

Rebuilding for a Resilient Recovery

Planning in California's Wildland Urban Interface

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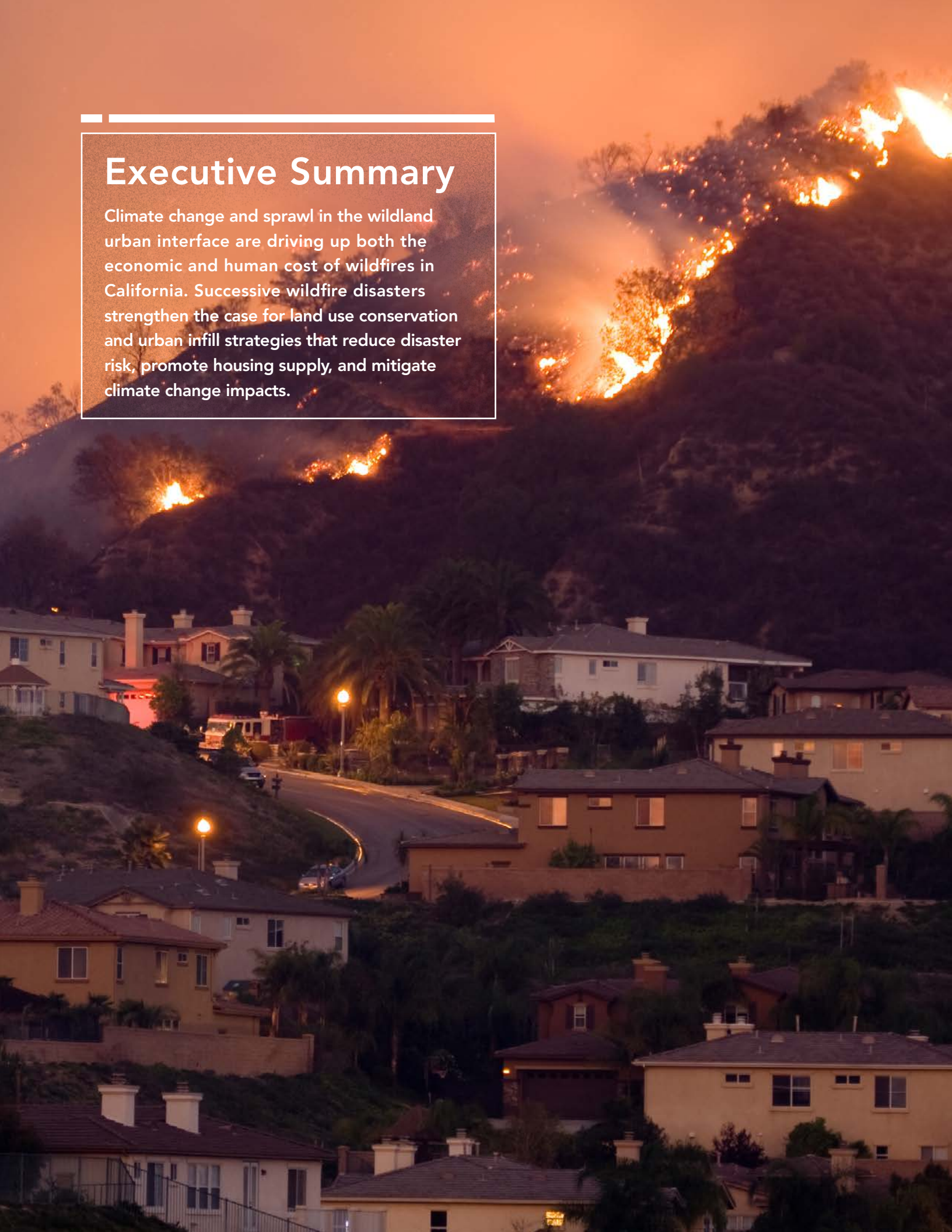
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Executive Summary

Climate change and sprawl in the wildland urban interface are driving up both the economic and human cost of wildfires in California. Successive wildfire disasters strengthen the case for land use conservation and urban infill strategies that reduce disaster risk, promote housing supply, and mitigate climate change impacts.



Wildfires in California are increasing in frequency and intensity. Accelerating climate change, changing land use patterns, and reduced forest management practices are major contributing factors. In 2020, California experienced five of the six largest wildfires in recorded history. Wildfire proliferation threatens the lives and homes of more than one quarter of the state's population; approximately 11.2 million people, in 4.5 million homes, are at-risk in the wildland-urban interface (WUI).^{1,2}

Rather than redirecting development away from high fire risk areas in the WUI, state and local policies primarily emphasize retrofitting existing homes, imposing stricter building codes and site design standards for new homes, and ensuring that jurisdictions have sufficient evacuation routes and shelter-in-place plans in case of an emergency. Building on prior land use research addressing infill development, sprawl management, and land conservation, this report suggests that continued development in the WUI will make California's already constricted supply of housing more vulnerable, will undermine state efforts to curb carbon emissions, and will further degrade the state's wildland habitats. The growing risk of wildfires also creates fiscal challenges for state and local governments, given the high cost of post-disaster recovery.

