

# Fire Hazard Planning Technical Advisory

## General Plan Technical Advice Series

2020 Update

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State of California  
Gavin Newsom, Governor

Governor's Office of Planning and Research  
Kate Gordon, Director

### **Agency Information**

#### *Address*

1400 10<sup>th</sup> Street  
Sacramento, CA 95814

#### *Phone*

(916) 322-2318

#### *Website*

[www.opr.ca.gov](http://www.opr.ca.gov)

### **OPR Project Manager**

Erik de Kok, AICP

### **OPR Report Contributors**

Beth Hotchkiss  
Debbie Franco  
Elliott Pickett  
Nikki Carevelli  
Nuin-Tara Key

### **Interagency Working Group Members**

*Board of Forestry and Fire Protection*  
Edith Hannigan

*California Department of Forestry and Fire Protection (CAL FIRE)*

Brian Barkley  
Carmel (Mitchell) Barnhart  
Gene Potkey  
Jeff Hakala  
Raymond Martinez  
Shane Vargas

*California Natural Resources Agency*  
Jennifer Montgomery

*Governor's Office of Emergency Services*  
Victoria LaMar-Haas

*California Department of Housing and Community Development*  
Paul McDougall

*California Public Utilities Commission*  
Koko Tomassian

*California Department of Insurance*  
Mike Peterson

*California Department of Justice*  
Christina Bull Arndt

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### **Disclaimer**

Because communities throughout California are varied and have different needs, the recommendations in this technical advisory are designed for a wide spectrum of uses and applications. This document is meant to be a resource for the public to use at their discretion; it does not alter or direct public agency discretion or decision-making in preparing planning documents. This document should not be construed as legal advice, nor is the Governor's Office of Planning and Research enforcing or attempting to enforce any part of the recommendations contained herein. (Government Code [GC] § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

## **1. Introduction**

This planning guide is one in a series of technical advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and California Environmental Quality Act (CEQA) practitioners. OPR issues technical guidance on issues that broadly affect land use planning, including the application of CEQA. The goal of this technical advisory is to provide a robust planning framework for addressing fire hazards, reducing risk, and increasing resilience across California's diverse communities and landscapes. To accomplish this goal, it is essential that local jurisdictions develop and incorporate effective policies and implementation programs in their general plans and integrate their general plans with other relevant hazard and risk reduction policies, plans, and programs. This advisory provides guidance on those policies and programs, and is also intended to assist city and county planners in discussions with professionals from fire hazard prevention and mitigation, disaster preparedness, and emergency response and recovery agencies as they work together to develop effective fire hazard policies for the general plan.

## **2020 UPDATE**

This Fire Hazard Planning technical advisory was first published in 2015. Pursuant to the requirements of SB 901 (Dodd, 2018) and AB 2911 (Friedman, 2018), as codified in GC § 65040.21, OPR is now updating this document to include "specific land use strategies to reduce fire risk to buildings, infrastructure, and communities." OPR must prepare this update "in consultation with the Department of Forestry and Fire Protection (CAL FIRE), the State Board of Forestry and Fire Protection (State Board), and other fire and safety experts." Per GC § 65040.21, OPR must update the guidance document "not less than once every eight years."

## DOCUMENT OUTLINE

This document is organized into the following sections:

- 1) Introduction**
- 2) Overview of Fire Hazards and Risks to California Communities:** This section provides background and context for understanding fire hazards and risks to California's communities and landscapes.
- 3) Regulatory and Policy Background:** This section summarizes legal and regulatory requirements that directly address fire hazard planning and mitigation, including federal and state laws and regulations, and key policies, programs and guidelines that complement the regulatory framework.
- 4) Fire Hazard Planning Guidance:** This section provides an overview of the key steps in the fire hazard planning process, general recommendations for incorporating these steps in general plan updates, and opportunities for alignment of fire hazard planning with other topics such as climate adaptation and local hazard mitigation plans.
- 5) Example Policies:** This section provides example fire hazard policies and implementation programs that could be included in general plans.
- 6) Appendices:** The appendices include potential resources – including funding sources, informational guidance, networks, and tools – to support fire hazard planning, recent planning examples from communities throughout California, and other technical sections that support the main body of the document.

## 2. Overview of Fire Hazards and Risks to California Communities

Fire is a natural part of California's diverse landscapes and is vital to many ecosystems across the state. For centuries, many California Native American tribes recognized this interdependence between fire and the environment and used prescribed burning—the intentional ignition of small fires—to maintain and restore environmental health and promote resilience against catastrophic wildfires (Lake, 2018). However, in the 1800's, ecosystem management changed when settlers began enforcing a strict fire-suppression regime. Over the next century, firefighters sought to extinguish all fire in California, which led to problems such as forest densification and heightened wildfire risk (Lake, 2018; Johnston-Dodds, 2002). In the 1960's the National Park Service began to acknowledge the negative impact of fire suppression on California's forests and revised its policies to better co-exist with fire (Parsons & Nichols, 1986). Since then, California's communities have also had to grapple with how to sustainably manage fire while reducing the associated risks. Today, this question has become even more complex to answer given the increase in frequency and severity of wildfires due to climate change, and the challenges presented by the expansion of new development into areas prone to severe fire hazards.

*Figure 1: Map of California's Wildland Urban Interface (Available from [CAL FIRE's Fire and Resource Assessment Program](#))*

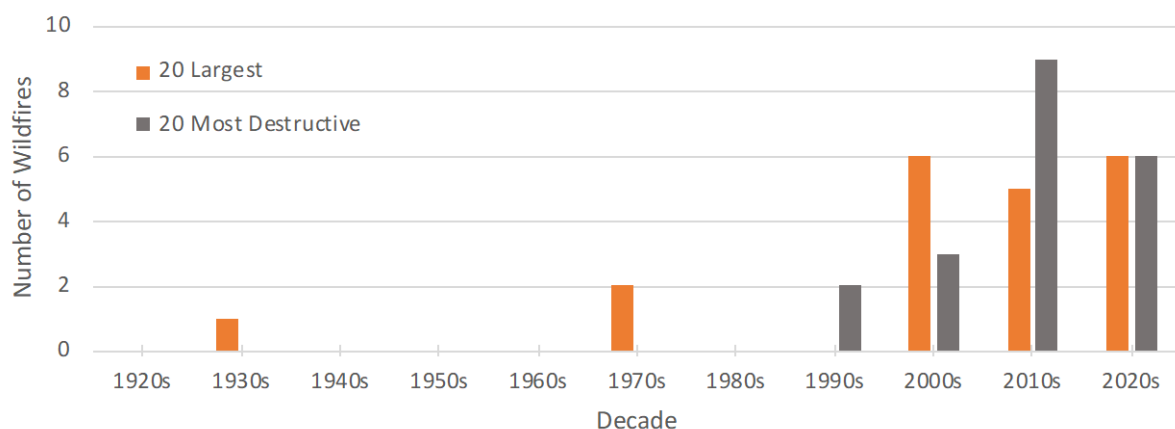


Cities and counties are frequently challenged to accommodate both current and future residents in need of safe and affordable housing. In California, approximately 180,000 homes need to be constructed annually to meet demand (Department of Housing and Community Development, n.d.). Over the past few decades, jurisdictions across the state have approved many new housing units. These are often placed within or adjacent to wildland areas, creating "wildland-urban interface" (WUI) conditions (see Figure 1). Today, approximately one third of all homes in California are located in the WUI (Mowery et al, 2019). When it comes to wildfire, this trend is of particular concern because WUI conditions are associated with an increased risk of loss of human life, property, natural resources, and economic assets. According to the [2018 Strategic Fire Plan for California](#), "since the turn of the century there has been a steep increase in structures lost compared to the 1990s".

This rise in destroyed assets is not only because of increasing housing demand and development in the WUI; it is also correlated to an increase in average fire size and severity (Strategic Fire Plan for California, 2018). The changing climate, specifically rising temperatures, shifting wind patterns, and increasing temporal variability of water availability, is substantially increasing wildfire risk across the state. The frequency of extreme fire weather during the Autumn months has more than doubled in California since the 1980s and, factoring in climate change, this frequency is projected to increase in the future (Goss et.al, 2020). According to [California's Fourth Climate Change Assessment](#), if greenhouse gas emissions continue to rise, California is likely to see a 50% increase in fires larger than 25,000 acres as well as a potential 77% increase in average area burned by 2100. According to some experts, we are now entering an era of “mega-fires” or “mega-disturbances” (Stephens et.al., 2014).

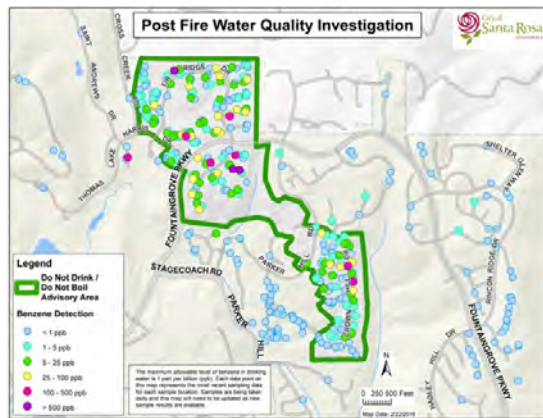
California has already begun to experience the effects of this new era. In 2017, two major catastrophic events in Ventura County and Sonoma County, the Thomas and Tubbs fires, topped the charts as the largest and most destructive wildfire events on record, respectively. However, these records were short-lived. In 2018, the Mendocino Complex Fire burned over 459,000 acres, while the Camp Fire took at least 85 lives and destroyed 18,804 structures in Butte County, including much of the town of Paradise (CAL FIRE, 2019), marking another year of unprecedented loss. Between 2003 and 2018, the top 10 costliest wildland fires in the United States all occurred in California (Insurance Information Institute, 2019). Today, catastrophic wildfire continues to pose a substantial threat to California's communities with 2020 marking another year of record-breaking events. This year's August Complex fire became California's first “gigafire” in modern history, with over 1 million acres burned. Moreover, as shown in Figure 2, six of the 20 largest and most destructive fires in California's history<sup>1</sup> occurred in 2020 alone (CAL FIRE, 2020).

*Figure 2: California's 20 Largest and Most Destructive Wildfires by Decade*  
(Data Source: CAL FIRE, 2020)



<sup>1</sup> CAL FIRE's historical record, at the time this document was prepared, spans from the 1932 through November 3<sup>rd</sup>, 2020. Three of the largest fires in California's history were still burning as of November 3<sup>rd</sup>, 2020.

*Figure 3: Outline of Santa Rosa's Water Advisory Area Following the Tubbs Fire (Source: City of Santa Rosa 2/23/18 Advisory)*



Wildfires in California not only cause direct damage, but also produce indirect impacts on ecosystem services and the built environment (Hill et al., 2020). For example, following the Tubbs fire, benzene—a toxic chemical—was released from melted plastic piping and entered Santa Rosa's drinking water system. As a result, the city implemented a water advisory (see Figure 3) that lasted for 11 months (City of Santa Rosa, n.d.). Moreover, as energy utilities responded to the growing threat and severity of catastrophic wildfire events and potential risk of ignitions by electrical transmission and distribution facilities and equipment, communities across the state were affected by public safety power shutoff (PSPS) events.

In 2019, about 2.7 million people experienced extended power outages during PSPS events as utilities responded to risky weather conditions (Botts, 2019). Utility credit downgrades are also resulting in higher customer rates, thereby reducing access to affordable electricity (Office of Planning and Research, 2019).

While many people have been impacted by wildfire, certain groups are particularly vulnerable to and disproportionately affected by these events. For instance, during the Thomas and Tubbs fires, counties struggled to provide Spanish speakers with timely emergency alerts and information (Mendez and Flores-Haro, 2019; Botts and Freedman, 2017; Roos, 2018). Moreover, during the Camp Fire, elderly residents and persons with disabilities were less likely to escape (Verzoni, 2019). The wildfire smoke from these events also had adverse health impacts downwind, particularly on outdoor workers and individuals with underlying health conditions. Similarly, the impacts from PSPS events acutely affected portions of the broader community, particularly low-income individuals and persons experiencing food insecurity (Botts, 2019).

#### Bi-lingual Social Media Messaging

The [U.S. Fire Administration](#) created a social media toolkit to promote fire preparedness and safety. Their messaging is currently available in Spanish and English but may also be customized for additional audiences.





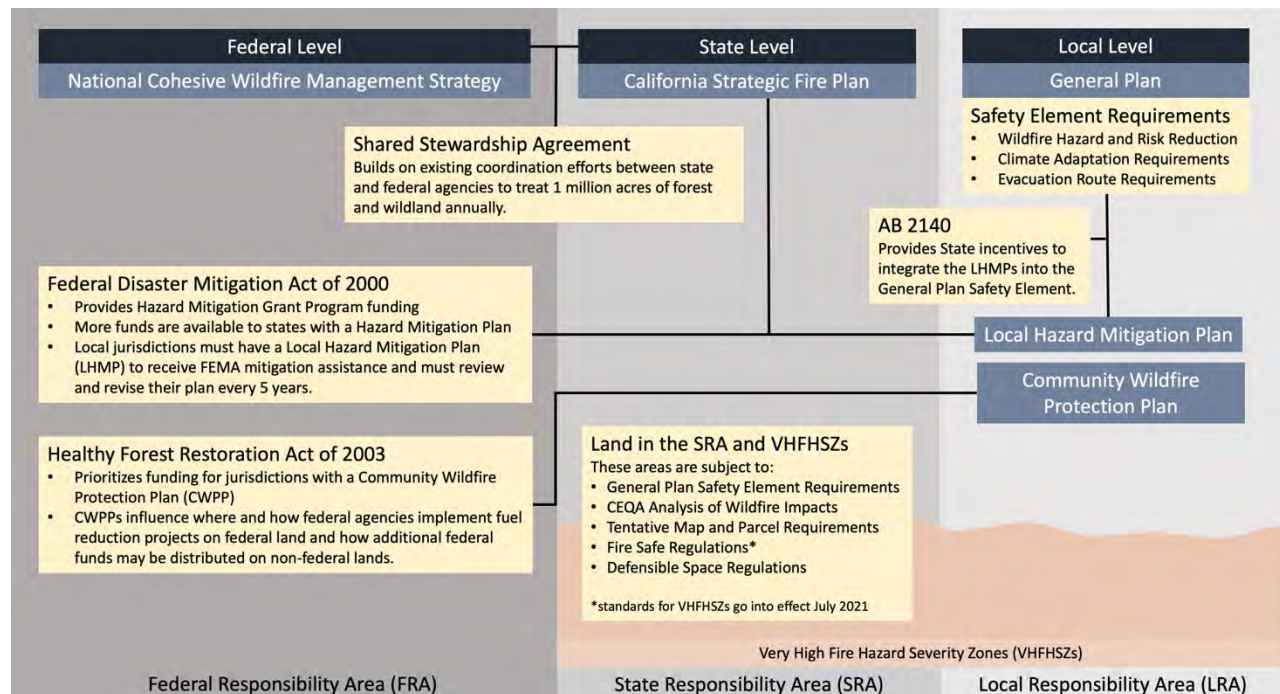
Rebuilding and recovery from wildfire events varies across income and demographic groups as well. For instance, “many individuals in rural areas, low-income neighborhoods, and immigrant communities do not have access to the resources necessary to pay for insurance [or] rebuilding” after a wildfire and, therefore, take a longer time to recover (Davies et al., 2018). Additionally, wildfires can exacerbate existing mental health conditions and lead to post traumatic stress disorder (PTSD), low self-esteem, and/or depression for vulnerable populations, including children and the elderly (Hill et al., 2020). Following the 2017 fires in Sonoma County, the Federal Emergency Management Agency (FEMA) referred thousands of residents to mental health services (Kuipers, 2019) and organizations created a Wildfire Mental Health Collaborative, which supported residents for nearly three years following the event (Healthcare Foundation Northern Sonoma County, n.d.).

Addressing the risks, impacts, and inequities caused by wildfire requires a holistic and integrated approach. California is working with local, regional, tribal, and federal partners to develop and implement a wide array of solutions in order to protect public health, promote resilience, and support local economies. CAL FIRE’s [Community Wildfire Prevention & Mitigation Report](#) outlines how the State will implement strategies such as fuel modification, prescribed burning, home hardening, and public education to reduce future fire risk. In addition, [California’s Forest Management Task force](#) is exploring avenues to address tree mortality and restore forests by developing new markets that will simultaneously promote economic sustainability. As communities plan for the future, they too can rise to the challenge, working collaboratively to address wildfire risk and build resilience moving forward.

### 3. Regulatory and Policy Background

This section describes federal and state laws, regulations, and policies related to fire hazard planning and mitigation, along with major programs and guidelines that complement the current regulatory framework. It is not intended to be an exhaustive list of all fire-related laws or policies that may exist. A general overview is depicted in Figure 4, followed by summary-level descriptions.

Figure 4: Overview of California's Wildfire Laws, Regulations, Plans, and Policies



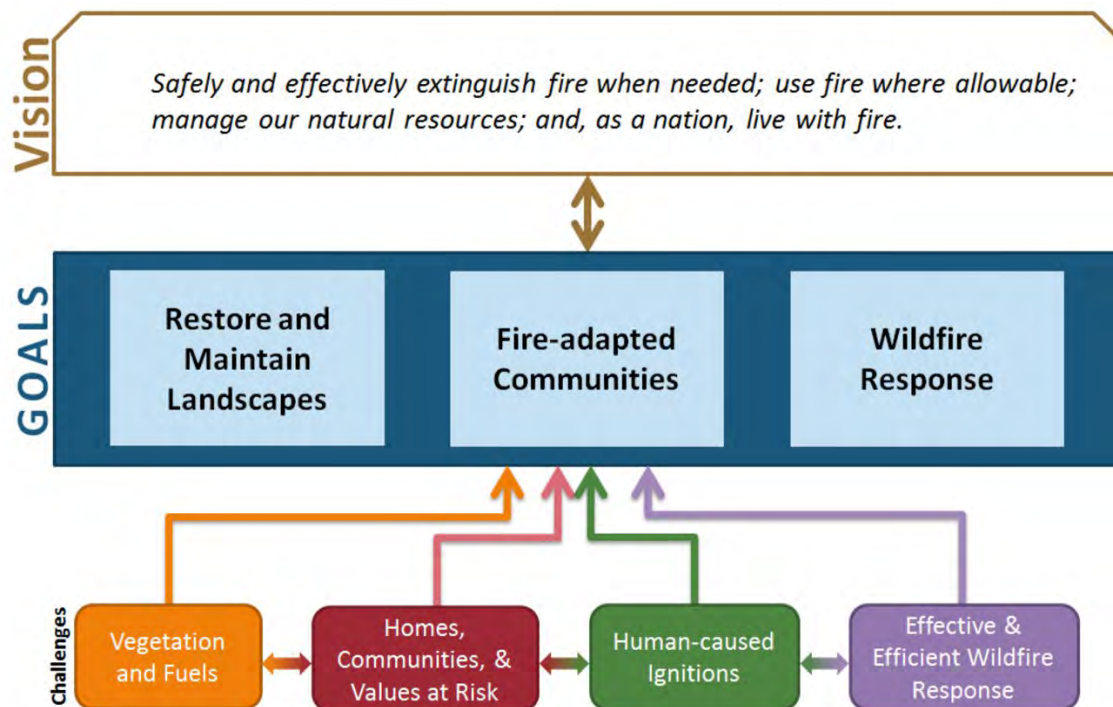
#### 3.1 FEDERAL

##### *National Cohesive Wildland Fire Management Strategy*

In response to requirements of the Federal Land Assistance, Management, and Enhancement Act of 2009, the Wildland Fire Leadership Council directed the development of the [National Cohesive Wildland Fire Management Strategy](#) (Cohesive Strategy). The Cohesive Strategy is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues. The strategy is regionally oriented and science based.

