

Insurance Institute for Business & Home Safety

# CALIFORNIA WILDFIRE PUBLIC POLICY: MAPPING THE WILDFIRE HAZARD

The scale of wildfire damages in America is worsening—and this trend must change. Nowhere is the wildfire hazard more prevalent and costlier than in California. The Camp Fire of November 2018 was the most deadly and costly wildfire in the recorded history of California wildfires. Extremes of weather, fuel, and complex topography came together to create a worst-case scenario—resulting in \$16.5 billion of losses, including \$12.5 billion of insured losses.<sup>1</sup> 2020 was another devastating year for California wildfires, accounting for five of the state's six largest wildfires, with more than 4.2 million acres burned and an estimated \$5–\$9 billion in losses.<sup>2</sup>

Although IBHS science-based research has identified ways to make homes and communities more resilient to wildfire (see “*IBHS Suburban Wildfire Adaptation Roadmaps*” on page 3), meaningful risk reduction requires individual, community, and government action. To increase California's resilience to wildfire, government resources and expertise must continue to be applied toward improving the state's wildfire resources, strengthening and enforcing wildfire building codes, and incentivizing resilience investments with state funds. **Improvements to California fire hazard severity zone (FHSZ) maps and a related expansion of the applicability of California's wildfire building code (Chapter 7A)—such as the ones proposed in California Senate Bill 63 (2021)—could strengthen these capabilities.**



*A photograph of a neighborhood destroyed during the Camp Fire in California in 2018.*

<sup>1</sup> <https://www.munichre.com/topics-online/en/climate-change-and-natural-disasters/natural-disasters/the-natural-disasters-of-2018-in-figures.html>

<sup>2</sup> <https://www.insurancebusinessmag.com/us/news/catastrophe/billions-in-insured-losses-for-2020-wildfires--rms-242108.aspx>



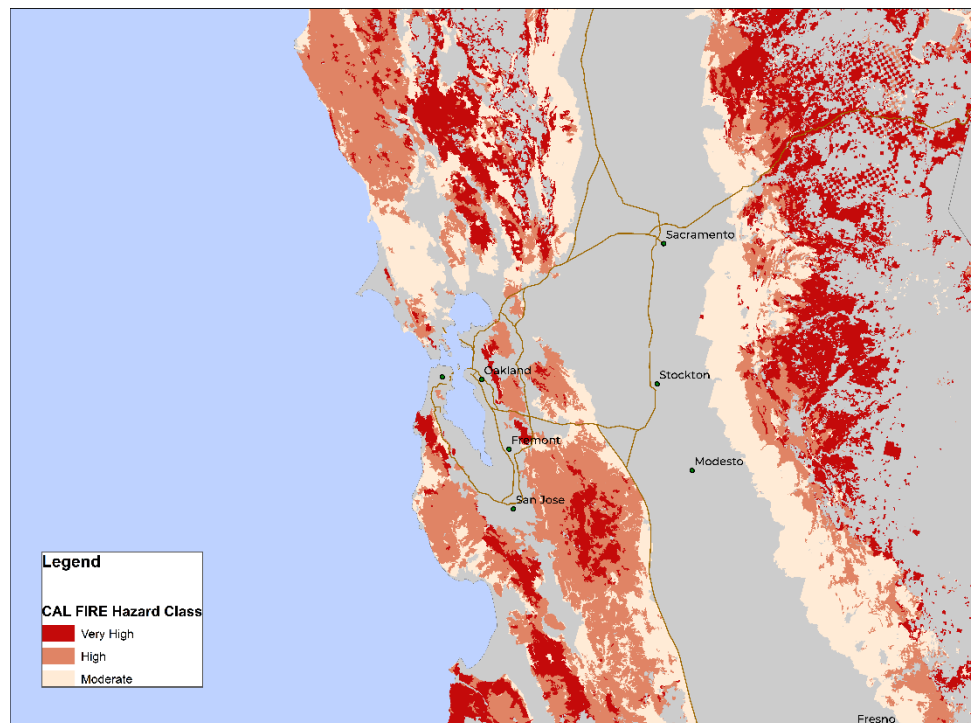
For more information, visit [IBHS.ORG/WILDFIRE](https://www.ibhs.org/wildfire)

## FIRE HAZARD SEVERITY ZONE MAPS SUPPORT RESILIENCE – BUT COULD BE IMPROVED

California’s FHSZ maps, created and maintained by the California Department of Forestry and Fire Protection (CAL FIRE), are a strong tool in California’s wildfire resilience toolbox. These maps inform local jurisdictions and residents whether they live in or near wildfire hazard areas, allowing them to make risk-informed choices about investing in resilience and property maintenance. Also, the designation of an area as an FHSZ triggers the applicability of California Building Code Chapter 7A, which has additional requirements specific to wildfire risk. However, limitations on the scope of existing FHSZ maps diminish their use as a statewide resilience tool. As California works to curb its worsening wildfire risk, the improvement and expansion of FHSZ maps would contribute to a safer and more resilient state.

