4.15 WILDFIRE

4.15.1 INTRODUCTION

This section describes the existing conditions at the project site and the surrounding area associated with wildfire hazards and the potential for the proposed Scott Ranch project to increase risk of wildfire. It also presents the potential wildfire impacts associated with the regional park trail that would extend from the western boundary of the project site to the existing Ridge Trail of Helen Putnam Regional Park (see **Section 4.15.6** below). The information presented in this section is informed by the Vegetation Management Plan and Wildfire Evacuation Analysis performed for the Scott Ranch project, as well as other sources.

4.15.2 EXISTING CONDITIONS

Wildfire conditions are primarily influenced by weather, vegetation, topography, and human activities. The interaction of these factors produce local and regional fire regimes.[1] The fire regime in any area is defined by several factors, including fire frequency, intensity, severity, and area burned.

The project site is located in the southwestern portion of the City of Petaluma adjacent to the City of Petaluma's Urban Growth Boundary and southern city limit. With the exception of the red barn complex, unoccupied mobile home, and the remnants of a collapsed farm house, the project site is generally undeveloped land covered by grasslands and rolling hills with a wooded riparian corridor along Kelly Creek.

Topography

Topographic features such as slope and elevation influence fire intensity, direction, and rate of spread. Fires in flat or gently sloping areas tend to burn more slowly and spread in wider ellipses than fires on steep slopes. Winds generally tend to move along streams and river corridors, which could influence fire's speed and direction.

Land elevation at the project ranges from 100 feet above mean seal level (amsl) in the eastern portion of the project site to 380 feet amsl near the southwestern corner of the project site. The northern parcel contains portions of two knolls and ranges in elevation from 210 feet above amsl at the northern property line to an elevation of 150 feet amsl near Windsor Drive. Elevations range in the southern parcel from approximately

[1] A "fire regime" is the term given to the general pattern in which fires naturally occur in a particular ecosystem over an extended period of time. Scientists classify fire regimes using a combination of factors including frequency, intensity, size, pattern, season, and severity. Individual fires can vary greatly in severity, and the specific effects and risks caused by a fire will depend on the specifics of its fire regime.

100 feet amsl at Kelly Creek to 380 feet amsl at the southwest corner of the parcel. A relatively flat alluvial plain associated with Kelly Creek occupies the central portion of the site and is bordered by moderately steep slopes to the north and south.

Weather

Weather is a major criterion in the start, dispersion, and containment of a wildfire. The most important weather variables used to predict fire behavior are wind, temperature, and humidity. Wind direction and velocity profoundly affect fire behavior, but wind is considered the most variable and unpredictable weather element. Wind increases the flammability of fuels both by removing moisture through evaporation and by angling the flames so that they heat the fuels in the fire's path. The direction and velocity of surface winds can also control the direction and rate of the fire's spread. Wildfires also generate winds of their own that can be faster than ambient wind conditions. This occurs as heat is constantly rising from the fire it moves the air upwards. That leaves an empty space, or vacuum, and air from all around the fire rushes to fill this gap.

The project site is located within the Petaluma Valley, bordered to the east by the Sonoma Mountains and to the west by a series of hills followed by Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay (located south of Petaluma) is known as the Petaluma Gap. This low-terrain area allows marine air to travel into the Bay Area from the south and west (City of Petaluma 2008). Wind patterns in the Petaluma Valley are strongly influenced by the Petaluma Gap, with winds flowing predominantly to the east from the west. The project site's area is characterized by warm, dry summers and cool, moist winters. The area averages about 30 inches of precipitation a year, primarily in the fall and winter. Most of the measurable rainfall generally occurs during the winter months (mid-October to mid-April). Thus, the fire season (the time of highest fire danger) comprises the dry months of May through October. Although average summertime temperatures are usually quite warm (75^{o} to 85^{o} F), proximity to the San Francisco Bay and the fog that rolls in during early evenings often creates a pattern of hot days and cool nights. Fog also sometimes keeps summertime temperatures cool in the project area.

The wind in the project area normally blows from the west. However, the most severe fire conditions occur in association with strong north or northeast winds. Under these conditions (common in the fall), humidities drop to 10 percent and temperatures soar to over 100 ^{o}F.

In addition, periods during the summer months, during stagnant days characterized by continuous high temperatures and low relative humidity, the vegetation dries to a National Fire Danger Rating System rating of over 81 for the Burning Index, indicating extreme resistance to fire-control. This overall weather pattern enhances the possibilities of ignition and extreme fire behavior.

The winds that create the most severe fire danger, known as the "Santa Ana" or "Diablo" winds, typically blow from the northeast and occur in October with humidity below 20 percent. During these events, the driest recorded relative humidity was 5 percent; the highest recorded temperature was 90 °F, and the greatest recorded wind speed was 47 mph. Diablo events generally last from 15 to 35 hours. During a Diablo wind event, the wind direction is somewhat sporadic, sometimes even exhibiting a complete reversal for 2-4 hours. The wind speed ramps up slowly - from 1-2 miles per hour up to its maximum speed, and then down again - similar to a bell-shaped curve.[2]

The project site situated east of major expanse of open space, and therefore, is vulnerable to a fire coming from the west with a westerly wind. In addition, winds from the east could cause off site fire to spread by embers to the project site. A fire could spread quickly with wind from the west in the summer. A fire originating in northeast of the project site, driven by northeasterly Diablo winds, would need to advance through embers from off site in order to cross Windsor Drive and other existing roads. Embers from fires in poorly maintained landscaping or shrubs/trees off-site could land anywhere on the project and cause new ignitions. The greatest vulnerability would come from ember cast, and the challenge that a long fire front would pose. [3]

Vegetation

The primary fuel source for wildfires is vegetation, which quantity, vertical and horizontal arrangement, condition (e.g., living or dead), and moisture content affect fire behavior, fire spread, and fuel type.

Approximately, 82 percent of the project site is covered with grass. Generally, grasslands are considered to respond markedly to changes in humidity and ignites easily in dry periods. Grass fuels do not produce much heat, but they produce a fire that travels quickly. In particular, grass can serve as a wick for more hazardous fuels whose ignition is apt to cause greater damage. Grass thus provides an avenue for fire to travel to densely vegetated areas, allowing it to build up enough of a "head of steam" to burn into landscaping or other types of fuels under conditions that would not otherwise be fire-sustaining.

Shrubs that are scattered throughout the site are considered to locally increase fire intensity. However, they do not affect the rate of fire spread. Shrubs that are part of the overgrown landscape near the barn complex could result in high flame lengths that could often generate embers that spreads fire offsite.

Trees at the project site include forest fuel types and forest/shrub fuel types. Trees considered as forest fuel types represent tree areas where the fire is carried by the forest litter under the tree canopy. Trees

2 Appendix 4.15, Fuel Management Plan, pages 12-14.

3 Ibid.

considered as forest/shrub fuel types represent tree areas with a shrubby understory where the fire is carried by grass and shrubs under the tree canopy rather than by forest litter.

Forest fuel type trees are located along Kelly Creek and in patches to the north and south are associated with low to moderate fire behavior and represent ideal conditions for fire resiliency. However, the Eucalyptus trees (also considered forest fuel type) surrounding the existing structures of the barn complex are associated with a high likelihood of a source of embers because of their height that is coupled with a low canopy base height. Trees considered forest/shrub fuel types are found in patches along Kelly Creek and its tributary and within the southwestern portion of the project site. Patches of these trees are also found north of Windsor Drive.

Human Influence and Wildfire

Human influence on wildfire can be direct or indirect. A direct human influence is the ignition or suppression of fires, indirect human influence is the modification of land use patterns (such as modified vegetation) and climate change. The majority of wildfires in California are direct human-caused by factors including but not limited to campfires, powerlines, and building fires.[4] Indirect human-caused factors are associated with the crisis of anthropogenic[5] climate change, which exacerbates wildfires. It is estimated that since 1985, more than 50 percent of the increase in the area burned by wildfire in the western U.S. is attributable to climate change (Abatzoglou and Williams 2016). Wildfire intensity is closely related to temperature and drought conditions, and in recent decades, increasing drought frequency and warming temperatures have led to an increase in the magnitude of wildfire (Westerling et al 2006, Schoennagel et al. 2017).

In the last decade, California has experienced five of the state's 10 largest wildfires and seven of its 10 most destructive fires in its history. Though no single wildfire can be attributed solely to climate change, evidence shows that the increase in average temperatures statewide is creating conditions more prone to wildfires.[6] Between 2017 and 2018, the state spent over $1.5 billion on fire suppression, far more than any previous 2-year period. Over the past five decades, summertime forest fires have increased in size by roughly 800 percent. Sonoma County has warmed about 2.1 degrees Fahrenheit (1.1 degree Celsius) since

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4 Balch, Jennifer K., et al. "Human-Started Wildfires Expand the Fire Niche across the United States." Proceedings of the National Academy of Sciences, vol. 114, no. 11, 2017, pp. 2946–2951., doi:10.1073/pnas.1617394114. Available online at: https://www.pnas.org/content/early/2017/02/21/1617394114, accessed October 21, 2019.

5 Anthropogenic: Relating to, or resulting from the influence of human beings on nature.

6 Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. (2019). Observed impacts of anthropogenic climate change on wildfire in California. Earth's Future, 7, 892–910. Available online at: https://doi.org/10.1029/2019EF001210, accessed September 16, 2019.

1895,[7] and every additional increment of warming speeds up evaporation, dries out soil and vegetation, and increases the amount of fuel available for a wildfire.[8] In 2018, wildfires in California released approximately 68 million tons of carbon dioxide, or about 15 percent of the state's annual emissions.[9] Refer to **Section 4.7, Greenhouse Gas Emissions**, for additional discussion of climate change trends and the effects of climate change on the environment.

Fire Hazard Severity Zones

The California Department of Forestry and Fire Protection (CAL FIRE) maintains historic fire perimeters for timber fires greater than 10 acres, brush fires greater than 50 acres, and grass fires greater than 300 acres. As shown on the CAL FIRE map (**Figure 4.15-1, Sonoma County Region Fire History 1939-2019**), no major fire events were recorded within the City of Petaluma between 1939 and 2019. The closest major fire event (named Anderson Fire) to the project site occurred in 1965 at approximately 4 miles to the west and covered an area of approximately 5,000 acres. Other relatively small fire events occurred in 1963 at approximately 5 miles to the west and in 1968 at approximately one mile to the south and covered an area of approximately 377 and 62 acres, respectively.

