WILDLAND-URBAN INTERFACE PLANNING GUIDE

Examples and Best Practices for California Communities

August 2022

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH · STATE OF CALIFORNIA

CWPC
Community Wildfire Planning Center

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
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PROJECT TEAM

PROJECT MANAGEMENT TEAM:
California Governor's Office of Planning and Research: Erik de Kok, Beth Hotchkiss, Nikki Caravelli, Clay Kerchof

RESEARCH TEAM AND REPORT AUTHORS:
Community Wildfire Planning Center: Molly Mowery, Kelly Johnston, Katie Oran

REPORT DESIGNER:
SWA: Jonah Susskind

PROJECT REVIEWERS:
California Office of State Fire Marshal / CAL FIRE: Matt Damon,
California Board of Forestry and Fire Protection: Claire McCoy, Edith Hannigan

TECHNICAL EDITOR:
Atlas Planning Solutions: Crystal Stueve

Cover photo: Orange County Fire Authority

ACRONYMS

AB	Assembly Bill
ADU	Accessory Dwelling Unit
APA	American Planning Association
CAL FIRE	California Department of Forestry and Fire Protection
Cal OES	California Office of Emergency Services
Caltrans	California Department of Transportation
CAP	Climate Action Plans
CCC	California Coastal Commission
CC&Rs	Covenants, Conditions, and Restrictions
CBSC	California Building Standards Code
CDBG	Community Development Block Grant
CCR	California Code of Regulations
CERT	Community Emergency Response Team
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWPC	Community Wildfire Planning Center
CWPP	Community Wildfire Protection Plan
DSAFIE	Defensible Space Assistance for Income-Eligible
EIR	Environmental Impact Report
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
FPP	Fire Protection Plan
FS	Fire Safety (Overlay Zone)
GC	California Government Code
GHG	Greenhouse Gas
HCD	California Department of Housing and Community Development

HOA	Homeowner Association
IBHS	Insurance Institute for Business and Home Safety
JPA	Joint Powers Agreement
LCP	Local Coastal Program
LHMP	Local Hazard Mitigation Plan
LRA	Local Responsibility Area
MCFAC	Mariposa County Fire Advisory Committee
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
OCFA	Orange County Fire Authority
OSFM	Office of the State Fire Marshal
OPR	California Governor's Office of Planning and Research
PG&E	Pacific Gas & Electric
PRC	Public Resources Code
REU	Redding Electric Utility
RPFPP	Ranch Plan Fire Protection Program
SB	Senate Bill
SRA	State Responsibility Area
TDR	Transfer of Development Rights
TEK	Traditional Ecological Knowledge
TFFT	Tahoe Fire and Fuels Team
USFS	United States Forest Service
VHFHSZ	Very High Fire Hazard Severity Zone
WECS	Wind Energy Conversion Systems
WUI	Wildland-Urban Interface

CONTENTS

OVERVIEW

The wildland-urban interface, or WUI (pronounced "WOO-EE"), is any area where the built and natural environments create a set of conditions that allow for the ignition and spread of wildfire. The extent to which a wildfire may impact the WUI depends on many factors, such as where and how homes, businesses, and infrastructure are developed, weather conditions, and the amount, type, and arrangement of "fuels." Fuels can include natural vegetation (wildlands, parks), cultivated vegetation (landscaping), structures (homes, commercial properties), infrastructure (bridges, utilities), and additional features (fences, attachments, propane tanks). When some, or all, of these factors are present, and conditions in the WUI are left untreated or unmitigated, this can result in a WUI fire disaster.

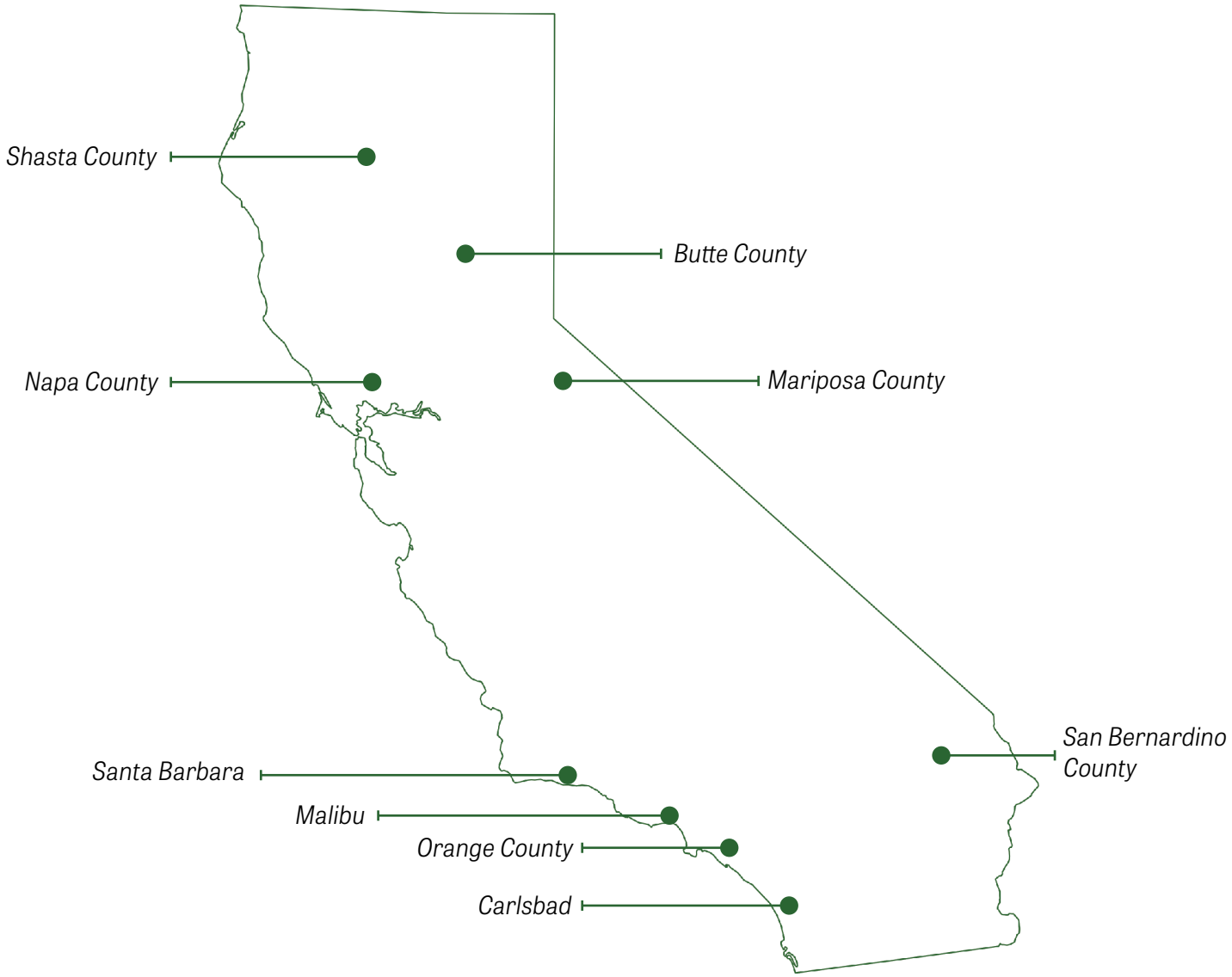
The WUI is widespread across the diverse ecosystems and communities in California. As a result, there are many communities across the state that would benefit from WUI planning tools to reduce wildfire risk and increase resilience.

This WUI Planning Tools Guide is intended to help planners, wildfire mitigation practitioners, and other professionals and decision-makers understand the myriad of options available to support WUI planning in California. WUI planning tools are those that can be adopted and implemented as standalone tools or as integral components of plans, local ordinances, agreements, programs, or other activities. These tools are intended to affect short and long-term change in addressing the WUI and associated wildfire hazard or risk.

Tools in this guide are primarily oriented to the built and natural environments at the home, parcel, neighborhood, and community (or district) scale. Some tools have also been included to highlight regional scale approaches. Although intended to be comprehensive, this guide is not necessarily exhaustive in terms of listing all WUI planning and mitigation options available to communities.

Throughout the guide, community examples are provided to help readers understand at a quick glance how different planning tools (e.g., plans, regulations) are being implemented across the State. In addition, this guide features nine case studies to provide a more in-depth understanding of where planning tools are considered WUI planning best practices. These case studies focus on a planning tool and its application and illustrate why it is a best practice. Community examples and featured case studies were based on a statewide inventory of counties, local jurisdictions in the Very High Fire Hazard Severity Zone (VHFHSZ) and Tribal Nations to determine the extent and type of tools being implemented across the State. Case studies underwent a comprehensive evaluation to assess their applicability as a WUI planning best practice. More information about the inventory and case study selection process is described in Appendix A.

Finally, this guide is intended to supplement the Fire Hazard Planning Technical Advisory, published by the California Governor's Office of Planning and Research (OPR). Where noted, references to the Technical Advisory are included in this guide to direct readers to that document when more information is available on a topic or tool.



WUI Planning Best Practices

This guide includes a number of WUI planning tools, community examples, and case studies from across California, which are based on a statewide inventory of WUI planning practices.

The nine featured case studies showcase a planning tool or practice that makes it a "WUI planning best practice"—a practice shown by research, experience, and evaluation to produce optimal results for addressing WUI risk. WUI planning best practice case studies are from ***Butte County, Carlsbad, Malibu, Mariposa County, Napa County, Orange County, San Bernardino County, Santa Barbara, and Shasta County*** *and offer opportunities for learning and potential replication in other communities.*

Each case study highlights how a WUI planning best practice achieves one or more of the following evaluation criteria: relates closely to land use planning, efficiently uses resources, innovatively addresses a WUI planning challenge, considers vulnerable populations, collaboratively engages the public and other stakeholders, results in long-term and sustainable outcomes, and effectively reduces wildfire risk.

PLANS

There are many plans that communities can adopt to address the WUI and associated wildfire hazard or risk. Some plans are entirely focused on these topics, such as Community Wildfire Protection Plans (CWPPs), while other plans may have a different primary focus but have strong linkages to WUI topics. This section covers the most typical plans that communities can, and in some cases must, consider when planning for the WUI and wildfire in California.

GENERAL PLANS

All cities and counties in California are required by state law to adopt a general plan, which sets forth a long-term vision of a community's future. The format and content of general plans can vary, and there is no mandatory structure or maximum number of "elements" or topics that a general plan must include. However, California law requires each general plan to address a minimum set of mandatory elements: land use, circulation, housing, conservation, open space, noise, and safety (California Government Code [GC] § 65302). Additional elements may also be required; for example, cities and counties that have identified disadvantaged communities must also address environmental justice in their general plans.

Senate Bill 1241 (2012) revised general plan safety element requirements such that all cities and counties whose planning area is within the designated state responsibility area (SRA), or in a very high fire hazard severity zone (VHFHSZ), must address and incorporate specific information on wildfire hazards and risk and adopt policies to address and reduce unreasonable risks associated with wildfire. The draft safety element of a county or a city's general plan must 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 its adoption or amendment. These requirements are codified in GC § 65302 (g)(3) and 65302.5(b). Additional requirements include:

§ 65302(g)4: Upon the next revision of a local hazard mitigation plan, the safety element shall be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to the city or county (SB 379).

§ 65302(g)(5): Upon the next revision of the housing element, the safety element shall be reviewed and updated as necessary to identify residential developments in any hazard area identified in the safety element that do not have at least two emergency evacuation routes (SB 99).

§ 65302(g)(6): Upon each revision of the housing element or local hazard mitigation plan, the safety element shall be reviewed to identify new information relating to flood and fire hazards and climate adaptation and resiliency strategies (SB 1035).

§ 65302.15: The safety element shall be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios (AB 747).

CALIFORNIA GOVERNMENT CODE REQUIREMENTS FOR GENERAL PLAN SAFETY ELEMENT – FIRE HAZARD §65302 (g)(3)

(3) 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 very high fire hazard severity zones, 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 of land 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.

In addition to the safety element requirements, communities may address the wildland-urban interface and wildfire hazard in other elements of their general plan. For example, San Bernardino County recently completed an update and expansion to their general plan, referred to as the Countywide Plan, which now references or discusses wildfire across several elements, including land use, housing, transportation, and mobility.

Extensive information on general plan requirements for wildfire hazard and examples of general plan safety element policies are provided in OPR's Fire Hazard Planning Technical Advisory.

SPECIFIC PLANS, PRECISE PLANS, COMMUNITY PLANS, NEIGHBORHOOD PLANS, MASTER PLANS

There are many local plan types which serve to implement the goals and policies of the general plan, including specific plans, precise plans, community plans, neighborhood plans, and master plans. Plan types can further vary based on how local jurisdictions define them. While these plans can share some features, there are several defining characteristics that help make the following plans distinct:

A **specific plan** *is the most detailed of these plan types and acts as a tool for systematic implementation of the general plan within all or a portion of a local agency's planning area. Specific plans may deal with one or more general plan policies and may also address subjects not included in the general plan. These plans are regulated by the State (GC § 65450) and must include a minimum set of requirements related to land use regulations and development standards, public works projects, implementation measures, and financing measures. These plans can be adopted within a zoning ordinance, as part of the general plan, or as a standalone planning document. Jurisdictions may have many specific plans—for example, the city of Los Angeles has more than 50 specific plans.*

A **precise plan** *is similar to a specific plan in terms of its detail but typically remains under the umbrella of a jurisdiction's general plan and does not necessarily include financing mechanisms or a capital improvements program. For example, the city of San Rafael has a Downtown San Rafael Precise Plan that includes all of the elements of a specific plan, including a zoning ordinance, but does not have a financing component.*

A **community plan** *is a policy document that sets forth a vision for growth within a defined area, such as a particular community or neighborhood. These plans contain goals, objectives, and programs for implementation to help meet the broad objectives of the general plan. Unlike a specific plan or precise plan, they do not include zoning regulations or development standards.*

A **master plan** *can vary significantly depending on how a local jurisdiction defines its purpose or use. Master plans may focus on one or more planning topics, such as infrastructure, facilities, recreation, open space, etc. in combination with the needs of a defined geographic area, such as a utility district, university campus, community area (e.g., downtown, creek way), or jurisdiction. Similar to community plans, master plans are typically designed to be comprehensive and set forth a long-range vision to guide growth and development.*

A **neighborhood plan** *is similar to a community plan or master plan, but the level of detail and scope can vary significantly based on the needs of the plan and neighborhood area.*

Importantly, all of these plan types provide an opportunity to integrate wildfire hazard into their contents. For example, specific plans, which are useful for planning large projects whose development may be phased over time, can 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 throughout the phases of each development. Community plans and master plans that have areas which overlap with wildfire-prone areas can integrate risk into the planning process. In Santa Barbara County, the Eastern Goleta Valley Community Plan has a planning area that includes mapped high and

very high fire hazard severity zones. Wildfire considerations are holistically incorporated throughout the plan and range from landscaping requirements to special design guidelines for parcels in fire hazard areas. Policy actions and objectives in the Eastern Goleta Valley Community Plan also include road connectivity and ingress/egress for new development, utilizing fire access roads as trails for recreation, and ensuring fuels treatments are cohesive with biological sensitivities. **Butte County's** Upper Ridge Community Plan, featured as a WUI planning best practice **case study** for community plans, also heavily incorporates wildfire resilience and recovery into its goals, objectives, and recommendations.

Engaging the public in local planning efforts can help guide wildfire resilience priorities. wildfire resilience priorities. Image: Butte County Planning Department

Many of these plan types are subject to environmental review under the California Environmental Quality Act (CEQA). The level of detail required in an Environmental Impact Report (EIR) will vary based on the plan type.

OPEN SPACE AND RECREATION PLANS

This broad category can encompass plans for parks, open space, recreation, sensitive lands, and similar land management topics. These plans can address wildfire in many ways, such as assessing how open space should be managed to reduce hazardous vegetation, identifying opportunities for park features to be used as fuel breaks, or analyzing the potential for recreational facilities to act as evacuation centers or temporary areas of refuge.

In 2006, the Town of Hillsborough worked with a biologist to identify and map sensitive species, endangered species, wildlife, and vegetation composition with the open space areas owned by the town. In addition, the Town conducted a fuel load and fire risk assessment survey and mapping effort to understand the extent of fuel load and wildfire risk within their open spaces. The results of these efforts are captured in the Town's Open Space Vegetation Management Strategy and Guidelines, which was adopted in 2008. To help implement its strategy, the Town formed an Open Space Vegetation Management Task Force with experience in biology, urban planning, fire prevention, architecture, and construction. The Town also received an $800,000 Federal Emergency Management Agency (FEMA) grant to manage wildfire hazards on open space adjacent to housing. Funding from FEMA also helped the Town to develop work plans for defensible space and priority fire management areas and undertake National Environmental Policy Act (NEPA) and CEQA processes and conduct initial vegetation

treatments. The town has since completed more than ten years of seasonal work to maintain their fuels, which is funded through the General Fund.

Mariposa County also recently completed a Recreation and Resiliency Master Plan, which integrates wildfire resiliency as a key theme throughout this countywide plan. This plan aligns with other county plans, including the Mariposa County Community Wildfire Protection Plan. Together, these plans are featured as a WUI planning best practice **case study** on plan alignment.

LOCAL HAZARD MITIGATION PLANS

Local hazard mitigation plans (LHMPs) are voluntary plans that help communities prevent or minimize risks within their jurisdiction to reduce response and post-disaster costs. The federal government requires local governments to develop and maintain LHMPs to receive FEMA mitigation project assistance. These plans must be revised by local/tribal governments, reviewed by the State Mitigation Officer, and approved by FEMA once every five years.

The LHMP and general plan safety element can share similar hazard planning data and analyses. A discussion on the relationship between these two plans is available in OPR's Fire Hazard Planning Technical Advisory. Additional guidance and resources are provided by the California Office of Emergency Services (Cal OES) to assist local and tribal governments on developing or updating hazard mitigation plans to meet the requirements of Title 44 Code of Federal Regulations (CFR) §201.6 for FEMA approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs.

Local governments can work with their local emergency management agencies, local fire authorities, Cal OES, California Department of Forestry and Fire Protection (CAL FIRE), and Fire Safe Councils to ensure effective, integrated, and consistent wildfire prevention and hazard mitigation programs across numerous plans, including LHMPs, CWPPs, and general plans. Marin County's Multi-Jurisdictional Local Hazard Mitigation Plan highlighted this integrated approach through its planning process, which includes a multi-disciplinary planning committee and extensive review and incorporation of existing plans, studies, and reports used to develop the updated plan. In addition, the plan's mitigation actions table shows a set of actions that meet the Hazard Mitigation Assistance Guidance for project criteria eligibility, including defensible space enforcement programs, roadside vegetation management programs, early evacuation warning systems, fuel reduction on open spaces and near residential areas, and post-fire soil stabilization.

General Plans and Local Hazard Mitigation Plans

Integrating the general plan with other key hazard plans strengthens a community's approach to mitigation and resiliency. The general plan and local hazard mitigation plan can reinforce connected goals and activities related to land use, development, wildfire hazard, public safety, and climate vulnerability. Aligning plan policies and referencing shared data sources and information also increases efficiency by reducing duplication of efforts.

California state law encourages the alignment of the safety element with the local hazard mitigation plan or similar plans. A county or city that has adopted a local hazard mitigation plan, emergency operations plan, or other document can use that information in the safety element to comply with the requirement to identify evacuation routes and their capacity, safety, and viability and evacuation locations under a range of emergency scenarios (§ 65302.15).

*The City of Rolling Hills is taking this approach with the update of their Safety Element. The safety element references the City's local hazard mitigation plan and community wildfire protection plan and incorporates key strategies, such as vegetation management, utility undergrounding activities, and roofing and structure hardening ordinances. An in-depth WUI planning best practice on plan alignment is featured in the **Mariposa County case study**.*

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 that requires communities to define their wildland-urban interface and create actions to reduce wildfire risk to landscapes and the built environment. These plans also incentivize communities by enabling them to influence where and how federal agencies implement fuel reduction projects on federal land and how federal or state funds may be distributed for projects on non-federal lands.

CWPPs have three minimum requirements:

Collaboration: *A CWPP must be collaboratively developed. Local and state officials must meaningfully involve federal agencies and other interested parties, particularly nongovernmental 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. CWPPs may also share wildfire hazard or risk data and analysis with the LHMP, and some jurisdictions adopt the CWPP as an appendix to the LHMP.

The geographic scope of a CWPP can vary based on local needs, lead entities, and other factors. Fire districts, counties, towns, tribes, subdivisions with homeowner associations (HOAs) or other organized entity, and other defined community areas can all adopt CWPPs. Counties that adopt CWPPs can create an overarching framework that provides local communities the opportunity to "plug into" the county plan. For example, **Mariposa County's** updated CWPP (2021) set up a structure for local WUI communities (as defined in their CWPP) to build on the countywide plan and create customized action plans that address unique risk factors, such as topography, vegetation type, housing stock, access, and fire history. The County's CWPP, along with several other plans, are featured as a WUI planning best practice **case study** on plan alignment.

Humboldt County adopted an updated countywide CWPP in 2019 that was based on a two-year collaboration among members of the

Many communities incorporate vegetation management and fuel reduction activities in their WUI planning approaches. Image: Santa Barbara County Fire Department

Humboldt County Fire Safe Council. The updated CWPP is the third edition of their CWPP, which was first adopted in 2006. This version focuses on six goal areas: wildfire ignition prevention, wildfire preparedness, disaster preparedness, fire protection, restoration of beneficial fire, and integrated planning with a corresponding action plan for each goal area.

CLIMATE MITIGATION AND ADAPTATION PLANS

Climate mitigation and adaptation plans help communities assess their vulnerability to the local impacts of climate change and create strategies to either mitigate or adapt to these changes. Climate mitigation plans, also known as climate action plans (CAPs), typically focus on strategies to lower greenhouse gas (GHG) emissions, while climate adaptation plans focus more on adapting to the adverse impacts associated with climate change.

Climate plans have a strong linkage to wildfire as they can consider how a community must adapt to changing conditions such as increased temperature, unpredictable precipitation and extreme weather events, and shifts in flora and fauna. One plan example that heavily focuses on wildfire is the Karuk Climate Adaptation Plan, which was collaboratively developed by the Karuk Tribe Department of Natural Resources in 2019 in partnership with other organizations and agencies. The plan addresses the impacts of wildfire on the tribal community's natural and built environments, as well as the physical and mental health impacts that wildfires can cause. The plan also acknowledges the ways in which social and economic marginalization reduces the adaptive capacity of many of their residents to withstand the impacts of climate change, particularly wildfires, describes how fire exclusion has harmed their unique ecosystems, and outlines ways to revitalize traditional ecological knowledge (TEK) to help their lands thrive. Another emphasis of the plan is how the Karuk Tribe is working to restore traditional ways of living with fire, while increasing the use of wet meadows, road networks, and open space as fuel breaks to protect their communities. This effort was produced with funding from the Department of Energy and Pacific Gas & Electric (PG&E). Resilient Communities Grant Program.

Tribal and community members prepare for a prescribed burn on Yurok land in November 2020. Image: Max Brotman

Adaptation Planning

Climate adaptation plans are essential for helping communities achieve long term resilience, particularly as local vulnerability to hazards such as wildfire increases based on temperature, precipitation, and vegetation changes.

OPR's Adaptation Planning Guide offers a step-by-step process to help communities plan for climate change. The guide is designed to be flexible and responsive to community needs and integrates equity and community engagement throughout all four phases of the guide.

Additional resources for local, regional, and statewide climate adaptation planning and decision-making are available through OPR's Adaptation Clearinghouse.

RESILIENCY AND POST-DISASTER RECOVERY PLANS

Resiliency and post-disaster recovery plans typically guide short and long-term recovery processes for communities who are planning for or recently experienced a disaster. These plans often include topics such as re-establishing critical infrastructure, rebuilding damaged or destroyed homes and businesses, supporting a just economic recovery, and improving resilience to the impacts from future disasters. They may also include a number of other topics such as capacity building, disaster preparedness, and hazard profiles.

Ideally, these plans are developed prior to a disaster, although it can be difficult to predict the outcomes of specific events. As a result, many communities may develop these plans after a disaster out of necessity to guide the recovery process. For example, after-action reviews following the 2017 Thomas Fire highlighted the need for Ventura County to create a comprehensive Disaster Recovery Plan to guide recovery efforts following extraordinary emergency situations. Lessons learned during the Hill and Woolsey fires helped further refine the plan's contents, which was adopted by Ventura County's Board of Supervisors in 2019. The plan designates that the Board of Supervisors and the County Executive Officer will serve in primary leadership roles for disaster recovery; other supporting roles are designated for the County Office of Emergency Services, recovery task forces, state and local disaster recovery managers, and local private and non-governmental organizations.

Sonoma County took a similar approach following the October 2017 fires by developing a Recovery and Resiliency Framework, which was adopted in 2018. The Framework serves as a vision for how the County can emerge as more resilient and is based on input from community members and stakeholders following extensive community engagement that included seven countywide community meetings, an online survey, and meetings with over 80 community organizations and local partners. The Framework focuses on five strategic areas: community preparedness and infrastructure, housing, economy, safety net services, and natural resources.

Another example is the City of Weed, a rural community in Siskiyou County which developed a Community Inspired Resilience Plan after the Boles Fire in 2014. The fire destroyed 150 homes in and around their city following a multi-year drought. These losses equated to 16% of the single-family housing stock. The plan was designed to help rebuild the community, with particular attention on building back affordable housing lost in the fire and preparing for future wildfire events.

The benefits of resiliency and post-disaster

recovery plans are maximized when they align with the local hazard mitigation plan, community wildfire protection plan, climate adaptation plan, emergency operations plan, general plan, and other applicable plans. This helps reduce content overlap—for example, hazard profiles and wildfire risk can reference the LHMP or CWPP and ensure that growth and redevelopment considers goals established in the general plan.

Recovery Planning

State and federal resources are available to help planners with post-disaster recovery planning, including:

The California Governor's Office of Emergency Services (Cal OES) provides state recovery resources to help communities with financial assistance, debris removal, and other disaster recovery support.

The California Department of Housing and Community Development (HCD) provides disaster recovery program information including Community Development Block Grants for jurisdictions impacted by recent disasters.

FEMA provides a list of top recovery planning resources as part of its Community Recovery Management Toolkit, including several publications from the American Planning Association (APA).

