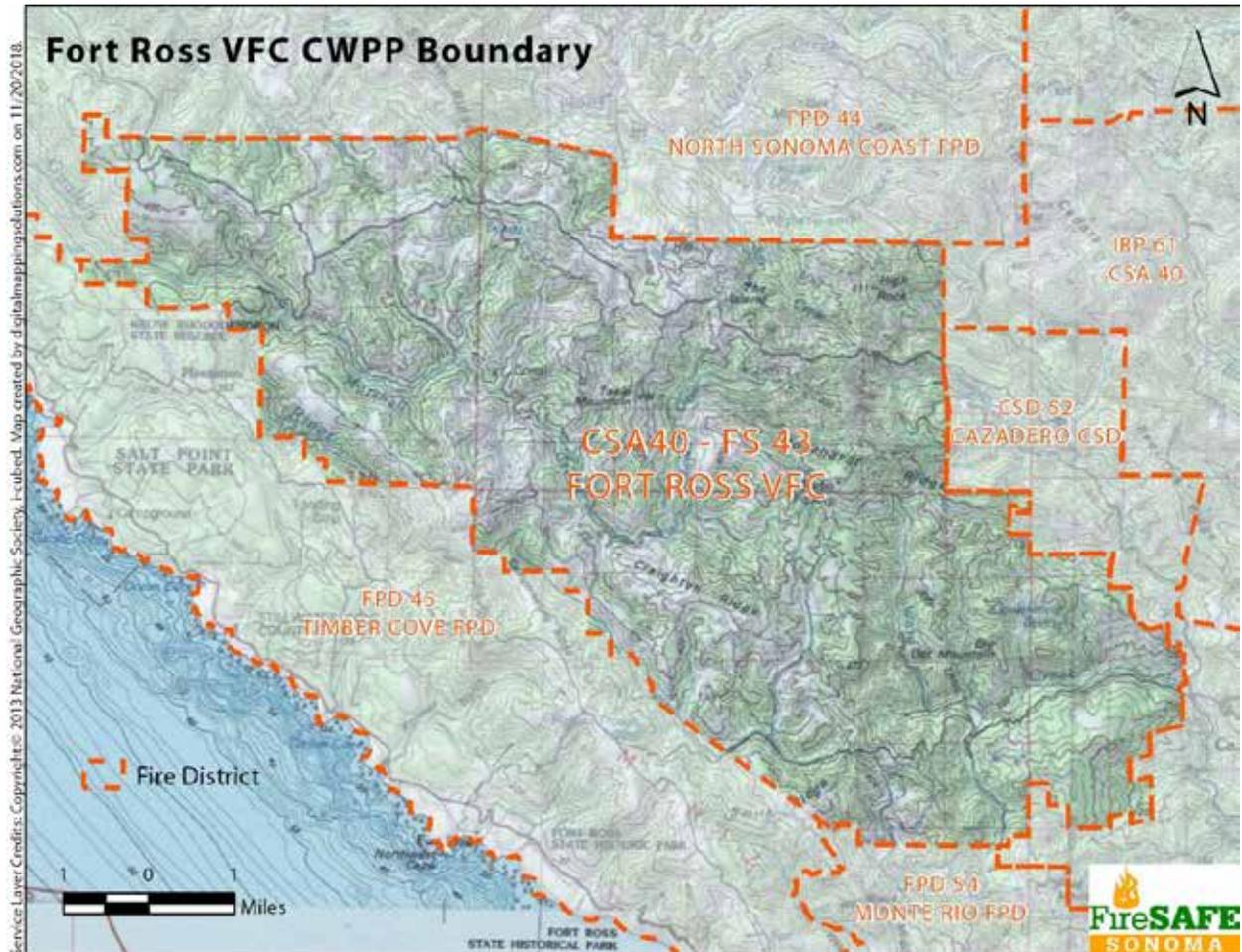


Fort Ross Volunteer Fire Department Service Area Community Wildfire Protection Plan (CWPP)



January, 2018

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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.

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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 and thus, is 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:

The 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 Volunteer Fire Department Service Area. 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 and unimproved parcels is 74.51. 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, average elevation 1,013.

Fire Services: The area is served by the Fort Ross Volunteer Fire Department, 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, and North Coast Fire. 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, and 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. There were thousands of pines and other conifers planted subsequent to the 1978 Creighton Ridge Fire. There has been little large-scale fuels reduction in the area since the 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 can raise fuel moisture and cool temperatures in lower elevations. 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 10,590 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 three 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 risk to these three priority assets at risk. 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 our community. The CWPP sets the foundation for actionable projects which will help the community plan and prepare for wildfires and other emergencies, and make our homes and landscapes more resilient. The goal of these projects is to protect life, property and the cultural and natural resources of the watershed.

Community Wildfire Protection Plan Planning Group Members

The following individuals were core committee collaborators on the Fort Ross Fire Service Area Community Wildfire Protection Plan.

Fort Ross Fire Service Area CWPP Core Committee:

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

- **Fort Ross Volunteer Fire Department:** Chief Steve Ginesi
- **CAL FIRE:** Division Prevention Chief Ben Nicholls, Battalion Chief Marshall Turbeville
- **Sonoma County Fire:** Fire Marshal James Williams
- **Coast Ridge Community Forest:** Judy Rosales, Executive Director
- **Fort Ross Community Disaster Preparedness Group:** Gayle Alexander
- **Fire Safe Sonoma:** Roberta MacIntyre, President, Caerleon Safford, Executive Coordinator
- **Homeowners Associations and Community Groups:** Gualala Ranch HOA; Navarro Ranch HOA; Seaview Ranch Road Association
- **The many community members** who participated in planning meetings

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: Southeast to Pole Mountain

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.