CAL FIRE has mapped areas of significant fire hazards in the state through its Fire and Resources Assessment Program (FRAP). This mapping system delineates areas where CAL FIRE is responsible for wildland fire protection. These areas are generally located in unincorporated areas and classified as a State Responsibility Area (SRA). The CAL FIRE mapping system also identifies areas under the responsibility of local fire protection agencies as a Local Responsibility Area (LRA). CAL FIRE map identifies the project site as an LRA (CAL FIRE 2019). The City of Petaluma Fire Department (PFD) is the designated LRA for the Fire Prevention Bureau. The project site is not within a "very high fire hazard severity" (VHFHS) zone by the State of California (Sonoma County 2008). The City designates the project site as a Wildland Urban Interface area (WUI)— a designation for areas with dense housing adjacent to vegetation that can burn in a wildfire (Sonoma County 2018). **Figure 4.15-2, City of Petaluma Wildland Urban Interface Areas**, shows the areas in the City within a WUI.

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7 Washington Post, *Extreme Climate Change has Reached the United States.* Available online at: https://www.washingtonpost.com/graphics/2019/national/climate-environment/climate-change-america/, accessed October 21, 2019.

8 US Environmental Protection Agency, *What Climate Change Means for California.* Available online at: https://www.epa.gov/sites/production/files/2016-09/documents/climate-change-ca.pdf, accessed September 16, 2019.

9 US Department of Interior, *Press Release, November 30, 2018.* Available online at: https://www.doi.gov/pressreleases/new-analysis-shows-2018-california-wildfires-emitted-much-carbon-dioxide-entire-years, accessed September 17, 2019.

Fire Hazards in the Project Area

The risk of fire danger in Sonoma County is the result of a Mediterranean climate that produces dry vegetation in the late summer and fall combined with Diablo wind events during the same time of year. In addition to the recent Kincade Fire in 2019 and the Tubbs Fire in 2017, major fires within Sonoma County have been recorded in 1964, 1923, and 1870 as illustrated in the maps below (Sonoma County 2017). **Figure 4.15-1** present the pattern of repeated fire in Sonoma County. As shown **in Figure 4.15-1**, firestorms in 1923, 1964, and 2017 occurred in the same location prone to wind corridors within Sonoma County. **Table 4.15-1**, summarizes the dates and size of fire for each of the major firestorms that occurred in the Sonoma County area. At the time of preparation of this analysis, California is experiencing major wildfires. Since the beginning of 2020, in California, over 4 million acres have burned, with 31 fatalities confirmed and over 9,000 structures destroyed.[10] The Glass Fire, spanning across Napa and Sonoma counties in the North Bay area, began on September 27, 2020 and was fully contained on October 20 after burning over 67,000 acres. The Glass Fire destroyed over 1,500 structures and damaged another 282 structures.[11]

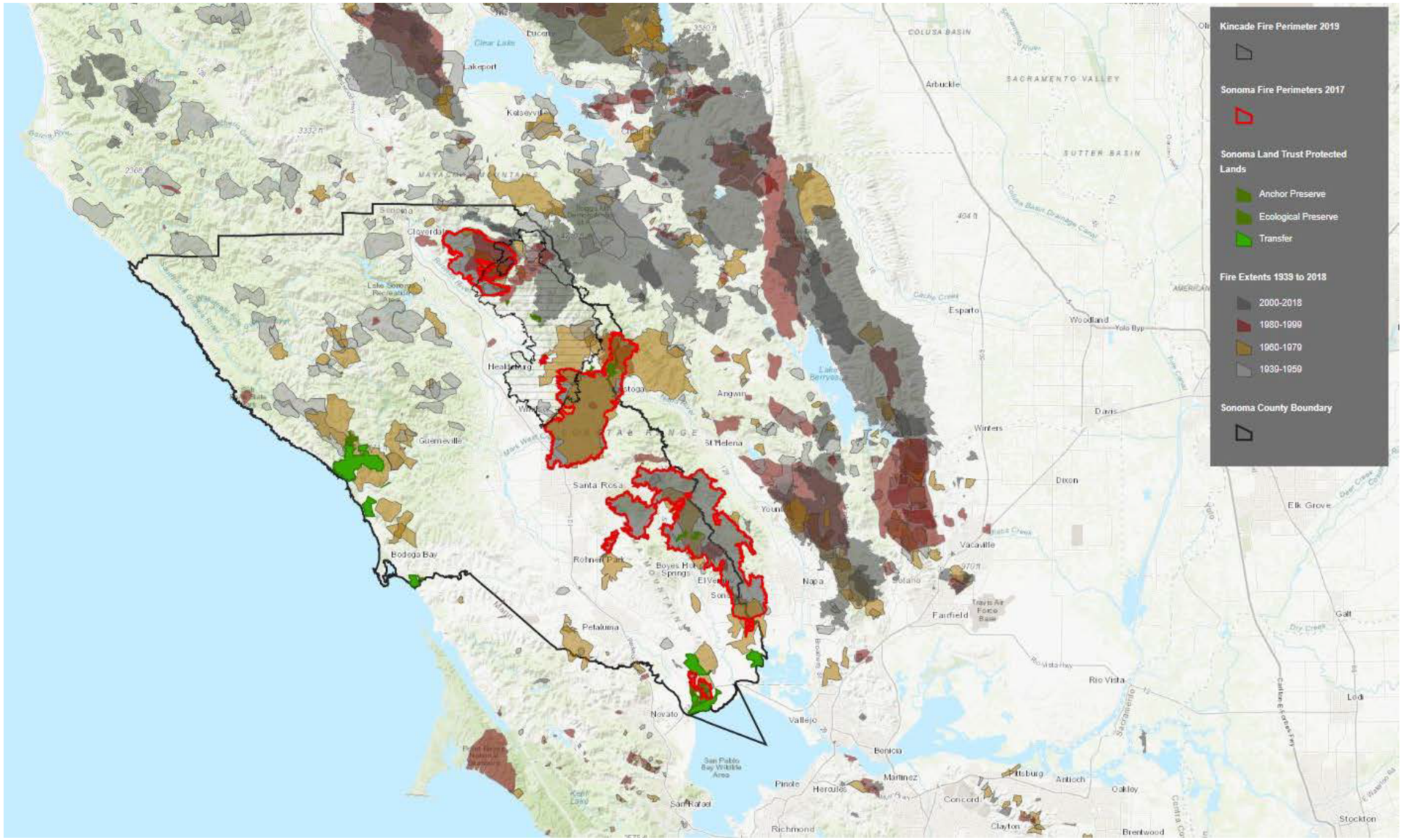
Table 4.15-1
Major Fire Events in Sonoma County

	1870	1923	1964	2017	2019
Start Date	October 13	September 16	September 19	October 8/October 9	October 23, 2019
Containment Date	NA	September 23 or before	October 2 or before	October 31/November 1	November 6, 2019
Total Acres Burned	Tens of thousands	76,000 (estimated)	65,983	87,673	77,758
Number of Structures Destroyed	Unknown	About 300	hundreds	6,843	374
Lives lost	0	0	0	25	0

Source: Sonoma County 2017; CAL FIRE 2020;

10 California Department of Forestry and Fire Protection. Incidents. Available at: https://www.fire.ca.gov/incidents/, accessed on October 22, 2020.

11 California Department of Forestry and Fire Protection. Incidents: Glass Fire. Available at: https://www.fire.ca.gov/incidents/2020/9/27/glass-fire/, accessed on October 22, 2020.



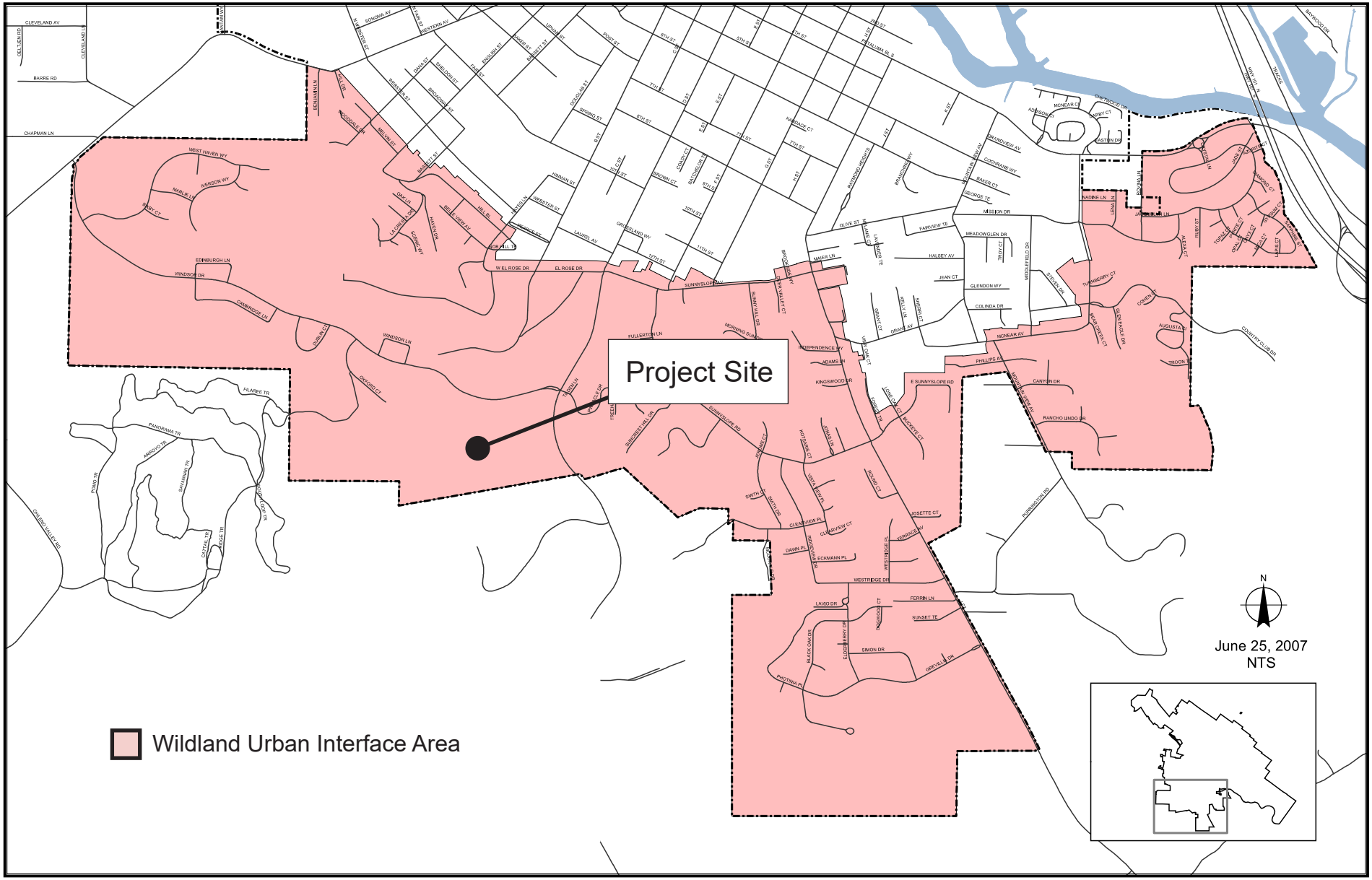
SOURCE: Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS, 2020.

