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# Wildfires in California – Zooming in on the Wildland Urban Interface

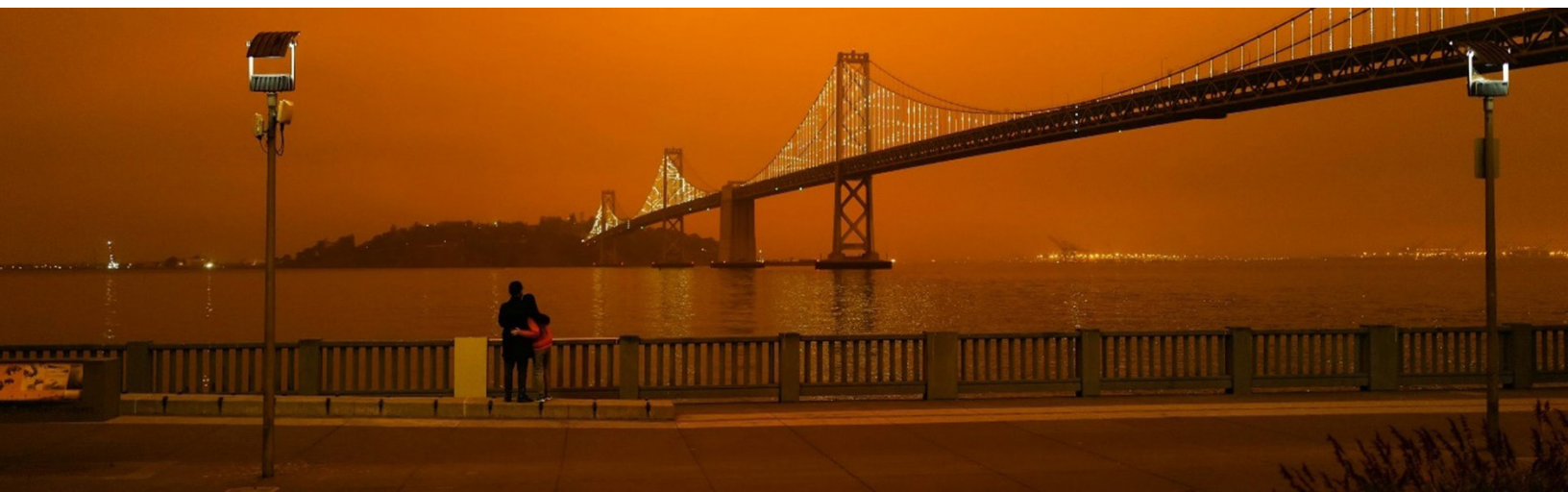


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## Introduction

Early this year wildfires exacerbated by hurricane-force Santa Ana winds tore through Southern California, forcing thousands to flee their homes and claiming dozens of lives.<sup>1</sup> The January devastation was not an anomaly, but rather part of a troubling trend. Since 2017, the state has experienced 13 of the 20 most destructive wildfires in its history.<sup>2</sup> The 2020 California wildfire season was the largest recorded in the state's modern history, burning 4.2 million acres—over 4% of California's total land area.<sup>3</sup> Furthermore, the total area burned in 2020 and 2021 was over ten times greater than the average from 1878 to 2011.<sup>4</sup> Yet this “anomaly” in burned acreage actually matches the state's pre-1800s historical fire regime of approximately 4.5 million acres. The key difference between then and now is the state's growing population, which has pushed development into the wildland-urban interface (WUI) and put more homes and lives in harm's way.

California is the most populated state in the nation and facing some of the most significant wildfire risk. But the impacts expand far beyond the state's border. The federal government plays a significant role in mitigating risk, fighting fires as they burn, and helping communities recover. Decisions made in California and in Washington can help create, cultivate, and shepherd improved outcomes for directly impacted communities and taxpayer pocketbooks alike.

At both the state and federal level the need for innovative solutions and adaptive strategies has never been more urgent. The Golden State's wildfire problem is harbinger of the challenges facing communities in Colorado, Oregon, Arizona, and nationwide. Understanding the complex array of factors behind these infernos is the first step in forging a path through the smoke and flames towards a more resilient future.

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## The Problem—a Fire Deficit

Not only is the country facing a seemingly ever growing financial annual deficit (projected at \$1.9 trillion for FY2025); our country faces an ever-growing fire deficit. Much of the country, including California, has historically been shaped by fire. Before the 1800s, an estimated 4.5 million acres of California wildlands burned annually.<sup>5</sup> What we now consider “extreme” fire seasons were once the norm, not the exception. The idea that roughly 5 million acres of annual wildfire is extreme is, as one study notes, “a 20th or 21st-century perspective.”<sup>6</sup>

This perspective shift happened as the 20th century ushered in a new era of fire management—or rather, fire suppression. In the 1930s, the U.S. Forest Service introduced the “10 a.m. policy,” which aimed to extinguish all fires by 10 a.m. the day after detection.<sup>7</sup> During this time, prescribed burns—controlled fires that help maintain ecosystem health—were also either prohibited or strongly discouraged.<sup>8</sup> These policies contributed to a major fire deficit, particularly in wilderness areas where periodic burns once cleared out underbrush and maintained forest health.