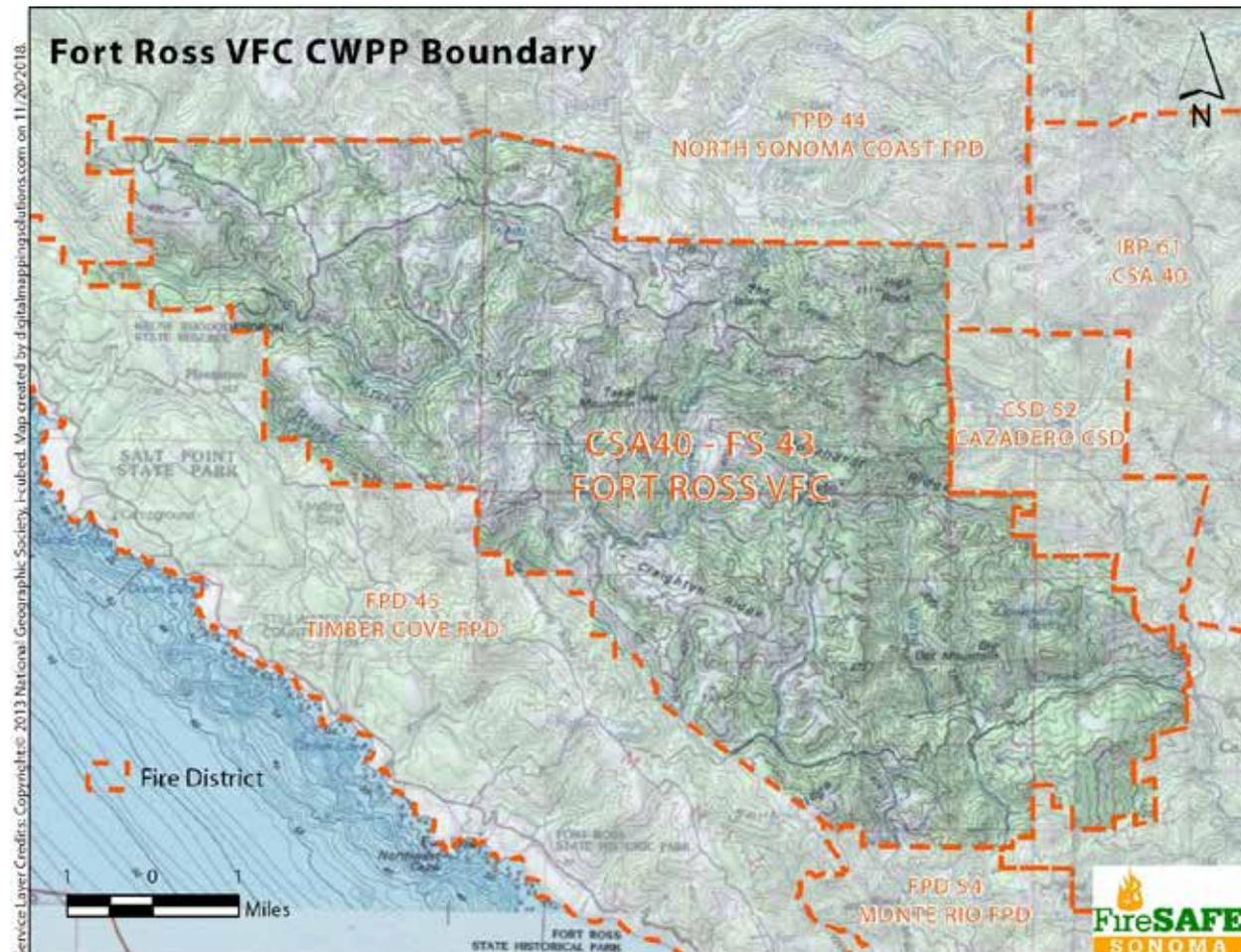
The following representatives of the entities required for CWPP approval mutually agree with and approve the contents of this Community Wildfire Protection Plan:

<hr/> <p>Lynda Hopkins Supervisor, Sonoma County District 5</p> <hr/>	<hr/> <p>Date</p> <hr/>
<p> Steve Ginesi (Mar 12, 2019)</p> <hr/>	<p>03/12/19</p> <hr/>
<p>Steve Ginesi Chief, Fort Ross Volunteer Fire Department</p> <hr/>	<p>Date</p> <hr/>
<p> Shana Jones (Mar 13, 2019)</p> <hr/>	<p>03/13/19</p> <hr/>
<p>Shana Jones Unit Chief, CAL FIRE Sonoma-Lake-Napa</p> <hr/>	<p>Date</p> <hr/>
<p> James Williams (Mar 13, 2019)</p> <hr/>	<p>03/13/19</p> <hr/>
<p>James Williams Assistant Chief, Sonoma County Fire Prevention</p> <hr/>	<p>Date</p> <hr/>
<p>Roberta MacIntyre</p> <hr/>	<p>3/12/19</p> <hr/>
<p>Roberta MacIntyre President, Fire Safe Sonoma</p> <hr/>	<p>Date</p> <hr/>

Fort Ross Volunteer Fire Department Fire Service Area CWPP

Location and Community Boundaries

The boundaries of this CWPP are formed by the Fort Ross Volunteer Fire Department Fire Service area. 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. Our highest elevation is 2,322 feet; the lowest is 1,011 feet, average elevation 1,013.



