Risk Reduction Effectiveness Research

- Multi-faceted programs most effective – synergistic effects to motivate homeowners

- CWPPs, Regulations, Public Education, Homeowner Assistance, Risk Assessment/Mapping, Firewise Communities, Fuelbreaks, Demonstration Projects, Prescribed Burns
How Homes Ignite

- **Causes:**
  - Direct flame contact
  - Burning embers

- **Solutions:**
  - Use ignition-resistant building materials.
  - Provide adequate defensible space.
Carrot or Stick?

• Guidelines or regulation?

• Appropriate level of government?

• New construction and/or retrofit?

• Enforcement and maintenance over time?

• Public Acceptance?
Eminent Domain

- The power to take private property for public use by a state, municipal or private person or corporation authorized to exercise functions of public character, following payment of just compensation to the owner of that property.
Town of Breckenridge

2008-9 Community Education / Adopted Mandatory D-Space Ordinance - June, 2009

Public outcry led to overturning ordinance – July, 2009

• Private property rights
• Questionable science
• Not effective in a massive blaze
• Lower property values
Voluntary Program

- Voluntary D-Space Ordinance
- Free Inspections
- $200 to create d-space
- Chip and haul program
- Town slash pile
- Mountain Pine Beetle Ordinance
- Town Open Space Treatments
State Level Ordinances

Police Power of the State - Responsibility to protect health, safety, and welfare of residents

States:
Zoning – California - 1993
6 Steps to Wildfire Protection

1. If there is a home or other structure on your property, then a fuel break is required to be established around it. A structure is defined as a permanently sided building that is at least 500 square feet. If no home or other structure exists on property then fuel reduction treatment is not required on the property. However, it is recommended that you send in your self-certification form; check the "No Structure" box on the form, sign, and return the form to ODF.

2. If the home has flame-resistant roofing (Class A, B or C), then a 50-foot fuel break is required. If it is roofed with cedar shakes or other flammable material, the fuel break must be 100 feet in size.

3. A fuel break begins at the outside edge of a home's furthest extension. This may be the edge of the roof eave, or the outside edge of a deck attached to the home. The shape of the fuel break mirrors the footprint shape of the home and anything that is attached to it.

4. Fuel break distances are measured along the slope, and does not need to extend beyond the property line.

5. The fuel break may use natural firebreaks, such as a rock outcropping or a body of water, or it can be completely man-made. The vegetation within the fuel break must meet the following guidelines:
   - Ground cover should be substantially non-flammable or fire-resistant. Examples of this include asphalt, bare soil, cinder, concrete, grass, hay, mulch, gravel, succulent ground cover or wildflowers.
   - Dry grass should be cut to a height of less than four inches.
   - Cut grass, leaves, needles, twigs and similar small vegetative debris should be broken up so that a continuous fuel bed is not created.
   - Shrubs and trees should be maintained in a green condition, be substantially free of dead plant material, and have any potential "ladder fuels" removed.
   - Trees and shrubs should also be arranged so that fire cannot spread or jump from plant to plant. Some thinning may be necessary to accomplish this.

6. Firewood and lumber piles near a structure can become a source of intense, sustained heat if they should catch fire. This could ignite nearby vegetation, or cause windows to break, admitting fire into the structure. During the months of fire season, move firewood and lumber piles at least 20 feet from any structure. A better solution is to put firewood and lumber into an enclosed shed.

5. Keeping the space under wooden decks and exterior stairways clean — and enclosed — is one of the best ways to keep a house safe during fire season. Firewood and lumber need to be removed, and dry needles, leaves and other litter need to be cleaned out, too.

4. All dead branches overhanging any portion of the roof must be removed. Also remove accumulations of leaves, needles, twigs, bark and other potentially flammable debris that may be on the roofing surface, in the valleys or in the rain gutters.

3. Sparks from a chimney connected to a fireplace or wood-burning stove could catch tree branches on fire. To reduce the chance of this happening, trim all branches ten feet away from a chimney that vents a wood-burning fireplace or stove.
Land Use Regulation Tools

- Comprehensive Plan
- Zoning
- Subdivision Regulations
- Fire Code
- Building Code
- Nuisance Ordinances
- Neighborhood Covenants, Conditions & Restrictions
"Structures shall be designed to minimize the potential for loss of life and property from wildfires."