By using CAL FIRE’s FHSZ maps, California residents can determine if they live in or near a wildfire hazard area. Armed with this knowledge, residents can take steps to make their home and property more resilient to wildfire, such as those identified in IBHS’s Suburban Wildfire Adaptation Roadmaps (see Box 1). CAL FIRE also has identified low-cost ways for homeowners to strengthen their resilience to wildfire by hardening their homes and creating defensible space, also known as home ignition zones, on their property,<sup>3</sup> many of which align with IBHS’s science-backed resilience pathways. FHSZ maps can also alert communities that they need to take community-wide steps to reduce wildfire risk, such as participating in the National Fire Protection Association’s (NFPA) Firewise USA program or California’s Fire Safe Council program.

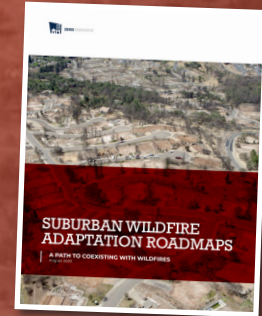
*Shown to the right is an example of a fire hazard map.*



<sup>3</sup> <https://www.readyforwildfire.org/wp-content/uploads/Low-cost-Retrofit-List-Final.pdf>

## IBHS SUBURBAN WILDFIRE ADAPTATION ROADMAPS

The key to preventing wildfires from becoming suburban disasters is to keep them from entering and spreading into the built environment. In 2020, IBHS released the Suburban Wildfire Adaptation Roadmaps, a detailed examination of wildfire vulnerabilities and specific solutions that – when put into action – can limit the catastrophic reach of wildfire as it approaches neighborhoods beyond the traditional wildland-urban interface (WUI). In the Roadmaps, IBHS has identified key vulnerabilities for suburban neighborhoods, setting a clear starting point so the most critical areas can be addressed first. The Suburban Wildfire Adaptation Roadmaps provide decision trees that show the range of possibilities and what to avoid. When put into action by homeowners, and whole communities, the risk curve can be bent downward to limit the catastrophic reach of wildfires.



IBHS identified the critical lanes across the elements of a suburban home and its surroundings that can increase or decrease the chance a home survives a wildfire:

- Fuel management
- Fences
- Decks
- Building shape
- Walls
- Roofs
- Vents
- Eave overhangs

In communities with closely spaced structures, the survivability of one structure depends on the surrounding buildings and the fuel they supply for a fire to grow and spread.

There are a set of required actions that must be addressed before any other mitigation action can effectively reduce a home's vulnerability. These include:

- Replacing unrated roof materials or unmaintained Class C roofs
- Ensuring a vertical noncombustible zone, including siding, sheathing, and structural framing, extends at least 6 in. above grade
- Keeping the area under decks free of combustibles
- Covering vents with 1/8-in. or smaller noncombustible mesh screening
- Removing combustible mulch and vegetation as well as boats, RVs, sheds, and other large combustibles from the 0–5 ft zone around the home (noncombustible home ignition zone)

Fuel management is one of the best ways to lower the risk to structures in the path of wildland fires. Managing and reducing available fuels surrounding a home can help defend against the three ignition mechanisms (ember exposure, direct flame contact, and radiant heat from flame) and provide a better opportunity for first responders to defend the house.

Of the areas around a home, the zone that extends outward 5 ft from exterior walls is critical. The best practice is to avoid anything that can burn, but when used with gravel or rock ground cover/mulch, fire-resistant plants can help slow fire from spreading or reduce the intensity of fire in the 0–5 ft noncombustible home ignition zone.

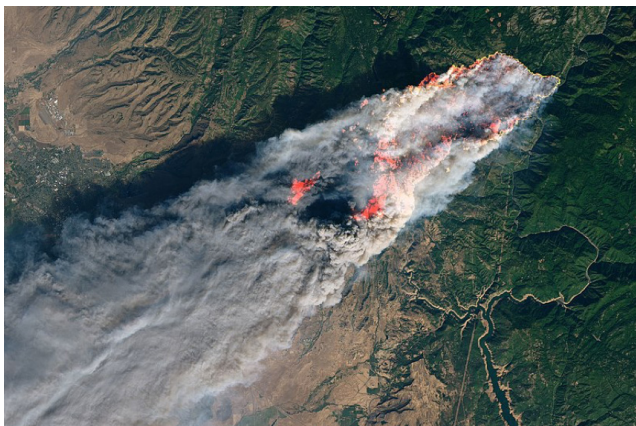
California uses FHSZ maps to designate the areas of the state required to comply with Chapter 7A of the California Building Code, as well as where defensible space is required and where certain natural hazard disclosures are required. Construction requirements in Chapter 7A increase a home's flame and ember intrusion resistance during wildfires. These requirements include minimum standards for construction materials and assemblies used on the exterior/shell of the building.

