that it has become a necessary component of many of California's ecosystems and essential to their health and regeneration.

For millennia, innumerable low-intensity fires served beneficial purposes, including reducing fuel loads by removing small diameter trees and brush. Fire created a mosaic of different vegetation types and fuel structure, and created large gaps between vegetation that reduced the movement of fire across the landscape. Frequent fire had an evolutionary impact on forested stands by naturally retaining the trees that were more resilient to fire. Fire reduced competition among vegetation for water, sunlight, and nutrients, which reduced stress on individual trees and created forests that were more resilient to forest pathogens.

Early European explorers were often rhapsodic in their praise of the open and abundant landscapes they saw, but did not realize the role of conscious use of fire in creating and maintaining these landscapes. With the arrival of European settlers, disruption in Native lifeways and prohibition of Native burning greatly decreased beneficial fires in the landscape.

Logging of the redwoods began as early as the 1850s. Extensive logging of the remaining old growth redwood and Douglas-fir, as well as much of the second growth timber, took place in the mid-20th Century. This modified the size and spacing of trees within western Sonoma County to be much smaller, and less fire resilient.

Since that time, little has been done to manage the forests in much of the area, and fires have been largely excluded from the landscape, with the exception of large, damaging fires such as the 1978 Creighton Ridge Fire. Today, forests are far denser with many more trees per acre and greater buildup of dead wood on the forest floors than would have been true when frequent, low-intensity fires were common. This means that when fires do burn, they burn with greater intensity, get much larger, and can cause irreversible damage to wildland ecosystems. At the same time, the population in the area has steadily grown; the probability that a fire will occur increases with population, along with life safety risk.

Approximately 15 individual landowners, and the Gualala Ranch Association have used California Forest Improvement Program (CFIP) funds to create forest management plans and some implementation. A few landowners in other parts of the Fort Ross Fire Service Area have done similar treatments, but the vast majority of acreage remains untreated.

Tree Mortality

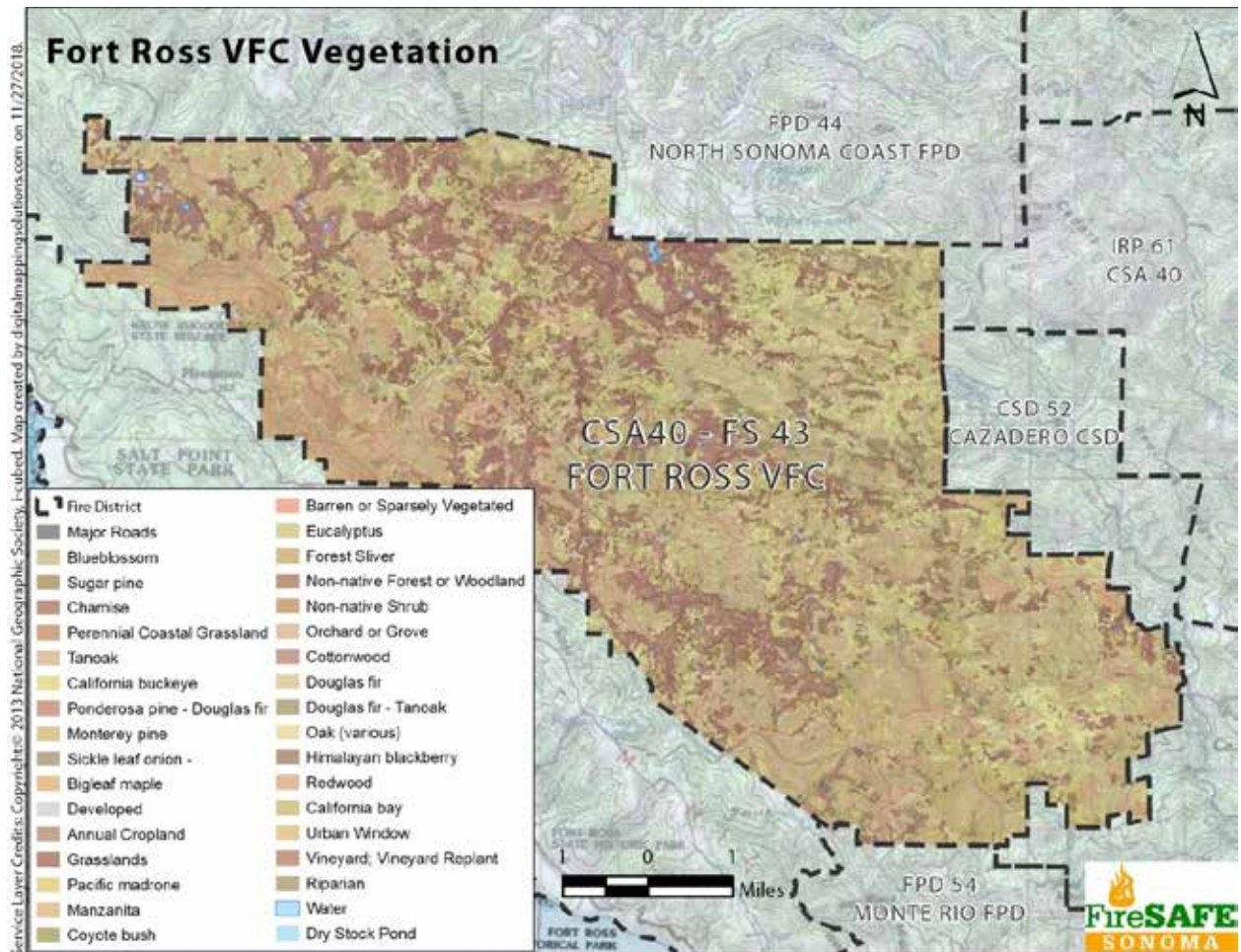
Northwest Sonoma County has been devastated by the tree disease Sudden Oak Death (SOD), caused by the plant pathogen *Phytophthora ramorum*. First discovered in Marin County in 1995, *P. ramorum* was introduced to California by infected nursery stock. Since its discovery, it has steadily moved north along the coastal regions of California, into Oregon and Washington. It has since been identified in the Southeast US, and around the world. In 2007, Sonoma County had the highest rate of new infection in the state. County-wide there are hundreds of thousands of SOD killed trees, especially tanoak, live oak, and black oak, on more than 75,000 acres; these dead trees greatly increase fire fuels and pose falling risks year round.

Northwest Sonoma County has been particularly hard hit for three primary reasons. *P. ramorum* thrives in the cool, wet climates which typify our winters. California Bay Laurel, which grows throughout our forested areas, acts as breeding grounds for inoculum, which may then be spread through wind-driven rain, flowing water, plant material, or human activity. In our area tanoak, which is especially vulnerable to SOD, is a dominant species. Tanoak mortality varies from patchy to nearly total in heavily impacted areas. SOD has continued to kill trees in the area since first identified over two decades ago. Large numbers of dead trees will cause operational complications for firefighters, severely impact egress and evacuation, increase fire behavior, and cause life safety risks. Therefore, removal of dead trees is a high priority. Unfortunately, little can be done to reduce the spread of SOD. For more information about SOD, visit www.suddenoakdeath.org.

SOD kills the above-ground growth of trees, leaving the roots alive. Unfortunately, this means that even if a dead tree is removed, it will sprout a significant amount of brushy growth from the stump, creating a low brushy fuel. Herbicides have been used to kill the tree, but there is significant opposition to herbicide use in the area. Stump grinding or removal of the root ball can help, but adds cost.

The area is also experiencing an increase in conifer mortality from various beetles, and pathogens like pine pitch canker. Lack of fire in the area has resulted in stands that are uniformly old, and are currently dying in large numbers. The proportion of dead fuels in the landscape is increasing annually at an alarming rate.

We can expect tree mortality to continue to get worse in the foreseeable future. Removal of dead and dying trees is a critical need, especially near roads and homes. Removal can be an enormous economic hardship. Grant funds can help, but challenges remain, such as difficulty of obtaining contractors to do the work, and maintenance of treated areas post-treatment. Outreach to affected property owners and collaboratively seeking solutions is a continuing need.



Map 5: Vegetation Communities. See larger map in Appendix

Wildland Fuels: Decades of fire suppression, in combination with conversion of managed forest and grazing lands to residential use and climate change, have had dramatic effects on virtually all of Sonoma County's ecosystems, leaving a legacy of dense vegetation with a high proportion of dead materials and brushy fuels that will increase fire behavior and fire spread. This is certainly true in this project area, where vegetative fuels have been increasing for decades. Projects that will help increase forest health and habitat while reducing available fuel are critically important. Wildland fuels need to be thinned and maintained to create healthier forests and landscapes that are better adapted to our fire prone environment.

While projects that increase forest health on a landscape scale are important, highest priority fuels treatments should be those which will help save lives and property. Reducing flammable vegetation within 100 feet of homes and on roadsides is critically important. It is also essential to educate residents about how to create "wildfire adapted" homes and defensible space, and provide assistance that will help them reduce risks of economic and life loss.

Vegetation Treatment Options

As noted, the Fort Ross Fire Service Area has a huge variety of native vegetation communities: redwood, Douglas fir, bay, madrone, tanoak, oaks, grasslands, and chaparral intermingle in a shifting mosaic with composition influenced by slope, aspect, and moisture availability. Here are some available options for thinning and management:

Mechanical: Using large machines like masticators, grinders, and chippers, trees are taken down and chipped on site. Chips can be disposed of by broadcasting, or removed off site for disposal or reuse (firewood, chips for cogeneration, finished wood products, etc.). Mechanical treatment can only be used when roads allow access to the site. Costs for mechanical means of treatment per acre vary considerably, and the cost of treatment will increase along with fuel loading, steepness, and difficulty of access to terrain. Disruption to sensitive natural resources must be considered when using mechanical means.