As California grapples with its wildfire crisis, it’s crucial to remember that fire is a natural force that has shaped this land for millennia. Our challenge lies in learning to live with fire, rather than attempting to eliminate it entirely. The path forward requires a delicate balance between protecting communities and allowing fire to play its natural role in California’s diverse ecosystems.

## The Growing Threat of the Wildland-Urban Interface

The continuous expansion of the Wildland-Urban Interface (WUI) is a key factor in the escalating California wildfire crisis. The WUI, where human settlements intermingle with natural landscapes, represents the greatest threat to life and property. California’s WUI problem is particularly acute. More than 11 million Californians—over a quarter of the state’s population—now reside in the WUI. Between 1990 and 2020, the number of housing units in California’s WUI grew from 3.6 million to 5.1 million, a staggering 42% increase.<sup>9</sup> Approximately 7% of California’s total land area is classified as WUI.<sup>10</sup>

Nearly 85% of all wildfires are ignited by humans, and proximity to human development often leads to more destructive fires in terms of structures burned and fatalities. 93% of the most destructive fires and 100% of the deadliest fires from 2012-2022 in California were ignited within 1 kilometer of a WUI area.<sup>11</sup>

### Limitations of Fire Suppression

For decades, U.S. wildfire policy has centered on fighting fires. Suppression remains the dominant response and is often successful—until it isn’t. This “wildfire paradox”—in which successful suppression leads to a fire deficit on the landscape and ultimately more intense, uncontrollable fires—has driven up suppression costs and increased the risk of catastrophic outcomes.

The deadliest and most destructive fires often start near the wildland urban interface (WUI) where risk reduction strategies that focus on treating natural landscapes are inadequate. To effectively address the unique challenges of the WUI, a fundamental shift in U.S. wildfire policy—to one that focuses on the built environment—is necessary.

The expansion of the WUI in California is exacerbated by several factors, including a housing shortage that pushes development into fire-prone areas, the allure of expensive real estate, and lifestyle choices that draw people to natural environments.<sup>12</sup>

The construction boom in WUI areas has created a disaster ‘bullseye’ in which wildfires threaten high numbers of homes and infrastructure, amplifying suppression costs and property losses.<sup>13</sup> WUI expansion contributes to higher wildfire risks by increasing human activity in fire-prone zones and, in turn, the chances of ignition. Combined with other factors, such as more frequent critical fire-weather days, the overall risk of extreme-impact fires has quadrupled since 1990.<sup>14</sup>

The continued expansion of the WUI has only intensified the wildfire problem in California. Over the past few decades, half of California’s new housing has been built in non-urban areas, many of which are located within high fire-risk zones. This development pattern has dramatically increased the stakes—both in lives and taxpayer dollars—when wildfires strike.



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## **The Built Environment is the Key: Moving out of the Forest**

Defending the WUI is imperative to saving lives and controlling costs. The 2025 wildfires in Los Angeles underscore the urgency of the issue. With estimated losses between \$250 billion and \$275 billion, the fires are among the most expensive in modern U.S. history.<sup>15</sup> A major driver of wildfire-related costs is the enormous expense of firefighting, much of which is devoted to protecting property. Research has found that fires ignited within 5 kilometers (km) of homes cost 900% more to suppress than those ignited at least 40 km away.<sup>16</sup>

To effectively address the unique challenges of WUI, a fundamental shift in U.S. wildfire policy—one that moves away from the forests and focuses on the built environment—is necessary. Addressing the WUI wildfire risks in California specifically requires a multi-pronged approach.

One of the most insidious aspects of California fires is the threat posed by embers. These small, burning particles—carried by California’s uniquely windy climate—can travel miles ahead of the main fire front, igniting new blazes in unexpected locations. In 2017, embers blew across a six-lane highway in Northern California, igniting businesses and homes in Santa Rosa’s Coffey Park neighborhood.<sup>17</sup> During the 2025 Los Angeles fires, embers traveled an estimated two to three miles ahead of the main fire as a result of strong Santa Ana winds.<sup>18</sup>

Reducing home ignition potential is key to preventing home destruction. This involves installing fire-resistant landscaping and constructing homes with fire-safe materials. California leads the nation in wildfire-specific building regulations, including requirements for retrofitting existing homes and stricter standards for new construction. However, some have noted that current regulations are insufficient because better fire-resistant building materials and risk reduction strategies are currently available than those required by building codes.<sup>19</sup> This presents an opportunity to further protect communities and taxpayers with improved, up to date regulations.





