

A REPORT BY
THE 2019-2020 CONTRA COSTA COUNTY CIVIL GRAND JURY

725 Court Street
Martinez, California 94553

Report 2007

**Wildfire Preparedness in
Contra Costa County**

APPROVED BY THE GRAND JURY

Date June 8, 2020

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ACCEPTED FOR FILING

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Contra Costa County Grand Jury Report 2007

Wildfire Preparedness in Contra Costa County

TO: Board of Directors of: Contra Costa County Fire Protection District, East Contra Costa Fire Protection District, Moraga-Orinda Fire Protection District, Rodeo-Hercules Fire Protection District, San Ramon Valley Fire Protection District

City Councils of: El Cerrito, Pinole, Richmond

SUMMARY

Wildfires occur every year in California and Contra Costa County (the County), but in recent years the size of and damage from wildfires has increased substantially. The Grand Jury examined Contra Costa County's preparedness for future wildfires.

Fire districts and fire departments in the County have responded to the elevated risks of fire in many ways, including:

- Increased staffing and patrols during a Red Flag Warning
- Expanded weed abatement programs
- Advising homeowners on hardening their homes and property
- New technology to detect fires earlier and aid in evacuation
- Evacuation planning
- Public education on fire hazards and preparation for fires

PG&E's recent Public Safety Power Shutoffs (PSPSs) have affected evacuation efforts

and emergency responses during a fire. Fire districts and fire departments are not always informed in advance of PG&E's non-emergency maintenance work in high fire risk areas.

Due to a lack of funding, the number of fire stations and staffing levels in East Contra Costa Fire Protection District has not been restored to the pre-2008 levels.

The Grand Jury recommends that County fire districts and fire departments consider updating their wildfire evacuation plans and incorporating advanced routing technology. The Grand Jury also recommends that the County fire district boards and the cities of El Cerrito, Pinole, and Richmond consider identifying funds to adopt or expand the use of new technologies to help detect fires in high-risk areas. The Grand Jury recommends that East Contra Costa Fire Protection District consider identifying options to fund additional fire stations and staff to restore fire services to pre-2008 levels. The Grand Jury recommends that the County fire district boards and the cities of El Cerrito, Pinole, and Richmond review and consider mechanisms, such as the ordinance passed by the San Ramon Valley Fire Protection District, that enable the fire district or fire department to recover labor and equipment costs from PG&E for overseeing electrical utility work that presents a high fire risk.

METHODOLOGY

During this investigation, the Grand Jury:

- Interviewed Contra Costa County fire personnel
- Reviewed evacuation plans and other fire preparedness materials provided by Contra Costa County fire districts and fire departments
- Toured the Contra Costa County Sheriff's Communications Center and Emergency Operations Center

BACKGROUND

Contra Costa County fire protection services are provided by eight city fire departments or fire protection districts. Fire protection districts cover multiple towns, cities, and unincorporated areas. They report to an elected board of directors. A few individual cities maintain their own fire departments and may contract with adjacent areas to provide fire protection services. They report to their respective city councils, usually through a city manager.

California experienced the most destructive wildfires in its recorded history in 2017 and 2018. Due to a combination of drought-stricken land and record high temperatures, wildfires burned over 1,500,000 acres, damaged or destroyed over 10,000 structures, and took 47 lives in 2017, as reported by the California Department of Forestry and Fire Protection (CAL FIRE). In 2018, CAL FIRE reported almost 2,000,000 acres burned and

24,000 structures damaged or destroyed, and 100 people lost their lives. In 2019, California experienced 7,860 wildfires resulting in an estimated 259,823 acres burned and 732 structures damaged or destroyed. According to CAL FIRE, the California fire season is starting earlier and ending later each year.

The increase in wildfires is partially attributed to over-dry vegetation, record high temperatures, and powerful offshore seasonal winds. Wildfires have also increased with the growth in population areas situated close to wildlands. These areas, known as Wildland-Urban Interface (WUI) zones, are surrounded by dense tree growth and often have limited egress routes for evacuation.