Manual Labor/Hand Tools: Chainsaws and other tools are used to cut trees and brush, either lopping and scattering, chipping debris in place, or burning in piles. Per acre cost for hand work varies considerably, and the cost of treatment will increase along with fuel density, difficulty of access, and steepness of terrain.

California Department of Corrections and Rehabilitation inmate crews, who do a lot of fuels mitigation work in communities across California, cannot work in much of the western half of Sonoma County because of the amount of time it takes for them to commute from their home camps. Additionally, inmate crews do not work on private property unless part of a Fire Safe coordinated project.

Grazing: Properly managed, grazing of domestic livestock such as sheep, goats, and cattle can be an efficient and cost effective means to control grasses and brush, and can greatly benefit soil health and the ecosystem. Grazing animals can browse noxious plants such as poison oak that are difficult to manage, and greatly reduce fuels on slopes too steep for easy maintenance. The local Community Forest group is exploring the potential for developing sustainable models for reintroduction of grazing across the area.

Prescribed Fire: The local ecology is fire-adapted, meaning that native plant species evolved with fire as an integral and regularly occurring component of ecosystem health. Prescribed fire is one of the best and most cost-efficient means of fuel reduction. Prescribed fire is the intentional use of fire to help control dry fuel build up, and control vegetation density by removing small diameter trees and brush. By reintroducing fire into this fire-adapted environment, we improve the health of local ecosystems. However, needless to say, it does come with inherent risks and complications. Anyone planning a prescribed burn must have all necessary permits and permissions, and ensure that there are sufficient qualified individuals on hand to support burn activities. In areas where there is significant fuels build up, prescribed burns cannot be attempted until mechanical treatment has reduced available fuel. “Prescribed Burn Associations” are forming across the county to help property owners use prescribed fire. Community and fire agency acceptance and buy-in for any burn operation is critical. Increasing capacity for prescribed burning across the project area is a high priority.

Water Supply

Water supply poses significant challenges for firefighters in the area. There are no hydrants or shared water systems. Household water is supplied by wells or springs on individual properties, and stored in tanks. County regulations stipulate that 2,500 gallons is maintained at all times for firefighting purposes. However, especially towards the end of the summer, many parcels may not have this supply available. Tanks are not always fitted for firehose; residents may consult with the FRVFC to determine the best fittings and locations for tanks.

There are some ponds and reservoirs scattered throughout the area. Usually these ponds are the primary source for water during fire incidents. However, because water has to be shuttled between the source and the fire, the distance between those two points can greatly impact the efficiency and safety of firefighting efforts. By the peak of fire season in the late fall, local creeks have very low flow, and typically do not have sufficient volume for firefighting use.

Development of strategically placed large water storage tanks for firefighter use should be a high priority project for the near future.

Watersheds and Hydrology

The Fort Ross Fire Service Area includes the watersheds of Ward Creek, the South Fork of the Gualala River, and Russian Gulch.

Historical logging practices, legacy logging roads, sheep and cattle grazing, vineyard conversions, the recent five-year drought, and a dry and wet season climate pattern all have impacts to streamflow.

As one example, the Gualala River Watershed is listed as sediment and temperature impaired. A Total Maximum Daily Load (TMDL) Technical Support Document (TSD) was completed in 2003. Over the past decade, high water temperatures within the watershed have been trending lower, due to restoration efforts, such as decreasing anthropogenic sediments loads and restoring in-stream habitat.

Landowners rely on stream diversions, springs, and near-stream wells as water sources and pump water for use during the dry months, which can reduce stream flows that endangered coho salmon and threatened steelhead populations rely on to survive. Increased pumping in the summer months, when water supply in the creek is already low, can lead to the creek losing all of its water to the aquifer and becoming ephemeral (USGS, 2012).

Damage to the watersheds subsequent to an uncontrolled wildfire is a critical concern for any large wildfire.

Assets at risk

Lives

- There is considerable risk of life loss due to a large, fast-moving wildland fires. Vegetation near homes and on roadsides, limited evacuation routes, and narrow dangerous roads place residents of our area at grave risk. Generally, older people are at higher risk during emergencies, and this is an aging community.

Homes, structures, and surrounding plantings:

- Most homes in the area are not hardened to resist wildland fire ignition, and many have not created or maintained adequate defensible space. Some local residents are uninsured or inadequately insured, so impact of losses will be significant.
- Equipment and tools: Many local residents make their living locally, thus have equipment and tools that are essential to their livelihoods.
- Established landscaping and orchards
- Vehicles

Utilities:

- Electrical lines are all above ground
- Solar systems that are the primary power source for many local homes
- Individual water systems and water lines
- Phone lines
- Most homes have propane tanks
- Cell/communications towers

Businesses:

- Wineries & Vineyards, olive orchards, and cannabis cultivation
- Ranches: cattle & sheep
- Many local residents have home-based businesses: carpenters, woodworkers and other trades, solar technicians, high tech, “telecommuters,” artists, vegetable farmers, etc. All would be tremendously impacted by loss of equipment, tools, and working spaces.

Ecological Values—Plants and Animals:

- While low-intensity fire is a necessity to maintain healthy ecosystems in this area, a large uncontrolled wildfire can have significant negative environmental consequences to natural vegetation and wildlife.
- Sedimentation after a major fire will cause damage to waterways and riparian habitat and species.
- Invasive plant species of particular concern include French, Spanish and Scotch broom, Harding grass, fennel, Himalayan Blackberry.

Bird and Animal List:

Forest and woodland habitats dominate the area and support birds, mammals, amphibians, reptiles, and a variety of invertebrates.

- Birds represent the most numerous and prominent wildlife species within these habitats. Year-round resident birds include chestnut-backed chickadee, western-scrub jay, American robin, common bushtit, oak titmouse, Bewick’s wren, California quail, dark-eyed junco, and spotted towhee. Migratory species observed and potentially breeding within the area include a number of species of vireos, flycatchers, and warblers. This area is part of the Pacific Flyway for migratory birds, including raptors.
- Tree-climbing birds such as woodpeckers, nuthatches, and brown creeper. Year-round residents include acorn, Nuttall’s, hairy, and downy woodpeckers. Casual winter residents include ruby-crowned kinglet, varied thrush, and Townsend’s and yellow-rumped warblers. The dense fir and redwood patches are also key habitat for Sonoma County’s largest woodpecker, the pileated woodpecker.
- Suitable foraging and breeding habitat also exists for raptors. Two of Sonoma County’s most common raptors, red-tailed and red-shouldered hawks, Cooper’s and sharp-shinned hawks, osprey and golden eagles inhabit the area.
- Locally common amphibians including Ensatina, California slender salamander and arboreal salamander. Common reptiles of this community include Skilton’s skink, fence

lizard, alligator lizard, common kingsnake, gopher snake, and ring-necked snake and rattle snakes.

- Other wildlife including mountain lion, coyote, wild pigs, deer, fox, bats, insects, reptiles, amphibians, fish, otters.
- Domestic animals including horses, sheep, cattle, chickens, pets.
- Several Special Status Animals:
 - Osprey (*Pandion haliaetus*)
 - White-tailed Kite (*Elanus leucurus*)
 - Great Egret (*Ardea alba*)
 - Great Blue Heron (*Ardea Herodias*)
 - Northern Spotted Owl (*Strix occidentalis caurina*)
 - Coho Salmon (endangered) and steelhead (threatened)
 - Monarch butterflies (special status)
 - There are approximately 15 bat species with known occurrences within northern California, and a number of these species have a high probability of occurring.

Existing Plans

As noted under “Natural Vegetation” (above), the Gualala Ranch HOA has an existing Forest Management Plan (FMPs), and thanks to California Forest Improvement Program (CFIP) funding, approximately 15 individual landowners have FMPs.

CAL FIRE’s *Strategic Fire Plan Sonoma-Lake-Napa Unit* addresses wildfire issues across the region’s five counties.

Priority	Ready to go?	Fund need 0=No 1=Low 2=Mod 3=High	Hazard Category	PROJECT TITLE	PROJECT DESCRIPTION	Type	Project Area or Address: Street or Coordinates	Cooperating & Interested Agencies and Groups	Sponsoring Agency
1	y	1	1. Life	EDUCATION: Life Safety and emergency preparedness	Community Education Project: <ul style="list-style-type: none"> • Fire Season Tips: Parking, gas, Evac Plans, Go Bags, Leave gates and homes open? Vehicle Safety and maintenance; • Burn Pile Training; Equipment use training • Evacuation Prep: Where to go? When to go? Communications availability, radio stations, etc.; Pet Safety prep; docs and pix; • Communications: W/ family and neighbors, scanners, where to find current fire information; Sirens, what do they mean? 	Education	Area Wide	CAL FIRE, FRVFD, Resources Conservation District (RCD) Sonoma County Fire (So Co), University California Cooperative Extension (UCCE), Community Forest	
1	y	2	1. Life	Evacuation Maps for Residents	Evacuation Routes & Refuge Areas: Maps of possible routes; Assess potential for planning, identification and creation of refuge areas.	Project	Area Wide	CAL FIRE, FRVFD, So Co Emergency Services	
1	y	1	1. Life	Community evacuation education and training drill	Evacuation Prep: Community Safety day with free stuff	Project	Area Wide	CAL FIRE, FRVFD	
1	y	1	1. Life	Road and House Signage	Road and house number signs: Identify needs, supply materials	Project	Area Wide	CAL FIRE, FRVFD	
1	y	1	2. Property	EDUCATION: Fire Adapted Homes and Landscapes	Home and Landscape EDUCATION TOPICS: <ul style="list-style-type: none"> • Defensible space and Structural Hardening • Water Supply: How much is enough? What is an accessible tank? Fittings? Exposed water lines; reliance on electrical; Water on roofs? • propane & fuel tank safety • Gardens & fencing; • Landscape Scale Fuels Reduction: When? Where? How Much? 	Education	Area Wide	Fire Safe Sonoma (FSS), CAL FIRE, FRVFD, Community Forest, TCVFD, UCCE, Sonoma Land Trust (SLT)	