The Cohesive Strategy identifies three primary goals as presenting the greatest opportunities for making a positive difference in addressing wildland fire problems and achieving their vision (See Figure 5).

Figure 5: The Cohesive Strategy's Vision, National Goals, and National Challenges



The Cohesive Strategy's goals are as follows:

- 1) Restoring and maintaining resilient landscapes: The strategy must recognize the current ecosystem health and variability of resilient landscapes from geographic area to geographic area, including variation in impacts from climate change. Because landscape conditions and needs vary depending on local climate and fuel conditions, among other elements, the strategy must address landscapes on a regional and sub-regional scale.
- 2) Creating fire-adapted communities: The strategy must offer options and opportunities to engage communities and work with them to become more resistant to wildfire threats and respond in the event of a wildfire emergency.
- 3) Responding to wildfires: The strategy must consider the full spectrum of fire management activities and recognize the differences in missions among local, state, tribal and federal agencies. The strategy must offer collaboratively developed methodologies to move forward.

### Shared Stewardship Agreement

In a key step to improve stewardship of California's forests, the State of California and the U.S. Forest Service launched a new joint state-federal initiative in August 2020 to reduce wildfire risks, restore watersheds, protect habitat and biological diversity, and help the state meet its

climate objectives. The [Agreement for Shared Stewardship of California's Forest and Rangelands](#) includes a commitment by the federal government to match California's goal of reducing wildfire risks on 500,000 acres of forest land per year. To protect public safety and ecology, experts agree that at least one million acres of California forest and wildlands must be treated annually across jurisdictions using various fuel modification techniques. A historical transition toward unnaturally dense forests, a century of fire suppression and climate change resulting in warmer, hotter and drier conditions have left the majority of California's forestland highly vulnerable to catastrophic wildfire and in need of active, science-based management. Since the federal government owns nearly 58% of California's 33 million acres of forestlands, while the state owns three percent, joint state-federal management is crucial to California's overall forest health and wildfire resilience. Improved coordination also is key since nearly half of the state dollars invested in fuels management in recent years was spent on federal land.

The Shared Stewardship Agreement builds on existing coordination between state and federal agencies, and outlines six core principles that will drive improved state-federal collaboration:

- Prioritize public safety;
- Use science to guide forest management;
- Coordinate land management across jurisdictions;
- Increase the scale and pace of forest management projects;
- Remove barriers that slow project approvals; and
- Work closely with all stakeholders, including tribal communities, environmental groups, academia and timber companies.

Specifically, through this agreement California and the U.S. Forest Service commit to execute the following activities together:

- Treat one million acres of forest and wildland annually to reduce risk of catastrophic wildfire (building on the state's existing 500,000-acre annual commitment);
- Develop a shared 20-year plan for forest health and vegetation treatment that establishes and coordinates priority projects;
- Expand use of ecologically sustainable techniques for vegetation treatments such as prescribed fire;
- Increase pace and scale of forest management by improving ecologically sustainable timber harvest in California and grow jobs by tackling structural obstacles, such as workforce and equipment shortfalls and lack of access to capital;
- Prioritize co-benefits of forest health such as carbon sequestration, biodiversity, healthy watersheds and stable rural economies;
- Recycle forest byproducts to avoid burning slash piles;
- Improve sustainable recreation opportunities;
- Enable resilient, fire-adapted communities; and
- Share data and continue to invest in science.

### *Local Hazard Mitigation Plans*

[The Federal Disaster Mitigation Act of 2000](#) (DMA 2000) enacted several changes under Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) related to pre-disaster mitigation, streamlining the administration of disaster relief, and controlling the costs of federal disaster assistance. These changes have collectively brought greater focus on pre-disaster planning and activities as a means for reducing response and post-disaster costs.

On February 26, 2002, an Interim Final Rule (IFR) (44 Code of Federal Regulations Parts 201 & 206) to implement the DMA 2000, was published in the Federal Register. This IFR addressed state mitigation planning, identified new local mitigation planning requirements, authorized Hazard Mitigation Grant Program (HMGP) funds for planning activities, and the possibility of an increase in the percentage of HMGP funds available to states that develop a comprehensive, enhanced, State Hazard Mitigation Plan.

In accordance with the February 26th IFR and a further October 1st IFR, local governments must have a Local Hazard Mitigation Plan (LHMP) that is reviewed by the State Mitigation Officer and then approved by FEMA, prior to November 1, 2004, as this is a required condition of receiving FEMA mitigation project assistance. LHMPs must be revised, reviewed, and approved every five years.

According to the February 26, 2002 IFR, Section 201.6, local and tribal governments must include the following in their LHMPs:

- a planning process;
- a risk assessment;
- a mitigation strategy; and,
- a plan maintenance and updating process.

The February 26th IFR directs state and local governments to develop comprehensive and integrated plans that are coordinated through appropriate state, local, and regional agencies, as well as non-governmental interest groups. Moreover, state and local governments are encouraged to consolidate the planning requirements for different mitigation plans and programs to the extent feasible and practicable.

Although the LHMP and the general plan safety element are not intended to be identical documents, many of the data and analysis requirements are similar. AB 2140 (2006) allows (but does not require) a county or city to adopt and/or incorporate by reference its current, FEMA-approved LHMP into the general plan safety element. AB 2140 encourages LHMP integration or incorporation by reference into the safety element by providing a disaster mitigation funding incentive that authorizes the state to use available California Disaster Assistance Act funds to cover local shares of the 25% non-federal portion of grant-funded post-disaster projects when approved by the legislature per GC § 8685.9. If an LHMP is adopted or incorporated by reference into the safety elements, it must be consistent with the safety element and all other

elements of the general plan, pursuant to internal consistency requirements for the general plan codified at GC § 65300.5.

Local governments can work with their local emergency management agencies, local fire authorities, the State's Office of Emergency Services (CalOES), CAL FIRE, and Fire Safe Councils to ensure effective, integrated, and consistent wildfire prevention and hazard mitigation programs across numerous plans, including LHMPs, community wildfire protection plans (CWPPs, addressed further below), and general plans. More detailed discussion of plan integration and alignment is addressed in Section 4 of this document.

### *Community Wildfire Protection Plans*

A [Community Wildfire Protection Plan](#) (CWPP) is a planning and funding prioritization tool created by the Healthy Forests and Restoration Act of 2003 as an incentive for communities to engage in comprehensive forest and fire hazard planning and help define and prioritize local needs. They are generally developed by local governments or other entities with assistance from state and federal agencies and in collaboration with other interested partners. This provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal land, as well as how additional federal funds may be distributed for projects on non-federal lands. CAL FIRE also provides funding opportunities for projects or activities that may be identified in CWPPs.

The minimum requirements for a CWPP are:

- Collaboration: A CWPP must be collaboratively developed. Local and state officials must meaningfully involve federal agencies and other interested parties, particularly non-governmental stakeholders that manage land in the vicinity of the community.
- Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments on both federal and non-federal land and recommend the types and methods of treatment that, if completed, would reduce the risk to the community.
- Treatment of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

Three signatures are required to approve a CWPP:

- 1) A representative of the applicable local government;
- 2) The chief of the local fire department/district; and
- 3) The state forester/fire warden.

As with the LHMP, a CWPP is not identical to the general plan; however, some of the data and analysis included in both documents are similar.



## 3.2 STATE

### *2018 California Strategic Fire Plan*

The [Strategic Fire Plan for California](#) is the State's road map for reducing wildfire risk. The Fire Plan is a cooperative effort between the [State Board](#) and CAL FIRE. By placing the emphasis on what needs to be done long before a fire starts, the Strategic Fire Plan looks to reduce firefighting costs and property losses, increase firefighter safety, and contribute to overall ecosystem health. The central goals of the 2018 Strategic Fire Plan include:

- Improve the availability and use of consistent, shared information on hazard and risk assessment;
- Promote the role of local planning processes, including general plans, new development, and existing developments, and recognize individual landowner/homeowner responsibilities;
- Foster a shared vision among communities and the multiple fire protection jurisdictions, including county-based plans and community-based plans such as CWPPs;
- Increase awareness and actions to improve fire resistance of man-made assets at risk and fire resilience of wildland environments through natural resource management;
- Integrate implementation of fire and vegetative fuels management practices consistent with the priorities of landowners or managers;
- Determine and seek the needed level of resources for fire prevention, natural resource management, fire suppression, and related services; and
- Implement needed assessments and actions for post-fire protection and recovery.

### *California Vegetation Treatment Program (CalVTP)*

The [California Vegetation Treatment Program \(CalVTP\)](#), developed by the State Board, is a critical component of the state's multi-faceted strategy to address California's wildfire crisis. The CalVTP defines the vegetation treatment activities and associated environmental protections to reduce the risk of loss of lives and property, reduce fire suppression costs, restore ecosystems, and protect natural resources as well as other assets at risk from wildfire. The CalVTP supports the use of prescribed burning, mechanical treatments, hand crews, herbicides, and prescribed herbivory as tools to reduce hazardous vegetation around communities in the WUI, to construct fuel breaks, and to restore healthy ecological fire regimes. The CalVTP will allow CAL FIRE, along with other agency partners, to expand their vegetation treatment activities to treat up to approximately 250,000 acres per year, contributing to the target of 500,000 annual acres of treatment on non-federal lands.

CAL FIRE has the primary responsibility for implementing proposed CalVTP vegetation treatments, though many local, regional, and state agencies could also employ the CalVTP to

implement vegetation treatments if their projects are within the scope of the CalVTP. For more information, see the State Board's [CalVTP Implementation](#) page.

### *Fire Risk Reduction Communities*

[Assembly Bill \(AB\) 1823 \(2019\)](#) amended PRC Section 4290.1 to require that, on or before July 1, 2022, the State Board must develop criteria for and maintain a list of local agencies considered to be a "Fire Risk Reduction Community" located in the SRA or VHFHSZ, identified pursuant to GC § 51178, that meet best practices for local fire planning. Criteria that must be used to develop the Fire Risk Reduction Community list include recently developed or updated CWPPs, adoption of the board's recommendations to improve the Safety Element, participation in Fire Adapted Communities and Firewise USA programs, and compliance with the Board's minimum fire safety standards.

### *California Wildfire Mitigation Financial Assistance Program*

[AB 38 \(2019\)](#) established a comprehensive wildfire mitigation financial assistance program to, among other things, encourage cost-effective structure hardening and retrofitting to create fire-resistant homes, businesses, and public buildings. The bill requires the State Fire Marshal, in consultation with specified State officials, to identify building retrofits and structure hardening measures, and CAL FIRE to identify defensible space, vegetation management, and fuel modification activities, that are eligible for financial assistance under the program. The bill specifies the types of designated wildfire hazard areas eligible for funding under the program.

## 3.3 LOCAL

### *General Plan Safety Elements*

#### **Wildfire Hazard and Risk Reduction Requirements**

[Senate Bill \(SB\) 1241 \(2012\)](#) revised the safety element provisions in State law to require all cities and counties whose planning area is within the state responsibility area (SRA) or very high fire hazard severity zones (VHFHSZs) to address and incorporate specific information regarding wildfire hazards and risk, and policies and programs to address and reduce unreasonable risks associated with wildfire. The specific requirements are codified in GC § 65302(g)(3) and 65302.5(b).

#### **State Responsibility Area**

Public Resources Code (PRC) Section 4102 defines "state responsibility area" (SRA) to mean areas of the state in which the financial responsibility of preventing and suppressing fires has been determined by the State Board to be primarily the responsibility of the State. As of July 2020, approximately 31% of the state is within the SRA. Any areas outside the SRA are either within the Local Responsibility Area (LRA), or Federal Responsibility Area (FRA) if



on federal lands. Approximately 21% of the state is within the LRA, while 48% of the state is within the FRA. (Data Source: State Board, SRA20\_2 dataset, July 2020).

Maps of the SRA, LRA and FRA can be viewed at one or more of the following websites:

<https://frap.fire.ca.gov/mapping/> and <http://myhazards.caloes.ca.gov/>

GC § 65302(g)(3) states the following:

*“Upon the next revision of the housing element on or after January 1, 2014, the safety element shall be reviewed and updated as necessary to address the risk of fire for land classified as state responsibility areas, as defined in Section 4102 of the Public Resources Code, and land classified as VHFHSZs, as defined in Section 51177. This review shall consider the advice included in the Office of Planning and Research’s most recent publication of “Fire Hazard Planning, General Plan Technical Advice Series” and shall also include all of the following:*

- (A) Information regarding fire hazards, including, but not limited to, all of the following:*
  - (i) Fire hazard severity zone maps available from the Department of Forestry and Fire Protection.*
  - (ii) Any historical data on wildfires available from local agencies or a reference to where the data can be found.*
  - (iii) Information about wildfire hazard areas that may be available from the United States Geological Survey.*
  - (iv) General location and distribution of existing and planned uses of land in very high fire hazard severity zones and in state responsibility areas, including structures, roads, utilities, and essential public facilities. The location and distribution of planned uses shall not require defensible space compliance measures required by State law or local ordinance to occur on publicly owned lands or open space designations of homeowner associations.*
  - (v) Local, state and federal agencies with responsibility for fire protection, including special districts and local offices of emergency services.*
- (B) A set of goals, policies, and objectives based on the information identified pursuant to subparagraph (A) for the protection of the community from the unreasonable risk of wildfire.*
- (C) A set of feasible implementation measures designed to carry out the goals, policies, and objectives based on the information identified pursuant to subparagraph (B) including, but not limited to, all of the following:*
  - (i) Avoiding or minimizing the wildfire hazards associated with new uses of land.*
  - (ii) Locating, when feasible, new essential public facilities outside of high fire risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in a state responsibility area or very high fire hazard severity zone.*
  - (iii) Designing adequate infrastructure if a new development is located in a state responsibility area or in a very high fire hazard severity zone, including safe access for emergency response vehicles, visible street signs, and water supplies for structural fire suppression.*
  - (iv) Working cooperatively with public agencies with responsibility for fire protection.*

- (D) If a city or county has adopted a fire safety plan or document separate from the general plan, an attachment of, or reference to, a city or county's adopted fire safety plan or document that fulfills commensurate goals and objectives and contains information required pursuant to this paragraph.*

### **Fire Hazard Severity Zones**

CAL FIRE maintains fire hazard severity zone (FHSZ) data and maps for the entire state. There are three classes of fire hazard severity ratings within FHSZs: Moderate, High, and Very High. Fire hazard severity considers vegetation amount, topography, and weather (temperature, humidity and wind), and represents the likelihood of an area burning over a 30- to 50-year time period.

GC § 51177 and 51178 define "Very High Fire Hazard Severity Zones" (VHFHSZs) within LRAs to mean areas outside of SRAs designated by the Director of Forestry and Fire Protection based on consistent statewide criteria and based on the severity of fire hazard that is expected to prevail in those areas. VHFHSZs are based on fuel loading, slope, fire weather, and other relevant factors including areas where Santa Ana, Mono, and Diablo winds have been identified by CAL FIRE as a major cause of wildfire spread.

CAL FIRE has a list of incorporated cities or areas within the LRA for which it has made recommendations on VHFHSZs. Local agencies must designate VHFHSZs within their jurisdictions within 120 days of receiving recommendations from the Director (GC § 51179(a)). A local agency may, at its discretion, include areas within the jurisdiction of the local agency, not identified as VHFHSZs by the director, as VHFHSZs following a finding supported by substantial evidence in the record that the requirements of Section 51182 are necessary for effective fire protection within the area (GC § 51179(b)).

FHSZ maps are available at <https://frap.fire.ca.gov/mapping/>

GC § 65302.5(b) further requires that the draft safety element updates must be submitted for review by the State Board and local fire agencies providing service in the territory of the jurisdiction. Specifically:

- (1) The draft element of or draft amendment to the safety element of a county or a city's general plan shall be submitted to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county at least 90 days prior to either of the following:*
  - (A) The adoption or amendment to the safety element of its general plan for each county that contains state responsibility areas.*
  - (B) The adoption or amendment to the safety element of its general plan for each city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (i) of Section 51177.*
- (2) The State Board of Forestry and Fire Protection shall, and a local agency may, review the draft or an existing safety element and recommend changes to the planning agency within 60 days of its receipt regarding both of the following:*
  - (A) Uses of land and policies in state responsibility areas and very high fire hazard severity zones that will protect life, property, and natural resources from unreasonable risks associated with wild land fires.*
  - (B) Methods and strategies for wild land fire risk reduction and prevention within state responsibility areas and very high fire hazard severity zones. These methods and strategies shall reflect accepted best practices in the most recent guidance document entitled "Fire Hazard Planning, General Plan Technical Advice Series," as identified in Section 65040.21.*

## Fire Hazard Planning Technical Advisory

- (3) (A) *Prior to the adoption of its draft element or draft amendment, the board of supervisors of the county or the city council of a city shall consider the recommendations, if any, made by the State Board of Forestry and Fire Protection and any local agency that provides fire protection to territory in the city or county. If the board of supervisors or city council determines not to accept all or some of the recommendations, if any, made by the State Board of Forestry and Fire Protection or local agency, the board of supervisors or city council shall communicate in writing to the State Board of Forestry and Fire Protection or the local agency, its reasons for not accepting the recommendations.*
- (B) *If the board of supervisors or city council proposes not to adopt the board's recommendations concerning its draft element or draft amendment, the board, within 15 days of receipt of the board of supervisors' or city council's written response, may request in writing a consultation with the board of supervisors or city council to discuss the board's recommendations and the board of supervisors' or city council's response. The consultation may be conducted in person, electronically, or telephonically. If the board requests a consultation pursuant to this subparagraph, the board of supervisors or city council shall not approve the draft element or draft amendment until after consulting with the board. The consultation shall occur no later than 30 days after the board's request."*
- (4) *If the State Board of Forestry and Fire Protection's or local agency's recommendations are not available within the time limits required by this section, the board of supervisors or city council may act without those recommendations. The board of supervisors or city council shall take the recommendations into consideration the next time it considers amendments to the safety element."*

Please see Appendix D to this document for additional information about the consultation process with the State Board and CAL FIRE Land Use Planning Program staff.

### Summary of State Fire Hazard Planning Requirements for Local Governments

- Safety elements of general plans must be revised upon the next update to the Housing Element on or after January 1, 2014 to address specific wildfire hazard planning requirements for all jurisdictions with lands in the State Responsibility Area (SRA) or Very High Fire Hazard Severity Zones (VHFHSZs) (GC § 65302(g)). The revisions must include information about wildfire hazards and risks, as well as goals, policies, objectives and implementation measures for the protection of the community from the unreasonable risk of wildfire (GC § 65302(g) and 65302.5).
- Before approving a tentative subdivision map or parcel map within the SRA or VHFHSZs, a county must make certain findings that the subdivision is consistent with fire safety and defensible space regulations in Public Resources Code § 4290 and 4291, and that fire protection and suppression services are available for the subdivision (GC § 66474.02).

