Home Survival in Wildfire-Prone Area: Design & Maintenance Considerations

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Today’s presentation

- How homes burn from wildfire
- Near home vegetation and landscaping
- Vulnerabilities in home design
- Resources

Thank Dr. Steve Quarles, UC fire durability expert (emeritus) now with the Insurance Institute for Business and Home Safety (IBHS), and UC Master Gardener volunteers for many of these slides and ideas.
How a house burns from wildfire?

Ember / Firebrand

Flame Contact

Radiant Heat

Tennessee Division of Forestry
Embers

Wind-blown embers are responsible for the majority of building ignitions

Angora Fire – South Lake Tahoe
**Know the basics of fire:**

Fuel + Oxygen + Heat = Fire
Fuel + Weather + Topography = Fire Behavior

➢ What can you control?

Fuel is... anything that will burn
  – Dry or dead vegetation
  – Wood siding, roofing, fencing
  – Trees
  – Woody shrubs or perennials
  – Landscape mulch
Work from the house out

Defensible Space

Zone 1:
0-5 feet “non-combustible zone”

Zone 2:
5-30 feet “lean and green zone”

Zone 3:
30-100 feet or to the property line “reduced fuel zone”
0-5 ft “noncombustible zone” to reduce chance of flame contact exposure

Effective defensible space must be present on all sides of the home
Fire resistant plant lists?

- All plants can burn regardless of how they are marketed
- Fire safe landscaping requires maintenance (pruning, irrigation, clean-up)
- Select low growing, open structured, less resinous, higher moisture content plants
- Native and drought tolerant can be options, if maintained well
- Mulch helps plants retain moisture, but it will burn too!
- Use hardscape, rock mulch or lawns <5 feet from the home.
Incorporate hardscape

Photo: El Dorado County UC Master Gardeners
Simulated embers exposure on a house
Roof (Priority #1)
Roof Edge
Litter accumulation creates exposure to the wall unit (not protected with roofing).
Embers can ignite litter in rain gutters. 

Plastic gutter vs metal gutter
Roof - Skylights
Vents (Priority #2)

- Through-roof (outlet)
- Under-eave (inlet)
- Gable end
- Foundation & other
Vents – Ember Entry
Vents – Mesh Size Use 1/8 inch or smaller

1/4-Inch Mesh Screening
1/4-inch (6 mm) mesh screening should not be used to cover vents on homes and businesses located in wildfire-prone areas. While research has shown that this size mesh does not allow small birds to pass through the screened opening, research has shown that embers passing through 1/4-inch screening can easily ignite fine fuels such as paper products that might be stored in attics and crawl spaces.

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1/8-Inch Mesh Screening
1/8-inch (3 mm) mesh screening is often preferred for vent screening due to its ability to reduce the size and number of wildfire embers entering a building while still allowing the need to perform its ventilation management function. 1/8-inch mesh screening can reduce embers passing through by 95-99% and it will require more cleaning & maintenance to remove ash that may accumulate on the screen surface. Accumulated debris can include fine dust and ignition particles.

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A = screening (embers) and intumescent honeycomb mesh (flame)
B = steel wool mesh (embers and flame); C = screening and baffles (embers and flame); D = screening and steel wool mesh (embers and flame)
Ridge vents – Vulnerable to debris accumulation
Exterior Walls – Vertical non-combustible zone
Firewood under a deck

Broom
Stored building materials under a deck is vulnerable
Fence Vulnerability
Fence to house
Coffey Park October 2017

Photo: Tom Welch
A metal gate can help prevent spread to home via a fence ignition.
Recommendations

1. **Roof**: install and maintain a Class A rated roof covering. Install a metal drip edge and address other edge of roof vulnerabilities.

2. **Vents**: upgrade to flame resistant and ember resistant.

3. **Non-combustible zone** should include the area 5’ near the house, under the entire footprint of the deck, and 6-inches vertically upward from the ground to the start of your siding.

- **CA Building Code Chapter 7A WUI construction:**
  - [http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes](http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes)
  - [http://osfm.fire.ca.gov/codedevelopment/wildfireprotectionbuildingconstruction](http://osfm.fire.ca.gov/codedevelopment/wildfireprotectionbuildingconstruction)

- **Home design, maintenance, and construction** can be more important than any individual fire resistant building product when addressing ember ignition. Poor installation and maintenance can increase the vulnerability of a given product to an ember exposure.

- **Good practices**: remove stored fuels, debris, clean gutters.
Recommendations

- **Fire safe landscape** is possible that includes beauty, safety, privacy and saves water.

- Selection and placement of vegetation is key, maintenance is essential:
  - 0-5’ (non-combustible materials only)
  - 5-30’ (lean, green and clean)
  - 30-100’ (reduced fuel zone)
We need to change our approach

Start at the house and work out
For more information visit:

- [http://ucanr.edu/sites/forestry/Wildfire](http://ucanr.edu/sites/forestry/Wildfire)
- [https://disastersafety.org/ibhs/ibhs-nfpa-wildfire-research-fact-sheets/](https://disastersafety.org/ibhs/ibhs-nfpa-wildfire-research-fact-sheets/)
Figure 19. Important guidelines for creating and maintaining a home and landscape that can survive a wildfire threat. 
Source: Stephen L. Quarles.

From: Home Survival in Wildfire Prone Areas