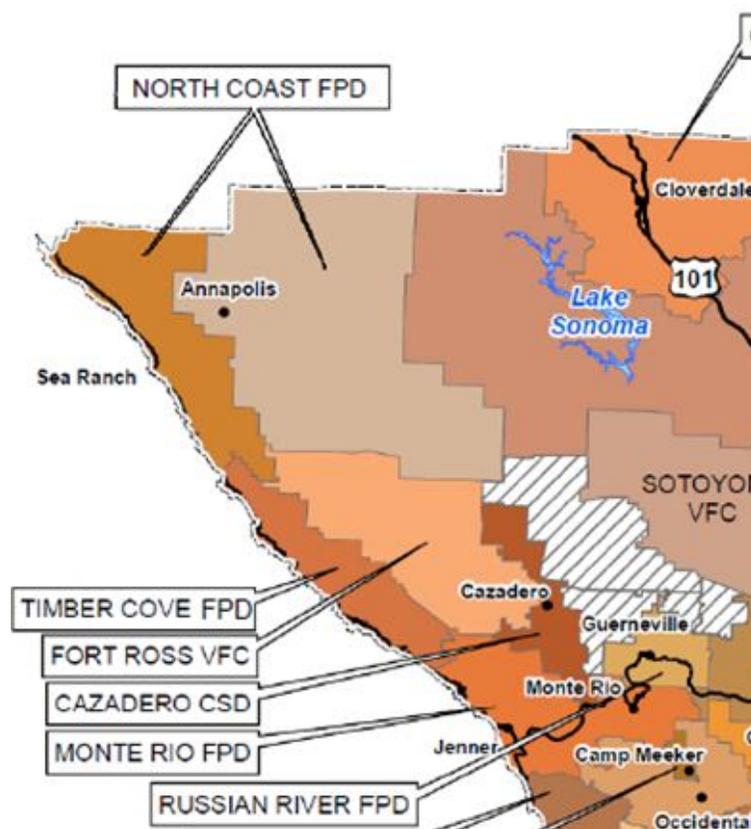
Map 1: Fort Ross VFD Fire Service Area and CWPP Project Area

Fire Department Service Areas

At the time of writing, the Fort Ross Volunteer Fire Department serves the project area for all emergency response including medical aid, fires, hazardous materials, and community emergencies, large and small. While the VFD 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 Fort Ross' Fire Service area. Timber Cove Fire Protection District is located on our western border, Cazadero Community Service District is on the east, North 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 VFD will respond to calls in neighboring districts, automatically in the event of fire, or upon request of the incident commander.

At the time of writing, there are considerable changes taking place in fire department organization across the county. The Fort Ross VFD, 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.



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

Volunteer fire departments are facing significant challenges to attract enough volunteers. Our communities are aging, a demographic reflected in local VFD 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 are doing an awesome 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 are not going to live here full time, and are not in likely to be able to volunteer. This is likely to be an issue which will continue to be problematic into the future.

Parcel Data

Fort Ross VFD 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 VFC 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 1 parcel owned by the State of California. Primary land uses are residential, vineyards, and ranching.

There are three residential subdivisions (40-acre minimum parcel size), which is where the majority of the population resides. Two of the subdivisions, Navarro Ranch and Gualala Ranch, have active Homeowners Associations and 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.”