WILDFIRE MITIGATION AND SAFETY PLANS

SB 901 (2018) expanded existing laws related to electrical corporations' responsibilities to plan for and minimize risks associated with overhead electrical lines and equipment. Public Utilities Code § 8386 now requires each electrical corporation to annually prepare and submit a wildfire mitigation plan for review and approval by the Office of Energy Infrastructure Safety within the California Natural Resources Agency. Plans must include a description of the preventive strategies and programs that the electrical corporation will adopt to minimize the risk of its electrical lines and equipment causing catastrophic wildfires (including consideration of dynamic climate change risks), plans for vegetation management, procedures for customer notifications, plans for inspections, roles and responsibilities for plan execution, metrics for measuring performance, and more.

While the primary focus of these wildfire mitigation plans is to address wildfire risks for the electrical grid, these plans typically align with the objectives of other community-based plans. For example, Redding Electric Utility (REU), a department within the City of Redding, describes in its Wildfire Mitigation Plan how this plan supports the city's local hazard mitigation plan goals related to wildfire and the wildland-urban interface. REU's Wildfire Mitigation Plan builds resilience by educating the public on wildfire danger, reducing the probability of fire ignitions, reducing the potential for destructive fires, and ensuring adequate staffing and resources are available. Being a municipal utility also helped REU take an integrated and collaborative effort with numerous city departments working together in the areas of prevention and response, technology solutions, emergency operations, and the 10-year capital improvement plan.

Communities can engage in a host of other fire safety, resiliency, and mitigation planning efforts that do not necessarily fit into the plan types described in this guide. For example, in response to growing concerns about local wildfire risks,

the City of Laguna Beach formed a subcommittee in 2018 to undertake an assessment of wildfire risk and prioritized mitigation measures for the city. The final Wildfire Mitigation and Fire Safety Report identified 47 mitigation strategies to address emergency alert systems, evacuation plans and improvements, fuel modification, public infrastructure improvements, and undergrounding of utilities. The highest priority strategy was undergrounding electrical utilities under Laguna Canyon Road, as well as a road improvement project that would increase capacity for evacuation in the event of a wildfire.

Another example is the Needs Assessment for Extreme Weather and Natural Disaster Prevention and Response Strategies, undertaken in partnership by Amador and Calaveras Counties. A primary focus of this report was to assess the existing conditions of roads (for evacuation, ingress/egress) and utility infrastructure, the vulnerability of this infrastructure to disaster impacts, and potential mitigation/adaptation strategies that would increase community resilience. The report also includes a list of potential funding sources for implementation of identified mitigation strategies.

Plan Alignment

Integrating various local planning initiatives can help communities develop a more unified, holistic, and inclusive planning approach that ultimately results in stronger and more resilient communities. Plan alignment involves leveraging connections, information, and resources to build shared language, data foundations, and processes across multiple planning efforts. The resulting deliverables are a suite of two or more plans (with different scopes and purposes) that share the same data, similar underlying assumptions, aligned visions, and complementary goals, strategies, and actions. Plan alignment helps communities integrate planning teams, data, and processes to achieve more effective solutions and outcomes. Finally, plan alignment means intentionally broadening planning approaches and coordination to be more collaborative.

A comprehensive and cohesive planning approach will pay great dividends and enable communities to holistically integrate wildfire risk considerations and resilience strategies throughout government decision-making processes. Most importantly, the outcome is that communities will be in a stronger position to mitigate wildfire risks. Other benefits include reduced duplication of effort, lowered potential for policy conflicts, streamlined public outreach, and increased eligibility for implementation funding.

For more information on plan alignment, including tools, guidance, and examples, visit the State Adaptation Clearinghouse Plan Alignment webpage.

REGULATIONS

Communities have a variety of regulatory options for addressing the WUI and related wildfire hazard conditions. Similar to plans, there are some state regulations, such as building codes, that must be adopted by local communities when tied to specific fire hazard severity zones or SRA. Other regulations for the WUI are adopted voluntarily at the local level. This section covers a range of regulatory options, both mandatory and voluntary, for communities to understand as part of WUI planning.

BUILDING CODES

The California Building Standards Code (CBSC) (California Code of Regulations [CCR], Title 24) contains minimum building design and construction regulations for the state, including standards for building in defined WUI areas, FHSZs, and SRAs. Wildfire requirements in the CBSC are designed to establish minimum standards for the protection of life and property by increasing the ability of buildings to resist the intrusion of flames or burning embers projected by a vegetation fire and reducing structure losses.

Minimum wildfire requirements and referenced performance-based test standards for building construction are found in different parts of the CBSC: Part 2 - California Building Code, Chapter 7A Materials and Construction Methods for Exterior Wildfire Exposure (typically referred to as "Chapter 7A") and Chapter 15 Roof Assemblies and Rooftop Structures; Part 2.5 - California Residential Code; Part 9 - California Fire Code; and Part 12 - California Referenced Standards Code. Similar wildfire protection requirements for mobile homes and other types of manufactured buildings are regulated by the California Department of Housing and Community Development (HCD) (CCR Title 25).

The Office of the State Fire Marshal (OSFM) is responsible for promulgating wildfire safety regulations based on Health and Safety Code § 13108.5. State law designates where CBSC wildfire requirements shall apply based on fire hazard severity zone classifications in the SRA and Local Responsibility Area (LRA). Recent legislation (SB 63, 2021) requires the OSFM and HCD, in consultation with interested stakeholders, to consider expanding the application of WUI building standards to moderate fire hazard severity zones, as defined in GC § 51178.

Cities and counties may adopt local ordinances and code amendments that exceed the state's WUI building code minimum standards. For example, the Town of Portola Valley recently approved an urgency ordinance to amend their local building code with additional provisions to enhance fire resistance and public safety. These amendments were based on recommendations from a Wildfire Preparedness Committee to clarify and add home hardening measures for all new buildings and applicable additions, alterations, and repairs to

existing buildings. Measures include requirements to protect the underside of deck structures with noncombustible exterior enclosures (when the deck is four feet tall or lower), elimination of combustible exterior wall coverings such as wood siding, requirements for noncombustible fences within 10 feet of the home or structures such as gazebos within 50 feet of a home.

FIRE CODES

The California State Fire Code, contained in the CBSC, establishes minimum requirements for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, panic, or dangerous conditions in new buildings & structures and a reasonable level of safety to firefighters and emergency responders during emergency operations.

Specific to wildfire, the California State Fire Code contains Chapter 49 – Requirements for Wildland-Urban Interface Fire Areas. This chapter provides minimum standards for hazardous vegetation and fuel management, defensible space, and building construction in accordance with other state codes and regulations. Other chapters and appendices in the state fire code establish minimum standards for emergency access and water supply for fire response. California's Code of Regulations Title 14 also contains regulations for fire protection and fire hazard reduction around buildings (see Fire Safe Regulations). The California Fire Code references Title 14 with additional information to assist the local jurisdictions with enforcements.

Jurisdictions are required to either enforce the California Fire Code, as adopted by the OSFM, or they can adopt the state fire code with local amendments that meet or exceed state minimum requirements. In either case, Chapter 49 - Requirements for Wildland-Urban Interface Fire Areas, must be adopted but some provisions are only required when the authority having jurisdiction requires them. For example, jurisdictions or the enforcing agency may require the submittal of a Fire Protection Plan (FPP) for a specific project or development proposed in the WUI to describe ways to minimize and mitigate potential losses from wildfire exposure for the project area. Other sections of the California Fire Code related to wildfire protection standards are optional, such as Appendix D – Fire Apparatus Access Roads or Appendix P, Community Wildland-Urban Interface (WUI) Fire Hazard Evaluation Framework which are there to assist jurisdictions when adopting their ordinances.

Some jurisdictions make local amendments to Chapter 49 to align with geographic designations. For example, the City of Los Angeles has adopted a local Fire Code, which is a combination of the state fire code and local amendments. The city's fire code is a component of their municipal code (Chapter V Public Safety and Protection, Article 7 Fire Protection and Prevention Code). Within their Fire Code, Chapter 49 has been modified to identify the VHFHSZs within the city.

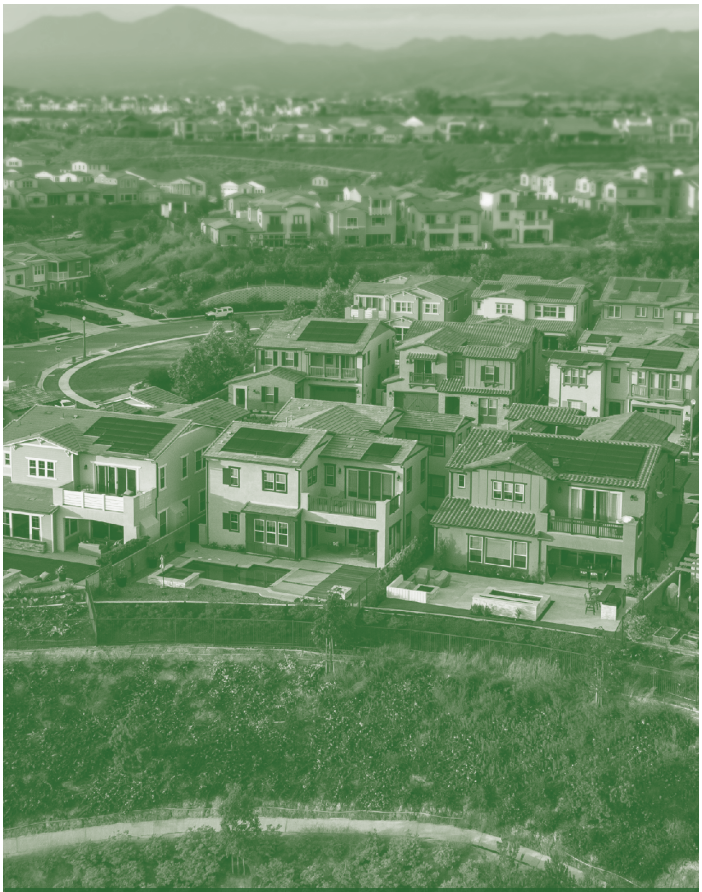
FIRE SAFE REGULATIONS

Public Resources Code § 4290 requires the California State Board of Forestry and Fire Protection to adopt regulations for minimum fire safety standards related to defensible space, road standards for fire equipment access, standards for signs identifying streets, roads, and buildings, minimum private water supply reserves for emergency fire use, fuel breaks and greenbelts, and measures to preserve undeveloped ridgelines to reduce fire risk and improve fire protection. These regulations are known as the Fire Safe Regulations and are codified in CCR, Title 14 (Natural Resources), Division 1.5 (Department of Forestry), Chapter 7 (Fire Protection) under Subchapter 2. The Fire Safe Regulations apply to the perimeters and access to all residential,

commercial, and industrial building construction within State Responsibility Areas (approved after January 1, 1991) and lands classified and designated as VHFHSZs (approved after July 1, 2021).

The State Board of Forestry and Fire Protection is also required to periodically update regulations for fuel breaks and greenbelts for greater fire safety. These regulations do not supersede local regulations which equal or exceed minimum regulations adopted by the State.

Many counties have streamlined compliance with the Fire Safe Regulations as part of their development permit or subdivision application process. For example, the County of Del Norte had a dedicated webpage on the Fire Safe Regulations to guide applicants through development activities subject to the regulations and forms such as a development checklist and exception request.



Subdivision in Orange County with houses surrounded by fuel modification zones. Image: Jonnu Singleton, SWA

SUBDIVISION ORDINANCES

Subdivision ordinances describe the conditions and procedures under which land may be subdivided. 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 land use, circulation, open space and safety element objectives, policies, and implementation measures.

Regulation of subdivision design can address wildfire safety by incorporating measures such as emergency access, adequate infrastructure and facilities, separation 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 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.

Counties may place other fire safety development standards or restrictions in their subdivision

ordinances. For example, the County of Los Angeles restricts the number of residential dwelling units allowed based on the type of street system and proximity to wildland areas in its subdivision ordinance (Title 21). Streets or street systems that are restricted to a single route of access to a highway cannot serve more than: 150 dwelling units where the restriction is designed to be permanent and the street or street system does not traverse a wildland area that is subject to hazard from brush or forest fire; 75 dwelling units where the restriction is designed to be permanent and the street or street system traverses a wildland area that is subject to hazard from brush or forest fire; 300 dwelling units where the restriction is subject to removal through future development (§ 21.24.020).

Additional considerations for subdivision ordinances and requirements pertaining to fire safety are discussed in OPR's Fire Hazard Planning Technical Advisory.

Subdivision Review Program

The Subdivision Review Program, formed by AB 2911, requires the Board of Forestry and Fire Protection, in consultation with the Office of the State Fire Marshal and the local jurisdiction, to identify existing subdivisions with more than 30 dwelling units, located in the SRA or LRA VHFHSZ, without a secondary means of egress route that are at significant fire risk (Public Resources Code 4290.5). In cases where such subdivisions have been identified, recommendations must be developed to improve the subdivision's fire safety.

More information about the program is available on the OSFM Subdivision Review Program website.

ZONING ORDINANCES

Cities and counties are required to adopt zoning ordinances (also referred to as zoning codes, land use codes, or development regulations) as a means of implementing their general plans (GC § 65860). Zoning ordinances control and regulate land use and development by establishing the types of uses allowed in legally designated geographic areas, the quality and quantity of site characteristics and development standards (e.g., building envelope, setbacks, parking, site access, landscaping, and signage), and procedures for evaluating different types of development applications.

Communities can adopt a fire hazard overlay zone that applies to specific areas of the community designated as a wildland-urban interface area or areas that are exposed to fire hazards. Specific use restrictions or development standards for fire safety apply in these overlay zones, in addition to the development requirements established in the base zone. For example, **San Bernardino County** adopted a Fire Safety Overlay Zone within its development code to provide greater public safety in areas prone to wildland brush fires by requiring additional development standards for these areas. This county example is highlighted as a WUI planning best practice **case study.**

Communities can integrate fire safety development standards into other zones. The City of Sierra Madre took this approach with their Hillside Management Zone. In addition to environmental protection, hillside preservation, and other purposes, this zone encourages the planning, design, development, and use of home sites that eliminate fire hazards and prevent exposure to geological hazards. When required, development permits in this zone must include a locally-defined fire plan that addresses standards for fire-resistant vegetation, roofing, eaves, exterior wall surfaces, overhangs, walls and fences, and other site or construction features that may pose a fire hazard.

Communities can also require fire mitigation and protection standards for special uses, conditional uses, or temporary uses. For example, the City of Colton allows Wind Energy Conversion Systems (WECS) through a Conditional Use Permit process in several of its designated land use zones. If recommended by the city's fire department, fire protection measures may be required for the use permit, including fire-resistant building materials, fire-extinguishing systems, or fire breaks.

LANDSCAPING, DEFENSIBLE SPACE, & HAZARD ABATEMENT ORDINANCES

Current state law requires that all property within the SRA and Local Responsibility Area VHFHSZ must maintain 100 feet of defensible space (GC § 51182, PRC § 4291). Recent legislation also focuses more attention on future requirements and guidance on the management of the "ember-resistant zone"—an area within five feet of a structure that can have combustible features (e.g., fencing) or landscaping that increases a structure's susceptibility to ignitions from embers (AB 3074).

In addition to state laws, local communities can adopt standards to further regulate landscaping, defensible space, brush or hazardous/flammable vegetation management, weeds, and other risk factors and features (e.g., fences, walls, gates) that are deemed to cause a fire hazard to people and property. These regulations may be adopted as a standalone ordinance, such as a landscaping ordinance, or within a chapter of municipal code—for example, a health and safety code, public nuisance code, or zoning ordinance (when tied to a designated land use zone or zones).

Landscaping requirements may also address a variety of other aesthetic and environmental issues, such as water conservation, tree preservation, and habitat protection. As a result, communities typically need to balance how landscaping requirements for fire hazards are implemented and enforced alongside other standards. Landscape guides and plant lists that provide information on the types of plants and materials can be useful in implementing these requirements. For example, the City of Chino Hills Tree Preservation requirements (Chapter 16.90) protect native trees located within the city's Fire Hazard Overlay District, but allows for some exemptions based on specified situations.

Regulations related to vegetation management and defensible space are often paired with inspection and enforcement mechanisms such as annual notices to abate, scheduled inspection programs, and fines or penalties for non-compliance. For example, the City of San Diego has adopted Brush Management Policy and Landscape Standards, and has corresponding guides, door-to-door inspections, and additional enforcement mechanisms to comprehensively implement its citywide brush management program.

Landscaping requirements that address areas within five feet of a home help reduce ember ignitions. Image: Napa County Fire Department

In-depth examples of fire-resistant landscaping ordinances, landscape manuals, and fire hazard abatement ordinances are featured in several WUI planning best practices **case studies**, including **Malibu, Carlsbad, and Napa County**.

POST-DISASTER RECOVERY ORDINANCES

Post-disaster recovery ordinances are a type of urgency ordinance that provide cities and counties with a means to address temporary housing needs, economic development, and other forms of relief to those affected by disasters or other emergencies. These ordinances can be adopted as standalone chapters or added to a jurisdiction's zoning code, health and safety code, or other chapter of the municipal code.

In some cases, these ordinances will temporarily suspend other zoning code requirements in an effort to ease the rebuilding process. For example, **Shasta County** adopted a disaster recovery ordinance following the Carr and Zogg fires. This ordinance modified and/or temporarily suspended various county housing, permitting, and health and safety codes and policies in an effort to expedite the transition of residents who had lost homes or were displaced by one of these fires. This ordinance is further detailed as a WUI planning best practice **case study**.

The City of Santa Rosa also adopted its Resilient City Development Measures ordinance following the Tubbs and Nuns fires of October 2017. This ordinance addresses temporary housing, temporary structures, and accessory dwelling units (ADUs) and also allows for reduced review authority and modification of the design review process for residential, lodging, and childcare facility projects. Additional amendments have since been made to the ordinance to modify and extend these temporary measures and incorporate additional measures related to the COVID-19 pandemic.

ADDITIONAL TOOLS

This section highlights additional planning tools for communities to consider when addressing wildfire risks in the WUI. Some of these tools support the implementation of plans or regulations described in other sections; for example, land acquisition programs may be a means of implementing general plan policies focused on WUI risk reduction. Other tools in this section may be developed and implemented as standalone tools, such as development agreements.

DEVELOPMENT AGREEMENTS

Any city, county, or city and county may enter into a development agreement with any person having a legal or equitable interest in real property for the development of the property (GC § 65864 et seq.). Development agreements are legally binding contracts that establish a specific set of standards for a proposed development. In some cases, requirements for the developer may be more stringent than otherwise allowed under the zoning code, such as higher design standards or dedication of additional public facilities. Development agreements can also provide more flexibility for the developer, such as density bonuses or expedited review times.

Communities may also use development agreements to set forth conditions and restrictions for subsequent discretionary actions. For example, a city or county agency 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.

A FFP can take the form of a development agreement that contains all aspects of fire safety and maintenance for a community. **Orange County** and Orange County Fire Authority took this approach with the Ranch Plan Fire Protection Program, which is an agreement with the developer for communitywide requirements related to fuels management and defensible space, building materials and landscaping rules, access to hydrants, road standards, and more. This example is highlighted as a WUI planning best practices **case study**. More information and considerations for the use of development agreements as a tool for fire protection is discussed in OPR's Fire Hazard Planning Technical Advisory.

JOINT POWERS AGREEMENTS

California Government Code § 6500 et seq. authorizes two or more public agencies to jointly exercise any power common to the contracting parties, including, but not limited to, the authority to levy a fee, assessment, or tax. This is established

through a joint powers agreement (JPA) and must be authorized by the agencies' legislative or other governing bodies. A JPA can also result in the formation of a new entity created by the public agencies.

In 2019, Marin County, along with numerous local fire districts, cities, and other member agencies, used their JPA authority to establish a new entity known as the Marin Wildfire Prevention Authority. The Marin Wildfire Prevention Authority is tasked with planning, financing, implementing, managing, owning, and operating a multi-jurisdictional and countywide agency to prevent and mitigate wildfires in Marin County. The need for this countywide coordinating authority arose from multiple fires and lessons learned, including a report issued by the Marin County Civil Grand Jury that identified an urgent need for a coordinated wildfire prevention program. Following the JPA, voters approved Measure C, which adds a tax on all parcels of real property in the County within a defined boundary for the next ten years. This tax funds the Authority's wildfire mitigation efforts, including vegetation management, defensible space and structure assessments, evacuation plans, public education, and more.

SPECIAL TAXES AND ASSESSMENT DISTRICTS

Communities and fire authorities can create dedicated sources of local funding for wildfire prevention activities through voter-approved measures that adopt special taxes and fees. These taxes are tied to designated parcels within districts or other identified assessment areas. This can result in predictable funding to enable proactive planning for activities such as fire mitigation, infrastructure improvements, and increased services.

Voters in the Truckee Fire Protection District took this approach in 2021 when they passed Measure T, which levies a special tax of $179 per parcel each year. This special tax will create an annual Community Wildfire Prevention Fund which is expected to bring in $3.7 million annually. Funds will be used to conduct fuel reduction and wildfire prevention projects, including an update to their Community Wildfire Protection Plan. The measure included a citizens committee that will provide oversight to ensure that funds are spent according to established guidelines. Low-income residents can also apply for an exemption from the cost of Measure T. The measure is in effect for eight years, at which point it will require voter approval to renew.

Other communities, including the City of **Santa Barbara** Fire Department, have created special assessment districts. Santa Barbara's Wildland Fire Suppression Assessment District, funded by annual fees from residents within the designated high fire hazard areas, is featured as a WUI planning best practice **case study**.

Voter-approved measures to adopt special taxes or fees can support dedicated funding streams for wildfire mitigation. Image: Owen Yancher

HOME RETROFIT & DEFENSIBLE SPACE ASSISTANCE PROGRAMS

Communities can create voluntary programs aimed at bringing existing homes up to current building code standards and implementing defensible space to increase wildfire resilience. Funding assistance is often a key component of these programs to support residents' ability to participate.

For example, between 2008 and 2019, the Big Bear Fire Department was awarded nearly $5.5 million through six different grants from Cal OES, FEMA, and CAL FIRE to fund a wood shake/shingle roof replacement grant program. The grant program helped hundreds of homeowners throughout different mountain communities in San Bernardino County, including Big Bear City and Big Bear Lake, replace their roofs.

The Mendocino Fire Safe Council administers a defensible space assistance program to help low-income seniors and physically disabled persons adhere to defensible space regulations, called Defensible Space Assistance for Income-Eligible (DSAFIE). The DSAFIE program services include brush and tree trimming, raking, chipping, on-site education, and more. In 2020, the Fire Safe Council partnered with the Hopland Band of Pomo Indians to train and employ tribal members to complete work for qualifying homeowners as part of the assistance program. Program funding has come from a variety of sources, including PG&E, the California Fire Safe Council, and the US Forest Service.

In some cases, community programs may be designed more broadly to help homeowners have healthy and safe places to live while bringing additional benefits for wildfire resilience. For example, **Butte County**'s Housing Rehabilitation Loan Program provides low to no-interest loans to help low and moderate-income homeowners fix and repair their homes. Eligible homeowners are those that earn 80% or less than the median Butte County income. Loan funds can assist homeowners in making home repairs for health and safety, which includes bringing homes up to current code. As a result, many homeowners have upgraded their homes to county building code requirements that also include compliance with WUI standards. This program is funded through the Community Development Block Grant (CDBG) and the Home Investments Partnership programs.

REGIONAL WILDFIRE MANAGEMENT PROGRAMS

Regional wildfire management programs are established by cities and/or counties to work across jurisdictional boundaries to implement coordinated activities for wildfire resilience. These programs typically focus on regional planning and implementation activities, such as landscape-scale fuel management projects, homeowner risk reduction projects (e.g., defensible space, evacuation preparedness), and outreach and education activities, and may include many other wildfire resilience and risk reduction activities.

A key ingredient of regional programs is a collaboration among many stakeholders and the public.

The Tahoe Fire & Fuels Team (TFFT) highlights this type of regional collaborative approach. The TFFT was formed in 2008 to implement the Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy. The original strategy was focused on addressing accumulations of hazardous vegetation in areas near homes in response to the Angora Fire (2007). In 2014, strategy goals were updated to

include restoring and maintaining fire-resilient landscapes, creating fire-adapted communities, and providing effective and efficient wildfire response. The program further expanded in 2017 to address general forest analysis through collaboratively developed, landscape-scale fuels reduction and forest restoration planning efforts, encompassing the WUI and Basin forests. TFFT is overseen by a multi-agency coordinating group consisting of seven Lake Tahoe Basin fire chiefs and nine local agency representatives, including the Tahoe Resource Conservation District and the University of Nevada's Living with Fire program. Current TFFT activities include a prescribed fire program and administration of the Living with Fire Tahoe program.

The Western Klamath Restoration Partnership is another example of a collaborative land and fire management effort formed between tribal, federal, and non-governmental stakeholders in the Western Klamath Mountains. The partnership was initiated in 2007 and has since enabled a diverse set of stakeholders to identify "Zones of Agreement" where all parties agree on restoration needs to maintain resilient ecosystems, communities, and economies guided by cultural and contemporary knowledge. Projects include the Somes Bar Integrated Fire Management Project and Happy Camp Integrated Community Protection and Workforce Development Project.

Fire Safe Councils also play an important role in regional fire planning. For example, in 2019, the Ojai Valley Fire Safe Council also launched a comprehensive, community-driven Wildfire Risk Mitigation Strategy for the Ojai Valley Area. As a first step, the Fire Safe Council prepared a roadmap to serve as a long-term plan and implementation strategy for increasing citizen and whole community-level capacities for wildfire mitigation preparedness and recovery.

All three approaches also highlight that regional fire planning efforts are often iterative, non-linear, and ongoing to adapt to changing conditions.

Western Klamath Restoration Partnership field trip to the Salmon River area, which has seen a number of large fires in the recent past. Photo: Karuna Greenberg

GROWTH MANAGEMENT & LAND ACQUISITION TOOLS

Communities can employ various growth management and land acquisition strategies to direct development away from wildfire hazard areas. These approaches can be implemented by general plan policies, land use regulations, or as part of open space, land acquisition, or conservation management programs.

For example, the Town of Windsor Growth Control Ordinance was adopted to establish an urban growth boundary that meets multiple objectives, including preserving open space land for agricultural uses, protecting natural resources, and protecting development from natural hazards by monitoring the Town's residential development.

