



## Research Brief for Resource Managers

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## The Structure Details That Help Homes Survive Wildfire

Syphard, A.D., and J.E. Keeley. 2019. *Factors associated with structure loss in the 2013-2018 California wildfires. Fire 2(49): 15pp.* [doi:10.33390/fire2030049](https://doi.org/10.33390/fire2030049)

With thousands of structures burned and hundreds of human lives lost in recent California wildfires, it has become urgent to understand how to avoid such losses. In response, Syphard and Keeley accessed public records of wildfire structure losses (CAL FIRE Damage INSpection Program data) with three questions in mind: 1) How important was defensible space in protecting homes? 2) What structure characteristics increased the likelihood of homes surviving fire? and, 3) How did these patterns vary by region?

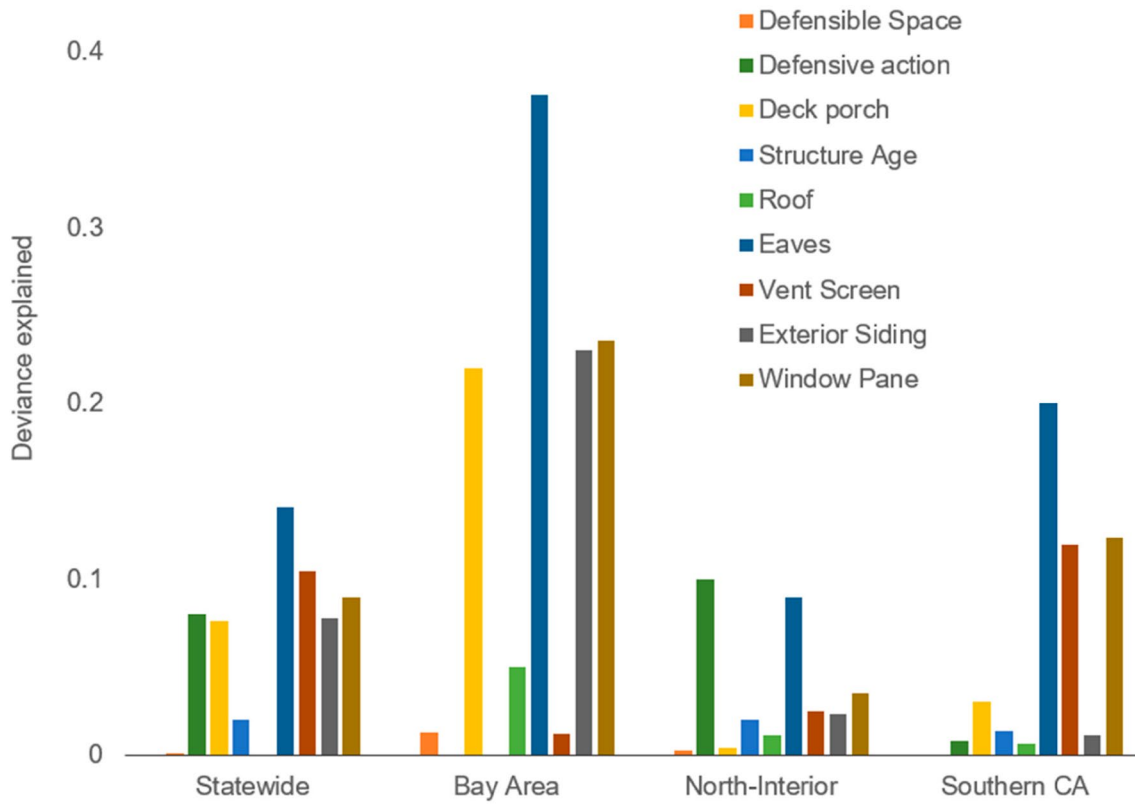
They analyzed the effectiveness of Home Ignition Zone (HIZ) characteristics for more than 40,000 California buildings to determine which features were the most important in preventing structure loss in wildfires between 2014 and 2018 (Fig.1). Most of the structures studied were affected by high-severity fires, with strong winds or other extreme fire behavior. After sorting the buildings into “survived” (about 10%) and “destroyed” (about 90%), statistical comparisons of the two groups showed that “hardened home” details were more important than defensible space distance to surviving these California wildfires.

### Management Implications

- Hardened homes with **enclosed eaves** and **multiple pane windows**, as well as with **fire-resistant exterior siding**, **composite deck materials**, and fine-mesh **vent screens**, were much more likely to survive fire.

For all of California, closed eave construction was the most important feature for surviving fire, followed by multiple-pane windows. Within geographic regions, fire-resistant siding was found to be important in the San Francisco Bay Area, while the presence of vent screens was very important in Southern California.

In this study, defensible space, sorted into coarse, 30m distance categories, was not a significant factor in preventing structure loss relative to home structural features (Fig.1, orange). The authors highlight that defensible space closest to the home (especially the 0-5ft zone) may still be a determining factor, but was not tested here given the coarse 30m categories. Information on defensive actions from firefighters or civilians was only available for north-interior and Southern California and was found to be moderately important statewide



**Figure 1.** Deviance explained for building inspection variables statewide in three California regions. Defensive action and structure age were only available for North-Interior and Southern California.