FIGURE **4.15-1**

Sonoma County Region Fire History 1939-2019

IMPACT SCIENCES

1222.01•11/20



SOURCE: City of Petaluma Fire Department, June 2007.

FIGURE **4.15-2**

IMPACT SCIENCES

City of Petaluma Wildland Urban Interface Areas

1339.001•11/20

Wildfire Reduction Strategies

Fire Prevention Team of the Petaluma Fire Department

The Fire Prevention Team within PFD maintain several fire prevention programs including regulation of hazardous material storage and use, safety education within local communities, inspections of commercial construction and equipment installation projects and residential projects, review of commercial and residential plans, imposing and monitoring installation of protection systems, weed abatement, and emergency preparedness.[12]

Local Hazard Mitigation Plan Update

In March 2020, the City of Petaluma prepared an update to the Local Hazard Mitigation Plan (LHMP) that identified a Mitigation Action Plan outlining how the City can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses.[13] The plan updated the City's previous hazard mitigation plan that was developed as part of a regional effort. The LHMP update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 so that Petaluma would be eligible for the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant programs. The LHMP include five action plans that address wildfire:

W-1: Establish a Defensible Space Funding Program. This action will establish a funding program for the City and the community to implement defensible space in the designated WUI. The program will include the identification of defensible space funding and grant opportunities, incentives for private landowners to conduct brush clearing and home hardening, project implementation tools (e.g. vegetation clearing), and a long-term management program for WUI areas around the City. The program will prioritize defensible space projects that may include brush removal and prescribed burns, while also working with the community to reduce fuel loads on private property. The City would also work with local fire protection agencies to promote structure hardening and retrofitting, and other mitigation techniques summarized in CAL FIRE's Wildfire Mitigation Program.

W-2: Develop a City-Wide Fire Suppression Master Plan. This action would involve the development of a City-wide fire suppression water system Master Plan to assess fire flow water capacity and how to upgrade the water system to accommodate projected changes in water availability and provide adaptability.

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12 City of Petaluma. 2020. Fire Prevention. https://cityofpetaluma.org/fire-prevention/. Accessed October 19, 2020.

13 City of Petaluma. 2020. City of Petaluma Local Hazard Mitigation Plan Update. March.

W-3: Evaluate Wildland Urban Interface Zone in the City Limits. This action involves an evaluation of the WUI zone and high and very high FHSZ's in the City limits and surrounding areas to develop a comprehensive plan to protect City buildings and infrastructure. The evaluation would address wildfire probability using metrics, such as fire history, fire threat, response time, proximity to WUI, fuel reduction projects, and mutual aid coordination.[14] This action also includes safe access for emergency response (street signs, water supply, and fire suppression), and identification of a minimum of two evacuation routes for neighborhoods in the City of Petaluma.

W-4: Install Fire Protection System in all City Facilities. This action will provide funding for the installation of the required systems in all City-owned facilities.

W-5: Wildland Urban Interface Pre-Fire Plan. Under this action, a WUI Pre-Fire Plan would be developed to help the City better prepare for future wildfires and ensure a more efficient response and deployment of resources. The Plan will identify hazard areas, access points, and location to fight fire.

4.15.3 REGULATORY FRAMEWORK

4.15.3.1 Federal Laws and Regulations

Robert T. Stafford Disaster Relief and Emergency Assistance Act, as Amended, and Related Authorities

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 100-707), signed into law on November 23, 1988, amended the Disaster Relief Act of 1974 (Public Law 93-288). The Stafford Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Disaster Mitigation Act (DMA) of 2000

The DMA 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for state, local, and Indian Tribal governments as a condition of mitigation grant assistance. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for state, local, and Tribal entities to closely coordinate mitigation planning and implementation efforts. The requirement for a state mitigation plan is continued as a condition of disaster assistance, adding

[14] As required by the California Office of Emergency Services (Cal OES), fire departments with nearby/overlapping jurisdictions participate in mutual aid agreements, California Governor's Office of Emergency Services, Fire and Rescue Division, website: http://www.caloes.ca.gov/cal-oes-divisions/fire-rescue, accessed November 17, 2020.

incentives for increased coordination and integration of mitigation activities at the state level through the establishment of requirements for two different levels of state plans. The DMA 2000 also established a new requirement for local mitigation plans and authorized up to 7 percent of HMGP funds available to a state for development of state, local, and Tribal mitigation plans.

Federal Response Plan

The Federal Response Plan of 1999 is a signed agreement among 27 federal departments and agencies, including the American Red Cross, that (1) provides the mechanism for coordinating delivery of federal assistance and resources to augment efforts of state and local governments overwhelmed by a major disaster or emergency; (2) supports implementation of the Robert T. Stafford Disaster Relief and Emergency Act, as well as individual agency statutory authorities; and (3) supplements other federal emergency operations plans developed to address specific hazards. The Federal Response Plan is implemented in anticipation of a significant event likely to result in a need for federal assistance or in response to an actual event requiring federal assistance under a Presidential declaration of a major disaster or emergency.

Presidential Policy Directive 8: National Preparedness

The National Response Framework (NRF) is an essential component of the National Preparedness System mandated in Presidential Policy Directive 8: National Preparedness (PPD-8). PPD-8 is aimed at strengthening the security and resilience of the United States through systematic preparation for the threats that pose the greatest risk to the security of the Nation. PPD-8 defines five mission areas— Prevention, Protection, Mitigation, Response, and Recovery—and mandates the development of a series of policy and planning documents to explain and guide the Nation's collective approach to ensuring and enhancing national preparedness. The NRF presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies. It establishes a comprehensive, national, all-hazards approach to domestic incident response. The National Response Plan was replaced by the NRF effective March 22, 2008 and updated most recently in June 2016.

The NRF defines the principles, roles, and structures that organize response protocols as a nation. The NRF:

- Describes how communities, tribes, states, the federal government, private-sectors, and nongovernmental partners work together to coordinate national response;
- Describes specific authorities and best practices for managing incidents; and
- Builds upon the National Incident Management System (NIMS), which provides a consistent template for managing incidents.

Federal Emergency Management Agency (FEMA) Regulation

In March 2003, the Federal Emergency Management Agency (FEMA) became a department of the U.S. Department of Homeland Security (DHS), pursuant to 44 CFR, Chapter 1 Part 201. The primary mission of FEMA is to reduce the loss of life and property and protect the nation from all hazards, including natural disasters, acts of terrorism, and other human-made disasters, by leading and supporting the nation in a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation. The City of Petaluma is under the jurisdiction of FEMA Region 9, which covers Arizona, California, Hawaii, Nevada, Guam, American Samoa, Commonwealth of Northern Mariana Islands, Republic of Marshall Islands, Federated State of Micronesia, and more than 150 sovereign tribal entities. FEMA Region 9 specifically plans for hazards such as major earthquakes and wildfires.

National Fire Plan

The Department of the Interior's National Fire Plan is intended to ensure an appropriate federal response to severe wildland fires, reduce fire impacts to rural communities, and ensure sufficient firefighting capacity in the future. The Rural Fire Assistance program is funded to enhance the fire protection capabilities of rural fire districts and safe and effective fire suppression in the wildland/urban interface. The program promotes close coordination among local, state, tribal, and federal firefighting resources by conducting training, equipment purchase, and prevention activities on a cost-shared basis.

4.15.3.2 State

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. CAL FIRE's firefighters, fire engines, and aircraft respond to an average of more than 5,600 wildland fires each year. The Office of the State Fire Marshal supports CAL FIRE's mission by focusing on the protection of life and property through the development and application of fire prevention engineering, education, and enforcement. It provides support through a wide variety of fire safety responsibilities including by regulating buildings in which people live, congregate, or are confined; by controlling substances and products which may, in and of themselves, or by their misuse, cause injuries, death, and destruction by fire; by providing statewide direction for fire prevention in wildland areas; by regulating hazardous liquid pipelines; by reviewing regulations and building standards; and by providing training and education in fire protection methods and responsibilities.

State Fire Regulations

Some fire regulations for California are established in Sections 13000 et seq. of the California Health and Services Code and include regulations for structural standards (similar to those identified in the California Building Code); fire protection and public notification systems; fire protection devices such as extinguishers and smoke alarms; standards for high-rise structures and childcare facilities; and fire suppression training. The State Fire Marshal is responsible for enforcement of these established regulations and building standards for all state-owned buildings, state-occupied buildings, and state institutions within California, which are not present on site.

California Fire Plan

The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection. By placing the emphasis on what needs to be done long before a fire starts, the Fire Plan looks to reduce firefighting costs and property losses, increase firefighter safety, and to contribute to ecosystem health. The current plan was finalized in the summer of 2018.

California Public Resources Code

Fire Hazard Severity Zones – Public Resources Code Sections 4201–4204 Public Resources Code (PRC) Sections 4201–4204 and Government Code Sections 51175–89 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as fire hazard severity zones (FHSZ), define the application of various mitigation strategies to reduce risk associated with wildland fires.

California Fire Code

The 2019 California Fire Code (Title 24, Part 9 of the California Code of Regulations) establishes regulations to safeguard against the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety for and assistance to firefighters and emergency responders during emergency operations. The provisions of the Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout California. The Fire, Residential and Buildings Codes include regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas.