When the 2019 Kincade Fire threatened the Town of Windsor, some advocates have attributed the Town's urban growth boundary as helping firefighters better position themselves to effectively respond and protect neighborhoods near the fire front.

Many land acquisition tools, including property buy-outs, Transfer of Development Rights (TDR), conservation easements, or government-run leasebacks, have been used to reduce the physical risk of hazards for decades, including flood & debris flows, liquefaction, sea-level rise, and erosion. These tools can also be useful in circumstances when property owners choose not to rebuild after a wildfire, and there is an opportunity to achieve land conservation and wildfire risk reduction goals in guiding fire and recovery processes to increase future resilience. For example, after the Camp Fire in 2018 burned almost 95% of structures in the Town of Paradise, stakeholders explored whether incorporating additional community design features could enhance wildfire resilience. The Conservation Biology Institute, in partnership with The Nature Conservancy and the Paradise Recreation and Parks District, undertook the Paradise Nature-Based Resilience Project to determine whether there is a scientific justification for creating a defensible space zone around a community. The idea is that this zone can act as a "wildfire risk reduction buffer" between an urban area and wildlands, serving as a boundary for urban growth to reduce habitat fragmentation and improve safety.

Similar concepts of protecting or transferring development from one area to another can be employed through a TDR program. TDR programs are designed to allow additional density in preferred growth areas in exchange for protecting other areas, such as areas that are environmentally sensitive or have been identified as hazardous. These areas become "sending areas" from which the rights to develop those areas are sent or transferred to receiving areas. Those wanting to develop in receiving areas can purchase the development rights to expand the development potential of that site, such as obtaining additional density, increased height, or more intense land uses. This tool is further explored as part of the **Butte County's** Upper Ridge Community Plan WUI planning best practices **case study**.

Outreach and Education

Outreach and education plays an integral role in supporting WUI planning activities. These activities can take many forms, such as the adoption of national or state programs, or the development of community-based initiatives. Outreach and education activities can be organized and implemented by state or local groups, including Fire Safe Councils, Resource Conservation Districts, fire departments and districts, planning departments, homeowner groups, volunteer associations, non-profit organizations, and more.

Statewide resources to support public education on wildfire safety, preparedness, and mitigation include:

- *CAL FIRE's* Ready for Wildfire program
- California FireSafe Council
- University of California Cooperative Extension

WUI PLANNING BEST PRACTICES

CASE STUDIES

A WUI planning best practice is a practice or procedure that has been shown by research, experience, and evaluation to produce optimal results for addressing risk factors in the wildland-urban interface. WUI planning best practices offer opportunities for learning and may be suitable for adoption and implementation in other communities.

WUI planning best practice evaluation criteria are based on the following categories:

1. RELEVANCY	Focuses on the connection between the featured planning tool and its relevancy to the WUI
2. EFFICIENCY	Evaluates how a community optimizes its use of resources to carry out the practice or planning tool
3. INNOVATION	Highlights a creative approach to problem solving planning challenges in the WUI
4. EFFECTIVENESS	Evaluates how a community produces measurable outcomes in terms of WUI risk reduction or resilience
5. REPLICABILITY	Helps determine whether the planning tool can be adopted in other communities with similar characteristics and, if applicable, scaled
6. EQUITY	Considers socially vulnerable groups as part of a planning tool's adoption or implementation process
7. COLLABORATION	Shows the level of engagement with stakeholders, including experts and members of the community, in the development, adoption, and implementation process
8. SUSTAINABILITY	Evaluates how mechanisms exist for long-term implementation and adaptation of the community's planning tool to new conditions

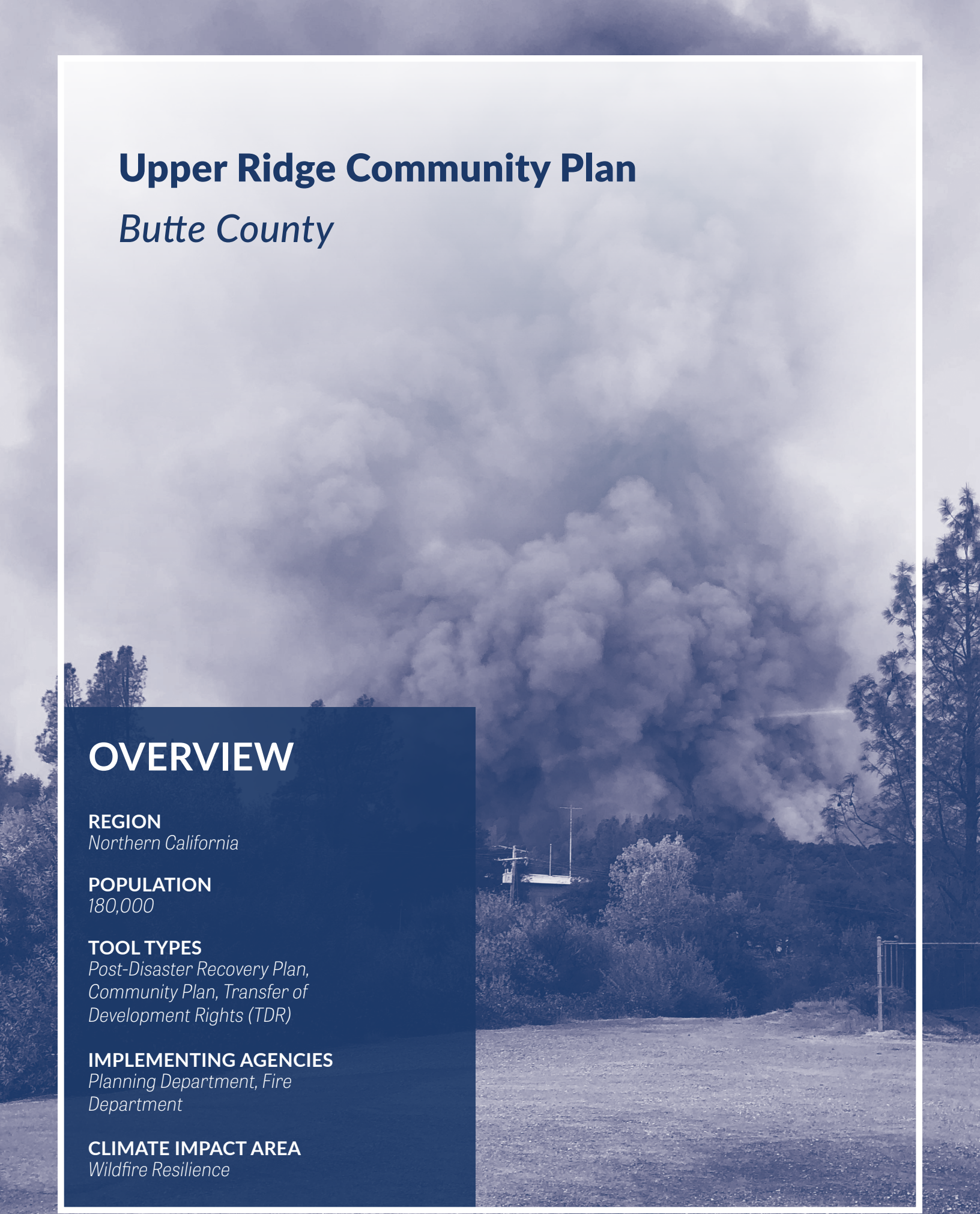
OVERVIEW OF WUI PLANNING BEST PRACTICES CASE STUDY EVALUATION CRITERIA

The following set of nine case studies excel in one or more of the WUI planning best practice evaluation criteria. More information about the methodology is provided in Appendix A.

COMMUNITY NAME	PRIMARY TOOL	EVALUATION CRITERIA AREAS OF EXCELLENCE
Butte County	Upper Ridge Community Plan	Relevancy, Innovation, Equity, Collaboration
City of Carlsbad	Landscape Manual	Relevancy, Efficiency, Collaboration, Sustainability
City of Malibu	Landscape Water Conservation and Fire Protection Ordinance	Relevancy, Innovation, Equity, Collaboration
City of Santa Barbara	Wildland Fire Suppression Assessment District	Efficiency, Innovation, Replicability, Sustainability
Mariposa County	Wildfire Plan Alignment	Innovation, Collaboration, Sustainability
Napa County	Fire Hazard Abatement Ordinance	Relevancy, Efficiency, Innovation, Effectiveness, Collaboration
Orange County	Ranch Plan Fire Protection Program	Relevancy, Innovation, Effectiveness, Equity, Collaboration, Sustainability
San Bernardino County	Fire Hazard Overlay Zone	Relevancy, Innovation, Collaboration
Shasta County	Carr Fire and Zogg Fire, Salt Fire, and Fawn Fire Disaster Recovery Ordinance	Relevancy, Efficiency, Innovation, Replicability, Equity

Upper Ridge Community Plan

Butte County



OVERVIEW

REGION
Northern California

POPULATION
180,000

TOOL TYPES
Post-Disaster Recovery Plan, Community Plan, Transfer of Development Rights (TDR)

IMPLEMENTING AGENCIES
Planning Department, Fire Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2018, the Camp Fire burned more than 153,000 acres throughout Butte County, resulting in 85 fatalities. More than 18,000 structures were lost, many in the Town of Paradise and surrounding Upper Ridge communities of Magalia, Concow, and Paradise Pines. Many community members have struggled to rebuild—only 3% of the 4,309 homes in unincorporated Butte County have been rebuilt in the four years since the fire.

Considering the challenges the area faces and to build resilience while fostering long-term recovery, the County has drafted a new plan for the Upper Ridge Community with goals to (1) develop a land use blueprint and policy direction, (2) improve circulation, (3) enhance emergency response and evacuation, (4) promote a resilient, healthy, and fire-safe community, (5) plan for a "vibrant" town-center, and (6) provide enhanced recreational opportunities. This plan is also novel because it explores opportunities such as resilience hubs, temporary areas of refuge, and the potential for a TDR program in the plan area.

This case study was selected as a WUI Planning Best Practice because it exemplifies a holistic approach toward wildfire resilience planning in the County's Upper Ridge Community Plan. The case study also highlights an innovative land use strategy (TDR program) to potentially minimize future wildfire risk to the community. Finally, the plan development process incorporated a strong public outreach component despite the challenges associated with long-term displacement of residents following the Camp Fire.

Community plans are policy documents that set forth a vision for growth within a defined area, such as a particular community or neighborhood. These plans contain goals, objectives, and programs for implementation to help meet the broad objectives of the general plan. Community plans can integrate fire risk and resiliency into local priorities and may also explore innovative land use planning features to achieve these measures.

TOOL DESIGN

The Upper Ridge Community Plan area consists of neighborhoods in unincorporated Butte County: Old Magalia, Central Skyway, Lower Pines, Fir Haven, Carnegie Colter, Steiffer, an area encompassing Nimshew, Humbug, and De Sabla, and Coutolenc. Of the 18,000 structures lost in the Camp Fire, 2,200 were homes located in these unincorporated areas of the Upper Ridge. This loss reflected more than 40% of the plan area's housing stock and displaced a significant percentage of local residents.

The new community plan is based on extensive community outreach and provides a vision for building a sustainable and resilient Upper Ridge. Chapters include specific strategies and recommendations for new County policies that would aid in plan implementation. Chapters and specific policies include:

Front Image: Butte County Planning Department

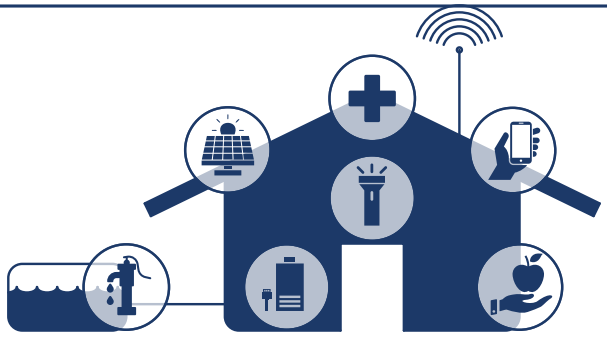
Land Use and Development: Strategies in this chapter are primarily focused on rebuilding residential housing lost in the Camp Fire, adding new residential housing options, and attracting new commercial development. Although many of the homes lost in the fire were single-family residential, more diverse housing typologies are needed to meet the growing demand for middle- and low-income housing, including garden apartments, townhouses, and ADUs. This chapter also focuses on ways to (re)build housing in safer locations, such as in areas of easy access for the fire department, near evacuation routes, or near communication centers.

Magalia Center: One major outcome of the community outreach process was a need to create a vibrant place for residents to gather, shop, and live. The plan provides a proposed starting point for a revitalized Magalia Center, already home to the Magalia Community Center and Community Park, that would serve the entire Upper Ridge Community. Potential development opportunities include a community garden, resilience hub (as further discussed in the plan's Resiliency chapter), and a "town square" for larger community gatherings.

Parks, Recreation, and Open Space: This chapter identifies opportunities to enhance existing parks and open spaces and propose new recreational amenities in the Upper Ridge, including a proposed Upper Ridge Connector Trail that would provide a cohesive trail network across the entire plan area. This chapter also discusses ways that parks can increase fire safety, such as ensuring regular maintenance of wildfire risk reduction buffers and identifying areas that can serve as temporary areas of refuge for community members who are unable to evacuate during a wildfire.

Circulation: This chapter proposes multi-modal mobility improvements for general circulation and identifies ways to improve the road system in the Upper Ridge Plan Area to increase evacuation options for residents during future wildfire events. Three of the main strategies for evacuation improvements include: (1) forming an evacuation task force to evaluate the five potential new evacuation routes identified in the plan, (2) prioritizing near-term roadway improvements, and (3) developing a comprehensive evacuation network.

Resiliency: Although resiliency is a major theme throughout the entire plan, this chapter focuses on hazard risk and trends on the Upper Ridge, disaster response capabilities and designs, and strategies to increase resiliency to drought, extreme heat, wildfire, flooding, seismic and geologic hazards, human health hazards, and more. The chapter contains individual strategies unique to specific hazards, overarching disaster preparedness and response strategies, such as developing a comprehensive emergency communications program and procedures for emergencies, and strategies to create physical and virtual "community resilience hubs" that provide everyday services and help the community prepare for, respond to, and recover from disasters.

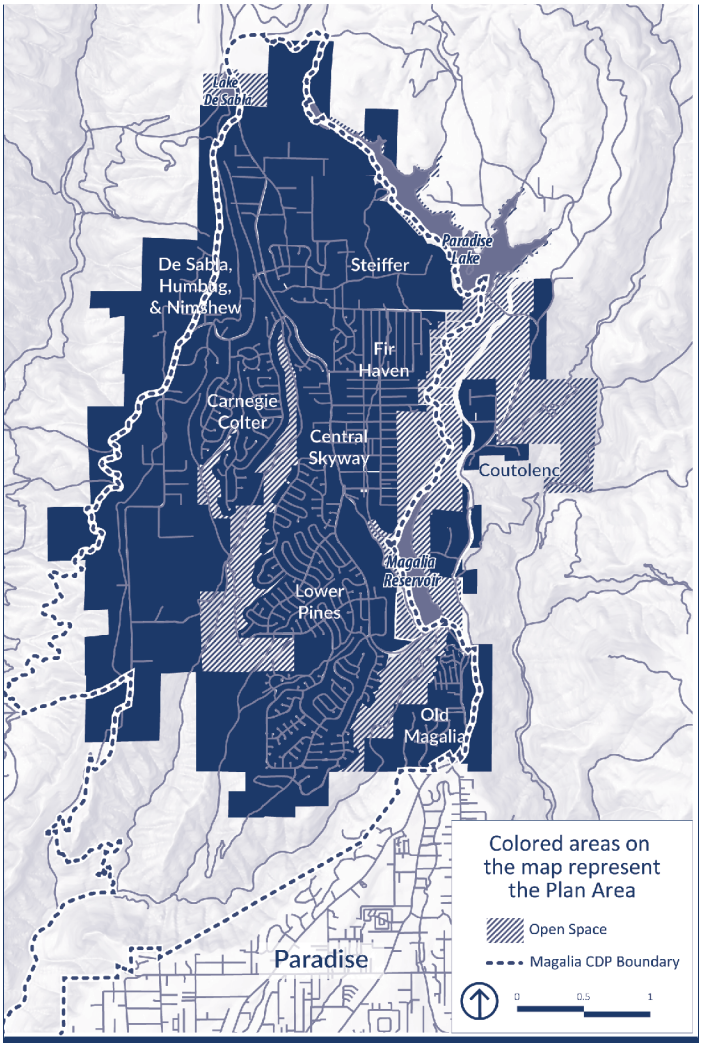


COMMUNITY RESILIENCE HUB

The proposed Magalia Center includes provisions for a Community Resilience Hub that can serve as a centralized resource for information and provide the Upper Ridge community with shelter, water, and electricity during extreme heat events, Public Safety Power Shutoffs, smoke events, wildfires, and other disasters.

Utility Infrastructure: Utility infrastructure in the Upper Ridge Plan area includes water, wastewater, stormwater, power, and communications. This chapter discusses ongoing considerations for property owners that are rebuilding from the Camp Fire and provides strategies to improve service and delivery of utilities in the plan area.

A major theme is the need to build resiliency and redundancy into the system to account for potential disruptions during emergencies, such as utilizing solar and battery storage for power during outages.



The Butte County Upper Ridge Community Plan Area includes eight unincorporated neighborhoods where more than 2,000 homes (or 40% of the housing stock) were destroyed during the 2018 Camp Fire.

Original map provided by Butte County Planning Department

IMPLEMENTATION

The Upper Ridge Community Plan has a chapter on Implementation that focuses on how the County will prioritize, fund, and implement plan strategies.

The chapter includes an implementation matrix that provides information on who the responsible party is, the timing, and the estimated cost of each recommended strategy. The chapter also provides a comprehensive list of potential funding opportunities, ranging from local sources to state and federal grant opportunities for strategies outlined in each chapter.

Another component of the plan's Implementation Chapter is a discussion on consistency and alignment with other planning efforts, both existing and in progress, including the County's General Plan update and Zoning Ordinance. County planning staff intend to include strategies first introduced in the Upper Ridge Plan in their new General Plan by reference. They may also adopt Upper Ridge Plan strategies as General Plan Policies and Guidance to further align planning outcomes. In addition, some of the proposed strategies in the Upper Ridge Community Plan will also be reflected in an update to the Butte County Zoning Ordinance, particularly in and around Magalia Center, where there is an opportunity for commercially zoned parcels to be transformed into mixed-use development.

COLLABORATION & ENGAGEMENT

The County undertook an extensive community outreach campaign to garner input on the future of the Upper Ridge. This process was complicated by both the large number of persons displaced from the Camp Fire that currently do not live in the area and the COVID-19 pandemic that limited the opportunity for in-person community workshops and meetings. To address these challenges, the County worked on a comprehensive digital and print campaign that included developing a project webpage, electronic media outreach through social media and email, and mailing information to area residents.

The County also hosted four community workshops to: (1) better understand the issues

The fourth, and final, Upper Ridge Plan Community Workshop was held in person, allowing residents to interact with each other and planning staff to share feedback on the final plan concepts.

Image: Butte County Planning Department.

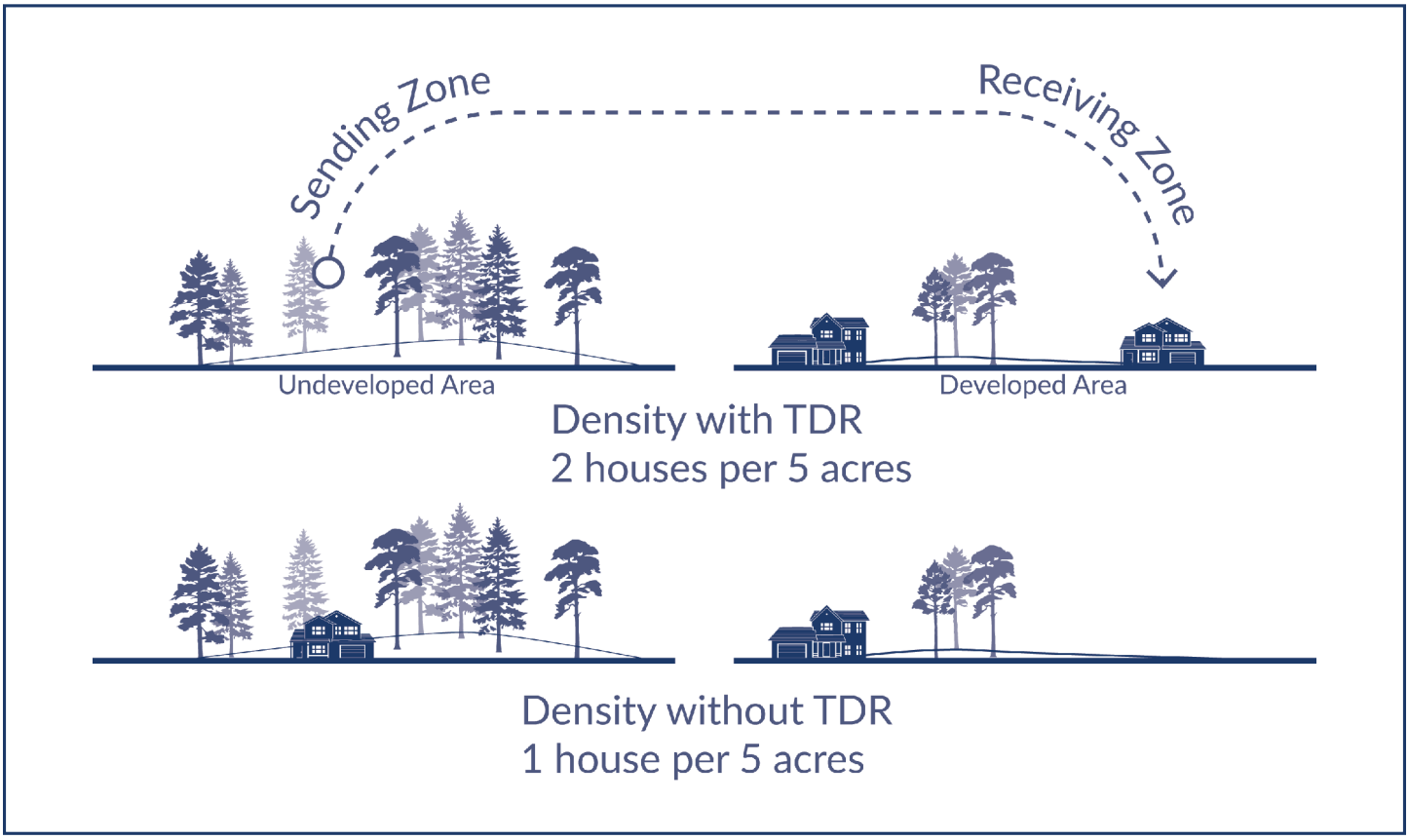
and opportunities, (2) undertake a community visioning process, (3) provide an opportunity for the County to share initial concepts, and (4) share final plan concepts. The four community workshops were held mostly remotely; however, the fourth (and final) workshop was hosted in-person during a period of low local COVID-19 transmission rates.

After the fourth community meeting, the County adapted feedback into a survey that was shared online for greater response opportunities. Priorities from the series of community workshops and surveys were incorporated into the plan.

INNOVATIONS

Butte County completed a feasibility analysis and evaluated the potential for utilizing a voluntary TDR program in the Land Use and Development Chapter of the Upper Ridge Community Plan. A local TDR program for the plan area could shift the location of new housing from parcels with high wildfire hazard to already developed areas that are less susceptible to wildfire based on an analysis of potential fire behavior and wildfire risk. This would ideally create open space areas, or "buffers," that could be more easily managed to reduce wildfire hazards through vegetation management and uninterrupted fuel treatments. The concept received general support from the community, as long as it could be accomplished in an efficient and streamlined manner.

The plan outlines a potential path forward for establishing overlay zones for unsafe sending sites (areas where landowners can trade or sell rights to develop housing based on specific criteria) and receiving sites that could accommodate a higher density of housing. An analysis completed for the community plan found that the most likely opportunity for a successful TDR program would be to allow increased density on lots zoned as Rural Residential with a minimum parcel area of five acres (RR-5) in or near developed parts



Above Image: A visual representation of what a TDR program may look like, including density of both the sending and receiving sites before and after TDR is implemented.

of the county. A TDR program could allow two houses per five acres instead of one in more developed areas, thus preserving outlying lots as undeveloped and making these areas available for vegetation management and fuel breaks.

The analysis is somewhat limited because the real estate and development markets have not fully recovered to normal, or a new normal since the Camp Fire. In addition, there is volatility in the cost of construction materials resulting from production slowdowns during the pandemic and the ongoing logistics and supply chain disruptions.

FUNDING SOURCE

The North Valley Community Foundation provided a $250,000 grant for the Butte County Planning Department to develop the Upper Ridge Community Plan. The North Valley Community Foundation has provided more than $35 million in grants through the Butte Strong Fund to support the recovery of communities impacted by the Camp Fire, including $4.2 million directly to Butte County.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering drafting community plans in areas recovering from wildfire disaster, Butte County's Upper Ridge Community Planning process offers several key insights:

1. *Broad outreach, including mailers and social media campaigns, are essential for reaching a population that may not currently reside in their homes. Many of the residents in the*

Upper Ridge Plan area currently do not live in the area due to home loss or feelings of isolation post-fire. However, Butte County worked to reach out to as many residents (current and former) as possible.

2. *Consider the feasibility of innovative land use planning tools that can increase resilience in the future, such as resilience hubs and TDR programs.*

3. *Linking community plans with General Plan policies and Zoning Ordinances can further advance strategies and recommendations for policy changes needed to implement plan priorities.*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

California's Fourth Climate Change Assessment Sacramento Valley Regional Report indicates there may be an increase in wildfire activity in the region, which includes Butte County, in response to cycles of drought followed by extreme precipitation (and vice versa). An increase in rain during the winter and early spring months, followed by an extremely dry summer and fall months may contribute to an excess of dry, dead vegetation that can contribute to extreme fire behavior.

The report also acknowledges that rural and forested communities, like those in the Upper Ridge, are exposed to greater fire risk with climate change and that rural development in high fire risk areas can increase surface and groundwater demand and depletion and extend electric utility lines that can lead to fires. Strategies within the Upper Ridge Community Plan that promote urban infill development and provide housing for diverse groups can help build resilience to climate change and the potential for increased wildfires in Butte County.

