

# *Living With Fire*

## **Wildfire Threat Reduction Recommendations for Nevadans**

**Ed Smith, Natural Resource Specialist  
University of Nevada Cooperative Extension**

### **Introduction**

In 2003, the University of Nevada Cooperative Extension initiated an effort to standardize wildfire threat reduction recommendations for homeowners among Nevada's federal, state, and local fire prevention organizations. The "Living With Fire — Wildfire Threat Reduction Recommendations for Nevadans" is the result of this process. It is important to note: these are suggestions for homeowners endorsed by the program's sponsors and are not requirements. Local fire jurisdictions should be consulted regarding requirements. These recommendations are not intended to be in conflict with local ordinances, codes, or laws.

### **Recommendations**

**1.0 Purpose:** These are wildfire threat reduction recommendations to homeowners for implementation on their property. The recommendations are presented in three categories: Built Zone; Defensible Space Zone; and Access Zone.

#### **2.0 Built Zone**

**2.1 Objective:** Improve the ignition resistance of the house and associated structures.

**2.2 Definition:** The Built Zone consists of the house, deck, and other structures.

#### **2.3 Roof**

- a. **Roof Covering:** Wood shake or shingle roofs should be replaced with a non-combustible roof covering such as composition, metal, cement product, or tile.
- b. **Roof Assembly:** The fire resistance of the roof assembly (includes the covering, underlayment, and support) should have at least a Class C rating. Contact the local fire department for detailed information concerning fire resistant roofs.

c. **Roof Openings:** All roof openings, such as a space between the roof covering and the roof decking, should be plugged or screened with at least ¼" wire mesh to prevent entry of embers.

d. **Roof Debris:** The roof should be kept free of fallen needles, leaves, branches, and other debris.

**2.4 Chimney:** Every chimney, flue, or roof vent should have an approved spark arrestor consisting of ½ inch or smaller wire mesh.

**2.5 Eaves and Overhangs:** The undersides of eaves and other overhangs (e.g., cantilever balconies) should be covered with at least a ½ inch thick solid sheathing material.

**2.6 Rain Gutters:** Rain gutters should be kept free of fallen leaves, needles, and other debris.

**2.7 Exterior Wall Covering:** Exterior wall coverings consisting of wood shakes or shingles, boards, or panels and vinyl siding are poor choices. Stucco, brick, metal, cement board, stone, and log wall construction are usually more fire resistant.

**2.8 Windows:** Single paned and large windows are poor choices. Windows that are at least double-paned or use tempered glass are preferred. Low "E" glass may provide some advantages. Windows with aluminum frames and sashes are better choices than those using vinyl or wood. Closable, solid exterior shutters can provide additional protection.

**2.9 Vents:** All vent openings should be covered with ¼ inch or smaller non-corrosive mesh. Do not use fiberglass mesh.

**2.10 Decks:** Preferably, the underside of decks should be enclosed with fire resistant materials such as those described in **2.7 Exterior Wall Covering**. As an alternative, the underside of decks can be screened with ¼ inch or smaller wire mesh. The area underneath decks should be kept free of all easily combustible materials.

**2.11 Flammable Items:** Flammable items, such as paper, fallen leaves and needles, trash, firewood, and combustible decorations, should be removed from exposed locations like porches, steps, patios, and decks.

**2.12 Wooden Fences:** If wooden fences are attached to the house, create a barrier using fire resistant materials, such as masonry or metal, between the house and the fence.

### 3.0 Defensible Space Zone

**3.1 Objective:** Reduce the flammability of vegetation near the house.

**3.2 Definition:** Defensible space is that area between a house and an oncoming wildfire where the vegetation has been managed (i.e., pruned, thinned, removed, replaced, etc.) to reduce the wildfire threat and allow firefighters to safely defend the house.

**3.3 Defensible Space Zone Distances:** The distance from the house in which defensible space practices are implemented vary by fuel type and steepness of slope. The recommended minimum distances are presented in **Table 3.3a**.

**Table 3.3a**  
**Recommended Defensible Space Zone Distances<sup>1</sup>**

Fuel Type (Fuel Models <sup>2</sup> )	Percent Slope		
	0-20%	21-40%	>40%
Grass (1-3)	30ft	100ft	100ft
Shrub and Pinyon-Juniper (4-7)	100ft	200ft	200ft
Timber <sup>3</sup> (8-13)	100ft	100ft	200ft

<sup>1</sup> As measured from the footprint of the house.