### Climate Adaptation Requirements

SB 379 (2015) amended GC § 65302(g)(4) to require that climate change adaptation and resilience be addressed in the safety element of all general plans in California. Specifically, "upon the next revision of a local hazard mitigation plan, adopted in accordance with the Federal Disaster Mitigation Act of 2000 (Public Law 106-390), on or after January 1, 2017, or, if a local jurisdiction has not adopted a LHMP, beginning on or before January 1, 2022, the safety element shall be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to the city or county."

GC § 65302(g)(4) requires that the following be included in the preparation of the climate adaptation and resiliency strategy:

- A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including, but not limited to, an assessment of how climate change may affect the risks associated with existing natural hazards that must be addressed in the safety element;
- Information that may be available from federal, state, regional, and local agencies that will assist in developing the vulnerability assessment and the adaptation policies and strategies required;
- A set of adaptation and resilience goals, policies, and objectives based on the information specified in the vulnerability assessment, for the protection of the community; and,
- A set of feasible implementation measures designed to carry out the goals, policies, and objectives identified.

SB 1035 (2018) further amended GC § 65302(g)(6) to require that local agencies update the climate adaptation portion of the safety element at least every eight years to identify “new information relating to flood and fire hazards and climate adaptation and resiliency strategies applicable to the city or county that was not available during the previous revision of the safety element.”

#### **OPR’s Integrated Climate Adaptation and Resiliency Program (ICARP)**

Established by Senate Bill 246 (Wieckowski) in 2015, ICARP is California’s primary program for driving a cohesive, coordinated response to the impacts of climate change across local, regional and state efforts, with a commitment to prioritizing equitable approaches and efforts that integrate mitigation with adaptation. ICARP includes oversight of the Adaptation Clearinghouse, an online database of climate adaptation resources, and coordinates a Technical Advisory Council (TAC).

The TAC brings together local government, practitioners, scientists, and community leaders to help coordinate activities that better prepare California for the impacts of a changing climate. The TAC supports OPR in its goal to facilitate coordination among state, regional and local adaptation and resiliency efforts, with a focus on opportunities to support local implementation actions that improve the quality of life for present and future generations. ICARP also develops recommendations and guidance to guide local, regional and statewide efforts: In 2017, the TAC developed a [vision statement](#) that expresses the characteristics of a resilient California, as well as principles that guide how adaptation actions should be implemented to achieve this vision. The TAC adopted the Vision and Principles in September 2017, and adopted a definition for vulnerable communities in April 2018, which is the basis for the ICARP guide Defining Vulnerable Communities in the Context of Climate Adaptation.

OPR recommends that safety element updates to address climate vulnerability assessment and adaptation requirements be coordinated with the ICARP vision and principles, definition of vulnerable communities, and state wildfire requirements, where applicable.

In addition to existing guidance for climate adaptation and safety elements in the General Plan Guidelines, the State of California currently maintains several resources that can assist local agencies with preparing a local climate vulnerability assessment and adaptation and resilience

strategies pursuant to GC § 65302(g)(4). These include the [California Adaptation Planning Guide](#), the [Cal-Adapt](#) tool, and the [Adaptation Clearinghouse](#).

### **Evacuation Route Requirements**

In 2019, two separate bills (AB 747 and SB 99) were signed into law that added new requirements for disclosing residential development without at least two points of ingress and egress and addressing the presence and adequacy of evacuation routes in the general plan safety element.

[SB 99 \(2019\)](#) amended GC § 65302(g) to require that, upon the next revision of the housing element on or after January 1, 2020, the safety element must be updated to include information identifying residential developments in hazard areas that do not have at least two emergency evacuation routes (i.e., points of ingress and egress) (GC § 65302(g)(5)).

[AB 747 \(2019\)](#) added GC § 65302.15, which requires that, upon the next revision of a LHMP on or after January 1, 2022, or beginning on or before January 1, 2022, if a local jurisdiction has not adopted a LHMP, the safety element must be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. If a LHMP, emergency operations plan, or other document that fulfills commensurate goals and objectives, a local agency may use that information in the safety element to comply with this requirement by summarizing and incorporating by reference such a plan or other document into the safety element.

These new requirements apply to all types of hazards in the safety element and are not unique to fire; however, local agencies should take these evacuation requirements into consideration when addressing all hazards generally, including the specific wildfire requirements for the safety element referenced in this document.

### ***Tentative Map and Parcel Map Requirements in the SRA and VHFHSZ***

GC § 66474.02 requires that a legislative body of a county make specific findings before approving a tentative map, or a parcel map for which a tentative map was not required, for an area located in the SRA or VHFHSZ. The findings must show that the subdivision is consistent with regulations adopted by the State Board pursuant to Sections 4290 and 4291 of the Public Resources Code (PRC) (see Fire Safe Regulations below in this section of the Technical Advisory) or consistent with local ordinances certified by the State Board as meeting or exceeding the State regulations. The county must also submit a copy of the findings to the State Board. Certain tentative maps or parcel maps for purposes of open space and conservation are exempt, as specified in the statute.

Note that the findings described above must be made in order to approve a tentative or parcel map. Even if the lead agency adopts a statement of overriding considerations for a proposed project, or if the lead agency determines a project to be exempt to CEQA, the substantive requirements in the Government Code regarding fire protection must be satisfied.

Information on how to submit these subdivision maps to the State Board can be found in the California Code of Regulations (CCR), Title 14, §§ 1266.00, 1266.01, and 1266.02.

### *Fire Safe Regulations*

[PRC Section 4290](#) gives the State Board the authority to adopt regulations for minimum fire safety standards applicable to SRA lands under the authority of the department, and to VHFHSZs starting on July 1, 2021. The Fire Safe regulations are codified in CCR, Title 14 (Natural Resources), Division 1.5 (Department of Forestry), Chapter 7 (Fire Protection) under Subchapter 2 ([SRA Fire Safe Regulations](#)). These regulations generally address the following:

- Standards for signs identifying streets, roads, and buildings.
- Minimum private water supply reserves for emergency fire use.
- Fuel modification<sup>2</sup> standards for fuel breaks and greenbelts.
- Road and driveway standards for emergency fire equipment access and public evacuation.

These regulations do not supersede local regulations that equal or exceed minimum regulations adopted by the State.

Pursuant to [SB 901 \(2018\)](#), the State Board is also required on and after July 1, 2021, to periodically update these regulations for fuel breaks and greenbelts near communities to provide greater fire safety for the perimeters to all residential, commercial, and industrial building construction within the SRA and VHFHSZs. These updated regulations “shall include measures to preserve undeveloped ridgelines to reduce fire risk and improve fire protection.” (PRC § 4290(b).) The board also, by regulation, must define “ridgeline.” (PRC § 4290(b).)

### *Defensible Space Regulations*

[PRC Section 4291](#) defines and describes mandatory fire protection measures and responsibilities for maintaining defensible space that apply to all property within the SRA in California. Per GC § 51182, defensible space regulations also apply to all property in the VHFHSZ within the Local Responsibility Area (LRA). The defensible space requirements generally include, but are not limited to, the following:

- 100 feet of vegetation clearance (“defensible space”) around homes
- May require extension of clearance past property lines
- May require extension of clearance as needed for insurance
- Removal of dead/dying vegetation
- Vegetation removal around chimneys/stovepipes
- Exemptions and exceptions from code
- Updating public access to code requirements

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<sup>2</sup> For a definition of fuel modification, please refer to Appendix F within this document.



The State Board provides direction for complying with the defensible space law in regulations in CCR Title 14, §§ 1299.01-1299.05.

Figure 6: Defensible Space Zones (Source: [CAL FIRE](#))



### *California Environmental Quality Act (CEQA)*

[CEQA](#) is California's statewide environmental review law that requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects, and to reduce those environmental impacts to the extent feasible. The laws and rules governing the CEQA process are contained in the CEQA statute (PRC Section 21000 and following), the CEQA Guidelines (CCR, Title 14, Section 15000 and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures.

The California Natural Resources Agency, with assistance from OPR, completed a comprehensive update to the CEQA Guidelines in late 2018. As part of this update, and pursuant to SB 1241 (2012), wildfire was added to the list of environmental topics that should be analyzed in the Environmental Checklist, which is contained in Appendix G to the State CEQA

Guidelines. The new wildfire section in the updated Appendix G checklist includes the following questions:

*XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:*

- a) Substantially impair an adopted emergency response plan or emergency evacuation plan?*
- b) 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?*
- c) 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?*
- d) 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?*

The addition of these wildfire questions into the Environmental Checklist clarifies that wildfire hazards, associated risks, and other wildfire-related impacts must be analyzed during the CEQA process for projects located in or near SRAs or VHFHSZs.



## 4. Fire Hazard Planning Guidance

This section provides guidance for addressing fire hazards and related risks during the general plan update process, including guidance for community and stakeholder engagement, preparing fire hazard and risk assessments, and policy development and implementation considerations to ensure long-term safety and resilience. The guidance incorporates the requirements under existing law for general plans, as well as opportunities for integration and coordination of fire hazard planning with hazard mitigation plan updates, climate adaptation planning, CWPPs, and other plans.

In general, local governments have wide discretion in addressing locally important issues in their general plans. While the types of safety issues that concern each city or county may vary, most rural, suburban, and even urban communities recognize wildland fire hazard as a growing concern—one that is exacerbated by climate change, the expansion of development in the WUI, and increasing demands on natural resources. As noted in the previous section, some communities are required by law to address specific wildfire hazard and risks in their safety elements, pursuant to GC § 65302(g) and 65302.5; however, all California communities subject to fire hazards may benefit from the planning guidance provided herein.

[OPR's 2017 General Plan Guidelines](#) recommends that for every locally relevant issue, the local government should articulate one or more broad objectives, establish policies that would help achieve those objectives, and finally, devise implementation measures (specific action items or funding programs) to carry out the policies. Additionally, adequate and accurate data and information should be collected and analyzed to provide the basis for sound policy decisions.

The primary steps or phases in the fire hazard planning process include:

- Outreach to and engagement with the community and responsible agencies;
- Preparation of a fire hazard and risk assessment; and,
- Development of goals, objectives, policies, and implementation programs that address fire hazards and reduce risk.

Each of these steps or phases is described within the following sub-sections.

### 4.1 ENGAGEMENT AND OUTREACH

The General Plan Guidelines encourage active engagement and involvement of the community, public agencies, subject matter experts, and other interested stakeholders throughout the general plan update process. More detailed guidance on this topic is included in the [General Plan Guidelines under Chapter 3 \(Community Engagement and Outreach\)](#); however, some specific community engagement and outreach considerations relative to fire hazard planning are described further below.

## *Community Engagement*

Local agencies should engage residents, business-owners, fire safe councils, and other interested stakeholders early in the planning process to establish an understanding of existing conditions as well as community issues and concerns regarding fire hazards. Fire safe councils, “Firewise” communities, or similar organizations or programs often already exist in communities subject to fire hazards and can play an important role during the planning process.

### **Fire Safe Councils: A Planning Partner**

Fire Safe Councils can play an important role in the development of LHMPs and general plans.

The typical Council consists of state and federal fire agencies, local fire districts, businesses, local government, and local concerned citizens formed to enhance the effectiveness of fire protection. Some Councils have also combined with neighboring fire safe councils to develop countywide wildfire hazard mitigation plans.

Fire Safe Councils may be an excellent resource to planners and elected officials as they develop fire protection and prevention policies and implementation measures in the general plan. OPR encourages engagement of these Councils for both their expertise and as a means for expanding public participation in the general plan update process.

## **Vulnerable and Disadvantaged Communities**

Outreach and engagement efforts should ensure that vulnerable and disadvantaged communities are properly identified and engaged as part of the fire hazard planning process. Safety element updates now must address both wildfire and the broader topic of climate adaptation and resilience, therefore agencies should consider OPR’s separate resource guide on this topic: [Defining Vulnerable Communities in the Context of Climate Adaptation](#). Agencies should also consider guidance regarding community engagement and disadvantaged communities in OPR’s [Environmental Justice element section of the General Plan Guidelines](#).

## **Tribal Governments**

Local governments must adhere to GC § 65352.3 and the provisions of SB 18 (2004), requiring local governments to consult with Tribal Governments prior to updating or amending their general plan and to provide notice to tribes at certain key points in the planning process. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in GC § 65300 et seq.) and specific plans (defined in GC § 65450 et seq.). Further, AB 52 (2014) added new requirements to CEQA to require analysis of “tribal cultural resources” during the environmental review process and noticing and consultation with all California Native American Tribes.

Many activities related to fire hazard mitigation can impact tribal cultural resources or sites, thus close coordination with Tribal Governments is imperative to protect such resources or sites from permanent damage. In addition, Tribal Governments may have insight into fire

hazards, including historical fire regimes and behavior gained through local traditional ecological knowledge, along with hazard mitigation practices that can be shared with local governments and fire professionals. Tribes may also have unique knowledge that allows for the protection of cultural places while also allowing for fire mitigation and suppression.

Pursuant to GC § 65092, 65352.3 and 65562.5, the Native American Heritage Commission (NAHC) maintains a list of California Native American Tribes with whom local governments must consult. The NAHC's "California Tribal Consultation List" provides the name, address, and contact name for each of these tribes; and telephone, fax and email information if available. Prior to initiating consultation with a Tribe, the city/county must contact the NAHC for a list of Tribes to consult with. OPR maintains separate [Tribal Consultation Guidelines](#) to provide information on how and when to conduct consultation with California Native American Tribes.

### *Interagency Outreach and Coordination*

OPR recommends early consultation with public agencies, such as the State Board and CAL FIRE's Land Use Planning Program, local fire agencies, emergency management agencies, resource conservation districts, and other agencies with local land use jurisdiction. University of California Cooperative Extension fire advisors and forestry management professionals can also be a helpful resource. Consultation with these agencies or organizations either prior to or early in the general plan update process can be beneficial to the local planning agency in scoping the fire hazard planning aspects of the project, particularly for jurisdictions required to comply with statutory requirements for addressing wildfire hazards in the safety element pursuant to GC § 65302(g). For more detailed information regarding the mandatory State Board review process for the safety element pursuant to GC 65302.5, see Appendix D (General Plan Safety Element Assessment).

Early and ongoing interagency consultation can help ensure that the latest resources or best practices are used to inform the planning process. Additionally, as noted earlier in this document, many programs and plans often already exist to address fire hazards and related risks, thus it is important to engage all agencies with responsibility for maintaining or updating related plans or programs during the general plan update. Many of the agencies cited above often lead or contribute to LHMPs, CWPPs, or related plans and thus can help inform the general plan update and avoid duplication of efforts.

Coordination and alignment with other agencies can also mitigate unintended conflicts between different agencies' land use policies and regulations. For example, working with agencies enforcing vegetative erosion control measures, or coordinating with urban greening programs and projects, can reduce instances where agencies have competing priorities over vegetation management in high wildfire risk areas. Agencies should consider working together to align their planning efforts and public engagement and enforcement around vegetation management and other land use policies and regulations.

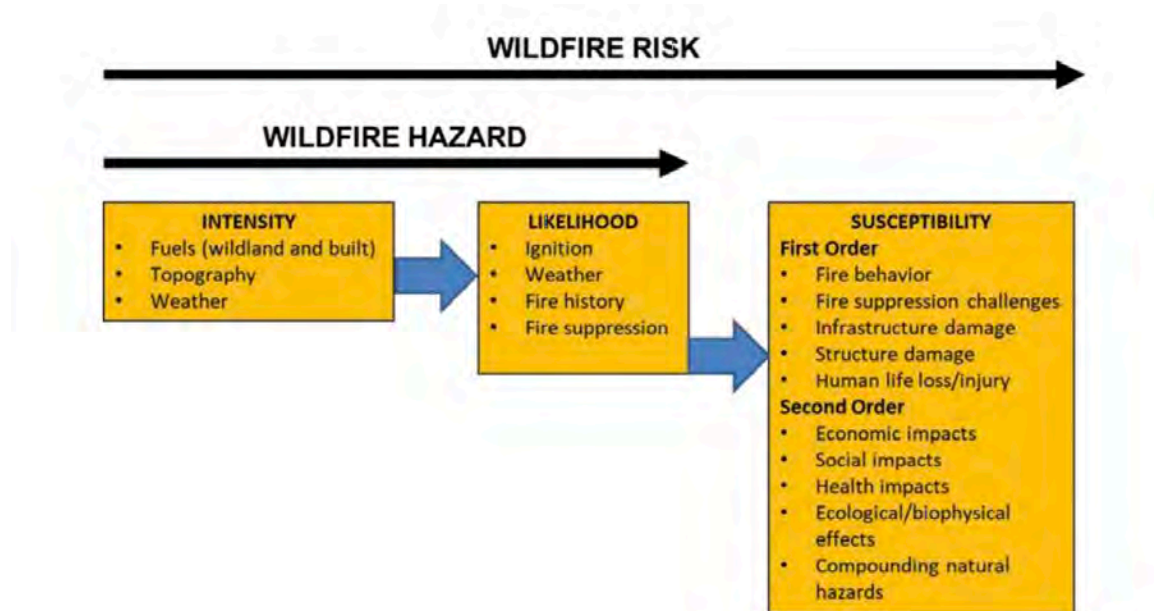
Early and ongoing interagency consultation can help ensure that the latest resources or best practices are used to inform the planning process. Additionally, as noted earlier in this document, many programs and plans often already exist to address fire hazards and related risks, thus it is important to engage all agencies with responsibility for maintaining or updating related plans or programs during the general plan update. Many of the agencies cited above often lead or contribute to LHMPs, CWPPs, or related plans and thus can help inform the general plan update and avoid duplication of efforts.

Finally, agencies should also consider engaging with insurance companies in their area to identify ways to align insurance policies and incentive programs with wildfire mitigation priorities, such as maintaining defensible space requirements or home hardening programs and ensure that affordable and accessible wildfire insurance is available to all residents. This form of engagement can further help to increase long-term resiliency against wildfire risks.

## 4.2 FIRE HAZARD AND RISK ASSESSMENT

The technical phase of the fire hazard planning process is generally referred to in this document as the “fire hazard and risk assessment”. Fire hazard mitigation, risk management, and resource protection all can be enhanced if the fire hazard and risk assessment phase of the planning process adequately describes the existing fire hazard environment, projected future changes in fire hazard severity, and relevant community values and assets that could be considered vulnerable or “at risk” to fire hazards. Figure 7 generally characterizes the key elements in the fire hazard and risk assessment.

*Figure 7: The relationship between wildfire risk and wildfire hazard and the factors that influence the components of each (Source: Community Planning Assistance for Wildfire, with permission by Wildfire Planning International)*



The fire hazard and risk assessment should occur as early as possible in the safety element update and/or general plan update process. If a local agency is preparing or updating a LHMP or CWPP, it may be appropriate for the fire hazard and risk assessment process to occur during the preparation of such plans and then later integrated into the safety element as part of the general plan update. More information and guidance provided by federal and state agencies related to these plans is referenced in the Appendices.