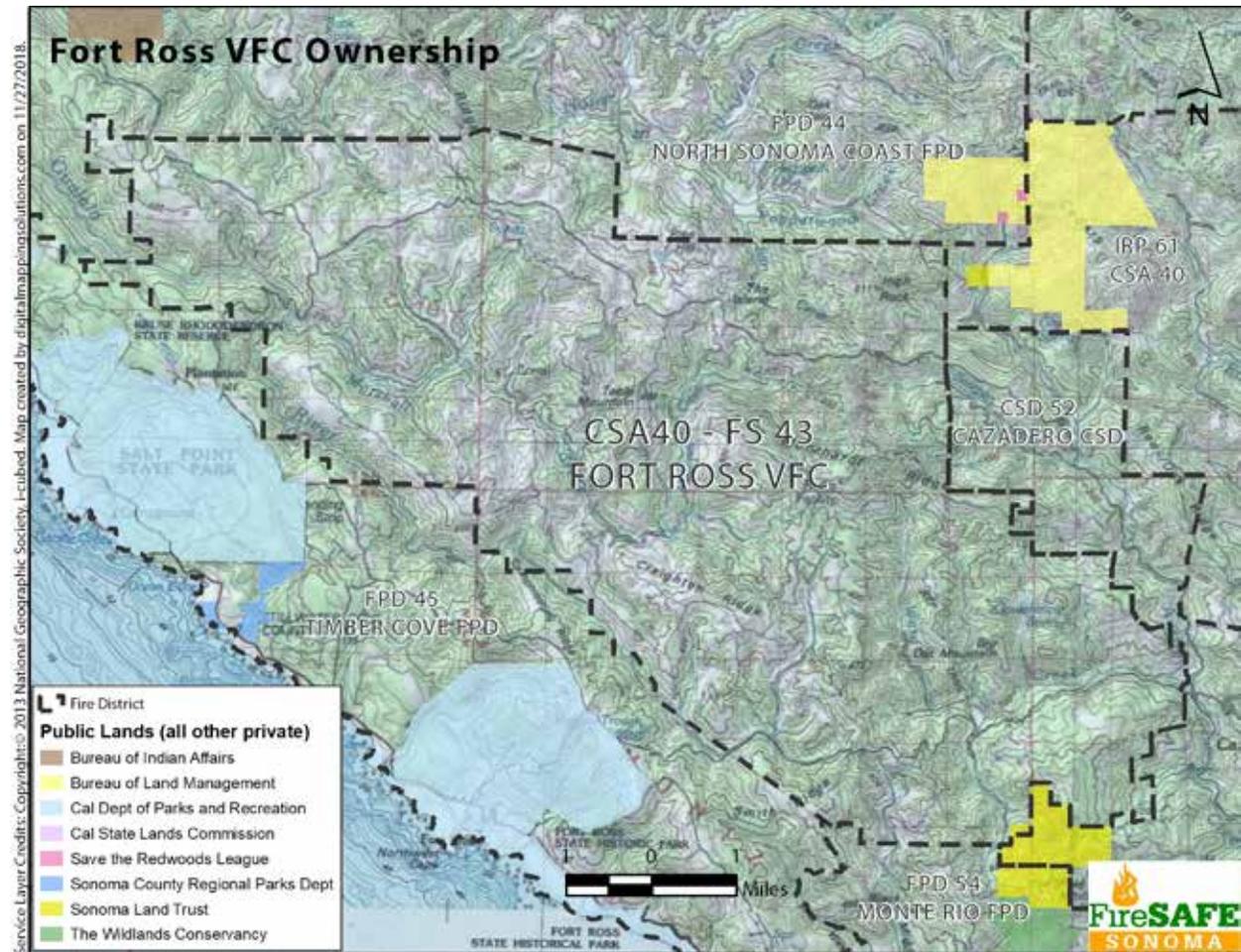
CC&Rs do provide for vegetation management within a 30 foot easement, and Gualala Ranch does annual mowing and trimming along common roadways. Though there are some commercial vineyards and olive orchards within in the subdivisions, the majority of parcels are residential. Most residents do not have the resources to maintain their 40 acre forested parcels, so there are significant fuels build up issues in these areas. The Coast Ridge Community Forest 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 increases in traffic on narrow roads, water use, environmental concerns, and fire risk due to equipment and people 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

Demographics

- The population in rural areas throughout the county is aging, which is also true in the project area. 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 activities 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 bicycles, 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 5 hours, can cause roadway congestion and response delays.
- Padmasambhava Peace Institute (PPI): Occupying the former Black Mountain CAL FIRE inmate camp, PPI hosts a variety of workshops and events throughout the year which can bring 50 or more participants. PPI generously hosts Fort Ross VFD Station 4 on the property.

Community organizations:

- **Fort Ross Volunteer Fire Department**
- **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. Our community first came together in 1978 to restore our 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 VFD and local residents created an emergency preparedness system several years ago. Neighbor “Pods” of three to six households create the foundation for our rural community’s disaster preparedness. Whether it’s fire, earthquake, or an intense storm, being in a Pod means shared mutual assistance. Each Pod is inherently committed to being highly alert during Red Flag Days as well as winter’s heavy rains risk of flooding and landslides. Our Pods also form the basic unit for an emergency phone tree. Along with a local internet alert system, the phone tree may be used to notify residents about fires, evacuation, or other emergency information. Many in the community have scanners and ham radios to aid each other in receiving and passing on vital information.
- **Coastal Hills Community Project:** This is a community wide email list serve which is widely subscribed to for information about all local events, as well as emergency info.
- **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 provide information about how to stay safe in a rural environment.

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.

Northeasterly winds are common in the late summer and fall months and pose the greatest wildfire risks. The 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).

Mediterranean climates are typified by an extended dry season from approximately April through November. Localized climate projections suggest that climate is likely to become increasingly arid with shorter winters and longer, drier summers. Rain is predicted to come in more intense rain events, rather than spread out over the wet season. Winter rainfall averages of 60 to 80 inches are among the highest in California.

Sonoma County and California in general experienced severe drought between 2011 and 2015. The 2013-2014 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 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 RAWs (Remote Access 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.

Date	Mean Wind Speed	Mean Wind Direction	Maximum Wind Gust	Average Air Temperature					Average Relative Humidity			Precipitation
	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

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, and limited egress and access roads. This potential turned into reality October 8 through October 31, 2017 when the Tubbs, Nuns, and Pocket fires, and several smaller fires (Pressley, 37, etc.) known as the Sonoma Complex, 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 impact of loss of life, homes, and harm to the Sonoma County economy will continue for decades. This tragic 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 far eclipsed those tragic 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 may underestimate 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 and 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. Our topography is steep. High annual rainfall, in addition to encouraging dense vegetation growth area-wide, means that the landscape is characterized by drainages or “chimneys” which flow during the winter only. During the dry season, fire can use drainages to make rapid runs upslope. We should think of fire as operating oppositely to how water will flow: fire goes fast up hill, and uses topographic features that water uses to go downhill to go uphill.