Senate Bill 1241

In 2012, Senate Bill 1241 added Section 66474.02 to Title 7 Division 2 of the California Government Code, commonly known as the Subdivision Map Act. The statute prohibits subdivision of parcels designated very high fire hazard, or that are in a State Responsibility Area, unless certain findings are made prior to approval of the tentative map. The statute requires that a city or county planning commission make three new findings regarding fire hazard safety before approving a subdivision proposal. The three findings are, in brief: (1) the design and location of the subdivision and its lots are consistent with defensible space regulations found in PRC Section 4290-91, (2) structural fire protection services will be available for the subdivision through a publicly funded entity, and (3) ingress and egress road standards for fire equipment are met per any applicable local ordinance and PRC Section 4290.

California Disaster Assistance Act (CDAA)

The California Disaster Assistance Act (CDAA; CCR Title 19, Chapter 6) authorizes the Director of the California Governor's Office of Emergency Services (Cal OES) to administer a disaster assistance program that provides financial assistance from the state for costs incurred by local governments as a result of a disaster event. Funding for the repair, restoration, or replacement of public real property damaged or destroyed by a disaster is made available when the Director concurs with a local emergency proclamation requesting state disaster assistance.

California Emergency Services Act (AB 38)

AB 38 gave Cal Emergency Management Agency (EMA) responsibility for overseeing and coordinating emergency preparedness, response, recovery, and homeland security activities in the state. The Governor's Office of Emergency Services (OES) mission statement is "Protect lives and property, build capabilities, and support our communities for a resilient California." OES goals include:

- **Goal 1:** Anticipate and enhance prevention and detection capabilities to protect our state from all hazards and threats.
- **Goal 2:** Strengthen California's ability to plan, prepare for, and provide resources to mitigate the impacts of disasters, emergencies, crimes, and terrorist events.
- **Goal 3:** Effectively respond to and recover from both human-caused and natural disasters.
- **Goal 4:** Enhance the administration and delivery of all state and federal funding, and maintain fiscal and program integrity.
- **Goal 5:** Develop a united and innovative workforce that is trained, experienced, knowledgeable, and ready to adapt and respond.

- **Goal 6:** Strengthen capabilities in public safety communication services and technology enhancements.

2018 State Hazard Mitigation Plan (SHMP)

Approved by FEMA in September 2018 as an Enhanced State Mitigation Plan, the 2018 SHMP update continues to build upon California's commitment to reduce or eliminate the impacts of disasters caused by natural, technological, accidental, and adversarial/human-caused hazards, and further identifies and documents progress made in hazard mitigation efforts, new or revised state and federal statutes and regulations, and emerging hazard conditions and risks that affect the State of California. Resilience depends on the whole community and is a shared responsibility for all levels of government, private and nonprofit sectors, and individuals.

Senate Bill 901

After record-breaking drought in California from 2011 to 2017, perfect wildfire conditions allowed faulty Pacific Gas & Electric (PG&E) utility lines to spark devastating fires that scorched over 4,000 square miles of land across the state. In response to the deadly season, the California Legislature developed Senate Bill 901 (Utility Wildfire Management Plans) as the "centerpiece measure" in its attempt to rectify damages from the 2017 wildfires and prevent future wildfire disasters. SB 901 mandates all electric utilities to prepare and submit wildfire mitigation plans that describe the utilities' plan to prevent, combat, and respond to wildfires affecting their service territories. The California Public Utilities Commission (CPUC) will review and refine the plans before implementing and enforcing them. In the short-term, SB 901 allows PG&E to lean on its customers in paying for billions of dollars in fire-related damages. It also provides over $1 billion for vegetation management over five years.[15]

Executive Order N-05-19

On May 31, 2019, Governor Gavin Newsom signed Executive Order N-12-19 to assist communities recovering from historically devastating wildfires in 2017 and 2018.[16] Specifically, the executive order extends protections against price gouging in counties recovering from fires, including Mendocino, Napa, Santa Barbara, Shasta, and Sonoma Counties. The extended protections would remain in effect through December 31, 2019. On November 22, 2019, Governor Gavin Newsom issued Executive Order N-21-19 to help streamline recovery efforts in communities across the state impacted by the previous month's

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15 California Public Utilities Commission (CPUC). *Utility Wildfire Mitigation Plans* (*SB 901)*. Available online at: http://cpuc.ca.gov/SB901/, accessed March 29, 2019.

16 Office of Governor Gavin Newsom. May 2019. *Governor Newsom Issues Executive Order to Support Communities Recovering from Wildfires.* Available online at: https://www.gov.ca.gov/2019/05/31/governor-newsom-issues-executive-order-to-support-communities-recovering-from-wildfires/, accessed September 23, 2019.

devastating fires. The executive order included a variety of relief measures for fire victims, including: a three-year suspension of planning and zoning rules pertaining to recreational vehicles and mobile home parks; fee waivers for replacement of driver's licenses and birth certificates; and easing liquor license rules for bars and restaurants damaged by the fires. The executive order extended the state of emergency proclaimed in October 2019 for the Sonoma County.

Assembly Bill 1054 (AB 1054)

AB 1054 was signed into law by Governor Gavin Newsom on July 12, 2019, creating a $21 billion fund to help California's investor-owned utilities cover liabilities caused by wildfires. Under the legislation, the state's investor-owned utilities will put a combined $5 billion toward improvements in their electrical grids to access the fund. Ratepayers will also contribute $10.5 billion by way of a 15-year extension of an existing rate increase. The bill also imposes several conditions on utilities, including $5 billion in safety investments and utility participation in a new annual safety certification process overseen by CPUC.[17] The legislation was passed in the wake of the Camp Fire, California's deadliest and most destructive wildfire in history. PG&E Corp's equipment failure was responsible for the blaze. PG&E sought bankruptcy protection after the Camp Fire so it could reorganize its finances to pay $30 billion in liabilities from multiple wildfires.[18]

4.15.3.3 Local

City of Petaluma General Plan 2025

The City of Petaluma's General Plan 2025, adopted in May 2008, contains policies and objectives related to the City's emergency management. Specifically, Chapter 7, Community Facilities, Services, and Education, sets forth several policies and programs relating to wildland fire protection. These include, but are not limited to, the following:[19]

Policy 7-P-17: Achieve and maintain a minimum ratio of one fire suppression personnel per 1,000 population served or a similar level of response service to meet increased call volumes.

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17 California Legislative Information. 2019. *Assembly Bill No. 1054.* Available online at: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB1054, accessed September 18, 2019.

18 New York Times. *California Says PG&E Power Lines Caused Camp Fire That Killed 85.* Available online at: https://www.nytimes.com/2019/05/15/business/pge-fire.html, accessed September 18, 2019.

19 City of Petaluma. May 2008. *General Plan 2025.* Available online at: https://cityofpetaluma.net/cdd/pdf/general-plan-may08/general-plan-may08.pdf, accessed September 19, 2019.

A. Fund additional staff to ensure minimum ratio is maintained as population increases occur.

Policy 7-P-18: Ensure facilities, equipment, and personnel are adequate to maintain quality of service demands of the community, including but not limited to: fire suppression, Advanced Life Support (ALS), rescue, fire prevention, education, CUPA, and disaster preparedness and management.

Policy 7-P-19: Maintain a four minute travel time for a total of 6-minute response time for emergencies within the City.

A. Require that properties outside of the four-minute (travel) response radii utilize fire-resistant materials and maintain fire breaks surrounding residences.

B Ensure that transportation improvements are provided for additional development so as not to adversely impact emergency response times.

Policy 7-P-22: Ensure emergency response equipment and personnel training are adequate to follow the procedures contained within the Emergency Operations Plan for a major event, through maintaining and updating, as appropriate, the City's emergency preparedness programs, plans, and procedures to ensure the health and safety of the community in the event of an earthquake or other disaster.

E. The Fire Department should provide the training and organization for community based volunteers who can provide localized assistance within their neighborhoods during an emergency.

Policy 7-P-23: Continue to utilize the Emergency Operations Center (EOC) to provide early warning of and response to all life-threatening hazards, such as earthquakes, floods, landslides, severe storms, and hazardous materials incidents.

Policy 7-P-27: Reduce the impacts of wildland fires.

A. Develop a program and standards to address the increased fire risk associated with development within the Urban Interface areas to the west.

B. Continue the annual Weed Abatement Program.

C. Continue the regulation of fireworks city wide.

D. Consider the prohibition of the sale and use of fireworks within the City, with the exception of city sanctioned and permitted events with appropriate City standards in place.

E. Conduct regular reevaluation of City-lands designated as Very High or High Fire Hazard Severity Zones.

Petaluma Fire Code (Chapter 17.20)

Under Fire Code Chapter 17.20, the City of Petaluma adopted and amended the California Fire Code for the purpose of prescribing regulations governing conditions hazardous to life and property from fire, hazardous materials, or explosions. The Fire Code includes regulations for new buildings within Fire Hazard Severity Zones and provides guidance for vegetation management as a measure of wildfire protection. The Fire Code includes fire suppression and mitigation policies that include requiring fire sprinklers in certain types of buildings, the establishment of fire hazard severity zones, regulations on defensible space around owned or leased property, and regulations on the use of outdoor fire pits and barbecues. The Fire Prevention Bureau is granted power to enforce statutes, issue citations, and make arrests if necessary.

Petaluma Emergency Management Program

When a state of emergency is declared, there is an immediate shift in the operation of the City government in which all government employees within the jurisdiction become emergency service workers. The plans set for this purpose and the City staff implementing the form the Emergency Operations Center (EOC). There are five main arteries of organizational structure that City officials coordinate during a state of emergency: Management, Logistics, Operations, Planning, and Finance. The EOC is activated during emergencies and disasters, such as severe storms, flooding, wildfires, and events requiring evacuations or shelters. The City conducts an annual EOC training exercise and coordinates with the County of Sonoma as well as state and federal agencies. In addition, the City's fire and police personnel participate in an Emergency Preparedness Fair every September. The City's fire department hosts emergency preparedness workshops based on the Citizens Organized to Prepare for Emergencies (COPE) model.[20]

Petaluma Municipal Code (Chapter 2.32 Civil Defense and Disaster)

Chapter 2.32 of the Petaluma Municipal Code (PMC) provides for the preparation of carrying out plans for public safety and protection in the event of an emergency. Qualifying emergencies may include air pollution, fire, flood, storm, epidemic, riot, or earthquake. The City's disaster council is comprised of the Mayor, the Director of Emergency Services and their assistant, chiefs of emergency services named in the City's relevant emergency plan, and appointed representatives of civic, business, labor, veterans, professional, or other organizations. The disaster council is empowered to develop emergency and mutual

[20] City of Petaluma. *Emergency Preparedness.* Available online at: https://petalumastar.com/petaluma-emergency-management/, accessed September 19, 2019.

aid agreements. The Director of Emergency Services is empowered to request emergency declarations from the City and state and is granted broad authority to issue rules and regulations to obtain vital lifesaving supplies. Overall, the City Disaster Council is responsible for the development of the City Emergency Plan, which mobilizes City resources in response to a local emergency.