The data collection and analyses required to complete the steps below may include narrative descriptions, numerical data, maps, charts, and any other means of providing information about fire hazards and associated risks or related issues of concern. The result of the analysis should be summarized and included in the general plan and/or in technical background documents adopted with, or incorporated by reference into, the general plan.

### *Fire Hazard Assessment*

The first step in the fire hazard and risk assessment process should begin with data collection and analysis of fire hazards. A “hazard” can be defined generally as an event that could cause harm or damage to human health, safety, or property. A “wildfire” can be generally defined as any unplanned fire in a “wildland” area or in the WUI, while a “wildfire hazard” is the potential fire behavior or fire intensity in an area, given the type(s) of fuel present – from both the natural and built environment – and their combustibility.

Local agencies should determine the appropriate data necessary to describe existing conditions related to fire or wildfire hazards, forecasts or projections of future hazards, and other characteristics of the community and its environs that relate to fire hazards. For communities in SRAs and VHFHSZs, the minimum statutory requirements for information that must be included in this first step are included under GC § 65302(g)(3)(A). Local agencies should also consider addressing post-fire hazards that may be triggered by wildfire events (e.g., flood, debris flow, landslide, toxic releases). Such information can be addressed in other sections of the safety element and cross-referenced to the wildfire section where appropriate. Table 1 includes a summary of data sources that can be incorporated in the fire hazard assessment process.

Moreover, pursuant to SB 379 (2015) and codified in GC § 65302(g)(4), local governments are now required to analyze and identify their community’s vulnerability to climate change and climate-related hazards in the safety element. OPR thus recommends that local agencies coordinate their fire hazard and risk assessment process with preparation of the climate vulnerability assessment to determine how climate change may increase or exacerbate wildfire hazards and risks. More detailed guidance on climate vulnerability and adaptation requirements for the general plan is included under the Safety Element section of Chapter 4 of the General Plan Guidelines. The State’s [Adaptation Planning Guide](#) published by CalOES also provides more detailed guidance on preparing a climate vulnerability assessment and adaptation strategies.

### Climate Impacts on Forests

Climate influences the structure, function, and health of forest ecosystems. Climate change is projected to alter the frequency and intensity of forest disturbances, including wildfires, storms, insect outbreaks, and the occurrence of invasive species. In addition, the productivity of forests could be affected by changes in temperature, precipitation and the amount of carbon dioxide in the air.

In conjunction with the projected impacts of climate change, forests face impacts from land development, suppression of natural periodic forest fires, and air pollution. The combined impact of these different factors is already leading to changes in our forests. Some of the valuable goods and services provided by forests may be compromised as these changes are likely to continue in the years to come.

In a key step to improve stewardship of California's forests, the State of California and the U.S. Forest Service launched a new joint state-federal initiative in August 2020 to reduce wildfire risks, restore watersheds, protect habitat and biological diversity, and help the state meet its climate objectives. The [Agreement for Shared Stewardship of California's Forest and Rangelands](#) includes a commitment by the federal government to match California's goal of reducing wildfire risks on 500,000 acres of forest land per year. To protect public safety and ecology, experts agree that at least one million acres of California forest and wildlands must be treated annually across jurisdictions.

Land managers are also taking steps to minimize the impacts of existing ecosystem stressors, such as habitat fragmentation, pollution, invasive species, insect infestations, and wildfire, to increase the resilience of forests to climate change. Moreover, the U.S. Forest Service has developed a [National Roadmap for Responding to Climate Change](#) ("Roadmap") that outlines how to apply adaptive management principles to forest and grassland management. OPR recommends that cities and counties that are required to update their safety elements per SB 1241 review the Roadmap and include principals that are tailored to impacts occurring or anticipated to occur within their area.



*Managed Versus Unmanaged Ponderosa Pine Forest (Source: Erika Sloniker, The Nature Conservancy)*



Table 1 identifies required data and mapping as well as additional inputs that may be helpful to consider during the fire hazard assessment process. While conducting this assessment, jurisdictions with lands in the SRA or VHFHSZs must reference information about wildfire hazard areas from the [U.S. Geological Survey](#) as well as [CAL FIRE's FHSZ Maps](#). In addition, the following resources may also be useful in this analysis:

- [Cal-Adapt](#)
- CAL FIRE's [Wildfire Perimeters Map](#), [WUI Map](#), and [Landcover Map](#)
- US Forest Service's (USFS) [Wildfire Hazard Potential Tool](#) and [CALVEG \(Vegetation\) Map](#)
- CalOES [MyHazards Tool](#)
- California Public Utilities Commission [Fire-Threat Maps](#)

*Table 1: Data for Consideration during the Wildfire Hazard Assessment Process*

Data Type	Examples
Fire History Data (Required) <sup>1</sup>	Fire perimeters
	Average fire danger
	Worst fire danger
	Rates of spread
	Ignition Causes
Additional Historical Data	Flooding Frequency
	Precipitation
Fire Hazard Mapping	<b>Fire Hazard Severity Zone Maps (Required)<sup>3</sup></b>
	Wildland-Urban Interface (WUI) Maps
	Wildfire Hazard Potential
Topographic characteristics	Slope and Aspect
	100-year and 500-year floodplains
	Landslide prone areas
	Soil moisture, erosion, and permeable surface loss
Fuel Characteristics	Fuel loading
	Shifting plant composition
	Dominant vegetation change
	Vegetation die-off
	Landscaping hazards

<sup>3</sup> Jurisdictions with lands in the SRA or VHFHSZ must incorporate data and analysis requirements specified in GC § 65302(g)(3).

Data Type	Examples
Climate and Weather Characteristics	<b>Climate change exposure (Required)<sup>4</sup></b>
	Climate change impact on flooding frequency & intensity
	Temperature
	Prevailing winds
	Water table, precipitation, and seasonal water availability
Post-Fire Hazards	Post-fire fuel hazard ratings
	Fuel conditions relative to future flood control
	Areas prone to flooding, landslide, and debris flow
	Post-fire air, water, and soil quality

### ***Risk Assessment***

The second step in the fire hazard and risk assessment process is determining the current and projected wildfire risk to values or assets in the community as well as the risk to the jurisdiction's population, for both pre- and post-fire scenarios. "Risk" builds upon the concept of "hazard", taking into account not only the intensity and likelihood of an event to occur but also the chance, whether high or low, that a hazard such as a wildfire will cause harm. "Wildfire risk" can be determined by identifying the susceptibility of a value, asset, or population to the potential direct or indirect impacts of wildfire hazard events.

For communities in SRAs and VHFHSZs, the minimum statutory requirements for information that must be included in this step are also included under GC § 65302(g)(3)(A). This section identifies both required data and mapping, as well as additional sources and analysis that may be helpful in conducting the fire risk assessment.

### **Determining Current and Projected Value and Asset Vulnerability**

Below is a list of data and analyses that may be useful in establishing a current picture of community values and assets that could be at risk. "Values and assets" refers to accepted principles or standards along with any constructed or landscape attribute that has value and contributes to community or individual wellbeing and quality of life. Examples include public health and safety, property, structures, physical improvements, natural and cultural resources, community infrastructure, commercial standing timber, ecosystem health, and production of water. Local agencies should check with the local [CAL FIRE Unit](#) for information with regard to values and assets at risk.

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<sup>4</sup> Climate change vulnerability assessment and adaptation requirements for the safety element are specified in GC § 65302(g)(4). For more information, see the Safety Element section of the General Plan Guidelines and the Adaptation Planning Guide.



- Identify the location and distribution of existing and planned land uses in the WUI, including structures, roads, utilities, and essential public facilities. (Note: this is a requirement for communities in the SRA and Very High FHSZs pursuant to GC § 65302(g)(4).)
- Identify values and assets that are currently, or projected to be, at risk to wildfire, such as:
  - Recreational areas
  - Scenic areas
  - Urban forests
  - Ecologically significant areas
  - Critical watersheds
  - Public and private timberland
  - Wildlife habitat
  - Rangelands
  - Sensitive soils
  - Landslide prone areas
  - Cropland
  - Water supplies
  - Watersheds that contribute to flooding
  - Air quality
  - Historic sites
  - Cultural sites
  - Tourism sites
  - Emergency shelters
  - Structures, such as homes and business
  - Utilities & accompanying infrastructure
  - Roadways and bridges
  - Population and economic centers
- Classify values and assets based on their vulnerability to wildfire by:
  - Evaluating the identified values and assets based on economic and social value to the community and replacement value.
  - Prioritizing the values and assets to assist in the selection of mitigation efforts and development of fire response plans. Prioritization can be accomplished in a variety of ways: most difficult or expensive to replace, most necessary for communities (especially vulnerable members of the community), easiest to protect, broadest benefit to community, closest to urbanized areas, or any other priority system that may be relevant to the community.

Further analysis may be appropriate based on local conditions and geographic circumstances. The table below identifies additional examples of data and analyses that may be considered during the risk assessment process.

**Example Plan: Riverside County**

The Riverside County General Plan Safety Element addresses secondary risks associated with wildfire, including landslides, rockfalls, and debris flows, and includes erosion and sedimentation control plans in design requirements in high-risk areas. To learn more, see Appendix C.

*Table 2: Data for Consideration during the Risk Assessment of Values and Assets*

Data Type	Examples
Landscape Vulnerability	Pest and drought damaged locations
	Fire damaged forests
	Neighborhood defensible space
	Vulnerabilities within flooding areas
	Landslide and debris-flow susceptibility
Structural Vulnerability	Age and condition of critical infrastructure
	Structure density and size
	Use and occupancy of structures
	Fire-rated roofing prevalence
	Fire-rated construction material prevalence

### **Determining Current and Projected Population Vulnerability**

Wildfires can directly impact the public health and safety of a community. Specifically, the increased severity and frequency of wildfires and length of the fire season may result in additional injuries and deaths from burns and smoke inhalation, eye and respiratory illnesses and exacerbation of asthma, allergies, chronic obstructive pulmonary disease (COPD), COVID-19, and other cardiovascular diseases from air pollution (Stone et al., 2019; Centers for Disease Control and Prevention, 2020). Illness and injuries can also result from the release of toxins from inorganic burning material into the air, water, and soil. Wildfires also cause harmful indirect effects. Increased erosion and sediment loading can impair water quality and adversely affect drinking water. Moreover, evacuation, temporary displacement, and property damage from wildfire can have adverse physical and mental health effects (Hill et al., 2020).

While an entire community can be at risk to fire-related health and safety impacts, there are groups who are more vulnerable to the health and safety impacts of fires because demographic and socioeconomic factors such as age, gender, ability, health status, status as a smoker, race/ethnicity/national origin, financial resources, knowledge, language, occupation, and physical location. Fire hazards may also disproportionately affect existing community members considered to be disadvantaged because of a combination of existing environmental or socioeconomic conditions (see Figure 8).

During the risk assessment process, jurisdictions should identify the ways in which their communities are vulnerable to wildfire's effects and use this information to develop policies and programs to protect public health. The following resources and example data within Table 3 may be helpful in this analysis:

- [OPR's Defining Vulnerable Communities Guide](#)
- [OPR's Environmental Justice Element guidance](#)

- [CalEPA CalEnviroScreen](#)
- [CAL FIRE's Communities at Risk List](#)
- [CAL FIRE's Priority Landscapes Viewer](#)
- [CDPH CalBRACE Health Vulnerability Indicators](#)

Figure 8: Wildfire Vulnerability Indicators  
(Source: Davies et al., 2018)



*Table 3: Additional Population Vulnerability Data for Consideration during the Risk Assessment*

Data Type	Examples
Geographic Vulnerability	Communities that are most at-risk to wildfire
	Disadvantaged communities
	Physical barriers to critical services
	Access to temporary shelter
	Evacuation routes
	Access to water resources
Social Isolation	Access to fire safety information
	Ability and health
	Undocumented community status
Financial Support and Stability	Home insurance status
	Health insurance status

### **Evaluating Short & Long-term Capacity to Reduce Risk and Improve Resilience**

As part of the risk assessment process, jurisdictions should anticipate community needs should a wildfire event occur and explore both short and long-term opportunities to reduce risk and improve resilience moving forward. As jurisdictions conduct this analysis, they should:

- Evaluate potential primary, secondary, and tertiary impacts of different wildfire scenarios on community values and assets as well as environmental and public health.
- Evaluate the success of previous suppression and risk mitigation efforts.
- Evaluate the jurisdiction's capacity to adequately suppress wildfire, taking into account adequacy of fighting resources, firefighter safety, water supply availability, fuel breaks, equipment maneuverability, and other factors.
- Evaluate the jurisdiction's capacity to mitigate wildfire risks through activities such as
  - Short-term evacuation and crisis management
  - Short-term landscape management
  - Fire-rated infrastructure implementation and long-term maintenance
  - Long-term environmental and public health management
- Evaluate opportunities to build resilience against wildfires through activities such as
  - Community education and capacity building,
  - Strategic land use and development
  - Economic development
- Evaluate existing plans and the safety element for adequacy.

*Table 4: Data for Consideration when Evaluating Short and Long-Term Risk and Resilience*

Data Type	Examples
Fire Management and Suppression	Fire district capacity and funding
	Water supply
	Ingress and egress, evacuation routes, and refugia
	Fuel breaks
	Neighborhood defensible space
	Prescribed burn and other fuel modification programs
Short-Term Human Health Impacts	Housing, water, and food needs
	Medical and psychological care
	Exposure to air, water, and soil pollution from wildfire
Short-Term Environmental Impacts	Risk of drought
	Risk of flooding or landslides
	Impact on wildlife habitat and ecological communities
	Impact on GHGs
Long-Term Population Trends	Population growth and demographic change
	Physical and mental health
	Socio-economic patterns
Long-Term Environmental Trends	Land use and development patterns
	Climate change effects on wildfire
	Changes to local ecological communities and vegetation
	Endangered species

## 4.3 POLICY DEVELOPMENT

After completing the wildfire hazard and risk assessment process, an analysis of costs and benefits as well as land use alternatives can inform jurisdictions as they work with their community to develop policies and programs. Considerations for these analyses as well as general policy development guidance is included in this section.

### *Analyzing Costs and Benefits*

As communities determine appropriate policies for their jurisdiction, they should analyze the costs and benefits of a mix of policies and programs that address fire hazard and associated risks and provide for long-term resilience. This analysis can be included as a key input to technical studies conducted to determine “best fit” policies and programs to support the general plan’s goals and objectives, and/or as part of studies conducted during the land use

alternatives analysis phase of the general plan update. Issues that policy makers can consider in such analyses include, but are not limited to:

- Costs of fire effects as a function of fire hazard severity, frequency, and potential for repetitive loss;
- Impact of the loss of critical or irreplaceable community assets;
- Impacts to community income and insurance costs;
- Fuel modification costs versus suppression costs;
- Costs and benefits of mitigation at the building or parcel level versus the landscape or community level;
- Balancing urban greening and vegetative soil cover/erosion management vs. defensible space priorities where appropriate
- Costs and benefits of replacing a community asset versus hardening and resilient design;
- Potential impacts of hazard mitigation measures on areas of special concern (e.g., cultural, environmental); and,
- Fixed fire defense opportunities versus land management opportunities.

For this analysis, communities should reassess as circumstances change, as specified in GC § 65302(g)(6).

### *Analyzing Land Use Alternatives to Avoid, Reduce or Minimize Risk*

During the general plan update process, local agencies frequently develop and analyze land use alternatives or scenarios as part of the planning process. Local agencies can consider avoiding placement of new land uses or new growth designations that are in or near high fire hazard severity areas, particularly in areas subject to high or extreme wildfire threats that could place future development at unreasonable risk. Areas in which avoidance may be considered include:

- All or portions of the High or Very High FHSZs;
- Areas mapped as having high or extreme wildfire threat on CAL FIRE's Fire Threat maps; and/or
- Specific sites or areas within the planning area that technical studies or fire behavior modeling demonstrate would place new development at unreasonable risk to extreme and catastrophic wildfire events.

Local agencies can develop technical studies, modeling, or mapping to determine avoidance areas during the fire hazard and risk assessment process outlined earlier in this technical advisory. Potential avoidance areas should be considered during the analysis of land use alternatives and selection of a preferred alternative, as well as the environmental impact report prepared for the general plan update.



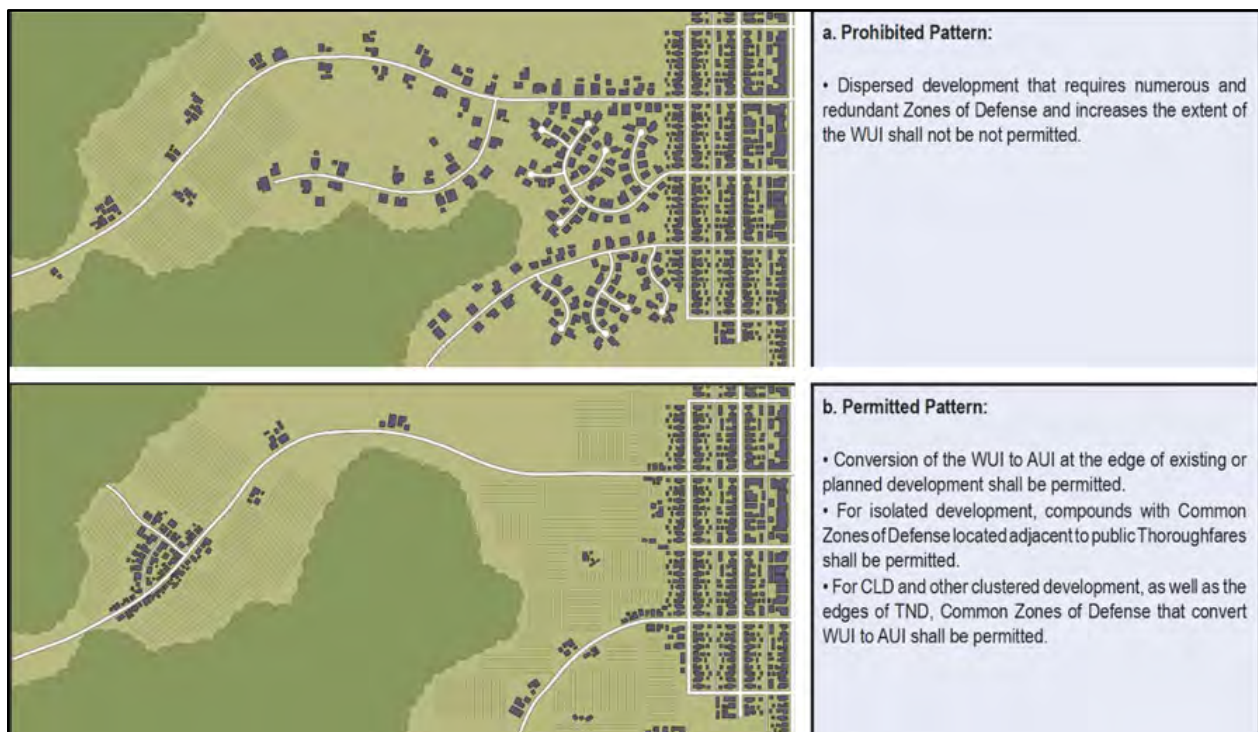
Local agencies can consider designating high or very high fire hazard severity or avoidance areas as open space or other similar land use designations to buffer against wildfire threats (see figure 9), in combination with policies and programs promoting land management activities that mitigate wildfire risk, such as fuel modification, designing and constructing fuel breaks, or related activities at the landscape scale in undeveloped areas. Local agencies can also consider the range of socioeconomic and environmental benefits of a more compact, infill-focused land use and development strategy that also avoids or minimizes further expansion of the WUI and associated risks.