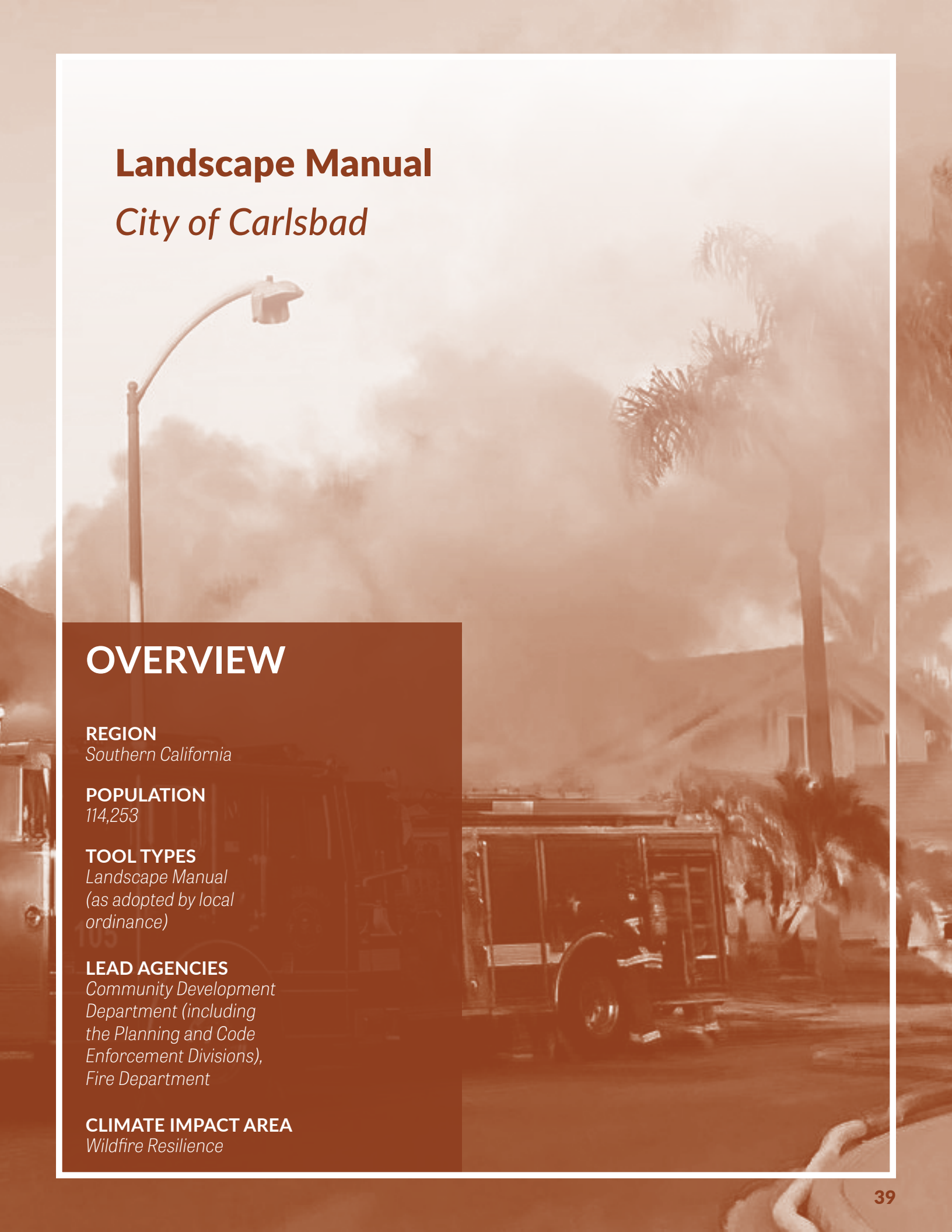
This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, ***a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.***

FURTHER INFORMATION

For more information about the Butte County Upper Ridge Community Plan, please visit the project website.

Landscape Manual

City of Carlsbad



OVERVIEW

REGION
Southern California

POPULATION
114,253

TOOL TYPES
Landscape Manual (as adopted by local ordinance)

LEAD AGENCIES
Community Development Department (including the Planning and Code Enforcement Divisions), Fire Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2005, the City of Carlsbad adopted a landscape manual that has since been incorporated into their municipal code as Chapter 18.50 Water Efficient Landscape Ordinance. The manual has been updated several times in subsequent years to include detailed fire protection requirements for properties located in, or abutting, established fire management zones across the City and additional requirements related to conservation and the efficient use of water.

Fire protection requirements in the manual are designed to address the design, installation, and modification of new and existing vegetation to mitigate fire risk to the built environment. Requirements are crafted in such a way that achieves wildfire risk reduction outcomes while addressing other environmental constraints or restrictions consistent with meeting the overall objectives of the manual.

This case study was selected as a WUI Planning Best Practice because it shows a well-established approach by a local planning agency administering a landscaping ordinance that achieves multiple objectives, including the incorporation of a wildfire risk reduction strategies. The case study also highlights a collaborative approach with the fire department and the incorporation of specialized expertise from a landscape architect. Finally, this example includes helpful illustrations of landscaping and fuel modification requirements that accommodate a flexible application in different terrain and vegetation types.

A Landscape Guide establishes local design standards for landscape development projects, such as aesthetic and environmental issues. They can also include restrictions on plant selection, defensible space and brush or hazardous/flammable vegetation management (e.g., fuel modification zones), and other features (e.g., fences, walls, gates) that are deemed a fire hazard.

TOOL DESIGN

The City's Landscape Manual applies to all public and private developments that require the submittal of landscape plans for new development or public improvement projects with a landscaped area of 500 square feet or more, any model home with a landscaped area, or rehabilitated landscapes that require a building permit or discretionary permit and the applicant is installing or modifying 2,500 square feet or more of landscaping.

The Landscape Manual is a broad document that provides applicants with all landscape-related policies and requirements related to sustainability, water conservation, planting, irrigation, the streetscape program, fire protection, and erosion control/slope revegetation. The manual also outlines any submittal requirements and documentation needed to comply with City regulations.

As included in the Landscape Manual, applicants

Front Image: Carlsbad Fire Department (Instagram)

for proposed projects that contain or are bounded by hazardous vegetation or in areas located within the City's VHFHSZ must also develop and submit a Fire Protection Plan. Property owners can determine if they are in this zone by typing in their address within the map viewer on the City's website.

Fire Protection Plan requirements are provided in Section 5 of the City of Carlsbad Landscape Manual and include compliance with Chapter 49 of the California Fire Code and/or Chapter 7A of the California Building Code (as adopted by the City of Carlsbad), mitigation of offsite wildfire hazards, including hazards located on an adjacent property, and identification of maintenance access to all fire protection areas.

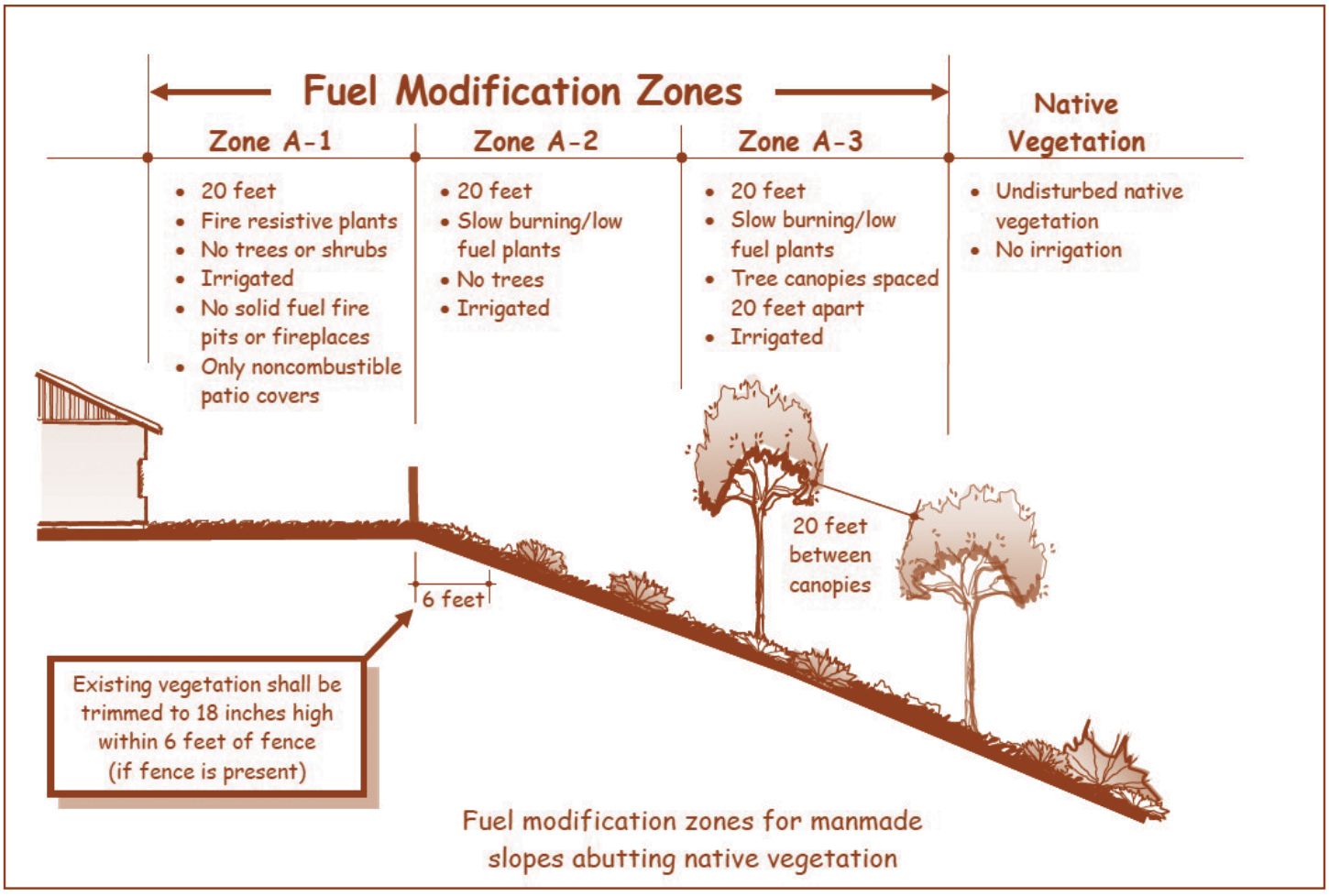
To address variations in terrain and vegetation, the City has created different fuel modification zones based on three distinct categories:

Condition A – Manufactured slopes abutting hazardous native vegetation

Condition B – Natural slopes with native vegetation where removal of native vegetation is restricted

Condition C – Manufactured or natural slopes which occur outside the fence line or property

Each Condition has three 20-foot zones with specific requirements for the type of landscaping allowed any restrictions on other features (e.g., fire pits, patio covers), irrigation, horizontal and vertical spacing requirements for trees and other vegetation, and more.



Excerpt from the Fire Protected Requirements section of the City of Carlsbad's Landscape Manual showing requirements for manufactured slopes. Image adapted from the City of Carlsbad's Landscape Manual

IMPLEMENTATION

Landscape plan applications are submitted to the Carlsbad Community Development Department (Planning Division), where they are reviewed and approved by a registered landscape architect who is on contract with the City to perform these duties. For any project that includes fire protection requirements, the City of Carlsbad Fire Department will also review and approve the final Fire Protection Plan. For any applications that require offsite mitigation of wildland fire hazards, it is the applicant's responsibility to secure agreements with owners of adjacent property(ies).

Landscape plans must be approved before a project receives its building permit or before a grading permit is approved. After a landscape plan is approved and implemented, the City's Code Enforcement Division and Fire Department ensure that landscape implementation aligns with the approved plan.

Fire crews work to maintain a fuel break outside a residential community in San Diego County. Image: Cal Fire, San Diego

The Fire Department also ensures that properties sold (or listed for sale) within mapped Fire Hazard Severity Zones comply with AB 38 (Fire safety: low-cost retrofits: regional capacity review: wildfire mitigation, 2019) and Section 4291 of the Public Resources Code for defensible space. As part of these inspections, the Fire Department also mandates compliance with specific requirements of the Landscape Manual, including for horizontal and vertical separation between trees and shrubs.

To aid in ongoing hazard reduction, the Carlsbad City Council has expressed interest in considering how to retroactively apply fire protection requirements to existing properties, though the Manual is not a nuisance ordinance. The City is also considering incorporating a zero to five-foot ember-resistant zone into their fire protection standards, consistent with the recently passed AB 38 legislation.

COLLABORATION & ENGAGEMENT

The City's Community Development and Fire Departments work closely to ensure that fire protection requirements are effectively administered, and fuel modification zone requirements are maintained over time. The long-term contract position of a registered landscape architect allows the City to maintain consistency in landscape plan reviews.

While the fire department has traditionally supported WUI risk reduction and maintenance by reviewing plans and answering questions, within the last five years, the City Council has approved a full full-time WUI position in the department to conduct annual inspections for fuel modification in large tract developments that are located in, or abut, wildfire hazard zones. This ensures that any maintenance, as requested by the Fire Code Official, is performed.

INNOVATIONS

The design of the Landscape Manual, including detailed diagrams of required fuel modification zones, is incredibly helpful for applicants to understand what their landscaping may look like. The guide works as both a book of regulations, as well as an educational tool for what fuel modification looks like under differing topographic conditions. Further, the close relationships between the various City Departments that implement the Landscape Manual contribute to success. The Manual is housed within the Planning Division, but Fire Department staff work in tandem with planning staff to ensure all projects comply with the Manual.

The flexibility of the Manual's implementation has also provided opportunity for alternative standards based on site-specific conditions. For example, in areas that abut environmentally sensitive habitats, where large fuel modification projects would adversely impact protected species, or where there may be natural features (e.g., large boulders) that compensate for a reduced buffer, the size of fuel modification zones has been reduced in close consultation with the fire department. In some cases, there may be specific alternative development features required to achieve similar wildfire risk reduction outcomes as the standards set in the manual.

Recent fires in 2014 (Poinsettia Fire) and in 2020 (Park Fire) have tested the effectiveness of fire protection requirements. Though several structures were lost, some of the area burned by the Poinsettia Fire had buffer zones between buildings and wildland areas, limiting the damage. Further, according to fire department Staff, during the 2020 Park Fire, strict fuel modification and fuels treatments in the coastal management zone worked to slow fire spread.

The Planning Division has also been working closely with large tract housing developments to ensure compliance with perimeter fuel modification and focusing on setbacks for urban interface-type projects that align with the manual. There has also been a recent trend of new multi-family housing projects that abut a fire management zone, and the fire department is beginning to think more about how to better utilize the manual to protect infill development from wildfire hazards.

FUNDING SOURCE

The City of Carlsbad implements their landscape ordinance using a cost recovery system, in which the permit review process and inspection is paid for by the applicant. Long-term maintenance of the manual including any future updates, or additional complaint-driven inspections are covered through funding provided by the City's general fund.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering adopting a landscape ordinance that includes fire protection requirements, the City of Carlsbad case study helps illustrate:

1. *Expanding existing local ordinances for water conservation to include fire protection requirements can help align multiple landscaping objectives, such as water conservation and management of hazardous vegetation for fire risk reduction.*

2. *Engaging the expertise of a registered landscape architect, in collaboration with the fire department, can address complexities encountered in California landscapes.*

3. *Creating distinct categories for fuel modification zones provides flexibility for mitigation to be applied based on-site specific conditions across a jurisdiction's designated fire hazard severity zone (FHSZ).*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

According to the San Diego Regional Report of the 4th California Climate Assessment, seasonal Santa Ana Winds will continue to contribute to wildfires in the region, including in the City of Carlsbad. Other climate impacts, alongside high wind events, including drought, may also add additional risk of wildfire during the late fall and into the early winter (Dec./Jan.). Some models show that with no reduction in GHG emissions, the area burned by wildfires each year in the San Diego region may increase by as much as 50% by 2070. The report also notes that additional development and activity in hazardous areas may contribute to increased wildfire impacts to the natural and built environment.

The City of Carlsbad's Landscape Manual has been working to make existing and new development within the city more resilient to a future in which wildfires may become more frequent. Requiring fuel modification zones and fire-resistant landscaping protects the built environment and may prevent the spread of wildfire from structure to structure or from wildlands to structures.

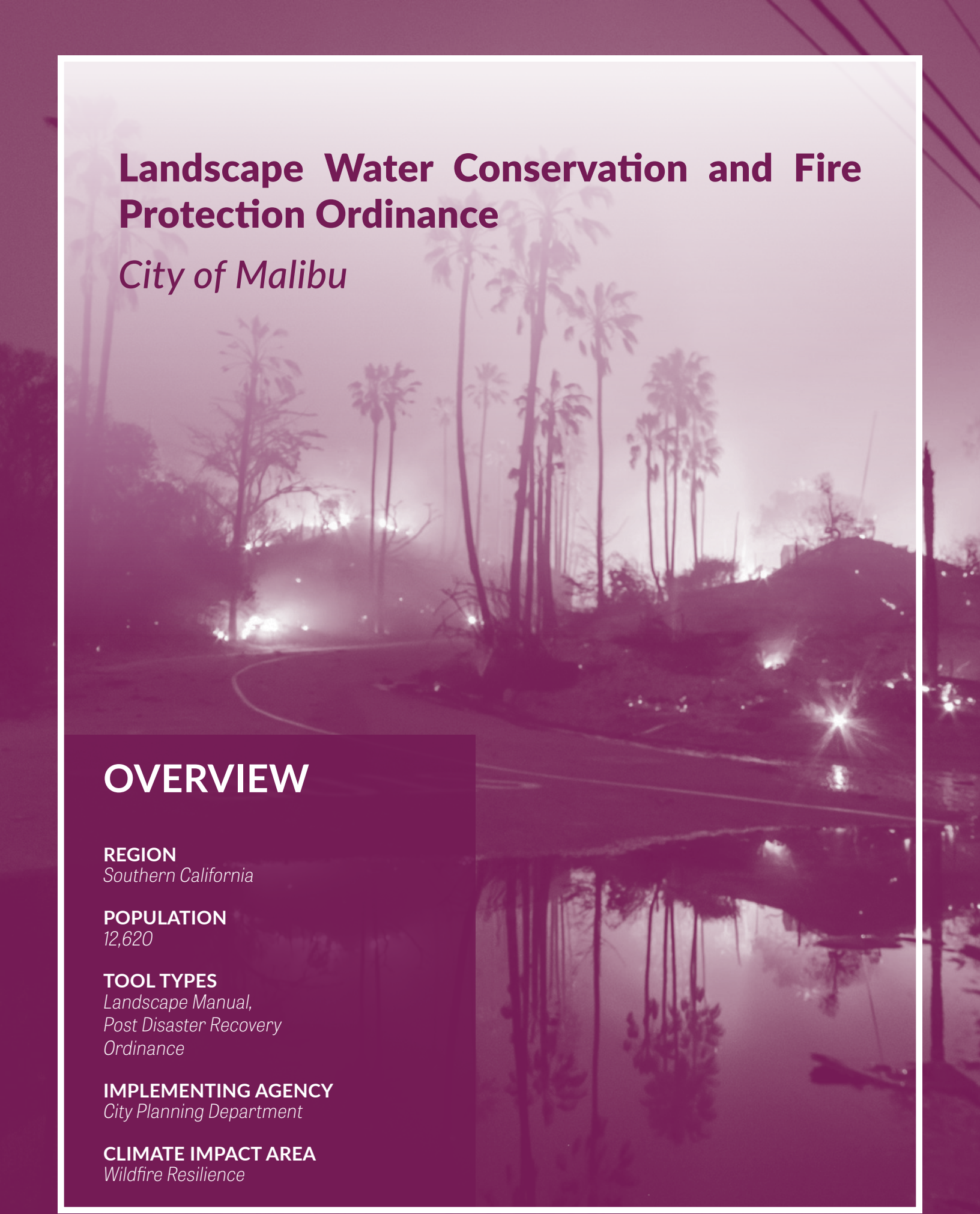
This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, *a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.*

FURTHER INFORMATION

For more information, please visit the City of Carlsbad's Planning Department Landscape Plans webpage.

Landscape Water Conservation and Fire Protection Ordinance

City of Malibu



OVERVIEW

REGION
Southern California

POPULATION
12,620

TOOL TYPES
Landscape Manual, Post Disaster Recovery Ordinance

IMPLEMENTING AGENCY
City Planning Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2018, the Woolsey Fire burned nearly 100,000 acres of land in Los Angeles and Ventura Counties during a strong Santa Ana wind event. The fire burned across the Santa Monica Mountains, through the City of Malibu, and to the Pacific Ocean. The fire destroyed 670 structures within the City of Malibu, and an additional 1,000 in surrounding areas.

After the fire, Malibu residents urged elected officials to act on concerns that hazardous landscaping contributed to fire spread within the city. In response, the City Council directed staff to prepare a citywide fire-resistant landscape ordinance. The ordinance, adopted in January 2020, updated the city's zoning code to include new fire protection standards as part of the landscaping chapter (17.53). New requirements include a citywide prohibition of palm trees and a ban on the installation of flammable materials such as bark chips, hedges, and artificial turf grass within zero to five feet from a structure.

Adoption of the ordinance successfully balanced several factors, including building public support while the community was still in recovery and ensuring that new fire-resistant landscaping restrictions were not at odds with other planning requirements in the Local Coastal Program (LCP).

This case study was selected as a WUI Planning Best Practice because it shows how the community quickly took action to adopt a fire-resistant landscape ordinance following a wildfire. The local ordinance also highlights different natural resource and fire experts working with residents to create science-based mitigation strategies that navigate other complex planning requirements, such as the LCP. Finally, this case study includes equitable approaches to the recovery process by offering permitting assistance options to homeowners to ensure they were not impacted financially by the new ordinance.

Landscaping ordinances are regulatory mechanisms that contain the development standards for the quantity, type, location, and design of landscaping on a site. They address a variety of aesthetic, environmental, and safety issues, which can include fire risk reduction and water conservation. Landscaping ordinances that integrate fire protection may also include standards for other landscaping materials, such as fencing, walls, and gates.

TOOL DESIGN

Malibu's new fire protection landscaping ordinance expands upon existing Landscape Water Conservation regulations, meant to originally conserve water, and create drought-tolerant landscaping within the City of Malibu. This new ordinance is meant to foster both drought tolerant and wildfire-resistant landscapes within the City.

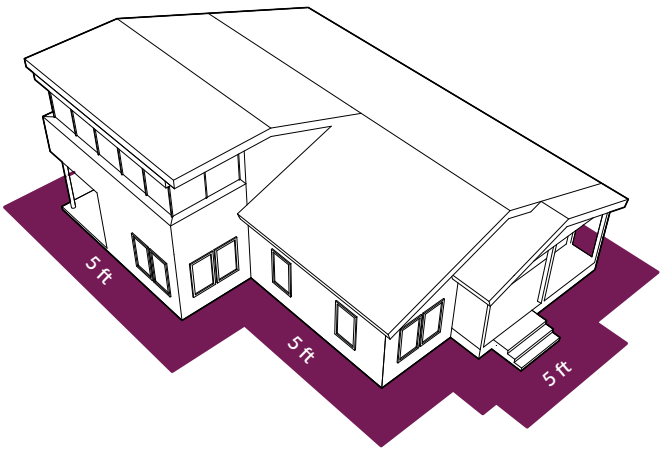
The City's new fire protection standards for landscaping broadly apply to industrial, commercial, multifamily or subdivision projects, and single-family residential uses which propose new or altered landscape areas (with a minimum of 500 sq ft. for new residential development and 2,500 sq ft. for existing residential development). The regulations also apply to any new landscaping for all single-family residences being rebuilt following destruction or damage due to a natural

Front Image: Lee Sternthal

disaster, like the Woolsey Fire.

Standards included within the ordinance are designed to reduce fire hazard and spread by minimizing the fuels available to wildfires, such as restricting or prohibiting trees, shrubs, and ground cover, and establishing the type of materials and siting for fences and walls allowed. Example provisions include:

1. *Prohibition of all new palm trees (citywide) and the prohibition of Eucalyptus, Pine, Cypress, Cedar, and Tree of Heaven species within 50 feet of a structure (with exceptions for Eucalyptus trees designated as monarch butterfly habitat)*
2. *Limitation on the maximum height of trees within or near existing utility easements where overhead power lines are present*
3. *Prohibition of all trees, shrubs, shredded bark, pine needles, artificial turf, and flammable fences and walls within zero and five feet from a structure*
4. *Removal and clearance of vegetation within ten feet on each side of public and private roadways or driveways*



Under the new ordinance, flammable materials including shredded bark, pine needles, and artificial turf are prohibited within five feet of a structure.

Landscape documentation packages are reviewed by a biologist contracted to work with the Planning Department before a permit is issued. This ensures each landscape plan complies with the Malibu Municipal Code, the LCP, as well as possible impacts to protected trees and Environmentally Sensitive Habitat Areas. Landscape installation is inspected by the City's contract biologist, and if there is a violation, that is enforced by the City's Code Enforcement Department.

IMPLEMENTATION

The City Planning Department worked closely with residents rebuilding their homes after the Woolsey Fire to ensure the new ordinance would not be a financial burden or barrier. Residents who lost homes in the fire, but who could not afford to hire a landscape architect to complete a landscape documentation package, worked with the Planning Department to draft and submit modified landscape plans that would meet the new minimum submittal requirements for permitting. These submitted plans were then reviewed and, if consistent, were approved by the Planning Department to help owners complete their rebuild.

The City of Malibu also adopted an emergency rebuilding ordinance that streamlined the coastal development permit process for on-site wastewater treatment and access road improvements where it could be demonstrated that the improvements would not impact coastal resources. The City's new zoning ordinance also created the Planning Verification process, which allowed fire-rebuild applications to be processed more efficiently over the counter instead of the typical process for a new replacement structure. This process previously consisted of a more front-loaded review of each application that may have required consideration and approval by the City's Planning Commission. The Planning Verification process helped homeowners submit and receive planning approvals for their rebuilds within a mandated three-year timeline. Furthermore, the

three-year window to obtain approval from the Planning Department also allowed homeowners to replace previously permitted development that was not consistent with current zoning ordinances without the need for a planning variance.