The Santa Rosa (Tubbs) and Paradise (Camp) fires have increased Contra Costa County residents' awareness of the fire potential in their neighborhoods.

Figure 1: Pocket, Tubbs, Nuns, and Atlas Fires



Source: CAL FIRE, October 15, 2017

The Tubbs Fire (shown in Figure 1) started on October 8, 2017. By the time it was contained, 22 people in Sonoma County had lost their lives, most in the city of Santa Rosa. The fire burned approximately 36,810 acres and destroyed more than 5,643 structures. Gale-force winds blew embers a half-mile ahead of the flames on the first night, causing the fire to move at a speed of three miles per hour. It took only four hours for the fire to travel from Calistoga to Santa Rosa, burning at a rate of about an acre a minute. The fire jumped Highway 101 and devastated the Coffey Park neighborhood in Santa Rosa. In all, more than 42 people across four counties lost their lives, making it

the most destructive wildfire in California history at the time.

On November 8, 2018, the Camp Fire consumed 10,000 acres around Paradise, California, in about 90 minutes – burning the equivalent of more than one football field every second. The fire spread rapidly because of windy and dry conditions, and it overwhelmed all communication and evacuation plans. Eighty-six people lost their lives in the fire.

In the 1960s, 8,000 people lived in Paradise. When the Camp Fire occurred, Paradise had grown to 26,572 people with only four evacuation routes running south – down ridges and through forests. After a wildfire in 2008, a forest roadway north of the town was paved to provide an outlet for residents on the upper ridge above Paradise. However, on the day of the Camp Fire, the narrow winding northern road became impassable, and existing roads failed to meet mass evacuation needs.

Before the 2018 fire, the city of Paradise conducted evacuation drills, advertised its warning system, and promoted “pack and go” preparations. These preparations did not prevent the destruction of Paradise during the chaos of the firestorm.

Before and After Photos:

Cypress Meadows Post-Acute Skilled Nursing Facility in Paradise



Source: P. Murphy, Paul. (November 14, 2018) CNN

The Grand Jury investigated Contra Costa County’s preparedness to handle a similar wildfire threat in the future.

DISCUSSION

Causes of Wildfires

The United States National Park Service states that humans cause nearly 85 percent of wildland fires in the United States. Human-caused wildfires can result from campfires left unattended, the burning of debris, equipment usage and malfunction, negligently discarded cigarettes, and intentional acts of arson. Hazardous fuels, such as accumulated vegetation, increase the likelihood of an unusually large wildland fire.

Red Flag Warning

According to CAL FIRE, the National Weather Service issues Red Flag Warnings to alert fire districts and fire departments of the onset, or possible onset, of critical weather and dry conditions that could lead to rapid or dramatic increases in wildfire activity. A Red Flag Warning is issued for weather events which may result in extreme fire behavior that will occur within 24 hours. A Red Flag Warning is the highest alert. During these times extreme caution is urged by all residents because a simple spark can cause a major wildfire.

During a Red Flag Warning, many Contra Costa County fire districts and fire departments increase their staff and send out patrols to monitor areas that are known to be high-risk fire areas, such as Wildland-Urban Interface (WUI) zones. Figure 2 shows areas of fire risk in Contra Costa County.

Figure 2: Fire Risk in Contra Costa County

CONTRA COSTA COUNTY'S FIRE DANGER

The county's fire chief has warned of a dangerous fire season ahead. Two-thirds of the county is currently in a fire hazard zone.