Priority	Ready to go?	Fund need 0=No 1=Low 2=Mod 3=High	Hazard Category	PROJECT TITLE	PROJECT DESCRIPTION	Type	Project Area or Address: Street or Coordinates	Cooperating & Interested Agencies and Groups	Sponsoring Agency
1	y	3	2. Property	Special Needs Assistance for Defensible Space (DS) and Structure Hardening (SH)	Funding for SH and DS, esp. for elders	Project	Area Wide		
1	y	3	3. Enviro/Fuel	Fuels Removal for roadside safety on Community Roads	Fuels removal on roads and driveways	Project	Area Wide	CAL FIRE, FRVFD, Resources Conservation District (RCD), Ranches, Community Forest	
1	y	1	3. Enviro/Fuel	California Forest Improvement Program (CFIP)	Continued implementation of CFIP	Project	Area Wide	CAL FIRE, FRVFD, RCD, Ranches, Community Forest	
1	y	3	3. Enviro/Fuel	Implementation of Grazing and Rx fire for Community fuels reduction	Community grazing and Rx fire implementation for roadsides and critical fuel breaks	Project	Area Wide	Community Forest, FRVFD, FSS, Ranches, CAL FIRE, National Resources Conservation Services (NRCS), UCCE	FRVFD, Community Forest
1	n	2	3. Enviro/Fuel	Increase capacity and planning for Prescribed burning	Rx Burning Program: Where? Select areas, who will do? Costs? Community Outreach	Project	Area Wide		
1	y	1	3. Enviro/Fuel	Chippers Ahoy!	Slash Removal: Best Management Practices (BMPs); coordinate chipper	Project/Community Engagement	Area Wide	So Co Fire, FRVFD, Ranches, Community Forest	
2	y	1	1. Life	Road Safety Improvements	Explore potential for Improvements on ranch roads: more pullouts, turn arounds? Can this be funded?	Plannning	Area Wide	CAL FIRE, FRVFD, RCD, SO CO FIRE, TPW, Ranches, Community Forest	
2	n	3	1. Life	Emergency Supply Cache	Purchase emergency supplies for caching in selected locations.	Project	Area Wide	CAL FIRE, FRVFD, TCVFD. TSRVFD, COPE, Red Cross, SO Co Emergency Services	
2	y	3	2. Property	Improved Water Supply	Water Supply: Create more water supply for homes and FF. Mark existing supplies	Project	Area Wide	Community Forest	Sonoma RCD & Community Forest

Priority	Ready to go?	Fund need 0=No 1=Low 2=Mod 3=High	Hazard Category	PROJECT TITLE	PROJECT DESCRIPTION	Type	Project Area or Address: Street or Coordinates	Cooperating & Interested Agencies and Groups	Sponsoring Agency
2	y	3	3. Enviro/Fuel	Fuels Reduction and Forest Health: SOD Removal	Fuels removal: Understory SOD & dead and dying	Project	Area Wide	CAL FIRE, FRVFD, RCD, Ranches, Community Forest	
2	n	3	3. Enviro/Fuel	Fuels Removal and Forest Health and Community Economics	Plantation Pines: Thin and remove. Explore potential for economic return from pines.	Project	Area Wide	CAL FIRE, FRVFD, RCD, Ranches, Community Forest	
3	y	1	3. Enviro/Fuel	Tree Puller tools for community use	Enable access to tree pullers for removing saplings	Project	Area Wide	CAL FIRE, FRVFD, RCD, Ranches, Community Forest	
3	n	2	3. Enviro/Fuel	Bridge Assessment and replacement	Bridges: Outreach to owners of wooden bridges: funding sources for replacement?	Project	Area Wide	FRVFD, Ranches, Community Forest	

Appendix A:

COMMUNITY WILDFIRE RISK AND HAZARD ASSESSMENT

This Form Prepared for:

How to Use This Community Wildfire Risk and Hazard Assessment Tool

These questions are designed to help you understand and assign risk ratings in your community. The ratings sum up the many factors that affect how a hazardous fire might behave in your local Wildland-Urban Interface (WUI).

Your working group will assess a variety of risk factors, including:

- Road infrastructure and access—Can residents and firefighters get in and out during an emergency?
- Construction materials—Are buildings designed or modified to resist ember ignition?
- Defensible space—Do buildings have a 100 foot defensible space radius?
- How available are local fire suppression resources, and what are their capabilities?
- How will local land conditions such as fuel types, fuel loading, and slope impact potential wildfire behavior and severity?

This interactive template will help you examine and rate the risks of each of these factors. After all the questions are answered, results will be automatically tabulated and your calculated hazard ratings will appear on the last page.

In Appendix B, you will identify more specifically where and to what extent risks exist, and present maps that show them. After that, your community, in collaboration with local fire agencies and other stakeholders, can come up with the strategies and projects that can help you to become better adapted to wildfire.

It may seem difficult to know which option to choose. For example, your community may have a wide variety of roads. To use this assessment tool effectively, you should provide a very basic answer to each question. For instance, ask yourself: “Do any of our secondary roads present risks to people trying to evacuate during a wildfire? Yes or No.” For this reason, we suggest that where there are a variety of conditions, use the worst case for the risk assessment.

The procedure for this Community Wildfire Risk/Hazard Assessments was originally developed by the “Living with Fire” program, University of Nevada Cooperative Extension, in conjunction with agency and community stakeholders. It was modified by permission for use in California by Fire Safe Sonoma, in conjunction with California stakeholders. Content for Appendix A was extracted or adapted from the *Nevada Community Wildfire Risk/Hazard Assessment: Washoe County* (Resource Concepts, Inc. 2005).

1. Access

Design aspects of roadways influence the hazard rating assigned to a neighborhood. Roads that are steep or less than twenty feet in width often impede two-way movement of vehicles for resident evacuation and access for fire suppression equipment. Hairpin turns and cul-de-sacs with radii of less than 45 feet can cause problems for equipment mobility. Visible, fire resistant, street and address identification and adequate driveway widths also reduce the overall neighborhood hazard rating.

Primary roads are those that most people use to access secondary roads and/or homes. A primary road is typically paved and maintained by the County or the State.

Primary Roads:

- Two or more primary roads.....1
- One road or loop road (exit possible in two directions).....3
- One road in, one way out (one road, dead end) 5

At the narrowest point, primary roads are

- More than 24 feet 1
- More than 20 feet and less than 24 feet 3
- Less than 20 feet..... 5

Slope:

- Road grades of 5% or less..... 1
- Road grades more than 5% 3

Secondary Roads are smaller roads that are used to access homes or neighborhoods. They may or may not be paved or maintained by the County or the State.

At the narrowest point, secondary roads are

- More than 24 feet 1
- More than 20 feet and less than 24 feet 3
- Less than 20 feet..... 5

Secondary road terminus:

- Loop roads or cul-de-sac with outside radius of 45' or greater 1
- Dead-end roads 200' or less in length 3
- Dead-end roads greater than 200'..... 5

Slope:

- Road grades of 5% or less..... 1
- Road grades more than 5% 3

Secondary roads in our area are:

- Mostly paved (more than 80%-100%) 1
- Some are paved (50%-79%) 3
- Few are paved (less than 50%) 5

Accessibility: Fire trucks are very large, and can be difficult to maneuver. Can a large two-wheel drive truck drive up the road? Can two trucks pass each other side by side? Are there sufficient turnout spots where trucks can turn around? Hint: Think of UPS trucks.

- Two-wheel drive trucks can easily handle road surface and slope and can pass each other side-by-side without pulling over 1
- Narrow road surface and/or roadside vegetation make it difficult for vehicles to pass side by side, but vehicles don't have to back up for more than twenty five feet for turnaround 3
- Narrow road surface and/or roadside vegetation with limited turn arounds (vehicles have to back up more than 150') 5

Bridges & Gates:

Some fire departments will not drive over a bridge that has not been rated for weight.

- No bridges 0
- All bridges in the area are rated for heavy vehicles..... 1
- There are a few unrated bridges 3
- Most bridges are unrated 5

Wood bridges can burn in wildland fires, rendering them impassible.

- No wood bridges 0
- All bridges have non-combustible surface and structure.....1
- Some secondary road bridges have wooden surfaces or structure 3
- Some primary roads have wooden surfaces..... 5

Gates:

- No gates 0
- Gates are equipped with fire dept access systems or no gates.....1
- Most gates are equipped with fire department access systems..... 3
- Locked gates will impede emergency access 5

Roadside Vegetation 10 feet from usable road edge :

- Grasses are mown to less than 4 inches, trees and brush are trimmed to provide 10' of horizontal clearance, and 15' of vertical clearance..... 1
- Roadside vegetation is mostly well maintained, but some areas need improvement 3
- Tall grass, brush and trees border and overhang the roadway 5

Signage

Street and home address signs should be metal with reflective numbers on non-combustible posts. Signs need to be visible from any point of entry and not obscured by vegetation. Signs made from combustible materials won't survive the wildfire!

Street signs

Present 90-100%	1
Present 75-89%	3
Present less than 75%	5

Address signs (house numbers)

Present 90-100%	1
Present 75-89%	3
Present less than 75%	5

2. Built Environment

When paired with good defensible space, appropriate home construction and maintenance can help homes survive wildfire ignition. Vulnerable points on homes include roofs, gutters and eaves, venting, attachments such as decks and fences, windows, and siding. Chapter 7A of the California Building Code applies to new construction in designated wildfire-prone (WUI) areas. In addition to noncombustible and ignition-resistant materials, Chapter 7A uses State Fire Marshal-approved standard test methods that provide a way to evaluate and compare the performance of exterior-use construction materials. Homes built after 2007, when California adopted the WUI Building Code, will have many important features to help prevent home ignition. You can learn more about home hardening at on the [Insurance Institute for Business and Home Safety](#) website.

