



WILDFIRE RESILIENCE

Solving with Science

Anne Cope, PhD, P.E.

Chief Engineer

Insurance Institute for Business & Home Safety

Wildfire losses are growing. **Why?**



Policy lagging WUI developments



Larger fires and climate trends



No longer a seasonal event



FIELD



IBHS






Embers & Flames



Preparing The Home





Roof & Gutters

- ✓ Class A Roof
- ✓ Noncombustible gutters & downspouts
- ✓ Maintain roof, gutters & downspouts clear of debris



Ember-Resistant Vents

- ✓ Install ember-resistant vents
- ✓ For older and inadequately protected vents, installing 1/8-inch metal mesh screens over the vents keep out larger embers.





6-inch Vertical Clearance

- ✓ Noncombustible wall material required in the International Residential Code for termite control



Flames can reach from combustible mulch to ignite cladding (Manzello et al., 2017)



Creating Defensible Space



Removing leaf clutter and overhanging trees is statistically significant on the status of the house after the fire.

83% of houses who removed overhanging branches and dead leaves were not damaged.

49% of houses that did not remove overhanging branches were damaged.

WITCH & GUEJITO FIRES

MARANGHIDES ET AL, 2013

A photograph of a house with a fire on its roof and a fire in the background. The house is a single-story building with a dark roof. The fire on the roof is bright orange and yellow, and the fire in the background is also bright orange and yellow. The sky is dark and smoky. The text is overlaid on the right side of the image.

Reducing woody
vegetation

cover up to **40%**
immediately adjacent to
structures and preventing
vegetation from
overhanging or touching
structures were
*the most effective
actions.*

SYPHARD ET AL., 2014



Zone 0: Create a 5-foot Noncombustible Buffer

- ✓ Remove all vegetation, including overhanging branches
- ✓ Remove wood mulch
- ✓ Remove combustible furniture
- ✓ Replace with rock, pavers, concrete or steppingstones.



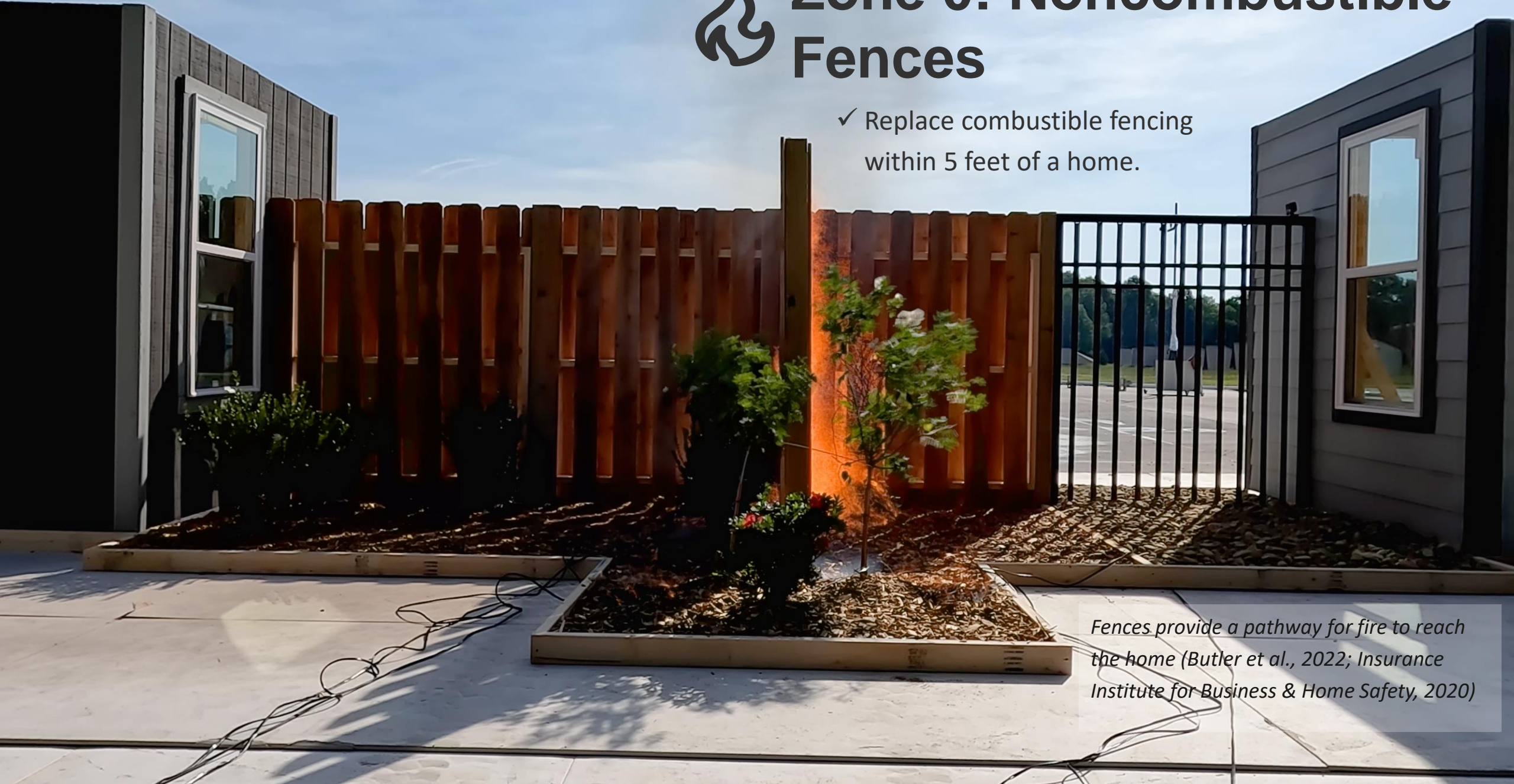
Reducing vegetation in the
0-5 ft zone *nearly doubles* a
property's wildfire survival rate