<sup>2</sup> BEHAVE Fuel Models.

<sup>3</sup> Use shrub values if a substantial shrub understory is present.

**3.4 Defensible Space Zone Areas:** The Defensible Space Zone consists of three areas: the Noncombustible Zone; the Lean, Clean, and Green Zone; and the Wildland Fuel Reduction Zone. See **Figure 3.4**.

**3.5 Noncombustible Area:** This area lies immediately adjacent to the house and extends out from the footprint of the house for at least three feet. The objective of this area is to prevent the ignition of a smoldering or flaming fire which could in turn ignite the house. Of particular concern is the prevention of ignition from burning embers. Recommendations for the Noncombustible Area include:

- a. **Remove Dead Plant Material:** All dead plant material including dead shrubs and trees; fallen leaves and needles; bark and wood mulches; dried grass, flowers, and weeds; dead leaves, flowers and branches still attached to living plants; firewood; and construction materials should be removed from this area.
- b. **Remove Flammable Living Plants:** Flammable native plants such as big sagebrush, bitterbrush, rabbitbrush, greenleaf manzanita, huckleberry oak, snowbrush, pinyon pine, Utah juniper, and small Jeffrey pine and white fir should be removed from this area. Flammable ornamental plants such juniper; mugo pine; Austrian black pine; other coniferous shrubs and

trees, large exotic grasses, and Scotch broom should be removed and/or not be planted in this area.

- c. **Use Noncombustible Materials:** Emphasize the use of noncombustible materials such as rock, gravel, brick, and concrete in this area.
- d. **Use Low Growing, Irrigated, Herbaceous Plants:** Emphasize the use of low growing (less than 18 inches in height) herbaceous (non-woody) plants that are kept green during the fire season with irrigation. Examples include lawn, clover, conservation grasses, bulbs (such as tulips, crocus, iris, and daffodils), ground covers (such as periwinkle, potentilla, woodruff, and thyme), flowers (such as columbine, marigolds, and daisies), and succulents (such as ice plant).
- e. **Use Deciduous Shrubs:** The use of deciduous shrubs, such as spirea, barberry, red-osier dogwood, is acceptable so long as they are kept healthy and vigorous, the lower branches do not touch the ground, and branches are not in contact with the house. Shorter shrubs (less than 18 inches in height) are preferred.
- f. **Fire Resistant Trellises:** Use metal instead of wood for trellises.

**3.6 Lean, Clean, and Green Area:** This area often serves as the transition between wildland vegetation and the house and is usually where the irrigated, residential landscape is situated. It extends out from the Noncombustible Area (at least three feet from the footprint of the house) for at least 30 feet. See **Figure 3.4**. The objectives for this area are to: 1) manage the vegetation so that the fuels present would be unable to generate enough heat for a long enough time to ignite the house and 2) provide a safe and effective area for firefighters, if present, to defend the house. Recommendations for the Lean, Clean, and Green Area include:

- a. **Dead Plant Material:** Remove standing dead trees and shrubs; recently fallen trees; dead branches that have fallen or that are still attached to living plants to height of 15 feet above ground; dried grass, flowers, and weeds; fallen needles and leaves covering areas other than bare soil (such as lawn, roof, plants, deck, etc.), dead leaves and needles that are still attached to living plants to a height of 15 feet; firewood (should be located at least 30 feet uphill from the house); and wood scraps or debris. Fallen dead trees that are embedded into the soil can be left in place so long as all exposed branches are removed. Wood and bark mulches can be used. Fallen leaves and pine needles covering bare soil should not be allowed to accumulate to depths greater than 2 inches.
- b. **Flammable Living Plants:** For the most part, the presence of flammable living plants as listed in **3.5b** should be substantially reduced in this area and replaced with less flammable species. Individual specimens or small group plantings of these species may be retained so long as they are kept

healthy and vigorous; are pruned to reduce height and/or fuel load; and cannot convey a fire burning in adjacent wildlands to the house.