Percentage of buildings in your area constructed or modified after 2007:

90-100%	1
75-89%	3
Less than 75%	5

Roofing materials

Non-combustible covering 90-100%.....	1
Non-combustible covering 80-90%	5
Non-combustible covering 70-80%	8
Non-combustible less than 70%	10

Siding materials

Non-combustible siding more than 75%	1
Non-combustible siding less than 75%	5

Unenclosed features (decks, wooden attachments such as fences, etc.)

Less than 25%	1
25-50%	3
More than 50%	5

3. Utilities

Overhead power lines can be a potential ignition source for wildfires. PG&E should regularly maintain vegetation near poles, and beneath power lines and transformers, as fires have been known to start from arcing power lines during windy conditions. If you are concerned about vegetation that may pose a risk to electrical lines, call PG&E at 1-800-PGE-5000.

Utility ignition risk

- All utility lines are underground..... 0
- Utility lines all above ground..... 3

4. Defensible Space

Fuels are simply anything that can burn. All plants, from grasses to redwood trees, are fuels. It is also important to remember that the human-built environment of homes are part of the fuels component in your area. The type, density, and condition of vegetation, the homes themselves, the presence of other combustible materials (for example wood piles, wooden fencing) together influence the ease of ignition, intensity, and duration of the fire. Defensible space is one of the factors that homeowners can modify in order to improve the chances that a home or other property avoids damage from a wildfire.

Average lot size

- 10 acres or larger 1
- 1 to 10 acres 3
- Less than 1 acre 5

Defensible space

- 70% or more adequate 1
- 30-70% adequate 3
- Less than 30% adequate 5

5. Fire Protection

Knowledge of the capabilities or limitations of the fire suppression resources in a neighborhood can help municipality officials and residents take action to maximize the resources available. Factors considered in the assessment include:

- A. Availability, Number, and Training Level of Firefighting Personnel. When a fire begins in or near a neighborhood, having the appropriate firefighting personnel available to respond quickly is critical to saving structures and lives. Whether there is a local paid fire department, volunteer department, or no local fire department affects how long it takes for firefighters to respond to a reported wildland fire or to a threatened neighborhood.
- B. The Quantity and Type of Fire Suppression Equipment has an important role in minimizing the effect of a wildfire on a neighborhood. Wildland firefighting requires specialized equipment.
- C. Availability of Water Resources is critical to fighting a wildland fire. Whether there is a community water system with adequate fire flow capabilities, or whether firefighters must rely on local ponds or other drafting sites, affects how difficult it will be for firefighters to protect the neighborhood.

Water source

- 500 gpm hydrants within 500' of structures 1
- 500 gpm hydrants or draft source within 1000' of structures 2
- Water source 20 minutes away roundtrip 5
- Water source 45 minutes away roundtrip 10

Fire department/protection district within 15 minutes

- Career Department 1
- Combination Career/Volunteer 3
- Volunteer with Seasonal Staffing 5
- All Volunteer Department 7
- No Organized Department or extended response times 10

6. Fire Behavior

Physical conditions include slope, aspect, topography, typical local weather patterns, wind patterns, fuel type, and fuels density. With the exception of changes to the fuel composition, the physical conditions in and around a neighborhood cannot be altered to make the neighborhood more fire safe. Therefore, an understanding of how these physical conditions influence fire behavior is essential to planning effective preparedness activities such as fuel reduction treatments. Physical conditions considered in the assessment include:

- A. Slope, Aspect, and Topography. In addition to local weather conditions, slope, aspect, and topographic features are also used to predict fire behavior. Steep slopes greatly influence fire behavior. Fire usually burns upslope with greater speed and longer flame lengths than on flat areas. Fire will burn downslope; however, it usually burns downhill at a slower rate and with shorter flame lengths than in upslope burns. East aspect slopes may experience afternoon downslope winds that may rapidly increase downhill burn rates. West and south facing aspects are subject to more intense solar exposure, which preheats vegetation and lowers the moisture content of fuels. Canyons, ravines, and saddles are topographic features that are prone to higher wind speeds than adjacent areas. Fires pushed by winds grow at an accelerated rate compared to fires burning in nonwindy conditions. Homes built midslope, at the crest of slopes, or in saddles are most at risk due to wind-prone topography in the event of a wildfire.
- B. Fuel Type and Density. Vegetation type, fuel moisture values, and fuel density around a neighborhood affect the potential fire behavior. Areas with thick, continuous, vegetative fuels carry a higher hazard rating than communities situated in areas of irrigated, sparse, or non-continuous fuels. Dry weather conditions, particularly successive years of drought, in combination with steep slopes or high winds can create situations in which the worst-case fire severity scenario can occur.

CAL FIRE Fire and Resource Assessment Program (FRAP) Maps: California Department of Forestry and Fire Protection (CDF) has mapped areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. All of the State Responsibility Areas in California have been mapped as moderate, high or very high Fire Hazard Severity Zones. You can view maps for your area on the FRAP website at frap.fire.ca.gov/.

FRAP Fire Hazard Severity Zone: Please download the FRAP maps from frap.fire.ca.gov or ask CAL FIRE personnel for a copy. If you have GIS mapping capability, determine the percentage of each FHSZ that you have in the project area. If you can't do it by GIS, an approximation is fine.

Enter the percentages of the FHSZs below, then use those values to choose a value.:

Very High FHSZ.....	%
High FHSZ.....	%
Moderate	%

Predominant FSHZ

Moderate FHSZ.....	3
High FHSZ.....	5
Very High FHSZ.....	7

Slope

- 8% or less 1
- 8% - 20% 4
- 20% - 30% 7
- More than 30% 10

Predominant aspect

- North 1
- East 3
- West 7
- South 10

Fuels

- Light density 1
- Medium density 3
- High density 5

Fire behavior situations

- Situation #1 - Fine and/or sparse fuels surround structures; infrequent wind exposure; flat terrain with little slope and/or north aspect. No large wildland fire history and/or moderate fire occurrence. 3
- Situation #2 - Moderate slopes; broken moderate fuels; some ladder fuels; composition of fuels is conducive to torching and spotting; conditions may lead to moderate suppression success; some fire history and/or moderate fire occurrence. 7
- Situation #3 - Continuous fuels in close proximity to structures; composition of fuels is conducive to crown fires or high intensity surface fires; steep slopes; predominately south aspects; dense fuels; heavy duff; prevailing wind exposure and/or ladder fuels that may reduce suppression effectiveness; history of some large fires and/or moderate fire occurrence. 10

7. Contributing Risk Factors

Please select the contributing risk factors on the table on Page 8.

8. Risk and Hazard Assessment Summary

Based on the inputs entered into Sections 1 through 7, the community's risks and hazards are summarized in the "Ignition Risk and Hazard Assessment Overview."

Use this chart to consider which projects might be tackled, and how. Some Green colored risks could potentially be tackled by neighborhood groups for little or no cost. The risks in the yellow category may need considerable planning and perhaps funding, but are modifiable. The Orange risks are physical features or infrastructure that are not easily modified. Risks in this area will be better modified by education and planning.

Risks that can probably be modified	Mitigation Strategies Include:	
Access		
Gates	Evacuation Planning, install "Knox Keys"	
Roadside vegetation	Fuels Management, education, funding	
Signage		
Street	Education, outreach, funding	
House	Education, outreach, funding	
Home Hardening/Construction		
Roofing	Education, outreach, retrofit, funding	
Siding	Education, outreach, retrofit, funding	
Unenclosed Features	Education, outreach, retrofit, funding	
Defensible Space		
Defensible Space	Education, outreach, funding, inspections	
Risks that possibly can be modified	Mitigation Strategies Include:	
Access: Bridges		
Unrated Bridges	Evacuation Planning, modification	
Wood Bridges	Evacuation Planning, modification	
Water and Fuels		
Water Sources	Develop further sources.	
Fire Behavior (strategic fuel breaks)	Planning, funding, education, outreach	
Fuels Density (fuels modification)	Planning, funding, education, outreach	
Risks that cannot likely be modified	Mitigation Strategies Include:	
ACCESS		
Primary Roads out	Evacuation Planning	
Primary Road width	Evacuation Planning	
Primary Road Slope	Evacuation Planning	
Secondary width	Evacuation Planning	
Secondary Terminus	Evacuation Planning	
Secondary Slope	Evacuation Planning	
Secondary Surface	Evacuation Planning	
Utilities		
Underground	Education, outreach, report issues	
Fire Behavior		
Fire Hazard Severity Zones	Education, outreach, planning	
Slope	Education, outreach, planning	
Predominant Aspect	Education, outreach, planning	

Creating Wildfire Adapted Homes and Landscapes



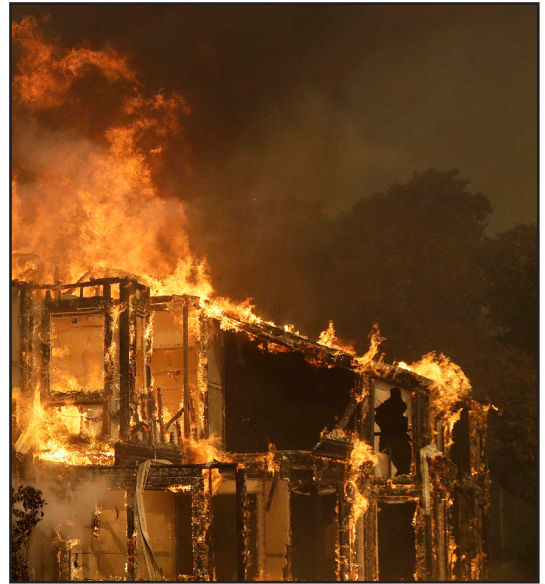
Creating Wildfire Adapted Homes and Landscapes

What Can Be Done to Reduce Structure Loss from Wildfire?