Petaluma Fire Prevention Guidelines: Weed Abatement

The Petaluma Weed Abatement Guideline, revised April 2019, sets forth the City's policy toward inspection of public and private properties for unabated hazardous and/or combustible fuels in vacant lots.[21] Weed abatement ensures that property owners maintain a defensible space around their properties that would allow firefighters to stop the spread of fires from open space areas to homes and other structures. The abatement criteria require all combustible growth be cut or removed from parcels of five acres or less. A defensible space of up to 100 feet may also be required to slow the spread and intensity of an approaching fire.

Sonoma County Fire Code

Chapter 13A. Chapter 13A of the County Fire Code establishes a hazardous vegetation and combustible material abatement program to protect lives, sensitive plants and animals, and property. Upon receipt of a notice of violation and order to abate, a property owner or supervisor is responsible for clearing combustible material by creating defensible space of up to 100 feet depending on the amount and type of material. This is enforced by the County Fire Chief, and failure to comply may result in civil or criminal penalties.

Sonoma County Hazard Mitigation Plan

The Sonoma County Hazard Mitigation Plan was prepared in April 2017 in accordance with FEMA guidelines for eligibility for federal assistance in hazard mitigation and disaster recovery.[22] Section 9, Wildland Fire Hazards, identifies past and future risk factors and disasters with regard to wildfires. It details past wildland fires and their locations within historic wildland fire corridors in order to assess where future wildfires may occur. The Hazard Mitigation Plan also identifies communities and facilities vulnerable to wildland fire risk, including fire stations, hospitals, schools, communications infrastructure, roads, utilities, hazardous materials sites, and certain buildings. Furthermore, the Hazard Mitigation Plan provides summaries of federal, state, and regional policy plans that pertain to wildfires, including the

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21 Petaluma Fire Prevention Bureau. April 2017. *Fire Prevention Guideline: Weed Abatement.* Available online at: http://cityofpetaluma.net/firedept/pdf/weed-abatement-guidelines.pdf, accessed September 23, 2019.

22 County of Sonoma. April 2017. *Sonoma County Hazard Mitigation Plan, Wildland Fire Hazards.* Available online at: https://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147539001, accessed September 19, 2019.

Sonoma Lake Napa Unit Fire Management Plan, the Sonoma County General Plan, and the Vision 2020 County Fire Strategic Plan. It also consolidates mitigation programs and activities, including the Sonoma County Fuel Reduction and Vegetation Management Program, Sonoma County Roadside Chipper Program, and Cal Fire Fuels Reduction Program.

Sonoma County Community Wildfire Protection Plan

The Community Wildfire Protection Plan (CWPP) was defined by the Healthy Forests and Restoration Act of 2003 with the intention of enhancing collaboration between stakeholders from federal, state and local agencies and community groups as they search for solutions to wildland-urban interface (WUI) issues.[23] There are three requirements for a CWPP: it is collaboratively developed with input from agencies and community members; it identifies and prioritizes treatment areas, mitigation strategies and treatments; and it recommends measures to reduce the ignitibility of structures. The plan was developed with input from state and local fire departments, federal agencies, community groups, and land management agencies and received funding from a FEMA grant. The purpose of the CWPP is to identify strategies and policies that community stakeholders would like to implement in order to help them safely coexist with fire threats.

Approximately one-third of Sonoma County residents reside in a WUI, wherein wildland fuels intermix with homes and structures. The CWPP designates areas of WUI, which can help in funding efforts for wildfire risk reduction projects. Several strategies can be undertaken to reduce the risk of wildfire to life, property, and the wildland environment, including:

- Structural modifications that residents can do to make their homes more resistant to ignition during wildland fires.
- Vegetation management within the 100-foot "Defensible Space Zone," proven to be critical to home survival in wildland fires.
- Landscape-scale projects such as fuel breaks and shaded fuel breaks, wherein fire fuels are strategically reduced in order to reduce risk to entire communities, ecosystems or infrastructure.
- Education and pre-fire planning.

Sonoma County Code of Ordinances

Chapter 20 – Parks and Recreation. Section 20-10 of the Sonoma County Code of Ordinances prohibits lighting, building, or maintaining fires in any park, except in portable barbecues or camp stoves.

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23 Fire Safe Sonoma. *Sonoma County Community Wildfire Protection Plan.* Available online at: https://www.firesafesonoma.org/wp-content/uploads/cwpp-final.pdf, accessed September 19, 2019.

Furthermore, it prohibits cutting or gathering wood and smoking unless authorized by the park authority.[24]

- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

4.15.4 IMPACTS AND MITIGATION MEASURES

4.15.4.1 Thresholds of Significance

According to Appendix G of the *State CEQA Guidelines* (Environmental Checklist Form), a project located in or near state responsibility areas or lands classified as very high fire hazard severity zones could have a significant impact when it would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan.
- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.

4.15.4.2 Methodology

To evaluate impacts related to wildfire, the analysis below is based on the *Fuel Management Plan* report (included in **Appendix 4.15** to this RDEIR) prepared for the proposed project that assess wildfire risk and establish appropriate treatment and monitoring measures. The analysis is also based on the *Wildfire Evacuation Transportation Assessment* (refer to **Appendix 4.15** Transportation Assessment) that evaluates the capacity of local roadways serving the project site during a wildfire evacuation scenario that is based on the evacuation plan developed as part of the Wildfire Analysis Report. The discussion below addresses whether the residential component and improvements associated with the park extension component would interfere with an emergency response plan, would exacerbate a wildfire, or expose people or structures to other risks as a result of a wildfire.

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24 County of Sonoma. *Ord. No. 1832 Section 20-10-Fires.* Available online at: https://library.municode.com/ca/sonoma_county/codes/code_of_ordinances?nodeId=CH20PARE_ARTIIPAGE_S20-2DE, accessed September 23, 2019.

4.15.4.3 Project Impacts and Mitigation Measures

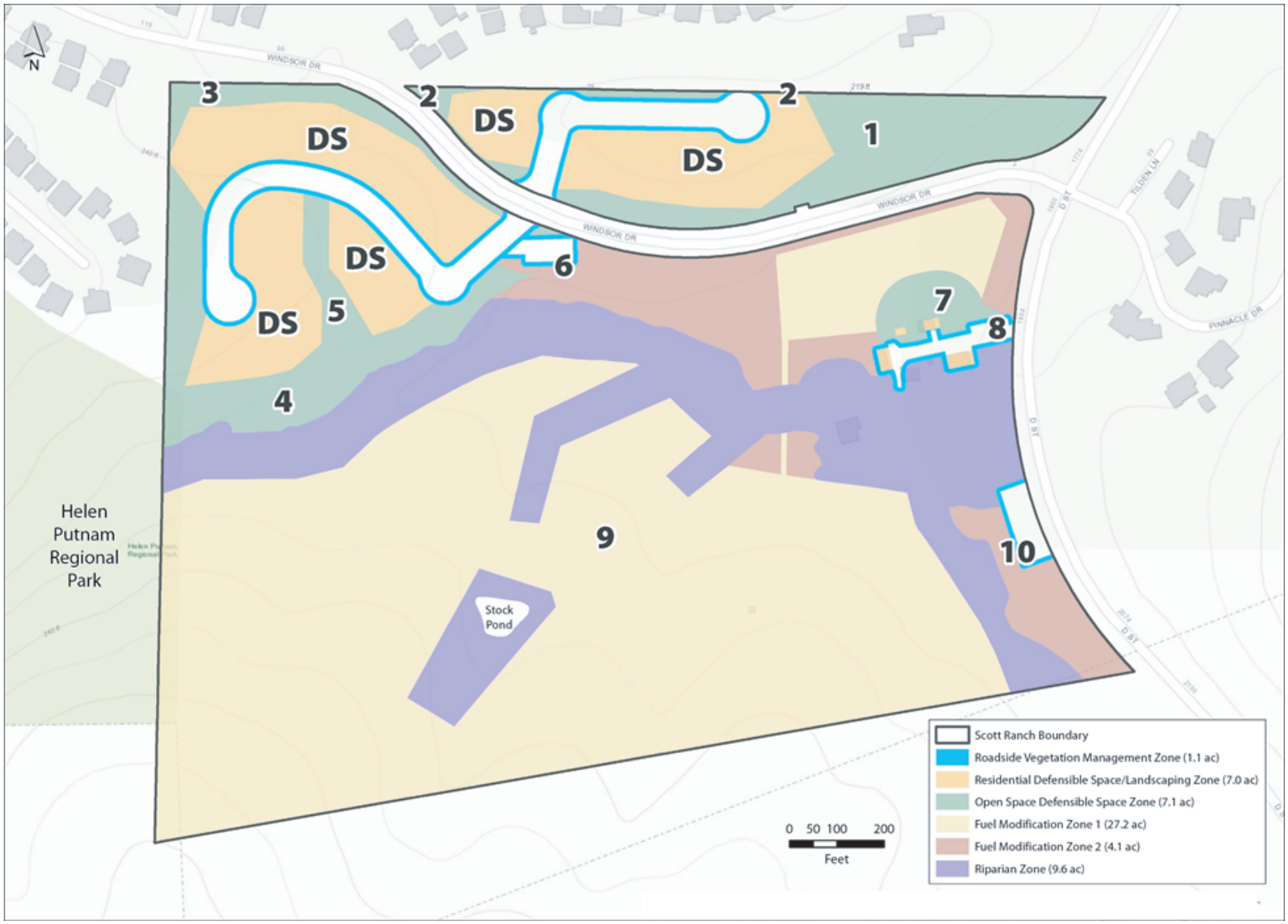
Impact WDF-1: The proposed project would not substantially impair an adopted emergency response plan. (*Less than Significant)*

Vehicular access to the project site would be provided at a new intersection on Windsor Drive. In addition, the proposed project would include direct access to proposed parking lots from Windsor Drive and D Street. As described under **Impact Trans-3** of **Section 4.13, Transportation**, proposed Streets A and B, as well as driveways, would be constructed to provide internal circulation to the project. These facilities would be designed and constructed in accordance with City regulations to ensure adequate access for emergency and fire vehicles. The design of emergency vehicle access on the project site would be developed in consultation with the City Fire Prevention Bureau. The project site would be required to provide turning radii and back-up space adequate to accommodate emergency fire equipment.