Notwithstanding their importance, existing FHSZ maps have a significant limitation derived from their scope and applicability. This limitation does not stem from CAL FIRE's capabilities—in fact, CAL FIRE can and does map the entirety of the state for all levels of fire hazard severity zones—but rather California law does not have moderate and high severity zones in local responsibility areas. Expanding CAL FIRE's authority to make recommendations to local jurisdictions would provide better knowledge and protection to all homes and businesses in local communities facing wildfire risk.

More specifically, wildland fire protection within the state falls into three distinct responsibility areas:

- **LOCAL RESPONSIBILITY AREAS (LRAs)** include incorporated cities, cultivated agricultural lands, and portions of the desert. Local responsibility area fire protection is typically provided by city fire departments, fire protection districts, counties, and by CAL FIRE under contract to local government.
- **STATE RESPONSIBILITY AREAS (SRAs)** are areas where the state has primary financial responsibility for wildland fire protection. Incorporated cities, densely populated areas, and lands under federal ownership are not included in the SRA.
- **FEDERAL RESPONSIBILITY AREAS (FRAs)** include areas under federal ownership. The federal government owns nearly 58 percent of California's 33 million acres of forestland.

Following California law, CAL FIRE's FHSZ maps identify moderate, high, and very high fire hazard zones in the state responsibility areas, but only very high zones in local responsibility areas. This gap could leave residents in local responsibility areas with the mistaken impression that they do not live in a hazardous area when, in fact, they do. Wind-borne embers do not respect jurisdictional boundaries and can blow miles ahead of a wildfire and account for up to 90 percent of home ignitions during these events. What's more, any vulnerable home acts as an available fuel, whose ignition exposes surrounding homes to radiant heat or direct flame contact and the entire community to ember exposure. This tragic reality resulted in widespread community devastation from the Tubbs, Camp, Glass and other recent wildfires—every home and business in the affected areas was at risk regardless of whether they were in a zone that was subject to Chapter 7A requirements.



*Landsat image of Camp Fire late morning of November 8, 2018. The image is infrared enhanced to show the location of active fires.*



*A home on the western edge in the community of Paradise after the Camp Fire. It was built after 2008 and to the California Building Code Chapter 7A requirements. Photograph courtesy of Munich Re.*

## IMPROVING CHAPTER 7A

Building codes are not static and should reflect the latest understanding of hazards and vulnerability. IBHS has identified the following areas where Chapter 7A (2019 edition) should be improved:

**ROOF EAVES (702A):** As currently defined, roof eaves can be open or closed. Research shows that (en)closed eaves are less vulnerable to flame and ember entry.

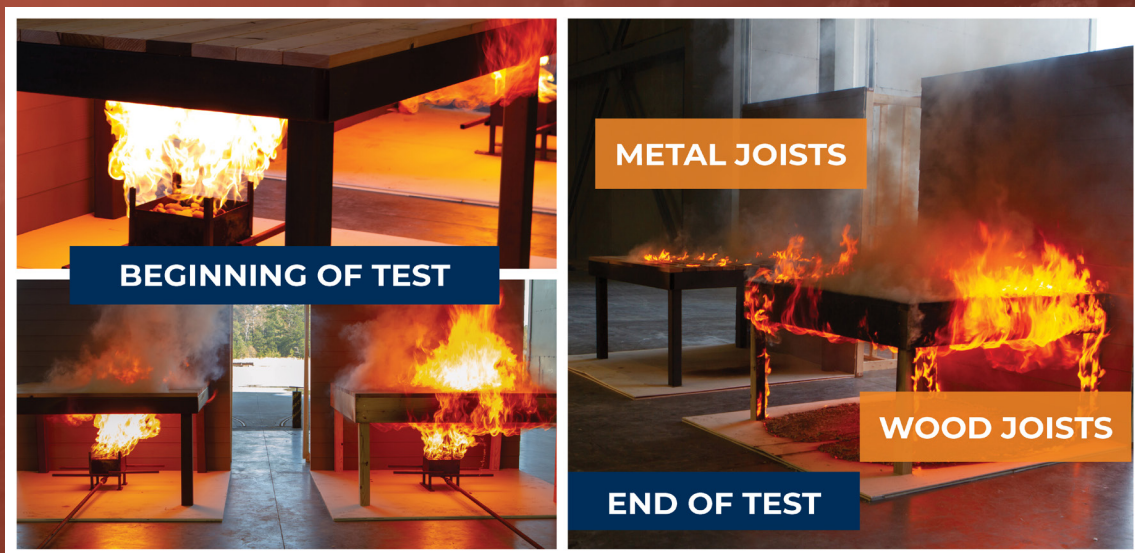
**ROOF GUTTERS (705A.4):** Vinyl gutters can ignite and melt, creating a burning plastics fire on the ground near an exterior wall. IBHS research has shown the importance of noncombustible gutters in addition to regular maintenance to remove debris. A metal drip edge at the roof edge provides some resistance to flame if debris does ignite.