Since the 1960s, researchers and firefighters have analyzed the causes of home loss in wildland fires. Their work clearly has indicated that to effectively reduce home loss, **we must treat BOTH the VEGETATION** surrounding the buildings **and the BUILDINGS themselves.**

Treating the Vegetation: Defensible Space

Defensible space is crucial for three reasons: to save lives of residents and firefighters, to keep fires that start in structures from escaping into the wildland, and to prevent home loss in a wildfire. Reducing vegetation helps protect structures by ensuring that intense radiant heat is far enough away from the sides of the building that the heat doesn't ignite the structure. Defensible space also ensures that flammable brush does not act as kindling allowing direct transmission of flames to the structure. **“Defensible space” does not mean “moonscape.”** A good defensible space is likely to have trees, but low branches and brush has been modified to remove the “ladder fuels” that increase fire behavior. Your defensible space landscape should be even more beautiful and wildlife friendly than before treatment. But there is much more to the picture than vegetation.



Embers and firebrands are a significant cause of home ignition.

Treating the Structure: Protecting Homes through Better Design and Materials

Additionally, we must construct buildings that can withstand the multiple threats of wildfire without igniting. Reducing the question of structural ignition to its simplest possible terms, we can say that a house won't burn in a wildfire if it doesn't ignite in the first place. The major ignition threat is firebrands—burning embers that can be carried for miles on the wind to fall on or near the house. This threat is addressed by treating the house so that even if firebrands fall on it, it is much less likely to ignite. Homes can be constructed or modified to greatly increase their chances of surviving a wildfire with minimal damage.

Please use this document as a starting place to learn how to make your home and surroundings more wildfire compatible. There's a lot you can do to protect both your home and surrounding wildlands!

Two Crucial Elements for Home Survival	Page 2
Homes are fuel too! Improving buildings' ability to withstand wildfire	Pages 3-12
Vegetation Management & Creating Defensible Space	Pages 13-15
Other important Safety Factors & Regulations.....	Pages 16-17
Resources for more information	Page 18

Protecting Your Home from Wildfire: Two Crucial Elements

Modifying **both** surrounding **vegetation** and **buildings and outbuildings** will tremendously improve the odds that your home can survive a wildfire, as well as provide an additional margin of safety for you, your family, and any firefighters who may actively defend your property.

Though firefighters will do all they can to defend homes, all residents in California's Wildland-Urban Interface (WUI) areas should be aware that, in the event of a large catastrophic fire, there simply are not enough fire engines and crews to protect all threatened homes. This observation is not meant to dishearten WUI residents or to imply that California firefighting agencies are not capable of carrying out their crucial role. However, clearly it is...

BAD ODDS: To assume that the firefighters will be on scene to defend your property.

GOOD ODDS: To take actions far in advance of a wildfire that will prepare you and your property to safely survive a wildfire event, even if firefighters can't make it to your home.



What actions can you take to better your chances to WIN in a wildfire?

Modify **Structures** so that burning embers and blowing around during wildland fires cannot easily cause ignition.

AND

Modify **Vegetation** within 100 feet of buildings and outbuildings so that there is less fuel available to transmit heat and flames and cause ignition.

We realize that for some Sonoma County homes, nearby fuels conditions are such that improving your odds may seem impossible. We often encounter those who think: "This home is a goner anyway, why should I do anything?" Here are just a few of the reasons that every resident of wildland areas should do everything they can to prepare for wildfire:

- ▲ Even small modifications to home can make a big difference in home survival.
- ▲ In the event that you are trapped by a wildland fire and cannot safely evacuate, a well-prepared home could save your life.
- ▲ A minimum 100' of defensible space is required by law.
- ▲ During a wildland fire, firefighters perform "triage" to determine which homes can be effectively and safely defended. Homes with surrounding vegetation that presents a danger to firefighters will likely be passed up in favor of homes that have been improved. Support your firefighters by providing a safe and defensible space.
- ▲ A well-treated wildland is a healthy wildland. Fuels treatment projects should improve overall health of surrounding vegetation, provide better habitat for wildland creatures, and be even more beautiful.

First we'll address structure improvements. Then we'll look at vegetation and defensible space.

Protecting Your Home from Wildfire: Buildings

Ongoing research on home loss in wildland fires shows that two out of three houses destroyed were ignited by wind-dispersed embers and not the actual flames of the wildfire.¹ As you look at the structures on your property, keep a vision in your mind of a blizzard, but rather than snow, burning bits of debris are flying around. Some embers are the size of a grain of sand, some the size of a dinner plate or larger. Ask yourself, “If a burning hunk of charcoal landed here, would it ignite? Can embers blow into that vent? Would this hole in the siding allow embers to accumulate or blow into the house walls?”

Luckily, there are many actions you can take to protect your home from embers and wildfire. While it is effectively impossible to make a structure “fire proof,” there is a lot you can do to make it much more wildfire safe. This section provides merely a brief introduction. Use it to launch your own investigations.

This section has been adapted from the work of fire researcher Dr. Steve Quarles. We sincerely thank him for his support. His research has been pivotal in increasing understanding of wildland structure ignition and how homeowners might prevent it.



Ember blizzard.

Six Priorities to Protect Homes

Quarles has identified six priority areas for making changes to existing homes in fire hazard zones. The priorities correlate to where and how your house is most vulnerable. As you go through the list, we suggest you prioritize it yourself by what you can do most immediately. For instance, if you need

to replace your roof (Priority One), but just can't take on that project right now, take on something else on the list that you can do as soon as possible. Some of the items listed in Priorities Two and Three, for example, can be done easily at little or no cost, and are also very important. However, if you have an untreated wood shake roof and don't replace it, almost anything else you do will be for for not.



¹ Quarles, Steve, et.al. “Home Survival in Wildfire-Prone Areas: Building Materials and Design Considerations.” UC ANR Publication 8393, May 2010. <http://ucanr.org/freepubs/docs/8393.pdf>, p.1.



Existing homes can and should be made fire resistant too.

Approved building products for the WUI are listed by the Office of the State Fire Marshal on their web site at http://osfm.fire.ca.gov/licensing-listings/licenseListing_bml_search-cotest.php

In 2008, California Building Codes were revised to require that new construction in Wildland Urban Interface (WUI) areas have increased wildfire safety measures.

The WUI code addresses the elements of construction most vulnerable to wildland fire and ensures that homes constructed in California after 2008 will have safety features built in. However, the new WUI building code doesn't address homes constructed before 2008. Unless you are undertaking a large remodeling project, there is no legal requirement to upgrade to the new building code's provisions. Voluntary upgrading to meet some of the requirements, however, will increase the likelihood that your home can survive.

While some structural improvements might be rather expensive, there is a lot that homeowners can do for minimal expense. Creating and maintaining a "Non-Combustible" zone five feet from house walls is critical. Making covers for eave, gable or foundation vents is cheap and may be more beneficial than much more expensive projects. Taking a close look at your home and making a prioritized list of the projects that you can realistically take on could reduce the vulnerability of your home and property.

Dr. Steve Quarles of the **Insurance Institute for Business and Home Safety (IBHS)**, is the leading expert in wildland home ignition. The publications on the IBHS website are an excellent resource. A wide variety of important publications including a Homeowners Checklist, can be found at www.disastersafety.org/wildfire

PRIORITY ONE: Roofs

The roof of your home is exposed to sun, rain, wind, and potentially wildfire-generated embers. If your roof is in poor shape or is untreated wood shingle, it will increase risk of home loss more than any other single component, and would be your highest priority.

Performance of a roof in a wildfire will depend on a number of factors, including:

- ▲ **Material classification:** A Class A fire rating simply means that the material will withstand exposure to burning materials for one hour without burning through. There are two ways to think about the Class A fire rating:

Covering alone (“stand alone Class A”): For example, Asphalt Comp (“three-tab” shingles) have a “stand alone” Class A rating: it doesn’t matter what kind of materials (sheathing and underlayment) are used under the roofing material.

By covering and underlying materials (“assembly rated Class A”). For example, aluminum roofing materials must have a specific underlayment to achieve the Class A rating.

It can be difficult to tell if you have a Class A roof. If you are not sure, schedule an inspection with a professional roofer to find out. When you replace, replace with Class A fire rated materials.

Condition (age): A Class A roof is only Class A for the time specified for that particular roofing material. Age and UV exposure degenerate some materials, reducing resistance to fire. Maintenance is crucial throughout the life of your roof: make sure you repair any wind damage, and replace the roof before it reaches the end of its service life.

Roof Shape: Home designs that have roof-to-vertical-wall intersections (e.g., at a dormer or chimney chase) can allow debris and embers to accumulate where they have the potential to ignite vulnerable vertical walls, bypassing the the protection provided by a fire-rated



Though it may have originally had a Class A rating, this old, weathered asphalt composition shingle roof would no longer provide adequate protection against embers and heat.



roof. If your house has a complex roof, be vigilant about keeping it clean, and consider replacing combustible siding located on vertical roof to roof-to-wall locations.

Keeping the roof clear of debris is crucial during fire season. Don’t let needles and leaves pile

up on the roof or in gutters. Even if your roof has a Class A fire rating to withstand burning materials without penetration into the building, flaming debris exploits any vulnerabilities on the roof and exposed exterior walls, and can roll off the roof to ignite materials on the ground.

Roof Edge:

In open eave construction, the edge of the roof, and the places where the roof meets other materials such as dormers, are the most vulnerable. There are two primary ways that the edge of the roof is exposed:

1. While the top of the roof is covered with (hopefully) fire-rated roof covering, the very outer edge and underside of the roof decking is often uncovered, with the plywood underlayment exposed. This edge is vulnerable to flaming debris in the gutter. Angle flashing should be used to cover the outer edge of the plywood decking.