To inform state policymakers, this report studies three communities recently affected by fires. The research combines a scenario exercise, secondary data analysis, and interviews to understand the impacts and possible recovery trajectories of the Tubbs Fire (2017), Thomas Fire (2017), and Camp Fire (2018) on the communities of Santa Rosa, Ventura, and Paradise, respectively. By analyzing three case study communities with different physical and socioeconomic characteristics, the policy recommendations reconcile a variety of goals, including reducing wildfire risk, increasing housing supply and resilience, and mitigating climate change, that are applicable across the state.

Using a scenario planning approach, this report summarizes the impacts of different post-fire land use patterns on a jurisdiction's housing supply, fire risk, affordability, and climate metrics such as greenhouse gas (GHG) emissions, residential energy use, and vehicle miles traveled (VMT). Scenarios at the city and regional level explore moving homes out of the WUI, incorporating greenbelts and wildfire buffers, increasing density in existing commercial cores, adding gentle density in the form of 'missing middle'³ housing and accessory dwelling

units (ADUs) to areas not in the WUI, and embracing manufactured housing as an affordable-by-design approach. The social, economic, and environmental impacts inform policy recommendations.

Each case study community explores three rebuilding scenarios:

1. **(Re)Building as Usual**, in which existing recovery plans and historical growth trends guide anticipated development patterns;
2. **Managed Retreat & Urban Density**, in which disaster survivors choose or are incentivized to move to lower risk locations, while land use planning and incentives promote infill development in existing urban nodes; and
3. **Resilience Nodes**, in which communities rebuild some housing in high-risk areas but incorporate robust wildfire mitigation features, including development clusters surrounded by defensible space

The analysis shows that there are more resilient paths to recovery than rebuilding as usual. Communities selecting either Managed Retreat or Resilience Nodes will be able to reduce fire risk for their residents, while also meeting housing and climate goals. Managed Retreat provides the biggest impact in terms of safety and climate, but presents new potential displacement risks. Resilience Nodes offers the most potential for economic growth, with fewer negative social equity impacts, but less of a guarantee in terms of future fire risk. If the State of California wishes to address its dual climate and housing crises, it will need to develop the right set of carrots and sticks to persuade jurisdictions not to simply pursue the greatest economic return.

Key findings from the case study analysis include:

- Urban growth boundaries and conservation easements protect environmentally valuable natural and working lands while also reducing wildfire disaster costs;
- Infill development has fewer GHG emissions, relative to existing patterns of sprawl that are common throughout the WUI. In addition to higher emissions, WUI sprawl increases the risk of wildfires and undermines state land conservation and carbon sequestration goals;

Table ES.1 Summary of Impacts by Scenario

Scenario	SANTA ROSA			PARADISE (BUTTE COUNTY)			VENTURA		
	(Re) Building-as-usual	Managed Retreat	Resilience Nodes	(Re) Building-as-usual	Managed Retreat	Resilience Nodes	(Re) Building-as-usual	Managed Retreat	Resilience Nodes
Housing Impacts									
Population	179,200	167,600	173,300	236,800	236,800	237,600	108,400	97,500	122,400
% change		-6.5%	-3.3%		0.0%	0.3%		-10.1%	12.9%
Dwelling Units (DUs)	70,900	76,100	76,100	103,900	104,800	104,700	42,900	43,000	52,300
% MF	18%	34%	41%	19%	20%	18%	16%	23%	32%
% change		7.3%	7.3%		0.9%	0.8%		0.2%	21.9%
DUs in Fire Hazard Zone	12,300	5,700	20,600	13,200	11,900	12,100	9,800	4,700	11,700
% change		-53.7%	67.5%		-9.8%	-8.3%		-52.0%	19.4%
Household Costs	\$17,800	\$11,300	\$14,300	\$26,900	\$25,300	\$23,800	\$15,500	\$13,000	\$13,600
% change		-36.5%	-19.7%		-5.9%	-11.5%		-16.1%	-12.3%
Environmental Impacts									
GHG Emissions (metric tons/year)	1,142,800	929,500	967,800	2,320,000	2,180,000	2,320,000	730,400	641,600	772,700
% change		-18.7%	-15.3%		-6.0%	0.0%		-12.2%	5.8%
GHG Emissions (metric tons per DU)	10.9	9.4	9.7	22.3	20.8	22.2	10.9	9.4	9.7
% change		-13.5%	-11.0%		-6.8%	-0.7%		-13.5%	-11.0%
VMT (DU/year)	23,000	14,200	18,400	33,200	31,200	33,300	11,500	9,500	10,100
% change		-38.3%	-20.0%		-6.0%	0.3%		-17.4%	-12.2%
Change in Carbon Stock (metric tons/year)	-2,300	22,900	81,800	-95,400	-68,900	-79,700	0	-300	-230
Economic Impacts									
One-time construction jobs	24,500	66,700	95,900	44,600	51,000	57,300	2,100	17,200	36,600
One-time economic output	\$1.82 billion	\$4.98 billion	\$7.22 billion	\$6.61 billion	\$7.58 billion	\$8.39 billion	\$0.32 billion	\$2.72 billion	\$5.03 billion
WUI Development						Statewide			
Dwelling Units in High and Very High Fire Risk Areas						1,456,300			
Minimum Residential Structure Replacement Cost in High and Very High Fire Risk Areas						\$610 billion			
Capacity for Additional Units in High and Very High Fire Risk Areas						523,000			
Annual Revenue from 0.25% Levy on Existing DUs in High and Very High Fire Risk Areas						\$1.81 billion			