Zone 0: Noncombustible Fences

- ✓ Replace combustible fencing within 5 feet of a home.



Fences provide a pathway for fire to reach the home (Butler et al., 2022; Insurance Institute for Business & Home Safety, 2020)



Zone 0: Enclose Low-Level Decks

- ✓ Clear area underneath
- ✓ 5-foot noncombustible zone around the deck
- ✓ Enclose low-elevation decks with noncombustible mesh to keep embers out.





Embers & Flames



Enclose Eaves

- ✓ Enclose eaves with noncombustible materials.

*Enclosed eaves have a significant protective effect compared to no eaves and open eaves
(Syphard & Keeley, 2019)*



Move Structures Farther Away

- ✓ Move structures like sheds, pergolas, playsets, and other outbuildings at least 30 feet away from your home.



Noncombustible Cladding

- ✓ Replace **combustible** siding including wood, wood-fiber, or vinyl siding with a **noncombustible** material like concrete-fiber board, stucco, brick, or stone veneer.



Ignition of siding can result in rapid fire growth (Green et al., 2022)

Combustible cladding can support unlimited vertical flame spread (Oleszkiewicz, 1990)



Upgrade Windows

- ✓ Upgrade to multipaned windows with at least 2 tempered panes or fire-resistant glass blocks.

- *Double-pane windows consistently provide better fire barrier performance (Shields et al., 2005)*
- *Tempered windows provide higher heat resistance (Babrauskas, 2003)*



Build A Fire-Resistant Deck

- ✓ Choose a noncombustible deck assembly. Use metal joists and a fire-resistant walking surface like a lightweight concrete, aluminum, or fire-rated composite deck material.

ROOF

- ✓ Choose a Class A fire-rated roof maintained clear of debris
- ✓ Choose noncombustible gutters & downspouts

WILDFIRE PREPARED HOME + PLUS

ADDITIONAL MITIGATION

- ✓ Remove back-to-back fencing
- ✓ Eliminate combustible siding
- ✓ Enclose eaves
- ✓ Enclose under bay windows
- ✓ Upgrade to a wildfire-resistant deck
- ✓ Upgrade windows & doors
- ✓ Cover gutters
- ✓ Move outbuildings at least 30 feet away

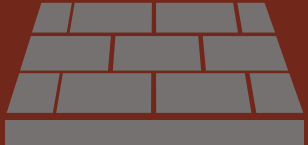
BUILDING FEATURES

- ✓ Install ember- & flame-resistant vents
- ✓ Ensure 6-inch vertical noncombustible clearance at base of wall

DEFENSIBLE SPACE

- ✓ Create & maintain the home ignition zone (0-5 ft) including the removal of branches that overhang this area
- ✓ Clear & maintain the underdeck area; enclose low-elevation decks
- ✓ Maintain yard clear of debris
- ✓ Replace combustible fencing within 5 ft of the home

**WILDFIRE
PREPARED**
— A PROGRAM OF IBHS —



6"





Anne Cope, PhD.
Chief Engineer



➔ ibhs.org



🐦 [IBHS_org](https://twitter.com/IBHS_org)