New palm trees, which are especially difficult for fire fighters to extinguish once ignited, are prohibited from being planted within the city limits. Image: San Bernardino County Fire

COLLABORATION & ENGAGEMENT

This process of developing an updated landscaping ordinance began almost immediately after the Woolsey fire. At the direction of City Council, the Planning Department worked with their staff arborist, a contract biologist, community members and representatives from the fire department, and other emergency response professionals to analyze how changes to landscaping requirements could decrease wildfire risk to homes and other features in the built environment. Discussions were based on fire behavior science in the home ignition zone and local observations witnessed during the recent fire. For example, bark chips, flammable vegetation, and combustible fencing acted as a wick, leading burning vegetation directly to structures, and palm trees generated embers that were carried in the wind toward surrounding homes and properties. In addition, the palm trees were difficult for firefighters to extinguish.

Champions for the proposed ordinance included Malibu residents, planning commissioners, and community emergency response team (CERT) members. Community support also allowed the City to adopt the ordinance while residents were still recovering to apply the new fire-resistant landscaping standards to properties being rebuilt from the Woolsey Fire. Although there was sympathy for residents who lost their homes, there was also broad consensus that increasing wildfire resilience through the new ordinance was important to prevent losses from future fires.

INNOVATIONS

During the development of the ordinance, staff worked closely with experts on coastal and natural resource protection rules to ensure that state regulations were followed and, where applicable, exceptions were created. For example, the ordinance allows Eucalyptus trees to be sited within 50 feet of a structure if the trees could potentially serve as a habitat for monarch butterflies. This factored into the City Council's determination that the project (i.e., ordinance) would not have any significant effect on the environment and therefore was exempt from CEQA.

In addition, the City of Malibu's location within the California Coastal Zone requires that all development and activity occurring within the Coastal Zone be subject to the City's LCP. In

the event of a conflict between the LCP and the City's General Plan or Zoning Code, those policies and regulations of the LCP will supersede. To avoid potential conflicts between the updated landscape ordinance and the LCP, the Planning Department crafted the fire-resistant landscaping standards to support the previously approved LCP goal that "new development shall minimize risks to life and property in areas of high fire hazard" without altering kind, location, intensity, or density of allowed uses.

This allowed the ordinance to be classified as a minor amendment to the City's Local Coastal Program Local Implementation Plan. Through close coordination with the California Coastal Commission (CCC), the minor amendment was reviewed and certified by the CCC in August 2020.

The Santa Monica Mountains Conservancy provided the City of Malibu with a $324,00 grant for a hazard tree removal program. Residents could apply for their hazardous trees to be removed by city staff under the grant program. Image provided by the City of Malibu.

FUNDING SOURCE

Funding for the drafting phase of the new fire-resistant standards within the City of Malibu's Landscaping ordinance was provided through the City's General Fund. Any ongoing costs associated with implementation are recovered through permit application fees.

Further, the City of Malibu received a $324,000 grant from the Santa Monica Mountains Conservancy for a hazard tree removal program. Residents with dead and dying hazardous trees could sign up to have trees removed for free with consultation from the city arborist and city public safety staff. While not directly linked to the new landscaping ordinance, this helped the city further advance its wildfire resiliency goals to help residents prepare for wildfire.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering adopting a landscape ordinance that includes fire protection standards, the City of Malibu's process offers key insights:

1. *Working with experts such as arborists, biologists, and fire specialists, can help determine the appropriate plant species to select and manage local climate and ecosystem conditions. Working with ecological experts also helps identify and create any necessary exceptions to avoid potential adverse environmental impacts. Based on capacity and need, this expertise can be built as internally, or on a contractual basis.*

2. *Advancing goals already adopted in the general plan, land use plan, and Local Coastal Program implementation priorities allows for a more efficient process when adopting new landscaping regulations.*

3. *Applying new regulations to include fire rebuilds also increases community resilience to future wildfire events. The City's creation of modified landscape plans for economically disadvantaged residents further enabled them to implement new regulations without creating an additional financial burden imposed by the ordinance.*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

California's Fourth Climate Change Assessment Los Angeles Regional Report acknowledged that climate projections indicate there could be a 60% increase in area burned as a result of Santa Ana driven wildfire events, and a 75% increase in non-Santa Ana driven events in the Los Angeles Region by the mid-21st century under a higher global GHG emissions scenario. If these projections prove true, fires like the Woolsey Fire, which occurred during a Santa Ana wind event, will become more common. In updating their landscape ordinance to include fire protection provisions, the City of Malibu has proactively increased the resilience of new and rebuilt homes for a future in which wildfire events are more frequent.

Research and guidance from the National Fire Protection Association (NFPA) and the Insurance Institute for Business and Home Safety (IBHS) on the importance of an ember-resistant zone (zero to five feet surrounding structures) support the efficacy of Malibu's Landscape and Fire Protection Ordinance on protecting homes from ignition during wildfire events. This ember-resistant zone is now also codified into state law for State Responsibility Areas (SRAs) and will be included in new Board of Forestry and Fire Protection regulations by January 1, 2023 (AB 3074, Fire prevention: wildfire risk: defensible space: ember-resistant zones).

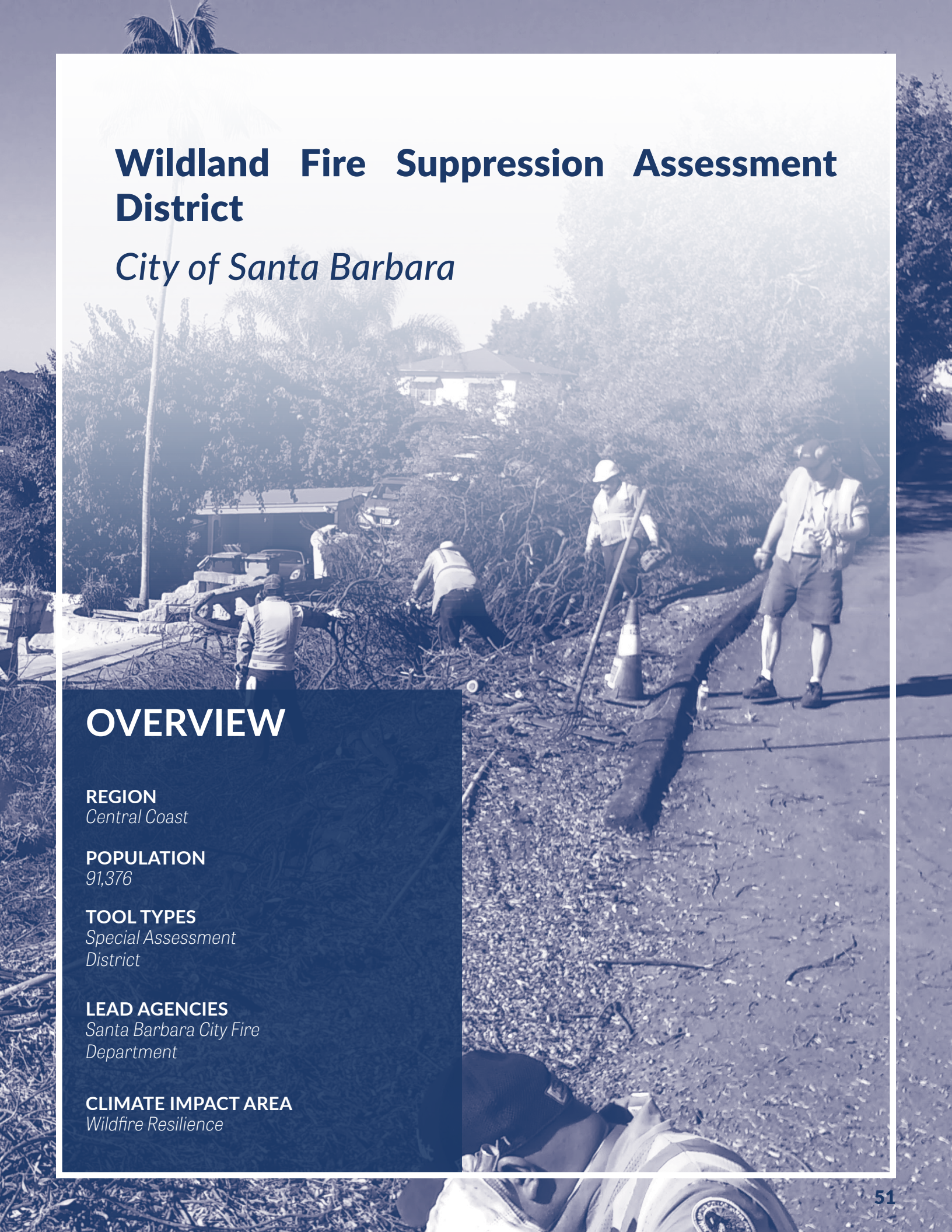
This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For more information, please visit the City of Malibu Planning Department's Fire-Resistant Landscaping Webpage.

Wildland Fire Suppression Assessment District

City of Santa Barbara



OVERVIEW

REGION
Central Coast

POPULATION
91,376

TOOL TYPES
Special Assessment District

LEAD AGENCIES
Santa Barbara City Fire Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

On July 11th, 2006, the Santa Barbara City Council approved the formation of a Wildland Fire Suppression Assessment District, which was then approved by voters in accordance with California Proposition 218. The Assessment District has been reapproved by City Council annually since 2006, providing hundreds of thousands of dollars in annual funding for wildfire risk reduction work, such as vegetation and road clearance, defensible space assistance (including voluntary evaluations and chipping), and community fuels treatments.

The boundaries of Santa Barbara's Wildland Fire Suppression Assessment District align with two of the city's mapped fire hazard areas — the Foothill Zone and the Extreme Foothill Zone. In addition to landscaping and defensible space regulations, these areas have code requirements for structural hardening (roofing, windows & doors, decking materials, etc.) consistent with Chapter 7A of the California Residential Building Code (Santa Barbara Municipal Code Chapter 22.04, §§ 22.04.020 – 22.04.070).

This broad approach to wildfire risk reduction through spatially implemented construction requirements, defensible space and landscaping regulations, and the Assessment District's programmatic community education and fuels reduction results in a holistic response to wildfire risk that protects both new and existing development in the City's highest-risk communities

This case study was selected as a WUI Planning Best Practice because it showcases a unique funding mechanism for local wildfire risk reduction activities by creating a designated assessment district within city boundaries. This well-established approach, which receives annual support from elected officials, has helped fund a staff position to engage residents in fuel mitigation and educational activities. Finally, this case study illustrates how a voter-supported voluntary initiative can complement other planning and fire-related activities, such as city regulations for the wildland-urban interface.

Special Assessment Districts are voter-approved property tax assessments utilized to raise funding for specific public improvement projects. These taxes are tied to designated parcels within districts or other identified assessment areas. Communities and fire authorities can create assessment districts to provide dedicated sources of funding for wildfire prevention and mitigation activities within designated area(s).

TOOL DESIGN

In 2004, the City of Santa Barbara Fire Department drafted and adopted the City's first Wildland Fire Plan, an early version of a CWPP. The plan worked to coordinate both city-owned and private lands to reduce hazardous vegetation. The first Wildland Fire Plan helped the City delineate its high fire hazard areas (including the Foothill and Extreme Foothill Zones) and craft specific policies to reduce wildfire hazard, while providing a framework for securing funding and coordinating risk reduction efforts.

The establishment of the Wildland Fire

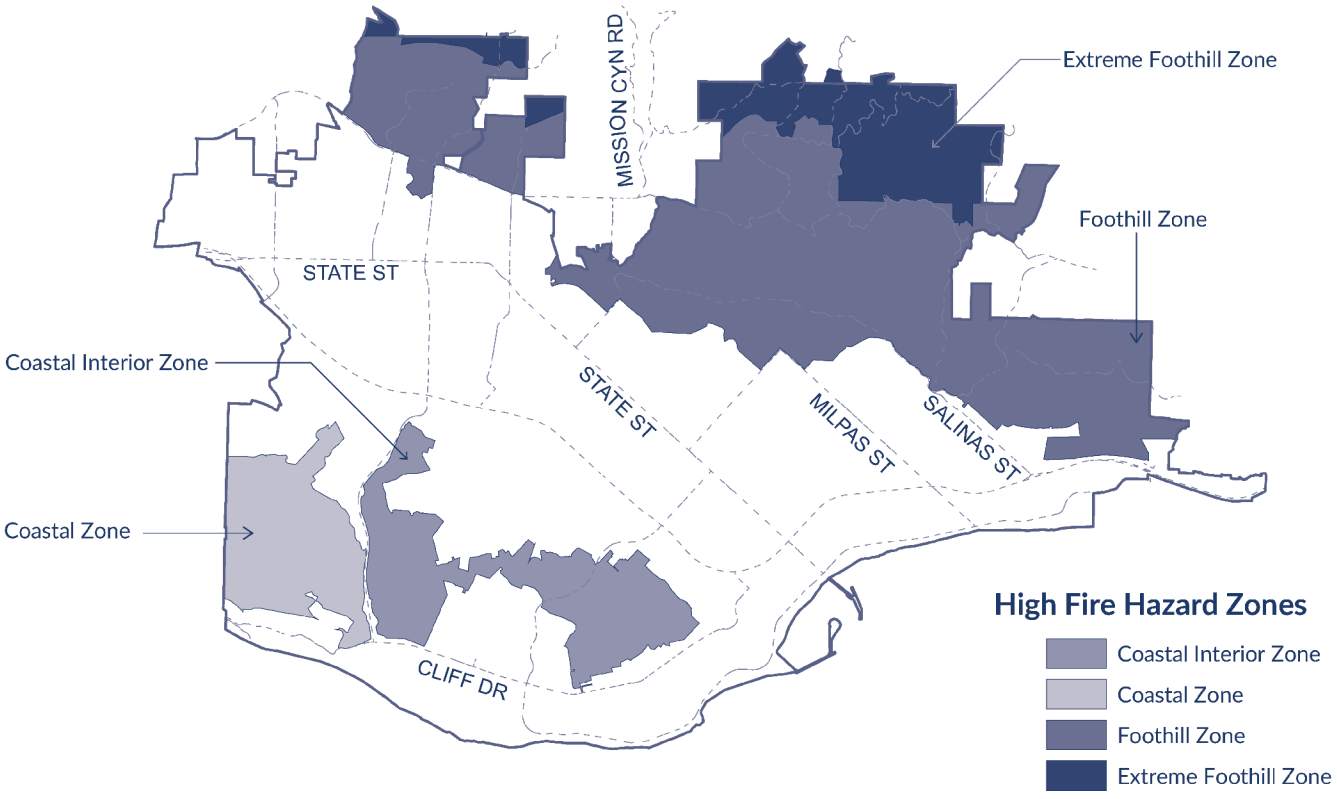
Front Image: Santa Barbara Fire Department

Suppression Assessment District followed in 2006 to aid the City in advancing policies and goals outlined within the Wildland Fire Plan, including the ability to leverage a special tax assessment on properties located within the two high fire hazards area identified within the 2004 Wildland Fire Plan. This would create a source of funding, separate from General Fund allocations, that could be used specifically for wildfire risk reduction activities including roadside clearance, chipping, and community fuels treatments.

The City Council, however, could not levee this assessment on homes located within fire hazard areas because of State Proposition 218, passed in 1999. Prop. 218 required local governments who wished to impose special assessments or property-related fees to hold an election to establish a special assessment district. Those who owned property within the proposed bounds of the district were allowed to vote to approve or disapprove the proposed assessment district. Other communities across the state have utilized Prop. 218, for example, to create pest control districts for mosquito abatement.

To gain voter support, the City decided that any staff funded by the Assessment District would focus on homeowner education and outreach and implement community-oriented fuels reductions activities but would not enforce municipal regulations related to fire prevention (e.g., fire hazard abatement or defensible space). The Assessment District passed with a simple majority (51% to 49%), achieving the goal of creating a sustainable funding source for wildfire risk reduction. The Assessment District must be re-approved each year by City Council but does not need to be voted upon again by the public.

City of Santa Barbara High Fire Hazard Area



Map of High Fire Hazard Areas of the City of Santa Barbara that constitute the Wildland Fire Special Assessment District. Adapted from image provided by the City of Santa Barbara

Programs that the Assessment District funds include:

1. *Vegetation Road Clearance (conducted September through January)*
2. *Defensible Space Assistance, including voluntary evaluations & chipping services*
3. *Community Fuels Treatment Network and Vegetation Management Units that are prioritized with the City Wildland Fire Plan (now the city's CWPP)*

The Community Fuels Treatment Network and Vegetation Management Units tie in with regional fire management priorities along the upper ridge of the district to prevent fire spread. Partners in the Treatment Network include the Santa Barbara County Fire Department and Montecito Fire Protection District.

IMPLEMENTATION

Funding that the district collects is used to staff a full-time Fire Services Specialist that works on wildfire programs within the boundaries of the district. Having a full-time Fire Services Specialist fosters close relationships between the Fire Department and homeowners, providing consistent and trusted resources. This parlays into increased educational opportunities for homeowners during voluntary inspections or while other mitigation work is being completed.

The Fire Services Specialist is required to provide an annual presentation to City Council for district renewal. Information shared with the Council includes yearly statistics of projects completed. Since 2006 the district has supported the clearing of 220 miles of roadway vegetation, treated 190 acres through fuels management projects, and assessed more than 600 properties for potential defensible space improvement.

While there are many projects funded through the district, the annual chipping program is the most popular, and is run from March to June. The chipping program helps encourage property owners to manage their defensible space each year in compliance with the City's ordinance. More than 5,100 tons of waste has been removed and chipped since 2008, including 400 tons in 2021.

Since its formation, several wildfires have occurred within the boundaries of the Assessment District including the 2008 Tea Fire, the 2009 Jesusita Fire, and the 2017 Thomas Fire. These three fires collectively resulted in the destruction of more than 1,300 structures across several communities. The highest loss of homes within the City of Santa Barbara occurred during the 2008 Tea Fire, during which more than 150 homes were lost. However, no fires have yet begun within the City of Santa Barbara (including within the Assessment District) and spread into surrounding wildland areas. These wildfires show the continued need for vegetation management and defensible space in hazardous areas like the Foothill and Extreme Foothill High Fire Hazard Areas within the City.

Fire Services Specialist, Chris Braden, providing a local homeowner with a Defensible Space consultation. Image: Santa Barbara Fire Department

Crews clear vegetation in the City of Santa Barbara as part of the annual Assessment District programming. Image: Santa Barbara Fire Department

COLLABORATION & ENGAGEMENT

As there is no enforcement mechanism within the structure of the Assessment District, including funding for any staff to enforce regulations, violations of city code must be collaboratively resolved with other Fire Prevention staff. Per municipal ordinance, property owners must maintain 100 feet of defensible space around any structure located in the Foothill Zone and 150 feet surrounding any structure in the Extreme Foothill Zone. This ordinance is enforced by the Santa Barbara City Fire Department through landscape development permits or upon complaint after installation. Any complaint-driven inspections within the Assessment District are completed by fire department staff, other than the District's Fire Services Specialist, including the City's Wildland Fire Specialist who works in all High Fire Hazard Areas within the city.

Unlike the Fire Services Specialist, the Wildland Fire Specialist is a fire department employee whose salary is funded through the City's General Fund to work city-wide addressing wildfire hazards. This collaboration is essential to maintain a fire-safe community within the Assessment District.

INNOVATIONS

Along with the City of Oakland, Santa Barbara was previously the only incorporated jurisdiction to utilize Proposition 218 to create a special district for wildfire prevention. Unlike Oakland's Wildfire Prevention Assessment District, which was repealed by voters in 2013, Santa Barbara's District must only be reapproved by City Council and does not need to be reauthorized by voters. This has allowed uninterrupted funding to support wildfire mitigation activities to continue for almost two decades.

A 2016 study by graduate students at the University of California, Santa Barbara (UCSB), found that the fuel management completed within the assessment district is, based on their models, successfully reducing fire intensity (including flame length and rate of spread) under normal and extreme wind conditions (60mph). Their model found that the fire risk was reduced between 60% and 80% when they compared pre- and post-treatment fuel loads.

While the Assessment District currently only operates in the Foothill and Extreme Foothill Zones of the City, a future ballot initiative could expand the district, or create a new district that covers other areas of the city with wildfire hazard so more homeowners can benefit from chipping, vegetation management, and roadside clearance programs.

Fire Services Specialist, Chris Braden, sharing information about free defensible space inspections. Image: Santa Barbara Fire Department

FUNDING SOURCE

There are currently 3,200 parcels with homes that pay the assessment fee, which raises approximately $290,000 annually for wildfire mitigation work, program management, and Fire Services Specialist wages. Although the Assessment District provides critical funding source, demand for mitigation work exceeds funds collected from the district. In 2021, the Santa Barbara City Council approved an additional $100,000 for vegetation management from the General Fund. The Fire Services Specialist position responsibilities also include pursuing grants to expand the amount of the mitigation work that can be undertaken each year.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering creating a Special Assessment District to support wildfire mitigation work, the City of Santa Barbara's process offers several key insights:

1. *Other communities may consider a similar hybrid approach to Santa Barbara's Wildland Fire Suppression Assessment District, where staff funded by the special assessment have no enforcement powers, but other City or Fire Department staff do to initially appeal to voters hesitant to pass an assessment that may lead to additional fines*

2. *An assessment completed by graduate students at the University of California, Santa Barbara found that were at least 80 communities across California that would have suitable conditions to benefit from a similarly structured assessment district.*

3. *Creating metrics and tracking progress helps show how funds are being successfully spent to reduce wildfire threat, increasing the likelihood of continued support from the*

public and elected officials, and resulting in district renewals.

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

According to the Central Coast Regional Report of the 4th California Climate Assessment, it is difficult to project future wildfire conditions due to uncertainty of predictions of precipitation and wind (which often drives extreme fire behavior in the fall and winter months). However, the report acknowledged that because the Mediterranean type of ecosystem that is prevalent in the region is dominated by fire regimes, it is likely the region will continue to see wildfire events that occur in the WUI communities of Santa Barbara. Other climate impacts including drought and extreme heat, as well as the potential for post-fire debris flows may impact communities already exposed to wildfire hazards.

Any increase in wildfire activity will likely create elevated hazards for communities located in the Wildland Fire Suppression Assessment District, particularly as previous wildfires resulted in the loss of hundreds of homes within the City of Santa Barbara. Work done to mitigate future and existing wildfire hazards through the programs funded by the Assessment District will protect communities in the future, regardless of projected risk.

This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For more information, please visit the City of Santa Barbara's Wildland Fire Suppression Assessment District webpage.

Wildfire Plan Alignment

Mariposa County

OVERVIEW

REGION
Western Sierra Nevada Foothills

POPULATION
17,420

TOOL TYPES
Community Wildfire Protection Plan, Master Plan

LEAD AGENCIES
Planning Department, Fire Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

Mariposa County has historically experienced a general pattern of fires that have occurred frequently, referred to as the natural fire regime. In many areas of the County, however, the natural fire regime has been significantly altered by human activities and forest health impacts, such as drought-induced insect outbreaks and tree mortality. These alterations have resulted in larger and more severe fires in recent years, including the Rim Fire (2013), Detwiler Fire (2017), Ferguson Fire (2018), and River Fire (2021), and have caused impacts ranging from fatalities, structure losses, post-fire rockslides, evacuations, national park closures, lost tourism revenues, and more.

In response, Mariposa County has prioritized wildfire resilience and collaborative partnerships throughout its planning activities. This includes the adoption of an updated countywide CWPP, which serves as the overarching document to guide wildfire planning and resilience activities, and two master plans, which integrate wildfire planning and adaptation into wider community building initiatives: Mariposa Creek Parkway Master Plan and the Mariposa County Recreation and Resiliency Master Plan. These plans are also aligned with other county plans, including the General Plan and LHMP.

This case study was selected as a WUI Planning Best Practice because it shows how different plans at local and countywide scales can incorporate wildfire resilience through topics such as land use planning, TEK, fire adaptation, parks and recreation planning, and forest health. This case study also offers an example of how the county aligns multiple plans to reinforce a holistic approach to wildfire mitigation and preparedness. Finally, this case study illustrates the importance of stakeholder collaboration as a key component in the development and ongoing implementation of wildfire resilience planning activities across the County.

Plan alignment involves leveraging connections, information, and resources to build shared language, data foundations, and processes across multiple planning efforts. The resulting deliverables are a suite of two or more plans that share data, aligned visions, and complementary goals, strategies, and actions. Plan alignment helps communities integrate planning teams, data, and processes to achieve more effective solutions and outcomes. Plan alignment means broadening planning approaches and coordination to be more collaborative.

TOOL DESIGN

The updated Mariposa County Community Wildfire Protection Plan was adopted by the Mariposa County Board of Supervisors in February 2021. This plan was a comprehensive update to the previous CWPP (2012) and included many new topics and features, such as a countywide assessment of wildfire hazard and risk, a delineation of the wildland-urban interface, and an action plan for implementation and tracking.

The CWPP acts as an umbrella document for compiling, guiding, and coordinating wildfire risk and mitigation activities across the County. These activities encompass a range of actions that target

Front Image: Jonah Susskind

resilient landscapes, fire-adapted communities, and response and suppression capabilities. The County uses the CWPP as its leading wildfire planning document to establish countywide priorities and coordinate wildfire activities that are also established in other plans, including the Mariposa Creek Parkway Master Plan and the Mariposa County Recreation and Resiliency Master Plan.

The Mariposa Creek Parkway Master Plan, adopted in January 2020 by the Mariposa County Local Transportation Commission, guides the implementation of improvements and enhancements to the Mariposa Creek Parkway to serve as a recreational and civic amenity for residents and tourists. The plan establishes a vision for an interconnected regional trail system while meeting a range of environmental objectives for restoration and resilience. Although pre-dating the recent CWPP update, the parkway master plan includes content on wildfires from the previous CWPP and incorporates strategies such as prescribed fire that achieve multiple objectives for wildfire risk reduction and resilience, habitat restoration, and increased public awareness of the environment.

The Mariposa County Recreation and Resiliency Master Plan, adopted by the Mariposa County Board of Supervisors in March 2021, further leverages opportunities to link resilience with park lands and open space, recreation and activities, trails and connectivity, and natural systems. This plan analyzes how resilience can be increased to improve the natural environment, built environment, human health, and social equity across the County. Wildfire resilience is integrated throughout the plan and has dedicated sections that discuss linkages to the updated CWPP and other applicable plans (e.g., Local Hazard Mitigation Plan), site planning considerations for wildfire, and best management practices.