Despite our location 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 nighttime cooling common at lower elevations. Likewise, while temperatures along the coast are typically well below 80 during most of the fire season, our average daytime high is 76°. On-shore winds are common as the cooler air along the coast is drawn inland by hotter temperatures there. Seasonal northeast wind events are common during summer and fall, and represent the greatest risk for increased risk of uncontrollable wildfire.

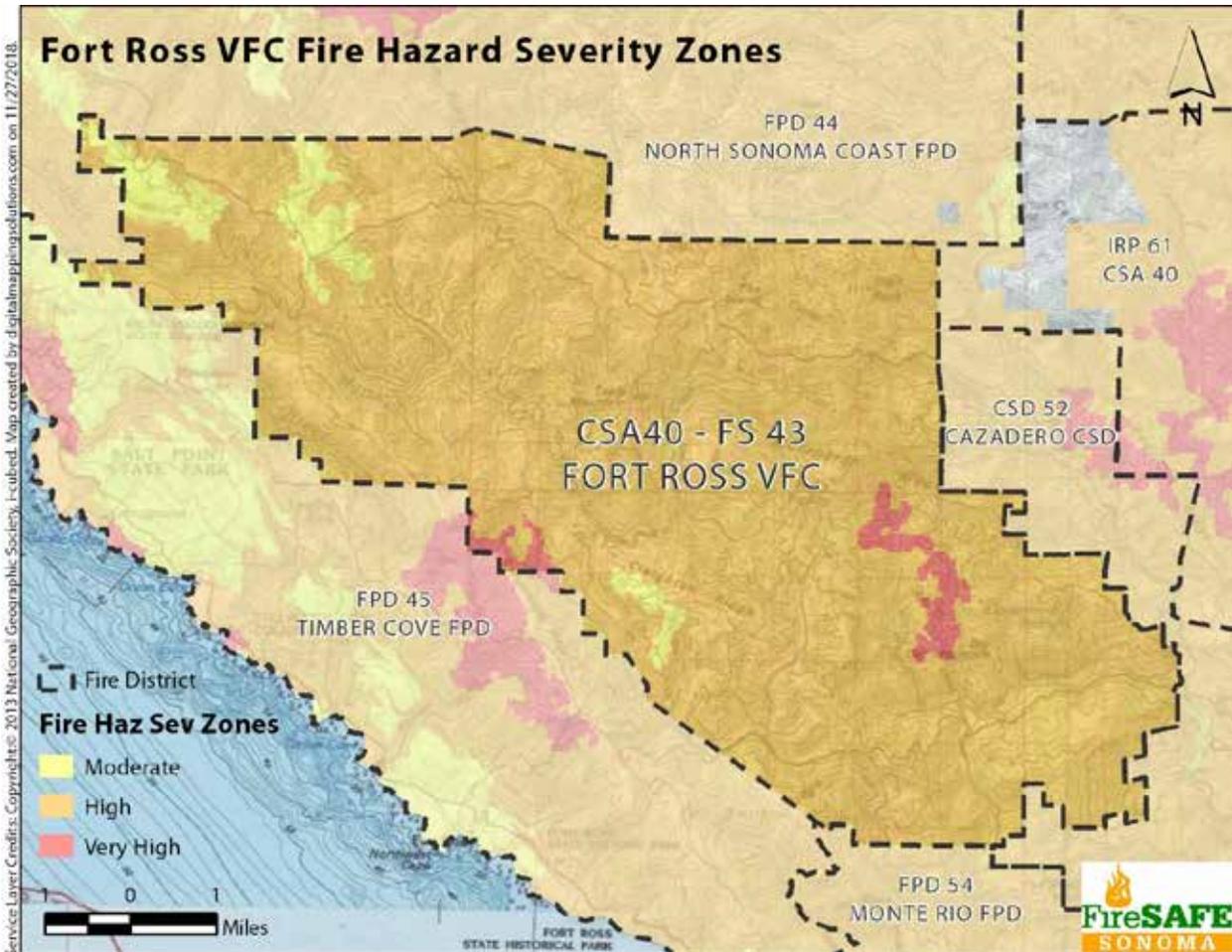
In general, this is a vastly different fire environment than even 10 years ago. Fuels are denser, and tree mortality, especially Sudden Oak Death, has left a legacy of dead and dying trees. Little large scale fuels treatment has been accomplished since the Creighton Ridge Fire in 1978. Additionally, subsequent to the Creighton Ridge Fire, thousands of conifers were planted across the area. There is been little or no maintenance to 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 towards a future characterized by more and higher intensity fires, it is increasingly important for homeowners to take responsibility for their homes and property.

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 CWPP

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



Map 4: Fire Hazard Severity Zones

The Built Environment Homes should be thought of as part of the fuel component. Most homes in the area were built before Wildland Urban Interface (WUI) building codes took effect, and most have vulnerable elements that will increase potential for ignition. Intensive education and outreach will help residents understand the importance of retrofitting vulnerable elements for increased ignition resistance, and maintaining homes clear of dry vegetation on and near buildings. Please see Appendix D *Creating Wildfire Adapted Homes and Landscapes* for specific guidelines about home hardening and defensible space.

Additionally, many homes do not have defensible space adequate for this high-risk area. Large parcel size means that most residents have sufficient space to create a 100 feet of defensible space, and are not vulnerable to the house-to-house ignitions which have characterized recent Northern California wildfires. It is critically important that homeowners take initiative to create and maintain adequate defensible space and harden homes against wildfire ignition.