*IBHS research shows the risks gutters pose when debris ignites and exposes an exterior wall to a burning plastics fire.*

**EXTERIOR WALLS (707A.3):** Because embers can accumulate at the base of walls, IBHS recommends a vertical noncombustible zone of 6 in. between the ground and the siding. In addition, the current requirement does not address all modes of flame spread. IBHS also recommends addressing all flame spread directions (vertical, lateral, and flame penetration) to avoid the exposure of vulnerable components like windows to direct flame contact.

**DECKING SURFACES (709A.3):** Combustible walking surfaces (e.g., wood) are vulnerable to ignition from embers and under deck flames. Several combustible materials are currently compliant with Chapter 7A. In addition to steps that must be taken to create more restrictive compliance criteria, IBHS recommends using noncombustible (e.g., metal) joists or covering combustible joists with foil-faced bitumen tape.



*IBHS deck research highlights the benefits of using metal joists rather than wood joists.*

# CALIFORNIA CAN STRENGTHEN WILDFIRE RESILIENCE BY IMPROVING ITS FHSZ MAPS AND EXPANDING THE APPLICABILITY OF CHAPTER 7A WILDFIRE BUILDING CODE

CAL FIRE is updating the state's FHSZ maps. This update provides a crucial opportunity to improve on CAL FIRE's existing work and expand the scope of the maps, as does California Senate Bill 63, which proposes expanding the scope of FHSZ maps and the applicability of California's wildfire-specific building code requirements. California should consider taking the following four actions to improve the wildfire resilience of its residents and communities:

- **EXPAND CAL FIRE'S MAPPING AUTHORITY.**

As proposed in SB 63, California can improve its resilience to wildfire by extending CAL FIRE's authority to recommend moderate and high fire hazard severity zone designations for local responsibility areas. This reform would provide California residents and policymakers with a more accurate understanding of their exposure to wildfire, the importance of hardening their homes and creating defensible space (home ignition zones) around their structures, and the necessity of increasing resilience at the community level.

- **APPLY CHAPTER 7A TO EXPANDED FHSZ MAPS.**

As proposed in SB 63, California should update its building code laws to apply Chapter 7A requirements to all fire hazard severity zones in local and state responsibility areas, including newly identified ones (e.g., moderate and high severity zones in local responsibility areas). Although not tied to FHSZ maps, California also should require that any house destroyed by wildfire—regardless of whether it is in a fire hazard severity zone—be rebuilt in compliance with Chapter 7A. Such expansions of Chapter 7A's applicability will make California's future homes more resilient than its existing housing stock.

- **IMPROVE CAL FIRE'S MAPPING METHODOLOGY REGARDING NEIGHBORHOODS.**

Current FHSZ maps do not reflect the shape of suburban neighborhoods. For example, some neighborhoods may have a section of houses or streets in a very high fire hazard severity zone while the rest of the neighborhood lacks any designation at all. If one part of a neighborhood is in a fire hazard severity zone, the entire neighborhood is at risk. CAL FIRE should update its mapping methodology to incorporate all parts of a neighborhood into the highest relevant fire hazard severity zone if at least some part of that neighborhood falls within that zone.

- **USE IMPROVED FHSZ MAPS IN PRIORITIZING WILDFIRE MITIGATION INVESTMENTS.**

Finally, California should use improved and expanded FHSZ maps to help inform the state's investments in wildfire resilience. California has developed a comprehensive wildfire mitigation program to “encourage cost-effective structure hardening and retrofitting to create fire-resistant homes, businesses, and public buildings.”<sup>4</sup> More accurate and detailed FHSZ maps would be an additional tool for California policymakers and relevant state offices—including the Office of Emergency Services and Department of Forestry and Fire Protection—to prioritize wildfire mitigation investments and incentives under this program for those communities that are exposed to wildfire.

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<sup>4</sup> [https://leginfo.ca.gov/faces/billTextClient.xhtml?bill\\_id=201920200AB38](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB38)