All three plans play important roles in addressing wildfire to influence outcomes at community and landscape scales. Cross-references and shared content among the plans, such as wildfire history, data, and trends, are also important to coordinate priorities and provide consistent messaging on wildfire to plan users.

Conceptual proposal for a section of the Mariposa Creek Parkway Master Plan. Image: WRT

CWPPs must meet three minimum requirements as established by the Healthy Forests and Restoration Act (2003). These requirements are:

1. *Identifying and prioritizing areas for hazardous fuel treatments*
2. *Recommending measures for reducing structural ignitability*
3. *Ensuring the plan was collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.*

Local government agencies and state entities responsible for forest management must also agree to the final CWPP.

IMPLEMENTATION

More than half of the total land area in Mariposa County is managed by state and federal land management agencies, including the National Park Service, Bureau of Land Management, US Forest Service. This broadens the scope of partnerships and working agreements required to plan and implement wildfire mitigation activities across the County and reinforces the need for collaborative planning.

To address this need, the Mariposa County Board of Supervisors established the Mariposa County Fire Advisory Committee (MCFAC) in 2019 by a County resolution. MCFAC is a multi-stakeholder working group that is tasked with considering and making recommendations on topics including pre-fire coordination, fire prevention education, fire risk reduction and resource resiliency to the County Fire Chief and Board of Supervisors. MCFAC is required to meet quarterly, and the County's planning department plays a designated role in facilitating the committee's meetings and activities.

Several members of MCFAC served as the leads for the CWPP, including the Mariposa County Fire Safe Council, Planning Department, Fire Department, and Resource Conservation District. The Planning Department also served as the lead agency to develop and implement the Mariposa Creek Parkway Master Plan and the Mariposa County Recreation and Resiliency Master Plan.

While each plan varies in how it gets implemented, the CWPP Implementation Chapter has an action plan with a list of actions, corresponding priority (high, medium, low), proposed leads and timeframes, and resources required for implementation. The action plan is designed to be flexible and updated often and can fold in wildfire-related actions from other plans for tracking and coordination. In addition, the CWPP risk assessment mapping process created community profiles that show local risk factors for each community and corresponding individual action plan templates for identifying customized risk reduction actions. This also enables communities' ability to track change in risk metrics and supporting projects as a decision support tool.

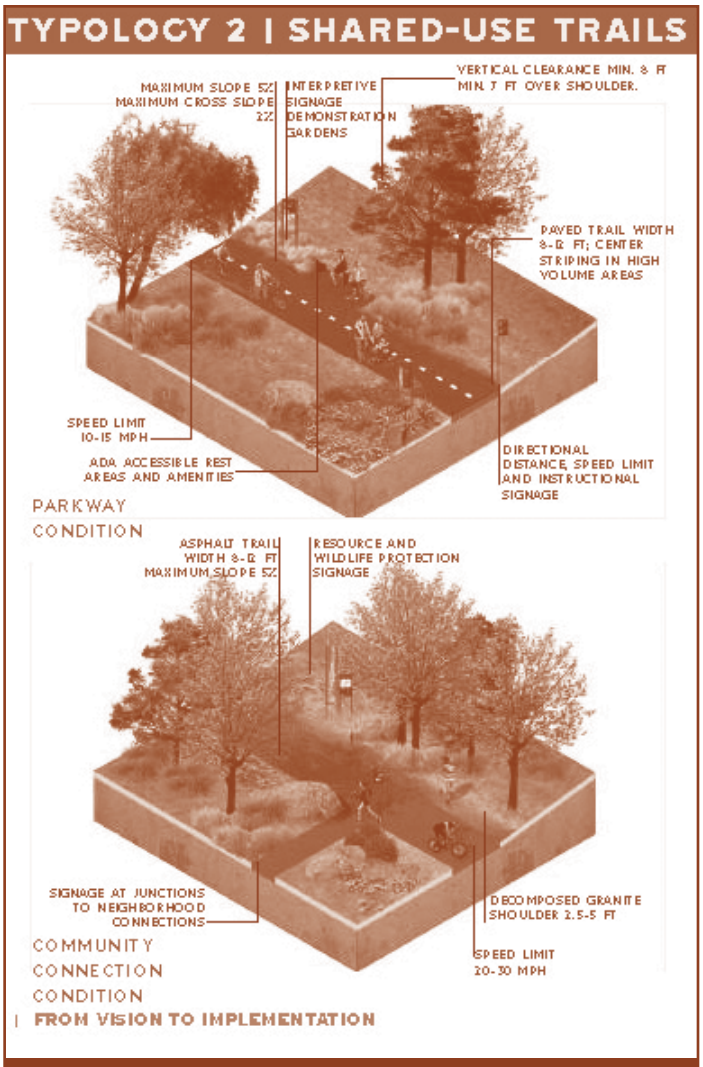
Mariposa County Fire Advisory Committee membership includes representatives from:

- *CAL FIRE*
- *Mariposa County Fire Department*
- *Mariposa County Fire Safe Council*
- *Mariposa County Resource Conservation District*
- *Mariposa County Planning Department*
- *Mariposa County Public Works Department*
- *American Indian Council of Mariposa County*
- *Yosemite National Park*
- *Pacific Gas and Electric*
- *Mariposa County Sheriff*
- *Sierra and Stanislaus National Forests*
- *Bureau of Land Management*
- *SouthWest Interface Team*
- *University of California Cooperative Extension*
- *Sierra Telephone*
- *Up to five members of the public*

COLLABORATION & ENGAGEMENT

The planning process is inherently designed to be collaborative. To qualify for funding under the Healthy Forests Restoration Act, CWPPs also have a legislative requirement to ensure that collaboration occurs. Several of the County's recent planning efforts, however, were undertaken during the pandemic—the CWPP and Recreation and Resiliency Master Plan were both being initiated in early 2020. This created unique challenges for public engagement, collaboration, and outreach. Both processes accommodated the virtual environment to find creative ways to engage stakeholders and the public.

The Recreation and Resiliency Master Plan conducted a series of online community forums to gather input on the project prioritization process. During the forum, the planning team used a detailed story map to help guide the discussion and planning process. The story board also served as an educational tool for anyone engaged in learning more about the plan during its development. The CWPP also held virtual public workshops and presented draft versions to MCFAC to receive feedback on the wildfire hazard and risk.



Schematic renderings of proposed shared use trail sections as part of the Recreation and Resiliency Master Plan. Image: Mariposa County Planning Department

INNOVATIONS

In addition to several features mentioned previously, the Mariposa County CWPP takes a unique approach by aligning with the three core tenets of the National Cohesive Wildland Fire Management Strategy: resilient landscape, fire-adapted communities, and improved response. This approach creates a comprehensive and holistic framework for addressing wildfire across the County. This also creates an effective umbrella for other plans to plug into at various scales.

For example, the Mariposa County Recreation and Resiliency Master Plan integrates wildfire planning considerations into priority projects. While this is a countywide scale, these projects are initiated within local priority areas. Project objectives align with countywide goals established in the overarching CWPP. Projects such as trail expansions should consider how trails can support fuel management objectives, such as the development of strategic fuel breaks and fire suppression access; upgraded park facilities, such as campgrounds or picnic areas, should also create and maintain defensible space and appropriate access to sites for effective fire management and response activities. The plan received a Planning and Analysis Award by the American Society of Landscape Architects in 2021 to recognize the plan for its clear goals and strategies that enabled planners to achieve the

co-benefits of resiliency with recreation planning.

The Mariposa Creek Parkway Master Plan also integrated TEK into one of its priority projects, which is to address the removal of invasive species, especially the Himalayan Blackberry and Tree of Heaven. Rather than exclusively relying on potentially harmful pesticides, the invasive species removal program employs TEK to treat invasive species and prime the Creek corridor for revegetation with native species. Through a partnership led by the American Indian Council of Mariposa County, project leaders will use both conventional fire prescriptions and traditional practices which Indigenous land managers have implemented for centuries to manage the foothills landscape. Not only are these methods proven to be successful, but they are also a significant part of the region's heritage and identity, making the prescribed burn program a unique opportunity for creative placemaking and storytelling. TEK and prescribed fire are also priority activities carried forward in the countywide CWPP.

Crews participate in the prescribed burn of a debris pile in Mariposa County, in partnership with the Southern Sierra Miwuk Nation. Image: Mariposa Planning Department

FUNDING SOURCE

Funding for plan development and implementation varied based on each plan. The CWPP was primarily funded by a CAL FIRE grant as part of the California Climate Investments Program, and the County Board of Supervisors also committed additional County funds. The Mariposa County Recreation and Resiliency Plan was funded by transferring $150,000 from a settlement fund (established by the County following a settlement with the Merced Irrigation District) for development of the plan. Implementation of both plans will rely on additional grant funding.

Funding to develop initial conceptual and enhancement plans for the Mariposa Creek Parkway was provided by regional planning assistance funds from the California Department of Transportation (Caltrans). Shortly after the master plan was adopted, the California Natural Resources Agency awarded nearly $800,000 to the Mariposa County Planning Department and the Sierra Foothill Conservancy to fund the acquisition of the property needed to extend the Mariposa Creek Parkway. This strategic acquisition was a priority implementation action and an essential step in realizing the community's vision for this transformational project. Additionally, the project has received $460,000 from the California Wildlife Conservation Board to implement restoration activities in the acquired parcels, and $4.4M from Caltrans to construct the Parkway in this key portion of the riparian landscape.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

Key insights from Mariposa County can help other communities consider wildfire resiliency as part of their planning process, including:

1. *Aligning the timing and momentum of related plans can make it easier to link*

current information, data, and priorities. In this case study, all three of the County's planning efforts took place within 18 months of one another. The Planning Department also acted as central agency to coordinate stakeholders, consultants, plan timelines, public outreach, and deliverables.

2. *Planning for wildfire resilience can take many forms, as illustrated by the projects and priorities in these three County plans. For example, wildfire resilience can be integrated into trail planning, the built environment and fire-adapted communities, TEK, prescribed burning practices, and more.*

3. *Incorporating tangible metrics and tracking mechanisms allows for easier jumping-off points for taking the next steps in plan implementation.*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

According to the Sierra Nevada Regional Report of the 4th California Climate Change Assessment, wildfire activity is expected to increase in frequency and intensity in many parts of the Sierra Nevada Region, including Mariposa County. The region may also experience a growth of large fires, or fires over 24,700 acres. This is particularly damaging to ecosystems, as large fires can contribute to conditions which delay or prevent forest recovery. Some contributions to this projected increase in size, frequency, and intensity of fires, are a result of potential reductions in annual snowpack, as well as drought-related forest-mortality events. The report acknowledges the role that indigenous communities can play in utilizing fire as a tool for managing ecosystem health.

The holistic approach that Mariposa County is utilizing integrates topics such as land use planning, TEK, fire adaptation, parks and recreation planning, that will build resilience to wildfire impacts, while improving forest and ecosystem health. This is essential as the Regional Report emphasizes that increased fire activity in the region will impact human development, and the capacity of the region to respond and recover to wildfire events. Further the report states that, "all communities but especially tourism-dependent communities suffer when active fire, smoke, and ash close facilities during the high season, constraining a critical economic sector."

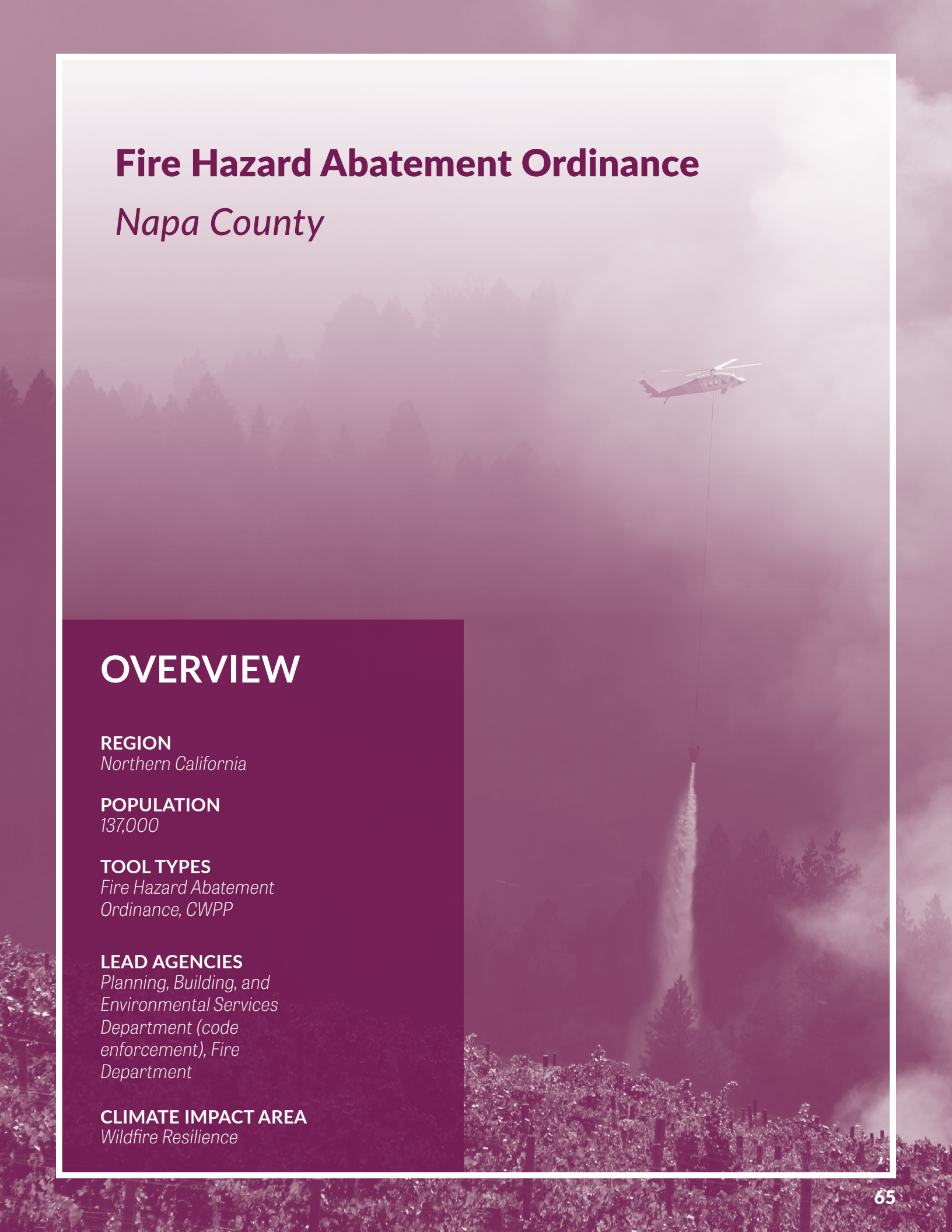
This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For further information about Mariposa County's current planning priorities, including the Recreation and Resilience Plan and the Creek Parkway Plan, please visit the County Planning Department's Current Project webpage. For information regarding the County's CWPP or the Mariposa County Fire Advisory Committee, please visit the Fire Department's webpage.

Fire Hazard Abatement Ordinance

Napa County



OVERVIEW

REGION
Northern California

POPULATION
137,000

TOOL TYPES
Fire Hazard Abatement Ordinance, CWPP

LEAD AGENCIES
Planning, Building, and Environmental Services Department (code enforcement), Fire Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2019, Napa County updated its Fire Hazard Abatement Ordinance and associated Defensible Space Guidelines to include standards that currently go above-and-beyond California State requirements in Public Resources Code 4291. These standards include a requirement for an ember-resistant zone within five feet of a structure for all new construction in unincorporated County areas. All defensible space requirements are enforced by the Napa County Fire Department, which is staffed by CAL FIRE employees through a contract with Napa County.

The updated ordinance was in response to the October 2017 fires, and other subsequent fires, which destroyed around 1,300 homes (10% of the County's housing stock) in unincorporated areas of Napa County. Lessons learned during these fires inspired the Planning, Building, and Environmental Services Department, Fire Department, and County Board of Supervisors to take additional actions to protect homes during future wildfire events. The County is also working closely with the Napa Communities Firewise Foundation to help property owners build community wildfire resilience and achieve community-wide fuels reduction goals outlined in their Countywide CWPP.

This case study was selected as a WUI Planning Best Practice because it illustrates a proactive and science-based approach to mitigating wildfire threats to structures, including ember ignitions within the zone closest to a structure. In addition, the success of these regulations is based on close collaboration among multiple county departments. Finally, this case study also shows how other voluntary wildfire risk reduction programs can work in tandem to support regulatory approaches.

Fire Hazard Abatement Ordinances are local regulations that dictate the maintenance of flammable vegetation or other fire hazards on private property. These regulations may be adopted as a standalone ordinance or within a chapter of municipal code. These regulations are often paired with inspection and enforcement mechanisms such as annual notices to abate, scheduled inspection programs, and fines or penalties for non-compliance.

TOOL DESIGN

Napa County's recent Fire Hazard Abatement Ordinance amended Chapter 8.36 (Fire Protection – Fire Hazard Abatement) of the County Municipal Code. Amendments were based on lessons learned during wildfire events, including a high number of structure losses from embers igniting combustible materials near structures, such as decks, patio furniture or ornamental plants.

In response, the County established a requirement for all new construction to create an ember-resistant zone—a noncombustible zone within five feet of a structure using non-combustible landscaping materials and/or approved high-moisture-content annuals and perennials. The ordinance became applicable immediately for new construction but gave existing property

Front Image: Napa County Fire Department

owners until 2023 to comply, when State Board of Forestry regulations take effect. The ordinance will be amended to include this additional requirement for existing properties then.

The Fire Hazard Abatement Ordinance also specifies the responsibilities of adjacent property owners. When a structure is less than one hundred feet from a property line and prohibited materials on an adjacent parcel present a fire hazard to the structure, the property owner of the adjacent parcel is responsible for clearing the area.

To comply with the County's Fire Hazard Abatement Ordinance, all properties must follow the Fuel Treatment Requirements within the Napa County Defensible Space Guidelines. These guidelines were also amended to provide greater specificity and direction for property owners, including considerations for defensible space and recommendations for decreasing fire hazards, such as removing combustible outdoor furniture and doormats, regularly clearing fallen leaves and needles from the property during fire season, and using only inorganic, non-combustible mulches such as stone or gravel.

Fuel treatment requirements in the Defensible Space Guidelines include:

1. *Maintain a buffer by removing and clearing all prohibited materials, including Pyrophytic species (e.g., Manzanita, Sargent Cypress, Tan Oak, Cedars, False Cypress, Junipers, Palm, Spruces, or Pines), within 30 feet of each structure.*

2. *Remove dead and dying woody surface fuels and aerial fuels within the Reduced Fuel Zone (30 – 100 ft from any structures). Loose surface fuels shall be permitted to a maximum depth of three inches.*

3. *Provide at least 100 feet of defensible space around all structures on the property, or to the property line if it is less than 100 ft from any structure. While 100 ft is a minimum, brushes and shrubs may require longer clearance distances depending on topography and fuel loads.*

IMPLEMENTATION

In 2007, Napa County's Fire Hazard Abatement Ordinance was originally adopted to establish requirements for the abatement of nuisances that create fire hazards around structures. As a result, compliance and enforcement of Chapter 8.36 follows a typical public nuisance abatement process.

First, an enforcement officer working with the County Fire Marshal's Office (either staff from code compliance or the fire department) issues an order of abatement for any nuisance on any property that is in violation of the fire hazard ordinance. Property owners have 14 days to comply with an order to abate. Property owners do have an opportunity to appeal; however, if they do not ultimately comply with the abatement order, the county will abate the nuisance utilizing private contractors or County staff at the expense of the property owner. Costs incurred may include costs associated with administering abatement and any failed appeals, in addition to the actual cost of the work done.

If a property owner does not pay this bill within 45 days of receipt, the bill will be sent to the County Auditor, who will then levee a tax assessment (or lien) against the parcel to be collected when annual property taxes are paid.

Example of fire resistant landscaping in Napa County that incorporates local defensible space guidelines. Image: Napa County Fire Department

A house in Napa County is rebuilt following a wildfire, incorporating new regulations for a five-foot ember-resistant zone. Image: Napa County Fire Department

COLLABORATION & ENGAGEMENT

The success of Napa County's Fire Hazard Abatement Ordinance can be attributed to close collaboration between the County Fire Department, Code Enforcement Division (part of the Planning, Building and Environmental Services Department), and the County Auditor. Code enforcement officers work in tandem with the County Fire Marshal's Office to ensure successful implementation and the County Auditor ensures that any costs associated with abatement on non-compliant properties are recovered. Further, this ordinance shows that county fire departments staffed by CAL FIRE employees can implement local ordinances that go above and beyond state requirements.

Napa County Fire Department also offers all property owners (including both residential and commercial properties) consulting inspections. This program is intended to assist property owners that have already met their defensible space requirements, with recommendations for additional hazard reduction work. Fire department staff, armed with their knowledge of fire behavior, inspect properties upon request and provide property owners with additional recommendations. Some recommendations have included extending defensible space beyond the minimum requirements, or even the creation of shaded fuel breaks on larger properties, like vineyards. This program is available during the winter months, so property owners have time to implement any recommendations before warmer weather comes.

INNOVATIONS

Supporting the implementation of fire hazard abatement and defensible inspections is the County's free Chipping Program. Property owners in unincorporated areas of Napa County do not always have the financial resources to perform annual defensible space. To help residents comply, the County offers a free chipping program for all residential properties located within fire hazard areas (this includes most properties in rural, unincorporated areas). Crews will chip for a maximum of three hours on a single visit or piles

up to a maximum size. Crews can return to chip additional piles of vegetation, and there is no limit to the number of piles property owners can chip during a single season.

In addition to the free chipping program, the Napa Communities Firewise Foundation is working to support the County in achieving its broad wildfire risk reduction goals. The Foundation worked with more than 20 agencies and organizations, including the County Fire and Planning Departments and 13 local Fire Safe Councils, to create a five-year community-wide fuels reduction plan in their 2021 Community Wildfire Protection Plan (CWPP).

The plan includes a collection of interactive maps and story maps that outline major priority projects for the first few years of the plan period. Some of these projects include emergency access and egress corridors, community perimeter fuel breaks, maintenance of selected historic containment lines, as well as continued support for the local Fire Safe Councils within the County.

FUNDING SOURCE

County Municipal Code (8.36.160) requires that any expense, including administrative expenses that the County incurred as a result of prohibited materials or other similar accumulations removed, or because of any other steps necessary to abate the fire hazard nuisance, are charged to the parcel owner. These costs are recovered through the process outlined previously in the implementation section.

To fully implement the five-year CWPP, it will cost an estimated $43 million, of which $5.4 million has been allocated for the first years of implementation by the Napa County Board of Supervisors. In addition to this initial investment in plan implementation, the County is working to secure more reliable funding. One option being considered is a quarter-cent wildfire prevention sales tax that would provide the funding needed to fully implement the $43 million 5-year plan and any continuations.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering adopting enhanced defensible space requirements, Napa County's process offers several key insights:

1. *Communities that develop defensible space provisions that go above and beyond state minimum requirements will benefit from also providing additional guidance and direction on the implementation of such requirements.*
2. *Free chipping programs and voluntary fire hazard evaluations (in addition to required inspections) can incentivize community members to complete their annual vegetation management work.*
3. *Partnerships with community organizations, like local or regional Firewise groups or Fire*

Chipping programs can incentivise community members to complete their annual vegetation management work. Image: Steve Cook

Safe Councils, can support the funding and implementation of defensible space alongside other vegetation management activities.

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

The Bay Area Regional Report of the 4th California Climate Assessment outlines that projections of future wildfire activity in the region must incorporate weather conditions (temperature, wind, or precipitation), vegetation accumulation, as well as patterns of land use (increasing development in the WUI, ongoing urbanization). In some areas, risk to the built environment may increase with additional development, while in others, more concentrated urbanization may reduce overall wildfire risk.

One highlight from the report states that "land use planning, together with fire-safe building standards and near-building vegetation management, are important strategies for managing future fire risk to people and structures."

Napa County's Fire Hazard Abatement Ordinance supports the risk reduction outcomes recommended in the 4th Climate Change Assessment Regional Report for "near-building vegetation management," and enhances state defensible space guidelines, including Public Resource Code (PRC) 4291. Research and guidance from the National Fire Protection Association (NFPA) and the Insurance Institute for Business and Home Safety (IBHS) on the importance of an ember-resistant zone (zero to five feet surrounding structures) supports the efficacy of Napa County's Fire Hazard Abatement Ordinance on protecting homes from ignition during wildfire events. The ember-resistant zone included in the ordinance is also now also codified into state law for SRAs and will be included in new Board of Forestry and Fire Protection regulations by January 1, 2023 (AB 3074, Fire prevention: wildfire risk: defensible space: ember-resistant zones).

This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For more information on Napa County's defensible space and chipping programs, please visit the Napa County Fire Marshal's Office website. To learn more about Napa County's CWPP and 5-year community fuels reduction plan please visit the Napa Communities Firewise Foundation website.

Ranch Plan Fire Protection Program

Orange County

OVERVIEW

REGION
Southern California

POPULATION
1.7 million

TOOL TYPES
Fire Protection Plan

LEAD AGENCIES
Public Works Department (Development Services), Fire Authority

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2007, the Ranch Plan Fire Protection Program (RPFPP) was approved for the planned community of Rancho Mission Viejo in the County of Orange. The program, collaboratively designed by the Rancho Mission Viejo developers, the Orange County Fire Authority (OCFA), and the County of Orange Public Works Department, serves as an all-encompassing regulatory document that replaces countywide fire protection standards with requirements for the Ranch. The program also includes responsibilities for County and OCFA in terms of plan-checks and reviews.

The RPFPP illustrates a unique, comprehensive approach for master-planned communities to process all emergency access and fire safety issues associated with proposed development. The program also allows requirements to be renegotiated to reflect new state or local legislation, updated science, of other changes to local conditions.

This case study was selected as a WUI Planning Best Practice because it highlights how master-planned communities can be developed and implemented with fire protection requirements that address hazardous vegetation, structural vulnerabilities, public safety, emergency access, and more. This case study also shows how the design of this fire protection plan took an adaptive management approach to accommodate changes at the state and local levels. Finally, this case study shows the success of communication and collaboration between a developer, fire authority, and county department to achieve shared outcomes of fire resilience and risk management.