Outdoor sprinkler systems, fire-resistant building materials, landscaping with appropriate vegetation, and site design practices.
Zoning/Subdivision Regulations

Local level --

WUI Overlay Map -- Landscape scale planning and fuel modification plans

Reduce housing densities, increased setbacks, water storage for firefighting requirements, fuelbreak requirements, reference to stricter building code, vegetation management plan
Model WUI Fire Codes

- International Wildland-Urban Interface Code
- NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire
- NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas
Elements of a WUI Code

- Wildfire Zone Map
- Administrator of Ordinance
- Compliance before a permit
- Inspection Form/Assessment
- Ignition-resistant construction materials
- Vegetation clearances around structures
- Access, roads, addresses, water supply
- Enforcement/Maintenance over time
# STRUCTURE ASSESSMENT GUIDE

**Date of assessment:** 22 Nov  
**Property address:** 70 Norris Rd.  
**Resident:** John and Jane Doe  
**Property owner:** Same

## PRIMARY INFORMATION

<table>
<thead>
<tr>
<th>Assessment Items</th>
<th>Mitigation Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. OVERVIEW OF SURROUNDINGS</strong></td>
<td></td>
</tr>
</tbody>
</table>
| How is the structure positioned in relationship to severe fire behavior?  
The house is located near peak of a ridge at local map reference Q-4-12. The setbacks from the lot lines are approximately 15-30 ft. There is a slight sloping of the lot away from the house within 50 ft of the lot line on the north. | Since prevailing winds during fire season are most likely from the west-southwest, keep pine needles and leaf litter cleaned up on roadside berm. |
| Type of construction:  
Wood frame construction with brick façade on the front. Vinyl siding on back and two sides. | |
| **2. CHIMNEY TO EAVES** | |
| Inspect the roof — noncombustible? shingles missing? shingles flat with no gaps?  
Noncombustible roofing in good shape. | Inspect roof each spring for damage, especially after a hard winter or wind storm. |
| Gutters — present? Noncombustible?  
Aluminum gutters at all eaves. No overhanging limbs nearby. Pine needles and leaf litter not likely to collect in deep quantities. | Keep gutters free of pine needles and leaves. Check early spring and fall. |
| Litter on roof, in gutters, and crevices?  
Fairly clean. Not much of a concern. Easy to maintain. | |
| **3. TOP OF THE EXTERIOR WALL TO FOUNDATION** | |
| Attic, eave, soffit vents, and crawl spaces:  
Not much of a concern. | |
| Inspect windows and screens — metal screens?  
Multi-paned windows? Picture windows facing vegetation?  
Metal screens on all windows. Some windows on west side are double-paned. Some high vegetation near front windows. Low vegetation in rear. | Keep front bushes pruned and watered during fire season. Replace any missing or torn screens immediately, especially the front. |
| Walls and attachments — noncombustible? Will they collect litter?  
Not much of a concern. | |
| Decks — combustible materials?  
Wooden deck and privacy fence on south side. No skirting or screening beneath deck. Deck in good condition. Small vegetation around deck but overhanging tree limbs. Some collection of leaves and needles near deck and wooden stairs. | Prune trees closest to deck and privacy fence. Remove the pine needles and leaves. Store combustibles elsewhere — perhaps the shed in the backyard — especially during high fire danger periods. Put skirting or 1/4" wire mesh around deck openings. |
### 3. TOP OF THE EXTERIOR WALL TO FOUNDATION (continued)

<table>
<thead>
<tr>
<th>Assessment Items</th>
<th>Mitigation Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fences. Wooden stockade fence joins house on north side. Wooden fencing also on south side. Chain link in rear along lot line. Neighbor’s wooden fence is less than 2-3 ft from their wooden fence — will allow leaves and embers to accumulate.</td>
<td>Keep wooden fence perimeter clear of dry leaves and other combustible materials like chairs, wood, etc. If the chance presents itself to use noncombustible materials to separate fence from house, you should consider it.</td>
</tr>
<tr>
<td>Flammable material next to or under the structure. None observed.</td>
<td></td>
</tr>
<tr>
<td>Combustible materials near or on the structure where walls meet roof or decking surfaces. Plastic outdoor furniture pads on deck might pose problem from ember shower.</td>
<td>Keep combustible chair pads put away except when in use.</td>
</tr>
<tr>
<td>Crawl space, attic vents, soffits. All appear to be in excellent condition and protected.</td>
<td></td>
</tr>
<tr>
<td>Nooks and crannies and other small spaces. All appear to be in excellent condition and protected.</td>
<td></td>
</tr>
</tbody>
</table>