Homeowners Insurance: While many local property owners do have insurance, there are a significant number of properties which are not insured. Recent wildfires have made obtaining coverage cost prohibitive for many local residents.

Wildland Fuels across the project area need to be thinned and maintained to create healthier forests and landscapes which are better adapted to a fire prone environment. 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 our 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.

While projects which 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 critical 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.

Egress and Access—Evacuation Routes

Road Infrastructure—Due to distance from population centers and narrow, steep and curving roads, access into the area is difficult, and slow response times from incoming emergency services can be expected. See Appendix C, "

Any fire in the area will be greatly complicated by the issues caused by narrow roads and limited access. The area is served primarily by five county-maintained paved roads, Fort Ross Road, Bohan-Dillon Road, King Ridge Road and Hauser Bridge Road and Tin Barn Road. Each of these roads is narrow, has steep slopes, limited visibility due to blind curves, and significant roadside vegetation. Most houses are accessed by a series of privately maintained secondary dirt roads. Typically, these secondary roads are narrow with limited turn-arounds and pull outs, steep grades, and limited visibility due to blind curves. In some areas, roads have been signed with metal reflective signs, but there are areas are not well signed.

There will be significant risks to life safety for evacuating residents and incoming firefighters in the event of a large uncontrolled wildfire. Many residences located on the secondary roads have one way-in-one-way out access.

While efforts have been ongoing to increase community-wide planning for wildfire and other emergencies, area-wide, participation and buy-in area wide has been limited. Following the 2017 Sonoma Complex Fires, there has been an increase in emergency planning, but continued and sustained activities and increasing participation are critical for life safety in the community. Advanced evacuation planning and identification and creation of places which might potentially be used by residents faced with deteriorating or unknown conditions during evacuation should be high priority.

Access to Structures for Fire Fighting: There are numerous non-conforming bridges on secondary roads and driveways. 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. Residents need to consider the risks and mitigation strategies for unrated bridges. Likewise, local residents need to maintain vegetation clearance on access roads and driveways so that they can be safely used during any emergency incident. Finally, it is critically important to clearly mark street names and address numbers with reflective metal signs.

While many area roads have been signed, many remained un-signed. Even more homes do not have house numbers clearly identified. This issue is complicated by problems with addressing in the area as a whole. Almost all addresses in the area 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 attempted 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.

It is critical that local residents understand that fully 80% of Fire Department responses are for medical emergencies! Seconds can count in a medical emergency. It is in residents' best interest that first responders can easily find them.

Gates: The Fort Ross VFD Department has made locks available to many landowners, but there are many gates that do not provide easy access for emergency services.

It is crucial that residents understand the risk of wildfire, reduce vegetation near homes and on roadsides and driveways, prepare for emergencies of all kinds, and work together to make the entire community better prepared for wildfire.

Emergency Notification and Alert

Landline and Cellular Phone Communications: The local landline phone system has been owned and operated by a variety of vendors over the years. As is true in many rural areas, the number of phones is low, so providing landline services to the area is typically not economically viable for the provider. Consequently, maintenance of the lines has been a continuing issue over the years, with frequent phone outages, some of which have lasted for multiple days. 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. One important safety tip is to keep a corded (non-wireless) landline phones 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 your 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. Recent incidents in Northern California have exposed vulnerabilities in how emergency alerts are delivered to residents. Additionally, wildfires are moving so fast that there can be very limited time for residents to safely evacuate.

Alternative alerting systems, such as developing our own 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. We have also encouraged local residents to become licensed Ham Radio operators, and many have.

There are sirens located in two locations, but complex topography will limit how many can hear sirens and residents have to know what sirens mean. Additionally, because sirens cannot be directed so that evacuations proceed in a manner that considers areas at highest risk and traffic flow on narrow roads, their use may cause additional risks. 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 if you have a scanner, listen frequently.

Natural Vegetation

Wildfire is a natural part of California's ecology. For more than 10,000 years, Native American tribes used fire 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 Anadel State Park concluded that fire return intervals in redwood-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 five years. Fire was used so often and for so long that it has become a necessary component of many of California's ecosystems.

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 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 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 has been largely excluded from the landscape, with the exception of large damaging fires such as the 11,000 acre 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. In addition, the population in the area has steadily grown; the probability that a fire will occur increases with population.

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, 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; greatly increasing fire fuels and posing falling risks.