If you have open rafter/eave construction, inspect the blocking. Caulk around the joints and seal any gaps. In future years inspect the blocking caulk at the beginning of every fire season and replace as needed.

Debris buildup in gutters can allow flames to enter the structure between the wall and the roof, and expose the roof edge. Always keep the gutters and the roof clear of debris during fire season! Investigate products that can keep gutters from filling up with leaves.



2. Large openings at the roof edge, such as those formed by barrel tile roofing, provide spaces where combustibles can accumulate. For example, these openings make the perfect place for birds to build nests. Needless to say, dry bird's nests are extremely combustible. Easily ignited by embers from a nearby wildfire, they can expose the roofing felt and sheathing beneath the roofing material to sufficient heat and flames to burn through and penetrate into the home's attic space. Tile roofs with "bird stops" at the edge should be inspected annually to make sure the stops are still in place.



Upgrading to a Class A roof should be the first priority for anyone with a wood shake or old, deteriorated roof covering. However, because the roof and siding are dominant features on houses, many homeowners get a false sense of security when they install Class A roofs and siding. Each year, many of the homes are lost in wildfires that had Class A roofing and non-combustible siding. This clearly illustrates that some less obvious fire-protection elements are also quite important.



Debris on the outside can lead to flames on the inside!



Foundation vent



Through-roof vent



Gable end vent

PRIORITY TWO: Vents

The second item on Quarles' priority list is vents. Unless a code-approved non-vented crawl space or attic design is used, vents for crawl spaces under homes or for attics are required by building codes to control moisture, which can lead to mold growth and decay in building materials. Yet vents that allow for sufficient air circulation also provide an easy entry point for burning embers and flames. During a wildland fire, embers, which can be smaller than a grain of rice, can blow in through vents and accumulate to ignite debris or stored items, and subsequently the house itself, setting the home ablaze from within.

What kind of venting do you have, and does it expose your home to ember ignition?

California building code generally requires that vents be covered with 1/8-inch mesh, which should be sufficient to allow air movement that will prevent moisture problems. Unfortunately, there is some evidence that even 1/8-inch mesh is wide enough to allow for intrusion of embers (See Quarles, *Home Survival in Wildfire Prone Areas*). The importance of vents in wildfire resistance has led to the development of vents designed to limit ember intrusion while still allowing sufficient air flow for ventilation. Some have been accepted for use by the Office of the State Fire Marshal for use in wildfire prone areas. See http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest, select 8165--"Vents for WUI" and search to see approved products.



This vent uses fine screen and intumescent paint to prevent both ember and flame intrusion. See the State Fire Marshal Buildings Materials Listings for information about WUI building products (web link p.16).

Vents: What you should do:

- Replace with WUI approved vents if possible.
- Check existing vents frequently to make sure screens are intact and clear from debris buildup.
- It is possible to make vent covers out of a non-combustible solid material such as fiber cement, or plywood and a thin metal plate. The covers can be quickly installed over vents if a wildfire threatens. Assemble all you'll attach the vent cover, and have everything you need ready and in one place. Number vent covers and vents so you can very quickly get the right cover on the right vent. You could even use duct or metal tape as a last-minute effort.

PRIORITY THREE: The critical five-foot noncombustible zone and Defensible Space



Though it charred the siding, luckily, the broom didn't fully ignite this building.

Defensible space is the area between an oncoming wildland fire and a building where the vegetation has been modified to reduce the intensity of an oncoming wildfire. Defensible Space is usually thought of in zones radiating from the house walls. Zone 1 goes from the house walls out to 30 feet. Zone 2 goes from 30 to 100 feet or the property line. Creating and maintaining defensible space in both Zone 1 and Zone 2 should be considered as very high priority projects for home survival. **You can read more about defensible space Zones 1 and 2 later in the document.**

Research about home loss from wildland fires increasingly shows that having a noncombustible zone from the exterior house walls out to 5 feet is extremely important to reduce home ignitions. Though not currently a “Defensible Space” requirement in California, the 0 to 5 foot noncombustible zone is recommended by several of the most influential outreach and education groups, including the IBHS, Nevada’s Living with Fire Program, and NFPA’s Firewise Program. The closer combustible items and vegetation are to buildings, the more likely they are to contribute to home ignition.

As you create your defensible space, it is very highly recommended to start at the house and work outwards to 100 feet. First, work on creating your noncombustible zone 0–5 feet from house walls. Then tackle vegetation in the 30 foot “Lean Clean and Green” zone. Then work on to fuels reduction in Zone 2, from 30–100 feet or the property line.

Throughout fire season, identify and re-move any items near structures that may catch fire from embers, radiant heat, or direct flame contact. Surprisingly often, it’s the little things around the house that ignite to spread flames to the building. Most of us have lots of the “Stuff of Daily Life” around our homes, which we don’t think of as wild-fire risks.

It is not unusual for firefighters to successfully defend a home during the initial impact of a wildfire, only to return hours or even days later to find that the house has burned down. This is usually because small fires started after the worst part of the fire front had passed, and slowly grew to sufficient size to ignite the buildings. Recognizing and eliminating the “little things” that cause these fires to ignite are critical for your overall wildfire prevention plan.



Create non-combustible space between the wood fence and the house walls with metal gates, and similar material. This fence would have burned to the house walls had firefighters not arrived to extinguish the fire.

The 0--5 foot noncombustible zone

The objective of this zone is to reduce the chance that an ignition will occur nearer the home, and result in flames directly contacting the building. The noncombustible zone includes everything from building walls out five feet, including the areas under decks or other building attachments (such as stairs).

First, do a slow walk around your structures to look critically for anything that might ignite and spread flames to the structure. Look critically at both vegetation and stuff. Think of things like wood piles, wooden planter boxes, combustible decorative items, natural-fiber door mats, brooms, etc.

If you can reasonably move it away from where it will expose the house to direct flame contact, or replace it with a noncombustible alternative, do so.

Ask yourself: Would this ignite if a burning chunk of charcoal dropped on it? If so, replace it with a non-combustible material or move it far enough away so that if it ignites, it won't spread fire to your structures. There may be risky items that have to stay near structures because that is where we use them, such as patio furniture. If that is the case, make a list of things that you will relocate to inside a building or away from the structure if a wildfire threatens to come near or during red-flag warning weather conditions. Making a list helps you think clearly and move fast when you must.



Wood trellis

In the 0--5 foot noncombustible zone

- ▲ **Install hard surfaces** such as concrete walkways, or use non-combustible mulch products, such as rock. Bare mineral soil is an option if erosion is not an issue. Do not use wood or combustible mulches in this area.
- ▲ **Vegetation:** Use only highly fire resistant plants in this area, such as irrigated lawn or low-growing non-woody plants. Shrubs and trees, particularly conifers, are not recommended. Maintain all plants free of dead and dying material throughout the fire season. Plants adjacent to combustible siding and foundation vents, under or next to windows, or under soffit vents or inside corners, present the greatest risks.
- ▲ **Firewood and wood piles:** One cord of wood will produce 20-million BTUs, the equivalent of 160 gallons of gas. Move firewood piles 30' away from buildings during fire season.
- ▲ **Wood fences** can act like a wick to bring the wildfire straight up to your home. Ideally, wooden fences should be located no closer than 10' from structures. If you have a wood fence that attaches to the house, break the continuity with a noncombustible element next to the house.
- ▲ **Needle litter, leaf debris and mulch:** Make sure that combustible materials don't pile up in the 5 foot non combustible zone or on the building--roofs, decks, stairs, etc.
- ▲ **Wood trellises** are commonly installed beneath decks to hide all of the stuff that accumulates underneath (a major no-no), or to support potentially combustible vegetation against house walls. Consider a trellis made of a noncombustible material. If the trellis is primarily used as under-deck screening, make sure to remove any combustible items under the deck! The trellis will not prevent embers from blowing onto flammable items. If the trellis is used to support a plant, make sure that the plant is a low combustible species, well maintained and irrigated, and, or better yet, remove it.

Other Important considerations near the home:

- ▲ **Garages:** Older garage doors typically have large gaps along the perimeter that embers can blow through. Typically, combustibles are stored in the garage, so it is important to make sure that gap is well sealed. **Safety note:** If you have an electric garage door, make sure you know how to open it if the power goes out. Practice opening it with your car parked in the garage as it normally would be. Consider purchasing a garage door opener with a battery back up. Not being able to open the garage door during a fire is a serious life safety concern.
- ▲ **Windows and Screens:** Look around your home to find any place that embers may enter. If you leave the house with the windows open in the summer time, make sure your screens have no gaps. According to an Australian study, bronze screening is best at stopping embers. However, screening will not stop penetration of flames or radiant heat if windows are open, exposing vulnerable interior items such as curtains.
- ▲ **Pet doors** can blow open to let embers in. If you have to evacuate, make sure to block them closed before you leave.

PRIORITY FOUR: Windows

The next priority should be windows. Glass can break when exposed to radiant heat or flames; a broken window provides an entry point for flames and embers. Consequently, having windows that can withstand the brief but intense blast of heat from a wildfire is very important. In dual pane windows, the outer pane protects the inner pane; the inner pane heats up more slowly and uniformly, and therefore may not break even though the outer pane does. Tempered glass is much stronger than annealed glass and fails at a higher temperature, so it provides more protection. The 2008 revision of the California Building Code for new construction in the WUI requires dual pane windows with at least one tempered glass pane.

Research has shown that by far the most important factor in determining the vulnerability of windows in a wildfire is the glass, not the frame. Since the type of frame doesn't make much difference in a fire, it can be selected based on cost, aesthetics, energy efficiency, and other factors.

As with vents, homeowners can fabricate window covers out of a noncombustible material or even plywood. Cut to size, have everything ready to attach them to the house and mark them clearly so they can be installed quickly over windows in the event of an approaching wildfire. Manufactured shutters might also be considered.