### 4. FOUNDATION TO IMMEDIATE LANDSCAPED AREA

<table>
<thead>
<tr>
<th>Assessment Items</th>
<th>Mitigation Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscaped (managed) vegetation — separation distances, maintenance, plant selection? Firewise Landscaping Zones? Lawn well cared for. Leaf and needle accumulation along east side (rear of property) with small stand of trees. Front and south side have mix of pine and other vegetation.</td>
<td>Be sure to keep these areas well tended, pine needles cleared and limbs pruned. Lawn needs to be kept green and mowed. Plants irrigated, pruned and raked — especially during high fire danger periods.</td>
</tr>
<tr>
<td>Propane tanks. No large ones. Outdoor grill small tank.</td>
<td>Make sure this area is kept clear of any combustibles — especially when using the grill.</td>
</tr>
<tr>
<td>Vehicle and RV use and parking, including lawn mowers, etc. Parking in front. Mower storage in shed which is 40-50 ft from NE corner of house. Plastic children’s play house etc. near wooden fence along north side but over 30 ft from house.</td>
<td></td>
</tr>
</tbody>
</table>

### 5. IMMEDIATE LANDSCAPED AREA TO EXTENT OF THE HOME IGNITION ZONE

<table>
<thead>
<tr>
<th>Assessment Items</th>
<th>Mitigation Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect vegetation clearance and crown separation. Lot is rather small and the neighboring properties vegetation is more dense than this one. Trees in back should pose little concern as prevailing winds will not communicate fire towards house.</td>
<td>Work with neighbors to improve all three lots to reduce the hazards on this corner. The neighbors behind this address and those on either side might benefit from some clearance that might take place but the separation of those properties appears to be sufficient.</td>
</tr>
</tbody>
</table>
### Rating Values by Areas Assessed

<table>
<thead>
<tr>
<th>Topographical Features</th>
<th>Overview of Surrounding Environment (4.2.1)</th>
<th>From Chimney to Eaves (4.2.2)</th>
<th>From Top of the Exterior Wall to Foundation (4.2.3)</th>
<th>From Foundation to Immediate Landscaped Area (4.2.4)</th>
<th>Area to Extent of Structure Ignition Zone (4.2.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Topographical features that adversely affect wildland fire behavior (4.2.1)</td>
<td>0–5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Areas with history of high fire occurrence (4.3.4)</td>
<td>0–5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Areas exposed to unusually severe fire weather and strong, dry winds (4.2.1.3)</td>
<td>0–5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Local weather conditions and prevailing winds (4.2.1.2)</td>
<td>0–5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) Separation of structure on adjacent property that can contribute to fire spread/behavior (4.2.1.5)</td>
<td>0–5</td>
<td>0–5</td>
<td>0–5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Vegetation — Characteristics of predominant vegetation

| Light (e.g., grasses, forbs, grassgrasses, and tundra) NFDRS Fuel Models A, C, I, N, S, and T | 5 | 15 | 5 |
| Medium (e.g., light brush and small trees) NFDRS Fuel Models B, E, F, H, P, Q, and U | 10 | 20 | 5 |
| Heavy (e.g., dense brush, timber, and hardwoods) NFDRS Fuel Models B, G, and O | 15 | 25 | 15 |
| Slash (e.g., timber harvesting residue) NFDRS Fuel Models J, K, and L | 15 | 30 | 20 |

### Topography (4.2.1.1, 4.2.4, 4.2.5)

| Slope 5–9% | 1 | 1 |
| Slope 10–20% | 4 | 2 |
| Slope 21–30% | 7 | 3 |
| Slope 31–40% | 10 | 6 |
| Slope >41% | 15 | 10 |

### Building Setback, relative to slopes of 36% or more (4.2.1.3, 5.1.3.2)

| ≥30 ft (9.14 m) to slope | 1 |
| <30 ft (9.14 m) to slope | 5 |

### Roofing Materials and Assembly, unexposed (4.2.2.1, 4.2.2.3)

| 50° |

### Ventilation Soffits, without mesh or screening (4.2.3.4)

| 20 |

### Gutters, combustible (4.2.2.4, 4.2.3.5)

| 5 |
### REQUIRED DEFENSIBLE SPACE

<table>
<thead>
<tr>
<th>WILDLAND-URBAN INTERFACE AREA</th>
<th>FUEL MODIFICATION DISTANCE (feet)³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate hazard</td>
<td>30</td>
</tr>
<tr>
<td>High hazard</td>
<td>50</td>
</tr>
<tr>
<td>Extreme hazard</td>
<td>100</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. Distances are allowed to be increased due to site-specific analysis based on local conditions and the fire protection plan.
SAFER FROM THE START

A Guide to Firewise-Friendly Developments
Covenants, Conditions & Restrictions (CC&R’s)

- Can be required by local government
- Filed with the subdivision plat
- Restrictions go with the lots in perpetuity
- Enforcement by the HOA – fines, liens
Dead trees and brush constitute a public nuisance in subdivisions.

Owners must keep land free of dead trees, brush and tree limbs.

$100. - $200. fine per day.
Questions?

Thank you!