Cal Fire fire hazard severity zones

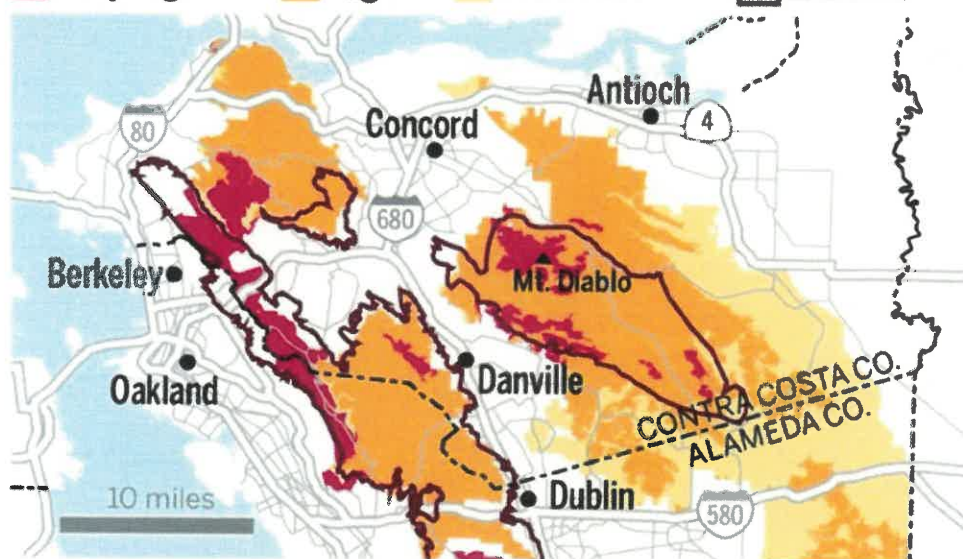
Very high

High

Moderate

Fire threat*

Extreme



* Designated by the California Public Utilities Commission
Sources: Cal Fire and CPUC

BAY AREA NEWS GROUP

During emergencies, fire districts and fire departments practice mutual aid when they provide fire equipment and personnel assistance to each other across jurisdictional boundaries. During a Red Flag Warning, Contra Costa County fire districts and fire departments often deploy pre-positioned strike teams to monitor vulnerable fire danger spots. These strike teams, composed of firefighters from Contra Costa County fire

districts and fire departments, provide backup to local firefighters with four to five fire engines, each staffed with four firefighters, a leader, and a trainee. The strike team also includes water tenders (used in remote areas), a bulldozer, and two to three chief officers. This strike team is deployed when there is a major fire in the County. During the 2019 Merrill Fire in Moraga, strike teams were used to contain and reduce the impact of the fire.

North Orinda Shaded Fuel Break

On February 22, 2019, CAL FIRE identified 35 priority projects that could be implemented immediately to help reduce public safety risk for over 200 of California's most wildfire-vulnerable communities. One of these projects is the North Orinda Shaded Fuel Break. On July 23, 2019, work on the project began along 19.3 miles of open space between the eastern part of Tilden Regional Park in Berkeley and Pleasant Hill Road near Acalanes High School, covering 1,429 acres. This area is vulnerable to Diablo winds, which are hot, dry winds blowing down the East Bay hills. This project removes hazardous dead trees, clears vegetation, creates fuel breaks and defensible community spaces, and creates safer ingress and egress corridors. Project participants include the Moraga-Orinda Fire District (MOFD), CAL FIRE, East Bay Municipal Utility District, and the East Bay Regional Park District.

Weed Abatement

County fire personnel make informational presentations to residents throughout the year on the process and importance of weed abatement. As a preventive measure, most fire districts and fire departments in Contra Costa County are expanding their weed abatement programs, which require the removal of vegetative growth and accumulated combustible debris on a homeowner's property. Fire personnel survey the area under their jurisdiction in the spring and document properties that need clearing. They then send notices to property owners describing the required work. Property owners have six to eight weeks to complete the weed abatement. Fire districts and fire departments send follow-up notices to property owners who have not completed the required abatement. If the property owner does not clear their property, the fire districts and fire departments notify their city council or the local Fire Board. The following consequences may apply:

- The property owner is required to attend a public hearing.
- A contractor is hired to clear the property, and the cost is added to the property owner's tax bill.
- A lien is placed on the property to pay for the abatement.

Fire districts and fire departments in the County emphasize the importance of practicing year-round abatement. If property owners do not clear their property, the fire danger increases for surrounding structures and residents in the neighborhood. The fire districts and fire departments may assist individuals, such as seniors, disabled, and low-income

property owners, who have difficulty complying with abatement requirements.