- c. **Retain Low Growing Native Plants:** Low growing (less than 18 inches in height) native plants such as squaw carpet, pinemat manzanita, phlox, and sulfur flower buckwheat, can be retained so long as they are kept healthy and vigorous.
  - d. **Use Noncombustible Materials:** See 3.5c.
  - e. **Use Low Growing, Irrigated, Herbaceous Plants:** See 3.5d.
  - f. **Use Deciduous Trees and Shrubs:** Deciduous trees and shrubs, such as aspen, spirea, and barberry can be used if they are kept healthy and vigorous; are kept free of dead leaves and wood; and are arranged so that a fire burning in the adjacent wildland vegetation cannot be conveyed through them to the house. Shorter shrubs (less than 18 inches tall) are preferred.
  - g. **Ladder Fuels:** A vertical separation between tree/tall shrub canopies and understory vegetation should be created that is at least three times the height of the understory plants. See **Figure 3.6g**. Removal of lower branches should not exceed 1/3 of the tree/tall shrub height. When no understory vegetation is present, the lower branches of trees and tall shrubs should be removed to a height of at least two feet above ground. For shorter shrubs, branches in contact with the ground should be removed.
  - h. **Problem Tree Branches:** Tree branches within 15 feet of a chimney; encroaching on power lines; overhanging the roof; or in contact with the house should be removed.
- 3.7 Wildland Fuel Reduction Zone:** This area extends out from the Lean, Clean, and Green Zone to the appropriate Defensible Space Zone Distance presented in **Table 3.3a**. This area typically consists of wildland vegetation such as sagebrush rangelands, pinyon-juniper woodlands, and mixed-conifer forest. The objective for this area is to reduce the intensity and duration of a wildfire burning more than 30 feet from the house. Recommendations for the Wildland Fuel Reduction Zone include:
- a. **Dead Plant Material:** Remove standing dead trees and shrubs; recently fallen trees; dead branches that have fallen or that are still attached to living plants to height of 15 feet above ground; dried grass, flowers, and weeds; and dead leaves and needles that are still attached to living plants to a height of 15 feet. Fallen dead trees that are embedded into the soil can be left in place so long as all exposed branches are removed.

- b. Reduce Horizontal Continuity of Wildland Vegetation:** For wildland shrubs, pinyon pine, and Utah juniper growing on flat to gently sloping terrain (<20% slope), create a horizontal separation between their canopies that is at least twice their height. See **Figure 3.7b**. On steeper terrain (>20% slope), this separation distance should be greater than twice their height. In forested areas, the recommended separation distance between tree canopies is presented in **Table 3.4b**.

**Table 3.4b**  
**Recommended Separation**  
**Distance Between Tree Canopies**

Percent Slope	Distance Between Tree Canopies
0-20%	10 feet
21-40%	20 feet
>41%	30 feet

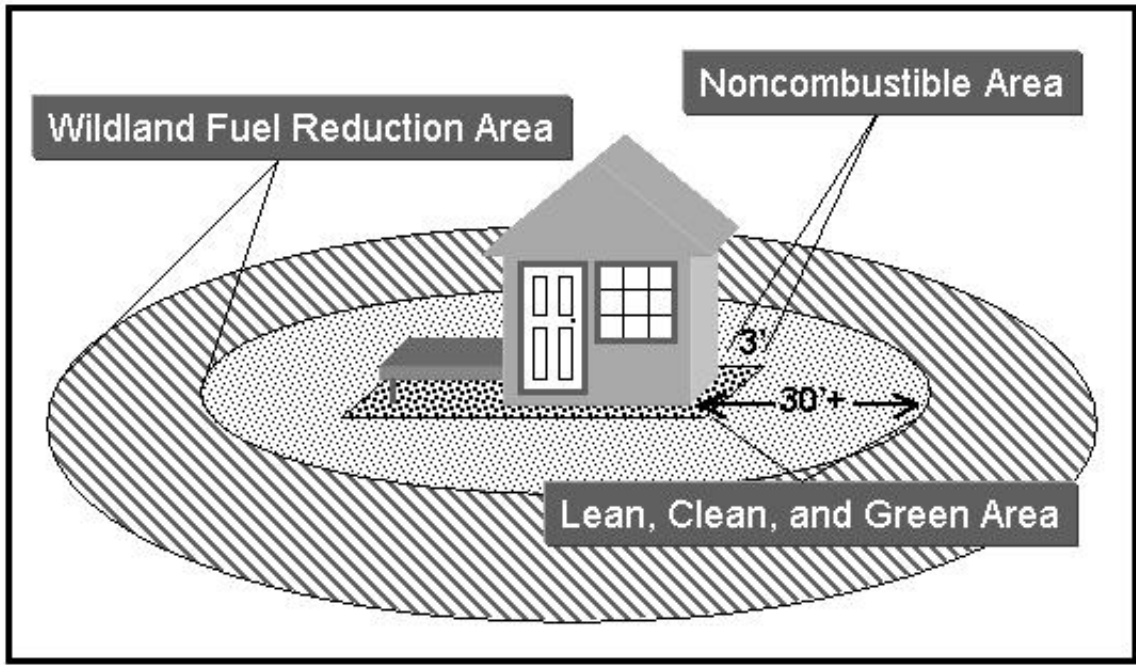
- c. Remove Ladder Fuels:** A vertical separation between tree/tall shrub canopies and understory vegetation should be created that is at least three times the height of the understory plants. Removal of lower branches should not exceed 1/3 of the tree height. When no understory vegetation is present, the lower branches of trees and tall shrubs should be removed to a height of at least two feet above ground.