- (Re)Building as Usual recovery scenarios miss an opportunity to reduce wildfire risk, expand the supply of affordable housing, and reduce per household GHG emissions;
- Post-disaster relocation within the region depends on the ability of the regional housing market to absorb disaster survivors. If the disaster is too large for the

housing market, people will be displaced to more distant locations; and

- Lack of integration between local and regional land use planning, housing policy, and state wildfire management undermines California’s efforts to address the concurrent climate and housing crises.

Scenario analysis findings are summarized in Table ES.1. Based on parcel-level tax assessor data compiled by Urban Footprint, as of 2020, California has 1.4 million homes in high or very high fire hazard severity zones alone, representing a minimum of \$610 billion in potential replacement costs if these homes were to be impacted by wildfires. Local land use and state hazard mitigation policies currently protect only a small share of these properties. In addition to existing at-risk homes, there are more than 555,000 underbuilt residential parcels in the WUI. If development in the WUI continues apace, the scale of potential losses will continue to grow rapidly.

Informed by the case study analysis and statewide fiscal assessment, the report proposes a series of policy recommendations for implementation at the state and local levels. Effectively addressing the escalating risk of wildfire requires large-scale cooperation, coordination, and political mobilization. Planning and policies for disaster recovery and wildfire resilience must recognize the costs of WUI sprawl along with the benefits of reorienting new development towards urban infill. Disaster recovery is an opportunity for California's regions and communities to reduce wildfire vulnerability, support housing supply and resilience, and promote climate change mitigation goals.

Key policy recommendations include:

- **Identify new revenue sources and financing mechanisms:** To effectively manage California's growing wildfire risk and disaster recovery costs, policymakers must identify new funding streams and financing mechanisms for adaptation and resilience in the WUI. For example, by levying a 0.25 percent fee on the assessed value of existing residential properties in high and very high fire hazard severity zones, the state could generate more than \$1.8 billion to reinvest in wildfire risk reduction planning and projects;
- **Prevent displacement:** State and local disaster housing policies must acknowledge that wildfire disasters disproportionately displace and unhouse renters and low-income homeowners and therefore should proactively plan for disparate disaster impacts and prioritize these residents in hazard mitigation and disaster recovery funding;
- **Incentivize lower-risk development:** Limiting WUI sprawl while not worsening California's housing crisis requires the state to provide disincentives against risky development and incentives for infill housing affordable to people of all income levels; and
- **Improve local capacity:** Institutional reinvention that builds capacity at regional and local levels will enable California and its communities to proactively and equitably govern recovery and adaptation in the WUI.

ENDNOTES

- 1 Weil, E. & Simon, M. (October 2, 2020). California will keep burning. But housing policy is making it worse. ProPublica. <https://www.propublica.org/article/california-will-keep-burning-but-housing-policy-is-making-it-worse>
- 2 Smith, J.E. (October 6, 2019). California ignores the science as it OKs more homes in wildfire zones, researchers say. Los Angeles Times. <https://www.latimes.com/california/story/2019-10-06/california-ignores-science-homes-wildfire-zones>
- 3 Missing middle' housing refers to multi-unit buildings such as duplexes and fourplexes that are small enough to be integrated within primarily single family neighborhoods. This building typology was common prior to World War II but fell out of popularity as low-density, single family suburbs expanded in the 1950s.