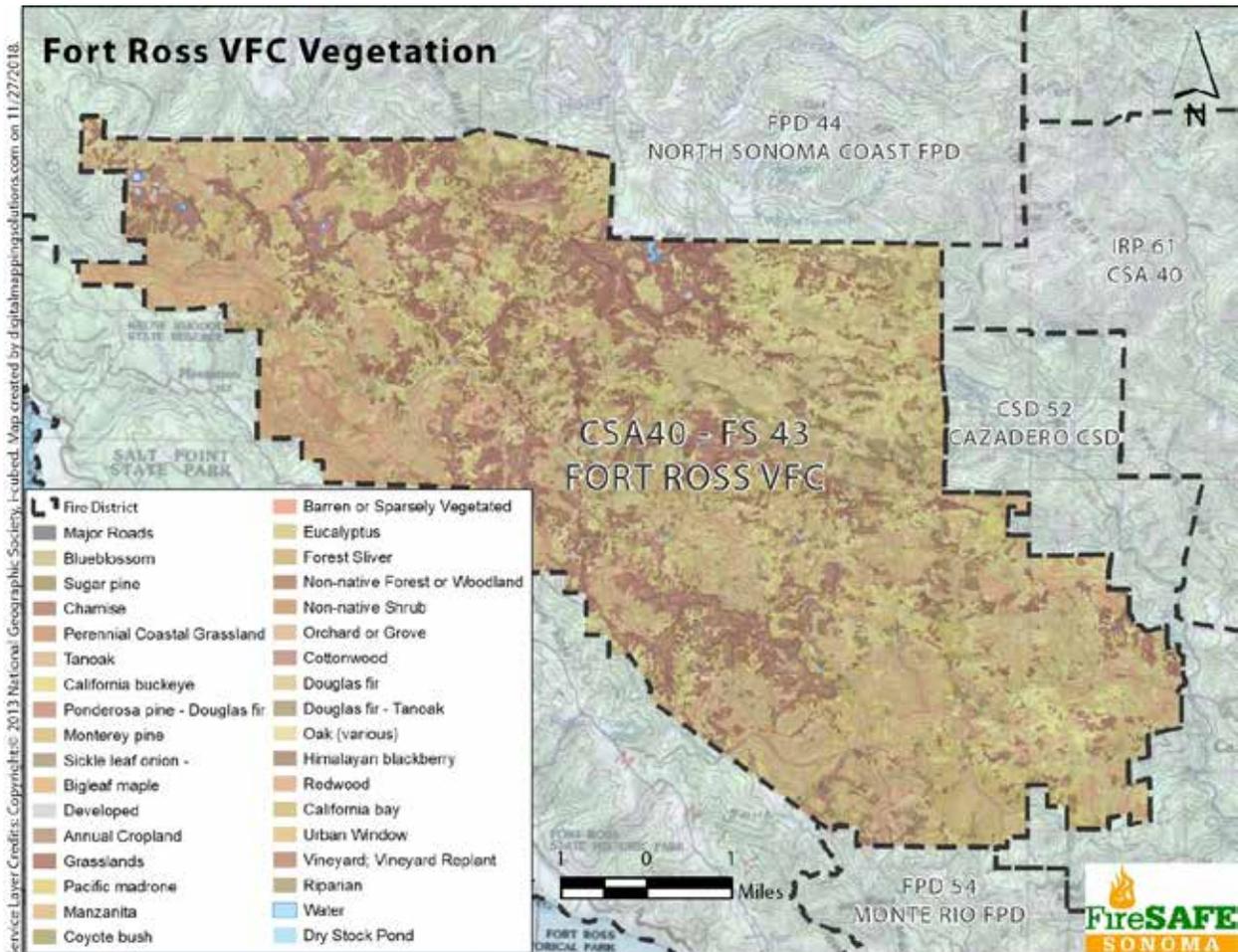
Northwest Sonoma County has been particularly hard hit for three primary reasons. *P. ramorum* thrives in the cool, wet climates which typify our area. California Bay Laurel, which grows throughout our forested areas, acts as breeding grounds for inoculum, which may then be spread through wind-driven rain, 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 near total in heavily impacted areas. SOD has continued to kill trees in the area since first identified a decade 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. It is because of these factors that 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 model. 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 will add cost.

We are 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

Vegetation Treatment Options

The CWPP area has a huge variety of native vegetation communities: redwood, Douglas fir, bay, madrone, oaks, tanoak, grasslands, and chaparral intermingle in a shifting mosaic with composition influenced by slope, aspect, and moisture availability.

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 removing for disposal or reuse (firewood, chips for cogeneration, finished wood products, etc.) off site. 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. 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 varies considerably, and the cost of treatment will increase along with fuel density, difficulty of access and steepness of terrain.

California Department of Corrections 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.

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 Community Forest is exploring potential for developing sustainable models for reintroduction of grazing across the area.

Prescribed Fire: The ecology of Sonoma County is fire-adapted, meaning that native plant species evolved with fire as an integral and regularly occurring component of ecosystem health. Decades of successful fire suppression has greatly increased the density of plants, while at the same time increased home building in wildland areas has put more homes and lives at risk to catastrophic wildfire. 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. Prescribed fire is one of the best and most cost efficient means of fuel reduction. However, needless to say, it does come with inherent risks and complications. Anyone planning for a prescribed burn will need to be sure they have all necessary permits and permissions, and 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.

Wildland Urban Interface (WUI) Condition:

The term "WUI" comprises both Wildland Urban Interface and Intermix, but there is a distinction. This plan uses the term Wildland Urban Interface/Intermix as defined in the Federal Register (66:751, 2001) report on WUI communities at risk from fire (USDA & USDI, 2001) as follows:

*“The **Interface** Community exists where structures directly abut wildland fuels. There is a clear line of demarcation between residential, business, and public structures and wildland fuels. Wildland fuels do not generally continue into the developed area. The development density for an interface community is usually 3 or more structures per acre, with shared municipal services. Fire protection is generally provided by a local government fire department with the responsibility to protect the structure from both an interior fire and an advancing wildland fire. An alternative definition of the interface community emphasizes a population density of 250 or more people per square mile.”*