Hardening of Homes

Hardening of homes combines landscape and home construction requirements to reduce fire danger. Hardened homes are constructed and modified with fire-resistant building materials, such as a composite, metal, or tile roof. Maintenance practices include keeping rooftops and gutters clean, removing dead vegetation and flammable materials near homes, and avoiding non-native trees in landscaping.

New Technology

New technologies are being used to enhance evacuation efforts, provide early detection of fires, check the depth of the fuel bed, and detect changes in ground temperature that can indicate a fire. Some examples are:

- **Routing algorithms:** These software programs generate efficient evacuation routes based on the progression of each fire. The program sends information to evacuation personnel and provides alternate routes to use when roads become clogged.
- **Satellites:** PG&E has deployed its Satellite Fire Detection and Alerting System, which uses data from a combination of five satellites to give PG&E advance notice of potential fires. Fire information is sent to participating Contra Costa County fire districts and fire departments after validating the satellite findings with wildfire alert cameras or information from other agencies. This technology can be used to spot fires in remote areas.
- **Drones:** UC Berkeley's Space Science Laboratory developed firefighting drone technology to assist in fire management. The drones can take aerial pictures of the ground every few seconds in search of hot spots that can ignite new wildfires. This technology also minimizes false alarms when no fire is present.
- **Fire spotting cameras:** These land-based cameras are particularly useful when a fire danger exists in a remote expanse of dry vegetation.
- **Aerial Laser LiDAR (Light Detection and Ranging):** LiDAR is a remote sensing method that uses a pulsing light laser to generate precise, three-dimensional (3D) information about the composition of the fuel bed. 3D simulations help firefighters manage or extinguish fires as safely and economically as possible. LiDAR can provide precise fuel information to help predict where a fire will go next.
- **Ground Sensors:** These sensors monitor an area to detect unusual rises in temperature and transmit information to an appropriate fire station, enabling rapid response to a fire.

The Moraga-Orinda Fire District (MOFD) has piloted some of these new technologies to

provide early detection of fires and aid evacuation routing. MOFD employs ground sensors in remote areas that track changes in relative humidity and temperature. These sensors, or the satellite detection system, can alert fire personnel to the beginning of a spot fire. This location information is combined with real-time weather data and fuel bed mapping to predict the fire spread at intervals of 1, 3, and 5 hours. This model is then used to prioritize and sequence evacuation zones, called polygons, most threatened by the fire spread. MOFD is also experimenting with the design of a computer application that could remotely control home sprinkler systems to irrigate vegetation and eaves of homes for an extra level of protection from advancing flames and embers. These emerging technologies provide advanced tools that can aid fire departments in reducing response time, potentially minimizing the scale of a fire event, and reducing the risk of loss of life and property destruction.

Evacuation Plans and Shelter-in-Place

Some communities in Contra Costa County divide their cities into sections called polygons to facilitate evacuation. A more advanced system to evacuate residents during an emergency uses a combination of polygons and routing algorithms. A geographical area is divided into a grid of polygons, on which roads, access points, and evacuation centers are mapped. A routing algorithm is applied to the grid to determine the most efficient evacuation routes for residents. The sizes of the polygons and the routes are flexible during a fire. If a particular route is suddenly blocked, the algorithm will adjust the evacuation routes.

Police departments control evacuation orders and work cooperatively with fire districts and fire departments during a fire. In the event of a major fire that threatens homes, fire personnel will relay the need for evacuation of certain areas to law enforcement, which then issues an evacuation order through the County Community Warning System (CWS). Pre-established polygons, where used, provide efficient identification of which areas to evacuate.

A good evacuation plan allows residents to quickly evacuate while allowing emergency equipment and personnel to reach the fire. The Grand Jury found that not all communities have updated wildfire evacuation plans that utilize new technology. In addition, some areas in Contra Costa County have limited egress routes, such as Discovery Bay and Bethel Island.

Shelter-in-place can be a first step in evacuation while firefighters assess the fire front and available routes for evacuation. Fire districts and fire departments issue shelter-in-place orders in some situations and strongly advise that residents heed all emergency orders.