#### Example Plan: Berkeley

The policy background section of Berkeley’s Disaster Preparedness and Safety Element includes a 2010 ordinance that prohibits residential units on Panoramic Hill until an adequate Specific Plan is adopted. For more information on this plan and others, see Appendix C.

If a local agency determines that wildfire hazard avoidance is infeasible, that agency can include specific policies or implementation programs in the land use element and/or safety element that identify and minimize risk during development project review and approval processes (see Section 5 for examples).

*Figure 9: Comparison of Conventional Versus Clustered Development in the WUI (Source: [Martin Dreiling Smart Code Module](#))*



The clustered development model contains the same amount of housing as the conventional development. In addition, it allows for a larger agricultural buffer between the development and wildlands, requires less fire suppression resources, and is easier to defend (Moritz and Butsic, 2020).

### *Developing Fire Hazard Mitigation and Risk Reduction Policies*

Goals, objectives, policies and implementation measures should be developed based on the outcomes of community and stakeholder engagement, interagency consultation, fire hazard and risk assessment process, costs and benefits analysis, and land use alternatives analysis. Policies should be action-oriented (“shall” rather than “should”) and linked to city or county ordinances or other feasible implementation mechanisms. Goals, objectives, policies and implementation measures will vary between jurisdictions. Generally, every aspect of an issue identified during the community and stakeholder engagement process, interagency consultation process, and fire hazard and risk assessment process should be addressed by a corresponding goal, policy, or objective. For example:

- Areas identified as being subject to extreme wildfire threat or “unreasonable risk” should be addressed through policies and programs in the land use or safety element that avoid or reduce risks to existing or new development.
- If fuel loading is identified as an issue contributing to elevated fire hazard risk, policies or programs requiring development or land management activities to be designed or required to modify, treat or reduce the volume of fuel in certain areas should be incorporated into the safety element.
- If emergency vehicle access and evacuation is identified as a problem or constraint, policies to improve roadway design, identify shelter-in-place facilities or locations, or improve notification and evacuation assistance procedures should be included in the safety element.

Fire hazard mitigation and risk reduction policies can be developed and implemented in a variety of ways. While the safety element is the primary general plan element where wildfire hazards must be addressed by law, other elements, such as land use, circulation, housing, conservation, or open space may also be appropriate for identifying complementary policies and programs. For example, GC § 65564 requires that every local open-space plan contain an “action program consisting of specific programs which the legislative body intends to pursue in implementing its open-space plan.” Fire mitigation policies could be implemented through this action program with regards to fuel break/fuel reduction programs within designated open-space areas. Additionally, GC § 65910 requires each city and county to “prepare and adopt an open-space zoning ordinance consistent with the local open-space plan.” Table 5 provides a crosswalk between various fire-hazard planning topics and the required general plan elements. More detailed examples are also provided in the next section.

Development of goals, policies, objectives, and implementation measures addressing fire hazards should be coordinated with climate vulnerability and adaptation requirements for the safety element. Similarly, coordination and integration of the policy development process with the LHMP, CWPP, or other related plans is also appropriate and encouraged. For more detailed guidance on the development of safety element policies and implementation measures, including incorporation of LHMPs or other plans by reference into the general plan, see OPR’s [General Plan Guidelines](#).

Finally, GC § 65302(g)(6) requires that wildfire, flood, and climate adaptation portions of the safety element be regularly reviewed and updated at least every eight years to account for new information relating to flood and fire hazards and climate adaptation and resiliency strategies that was not available during the previous revision of the safety element.

*Table 5: Opportunities for Fire Hazard Mitigation and Resource Protection in General Plan Elements*

Elements	Opportunities
Land Use	Fuel breaks and fuel reduction zones, buffer zones, water supply requirements, hazard avoidance areas, fire protection standards and development review requirements
Housing	Definition of appropriate mitigation for protecting existing housing stock or building new housing in higher-risk areas, fire protection standards, building codes, structural and home hardening
Circulation	Strategic access, road standards, helibases, helistops, air tanker base locations, evacuation routes (ground and air), ingress/egress, early warning and notification systems
Conservation	Fuel breaks and fuel reduction zones, additional design requirements for development near commercial timber zones, use of conservation easements or transfer of development rights (TDR) to avoid hazards and protect open space, water supplies
Open Space	Fuel breaks and fuel reduction zones, strategic access, water supplies, off-site linking of strategic improvements, use of conservation easements or TDR to avoid hazards and protect open space
Safety	Identification and mapping of fire hazards and risks, evacuation routes, water supplies, road standards, fuel breaks and fuel reduction buffer zones, air access, definition of hazard areas and mitigation requirements, house and road signage, early warning and notification systems
Environmental Justice	Promotion of safe housing, reduction of air pollution (smoke) exposure, addressing the needs of vulnerable communities, prioritizing measures to reduce disproportionate wildfire-related health and safety risks in disadvantaged and vulnerable communities

## 5. Example Policies

This section provides example fire hazard policies and programs that could be included in the general plan. The subsections are organized by specific topics related to fire hazards and risks that should be considered during the general plan update process. For each policy topic, the subsection identifies the general plan elements where it may be appropriate to address fire hazard mitigation and risk reduction followed by examples of policies and programs. The subsections are not organized in any particular order and each plays an integral part in fire hazard mitigation planning.

The conceptual goals, objectives, policies, and implementation measures included in this section are primarily intended for use in general plans, but in some cases they may also be suitable for inclusion in more detailed plans, codes or other implementation programs (e.g., CWPPs, LHMPs, consolidated fire codes, or other local plans, ordinances and codes) that implement the overall goals and policies of the general plan. Local governments should develop and implement fire hazard policies in their general plan or other plans, codes and programs that are relative to their local conditions and context. The policy examples included vary in range of scope and level of detail. Because these policies below are merely examples, any of them can be modified by the local public agency in a way that may be appropriate for that particular community. Appendix E provides additional guidance on how these policies can be further addressed in specific plans, zoning, and development agreements.

### 5.1 MINIMIZING RISKS TO EXISTING AND NEW LAND USES

Based on the analysis and prioritization of the local values and assets during the fire hazard and risk assessment phase, appropriate policies should be developed to mitigate fire hazards and reduce risks to existing and new land uses, particularly in areas that could be subject to unreasonable wildfire risks.

Jurisdictions should devote particular attention to addressing vulnerabilities of existing development located in the WUI, such as home hardening measures for existing residential land uses, improving compliance with and enforcement of defensible space and fire safe regulations, or other protective policies to address specific values and assets at risk.

Policies governing land use and future growth also provide an opportunity to integrate resilience into long-range plans by avoiding placing new development or new growth designations for expansion of development in areas with extreme threat or elevated hazard severity that pose an unreasonable risk, or introducing new zoning or building code requirements that help to avoid or minimize risks in such areas. Local agencies can also prioritize new growth in infill areas with existing infrastructure and adequate fire protection capacity in lower-risk areas to reduce overall wildfire risk in the future.

### *Potential General Plan Elements*

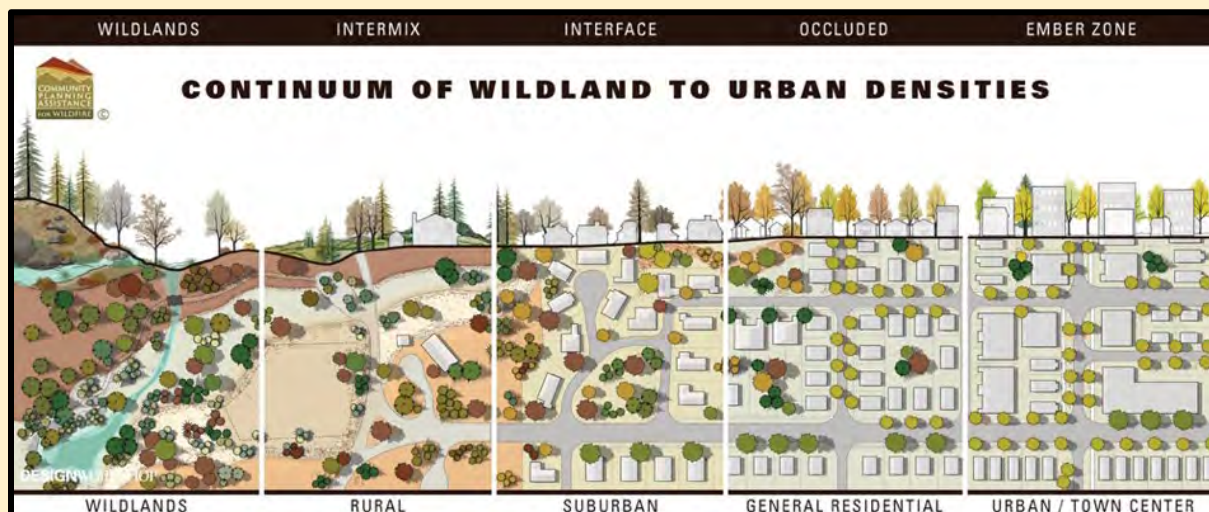
The following general plan elements may be appropriate for incorporating fire hazard and risk reduction information and policies related to existing and new land uses :

- Land Use
- Housing
- Conservation
- Open Space
- Safety
- Circulation (critical infrastructure)
- Environmental Justice

#### **Wildland Urban Interface (WUI) Definition**

WUI areas can be defined broadly as “any developed area where conditions affecting the combustibility of natural and cultivated vegetation (wildland fuels) and structures or infrastructure (built fuels) allow for the ignition and spread of fire through these combined fuels”. WUI areas can be further defined by different spatial configurations. The “interface” WUI condition exists where development and/or structures are adjacent to wildland areas, in which there may be clear demarcation or a hard edge between developed and undeveloped areas. By contrast, the “intermix” WUI condition refers to areas in which structures or semi-developed areas are mixed with wildland areas and vegetation, such as in rural, ex-urban, or large-lot semi-rural developed conditions. In the “occluded” WUI condition within an urban environment, structures may abut an island of wildland fuels, such as a community park, open space, greenbelt, or other natural area. (APA 2019).

A broader term that further describes conditions that may be adjacent to either the intermix or interface WUI is the “wildfire influence zone”, which can be characterized by susceptible vegetation up to 1.5 miles from the WUI (CAL FIRE 2019). Similarly, in areas where wildfires can occur under high-wind conditions near urbanized areas, the “ember zone” can extend up to several miles into more densely-developed areas that are outside of the WUI or wildfire influence zone areas, in which new spot fires could occur far ahead of the main wildfire perimeter.



*Image of the continuum of wildland to urban densities. (Source: Community Planning Assistance for Wildfire with permission by Wildfire Planning International)*

### ***Policy and Implementation Program Examples***

Examples of specific policies or implementation programs that address wildfire hazards and reduce risk are listed below according to their applicability in different land use and development contexts, including existing development, infill development, and new development. These examples are meant to provide potential model policies or programs; local agencies are not required to adopt or incorporate any of them into their planning documents.

For a more detailed analysis and compilation of community risk reduction measures that could be incorporated into the general plan policies or implementation measures, see “Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California” (Moritz and Butsic, 2020), and other resources cited in Appendix B.

#### **Existing Development**

- |                |  |
|----------------|--|
| <i>Policy</i>  | Increase resilience of existing development in high-risk areas built prior to modern fire safety codes or wildfire hazard mitigation guidance.   |
| <i>Policy</i>  | Public and private landowners for all existing land uses shall comply with all applicable state and local requirements and implement site-specific safety measures that mitigate to a low risk condition around or near public facilities, infrastructure, and natural resources.  |
| <i>Policy</i>  | Public and private funding, where available, shall be used to the greatest extent practical to assist private landowners in implementing defensible space and building retrofits to achieve a low risk condition.  |
| <i>Policy</i>  | Public and private landowners shall minimize the risk of wildfire moving from wildland areas to developed properties, or from property to property, by increasing structural hardening measures (e.g., fire-rated roofing and fire-resistant construction materials and techniques), maintaining and improving defensible space on site, and supporting vegetation management in adjacent undeveloped areas. |
| <i>Policy</i>  | Require structures with fire protection sprinkler systems to provide for outside alarm notification.   |
| <i>Program</i> | Update building codes in high fire hazard severity areas to meet or exceed hardening requirements in Chapter 7A of the California Building Code or other applicable codes, based on local studies or conditions identified in the local fire hazard and risk assessment.   |
| <i>Program</i> | Develop a comprehensive WUI risk reduction program and associated funding/financing for existing development to improve defensible space, increase home and structural hardening, and increase vegetation and fuels management in wildland areas adjacent to existing development.   |



### **Infill Development**

- Policy* Prioritize infill development within the existing developed footprint to reduce vehicle miles traveled; improve access to jobs, services, and education; increase active transportation choices; avoid future unfunded infrastructure repair and maintenance liabilities; and avoid hazardous or environmentally sensitive open space areas.
- Policy* All infill development projects within the SRA or VHFHSZ shall be required to comply with all applicable state or local fire safety and defensible space regulations or standards, and any applicable fire protection or risk reduction measures identified in locally adopted plans.
- Policy* Discretionary infill projects may be required to prepare a project-specific fire hazard and risk assessment and incorporate project-specific risk reduction measures, subject to the determination and approval of the local agency.
- Program* Develop streamlined wildfire risk assessment and mitigation procedures for infill projects in the SRA and VHFHSZ.
- Program* Conduct a feasibility study for a TDR program that identifies undeveloped wildland areas within high or very high FHSZ or subject to extreme threat as “sending areas” and areas outside of FHSZs or high fire threat areas as “receiving areas”.

### **New Growth**

- Policy* Avoid expanding new development, critical facilities, and infrastructure in areas subject to extreme threat or high risk, such as High or Very High FHSZs or areas classified by CAL FIRE as having an Extreme Threat classification on Fire Threat maps, unless all feasible risk reduction measures have been incorporated into project designs or conditions of approval.
- Policy* Prohibit land uses that could exacerbate the risk of ignitions in High or Very High FHSZs, such as outdoor storage of hazardous or highly flammable materials, automobile service or gas stations, or temporary fireworks sales.
- Policy* Prohibit land uses that could place occupants at unreasonable risk in high or very high fire hazard severity areas, such as areas with large events or assembly of people, health care facilities, etc.
- Policy* Encourage the use of conservation easements or establish a TDR program in undeveloped wildland areas within high fire hazard severity zones.
- Program* Update local zoning and subdivision codes to designate wildfire hazard overlay zones and associated conditional use, site development standards, and design criteria to mitigate wildfire hazards and reduce risks to new development within the overlay zones.

- Program* Update local codes and ordinances to require preparation of a project-specific fire protection plan (FPP) for all new development projects in high fire hazard severity areas and require that such projects incorporate all recommended risk reduction measures from the FPP into project designs or conditions of approval.
- Policy* All residential, commercial and industrial construction and development will comply with the statewide Fire Safe Regulations (see CCR, Title 14, Sections 1270 et seq.) relating to roads, water, signing and fuel modification.
- Policy* Urban development shall be planned and constructed to resist the encroachment of uncontrolled wildfires from adjacent WUI or wildland areas.

## 5.2 FUEL MODIFICATION AND LAND MANAGEMENT

This section contains examples of policies that a local government might adopt with regards to fuel modification and other land management activities that promote resilience by reducing wildfire hazard severity and associated risks. Policy considerations for fuel modification or other land management activities may vary considerably for communities based on their development context (e.g., wildland, WUI, or urban areas).

“Wildland areas” generally refer to rural or undeveloped lands outside of the WUI. In some cases, wildland areas might be adjacent to the WUI and may be referred to in some cases as the “Wildfire Influence Zone,” which can be defined as wildland areas with susceptible vegetation within 1.5 miles of the WUI. Addressing and mitigating fire hazards in wildland areas will most often involve land management strategies that address the conditions that lead to uncontrolled wildfire. This may include a variety of vegetation treatments or “fuel modification” strategies designed to reduce the primary driver of wildfire that is within control of managing agencies or entities, which is the biomass or fuel that feeds a wildfire under favorable conditions.

Vegetation treatment and fuel modification activities can be coordinated with other policy objectives, including managing open spaces and natural resources, or enhancing economic development activities associated with forestry, timber production, and harvesting thinned biomass for energy production and other useful end-products such as cross-laminated wood products, biochar, or other end uses.

For more urbanized conditions or interface WUI conditions, jurisdictions may consider additional strategies such as fire-adapted landscaping, agricultural or managed open space buffers, or urban forest management. Generally, when developing policies, jurisdictions should consider the acceptable level of fire risk, the degree of consistency and coordination between federal, state and private landowner fuel modification activities, the variety of fuel modification techniques, as well as public awareness and ability to comply with residential vegetation clearance (i.e., defensible space) regulations or policies.

### *Potential General Plan Elements*

- Land Use
- Conservation
- Open Space
- Safety
- Air Quality<sup>5</sup>
- Environmental Justice

### *Policy Examples*

The following are examples of policies that a local government might adopt with regards to fuel modification and landscaping considerations.

#### **General Considerations**

- Policy*      Coordinate with CAL FIRE, local fire agencies, fire safe councils, private landowners, and other responsible agencies to identify the best method(s) of fuel modification to reduce the severity of future wildfires, including:
- Prescribed fire
  - Forest thinning
  - Grazing
  - Mechanical clearing
  - Hand clearing (piling, burning/chipping)
  - Education
  - Defensible space
- Policy*      Encourage open space preservation and conservation of sensitive areas within natural and working lands, including wildlands, to achieve multiple benefits including (but not limited to) species and habitat protection, agricultural and forest resource protection, water quality, carbon sequestration and storage, and wildfire hazard and risk mitigation.
- Policy*      Balance and integrate fuel modification with habitat and open space management, vegetative soil cover/erosion management, and urban greening, to reduce the potential for conflicts between safety and environmental goals.

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<sup>5</sup>Air quality is a generally an optional element for local governments. GC § 65302.1 requires each city and county within the jurisdictional boundaries of the San Joaquin Valley Air Pollution Control District to either adopt an air quality element or amend appropriate elements of their general plan to include data and analysis, comprehensive goals, policies, and feasible implementation strategies to improve air quality.

- Program* Facilitate and maintain agreements to provide fuel reduction efforts between public and private landowners where recommended clearances extend onto public lands. This may require collaboration with the USFS or other federal or state agencies.
- Program* Create a special assessment district to fund and maintain a fuel modification program to reduce wildfire risk.
- Program* Develop a local program to identify, prioritize, and fund fuel modification projects in the Local Responsibility Area, and leverage the California Vegetation Treatment Program (CalVTP) and Program EIR for eligible projects in the State Responsibility Area.