A Fire Protection Plan is a document prepared for a specific project or development proposed in the WUI. This plan describes ways to minimize and mitigate potential losses from wildfire exposure, such as through vegetation and fuel management (including defensible space), adequate emergency access, identification of approved water supply sources, WUI building standards, and ongoing maintenance. Fire protection plans can be required under a jurisdiction's fire code or other municipal code chapter.

TOOL DESIGN

In 2004, the County of Orange Board of Supervisors approved a general plan amendment, zone change, and development agreement to establish a comprehensive land development and conservation plan for more than 22,000 acres of land remaining in the historic Rancho Mission Viejo. The plan, known as the "Ranch Plan," set the stage for the future development of residential homes (including affordable housing), senior living facilities, businesses, schools, and supporting infrastructure; when fully built out, the Ranch will have more than 14,000 housing units. The plan also ensured that the majority of the project area would remain undeveloped and managed in its natural condition, a key component of its final approval.

Another key part of the approval process was for the developer to prepare an RPFPP. This program

Front Image: Orange County Fire Department

replaces all existing County of Orange Standard Conditions and OCFA Guidelines that are adopted by Ordinance, with fire protection standards, fuel modification requirements, and conditions of approval for all proposed development in the Ranch. The RPFPP does not replace, but does modify, some specific regulations in the California Building Code and does not replace nor modify the California Fire Code or other state standards.

Fire master plan guidelines in the RPFPP include criteria for fire access roadways (e.g., secondary emergency vehicle access, fire lanes, grades), premises identification, gates, hydrants and water availability, building construction features, interior landscaping and more. The RPFPP also requires automatic fire sprinkler systems for all structures (with limited exceptions).

Each applicable fire master plan must identify two science-based classifications for development areas: Radiant Heat/Ember Mitigation and Ember Mitigation Only. These two classifications are based on a development's location within the Ranch and proximity to fuel modification zones. All construction within the Ember Mitigation Only zone requires special construction features for venting, decks, and ornamental vegetation to address ember intrusion; in areas also vulnerable to radiant heat, additional special construction features are required for walls, windows, and decks.

Although a Ranch Plan Planned Communitywide Preliminary Fuel Modification Plan was approved for the peripheral edge of all ranch development planning areas, each new master plan area must also gain approval for a fuel modification plan specific to its project area. Fuel modification zones located directly adjacent to private parcels are required to be 110 feet wide, unless adjusted based on fire modeling, and consist of three zones with associated requirements:

Zone A – Setback Irrigated Zone (20 feet wide)

Zone B – Irrigated Zone (50 feet wide)

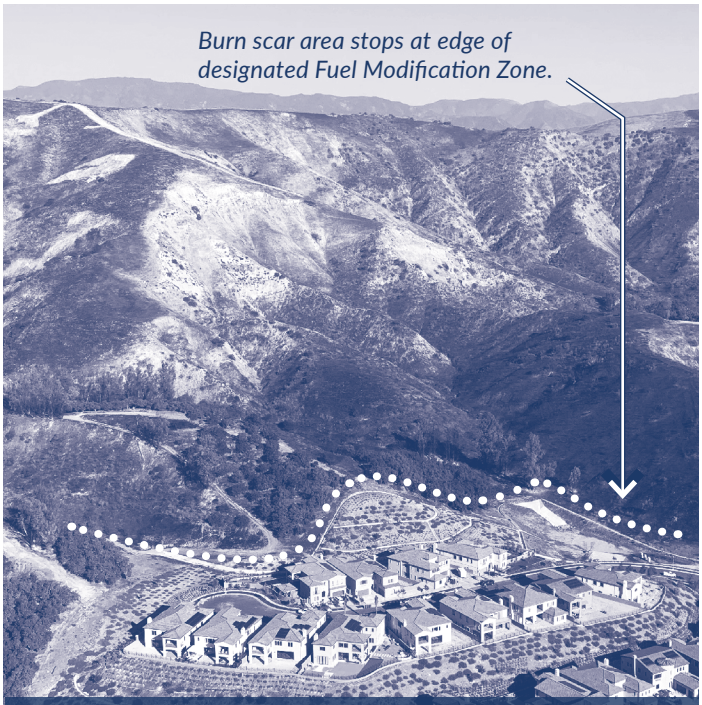
Zone C – Thinning Zone, Non-irrigated (40 feet wide)

IMPLEMENTATION

Permits and plans submitted for approval by the Rancho Mission Viejo developers are reviewed for compliance with standards established within the RPFPP. The County of Orange Public Works Department and the OCFA both have responsibilities for plan-checks and inspections, depending on the type of permit, plan, or inspection.

The RPFPP is also structured with a mechanism for revising the Ranch fire protection and fuel modification requirements as local and state regulations related to wildfire change. For example, a previous alternative development standard in the plan allowed greater spacing between hydrants in exchange for installing sprinklers in all structures. This is no longer modified as current fire code and state regulations have changed.

The RPFPP will continue to be updated as local and state regulations change, including new state requirements for ember-resistant zones, Fire Safe Regulations, and more.



Fuel modification zones, as required by OCFA, acted as a buffer for the Orchard Hills neighborhood in the City of Irvine during the 2020 Silverado Fire. Image provided by the Orange County Fire Authority.

COLLABORATION & ENGAGEMENT

The success of the RPFPP can be attributed to the ongoing support and collaboration between the Rancho Mission Viejo, LLC, the OCFA, and the County of Orange Public Works Department. One example of ongoing collaboration is in the inspection and maintenance of fuel modification and vegetation management. The RPFPP stipulated the creation of a Ranch Plan master maintenance corporation (Rancho MMC) that is responsible for annual inspections and all maintenance of Fuel Modification Zones within the Ranch. These areas are inspected annually to confirm compliance with approved plant types, vertical and horizontal grouping and spacing, replanting dead and dying vegetation, and the removal of undesirable species.

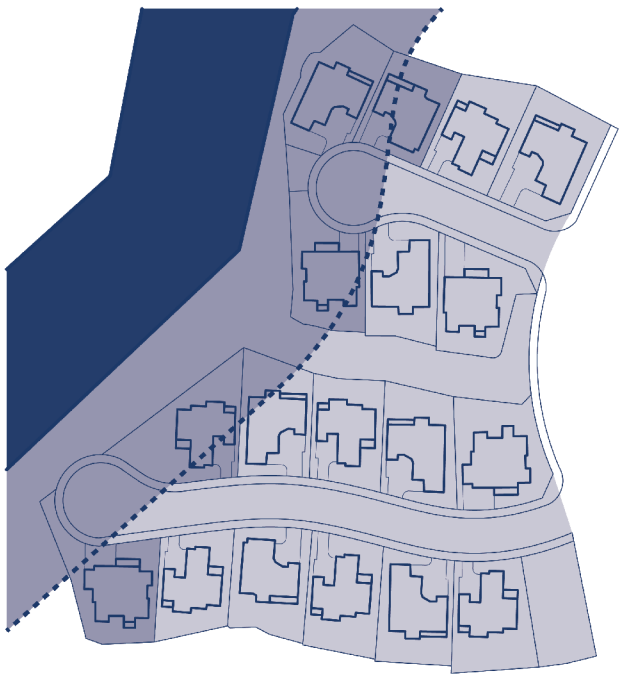
INNOVATIONS

The RPFPP offers a flexible approach with multiple benefits. The plan can be updated when state legislation gets passed, ensuring ongoing compliance with any new state requirements. In addition, alternative development standards within the plan help the developer and the County of Orange achieve wildfire risk reduction outcomes when modifications are needed to account for local needs. Alternative development standards are allowed so long as the outcome of the alternative meets certain performance standards and has specific project benefits that would be impossible to obtain under standard conditions.

Alternative development standards exist for road and street layouts, including curb-cuts, roundabouts, intersections, medians, and neighborhood entryways while maintaining fire

Irrigated vegetation along a slope in the community of Rancho Mission Viejo is inspected annually to ensure compliance with the Fuel Modification Zone maintenance requirements. Image provided by the Orange County Fire Authority.

access per state regulations. Project benefits may range from enhancing residential ambiance to better ongoing maintenance costs. The flexibility of alternatives allows both the County and the developer to adjust and re-adjust requirements for subsequent phases of development.



CONCEPTUAL FIRE MASTER PLAN AND FUEL MODIFICATION PLAN

All Ranch Plan development areas are potentially vulnerable to ember intrusion from a wildfire event. Therefore, all construction within the Ember Mitigation Only zone shall require special construction features intended to reduce impacts from ember intrusion (venting, decks and ornamental vegetation).

In areas vulnerable to radiant heat, an additional classification requires special construction features aimed at reducing impacts from radiant heat as well (walls, windows and decks).

Image: Ranch Plan Planned Community-Wide Fire Protection Program

FUNDING SOURCE

OCFA costs associated with administering the fire protection planning process, including initial permit and plan approvals, and inspections, are cost-recovered through permit application fees. Rancho Mission Viejo is also funding two new fire stations in the plan area. Any administrative costs for the Public Works Department (including updating and tracking amendments to the RPFPP, development review or permitting) is funded through a reimbursement agreement with the Ranch Developers that also guarantees expedited plan reviews.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering adopting a comprehensive fire protection plan for planned communities, the County of Orange's process offers key insights:

1. *Changes may be necessitated by science, legislation, or even unanticipated events such as economic downturns based on updates to the regulatory landscape. Creating strong collaborative partnerships and adding flexible mechanisms to open the approved plan and negotiate changes among signatories helps adapt the plan to these changing conditions while keeping fire safety at the forefront.*

2. *Creating performance-based alternatives to standards also allows for modifications based on site constraints or other factors while still achieving the intended outcomes.*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

California's Fourth Climate Change Assessment Los Angeles Regional Report acknowledged that climate projections indicate there could be a 60% increase in area burned as a result of Santa Ana driven wildfire events, and a 75% increase in non-Santa Ana driven events in the Los Angeles Region by the mid-21st century under a higher GHG emissions scenario, including in the County of Orange.

Although the Ranch has not directly experienced any structure losses, other fires in the region, including the 2020 Bond Fire, destroyed nearly 31 structures and damaged a further 21, underscoring the ongoing need for fire protection standards. As noted, the RPFPP will continue to be updated to reflect local and state regulations, including ember-resistant zones (AB 3074, Fire prevention: wildfire risk: defensible space: ember-resistant zones) and any applicable changes to the State's Fire Safe Regulations (SB 901).

This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For further information regarding the typical fire protection planning process please visit the Orange County Fire Authority's Development Services Webpage*, and for information regarding Ranch Mission Viejo please visit OC Public Works, Development Services webpage hosting* Ranch Plan documents.

Fire Safety Overlay Zone

San Bernardino County

OVERVIEW

REGION
Southern California

POPULATION
2.18 million

TOOL TYPES
Overlay Zone, Development Code, Fire Hazard Abatement, General Plan Integration

LEAD AGENCIES
County Fire District, Land Use Services Department (including Planning & Code Enforcement Divisions)

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2007, San Bernardino County established a Fire Safety (FS) Overlay Zone within their Development Code (Chapter 82.13) that requires additional development standards to provide greater public safety in areas with identified wildfire hazard. The FS Overlay was updated in 2017 to remove duplicitous policies that were no longer relevant or needed within the county code because they have since been addressed by state regulations.

The boundaries of the FS Overlay Zone were delineated utilizing data and institutional knowledge from CAL FIRE, the United States Forest Service (USFS), and the San Bernardino County Fire Protection District. As an overlay zone and associated development code tied to hazardous areas, particularly wildfire hazard, this land use planning tool allows the County Land Use Services Department and Fire District to require fire protection standards within the planning and entitlement process, including fuel modification plans. The FS Overlay is also included within the County's General Plan, known as the Countywide Plan – Policy Plan, Hazards Element as a geography in which wildfire risk reduction policies are applicable.

To strengthen long-term risk reduction outcomes of the FS Overlay standards, San Bernardino County implements an extensive fire hazard abatement inspection program for County and state regulations that confirm annual compliance with some standards outlined in the FS Overlay, including defensible space and fuel modification plans.

This case study was selected as a WUI Planning Best Practice because it shows a county that took early initiative in adopting an overlay zone as a regulatory strategy to address wildfire risk. In addition, this case study highlights several unique requirements within the overlay zone that help achieve fire risk reduction objectives while allowing for performance-based alternative means and methods. Finally, this case study shows how previously adopted regulations can continue to be supported by broader policies within the General Plan.

A fire hazard overlay zone is a type of overlay zone within a zoning ordinance or land use development code that applies requirements to specific areas of the community designated as a wildland-urban interface area or areas that are exposed to fire hazards. Specific land use restrictions or development standards for fire safety apply in these overlay zones, in addition to the development requirements established in the base zone.

TOOL DESIGN

The FS Overlay Boundaries pre-date CAL FIRE Fire Hazard Severity Zones (FHSZs) Maps and include a wide range of geographic and vegetative diversity, from the mountains, characterized by steep sloping terrain and heavy vegetative fuel loadings; through the valley foothills with moderate slopes and moderate fuel loading; to the relatively flat areas of the desert with relatively light, but volatile fuels; all of which contribute to high fire hazard conditions. Unique weather influences, such as the Santa Ana winds were also accounted for in the hazard delineation. The FS Overlay is used as a means for enforcing fire

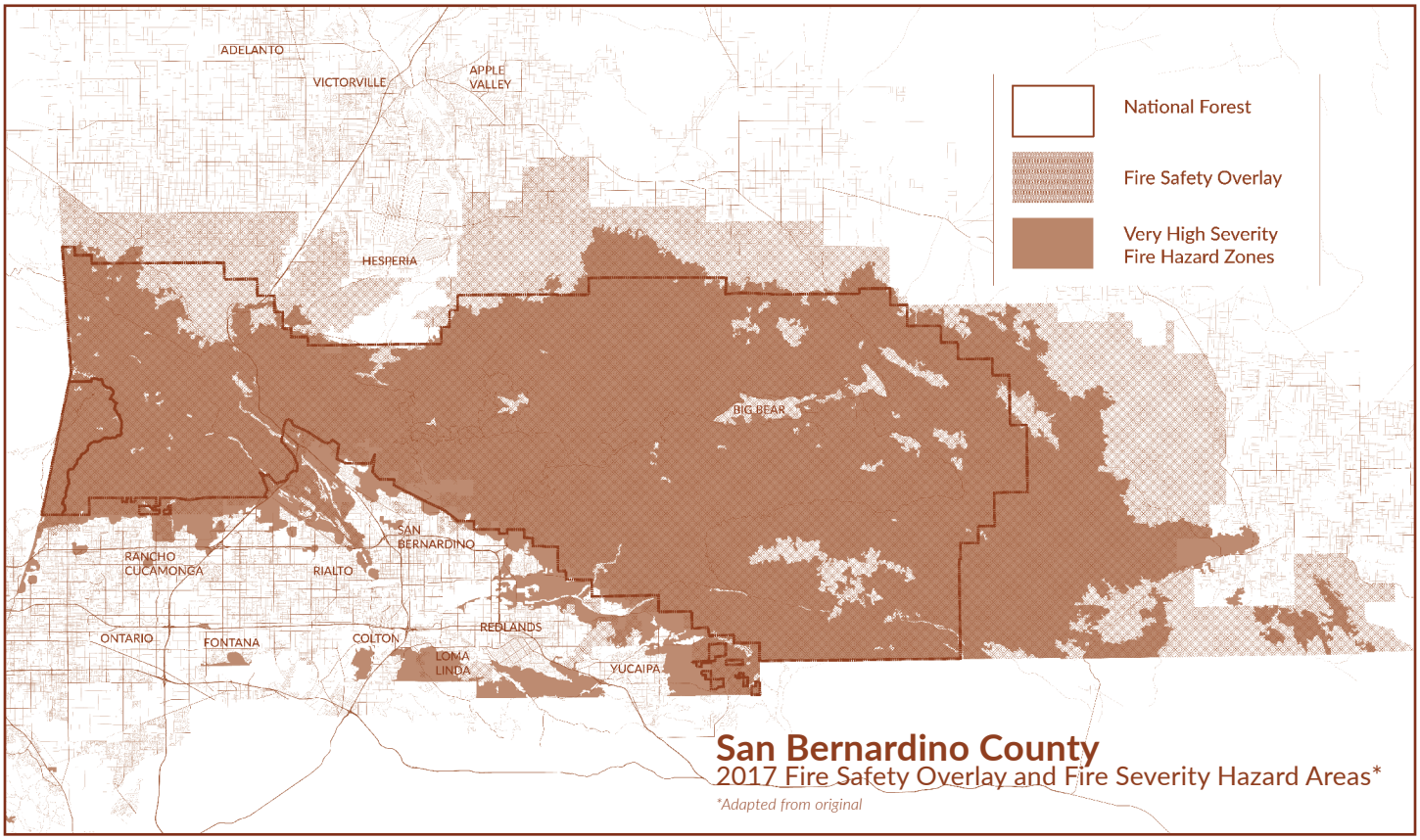
Front Image: Doc Searls via Flickr

protection development standards and adequate mitigation, as well as implementing General Plan Policies and additional ordinances, including Fire Hazard Abatement.

Each project located in the FS Overlay that goes through the entitlement process must submit a fuel modification plan that addresses fuel loading, ungraded slopes, maintenance, on-site water availability, and landscaping. In addition, each proposed development must comply with FS Overlay general development standards (82.13.050), including but not limited to:

1. *Residential density criteria that limit the number of dwelling units per gross acre based on slope percentage*
2. *Site and emergency access that requires a minimum of two points of ingress and egress, and minimum width of 26 feet of all-weather surface for roads*
3. *Private driveways or access roadways for residential units that have a 150-foot maximum length*
4. *Fencing requirements, including a minimum five-foot separation for wood or vinyl fencing and the wall of the nearest structure*
5. *Cul-de-sac length limits of 350 feet in length*
6. *Vehicular access to water sources, including ponds, lakes, swimming pools, reservoirs, and water storage tanks*
7. *Permanent fuel modification areas around a development project or portions adjacent or exposed to hazardous fire areas*

All applications must also comply with fire authority standards, including California Building Code Chapter 7A and California Residential Code Chapter 327. Some provisions offer exceptions with alternate hazard protection measures, dependent upon site-specific conditions. For example, fuel-modified areas around the perimeter of the development project may be expanded in cases when exterior wall separation requirements cannot be met.



An area outside the Rosena Ranch neighborhood before fuel modification work is performed. Images: San Bernardino County Fire Department

IMPLEMENTATION

Parcels located within the FS Overlay are tagged in the County's electronic parcel recording system. Any new application for a planning, building/safety, or land use permit for the construction of new structures, expansion of existing structures, or the subdivision of land within the FS Overlay Zone automatically triggers an additional review by the Fire Authority. Any recommendations from reviewing authorities are incorporated as conditions of approval where possible.

The FS Overlay was updated in 2017, as changes to the California Building Code Chapter 7A and California Residential Code Chapter 327 made some of the provisions redundant. However, the policies that exceed state standards remain, and the inclusion of fire prevention planning within the County's general planning and entitlement process remains a key outcome of the Overlay's standards.

After a project is approved, the code enforcement division is responsible for ensuring compliance with the conditions agreed upon in the approved permit, as well as annually inspecting fuel modification and defensible space.

COLLABORATION & ENGAGEMENT

As mentioned previously, a major benefit of the FS Overlay is that it allows the San Bernardino County Land Use Services Department and the Fire District to collaborate in addressing wildfire risk reduction, including requiring fuel modification plans within the planning and entitlement process. These fuel modification plans can determine on a case-by-case basis the types of plants and their spacing permitted, allowing for a specific treatment plan to be established based on fire behavior studies or prescriptions by fire professionals.

The County's Fire Hazard Abatement Division is housed within the Land Use Services Department, adding another layer of collaboration as those working on annual inspections partner closely with those approving development permits. Inspectors are active each year in working with homeowners to help them stay in compliance with county and state regulations for defensible space (including PRC 4291).

The County's Fire Hazard Abatement Ordinance (which is applicable in several FS Overlay areas) provides a framework for inspectors to work across diverse fire districts in the County to complete annual inspections. If homeowners are unwilling to complete the mandated work, the County will issue an abatement warrant and send a contractor, or a type 1 hand crew, to complete the work for them. Utilizing hand crews provides off-season funding to staff that typically only work part of the year. Abatement warrants are only required for developed parcels and are not obtained for open undeveloped lots.

Homeowners who have work done for them are required to reimburse the County for costs associated with the work, any late fees, and the administrative costs of the abatement warrant. If payment is not received within 60 days, the County will place a tax lien on their property. Economically disadvantaged homeowners may be directed to a FireSafe Council's work week or fire agency cost-sharing programs where available.

INNOVATIONS

The County's Land Use Development Code and FS Overlay are tied directly into the General Plan, also known as the Countywide - Policy Plan. The Plan was adopted in 2020 after a seven-year update process that utilized institutional knowledge from every department within the County government.

To help the community better access Policy Plan information, the county has created a web-based tool that allows users to select elements of the plan and search for specific goals or policies. The search function for "Fire" brings up 33 policy plan results and 12 community results across the land use, housing, transportation and mobility, personal and property protection, and hazards elements. While wildfire-related policies are included throughout the plan, they are grouped primarily within the Hazards Element including:

1. *Policy H-Z-1.13 Fire protection planning: requires all new development within the FS Overlay or CAL FIRE Very High Fire Hazard Severity Zones (VHFHSZs) to meet all state and local requirements for building and vegetation management.*
2. *Policy HZ-1.14 Long-term fire hazard reduction: requires proactive vegetation management/hazard abatement within the FS Overlay or VHFHSZs on private properties and along roadsides of evacuation routes. It also mandates new development enter into a long-term vegetation maintenance agreement for defensible space and fuel modification.*
3. *Policy HZ-1.15 Evacuation route adequacy: states that the County will coordinate with state agencies and local fire districts to ensure the maintenance and reliability of evacuation routes that may be compromised by wildfire.*

In some neighborhoods throughout San Bernardino County, goats are used to assist fuel modification efforts. Image: Don LeBold via Flickr

FUNDING SOURCE

Administrative costs associated with implementing standards attached to the FS Overlay are recovered through permit application fees.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering adopting a fire hazard overlay zone, San Bernardino County's process offers several key insights:

1. *Communities should consider tying land use tools like fire hazard overlay zones directly into General Plan policies to align wildfire planning priorities. This strengthens both the implemented tool and the General Plan.*
2. *Strong collaboration between the planning and code enforcement departments, as well as the fire authority, is essential to the efficient implementation of a fire hazard overlay zone where multiple departments are required to review permit applications or confirm compliance.*
3. *Flexibility should be built into the review process to allow the fire authority reviewing proposals to design outcomes that achieve the main goals of the overlay zone, including building fire resilient communities.*
4. *Fire hazard overlay zones should be designed to leverage future implementation of new best practice risk reduction ordinances as wildfire science and planning evolves.*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

California's Fourth Climate Change Assessment Los Angeles Regional Report indicates there could be a 60% increase in area burned as a result of Santa Ana driven wildfire events, and a 75% increase in non-Santa Ana driven events by the mid-21st century in the Los Angeles Region, including the western mountain communities of San Bernardino County. However, for regions of San Bernardino County located within the study area of the Inland Desert Regional Report, there is less certainty regarding the potential for increased wildfire activity as the climate continues to change due to annual variations in fuel loading, precipitation, and wind.

Any increase in wildfire activity will likely create elevated hazards for communities located in the FS Overlay, particularly as data shows that historical fire activity in the County has been clustered in and around populated areas and national parks, as well as along transportation routes. Work done to mitigate future and existing wildfire hazards through the standards included in the FS Overlay, as well as ongoing enforcement of State Fire Protection Regulations and the County Fire Hazard Abatement Ordinance, will protect communities in the future, regardless of projected risk.

This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For more information, please see the County of San Bernardino Land Use Services Department Website or the County's web-based Policy Plan Tool.

Carr Fire, Zogg Fire, Salt Fire, and Fawn Fire Disaster Recovery Ordinance

Shasta County

OVERVIEW

REGION
Northern California

POPULATION
180,000

TOOL TYPES
Post-Disaster Recovery Emergency Ordinance

LEAD AGENCIES
Resource Management Department, Fire Department

CLIMATE IMPACT AREA
Wildfire Resilience

SUMMARY

In 2018, the Carr Fire in Shasta County burned almost 230,000 acres and destroyed more than 1,600 structures in the unincorporated area and in the city of Redding. In subsequent years, the County has experienced several other major wildfires, including the 2020 Zogg Fire and the 2021 Salt and Fawn Fires, which collectively destroyed more than 400 additional structures.

Many of the homes lost in these fires were in rural, unincorporated areas of the County, with property owners struggling to recover and rebuild. Many struggled due to a widespread lack of fire insurance, or easily accessible financial resources that would aid in recovery. In response, the Shasta County Resource Management Department worked with the Board of Supervisors to adopt an urgency ordinance for the Carr Fire that has since been amended to support those impacted by the Zogg, Salt, and Fawn Fires and to extend the effective period for persons displaced by the Carr Fire by approximately 18 months.

Due to the scale of loss of housing units amidst a statewide housing crisis, the Shasta County Carr Fire, Zogg Fire, Salt Fire, and Fawn Fire Disaster Recovery ordinance temporarily suspends several countywide health and safety codes in order to expedite the ability of fire victims to transition to temporary housing while they rebuild or pursue other permanent housing options. The ordinance also adds other flexibility to the recovery process, such as allowing for the replacement, repair, and reconstruction of nonconforming structures damaged by the fires, automatically extending certain land use entitlements, and permitting the use of temporary cargo containers for secure storage of personal items.

This case study was selected as a WUI Planning Best Practice because it shows how counties can adopt and modify emergency ordinances to support the short and long-term recovery process following wildfires. This case study also highlights several unique provisions in the ordinance that support local recovery efforts, such as temporary housing and storage needs. In addition, this case study includes several strategies to assist lower-income residents with rebuilding.

Post-disaster recovery ordinances are a type of urgency ordinance that provide cities and counties with a means to address temporary housing needs, economic development, and other forms of relief to those affected by disasters or other emergencies. These ordinances can be adopted as standalone chapters or added to a jurisdiction's zoning code, health and safety code, or other chapter of the municipal code.