A structure fire at the arrow burned into nearby trees. Radiant heat cracked the window shown in the red circles.



PRIORITY FIVE: Decks

Post-wildfire research has shown that the initial ignition point for many homes is on or under a deck. An ignited deck endangers many portions of a structure and is often adjacent to large windows or sliding glass doors that can break and permit the fire to enter the house.

How vulnerable the deck is to ignition depends on what it's made of and its condition (rotten wood is much more ignition prone), as well as combustible or flammable items kept on and under the deck and the amount and condition of vegetation near the deck.

Although most common decking materials are combustible, there are some noncombustible alternatives, such as metal decking, lightweight concrete and Class A composites. However, testing has indicated that combustible decking products are likely to ignite from other fuel sources (such as firewood, ignition-prone furniture, vegetation or debris) that are on, under or near the deck.¹

If you can replace your wooden deck, there are several options that will resist combustion, including using tile, some composite materials, etc. You will need to do some homework to find the best option for your home. However, if you can't replace the deck, you can reduce the ignition risk posed by your combustible deck:

- ▲ Ensure that the deck is kept clean of debris both above and below.
- ▲ Limit the number of combustible items you keep on the deck—think of door mats, plants in baskets, wicker furniture, patio umbrellas and such items.
- ▲ On top of or under a deck is a bad place to keep flammable items such as firewood or a gasoline can.
- ▲ Embers tend to accumulate where the deck surface meets the wall. To protect vulnerable siding, install 18" of metal flashing between edge of deck and siding, tucked in behind the lap joint where it terminates.



Consider replacing ground level wooden decks with non-combustible patio materials such as brick, stone or concrete.



Keep needles and debris from accumulating between deck boards or between deck and siding.



If items stored under the deck can ignite from embers, deck and structure will follow along. Don't store combustibles under decks!

PRIORITY SIX: Siding

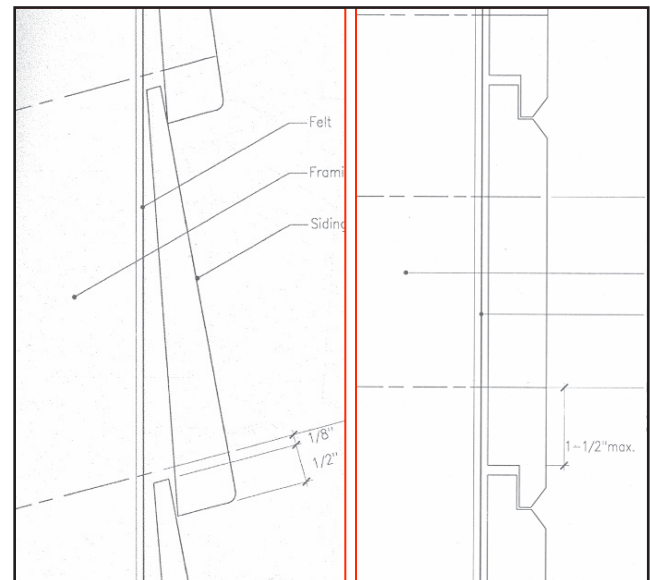
There are several noncombustible siding products on the market: fiber cement boards and panels, traditional three-coat stucco, and so on.

Well-maintained wood siding, though certainly more vulnerable than products such as stucco or fiber cement, is not as big a risk as you might think, assuming that defensible space standards for vegetation have been maintained. However, some wood siding is better than others. For example, plain bevel lap joints are more vulnerable to flame penetration at the joint than are more complicated lap joints, such as a shiplap joint.

Take a hard look at your siding. Combustible siding such as wood panels and clapboard should be carefully inspected annually for gaps and filled with a high-quality caulk to prevent hot embers lodging and burning. Partly decayed wood is more vulnerable. If your siding is starting to show signs of aging, you may need to consider replacement.

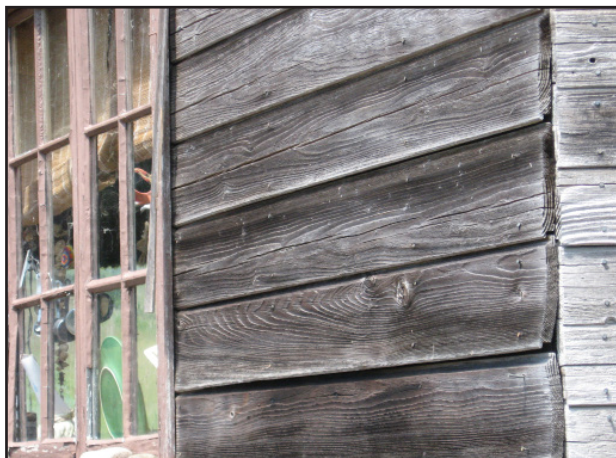
Do you know what is between your siding and the studs? In research trials, good quality sheathing—which is installed underneath the siding—is a key to protecting the home's studs. Combustible siding in combination with inadequate sheathing may have a higher priority for replacement.

If you have an ignition-prone siding like wood shake, but can't afford to replace it, you may want to consider investing in a gel fire retardant. Gels hold water in suspension on the walls, decreasing likelihood that an ember will cause the siding to burn. These products are applied to the structure when a fire threatens, preferably no more than four hours before the flame front hits—something that may be impossible if the fire is moving very fast and residents need to evacuate immediately. Several products are currently available on the market. Do some research and talk with your local CAL FIRE or Fire Department representative, both with questions about the products and to let them know that it is available on your property.



Plain bevel lap joint

Shiplap joint



Home on left is vulnerable to wildfire because of its aging, shrinking wood siding and single pane windows. Home on right was retrofitted with fire-resistant siding, boxed eaves, metal-clad fascia and double-paned windows.

What is Defensible Space?

Defensible Space is a radius of 100+ feet (or up to the property line) around buildings where vegetation has been modified so that an approaching wildfire's power is diminished. Defensible space does **not** mean that all vegetation has been removed. It just means that it has been treated so that there is less fuel available to transmit heat and flames directly to structures or into the tops of trees.

Creating an effective defensible space means developing a series of **management zones** in which you do greater or lesser fuel modifications. Develop defensible space around each building on your property. Include detached garages, storage buildings, well houses, barns, and other structures in your plan.



Defensible space need NOT be a moonscape. Thoughtful landscaping can be beautiful and safe.



Defensible space: before ...



... and after.



Defensible space: before ...



... and after.

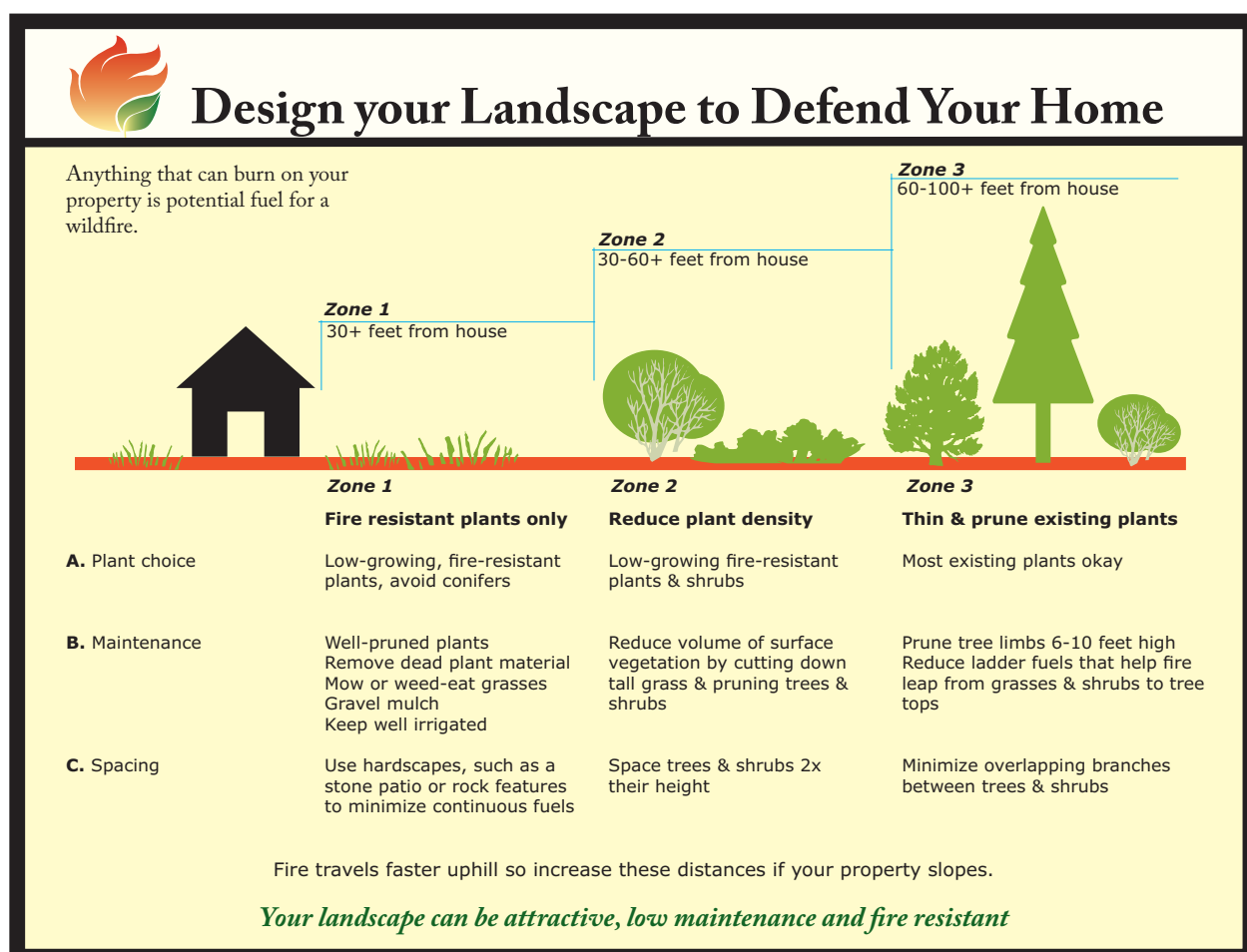
Shaping Your Defensible Space Zones

The actual design and development of your defensible space depends on several factors. A defensible space radius needn't be a perfect circle, it should be shaped to reflect the nature of the property and structures. Consider:

- ▲ Size and shape of buildings: Your defensible space radius is not the center of the structures, but starts at the outer edges of structures and decks, and extends out.
- ▲ Materials used in construction: If your buildings are constructed of combustible materials, increase defensible space distances to compensate.
- ▲ Slope of the ground on which structures are built: Fire moves faster and behaves more aggressively when it is moving uphill. If your house is on a slope, you may need to increase your defensible space radius downhill from structures.
- ▲ Surrounding topography: Natural features such as drainages can funnel fire towards structures. Your defensible space zone should compensate.
- ▲ Sizes and types of vegetation on your property: Not all vegetation burns with equal vigor. Take the time to learn about risky vegetation around your home.