The Fuel Management Program, identified in the *Fuel Management Plan* report and presented in **Section 3.0, Project Description**, identified a Roadside Vegetation Management Zone, shown on **Figure 4.15-3, Fuel Management Zones**, which includes vegetation near roads, driveways and parking lots. The Roadside Vegetation Management Zone would be designed to assist evacuation and emergency vehicle access to the residential and park portions of the proposed project and to limit ignitions from vehicles. As presented in **Section 3.0, Project Description**, maintenance standards identified by the Fuel Management Program for the Roadside Vegetation Management Zone would be similar to those identified for the Residential Defensible Space/Landscaping Zone shown in white on **Figure 4.15-3** with one exception. Additional requirement in the Roadside Vegetation Management Zone is a 15-foot vertical clearance created by tree-trimming over pavement along the entire length of the roadway, parking lot, or driveway. Standards identified for this zone in the Fuel Management Program include ongoing maintenance of the emergency-access easement.

The Transportation Assessment prepared for the proposed project examined roadway capacities under evacuation conditions for D Street and Western Avenue between Windsor Drive and Petaluma Boulevard.[25] The Transportation Assessment considered evacuation conditions under worst-case traffic conditions during major wildfires that may occur under two wind scenarios analyzed in the *Fuel Management Plan* report. Under both scenarios, the assessment assumed that the majority of residences within the fire zone would evacuate north to Petaluma Boulevard via D Street or Western Avenue. The assessment assumed two lanes would be available under the evacuation conditions with one lane of travel

25 Fehr & Peers. 2020. Memorandum: Scott Ranch DEIR: Wildfire Evacuation Transportation Assessment. June 26.



SOURCE: WILDLAND RES MGT, Fuel Management Plan, November 2020.

FIGURE **4.15-3**

IMPACT SCIENCES

Fuel Management Zones

for egress and the second lane used for emergency access. The assessment found that under both scenarios, all roadway segments would operate at volume to capacity (V/C) ratios of under 1.0, which indicates that the roadways can successfully operate at evacuation capacity. A V/C ratio of greater than 1.0 would result in a vehicle slowdown and longer travel times. The highest V/C ratio expected is 0.86, for Western Avenue between English Street and Petaluma Boulevard. Therefore, under the worst-case traffic assumptions and fire scenarios identified and analyzed in the *Fuel Management Plan* report, D Street and Western Avenue would have sufficient capacity to accommodate evacuating vehicles while maintaining one lane along those streets for emergency access.

Given the project conditions discussed above related to the project's Fuel Management Program maintenance standards for emergency access easement and because the proposed project would not exacerbate nearby roadway network capacity during worst-case traffic conditions, the proposed project would not affect existing emergency response plans within the City of Petaluma. Therefore, the proposed project's impact associated with implementation and/or conflicting with emergency plans would be less than significant.

Impact WDF-2 **The proposed project would not exacerbate wildfire risks, or expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. (*Less than Significant)***

The project site is located within a WUI where the proposed residential component would be in proximity to open spaces— including the proposed park extension component and the nearby Helen Putnam Regional Park. The topography, climate, and vegetation of much of the project area are conducive to the spread of wildland fires once started. Wildfires in the project area are a potential hazard, particularly during the fall seasons, when warm and dry winds combined with the dry vegetation have the potential to exacerbate ignition sources. Potential to trigger a wildfire could occur not only in fire-prone undeveloped areas, but also in developed areas where fire would be related to human causes.

The proposed project, including the residential component and the park extension component, is designed in compliance with the City of Petaluma Fire Code. Future lot-specific house plans would be reviewed by the City staff including the City's Fire Prevention Bureau as part of both the Site Plan and Architectural Review and building permit issuance to ensure that the new construction and its fire and life safety systems are designed, installed, and tested to the most current code requirements.

Based on the *Fuel Management Plan* report, most of the current vegetation at the project site is of low fire hazard. However, a fire could spread quickly with wind from the west in the summer. A fire originating

northeast of the project site, driven by northeasterly Diablo winds, would advance through embers from off site in order to cross Windsor Drive and other existing roads. Embers from fires in poorly maintained landscaping or shrubs/trees off-site could land anywhere at the project site and cause new ignitions. The greatest vulnerability would come from ember cast, and the challenge that a long fire front would pose.[26]

Based on CAL FIRE's annual Wildfire Activity Statistics, the most common causes of wildfires are mechanical use, debris burning, arson, electrical powerlines, campfires, playing with fire, and lightning. Arson, campfire and playing with fire are more likely to occur in vacant lots. In contrast, the risk of fire from mechanical use, vehicles, debris burning, electrical powerlines, and smoking is greater in developed lots. Debris burning is prohibited in the project area and neighbors would be expected to promptly report any such burning. In addition, all electrical powerlines added by the proposed project would be under ground. Therefore, no wildfire ignition risk would be anticipated from these two sources as a result of the proposed project. As demonstrated by the relative percentage of acreage burned by different causes in these Wildfire Activity Statistics, some causes of fires typically result in longer detection time because they tend to occur in locations which are difficult to access and thus have greater response times associated with them. However, the proposed project would result in ignition risk from sources associated with mechanical use, vehicles, and smoking. The proposed project would offset the increased ignition risk by replacing approximately 15 acres of fuel (current vegetation) with fire-resistant residences and landscaping. In addition, the residential component would include improved access, water supply, water delivery systems, and restrictions on dangerous fire-related behavior.

Construction of the residential component would comply with the City's Fire Code Chapter 17.20, which adopts the California Building Standards Code, Title 24, Part 9, 2019 California Fire Code, incorporating the 2018 Edition of the International Fire Code (California Building Code 2019). Chapter 7A of the California Building Code 2019 applies to building materials, systems and/or assemblies used in the exterior design and construction of new buildings located within a WUI and provides materials and construction methods for exterior wildfire exposure. The proposed residences would include ignition resistance components as described in **Section 3.0, Project Description**.

The development area of the residential component would be planted with native trees, shrubs, and groundcover. The front yards would be landscaped, complying with water conservation standards from the Petaluma Municipal Code. Additionally, there would be a minimum 5-foot wildlife corridor between the fences of the project's residences and the existing fences of the adjacent Victoria subdivision. Landscaping vegetation that would be located near structures and evacuation routes could either be the

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26 Wildland Restoration Management. 2020. Fuel Management Plan. Scott Ranch. Petaluma, California. November, included as Appendix 4.15 to this RDEIR.

most damaging vegetation fuel type or provide an additional layer of safety and protection from fires. Domestic landscaping may fall into one of the following conditions:

1. Landscapes are moist, and therefore won't burn; or
2. They contain large amounts of fuel, which will burn with great intensity; or
3. They contain fire-resistant plants, and will burn slowly with little resistance to control, or
4. They are maintained to be of low fuel volume, so provide little heat when they do burn.

Poor maintenance, breakage in irrigation pipes, and unremoved dead plant material could result in a large dead-fuel component amounting to a large volume of fuel. The proposed project would include several improved fuel characteristics that would make the site less prone to ignition and less likely to spread rapidly or burn with intensity. The following characteristics would result from the proposed project:

- Areas of low-fuel in the residential portion of the site.
- Firebreaks in the form of parking lots, and development of trails.
- Removal of flammable abandoned buildings.
- Minimization of grass volume through grazing, and as needed flash grazing.
- Increased moisture of portions of the grassland through habitat restoration projects that alter the species to more moisture-loving types of herbaceous plants.
- Two infiltration basins that would support plants with higher levels of moisture than currently existing vegetation.

The Putnam Park Extension Project component would attract more people to this portion of the project site, which would have the potential to increase the number of ignitions. However, based on a survey with open space managers, authorized use of open space with attendant fuel management, patrol, and enforcement presence have limited the risk of wildfire as compared to unpatrolled private land. Based on the survey, illegal campfires are the biggest source of wildfires. The survey also showed that stoves have not caused wildfires and trail users have rarely started fires. The survey results indicated that fuel management plays a role in the extent of fires.[27]

In compliance with PMC Section 4907.1 and as discussed in **Section 3.0, Project Description**, the proposed project would include a Fuel Management Program identified in the *Fuel Management Plan* report which

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27 Wildland Restoration Management. 2020. Fuel Management Plan. Scott Ranch. Petaluma, California. November, included as Appendix 4.15 to this RDEIR.

would provide protection measures for both the project site and neighboring properties from the wildfire risk that could occur on site or off site.

The Fuel Management Program would divide the project site into six treatment zones as shown on **Figure 4.15-3.**

1. Residential Defensible Space/Landscaping Zone
2. Open Space Defensible Space Zone
3. Roadside Vegetation Management Zone
4. Fuel-Modification Zone 1
5. Fuel-Modification Zone 2
6. Riparian Zone

Both the Residential Defensible Space/Landscaping Zone and the Open Space Defensible Space Zone (including any barbecue areas in the developed portion of the extension of the Helen Putnam Regional Park) are designed to reduce ignitions near structures, support structural survival during a wildfire, and reduce the chance that an ignition would move offsite. The Residential Defensible Space/Landscaping Zone is shown in white on **Figure 4.15-3**, and labeled as DS. The Open Space Defensible Space Zone is indicated as green on the same figure, and is comprised of areas 1, 2, 3, 4, 5 and 7.

The Roadside Vegetation Management Zone consists of vegetation near roads, driveways and parking lots, and is designed to assist evacuation and emergency vehicle access and to limit ignitions from vehicles. It is shown in blue in **Figure 4.15-3** (zones 6, 8, and 10) and also applies along Streets A and B. The standards and actions to comply with both the Defensible Space/Landscaping Zone and the Roadside Vegetation Management Zone are the same, with one exception. In the Roadside Vegetation Management Zone a 15-foot vertical clearance would be maintained by tree-trimming over pavement along the entire length of the roadway, parking lot, or driveway.