Public Relations and Community Awareness

Cities and counties use numerous warning systems to inform residents of emergencies

in their area. These systems range from the use of outdoor speakers on a truck or car, to local TV and radio Emergency Alert Systems, to internet applications. Most require some form of electrical power to function, and that residents possess the equipment necessary to receive the warnings. Some warning systems require residents to opt-in to receive alerts, such as the Contra Costa Community Warning System (CWS).

The CWS is activated whenever there is an imminent threat to life or health. CWS may use the following tools to alert the public:

- Landlines
- Cell phone, voice messaging, text, and email (upon user registration)
- Public website
- Social media (Facebook and Twitter)
- Sirens
- NOAA weather radios
- Emergency Alert System
- Wireless Emergency Alert System

In addition, individuals can sign up for internet applications that provide alerts:

- Nixle – an application which can send texts and email alerts from local agencies
- Nextdoor – an internet site with neighborhood alerts and news

Warning systems not requiring individuals to opt-in include:

- Emergency Alert System on local TV and radio stations
- Reverse 911 calls (only works with landlines)
- Sirens activated by the CWS, near major industrial facilities and in other special safety zones

Residents who have registered for emergency alerts on all their communication devices are most likely to receive early warnings of emergencies.

PG&E's Impact on Fire Districts and Fire Departments

Fire districts and fire departments in Contra Costa County have found that PG&E does not always inform fire personnel of planned maintenance work.

On October 23, 2019, San Ramon Valley Fire Protection District (SRVFPD) passed Ordinance No. 35. This ordinance prohibits PG&E and any other electrical utility from performing scheduled "non-emergency" work that presents a high fire risk when a Red Flag Warning has been issued. The ordinance gives SRVFPD the ability to pre-position

a team at the utility worksite and recover labor and equipment costs for teams overseeing electrical utility work.

On October 10, 2019, during the Public Safety Power Shutoff (PSPS), the Merrill Fire burned in the hills around Moraga, and dozens of residents were evacuated to an emergency shelter. The lack of electric power made the evacuation more difficult. The power shutoffs resulted in a lack of electricity for traffic signals, emergency alerts, and health equipment (oxygen and ventilators) needed by seniors and the disabled.

Staffing and Budgeting for East County

The East Contra Costa Fire Protection District (ECCFPD) has three active fire stations, each with three firefighters on duty at any given time. ECCFPD closed five other fire stations after the 2008 recession. In partnership with the City of Oakley, ECCFPD is currently building a fourth fire station to be opened in 2020.

Due to a lack of funding, the number of fire stations and staffing levels in East Contra Costa Fire Protection District has not been restored to pre-2008 levels. The ECCFPD property tax allocation is 7.5% of the county-wide property tax assessment, compared to the other fire protection districts and fire departments in the County that receive 12% to 30% of the assessment. Within the last five years, ECCFPD put three ballot measures before the electorate to increase the property tax allocation, but all three measures failed.

ECCFPD does not charge property owners for fighting residential, commercial, or vegetation fires. However, to meet the cost of firefighting in the district, ECCFPD does charge for emergency responses involving vehicle accidents and extractions, helicopter landings, illegal fires, hazardous material releases, and water emergencies.

FINDINGS

- F1. During a Red Flag Warning, fire districts and fire departments in Contra Costa County often deploy pre-positioned firefighting strike teams to maximize the ability to respond to wildfires.
- F2. Fire districts and fire departments in Contra Costa County require property owners to perform weed abatement on their property to reduce the risk of fire spread.
- F3. Not all fire districts and fire departments in Contra Costa County use pre-determined polygons and routing algorithms in their evacuation plans.
- F4. Fire districts and fire departments in Contra Costa County recommend that residents comply with law enforcement's orders to evacuate during an emergency.
- F5. Not all fire districts and fire departments in Contra Costa County use new

technologies, such as ground sensors, drones, satellites, and fire spotting cameras, for early detection of fires.