### **Defensible Space**

- Policy* Public landowners shall provide a minimum of a one quarter mile defensible fuel profile (buffer zone) at property lines and near points of special interest.
- Policy* Public landowners shall implement safety measures that result in a low risk category designation for wildfires threatening the urban interface.
- Policy* Public and private funding for fire risk hazard reduction shall be prioritized to assist private landowners in implementing safety measures to achieve a low risk condition.
- Policy* Public and private property owners shall maintain property in a low risk category (PRC Section 4291 and GC § 51182).
- Policy* Landowners shall maintain minimum defensible space from all structures or improvements on their property and work with neighbors and local government to address defensible space within 100' of structures that lies on adjacent property.

### **Wildland Considerations**

- Policy* Plant communities in wildland areas shall be monitored over time for changes in potential fire hazard severity or risks.
- Policy* Promote and encourage the conversion of biomass removed during vegetation treatment and fuel modification activities to energy, cross-laminated timber, engineered wood products, biochar, or other end uses.
- Program* Support economic development programs and projects related to productive use of biomass from vegetation treatment and fuel modification projects.
- Program* Update codes and ordinances to identify potential sites, land uses, development standards, and other development criteria for biomass facilities and related industrial projects.

### **Urban Considerations**

- Policy* Prior to the construction of any structure, whether residential, recreational, or commercial, a site-specific fuel modification plan shall be prepared. The location and

development of any road, or any other man-made structure that may act as a fuel barrier, shall be done in consideration of its maximum benefit as a fuel barrier/fire break. The plan shall cover the entire parcel and include measures for modifying fuel loading prior to development and a plan to maintain that protection over time.

*Policy* All residences shall comply with the fuel modification requirements of PRC Section 4291, whether located in state responsibility or local responsibility areas.

*Policy* Plan, design, and manage urban open space facilities to reduce wildfire hazards and associated risks.

*Policy* Maintain open spaces and urban forests so that ground fuels do not promote the spread of wildfire and aerial fuels do not allow the spread of a fire through the tree canopy.

*Policy* Public open spaces shall be used as demonstration areas and examples to neighborhood residents for fire-adapted landscapes.

*Program* Update site landscaping standards to be fire-adapted using native vegetation or fire-resistant planting palettes and prohibit flammable landscaping plantings or materials storage within the structure ignition zone (e.g., within 0-5 feet of the structure).

*Program* Develop a comprehensive vegetation management and weed-abatement program for open-space areas, including those that are located in or adjacent to existing subdivisions and new development areas.

## 5.3 PROTECTING PUBLIC HEALTH AND PROMOTING EQUITY

Fire hazard planning presents an opportunity for local planning agencies to identify just and equitable solutions to fire hazard and risk mitigation when updating general plan policies and programs. Local agencies should coordinate fire hazard planning with environmental justice requirements in the general plan update process where applicable, pursuant to GC § 65302(h). In addition, because wildfire-related vulnerabilities will be exacerbated by climate change, general plan updates should coordinate wildfire-related health and safety vulnerability with climate vulnerability and adaptation requirements that must be included in the safety element pursuant to GC § 65302(g)(4).

Wildfire policies and programs focused on outreach and engagement to vulnerable populations should focus not just on health and safety, but also on education and capacity-building needs. Local agencies can identify the most vulnerable populations and develop a plan to disseminate information about evacuation procedures, develop measures for protecting sensitive receptors from wildfire smoke, or designate locations and programs for sheltering in place or providing temporary housing, and other measures.

Perhaps the most important step for a community is to identify and empower existing organizations or networks (e.g., community-based organizations, faith communities, philanthropic organizations, and others) who can reach, organize, and build capacity among

residents and vulnerable communities most susceptible to wildfires, including people who live alone, the elderly, outdoor workers (including undocumented and migrant workers) and their employers, asthmatics, the differently abled, chronically ill individuals, and populations with literacy/language needs.

### *Potential General Plan Elements*

- Safety
- Land Use
- Air Quality<sup>6</sup>
- Housing
- Circulation
- Environmental Justice

### *Policy Examples*

The following are examples of policies that a local government might adopt to consider and mitigate impacts to public health and promote equitable fire hazard planning policies and programs:

#### **Disaster Preparedness Activities**

- Policy*      Ensure completeness and availability of identified emergency supplies and resources to all segments of the population, focusing especially on vulnerable and disadvantaged communities, including but not limited to temporary shelter or housing, and items such as medical supplies and services, water main repair parts, generators, pumps, sandbags, road clearing, and communication facilities.
- Policy*      Disaster response and recovery capabilities shall be maintained and improved to protect and meet the needs of all members of the community, especially the most vulnerable and disadvantaged.
- Program*    Update existing emergency preparedness and response plans and conduct community-facing exercises to enhance disaster preparedness and build local capacity to better address and mitigate health and safety impacts resulting from wildfires.
- Program*    Identify and catalogue the current supply of housing, services, and supplies and procure additional items and services to ensure preparedness and availability in the event of a wildfire emergency.

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<sup>6</sup>Air quality is a generally an optional element for local governments. GC § 65302.1 requires each city and county within the jurisdictional boundaries of the San Joaquin Valley Air Pollution Control District to either adopt an air quality element or amend appropriate elements of their general plan to include data and analysis, comprehensive goals, policies, and feasible implementation strategies to improve air quality.



*Program* Partner with existing public health community outreach and engagement efforts to address fire-related health and prevention needs.

### **Public Education and Financial Assistance**

*Policy* Work cooperatively with other agencies and private interests to educate private landowners on fire-safe and defensible measures to increase compliance with existing regulations to achieve a low risk condition.

*Policy* Establish public education services through the appropriate fire protection agencies.

*Program* Identify or develop programs to provide financial incentives or assistance to low-income households for defensible space maintenance, home hardening, and other measures to reduce risk.

## **5.4 DISASTER RESPONSE, RECOVERY, AND MAINTENANCE**

In California, wildfire is inevitable. Therefore, in addition to minimizing wildfire risk through land use and fuel modification strategies, jurisdictions should also build resilience through policies that address wildfire response, recovery, and maintenance.

Considerations for the response phase may include policies regarding fire suppression that address firefighter safety, response times, mutual aid agreements, water supply, as well as defensible space. The recovery and maintenance phase, meanwhile, presents an opportunity for the community and landowners to reevaluate land uses and practices following a wildfire event or disaster. A current general plan or LHMP will usually have the baseline data for the analysis.

Based on the data and analysis, policies should be developed for short-term recovery methods that are appropriate for local conditions to mitigate potential future losses or impacts due to wildfire. Issues that public policy makers may choose to consider include but are not limited to, benefit of recommended measure commensurate with the protection needed, immediate recovery needs versus long-term environmental health, debris removal versus habitat health, opportunities for re-introduction of native species, and short-term flood risks and mitigation opportunities.

Wildfires can directly cause or exacerbate flooding, debris flow, and landslide hazards because vegetation losses and disruptions or changes in soil permeability and slope stability, which reduce the ability of the landscape to absorb or slow down precipitation and storm runoff. In some cases, these induced or exacerbated hazards can rival the severity of a wildfire event. General plan updates should account for the potential for wildfires to increase or exacerbate flooding, debris flow and landslide hazards and related risks.

Long-term recovery and maintenance policies should also be developed to mitigate future loss due to wildfire. Issues that public policy makers may choose to consider include (but are not

limited to) the extent to which existing land use and zoning designations are appropriate, the potential for the re-evaluation of community assets, the success of past mitigation measures, sustainability of recommended fire mitigation measures, and assurance that mitigation measures will continue to be implemented.

### *Potential General Plan Elements*

- Safety
- Land Use
- Open Space
- Conservation
- Housing

### *Policy Examples*

#### **Wildfire Response Considerations**

- |                |   |
|----------------|---|
| <i>Policy</i>  | Identify low risk fire safety areas, including locations that may serve as temporary shelter or refugia during wildfire events.   |
| <i>Policy</i>  | Identify fire defense zones where firefighters can control wildfire without undue risk to their lives.  |
| <i>Policy</i>  | Designate and publicize areas where firefighter safety prohibits ground attack firefighting.  |
| <i>Policy</i>  | Maintain fuel breaks and other fire defense improvements on both public and private property.   |
| <i>Policy</i>  | Provide for adequate fire suppression resources in the local responsibility area, and coordinate with CAL FIRE regarding state responsibility area and scenarios where wildfires affect both areas. |
| <i>Program</i> | Develop or amend special assessment districts to ensure adequate fire suppression resources in the most vulnerable areas of the community.  |
| <i>Program</i> | Develop and adopt coordinated emergency notification and evacuation procedures that may be required across jurisdictional boundaries under extreme wildfire event scenarios.                        |
| <i>Program</i> | Review and update emergency response and evacuation plans and procedures at least every 5 years to reflect current conditions and community needs.  |

#### **Short-term Recovery Considerations**

- |               |   |
|---------------|---|
| <i>Policy</i> | Prioritize the needs of vulnerable and disadvantaged communities during emergency response and disaster recovery efforts. |
|---------------|---|

- Policy* Reduce post fire recovery time by replanting native species.
- Policy* Ensure fire protection measures enhance sustainability of restoration projects.
- Policy* Ensure reduced future fire risk by removing sufficient dead woody vegetation while retaining reasonable wildlife habitat (cross-link with water quality).
- Policy* Retain sufficient downed logs for erosion control as well as habitat maintenance.
- Program* Evaluate and update disaster recovery plans every 5 years to respond to changing needs and characteristics of the community.
- Program* Coordinate with planning, housing, health and human services, and other local, regional or state agencies to develop contingency plans for meeting short-term, temporary housing needs of those displaced during a catastrophic wildfire event.
- Program* Research and develop general rules and procedures that would govern planning and permitting requirements for construction of temporary housing or permanent rebuilding activities following a wildfire disaster, such as model emergency or urgency ordinances. This may also need to include staffing and tools needed to facilitate unique permitting needs in the recovery phase.

#### **Flood and Debris Flow Considerations**

- Policy* All wildfire burned areas shall be treated to control storm water runoff prior to winter rains.
- Policy* Wildfire areas shall be restored by planting native vegetation cover or encouraging the re-growth of native species using best practices as soon as possible to aid in control of storm water runoff.
- Policy* Potential for future flood hazard shall be reduced by sufficient removal of dead, woody vegetation along watercourses following a catastrophic fire to reduce the risk of future catastrophic fires.
- Policy* Fire hazard reduction measures should balance forest health with fuel reduction activities while considering the potential effect on flood management. Reduction in fire risk will simultaneously reduce flood risk.
- Policy* All wildfire areas prone to landslides shall be treated to avert storm water runoff prior to winter rains.
- Policy* Native vegetation cover shall be planted and/or temporary slope stabilization measures will be installed as soon as possible to aid in landslide control.
- Policy* Potential for landslides shall be reduced by sufficient removal of dead, woody vegetation following a catastrophic fire.

#### **Long-Term Considerations**

- Policy* Design subdivisions and developments to exist in concert with the natural ecosystem and to promote forest health and stewardship.

## Fire Hazard Planning Technical Advisory

- Policy* Periodically review trends and projections of future fire risk and fire risk reduction capabilities to ensure that mitigation measures are adequate.
- Policy* Incorporate forecasted impacts from climate change into trends and projections of future fire risk and consideration of policies to address identified risk.
- Policy* Require defensible space maintenance agreements for new development projects and require extension of defensible space maintenance agreements to subsequent landowners.
- Policy* In high fire hazard severity areas, rebuild structures with a minimum 100' setback (when feasible) from property lines.
- Policy* Residential dwellings shall be rebuilt using best practices for fire-resistant or fire-proof construction methods, materials and landscaping to reduce their susceptibility to wildfire.
- Policy* In high fire hazard areas fire rated roofing and construction materials shall be used in reconstruction and new development pursuant to Section 703.1 of the California Fire Code (CCR, Title 14, Part 4).
- Program* Update codes and ordinances to specify procedures and standards for planning and permitting the reconstruction of buildings destroyed by wildfire.
- Program* Update codes and ordinances to require all replacement structures or redevelopment projects following a wildfire to comply with applicable project-level wildfire risk reduction measures and WUI building codes in high hazard areas.
- Program* Periodically review fire history and lessons learned to ensure that hazard mitigation measures and future disaster recovery needs are being managed to optimize effectiveness.
- Program* Using best available data and tools, update the fire hazard and risk assessment regularly to account for climate change or other factors, and alert public and private landowners in future high-risk areas regarding changes in hazard severity or risk levels.

## References

- Botts J., Freedman D. (2017, Nov). *In aftermath of wildfires, Sonoma County officials face language barriers, ICE fears from immigrants*. Peninsula Press.  
<http://peninsulapress.com/2017/11/17/sonoma-county-officials-faced-language-barriers-ice-fears-in-reaching-undocumented-during-fires/>
- Botts J. (2019, Nov). "We need the food that we lost." *Low-income families still reeling from blackouts*. Cal Matters. <https://calmatters.org/projects/california-psps-power-shutoffs-poverty-spoiled-food-hunger/>
- CAL FIRE. (2019). *Community Wildfire Prevention & Mitigation Report*.  
<https://www.fire.ca.gov/about-us/45-day-report/>
- CAL FIRE. (2018). *Strategic Fire Plan for California*.  
<https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/fire-plan/>
- CAL FIRE. (2020). *Top 20 Largest California Wildfires*.  
[https://www.fire.ca.gov/media/11416/top20\\_acres.pdf](https://www.fire.ca.gov/media/11416/top20_acres.pdf)
- CAL FIRE. (2020). *Top 20 Most Destructive California Wildfires*.  
[https://www.fire.ca.gov/media/11417/top20\\_destruction.pdf](https://www.fire.ca.gov/media/11417/top20_destruction.pdf)
- California Department of Housing and Community Development. (n.d.). *Addressing a Variety of Housing Challenges*. <https://www.hcd.ca.gov/policy-research/housing-challenges.shtml>
- California Forest Management Taskforce. (2020). *Restoring Health and Reducing Wildfire Threat to California's Forests*. <https://fmtf.fire.ca.gov/>
- California Governor's Office of Emergency Services. (2020, Mar). *California Climate Adaptation Planning Guide*.  
<https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/california-climate-adaptation>
- California's Fourth Climate Change Assessment. (2018). *Wildfire*. <http://climateassessment.ca.gov/state/overview/#wildfire>
- Centers for Disease Control and Prevention. (2020, Aug 25). *Wildfire Smoke and COVID-19*.  
[https://www.cdc.gov/disasters/covid-19/wildfire\\_smoke\\_covid-19.html#:~:text=People%20with%20COVID%2D19%20are,function%20related%20to%20COVID%2D19.](https://www.cdc.gov/disasters/covid-19/wildfire_smoke_covid-19.html#:~:text=People%20with%20COVID%2D19%20are,function%20related%20to%20COVID%2D19.)

City of Santa Rosa. (n.d.) *Water Quality Advisory*. <https://srcity.org/2801/Water-Quality-Advisory>

Davies I., Haugo R., Robertson J., Levin P. (2018, Nov). *The unequal vulnerability of communities of color to wildfire*. PLOS ONE. <https://doi.org/10.1371/journal.pone.0205825>

Federal Emergency Management Agency. (2013, Sept). *Disaster Mitigation Act of 2000*. <https://www.fema.gov/media-library/assets/documents/4596?id=1935>

Goss M., Swain D., Abatzoglou J., Sarhadi A., Kolden C., Park Williams A., Diffenbaugh N. (2020, Mar). *Climate change is increasing the risk of extreme autumn wildfire conditions across California*. Environ. Res. Lett. in press <https://doi.org/10.1088/1748-9326/ab83a7>

Governor's Office of Planning and Research. (n.d.). *CEQA: The California Environmental Quality Act*. <http://opr.ca.gov/ceqa/>

Governor's Office of Planning and Research. (2018, July). *Defining Vulnerable Communities in the Context of Climate Adaptation*. [http://opr.ca.gov/docs/20180723-Vulnerable\\_Communities.pdf](http://opr.ca.gov/docs/20180723-Vulnerable_Communities.pdf)

Governor's Office of Planning and Research. (2019, June). *Final Report of the Commission on Catastrophic Wildfire Cost and Recovery*. <https://opr.ca.gov/wildfire/>

Governor's Office of Planning and Research. (2017). *State of California General Plan Guidelines*. <https://opr.ca.gov/planning/general-plan/guidelines.html>

Governor's Office of Planning and Research. (2005, Nov). *Tribal Consultation Guidelines: Supplement to General Plan Guidelines*. [http://www.opr.ca.gov/docs/011414\\_Updated\\_Guidelines\\_922.pdf](http://www.opr.ca.gov/docs/011414_Updated_Guidelines_922.pdf)

Healthcare Foundation Northern Sonoma County. (n.d.) *Finding Our New Normal Together*. [https://healthcarefoundation.net/fire\\_recovery/](https://healthcarefoundation.net/fire_recovery/)

Hill L., Blythe R., Krieger E., Smith A., McPhail A., Shonkoff S. (2020, July). *The Public Health Dimensions of California Wildfire and Wildfire Prevention, Mitigation and Suppression*. <https://www.psehealthyenergy.org/our-work/publications/archive/public-health-dimensions-of-california-wildfire-prevention-mitigation-and-suppression/>

Insurance Information Institute. (2019, November). *Fighting Wildfires with Innovation*. [https://www.iii.org/sites/default/files/docs/pdf/fighting\\_wildfires\\_with\\_innovation\\_wp\\_112619.pdf](https://www.iii.org/sites/default/files/docs/pdf/fighting_wildfires_with_innovation_wp_112619.pdf)



- Johnston-Dodds K. (2002). *Early California Laws and Policies Related to California Indians*. California State Research Bureau, California State Library.  
[https://water.ca.gov/LegacyFiles/pubs/planning/california\\_water\\_plan\\_2005\\_update\\_bulletin\\_160-05\\_vol4-tribal-earlycalifornialaws.pdf](https://water.ca.gov/LegacyFiles/pubs/planning/california_water_plan_2005_update_bulletin_160-05_vol4-tribal-earlycalifornialaws.pdf)
- Kuipers D. (2019, Aug 26). *After the wildfire: treating the mental health crisis triggered by climate change*. The Guardian. <https://www.theguardian.com/world/2019/aug/26/climate-change-mental-health-wildfires-santa-rosa>
- Lake F. (2018, Sept 13). *Fire as Medicine: Fire Dependent Cultures and Re-Empowering American Indian Tribes*. Fire Adapted Communities Learning Network.  
<https://fireadaptednetwork.org/fire-as-medicine-fire-dependent-cultures/>
- Mendez M. and Flores-Haro G. (2019). *Disparate Impacts of Wildfire on Undocumented Immigrants*. UC Center Sacramento. <https://uccs.ucdavis.edu/events/2019-November-13-Mendez>
- Mowery M., Read A., Johnston K., Wafaie T. (2019, Apr). *Planning the Wildland-Urban Interface*. American Planning Association. <https://www.planning.org/publications/report/9174069/>
- Moritz M. and Butsic V. (2020, Apr). *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California*. <https://doi.org/10.3733/ucanr.8680>
- Parsons, D.; Nichols, H. (1986). *Management of Giant Sequoia in the national parks of the Sierra Nevada, California*. In: Weatherspoon, C. Phillip; Iwamoto, Y. Robert; Piirto, Douglas D., technical coordinators. Proceedings of the workshop on management of giant sequoia; May 24-25, 1985; Reedley, California. Gen. Tech. Rep. PSW-GTR-95. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture: p. 26-29  
<https://www.fs.usda.gov/treearch/pubs/27509>
- Roos, M. (2018, Sept 28). *Climate Justice Summary Report*. California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-012.  
<https://www.climateassessment.ca.gov/state/index.html>
- State Board of Forestry and Fire Protection, California Department of Forestry and Fire Protection. (2006, May). *General Guidelines for Creating Defensible Space*.  
<https://bof.fire.ca.gov/media/8935/defensible-space-guidelines.docx>
- State of California Native American Heritage Commission. (n.d.). <http://nahc.ca.gov/>
- State of California Office of Administrative Law. (2019, Sept). *Notice of Approval of Regulatory Action: SRA Fire Safe Regulations*.<https://bof.fire.ca.gov/media/9267/6-sra-fire-safe-regulations-2020-approved-ada.pdf>