The Fuel Modification Zones (1 and 2) encompass the remainder of the open space portion of the project site (shown in yellow and tan, and ensure the fuels do not exacerbate fire hazards to adjacent landowners and structures. Fuel Modification Zone 1 (yellow) is within the fenced cattle grazing area of the proposed Helen Putnam Park Extension and is designed to limit fire intensity and spread by means of the pruning of trees, reduction of understory plants, and use of prescribed herbivory (grazing). Fuel Modification Zone 2 (tan) is also within the proposed Helen Putnam Park Extension, but is outside the regular cattle grazing area; accordingly, options for fuel reduction other than prescribed herbivory are more likely to be used within this zone.

The Riparian Zone is also within the proposed Helen Putnam Park Extension and outside the fenced cattle grazing area. This zone covers those areas along Kelly Creek and its tributary, and immediately surrounding the stock pond (shown in purple). For each of the site zones, the *Fuel Management Plan* report identifies a set of maintenance standards that are developed in compliance with California State PRC 4291 and the Petaluma Municipal Code. Maintenance standards are included in Section IV., Fuel Management Program. The *Fuel Management Plan* report also identifies general measures for fire-resistant landscaping including spacing and design, landscape maintenance, and species selection criteria (Appendix B, Fire-Resistant Plants and Prohibited Species).

The *Fuel Management Plan* report examined fire behavior at the project site with three different fire scenarios: 1) a fire beginning to the southwest of the project site, near the main entrance of Helen Putnam Regional Park, on an August day with a southwesterly wind blowing toward the project site; 2) a fire beginning immediately to the northeast of the project site on an October day with northeasterly Diablo winds blowing toward the project site and with normal moisture in on-site riparian vegetation; and 3) a fire beginning immediately to the northeast of the project site on an October day with northeasterly Diablo winds blowing toward the project site, but with on-site riparian vegetation dried by drought.

For all three scenarios, the *Fuel Management Plan* report concluded that the proposed project with the implementation of the Fuel Management Plan showed improved fire conditions compared to the same scenarios under existing conditions, without the project. Modeling of fire growth showed a modest improvement for the first scenario (15,683 versus 16,337 acres burned in 9 hours assuming no fire suppression activity); good improvement for the second scenario (174 versus. 225 acres burned in 9 hours assuming no fire suppression activity); and excellent improvement for the third scenario (193 versus 4,833 acres burned in 9 hours assuming no fire suppression activity). Given the conversion of grasslands to residences, the improved conditions would also occur if grazing continues within the Putnam Park Extension portion of the project and the other vegetation management measures are not implemented within the park portion until the Putnam Park Extension Project component is open to the public.

Predicted Fire Behavior with Implementation of the Fuel Management Plan Report

Model analysis in the *Fuel Management Plan* report showed that once the fire-management measures as outlined in the Fuel Management Program (**Section 3.5.7**, in the Project Description) have been implemented on the site, fire behavior in the area within 100 feet of structures would exhibit less than two-foot flame lengths. Flame lengths of less than two feet typically do not threaten structure survival. Also, because available fuels would either be kept mowed or would be compact in nature, any ignited fire(s) would travel at containable speeds.

Flame lengths produced further away than 100 feet from a structure would be slightly greater but crowning and torching of trees would be minimized; fires are expected to quickly subside in intensity in the Defensible Space/Landscape Zone. Where fuel management is limited (i.e. in riparian zone) flame length may exceed two feet.

The structures of the barn complex and the proposed residences would be minimally exposed to ignition from embers as a result of the band of non-combustible materials immediately next to the structure and landscaping of low fuel volume. Embers that land within 100 feet of structures would not be apt to ignite or carry fire with intensity that can damage a structure.

Conclusion

The project's compliance with the California Building Code 2019 to develop the residential component with fire-resistant construction materials and the wildfire fuel control through the implementation of the Fuel Management Program developed for the proposed project would improvement existing conditions (without the proposed project), reduce the risk of wildfires, and facilitate quick containment, so that fire would not spread quickly within the residential portion of the site and nearby residential subdivisions. Also as discussed under **Impact WDF-1** above, with the worst-case traffic assumptions and fire scenarios identified and analyzed in the *Fuel Management Plan* report, D Street and Western Avenue would have sufficient capacity to accommodate evacuating vehicles while maintaining one lane along those streets for emergency access. Therefore, the proposed project's impact associated with the risk wildfire and exposure of project occupants to spread of a wildfire would be less than significant.

Impact WDF-3: **The proposed project would not require the installation or maintenance of associated infrastructure (such as road, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment. (*Less than Significant)***

The proposed project would install new electric, gas, and communication facilities underground in a joint trench. Public utility easements would be provided along the street rights-of-way to allow for joint trench facilities such as pull boxes and transformers. Electricity lines would run to a stub out located near the service vehicle entrance to the barn complex along D Street to facilitate the provision of electricity to the Putnam Park Extension Project component. No electric utilities, such as temporary power poles, are proposed during construction. All proposed utilities and associated infrastructure would be designed and installed in compliance with the Petaluma Fire Code, Building Code, and Public Works Codes and Standards.

As described under **Impact WDF-1**, design of emergency vehicle access on the project site would be developed in consultation with the City's Fire Department staff. The project site would be required to provide turning radii and back-up space adequate to accommodate emergency fire equipment. The Roadside Vegetation Management Zone would be designed to assist evacuation and emergency vehicle access to the residential and park portions of the proposed project and to limit ignitions from vehicles.

As described under **Impact WDF-2** above, the proposed project would comply with the amended Section 4907.1 of the California Fire Code and establish a defensible area with maintenance of emergency vehicle access, emergency water supplies, street names, building identification, and fuel modification measures. Therefore, the proposed project would not require the installation or maintenance of associated infrastructure that would exacerbate fire risk and this impact would be less than significant.

Impact WDF-4: **The proposed project would not expose people or structures to significant risks, including downslope or downstream flooding or landslide, as a result of landslide, runoff, post-fire slope instability, or drainage changes. (*Potentially significant; less than significant with mitigation*)**

As described in **Section 4.6, Geology and Soils** and shown on **Figure 4.6-3**, of the 18 landslides at the project site, eight are large (Landslides A through H) and the remaining (Landslides I through R) are small landslides. Two of the large landslides (Landslides E and F) are located within the limits of residential grading. Three of the large landslides (Landslides B, G, and H) and four of the small landslides (Landslides L, N, O, and R) are located within, or very close to, the limits of grading for the loop trail. The rest of the landslides are outside the grading limits of the Davidon (28-Lot) Residential Project component and the Putnam Park Extension Project component. As discussed in **Section 4.6**, risk associated with potential destabilization of existing landslides would be reduced to a less-than-significant level with implementation of **Mitigation Measures GEO-1a** and **GEO-1b**, which would require the preparation and implementation of the recommendations of a preconstruction geotechnical report that would address project impact associated with landslides and landslide movement. **Mitigation Measures GEO-3a** and **GEO-3b**, which would require the preparation of project specific design-level recommendations for the removal of the two large Landslides E and F and the design of surface benches on graded slopes. The provisions outlined in **Mitigation Measures GEO-1a, GEO-1b, GEO-3a,** and **GEO-3b** would reduce the impact associated with landslide movement as a result of soil instability post-fire to a less-than-significant level.

There is no FEMA-designated 100-year flood zone within the proposed project site; the 100-year flood would be contained within the incised stream channel. As described in **Section 4.7, Hydrology and Water**

Quality, grading for the project site would be limited to elevations above the top of the bank of Kelly Creek, and grading would be limited to only the northwestern portion of the project site. As such, the proposed project would not significantly affect or redirect flood flows. As described under **Impact HYD-6** in **Section 4.7, Hydrology and Water Quality**, to reduce the potential impact of the proposed three pedestrian bridges to impede and or redirect flood flows within the Kelly Creek corridor, **Mitigation Measure HYD-6** would require designing the pedestrian footbridges to maximize the natural channel cross section and reduce potential obstruction of in-stream flow.

As described in **Section 4.7, Hydrology and Water Quality,** the proposed project would not alter drainage patterns. **Mitigation Measure HYD-4a** and **Mitigation Measure HYD-4b** were identified to ensure that final project designs maintain peak flows at or below existing conditions and ensure continuous maintenance of the proposed water detention facilities. Therefore, with incorporation of **Mitigation Measures GEO-1a, GEO-1b, GEO-3a, GEO-3b, HYD-4a, HYD-4b, and HYD-6**, the potential risk to expose people or structures to landslide, slope instability, flooding, or drainage changes would be less than significant.

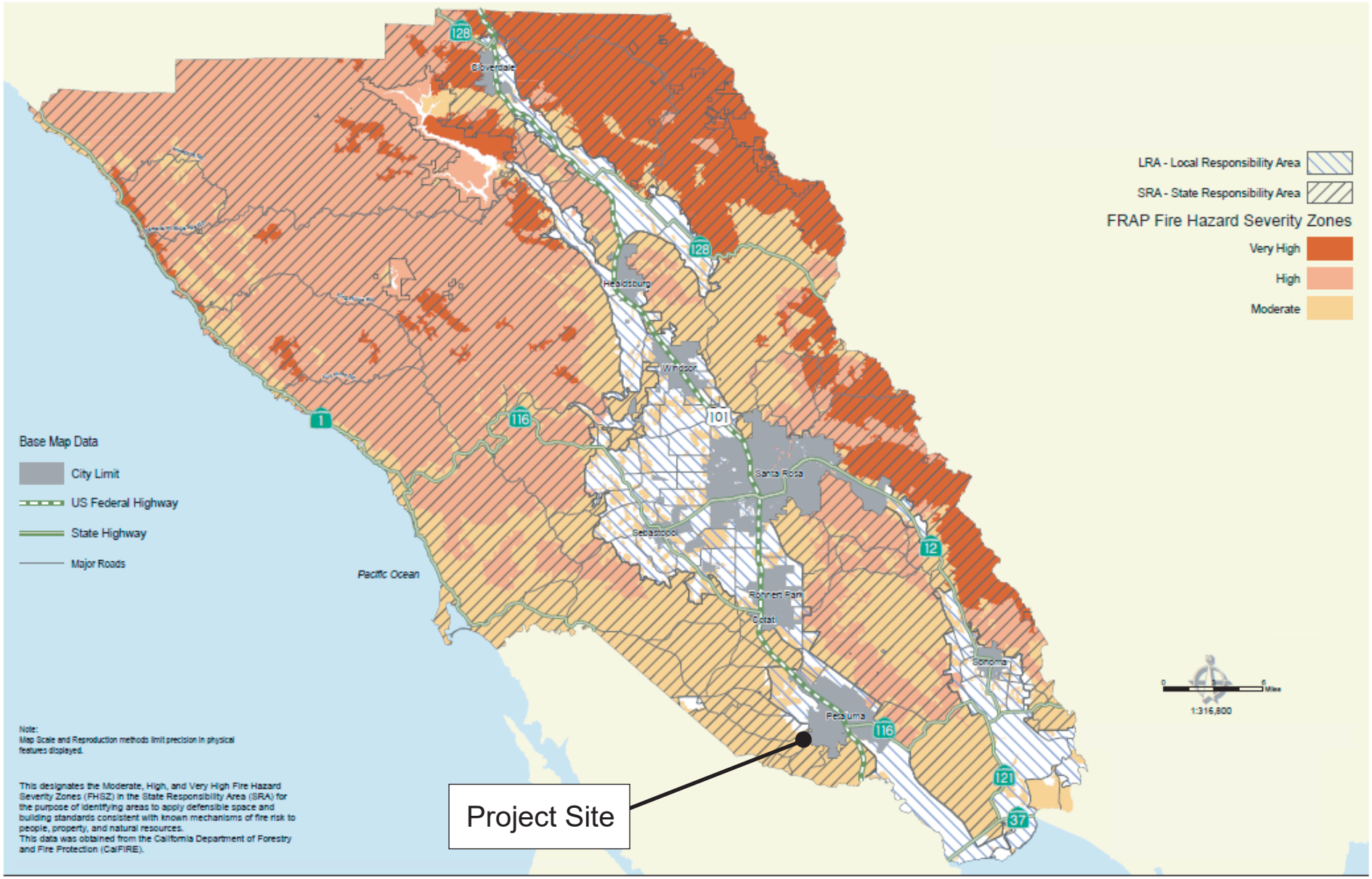
4.15.4.4 Regional Park Trail Impacts and Mitigation Measures