- F6. The October 2019 Public Safety Power Shutoff (PSPS) events disrupted emergency response efforts and communications in Contra Costa County.
- F7. Fire districts and fire departments in Contra Costa County are not always informed by PG&E when the utility is performing non-emergency maintenance work that presents a high fire risk during a Red Flag Warning.
- F8. An ordinance passed by the San Ramon Valley Fire Protection District, requiring PG&E to give advance notice of non-emergency maintenance work that presents a high fire risk, enables the fire district to pre-position a team at the utility worksite and recover labor and equipment costs.
- F9. Due to a lack of funding, the number of fire stations and staffing levels in East Contra Costa Fire Protection District has not been restored to pre-2008 levels.

RECOMMENDATIONS

Note: The Grand Jury conducted the majority of its investigation before Contra Costa County and the State of California issued shelter-in-place orders. The Jury recognizes that County departments, agencies, and cities are currently addressing COVID-19 related matters and the Jury has adjusted implementation dates in the recommendations accordingly.

- R1. The Board of Directors of Contra Costa County Fire Protection District, East Contra Costa Fire Protection District, Rodeo-Hercules Fire Protection District, and San Ramon Valley Fire Protection District should consider directing their Fire Chief to update wildfire evacuation plans and incorporate pre-determined polygons and advanced routing technology, by June 30, 2021.
- R2. The Board of Directors of Contra Costa County Fire Protection District, East Contra Costa Fire Protection District, Moraga-Orinda Fire Protection District, Rodeo-Hercules Fire Protection District, and San Ramon Valley Fire Protection District should consider identifying funds to adopt or expand the use of new technologies, such as ground sensors, drones, satellites, and fire spotting cameras, to help detect fires in high-risk areas, by June 30, 2021.
- R3. The East Contra Costa Fire Protection District Board of Directors should consider identifying options to fund additional fire stations and staff to restore fire services to pre-2008 levels, by June 30, 2021.
- R4. The Board of Directors of Contra Costa County Fire Protection District, East Contra Costa Fire Protection District, Moraga-Orinda Fire Protection District, and Rodeo-Hercules Fire Protection District should review and consider mechanisms, such as the ordinance passed by the San Ramon Valley Fire Protection District,

that would enable their fire district to recover labor and equipment costs from PG&E for overseeing electrical utility work that presents a high fire risk, by June 30, 2021.

- R5. The City Councils of El Cerrito, Pinole, and Richmond should consider directing their Fire Chief to update wildfire evacuation plans and incorporate pre-determined polygons and advanced routing technology, by June 30, 2021.
- R6. The City Councils of El Cerrito, Pinole, and Richmond should consider identifying funds to adopt or expand the use of new technologies, such as ground sensors, drones, satellites, and fire spotting cameras, to help detect fires in high-risk areas, by June 30, 2021.
- R7. The City Councils of El Cerrito, Pinole, and Richmond should review and consider mechanisms, such as the ordinance passed by the San Ramon Valley Fire Protection District, that would enable their fire department to recover labor and equipment costs from PG&E for overseeing electrical utility work that presents a high fire risk, by June 30, 2021.

REQUIRED RESPONSES

	Findings	Recommendations
Contra Costa County Fire Protection District Board of Directors	F1, F2, F3, F4, F5, F6, F7, F8	R1, R2, R4
East Contra Costa Fire Protection District Board of Directors	F1, F2, F3, F4, F5, F6, F7, F8, F9	R1, R2, R3, R4
Moraga-Orinda Fire Protection District Board of Directors	F1, F2, F3, F4, F5, F6, F7, F8	R2, R4
Rodeo-Hercules Fire Protection District Board of Directors	F1, F2, F3, F4, F5, F6, F7, F8	R1, R2, R4
San Ramon Valley Fire Protection District Board of Directors	F1, F2, F3, F4, F5, F6, F7, F8	R1, R2
City of El Cerrito	F1, F2, F3, F4, F5, F6, F7, F8	R5, R6, R7
City of Pinole	F1, F2, F3, F4, F5, F6, F7, F8	R5, R6, R7
City of Richmond	F1, F2, F3, F4, F5, F6, F7, F8	R5, R6, R7

These responses must be provided in the format and by the date set forth in the cover letter that accompanies this report. An electronic copy of these responses in the form of a Word document should be sent by e-mail to ctadmin@contracosta.courts.ca.gov and a hard (paper) copy should be sent to:

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