Stephens S., Burrows N., Buyantuyev A., Gray R., Keane R., Kubian R., Liu S., Seijo F., Shu L., Tolhurst K., van Wagendonk J. (2014, Jan 15). *Temperate and boreal forest mega-fires: characteristics and challenges*. *Front Ecol Environ* 2014; 12(2): 115–122, doi:10.1890/120332. <https://nature.berkeley.edu/stephenslab/wp-content/uploads/2015/04/stephens-et-al-boreal-mega-fires.pdf>

Stone S., Anderko L., Berger M., Butler C., Cascio W., Clune A., Damon S., Garbe P., Hauptman M., Haskell W., Hoshiko S., Lahm P., Materna B., Mirabelli M., Larkin N., O'Neill S., Peterson J., Riveles K., Sacks J., Wayland M., Williams J. (2019, Aug). *Wildfire Smoke: A Guide for Public Health Officials*. <https://www.airnow.gov/publications/wildfire-smoke-guide/wildfire-smoke-a-guide-for-public-health-officials/>

United States Department of Agriculture. (2020, Apr). The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide. <https://www.fs.fed.us/projects/hfi/field-guide/web/page15.php>

United States Department of the Interior, United States Department of Agriculture. (n.d.). *National Cohesive Wildland Fire Management Strategy*. <https://www.forestsandrangelands.gov/strategy/>

USDA Forest Service. (2010, Jul). National Roadmap for Responding to Climate Change. <https://www.fs.fed.us/climatechange/pdf/roadmap.pdf>

Verzoni A. (2019, Jan). Old & In Harm's Way: How demographics and topography collided to make the Camp Fire California's deadliest and most destructive wildfire ever. *NFPA Journal*. <https://www.nfpa.org/News-and-Research/Publications-and-media/NFPA-Journal/2019/January-February-2019/News-and-Analysis/Dispatches>

# Appendices

## A. ACRONYMS/ABBREVIATIONS

CAL FIRE – California Department of Forestry and Fire Protection  
CalOES – California Governor’s Office of Emergency Services  
CalVTP—California Vegetation Treatment Program  
CCR – California Code of Regulations  
CEQA – California Environmental Quality Act  
COPD – Chronic Obstructive Pulmonary Disease  
CWPP – Community Wildfire Protection Plan  
DMA – Disaster Mitigation Act  
FEMA – Federal Emergency Management Agency  
FHSZ – Fire Hazard Severity Zone  
FPP – Fire Protection Plan  
FRA – Federal Responsibility Area  
GC – Government Code  
HMGP – Hazard Mitigation Grant Program  
IFR – Interim Final Rule  
ICARP – Integrated Climate Adaptation and Resiliency Program  
LHMP – Local Hazard Mitigation Plan  
LRA – Local Responsibility Area  
NAHC – Native American Heritage Commission  
OPR – Governor’s Office of Planning and Research  
PRC – Public Resources Code  
PSPS—Public Safety Power Shutoff  
PTSD – Post Traumatic Stress Disorder  
SRA – State Responsibility Area  
State Board – State Board of Forestry and Fire Protection  
TAC – Technical Advisory Council  
TDR – Transfer of Development Rights  
USFS – United States Forest Service  
VHFHSZ – Very High Fire Hazard Severity Zone  
WUI – Wildland-Urban Interface

## B. RESOURCES

The table below describes and provides links to a variety of resources that may be helpful for local fire hazard planning and implementation efforts.

Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#">State of California's Grants Portal</a>	OPR recommends using this portal to find out about the latest grants that could support fire hazard planning or related implementation efforts that support fire hazard mitigation, climate adaptation, forest management, and other related projects and programs.					
<a href="#">CalOES / FEMA - Hazard Mitigation Grant Program (HMGP)</a>	The HMGP program provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration.					
<a href="#">California Air Resources Board Funding Wizard</a>	The Funding Wizard is a tool provided by the California Air Resources Board that aggregates current federal, state, regional, foundation and other funding opportunities for environmental and sustainability projects. It allows entry of keyword search terms to identify possible funding for identified projects.					
<a href="#">CAL FIRE Grant Programs</a>	CAL FIRE offers several different grant opportunities related to fire prevention, hazard mitigation, forest health, many of which can fund implementation of activities identified in or consistent with local plans. Specific CAL FIRE grant opportunities are also outlined in this resource table.					
<a href="#">Fire Prevention Grants Program</a>	CAL FIRE provides funding for local projects and activities that address the risk of wildfire and reduce wildfire potential to forested and forest adjacent communities. Funded activities include hazardous fuel reduction, fire prevention planning, and fire prevention education with an emphasis on improving public health and safety while reducing greenhouse gas emissions. This program is funded by California Climate Investments (CCI).					
<a href="#">Forest Health Grant Program</a>	CAL FIRE funds projects that proactively restore forest health to reduce greenhouse gases, protect upper watersheds where the state's water supply originates, promote the long-term storage of carbon in forest trees and soils, minimize the loss of forest carbon from large, intense wildfires, and further the goals of the California Global Warming Solutions Act of 2006 (AB 32). This program is funded by CCI.					

Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#"><u>Urban &amp; Community Forestry Grant Programs</u></a>	CAL FIRE provides local grants that optimize the benefits of trees and related vegetation through multiple-objective projects as specified in the California Urban Forestry Act of 1978 (PRC Section 4799.06-4799.12). These projects further the goals of AB 32, result in a net greenhouse gas benefit, and provide environmental services and cost-effective solutions to the needs of urban communities and local agencies. This program is funded by CCI.					
<a href="#"><u>California Forest Improvement Program</u></a>	California Forest Improvement Program (CFIP) program encourages private and public investment in, and improved management of, California forest lands and resources. This focus of CFIP is to ensure adequate high-quality timber supplies, related employment and other economic benefits, and the protection, maintenance, and enhancement of a productive and stable forest resource system for the benefit of present and future generations. Cost-share assistance is provided to private and public ownerships containing 20 to 5,000 acres of forest land. Cost-shared activities include management planning, site preparation, tree purchase and planting, timber stand improvement, fish and wildlife habitat improvement, and land conservation practices.					
<a href="#"><u>Wildfire Resilience and Forestry Assistance Grant – Prop 68</u></a>	CAL FIRE has created a new grant opportunity focused around providing funding for eligible entities to provide technical and financial assistance to forestland owners for projects that provide ecological restoration of forests. Projects may include forest restoration activities for forestland already impacted by natural disturbance such as fire, insect, and disease, and forest management practices that promote forest resilience to severe wildfire, climate change, and other disturbances. CAL FIRE expects to award at least \$2,200,000 of Proposition 68 funding for Forestry Assistance in the fiscal year 2019/2020 for projects that propose to provide financial and technical assistance to private, nonindustrial landowners for the goals stated above.					

Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#">Northern California Forests and Watersheds Program</a>	The National Fish and Wildlife Foundation has partnered with the U.S. Forest Service to restore and enhance National Forests and watersheds affected by wildfires within Northern California. The Northern California Forests and Watersheds program will administer an initial \$6 million in grants to projects that increase wildfire resiliency for Northern California National Forests and associated watersheds.					
<a href="#">Western Forestry Leadership Coalition</a>	Formally established in 2000, the Western Forestry Leadership Coalition is comprised of members across federal and state agencies of the west who work together to assist family forest owners, rural and state fire organizations, and community forestry groups; improve forest health, encourage land conservation, and stimulate community economic recovery. The Coalition provides funding opportunities such as the Landscape Scale Restoration (LSR) Competitive Grant Program, which prioritizes landscapes of national importance, using the Forest Action Plans and the national themes (specifically the National Themes/Priorities identified in the federal Farm Bill consistent with P.L. 110-246 Section 8001). The objective is to focus competitive LSR funds on activities that address priority areas, challenges, and opportunities facing Western lands. Funding for the LSR Competitive Process is made possible through the USDA Forest Service.					
<a href="#">California FireSafe Council</a> and the <a href="#">Fire Safe California Grants Clearinghouse</a>	The Council's intent is to bring together governmental agencies and corporations to provide education to the residents of California on the dangers of wildfires and how they can be prevented. As part of its mission, the Council maintains the Fire Safe California Grants Clearinghouse: a one-stop shop that simplifies the process of finding and applying for grants to improve California's community wildfire preparedness. The portal includes information on open grant programs and includes an online grants application process to makes it easier to find and apply for wildfire prevention grants to support community projects.					

Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#">Adaptation Clearinghouse</a>	OPR's Adaptation Clearinghouse has numerous wildfire related resources such as funding opportunities, assessments, case studies, educational materials, data and tools, example plans and strategies, as well as additional policy guidance.					
<a href="#">Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California</a>	This guidance document, published by University of California Agriculture and Natural Resources, includes a compilation of community risk reduction measures for California communities based on a literature review and professional experiences of both firefighters and planners.					
<a href="#">Climate Action for Health: Integrating Health into Climate Action Planning</a>	This document helps communities that are working to create a Climate Action Plan identify the health co-benefits of reducing Greenhouse Gas Emissions and forge partnerships between planning and health organizations.					
<a href="#">California Climate Adaptation Planning Guide</a>	This guide outlines a step-by-step process to help jurisdictions assess their climate vulnerability as well as develop, implement, and evaluate local and regional climate adaptation strategies.					
<a href="#">General Guidelines for Creating Defensible Space</a>	This guide outlines common practices for managing fuels and creating defensible space around structures.					
<a href="#">Reducing Wildfire Risks in the Home Ignition Zone</a>	This document, created by the National Fire Protection Association, outlines actions that can be taken to reduce wildfire risks in the immediate, intermediate, and extended vicinity of a structure.					
<a href="#">Wildfire Smoke: A Guide for Public Health Officials</a>	This guide characterizes the health effects of wildfire smoke on sensitive populations and provides several strategies for reducing smoke exposure and protecting public health.					
<a href="#">Defining Vulnerable Communities in the Context of Climate Adaptation.</a>	This document defines vulnerable communities in the context of climate adaptation and summarizes existing assessment tools and indicators that can be used to identify vulnerable communities.					

Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#">Planning the Wildland-Urban Interface</a>	This document provides planners with an introduction to challenges in the WUI and highlights potential solutions to mitigate wildfire risk. In addition, case studies from communities across the US are included to showcase how a wide variety of jurisdictions are taking action.					
<a href="#">California Fire Science Consortium (CFSC), Northern California Module</a>	The CFSC is a network of fire science researchers, managers, and outreach specialists tasked with improving the availability and understanding of fire science and management knowledge. This includes increasing communication between fire researchers, managers, policymakers, tribes, landowners, and other stakeholders.					
<a href="#">California Forest Management Task Force</a>	This task force was created to “to establish healthy and resilient forests that can withstand and adapt to wildfire, drought, and a changing climate” and provides a space for local governments to engage with each other, the state and the federal government around wildfire and forest related issues.					
<a href="#">Community Planning Assistance for Wildfire (CPAW)</a>	This organization, funded by the U.S. Forest Service and private foundations, works with communities across the country to reduce wildfire risk in the WUI through land use planning strategies. One aim of CPAW is to build community capacity by providing technical consulting services, trainings, and other resources.					
<a href="#">ICARP Technical Advisory Council</a>	The Advisory Council facilitates the development of holistic, complimentary strategies that increase California’s resilience to climate change, advance equity and environmental justice, and benefit both greenhouse gas emissions reductions and adaptation efforts. The Council provides a space for state, regional, and local coordination.					
<a href="#">Northern California Prescribed Fire Council</a>	The Northern California Prescribed Fire Council is a venue for practitioners, state and federal agencies, academic institutions, tribes, coalitions, and interested individuals to work collaboratively to promote, protect, conserve, and expand the responsible use of prescribed fire in Northern California’s fire-adapted landscapes.					
<a href="#">Northern California Society of American Foresters</a>	The Society is a national organization representing all segments of the forestry profession in the United States. It includes public and private practitioners, researchers, administrators, educators, and forestry students.					



Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#">Fire-Adapted Communities Learning Network</a> (FAC Net) and Self-Assessment Tool (FAC SAT)	The purpose of FAC Net is to exchange information, collaborate to enhance the practice of fire adaptation, and work together and at multiple scales to help communities live safely with fire. This includes embracing resiliency concepts and taking action before, during and after wildfires. The <a href="#">Fire Adapted Communities Self-Assessment Tool (FAC SAT)</a> can also help communities assess their level of fire adaptation and track their capacity to live safely with fire over time. This tool can be used to assess individual neighborhoods, cities and even large counties.					
<a href="#">Firewise Communities</a>	The Firewise Communities/USA Recognition Program brings together homeowners, community leaders, planners, developers, and others in the effort to reduce wildfire risk. The program provides a number of resources and action steps homeowners can utilize now to reduce their community's risk of potential wildfire damage.					
<a href="#">Unit Fire Plans</a>	Drawn from the California Strategic Fire Plan, the CAL FIRE Units and Contract Counties develop plans that include stakeholder contributions and priorities and identify strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work with the local fire problem.					
<a href="#">Cal-Adapt: Wildfire: Climate Change Fire Risk Map</a>	Cal-Adapt is a statewide tool for viewing downscaled climate change exposure data and associated research on the effects of climate change for the entire state of California. Cal-Adapt includes numerous tools for viewing this data and research, including a Wildfire tool that allows a user to explore projected changes in average area burned by wildfires in California under various scenarios. The tool is based on wildfire scenario projections using a statistical model based on historical data of climate, vegetation, population density, and fire history coupled with regionally downscaled climate projections from Cal-Adapt.					
<a href="#">Connecting Wildlands and Communities Project</a>	This project is assessing the implications of connected landscapes on wildfire risks, patterns, and recovery. As part of the project, the CWC team plans to publish datasets and mapping tools to aid planners and other community stakeholders as they plan, prepare, and adapt to climate risks in southern California. These resources will be coming soon!					

Name	Description	Funding	Guidance	Networks	Examples	Tools & Data
<a href="#">CalEnviroScreen</a>	This tool maps census tracts that are burdened by or vulnerable to environmental stressors. The map contains over 20 indicators including air quality, asthma, cardiovascular disease, housing burden and linguistic isolation.					
<a href="#">CAL FIRE's Fire and Resource Assessment Program (FRAP)</a>	The FRAP division within CAL FIRE provides a variety of maps, geospatial data, reports, and other products including a detailed report on California's forests and rangelands. FRAP provides extensive technical and public information for statewide fire threat, fire hazard, watersheds, socio-economic conditions, environmental indicators, and forest-related climate change.					
<a href="#">My Hazards</a>	My Hazards is a tool for the general public to discover hazards in their area (e.g., earthquake, flood, fire, and tsunami) and learn about steps to reduce personal risk. Using the MyHazards tool, users may enter an address, city, zip code, or may select a location from a map. This website is provided by CalOES to allow users to easily make hazard maps for mitigation planning, report generation, and other tasks. The maps under "Fire Risk" depict the SRA according to Fire Hazard Severity Zone (FHSZ) classifications (i.e., Moderate, High and Very High).					
<a href="#">U.S. Forest Service Fire, Fuel, Smoke Science Program – Applications List</a>	The U.S. Forest Service's Fire, Fuel, and Smoke Science Program includes a list of applications that include possible models or tools to use for understanding fire behavior, fire danger ratings, wind, fire effects, fuels management, monitoring, and fire risk assessment. These tools are typically used by professionals with technical expertise in fire behavior and suppression, forest management, or other related disciplines.					

## C. RECENT EXAMPLES OF FIRE HAZARD PLANNING AND IMPLEMENTATION

The following case studies provide recent examples of local jurisdictions who have updated their safety element or other general plan elements to address wildfire hazards and risks, as well as local implementation measures or programs that have implemented the general plan or other plans that address fire hazards.

### [Berkeley](#)

## Fire Hazard Planning Technical Advisory

Population: 121,363

Region: Bay Area

Key Words: evacuation planning, community support

The City of Berkeley updated the Disaster Preparedness and Safety Element of its General Plan in 2019. Policies within the element include ensuring safety of residents with access and functional needs, identifying a contingency water supply, undergrounding utilities, and preventing future development in areas with increased fire hazard potential and limited access. The City also adopted its 2019 LHMP by reference into the General Plan, which includes a more detailed analysis of vulnerabilities and values at risk, protections for historically underserved communities, and details regarding mitigation work in progress. The plan includes local policy background, including a 2010 ordinance blocking establishment of residential units on Panoramic Hill until an adequate Specific Plan is adopted. These plans and the City's focus on resilience and disaster preparedness have led to an increased evacuation planning effort, including infrastructure and education surrounding pedestrian evacuation routes. The plan also supports ongoing Disaster Cache and Community Resilience Center programs, which have decentralized emergency resources and have been valuable to residents in decreasing secondary hazard related to wildfires, including Public Safety Power Shutoffs and air quality hazards from wildfire smoke.

### Mammoth Lakes

Population: 8,235

Region: Sierra Nevada

Key Words: tourism, small town, secondary impacts, vulnerable communities, adaptation and resilience

The Town of Mammoth Lakes updated the Safety Element of its General Plan in 2019. The town faces unique wildfire safety challenges associated with tourism and seasonal residents, and limited evacuation access. Policies in the General Plan include incentivizing and funding to support mitigation retrofits, developing plans for emergency and evacuation access, increasing capability for Spanish language emergency notifications, and protecting water supply from wildfire impacts. The plan also includes policies related to secondary impacts from wildfires, including creating wildfire smoke relief centers and addressing the needs of vulnerable communities.

### Santa Paula

Population: 29,806

Region: Central Coast

Key Words: land use, at-risk populations, financing fire protection services

The City of Santa Paula updated its General Plan, including its Hazards and Public Safety Element, in 2020. The plan includes a brief history of wildland fires in the area, acknowledges

increased wildfire risks associated with climate change, and describes existing and proposed land use in FHSZs, including in the city's sphere of influence. The plan's policies include enforcing fire safe and defensible space regulations and standards, including the Ventura County Fire Code, which is more stringent than the State requirements. Programs include public outreach targeting at-risk populations, identifying methods of establishing buffer zones between residential development and foothill vegetation, and regularly reviewing and updating fire hazard maps, fire codes, water supply, and the city's Emergency Operations Plan. The Public Services and Utilities element of the General Plan contains policies and programs related to fire protection services, including options for financing fire protection facilities using impact fees or development agreements, and continuation of a fire code compliance program.