Environmental Setting

The proposed regional park trail is located near the upstream end of Kelly Creek within Helen Putnam Regional Park. The park is located within an SRA as classified by the Fire and Resource Assessment Program of the CAL FIRE. The park is within a moderate Fire Hazard Severity Zone as depicted on the FRAP map for Fire Hazard Severity Zones in SRA within Sonoma County (See **Figure 4.15-4, Sonoma County Fire Hazard Zones**). The proposed trail would be located in hilly terrain with rolling dips and switchbacks. Vegetative cover consists of a mosaic of non-native grasslands, native grasslands, and oak and riparian woodlands, with scattered wetland seeps and ephemeral drainages along the trail alignment and the main channel of Kelly Creek to the south of the trail alignment.

Ongoing vegetation management at Helen Putnam includes annual mowing and weed whacking, annual grazing, control of invasive species, and restoration of native species. Mowing and weed whacking is primarily along park trails and includes the northern most park boundary along Windsor Road. Mowing and weed whacking occur at least once annually by Regional Parks staff.

Annual grazing is used at Helen Putnam to meet two discreet yet overlapping goals. Heavy grazing used primarily to create fuel breaks, facilitate access, and reduce the need to mow occurs at both park entrances and along the southern boundary of the park. Lighter grazing is used to reduce the accumulation of thatch,



SOURCE: County of Sonoma, California Department of Forestry, CalFIRE, 2013.

FIGURE **4.15-4**

IMPACT SCIENCES

Sonoma County Fire Hazard Zones

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promote regeneration of native species, broadly introduce beneficial disturbance, and also reduce the risk of wildfire. The location of lighter grazing varies annually and is determined by the contracted rancher and Regional Parks staff annually. Typically, heavy grazing occurs across 10 acres of the park and lighter grazing occurs across 20-40 acres of the park as funding and resources allow.

Invasive species control at Helen Putnam is determined on an ongoing and as needed basis. Some control is achieved by grazing, mowing, and weed whacking as described above. In 2018, Regional Parks adopted a weed mapping and weed treatment tracking software developed by Calflora. The park was mapped in 2019 for emergent invasive weeds. Results show 89 unique weed observations to date of commonly occurring invasives such as thistle and broom species.

Restoration of native species at Helen Putnam has recently occurred around the pond feature and to decommission old trails. Over 400 native plants were planted in early spring of 2020.[28]

RPT Impact WDF-1: The implementation of the proposed regional park trail would not cause substantially exacerbated wildfire risks or result in an adverse impact related to an emergency response plan, or expose people or structures to significant risks. (*Potentially significant; Less than Significant with mitigation*)

Emergency Response

No new vehicular roadways or traffic improvements would be constructed as part of the proposed regional park trail project. The proposed regional park trail project would include a multi-use trail that would be accessed from the project site. Visitors could use the two parking lots of the proposed project to access the proposed regional park trail. However, no vehicular roadways or traffic improvements would be constructed as part of the proposed park trail project. As discussed in **Section 4.13.4.4, Transportation**, trips generated by construction and operation of the proposed regional park trail would be minimal, as the trail would not change the size or characteristics of the existing regional park. Therefore, construction and operation of the proposed regional park trail would not impede emergency access to the regional park or surrounding residential areas. No impact would occur on emergency response as a result of the regional park trail project.

Wildfire Risks

The proposed regional park trail would construct a multi-use trail through Helen Putnam Regional Park to eventually connect to an existing trail on the Regional Park property. The regional park trail would be

28 Steve Ehret, Planning Manager, Sonoma County Regional Parks, personal communication via email, November 16, 2020.

constructed from the western boundary of the project site to connect with the existing Ridge Trail located west of the Victoria Subdivision as shown in **Figure 3.0-12, Helen Putnam Regional Park Trail Section**. The trail would be approximately 0.5-mile long and four feet wide. Trail construction would require some grading to create a shelf for the trail depending on the hillside slope and to achieve trail slopes that are usable. No trees would be removed for the construction of the regional park trail. Therefore, the trail would not alter the topography and vegetation of the Regional Park nor it would it change the wind patterns.

As described in the Fuel Management Program, for the first year and until the park extension component is transferred to the Sonoma County Regional Parks, the Home Owner Association of the proposed residential component would be responsible for implementing fuel management and control in Area 4 shown on **Figure 4.15-3** where the regional park would be connected to the project site. The Sonoma County Regional Parks Department works to mow and graze grassland on park boundaries to provide fuel breaks. Sonoma County Regional Parks also thins unnatural buildup of shade-tolerant trees like Douglas fir in some areas.[29] In collaboration with CAL FIRE personnel, Sonoma County Regional Parks has also begun to reintroduce the use of prescribed burns to reduce wildfire risk and enhance biodiversity within grasslands.[30] Beyond hydrologic control measures such as rolling dips and switchbacks, the regional park trail project would not require the installation or maintenance of new infrastructure that may exacerbate fire risks or result in other impacts to the environment. The regional park trail would not result in an increased risk of wildfire when compared to existing conditions. The proposed regional park trail would attract more visitors to the regional park. This would have the potential to increase the number of ignitions. However, as discussed in the *Fuel Management Plan* report (**Appendix 4.15**), based on a survey with open space managers, illegal campfires are the biggest source of wildfires. The survey showed that trail users have rarely started fires. Therefore, the regional park trail project would not exacerbate wildfire risks or expose people or structures to significant risks and impact would be less than significant.

Landslide and Post-Fire Slope Instability

As discussed in **Section 4.6, Geology and Soils**, no permanent residences or structures are associated with the proposed regional park trail project. Landslide movement would be limited to the trail becoming inaccessible to visitors. **Mitigation Measure RPT-GEO-1** would require periodic inspection and repair of the regional park trail to reduce impact associated with landslide movement. With implementation of

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29 Sonoma County Regional Parks. Fuels in Sonoma County Parks. Available at: https://parks.sonomacounty.ca.gov/Learn/Natural-Resources/Fuels/, accessed October 22, 2020.

30 Sonoma County Agricultural Preservation and Open Space District. Successful controlled burns in Sonoma Valley. Available at: https://www.sonomaopenspace.org/news-and-features/2019/06/successful-controlled-burns-in-sonoma-valley/#:~:text=On%20June%2017%2C%202019%20our,the%20Sonoma%20Valley%20Regional%20Park.&text=The%20burn%20was%20conducted%20by,biodiversity%20within%20the%20park's%20grasslands., accessed on October 22, 2020.

Mitigation Measure RPT GEO-1, the potential impact of exposing people to significant risk associated with damage of the proposed regional park trail from landslides and post-fire slope instability would be less than significant.

4.15.4.5 Cumulative Impacts and Mitigation Measures

The geographic area for the evaluation of cumulative wildfire impacts resulting from the proposed project and the regional park trail project is the area surrounding the project site, including the Single-family subdivisions located to the north (The Summit Above Petaluma), northwest (Victoria), and east (Pinnacle Heights). It also includes undeveloped land within unincorporated Sonoma County located to the south and southwest of the project site and to the west of the Helen Putnam Regional Park.

Cumulative Impact C-WDF-1: The proposed Scott Ranch Project and the regional park trail project, in conjunction with other closely related past, present and reasonably foreseeable future development, would not result in a significant cumulative impact on wildfire. (*Less than Significant*)

Similar to the proposed project, all development projects within the City of Petaluma are subject to the City's Fire Code requirements. All new construction would be designed and constructed in accordance with City regulations to ensure adequate access for emergency and fire vehicles. In addition, each of the cumulative projects would be individually required to comply with all other applicable City fire safety requirements, including hydrant and access improvements, if necessary, to adequately mitigate impacts related to wildfires. The proposed project would comply with all applicable requirements of the City's fire code including fire-resistant construction materials and vegetation control measures. As discussed under Impacts WDF-1 and WDF-2, the proposed project would not exacerbate the conditions of emergency access or evacuation in the event of a major wildfire. In addition, the proposed project would implement the Fuel Management Program outlined in **Section 3.5.7, in the Project Description**, which would result in a reduction of wildfire risk, compare to existing conditions. Implementation of the Fuel Management Program would facilitate quick containment of fire. In addition, the proposed project would comply with the California Building Code 2019 to develop the residential component with fire-resistant construction. Therefore, the proposed project's contribution to wildfire impacts would not be cumulatively considerable. With full compliance with all applicable local and state rules and regulations, as well as implementation of site-specific recommendations for the cumulative projects, cumulative impacts related to wildfires would be less than significant.

4.15.5 REFERENCES

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