



Research Brief for Resource Managers

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Where the WUI is: Implications for wildfire mitigation and outreach communities

Kramer, H. Anu et al. 2018. Where wildfires destroy buildings in the US relative to the wildland-urban interface and national fire outreach programs. International Journal of Wildland Fire. 27(5): 329-341. <https://doi.org/10.1071/WF17135>

The Wildland Urban Interface or WUI is used throughout the fire world as a designation for where to focus pre-fire risk mitigation and active fire tactics. The WUI is composed of interface WUI, where buildings and vegetation meet, and intermix WUI, where they intermingle. WUI designations and risk factors differ across the nation, but the overall trend of increased development in these areas continues.

This paper explores the assumptions and connections of the WUI to actual buildings that were threatened or destroyed by wildfires, the proximity of fire outreach programs, and the establishment timing of these outreach programs (before or after a nearby destructive fire). Regional comparisons and the influence of the most destructive fires were also considered.

Largely destructive fires (of buildings, not of area burned or ecosystem impact) played a major role throughout the findings of this paper. Of the 20 most destructive fires, 12 occurred in California, where the proportion of threatened buildings that were destroyed by the fire was high. California contained 60% of the buildings destroyed for the entire national set.

Management Implications

- Most buildings threatened or destroyed by wildfire were in the WUI at the national scale, despite non-WUI being the vast majority of area burned.
- Mapping locations of building destruction by wildfire can give managers a better target on where to focus outreach and prevention efforts in a specific area.
- With the WUI continuing to expand, new buildings in fire-prone areas may be located beyond the scope of current outreach networks.

Where were buildings destroyed?

The WUI concept was originally developed to augment wildfire risk designations to identify areas with high potential for loss of lives and property. This paper found that overall, most buildings threatened and destroyed by wildfire were in areas mapped as WUI.

However, there are some interesting caveats to this overall conclusion. Regional differences occurred in overall destruction and likelihood of destruction in the WUI: California had the highest building loss, with the majority of that loss occurring in the WUI, while Washington had substantial building loss, with the majority of that loss outside the WUI (Fig 1).

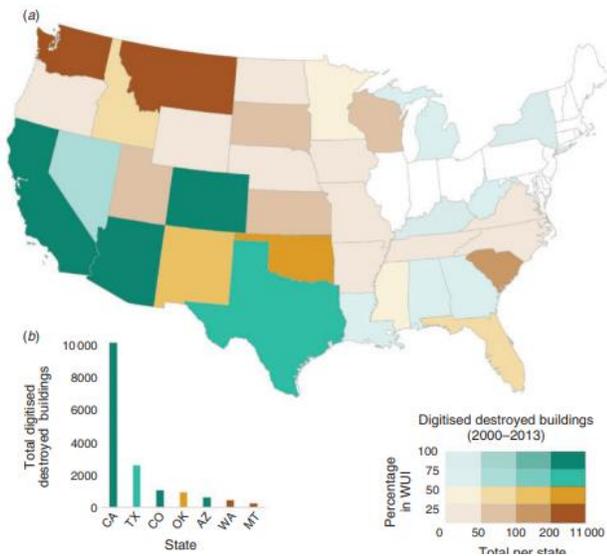


Figure 1. Of buildings destroyed by wildfire across the US, the (a) percentage of those buildings in the wildland– urban interface (WUI) and total number of destroyed buildings by state, and (b) the total number of destroyed buildings in the seven states with the highest total destruction.

Being in the WUI is a strong motivator for communities to undertake fire mitigation action. While an area may fit the WUI definition for housing density and proximity to wildland vegetation, it may not be at high risk from fire due to factors such as vegetation type (for example in the Northeastern US, Fig 1). Also, many buildings surrounded by flammable wildland vegetation (and destroyed by wildfire) were not mapped as WUI because they were so spread out. The authors note that WUI communities could benefit from new and varied approaches for risk mapping and outreach efforts.

Proximity of outreach programs

Wildfire is also a strong motivator for action. The authors of this paper found that locations of the national Firewise program were often established after wildfires, and that the majority wildfire destruction near these locations happened prior to their establishment.

This paper also compared locations of the nationwide outreach programs to the state programs of California. While California has restrictions on new buildings related to building materials, there are additional considerations when it comes to fire mitigation and successful protection during a fire event.

Most places that experienced fire, especially when those fires destroyed or threatened many buildings, were close (within 50 km) to an outreach program. For California, state-based programs were often located in geographic areas not served by national efforts, emphasizing the value of diverse outreach programs (Fig 2).

The intermix and interface WUI continue to expand to new areas, and new buildings are often built in areas without a nearby outreach program. Further research into the connection between proximity of a Firewise program before fires and building destruction by fire is suggested.

The paper expressed that fire outreach program success does not depend solely on reducing building destruction by wildfire. There are numerous factors that determine building survival in wildfire. Furthermore, these programs build community cohesion before fire that builds a strong foundation for recovery after fire.

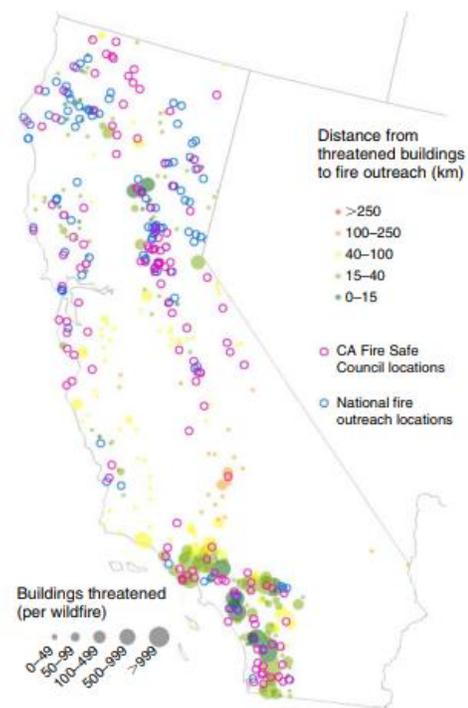


Figure 2. California wildfires, with total buildings threatened and average distance from those buildings to national fire outreach location, by fire, and the locations of national and state fire outreach programs.