Defensible Space as Management Zones

Start near the home with the **easiest** and least expensive actions. **Keep working** outwards and on the more difficult items until you have completed your entire project.



Zone 1: Begin closest to your house and move outward. Create a “clean, lean and green” **30’ low fuel zone around all structures.**

- ▲ Replace or remove highly combustible plants.
- ▲ Remove all dead materials on the ground or in trees adjacent to or overhanging a building.
- ▲ Thin and prune trees. Remove dead and dying woody surface fuels.
- ▲ Remove “ladder fuels” that fire can use to climb from the ground into the crowns of trees.
- ▲ Clean the roof of the structure free of leaves, needles or other dead vegetation.
- ▲ Remove any portion of any tree within 10’ of a chimney outlet or stovepipe and make sure that there is a screen over the stovepipe or chimney outlet. The screen should be of non-flammable material with openings of one-half inch or less.

Zone 2: at **30’-60+’** from structures create a **Reduced Fuel Zone.**

- ▲ Thin and prune trees. Remove dead and dying woody surface fuels.
- ▲ Remove “ladder fuels” that fire can use to climb from the ground into the crowns of trees.
- ▲ Break up the “horizontal continuity” of fuels so breaks occur between plants that will reduce fire intensity and decrease likelihood that fire will move from plant to plant straight to structures

Zone 3: at **60’-100+’** work on **wildlands vegetation management.**

- ▲ Thin, prune and limb up trees and shrubs and reduce horizontal and vertical continuity, but it can be left a bit more wild.

Homeowners interested in learning how to create defensible space can find information in Fire Safe Sonoma’s publication, **Living with Fire in Sonoma County** (available at www.firesafesonoma.org) and/or consult with local firefighters.

Other Factors for Safety

Can the Fire Department Find You?

Too frequently, emergency responders have trouble finding homes in rural areas because roads and/or house addresses are not clearly marked. 85% of emergency responses are for medical problems, where seconds can matter for your health and survival. Make sure firefighters can find you! Mark access roads with reflective signs containing numbers and letters at least 4” in height, and make sure signs are visible from both directions. Use reflective or illuminated numbers for your house. If your home is accessed from a long driveway, also put a reflective street number sign at the base of the driveway that is visible from both directions.

Can the Fire Department Safely Drive the Access Roads to Your House?

Vegetation-clogged roads present a multitude of dangers for both you and incoming firefighters. Fire trucks are large, so make sure your driveway has at least 15’ of vertical clearance and is at least 10’ wide. Access roads clogged with vegetation pose enormous risks to evacuating residents and incoming firefighters. Make sure you can get out safely, and firefighters can get in to help you.

Water Supply

The more water you can store, the better. Mark water supplies for firefighters. Sonoma County Code requires a minimum of 2500 gallons of water in reserve for firefighter use or a hydrant system approved by fire inspectors.

Costs of Creating Defensible Space

By choosing to live in the beautiful wildland-urban interface, we are also choosing to take responsibility for keeping our homes wildfire safe. Creating and maintaining defensible space is simply one of the costs of living in the WUI.

Unless you do the work yourself, creating defensible space can be an expensive prospect for homeowners, especially those who live in forested environments. Tree diseases such as Sudden Oak Death can force homeowners to do the same work year after year as more trees die. Typically, a five person crew with a 15" chipper costs about \$2,250 per day. While one day with a crew can be enough to clear defensible space, cost estimates can greatly increase if large trees and/or large numbers of trees need to be removed.

Before you get bids on your job, make sure you know exactly where your property lines are, and decide what needs to be done. You may want to consult with an expert to determine which vegetation should be removed. Always consider erosion for any vegetation management! Remember that you can only work on your own property, even if your defensible space is impacted by issues that are over the property line. If possible, work with neighbors to arrive at mutually acceptable solutions.

Check for current licenses and insurance of anyone you hire to work on your property. Ask to be sure they have sufficient experience to safely do the job. Check references!

The Sonoma County Fire and Emergency Services Department currently has a seasonal free curbside chipper program for residents in some areas at risk to wildfire. The program sends a chipper and crew to chip woody materials that have been cut and stacked by residents. You can find out about the program at www.sonomacounty.ca.gov/FES/Fire-Prevention/Curbside-Chipper-Program or by calling 707-565-6070.

Regulations



Defensible space: before...



... and after.

Timber Harvest? Riparian alteration? Endangered species? Such issues are rarely a concern for homeowners creating defensible space, but it's good to know what the laws and regulations are.

If and grant funding is received from state or federal agencies and prior to work performed pursuant to a CWPP, or prior to issuance of discretionary permits or other entitlements by any public agencies to which CEQA or NEPA may apply, the lead agency must consider whether the proposed activity is a project under CEQA or NEPA. If the lead agency makes a determination that the proposed activity is a project subject to CEQA or NEPA, the lead agency must perform environmental review pursuant to CEQA or NEPA.

If a landowner conducts a commercial timber operation while removing commercial tree species from protection zones around homes to comply with PRC 4291, a 1038(c) exemption permit from CAL FIRE must first be submitted. No permits are required if there is no commercial sale of timber (unless local ordinances restrict tree cutting—check with local authorities).

The laws relating to wildfire prevention and loss reduction can be found in Public Resource Code 4290-4299. In addition to setting standards for defensible space, the code also addresses other crucial wildfire safety issues.

Other regulations may also apply, including the Threatened and Endangered Species Act and California Environmental Quality Act.

California Department of Fish and Wildlife reviews all timber harvest plans for compliance with section 1600 and the California Endangered Species Act (CESA). Fish and Wildlife may issue permits for road construction across streams and incidental lake permits when endangered species habitat is involved.

CESA usually comes up in bigger forestry projects and isn't usually a concern for landowners creating defensible space. CESA allows the Department to authorize project proponents to take state-listed threatened, endangered, or candidate species if certain conditions are met.

Fish and Wildlife's 1600 jurisdiction includes the clearing of brush in the riparian corridor of stream/river. Section 1600-1616 of the Fish and Game Code, called a Lake or Streambed Alteration Agreement is required for any project that will:

- ▲ Substantially divert or obstruct the natural flow of any river, stream or lake;
- ▲ Substantially change or use any material from the bed, channel, or bank of any river, stream or lake;
- ▲ Deposit or dispose of debris, waste, or other material containing crumbled, flaked or ground pavement where it may pass into any river, stream or lake.

Sonoma County regulations may also apply to vegetation management in riparian areas. Contact Permit Sonoma for further information.

Resources

Research over the last 20 years has led to a wealth of information about how to reduce structural ignitions from wildland fires. This document provides an introduction to the basic concepts, and is intended to inspire readers to further research. Here are just a few of the great resources out there.

Steve Quarles is a researcher for **The Insurance Institute for Business and Home Safety**. See the Southern California Guide for information relevant to Sonoma County. Download these materials at www.disastersafety.org/wildfire

Home Survival in Wildfire-Prone Areas: Building Materials and Design Considerations Stephen L. Quarles, et al. UC ANR Publication 8393, May 2010. <https://anrcatalog.ucanr.edu/pdf/8393.pdf> This publication is a great place to start for anyone interested in learning a lot more about the design methods and materials that can help your home survive a wildfire. Also from the UC Cooperative Extension, the **Homeowner's Wildfire Mitigation Guide** ucanr.edu/sites/wildfire/ provides easily accessible information about each vulnerable part of a structure.

CAL FIRE's website at www.fire.ca.gov provides up to date information about wildfires as well as a wealth of information about forestry issues, grants and wildfire safety and preparation, including access to the excellent **READY SET GO** program materials www.readyforwildfire.org

The **California Office of the State Fire Marshal** regularly updates the **Buildings Materials Listings**, which lists homebuilding products approved for Wildland /Urban Interface areas. http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.php

Firewise Communities USA www.firewise.org. "The National Fire Protection Association's (NFPA) Firewise Communities program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from the risk of wildfire." The "Firewise You Can Use" section on their website contains a wealth of great information.

Our own **Fire Safe Sonoma** has excellent information specific to our region. www.firesafesonoma.org

Fire Safe Marin has a truly excellent website. See the excellent plant list! www.firesafemarin.org

The **California Fire Safe Council's** offers great information as well as access to the Grants Clearinghouse, which provides funding for projects in WUI areas. www.cafiresafecouncil.org.

This document was created by Fire Safe Sonoma, Sonoma County's non-profit fire safe council. Our

mission:
To promote fire safety and protect natural and man-made resources in Sonoma County through education, information exchange, resource sharing and community cooperation.

You can learn more about Fire Safe Sonoma at www.firesafesonoma.org or by calling 707.206.5467. Join with us to make Sonoma County a Wildfire Adapted Community!