### Riverside County

Unincorporated Population: 385,953

Region: Inland Empire

Key Words: WUI, regulations, open space, secondary risks

The County of Riverside updated its General Plan Safety Element in 2019. The plan explains the wildfire regime in the area, and identifies unique vulnerabilities, including the large number of mobile homes in the County that are disproportionately vulnerable to wildfire. The plan includes policies to implement fire safe development standards, including additional standards and design requirements for high risk facilities. These standards and requirements consider not only wildfire risk, but secondary risks associated with wildfire, including erosion control plans to address post-fire debris flow hazards. The safety element also includes background information and policies related to long-range fire planning, including open space, cluster developments, a TDR program, and a regional coordination program for fire protection and emergency service providers.

### Colton

Population: 54,824

Region: Inland Empire

Key Words: WUI, fuel modification, interjurisdictional cooperation, impaired access, hazard recovery plan

The City of Colton updated its General Plan Safety Element in 2018. The plan identifies connections to other elements of the General Plan, including Land Use, Mobility, Housing, and Open Space and Conservation. The Safety Element of Colton's General Plan is supplemented by the 2018 City of Colton LHMP. This plan includes a more thorough wildfire hazard background and analysis of vulnerable populations, including disabled individuals, persons with limited English proficiency, households under the poverty limit, and senior citizens living alone, living in CAL FIRE identified Fire Hazard Severity Zones. The safety element describes implementation programs, including the preparation of a CWPP, an Impaired Access Analysis to re-examine circulation requirements, and the preparation of a Hazard Recovery Plan.

### Westlake Village

Population: 8,217

Region: Southern California

Key Words: open space, hillside, fire breaks

The City of Westlake Village updated its General Plan in 2019, including the Hazards and Public Safety Elements. This plan explains the current policy landscape around fire hazards, Hillside Development Standards, required fire flow levels, and brush clearance requirements imposed at a minimum of 30 feet from the structure up to 200 feet from the structure. It also explains current fire hazard conditions and ongoing mitigation strategies the City has implemented related to local vegetation, community wildfire breaks, and evacuation access strategies. The plan contains objectives and policies that connect to implementation programs, including code enforcement, a feasibility study about funding for smoke alarms, and evaluating fire safety in the design review process. The plan also includes the Las Virgenes-Malibu Council of Governments 2018 Multi-Jurisdictional Hazard Mitigation Plan as an appendix to the General Plan.

### Redlands

Population: 71,513

Region: Inland Empire

Key Words: zoning, development standards, open space, water supply, vegetation management

The City of Redlands updated its General Plan in 2017, including fire hazard planning under its “Healthy Communities” theme. The Fire Hazard section includes local wildfire history, explains mutual aid agreements, and describes areas of the city that are particularly susceptible to wildfire, including canyon areas with extreme topography and susceptible to drought conditions and high winds. The plan describes land use tools in place to address this vulnerability, including low housing density down to one dwelling unit per 40 acres; Open Space designations that prohibit residential, commercial, or industrial development; and, City-owned land preserves maintained as open space. It also describes other current standards and requirements related to water supply, fire access standards, vegetation management, and building and signage. Fire hazard policies and principles in the general plan include 24 action items, which include maintaining updated hazard maps, continuing weed abatement, enforcing codes and standards, considering new fire protection standards and implementation measures for foothill development, and educating the public about fire prevention.

### Humboldt County

Unincorporated Population: 27,191

Region: Northern Coast

Key Words: fire services financing, fire safe and defensible space regulations, prescribed burning, conservation

The County of Humboldt updated the Safety Element of its General Plan in 2017. The plan contains background information on local fire hazards and fire protection services and contains a summary of key findings from the 2013 Humboldt County Community Wildfire Protection Plan. These key findings include wildfire hazard areas in the county that are not included within designated fire districts and rely on “good will” service from nearby fire districts and an increase in hazardous fuel loading. Since then, these issues have been addressed through fire district boundary expansions, formation of a new fire protection district, funding through special tax districts and a County-wide Public Safety and Essential Services sales tax, and increased fuel-reduction efforts including a cost-share program for homeowner fuel reduction efforts. Policies for new development in designated high and very high fire hazard severity zones include requiring building materials conforming to fire safe regulations, and subdivision developments requiring consideration of wildfire hazard mitigation design and layout practices including lot clustering, irrigated green belts, perimeter roads, and slope development constraints. Other policies include encouraging prescribed burning and promoting fire safe practices that encourage conservation and use of native plants and native plant ecosystems. The County’s 2014 LHMP, incorporated into the Safety Element by reference, includes further policies and plans encouraging vegetation management and compliance with defensible space regulations.

## D. GENERAL PLAN SAFETY ELEMENT ASSESSMENT

State law requires that cities and counties adopt a comprehensive general plan with various elements, including a safety element for protection of the community from unreasonable risks associated with various hazards, including wildfires. CAL FIRE and the State Board of Forestry and Fire Protection (Board) have a long history of acknowledging the importance of planning and its importance to wildland fire safety and risk mitigation.

As described under Section 3 (Regulatory and Policy Background) in this technical advisory, pursuant to Government Code 65302.5, local agencies with land classified as SRA and/or VHFHSZ must submit copies of their draft safety element to the Board for review and comment no later than 90 days prior to adoption of the safety element and/or general plan update. CAL FIRE's Land Use Planning Program, within the Office of the State Fire Marshal, assists the Board with safety element reviews and provides information and technical assistance to local agencies.

CAL FIRE's Land Use Planning staff provide planning departments with feedback and guidance to develop draft goals, policies, programs and implementation measures to improve fire safety in the community. Land Use Planning staff attend stakeholder meetings to communicate the collaborative efforts the state and the local jurisdictions are taking to address the threat posed by wildfire in the State of California. Land Use Planning Staff also provide legislative updates to City and County planning staff that relate to wildfire planning and risk mitigation, as well as conducting informal Safety Element Assessment pre-reviews of existing safety elements to provide jurisdictions a guideline for any planned future updates.

CAL FIRE and the Board encourage early consultation with the Land Use Planning staff when a general plan update is being considered by a local agency, so they can provide support and guidance through the process. For additional information on the CAL FIRE Land Use Planning Program, or your local CAL FIRE Land Use Planning staff member, you can go to their website at <https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/land-use-planning/>

A copy of the Safety Element Review Assessment Checklist and accompanying guidance for the safety element review process can be accessed at <https://bof.fire.ca.gov/board-committees/board-standing-committees-forest-practice-management-resource-protection/>



## E. OTHER PLANNING AND REGULATORY TOOLS

California courts have placed general plans “atop the hierarchy of local government law regulating land use.” (See e.g., *Neighborhood Action Group v. County of Calaveras* (1984) 156 Cal.App.3d 1176, 1183.) The general plan is often analogized to “a constitution for all future development.” (*Ibid.*) In that regard, all other land use plans and development approvals in that jurisdiction are subordinate to the general plan and must be consistent with it. For example, all subdivisions, zoning decisions, specific plans, and public works projects must be consistent with the general plan. On this basis, there are numerous planning tools that are used to implement the general plan. Several commonly used tools are briefly described below to illustrate how fire hazard planning can be incorporated into site specific, or project specific developments, as well as other local plans, codes and ordinances, or other programs that implement the general plan.

### *Specific Plan*

A specific plan is a tool for the systematic implementation of the general plan within all or a portion of the county's planning area (GC § 65450). It may encompass unlimited land area within the jurisdiction, may deal with only one or all policies in a general plan, and may even delve into subjects that were not addressed in a General Plan if they are relevant to the community. At a minimum, the specific plan must include a text and diagram which specifies all of the following: (1) the proposed distribution, location and extent of all land uses including open space, (2) the proposed distribution, location, and extent of major components of the transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities that are needed to support the proposed land uses, (3) standards and criteria by which development will proceed and standards for the conservation and use of natural resources, and (4) a program of implementation measures including regulations, programs, public works projects, and financing measures to carry out the specific plan (GC § 65451). Specific plans must also include a statement of its relationship to the general plan (GC § 65451(b)).

All principles, goals, objectives, policies, standards, and implementation measures of a specific plan must be consistent with the general plan (GC § 65454). Adoption of a specific plan is a legislative act similar to the adoption of a general plan or zoning ordinance (GC § 65453). It can be adopted by resolution or by ordinance and may be amended as often as necessary (GC § 65453). All future public works projects, subdivisions, zoning actions and development activities within the planning area must be consistent with the specific plan (GC § 65455).

A specific plan is particularly useful for planning large projects whose development may be phased over time. It can be used to assemble a set of land use specifications and implementation programs tailored to the unique characteristics of a particular site. Specific plans can stipulate development timing or set a schedule for infrastructure improvements, fuel modification and landscape maintenance requirements, or other development standards or requirements to address and mitigate wildland fire hazards and associated risks.

### *Subdivision Ordinance*

Land cannot be subdivided for sale, lease or financing in California without local government approval. The Subdivision Map Act (GC § 66410, et seq.) establishes the basic subdivision procedures, while giving local government the authority to regulate the design and improvement of subdivisions, require dedications of public improvements, require payment of impact fees, and require compliance with the objectives and policies of the General Plan.

These regulatory powers can promote the usual array of land use, circulation, open space and safety element objectives, policies, and implementation measures. Regulation of subdivision design can encourage numerous General Plan objectives including wildland fire safety, through the requirement to address fire prevention measures such as emergency access, adequate infrastructure and facilities, and separation (buffers) between buildable lots and wildland areas, fuels reductions and fire protection measures such as residential sprinkler systems in homes abutting open space or where there is inadequate water for structural fire suppression. Local governments can also require dedication of public improvements and land (through fee title or easements) to serve the subdivision.

A tentative subdivision map or parcel map cannot be approved unless the county finds that the subdivision, together with design and improvement conditions, is consistent with all aspects of the general plan or any applicable specific plan (GC § 66474). Two (2) of the findings that can cause a subdivision to be denied are (1) that the site is physically ill suited for the proposed type or density of the development or (2) that the subdivision's design or improvements are likely to cause substantial environmental damage or cause public health or safety problems (GC § 66474). These are important considerations for counties who are reviewing subdivision proposals in areas that are subject to wildland fire hazard.

Furthermore, as discussed under Section 3 of this technical advisory, GC § 66474.02, requires that a legislative body of a county make specific findings of compliance with the Fire Safe Regulations before approving a tentative map, or a parcel map for which a tentative map was not required, for any project located in the SRA or VHFHSZs within the LRA. The county must also submit a copy of the findings and accompanying maps to the State Board (GC § 66474.02(b)).

### *Development Agreement*

Development Agreements are contractual agreements voluntarily entered into by a city or county and a developer to vest development rights for a specific development project. They provide the developer with the advantage of “locking-in” zoning and development regulations for a specified time period, giving the developer a degree of assurance that some future local policy or regulation will not nullify a development proposal. In exchange, the Development Agreement allows the local jurisdiction to obtain additional concessions from the developer, such as higher design standards or dedication of additional public facilities, or otherwise obligate the developer to provide improvements in excess of the usual legal limits on exactions.

Through the Development Agreement, the city or county may require the reservation or dedication of land for public purposes and may include conditions and restrictions for subsequent discretionary actions. For example, the city or county may require dedication of emergency access easements, dedication of land for firefighting facilities, on-going maintenance of those facilities, and subsequent review of fire safety plans before later phases of development can begin (GC § 65865.2).

It is important that local governments be aware of their authority to negotiate and enforce the terms of a Development Agreement to prevent and mitigate wildland fire hazards. Since many Agreements include phased development anticipated to occur over many years, they often describe the first phase of development in detail but leave later phases less well defined. To ensure that fire prevention, protection and mitigation are adequately considered in all phases of a project, it is important for local jurisdictions to anticipate fire protection needs for all phases of the project, condition the Agreement accordingly, and monitor and enforce the terms of the Agreement.

GC § 65865.1 requires annual review of the Development Agreement at which time the developer must demonstrate good faith compliance with the terms of the Agreement. If the city or county finds that this has not occurred and makes the necessary findings, it may terminate or modify the Agreement (GC § 65865.1). Where measures to prevent and mitigate fire hazard have been incorporated into a Development Agreement and have not been implemented according to the Agreement, the city or county may enforce compliance.

### *Zoning Ordinances*

Cities and counties are required to adopt zoning ordinances as a means of implementing their general plans (GC § 65860). The zoning ordinance can include requirements for setbacks, landscaping, and site access, to name a few, that can assist in reducing fire hazards and risks. Further, a county could enact a fire hazard overlay zone that would apply to identify specific areas of the community susceptible fire hazards and risks that would set out specific development standards that apply in addition to the requirements in the base zone. Zoning sets out physical standards for development and is generally not well suited to enforcing landscaping and vegetation maintenance and other activities. Most city/county ordinances provide for these activities outside the zoning ordinance; an example is yard or landscaping maintenance ordinances established by some communities to enforce landscaping and vegetation maintenance requirements. In addition, GC § 65910 requires each city and county to have an “open-space zoning ordinance” that is consistent with its open-space element. This requirement is an important implementation tool in linking fire safety provisions in the open-space element such as fuel break/fuel reduction with zoning for site-specific development permits.

## F. GLOSSARY

**Climate Adaptation** - Adaptation is an adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

**Climate Change** – A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

([https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-AnnexII\\_FINAL.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-AnnexII_FINAL.pdf))

**Communities at Risk** – Defined by the Healthy Forest Restoration Act of 2003 as “Wildland-Urban Interface Communities within the vicinity of federal lands that are at high risk from wildfire.” CAL FIRE expanded on this definition for California including all communities (regardless of distance from federal lands) for which a significant threat to human life or property exists as a result of a wildland fire event. California uses the following three factors to determine at risk communities: 1) high fuel hazard, 2) probability of a fire, and 3) proximity of intermingled wildland fuels and urban environments that are near fire threats.

**Defensible Space** – In PRC Section 4291, “defensible space” refers to a 100-foot perimeter around a structure in which vegetation (fuels) must be maintained in order to reduce the likelihood of ignition. This space may extend beyond property lines or 100 feet as required by State law as well as local ordinances, rules, and regulations.

**Fire Hazard** – Fire hazard is the potential fire behavior or fire intensity in an area, given the type(s) of fuel present – including both the natural and built environment – and their combustibility.

**Fire Prevention** – Activities such as public education, community outreach, planning, building code enforcement, engineering (construction standards), and reduction of fuel hazards that is intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property or resources. (<https://www.nwccg.gov/glossary/a-z>)

**Fire Risk** – “Risk” takes into account the intensity and likelihood of a fire event to occur as well as the chance, whether high or low, that a hazard such as a wildfire will cause harm. Fire risk can be determined by identifying the susceptibility of a value or asset to the potential direct or indirect impacts of wildfire hazard events.

**Fire Hazard Severity Zones** – Fire hazard severity zones are defined based on vegetation, topography, and weather (temperature, humidity and wind), and represents the likelihood of an area burning over a 30- to 50-year time period without considering modifications such as fuel reduction efforts. CAL FIRE maintains fire hazard severity zone (FHSZ) data for the entire state. There are three classes of fire hazard severity ratings within FHSZs: Moderate, High, and Very High.

**Fuel Modification**— The manipulation or removal of fuels (i.e., combustible biomass such as wood, leaves, grass, or other vegetation) to reduce the likelihood of igniting and to reduce fire intensity. Fuel modification activities may include lopping, chipping, crushing, piling and burning, including prescribed burning. These activities may be performed using mechanical treatments or by hand crews. Herbicides and prescribed herbivory (grazing) may also be used in some cases. Fuel modification may also sometimes be referred to as “vegetation treatment”.

**Hazard** - A “hazard” can be defined generally as an event that could cause harm or damage to human health, safety, or property.

**Local Responsibility Area** – Wildland fire protection in California is the responsibility of either the state, local government, or the federal government. The Local Responsibility Area (LRA) includes incorporated cities, cultivated agricultural lands, and portions of the desert. Local responsibility area fire protection is typically provided by city fire departments, fire protection districts, counties, and by CAL FIRE under contract to local government.

**Resilience** - Resilience is the capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience.

**Safety Element** – One of the seven mandatory elements of a local general plan, the safety element must identify hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. The element should contain general hazard and risk reduction strategies and policies supporting hazard mitigation measures.  
(<http://opr.ca.gov/planning/general-plan/guidelines.html>)

**State Responsibility Area** – The state responsibility area (SRA) is a legal term defining the area where the State has financial responsibility for wildland fire protection. Incorporated cities and lands under federal ownership are not included in the SRA. Lands under federal ownership are in the federal responsibility area. See also the Local Responsibility Area definition above.

**Transfer of Development Rights** - Transfer of development rights (TDR), sometimes also known as transfer of development credits (TDC), is a market-based tool that allows communities to channel development toward designated growth areas and away from natural/wildland areas, drinking water sources, and farmland. Development rights are separated from a parcel of land that needs protecting (the sending site) and transferred to a parcel of land more appropriate for development (the receiving site). Future development on the sending site is permanently restricted, thereby protecting that asset. The project in the receiving site where the TDR credit is applied gains a density bonus above what would otherwise be allowed by zoning.  
(<https://www.smartgrowthamerica.org/app/legacy/documents/transfer-development-rights-policy-toolkit.pdf>)

**Values and Assets at Risk** – The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and can include public and private assets (natural and manmade) -- such as homes, specific structures, water supply, power grids, natural

and cultural resources, community infrastructure-- as well as other economic, environmental, and social values. (<https://www.nwcg.gov/glossary/a-z> and <https://www.fire.ca.gov/media/4934/fireplan.pdf>)

**Vulnerable Community** – Vulnerable communities experience heightened risk and increased sensitivity to natural hazard and climate change impacts and have less capacity and fewer resources to cope with, adapt to, or recover from the impacts of natural hazards and increasingly-severe hazard events because of climate change. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality. ([http://opr.ca.gov/docs/20180723-Vulnerable Communities.pdf](http://opr.ca.gov/docs/20180723-Vulnerable_Communities.pdf))

**Wildfire** – A “wildfire” can be generally defined as any unplanned fire in a “wildland” area or in the wildland-urban interface (WUI).

**Wildfire Influence Zone** – A wildland area with susceptible vegetation up to 1.5 miles from the interface or intermix WUI.

**Wildland** –Those unincorporated areas covered wholly or in part by trees, brush, grass, or other flammable vegetation.

**Wildland Fire** – Fire that occurs in the wildland as the result of an unplanned ignition.

**Wildland-Urban Interface (WUI)** – The WUI can be defined broadly as “any developed area where conditions affecting the combustibility of natural and cultivated vegetation (wildland fuels) and structures or infrastructure (built fuels) allow for the ignition and spread of fire through these combined fuels”. WUI areas can be further defined by different spatial configurations. The “interface” WUI condition exists where development and/or structures are adjacent to wildland areas, in which there may be clear demarcation or hard edge between developed and undeveloped areas. By contrast, the “intermix” WUI condition refers to areas in which structures or semi-developed areas are mixed with wildland areas and vegetation, such as in rural, ex-urban, or large-lot semi-rural developed conditions (APA 2019).