#### **4.0 Access Zone**

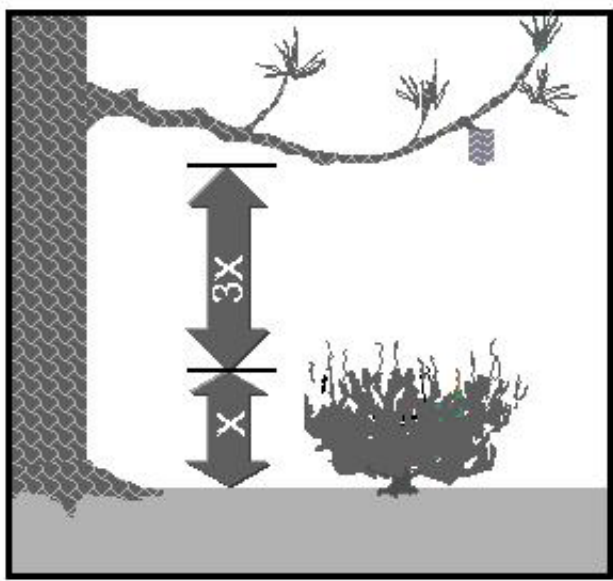
- 4.1 Objective:** Improve the ability of firefighters to locate and arrive at a house threatened by wildfire in a timely manner.
- 4.2 Definition:** The Access Zone consists of driveways and signage associated with house location.
- 4.3 Address:** The home address sign should be readily visible from the street, use characters that are at least four inches high, and be constructed of fire resistant material.
- 4.4 Street Signs:** Street signs should be at every intersection leading to a house, use characters that are at least four inches high, and be made of reflectorized, noncombustible material.
- 4.5 Driveways and Clearance:** Flammable vegetation should be cleared for at least 10 feet on either side of the driveway. Overhead obstructions, such as

overhanging branches, should be cleared for at least a 15 foot vertical clearance.

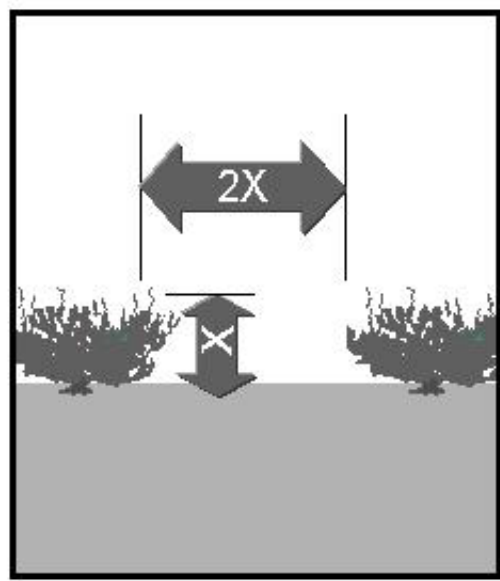
**4.6 Driveway Characteristics:** Houses located at the end of long driveways (greater than 300 feet) should have turnaround areas suitable for large fire equipment.



**Figure 3.4:** Defensible Space Zone Areas.



**Figure 3.6g:** Separation distance for ladder fuels.



**Figure 3.7b:** Separation distance between shrubs, pinyon, and Utah juniper located on 0-20% slopes.

## Literature Review

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