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Further, these costs can be within reach for many homeowners. Simple measures—such as ember-resistant vents, noncombustible landscaping, and flame-resistant siding—only cost between \$2,000 and \$15,000 per home, depending on the level of protection.<sup>20</sup> A recent report calculated that adopting enhanced building materials adds 2-8% to the cost of a new home, while using the most stringent fire-resistant options—including noncombustible materials—adds 4-13%.<sup>21</sup>

Reducing WUI wildfire risk also requires a community-wide approach. Although home hardening techniques can improve the probability of survival, they may be unable to fully protect buildings once neighboring structures ignite.<sup>22</sup> Community Wildfire Protection Plans (CWPPs) and other federal programs intended to protect communities often tend to prioritize wildland fuel reduction measures, such as defensible space and fuel breaks.<sup>23</sup> This focus reflects a flawed assumption that reducing fuels in the surrounding landscape will prevent home loss.<sup>24</sup>

Comprehensive risk mitigation involves more than just fuel reduction—buffering the landscape with smart, less flammable land uses around communities can create additional fire barriers that complement traditional fuel breaks. Community and regional risk mitigation should also involve retrofitting the built environment—upgrading electrical grids, planning evacuation routes, and securing reliable water supplies—as well as enhancing community training. However, these methods are often missing from wildfire resilience strategies.<sup>25</sup>

Smarter land use planning is also essential. Coordinated development policies can mitigate wildfire risk by curbing WUI sprawl. “Leapfrog development”—isolated housing clusters in previously undeveloped areas—has been identified as one of the riskiest development patterns for wildfire exposure.<sup>26</sup>

Encouraging high-density, clustered housing over low-density sprawl is critical in fire-prone regions.<sup>27</sup> On average, 35% of firefighting costs are directly tied to protecting homes near fires.<sup>28</sup> Consider the 217,000-acre blaze

### **Broken Insurance Market that Incentivized Risky Development**

In the late 1980s California enacted a law that restricted insurers ability to update rates in accordance with increasing wildfire risks. While intended to protect consumers from automobile insurance hikes, this legislation led to distorted markets and incentivized developers to build in fire-prone WUI areas that would otherwise be less developable due to insurance costs.

As a result, wildfire-related claims have surged 3,900% since the 1960s and average around \$4 billion per year. Because of this, major insurers, including State Farm and Allstate, have scaled back or exited the California market. Although recent regulatory reforms now permit insurers to more accurately set premiums, longer-term solutions are needed to truly resolve the structural imbalance between consumer protection and risk-based pricing.

in Idaho's Salmon-Challis National Forest: though the fire mostly burned remote, mountainous terrain, its proximity to populated valleys drove suppression costs above \$71 million—borne largely by taxpayers.<sup>29</sup>

The WUI remains a major vulnerability in California's wildfire landscape. Traditional firefighting and fuels treatment mitigation strategies are no longer enough. A forward-looking approach that combines smarter building codes, targeted retrofits, and better land use planning is needed to reduce both risk and cost in the years ahead. By shifting the focus from treating vast wildland areas to making homes and communities more fire-resistant, and by reconsidering policies that encourage WUI expansion, California can more effectively mitigate the growing wildfire risk in these interface zones.

## Charting a Path Through the Flames

California's wildfire crisis represents a complex mix of historical, ecological, and human factors that have converged to create an unprecedented challenge. The state's relationship with fire is deeply rooted in its natural history, but human intervention—from aggressive fire suppression to expansive development in fire-prone areas—has dramatically altered this relationship, often with unintended consequences.

The expansion of the WUI within the state has emerged as one of the main drivers of the growing risk of wildfires. With more than a quarter of California's population now residing in these vulnerable areas—a population that would be the 11th largest state, more populous than New Jersey—the stakes have never been higher. Traditional approaches to fire suppression and forest treatment, while important, have proven to be insufficient in addressing the unique challenges posed by WUI fires.

Understanding where our dollars are flowing and how to better direct those dollars to reduce risk in the WUI is the challenge of state and federal policymakers. The need to direct both federal and state dollars towards mitigation and risk reduction in the built environment has never been greater.

The urgency of this task cannot be overstated. This year's Los Angeles fires serve as a stark reminder of what's at stake. Yet, within this crisis lies an opportunity—a chance for California to pioneer innovative approaches to wildfire spending and management that could serve as a model for other fire-prone regions across the country.



Photo by Jay Heike | Unsplash



## Endnotes

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