*“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.”*

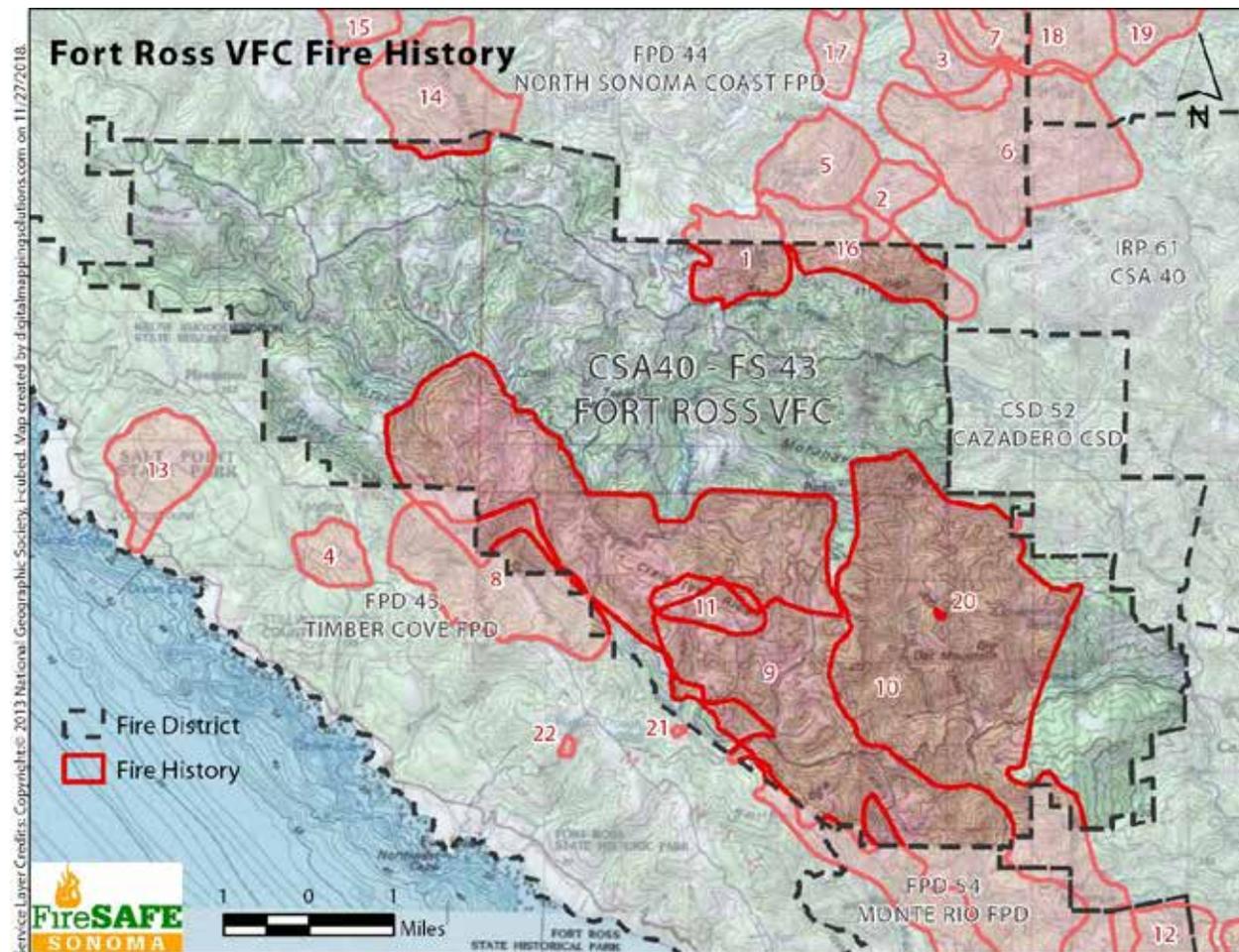
Using this definition, the Fort Ross Fire Service Area CWPP is designated as Wildland/Urban Intermix.

Fire History

Northwestern Sonoma County and the Fort Ross Fire Service Area 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 our CAL FIRE Unit, 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. These have typically been our most common causes in this area.

Prior to the 1978 Creighton Ridge fire, several fires burned in the steep terrain and heavy fuels. It can be expected that fire will return to the landscape in the future. Fire intensity, size and rate of spread, and home and life loss 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 6: MAP: West County Fire History: See following page for key.

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

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; consult with the fire department to determine the best fittings and locations for tanks.

There are some ponds and reservoirs scattered throughout the area. Typically, it is these ponds which 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 into the future.

Existing Plans:

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 unit.

Watersheds and Hydrology:

Ward Creek, South Fork of the Gualala, 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 in the Russian Gulch and Gualala River Watersheds.

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 in the Gualala River and Russian Gulch watersheds rely on the Gualala River, 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 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.
- Established landscaping and orchards
- Vehicles

Utilities:

- Electrical lines are all above ground
- Solar systems
- 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 causing damage to waterways and riparian habitat and species

Plant and Animal list

- Forest and woodland habitats dominate the Preserve 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 Preserve include a number of species of vireos, flycatchers, and warblers.
- 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.
- Invasive plant species of particular concern include: French, Spanish and Scotch broom, Harding grass, fennel, Himalayan Blackberry,
- Domestic animals including horses, sheep, cattle, chickens, pets.
- Commercial Agriculture (Vineyards, vegetables, flowers)
- 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.