TOOL DESIGN

In 2015, Shasta County approved a robust emergency ordinance (SCC 2015-2) that grants the County supervisors and the Director of Resource Management powers to undertake actions during a declared local emergency that "preserve the public peace, health and safety, and to protect the life and property of those who have suffered damage from such events, by allowing safe temporary occupancy of affected properties, and facilitating the replacement, repair or reconstruction of those dwellings and

Front Image: CAL FIRE

structures that have been damaged or destroyed."

Shortly after the 2018 Carr Fire, it became clear to Shasta County that there was an urgent need to provide safe, legal options for persons displaced by wildfire to live in temporary dwellings on their property, or on other property within the County, beyond the options permissible under the 2015 ordinance. Many of those displaced by the Carr Fire and subsequent fires did not have the resources to quickly find nearby alternative housing that they could afford.

To support those impacted by the fire, the County quickly passed the Shasta County Carr Fire Disaster Recovery ordinance to allow those displaced by wildfires to live in a temporary dwelling—defined as a recreational vehicle, manufactured home, mobile home, or movable tiny house—for up to 60 days from the date the ordinance was adopted (or amended) without first obtaining approval from the County. This allowed people to immediately access temporary housing.

IMPLEMENTATION

Despite the rapid deployment of the urgency ordinance, safety and environmental health standards were required to protect the community. Temporary dwellings are required to be connected to a public sewer system, functioning on-site sewage disposal system, or a temporary holding tank with a contract for regular pumping, or other method of sewage disposal approved by the County Environmental Health Division.

After the first 60 days, displaced persons must obtain a building permit to continue utilizing temporary dwellings. The urgency ordinance includes rules for permitted temporary dwellings that mandate an approved source of water and source of electricity, in addition to the approved method of sewage disposal.

House lot and car after the Carr Fire in Redding California. (Forest Service photo by Cecilio Ricardo)

COLLABORATION & ENGAGEMENT

Since the 2018 Carr Fire, only around 25% of destroyed homes in unincorporated County areas have been rebuilt. For houses lost in the subsequent Zogg, Salt, and Fawn Fires, even fewer properties have been redeveloped, as many victims of these fires have struggled to maintain their fire insurance, and as such, have struggled to afford the cost of rebuilding.

The recent wildfires that Shasta County has experienced has allowed the County to improve upon its disaster response and recovery process, including the adoption and amendment(s) of the Disaster Recovery Ordinance. Some of these lessons learned have also resulted in pairing the Disaster Recovery Ordinance with programs for debris removal.

INNOVATIONS

Shasta County also realized that simply allowing temporary dwellings to be sited on damaged properties would not be sufficient to house all displaced persons in a sustainable manner. To utilize all possible housing options, the urgency ordinance also allows for existing guest houses to be rented to persons displaced by fires, which is otherwise prohibited pursuant to Shasta County Code.

In addition, the County has supported the permitting of ADUs by suspending associated development impact fees to expand the availability of housing units for fire displaced residents. In addition, the ordinance provides an opportunity for existing mobile home parks to expand to a maximum of 135% of the density established by the adopted zoning map. The innovative solutions related to ADUs and mobile home parks provide more permanent emergency housing options to displaced residents, while the solution related to guest houses provides an additional temporary housing option to displaced residents.

It also became clear that housing availability was not the only community concern. Displaced residents were struggling to safely store household belongs that either survived the fire or were either donated or purchased shortly after. To help keep this personal property secure, the County included a provision to permit a single cargo storage container per residential parcel within the ordinance. This allows displaced persons to store any surviving or new household belongings in a secure location on their property while they rebuild. Property owners must show a residence was destroyed, damaged, or rendered uninhabitable to receive a permit for a temporary cargo container storage unit.

The Urgency Ordinance allows each fire damaged residential property to house a single shipping container in order to store household belongings while residents rebuild. Image: DryboxUSA

FUNDING SOURCE

The lower socio-economic status of those primarily impacted by the Zogg Fire (versus the Carr Fire, for example), and the widespread lack of fire insurance resulted in a higher amount

of federal disaster aid delivered to the region, including FEMA and state funding for debris removal. This process was extensive, and even covered the cost of hazard tree removal, which successfully aided residents in preparing their properties for rebuilding. Although no state or federal debris removal assistance was provided for the Salt Fire, Cal OES will provide a fully funded debris removal program for the Fawn Fire.

For the Salt Fire, the County has stepped in to provide financial assistance in the form of no-cost demolition permits and landfill vouchers in the amount of $2,000 per parcel to property owners for structure demolition and debris removal. County support for debris removal has allowed displaced persons to begin the rebuilding process.

ADDITIONAL CONSIDERATIONS

REPLICABILITY

For communities considering adopting an emergency post-disaster recovery ordinance, Shasta County's process provides key insights:

1. *Having an approved emergency ordinance that already grants powers to local officials or staff to temporarily house displaced residents can aid in the quick adoption of an ordinance that outlines the implementation in response to a specific disaster event.*

2. *Allowing the flexibility of temporary dwellings*

New projects planned in the City of Redding will bring the first 3D-printed homes to Shasta County to support current and future disaster recovery and affordable housing options for the community. These homes can be built autonomously and with materials that are more fire-resistant, such as concrete. Innovative and rapid rehousing solutions like those included in Shasta County's Urgency Ordinance, paired with emerging technologies that may reduce the time and costs associated with rebuilding, can support those displaced by wildfire events.

to be used without a permit in the immediate aftermath of a wildfire event helps rapidly rehouse vulnerable residents.

3. *If there are requirements for temporary occupancy of property post-wildfire, including the completion of debris removal or clearance of hazard trees, it may be useful to establish a funding program to help economically disadvantaged residents meet the requirements.*

4. *Considering needs other than housing, like permitting cargo containers to store household belongings, can aid residents in long-term recovery.*

RESPONDING TO DATA, STATE REGULATIONS, & CLIMATE CHANGE IMPACTS

California's Fourth Climate Change Assessment Sacramento Valley Regional Report indicates there may be an increase in wildfire activity in the region, which includes Shasta County, in response to cycles of drought followed by extreme precipitation (and vice versa). An increase in rain during the winter and early spring months, followed by an extremely dry summer and fall months may contribute to an excess of dry, dead vegetation that can contribute to extreme fire behavior. The Regional Report also acknowledges that rural areas of the Valley, including Shasta County, house many "historically underserved populations" including farmworkers, low-income households, and tribal communities. These groups are less resilient to climate impacts, including wildfires.

Any increase in wildfire activity in Shasta County will likely create elevated hazards for communities located in areas of wildfire risk, particularly vulnerable communities in rural areas. To combat climate change, and increasing climate hazards, the state of California has developed the Integrated Climate Adaptation and Resiliency Program (ICARP), established by Senate Bill 246 (Climate Change Adaption, 2015). ICARP works to coordinate climate activities at the state, regional, and local levels in support of building climate resilience for vulnerable communities. Outcomes of Shasta County's Disaster Recovery Ordinance, including providing immediate housing options to displaced residents and associated programs that provide funding for debris removal align well with state priorities for improving the quality of life for present and future generations.

This case study is part of a series of Wildland Urban Interface (WUI) Planning Best Practices. Each case study focuses on a specific planning tool (or set of tools) that a community is utilizing to reduce risk and build resilience to wildfire across the state of California. This project is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

FURTHER INFORMATION

For further information on Shasta County's disaster recovery process see the Department of Resource Management's website.

APPENDIX A: RESEARCH AND METHODOLOGY

This appendix summarizes the research methodology and findings based on work conducted for this project. Research and findings are presented based on the general sequence of work undertaken: conducting a literature review, developing best practices evaluation criteria, creating a WUI planning inventory, developing and distributing a survey, compiling and categorizing information into a draft WUI planning tools guide, scheduling and conducting community interviews, evaluating each community tool for WUI planning best practices, and identifying final selections for WUI planning best practice case studies.

LITERATURE REVIEW

The project team (hereinafter referred to as "we") reviewed academic and scientific literature in several categories including the physical risks to the built environment and governance responses to wildfire disasters. Some of these articles include research on how and where houses have burned in past wildfire events, as well as the types of planning and governance activities that have occurred in post-wildfire disaster communities. The review also included several reports and guidance documents published by both government and non-governmental groups, including OPR, National Institute of Standards and Technology, California Board of Forestry and Fire Protection, American Planning Association, and the University of California Cooperative Extension.

This literature review helped guide initial work inventorying planning tools that communities are using across the State. It also helped avoid any potential duplication of case studies based on previous case study research already published. Finally, the literature review helped inform the development of criteria for evaluating WUI planning best practices.

BEST PRACTICES EVALUATION CRITERIA

For the purposes of the project, we generally defined a best practice as "a procedure that has been shown by research and experience to produce optimal results, and that is established or proposed as a standard suitable for widespread adoption" based on the definition provided by the Merriam-Webster Dictionary. Based on the literature review and team input, we developed draft evaluation criteria to adapt this definition to meet the objectives of the project to identify and evaluate WUI planning best practices. Evaluation criteria were based on eight categories:

Relevancy - *focuses on land use planning and the WUI*

Efficiency - *optimizes use of resources to carry out the practice*

Innovation - *introduces a creative approach to problem-solving land use challenges in the WUI*

Effectiveness - *produces measurable outcomes*

in terms of WUI risk reduction or resilience

Replicability - *can be adopted/implemented in other communities with similar characteristics and, if applicable, scaled*

Equity - *considers socially vulnerable groups as part of the implementation*

Collaboration - *engages stakeholders, including experts and members of the community, in the development, adoption, and implementation process*

Sustainability - *includes mechanisms for long-term implementation and adaptation to new conditions*

For each category, we developed a set of questions with a corresponding rating scale of 1-3 (3 as the highest) to ensure a consistent approach to community research and evaluation. This criteria was reviewed by the entire project team and finalized.

RELEVANCY

Does this best practice (plan/regulation/program) focus on land use planning in the WUI? If not, does it have a close alignment or strong potential to directly improve land use planning outcomes in the WUI?

Prioritize best practices that are focused on land use planning or directly complement land use planning.

Relevancy Rating:

- *3 = high (best practice has a primary focus on land use planning in the WUI in terms of its application of affecting land uses/built environment and its development, administration, and/or enforcement is through a land use planning department and connection to wildfire)*
- *2 = moderate (best practice has a connection with land use planning and the WUI/wildfire but may be developed, administered, or enforced through a separate department)*
- *1 = low (best practice outcomes have the potential to influence the built environment and the WUI or transfer similar hazard planning approaches/ tools to the WUI, but the connection is not currently well-established)*
- *0 = not applicable or red flag (best practice has no established connection to land use planning)*

INNOVATION

Is there an aspect of this best practice that makes it unique, creative, or innovative in terms of problem-solving wildfire risk in the WUI through land use planning?

Seek best practices that showcase an "above and beyond" approach or creatively meet state minimum requirements in areas with limited capacity/resources.

Innovation Rating:

- *3 = high (best practice exhibits a unique approach that showcases a new way of approaching the WUI, such as a tool or program that has not yet been adopted or implemented by other communities but shows potential impact)*
- *2 = moderate (best practice is somewhat unique in that the tool is familiar and has only been developed or adopted in several other communities)*
- *1 = low (best practice is already widely adopted elsewhere but the community has made some some minor tweaks that reflect novel changes for local needs)*
- *0 = not applicable or red flag (best practices represents a minimum standard without any novel changes)*

EFFICIENCY

What resources are required to develop and/or implement this best practice?

Seek best practices that efficiently use resources and/or an integrated approach to achieve multi-benefit outcomes and do not rely on a level of skills, funding, time, or capacity that may be infeasible for a community to initiate and sustain.

Efficiency Rating:

- *3 = high (best practice is highly efficient and organized in using resources that are available through ordinary practices and does not require difficult to obtain funding, skills, or other capacity; exemplifies an approach of "doing more with less")*
- *2 = moderate (best practice is somewhat efficient in using resources that are available through ordinary practices but may require less sustainable funds or more capacity to implement than is customary for the local department)*
- *1 = low (best practices requires a burdensome amount of time, resources, skills, or other capacity to develop and implement)*
- *0 = not applicable or red flag (an inefficient approach that is not a good use of resources for a known reason)*

EFFECTIVENESS

How does this best practice result in wildfire risk reduction and/or resilience outcomes for both current and projected wildfire risk within and around the community?

Select best practices that can be justified through tracking, metrics, or other successful implementation measures.

Effectiveness Rating (1):

- *3 = high (best practice has proven its effectiveness through a known measure such as tracking system, post-fire analysis, or other recorded outcomes with evidence of risk reduction over time)*
- *2 = moderate (best practice has a known measure such as tracking system or other recorded outcomes with potential to record evidence of change over time but is too soon to measure)*
- *1 = low (best practice can be measured or tracked, but no such system has been designed; or a system has been designed and shows negligible results)*
- *0 = not applicable or red flag (best practice was shown to be ineffective for a known reason)*

Does this best practice align with literature, data, traditional ecological knowledge, case studies or other information?

Aligning best practices with published, peer-reviewed literature, data, case studies, traditional ecological knowledge, or sources of information can help support its effectiveness and guide other communities in the process of replication.

Effectiveness Rating (2):

- *3 = high (best practice has specific and relevant literature, case study material, and other data to directly inform its effectiveness)*
- *2 = moderate (best practice general literature, case study material, and other data to help inform its effectiveness)*
- *1 = low (best practice is loosely mentioned in literature or other materials but there is no direct connection)*
- *0 = not applicable or red flag (best practice is not mentioned in any known literature, data or other information that recognizes its potential effectiveness)*

REPLICABILITY

Is the best practice organized and implemented in a logical manner that could be replicated by other communities?

Select best practices that are organized and implemented in a manner that does not rely on difficult practices that could constrain its replicability?

Replicability Rating:

- *3 = high (best practice can be explained without difficulty in terms of its administration and/or enforcement processes; materials or other best practice information can be replicated and transferred to other communities of similar or different scales)*
- *2 = moderate (best practice can be explained without difficulty in terms of its administration and/or enforcement processes; transfer of materials or other best practice information would require moderate to significant customizations to other communities)*
- *1 = low (best practice is difficult to determine how it could be transferred to other communities without significant obstacles)*
- *0 = not applicable or red flag (best practice cannot be transferred for a specific reason)*

EQUITY

How does this best practice address the needs of socially vulnerable or marginalized groups as part of the implementation?

Ensure that the needs of socially vulnerable groups are addressed and/or prioritized by this best practice; or ensure that disproportionate impacts to socially vulnerable groups are avoided or minimized.

Equity Rating:

- *3 = high (best practice has incorporated direct assistance tools or other methods to successfully address the needs of a potentially affected socially vulnerable groups, such as low-income, disadvantaged, English as a second language, or those with mobility constraints)*
- *2 = moderate (best practice has identified and considered the needs of a potentially affected socially vulnerable group or groups in its implementation, but specific assistance has not yet been implemented)*
- *1 = low (best practice has limited identification of the needs of a potentially affected socially vulnerable group or groups in its implementation, but specific assistance has not yet been implemented)*
- *0 = not applicable or red flag (best practice has not considered opportunities to address the needs of a potentially affected socially vulnerable group or groups in its implementation, or best practice may adversely impact these groups)*

COLLABORATION

What type of process was used to engage stakeholders, including experts and members of the community and socially vulnerable groups, in the development, adoption, and implementation process?

Consider best practices that reflect a participatory approach, community values, and stakeholder expertise.

Collaboration Rating:

- *3 = high (best practice was developed in a manner that directly reflects a participatory process during the appropriate stages, such as design, development, and/or implementation to incorporate community voices; if applicable, a range of local technical expertise including*

traditional ecological knowledge and representation spanning local boundaries were part of the development process to ensure a multidisciplinary and cross-boundary approach)

- *2 = moderate (best practice aligns with community values as expressed through the General Plan or other planning process; some outreach may have been conducted; some technical and local experts were consulted in the development process)*
- *1 = low (best practice incorporated minimal public input or stakeholder)*
- *0 = not applicable or red flag (best practice was developed exclusively outside of the public realm and did not invite any other stakeholders)*

SUSTAINABILITY

Are there mechanisms to ensure long-term implementation of this best practice?

Consider how best practice will be updated, maintained, and implemented over time, including adapting to future conditions.

Sustainability Rating:

- *3 = high (best practice has operational and fiscal methods in place to continue its implementation regardless of staff transitions or future changes to local budgeting; best practice is annually evaluated to adapt to changing conditions)*
- *2 = moderate (best practice is likely to succeed but some challenges may exist in its long-term implementation; best practice can be evaluated to adapt to changing conditions)*
- *1 = low (best practice has several known factors which may hinder its ability to be implemented in the long-term, such as unsustainable sources of funding, time-limited staff positions, etc.)*
- *0 = not applicable or red flag (best practice is not sustainable for a specific reason)*

Additional information gathered during the best practice research phase included:

- *What is the tool / type: ordinance, policy, plan, program, incentive?*
- *Select best practices that represent a range of tools.*
- *What is the stage at which this best practice occurs?*
- *Select best practices / case studies that represent different aspects of development and implementation, including pre- and post-fire, new and existing development, etc.*
- *What is the scale (building, lot, subdivision/ neighborhood, zone(s), communitywide) and geographic area that is addressed by this best practice?*
- *Consider best practices / case studies that represent a range of local geographic and social characteristics.*
- *What is the administrative process?*
- *Capture detailed information on roles and responsibilities of different agencies, resources, costs, and other information not otherwise captured above.*
- *(If applicable) What is the funding source(s)?*
- *Information on the funding mechanisms used to complete planning, implementation, monitoring, etc.*

WUI PLANNING INVENTORY

We reviewed a variety of planning and fire-related documents for all 58 counties across California to

understand which tools communities are using, including: General Plans (specifically the Safety Element and Land Use Element), Community Wildfire Protection Plans, Local (or multi-jurisdictional) Hazard Mitigation Plans, land use regulations and zoning codes related to fire hazard mitigation, local amendments to required building or fire codes that uniquely address fire, and other planning documents including climate adaptation plans.

We also reviewed similar planning tools for all 189 LRA jurisdictions within the VHFHSZ across the State. Additionally, we reviewed several other documents including fire prevention programs, landscape plans, climate action plans, open space and recreation plans, and resilience and recovery plans where available.

Of the 109 Federally Recognized Tribal Nations in California, we identified 39 nations with potentially relevant fire management and land use planning tools based on internet research. We reviewed the applicable programs and tools for each of these Nations related to wildfire management, climate adaptation, and the limited number of Tribal CWPPs that were available online.

In reviewing communities, we kept our focus primarily on activities that were tied to plans and the planning process in terms of land use, community development, and mitigation of the built environment. We did not focus on activities that were oriented toward suppression and response such as emergency management plans, national voluntary/education programs for residents such as the Firewise USA® programs or Ready, Set, Go!, vegetation management plans for landscape-scale treatments, forest management plans, and adoptions of state requirements such as building codes and fire codes unless there is evidence of an effective local approach to its adoption and implementation.

The WUI Planning Inventory provided a broad snapshot of the plans, regulations, and other related activities that communities have adopted for both pre-fire and post-fire planning. This offered a useful and efficient way to quickly access materials and information and identify potential community examples of interest related to the WUI. The inventory also helped illustrate that communities across the State are using a variety of planning and regulatory strategies to address wildfire risks in the WUI.

The WUI planning inventory had several limitations. Despite its broad scope, our research was limited to what was available and current online—a more comprehensive inventory would require additional outreach to every jurisdiction and Tribal Nation in the State. Ensuring the accuracy of links and materials also requires ongoing review and maintenance to maximize the inventory's usefulness in the future. Finally, it is difficult to measure the effectiveness of all online materials as a WUI planning best practice without a deeper level of analysis that would require extensive input from local stakeholders beyond the scope of the current project.

WUI PLANNING SURVEY

To cast a wider net for identifying potential WUI planning best practices, we developed a 17-question WUI planning survey for online distribution. Survey questions were designed to help our team better understand a respondent's perception of their community's risk, current planning tools they utilize or have considered and their perceived effectiveness, potential barriers and drivers of wildfire planning and mitigation tools, and topics that respondents may want to learn more about related to wildfire mitigation and planning. The survey also included several opportunities for respondents to identify potential best practice planning tools in short answer form.

We sent the survey to the directors of all California planning departments included on an internal OPR contact list, the Board of Forestry and Fire Protection's general mailing list, and CAL FIRE's Land Use Planning Program and Subdivision

Review program staff, Pre-Fire Engineer mailing list, and the NorCal and SoCal Fire Prevention Officer groups. California Board of Forestry and Fire Protection staff also sent the survey to the Inter-Tribal Long-Term Recovery Foundation. In total, we estimated that the survey was sent to an initial group of approximately 600 individuals and was further forwarded to others.

We received 117 responses reflecting diversity in location and professions (planning, fire, resource management). Highlights from survey responses showed more than half of respondents have experienced a fire in their community within the past five years. Recent destructive fires also ranked highest as an extremely influential driver of wildfire mitigation. Many respondents are using or have considered wildfire hazard overlay districts and post-disaster wildfire recovery plan; however, less than half of respondents have considered other tools such as special assessment districts, TDR programs, or property buyout programs for wildfire.

Survey comments provided a range of suggestions related to WUI planning tools, some of which became helpful leads for follow-up research and potential case studies. Other comments were focused on related but different topics than what our team was seeking, such as the Ready, Set, Go! program being implemented by fire departments. The survey also revealed that few respondents are considering strategies such as managed retreat or parcel buy-out programs. Finally, the range of comments underscored that there is no broad consensus on what "WUI planning" means and that there are many practitioners engaged in a variety of WUI activities across the State.

WUI PLANNING TOOLS GUIDE

Based on the compilation of the WUI planning inventory and WUI planning survey results, we identified an initial set of three broad categories that communities and tribes are using that address WUI planning: plans, regulations, and additional tools. These categories included general plans, local ordinances, landscape guides, special assessment districts, fire hazard abatement programs, open space plans and more.

For each planning tool within these three categories, we created a summary to briefly describe the purpose of the tool in terms of its relationship to the WUI. This resulted in a total of 21 distinct tools that were matched with 37 communities from the inventory and survey results. These matches indicated where a community example could help illustrate a specific planning tool, and where there was potential for follow-up research to identify a case study. This process was beneficial for narrowing the WUI planning inventory into a manageable set of featured communities and potential WUI planning best practices but it's also important to recognize that the final guide does not include every potential example identified in the inventory. Many communities are doing exemplary work and just because they are not included in this guide does not diminish their WUI planning efforts.

COMMUNITY INTERVIEWS

We selected 21 communities for potential interviews to learn more about their WUI efforts and determine if they may be suitable as a WUI planning best practice case study. Our selections were based on our initial research of perceived relevance to land use planning, diversity in jurisdictional scale, type and location across the State, applicable survey respondent suggestions, and feedback from all members of the team to incorporate practitioners' experience in the State.

During follow up research to further evaluate each community's potential as a case study, we eliminated seven communities: three communities were eliminated for the likelihood they would not adequately meet our established best practice criteria (e.g., their tool was not seen as relevant

or there was contrary information once we did further research); one was eliminated for location and tool type redundancy; one community was eliminated for limited information on tool implementation; and two communities did not respond to several follow up interview request emails or did not have the capacity to participate in an interview.

Following this process, we conducted 14 one-hour virtual interviews. Across the 14 interviews, there were a total of 45 interview participants representing planning, fire, public works, building or engineering, and code enforcement departments. Each interview was tailored to a specific tool of interest; however, interview questions were guided towards understanding how the tool in question would fit with the eight best practice criteria categories.

Community interviews provided our team with an opportunity to explore the nuances, history, and status of planning tools. In many cases, conversations also revealed insights into how planning tools and departments were coordinated across broader WUI planning and mitigation activities.

COMMUNITY EVALUATIONS

For each community interviewed, we applied the WUI planning best practices criteria to evaluate each community for its potential as a case study. We focused our evaluation on the primary tool discussed during each community interview and evaluated this tool across all eight categories (one community was evaluated on multiple tools based on the integration of local plans). We also provided general comments relevant to the evaluation, a total number based on ratings from all evaluation categories, and a general determination of high, medium, or low regarding whether the community may be suitable as a case study based on the evaluation rating and team discussion.

The evaluation process revealed that many best practices rated high in several categories, but no community rated high in every category. Innovation, Collaboration, and Relevancy were the categories where most communities rated highest. In some cases, Innovation focused on creative ways to accomplish tested tools rather than the tool itself. In addition to the specific criteria considered for our evaluation, we observed several other themes from the community interviews, including the importance of having local flexibility in the design and implementation of planning tools, being opportunistic in terms of timing, and working within the constraints of other regulatory frameworks.

WUI PLANNING BEST PRACTICES CASE STUDIES

Based on community interviews, follow up evaluations as a WUI planning best practice, and team discussions:

- *Nine communities were rated as HIGH suitability for case studies*
- *Three communities were rated as MEDIUM suitability for case studies*
- *Two communities were rated as LOW suitability for case studies*

The nine communities selected for case studies to showcase representative WUI planning best practices are listed in Table 1 below, in alphabetical order.

TABLE 1. CASE STUDY SELECTION FOR WUI PLANNING BEST PRACTICES

COMMUNITY NAME	PRIMARY TOOL
Butte County	Upper Ridge Community Plan
City of Carlsbad	Landscape Manual
City of Malibu	Landscape Water Conservation and Fire Protection Ordinance
City of Santa Barbara	Wildland Fire Suppression Assessment District
Mariposa County	Wildfire Plan Alignment
Napa County	Fire Hazard Abatement Ordinance
Orange County	Ranch Plan Fire Protection Program
San Bernardino County	Fire Hazard Overlay Zone
Shasta County	Carr Fire and Zogg Fire, Salt Fire, and Fawn Fire Disaster Recovery Ordinance

Case studies were written by the project research team based on community interviews and any additional research conducted, such as document reviews of plans, ordinances, presentations, and similar materials. All draft case studies were shared with the primary points of contact from each case study community to request their review and feedback. Any edits from community reviewers were integrated into the final case study to ensure each case study accurately reflects the featured WUI planning best practice.

WILDLAND-URBAN INTERFACE PLANNING GUIDE

Examples and Best Practices for California Communities

August 2022

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH · STATE OF CALIFORNIA

CWPC
Community Wildfire Planning Center

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
CAL FIRE
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BOARD OF FORESTRY AND FIRE PROTECTION

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Cap and Trade Dollars at Work