

## **Be Ember Aware! Tip Series**

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To learn more about protecting your home from the ember threat, visit [www.livingwithfire.info](http://www.livingwithfire.info) and request a free copy of our publication, *Be Ember Aware!*, download it at [www.unce.unr.edu](http://www.unce.unr.edu) or contact Ed Smith at [smithe@unce.unr.edu](mailto:smithe@unce.unr.edu). *Be Ember Aware* is a component of the *Living With Fire program*, an interagency program coordinated by University of Nevada Cooperative Extension.

### **Be Ember Aware Tip #1 - Stop Shaking**

The most reliable way to predict which houses will survive a wildfire and which will be destroyed is by looking at the roof.

Houses with wood shake or shingle roofs are many times more likely to be destroyed during a wildfire. Using wood shakes or shingles for roofs in high fire hazard areas is like stacking hundreds of pounds of kindling on top of your home. During the hot summer months, the shakes or shingles can be nearly bone dry and easily ignited by embers. The embers come from pieces of burning material that can be lofted high into the air during a wildfire and travel a mile or more from the actual fire.

Unfortunately, there is no effective, inexpensive long-term solution to the ember threat to wood roofs. We recommend replacing wood shake or shingle roofs with a rated, fire-resistant roofing material, such as asphalt composition shingles, metal, or concrete or clay tile. Although this can be expensive, it may well be the one thing that saves your home when the embers arrive.

### **Be Ember Aware Tip #2 - Unclutter the Gutter**

Rain gutters attached to the edge of your roof are the perfect contraptions for catching embers during wildfire. Burning embers can land in the gutters and if they are filled with dried leaves, pine needles, and twigs, a fire can start and possibly ignite the roof, roof sheathing, and fascia. Even houses with fire rated roofs are vulnerable to this type of ember attack. Rain gutters made of vinyl will melt and drop into flower beds, igniting plants next to the house and maybe even combustible siding. To keep your home safe, we suggest that you:

- Remove all dried leaves, pine needles or other materials from your rain gutters before fire season. Over the winter, debris often accumulates in them.
- Keep your ladder handy and check your rain gutters throughout the fire season, cleaning them out as necessary.
- If a wildfire is approaching and there is no time to clean out the debris, plug the rain gutter down spout with a tennis ball, or something similar so that the down spout will be plugged, and fill the rain gutter with water.

### **Be Ember Aware Tip #3 - Chucking Your Wood**

How much wood could a woodchuck chuck? If he lived in one of Nevada's high fire hazard areas, he should chuck all of it at least 30 feet from his home.

One of the most common ember hazards homeowners create is the placement of firewood stacks next their home. During a wildfire, hundreds of burning embers could become lodged within the stack. The dry, high winds that often accompany wildfire can fan the embers and cause ignition. Once burning, the firewood stack can jeopardize just about any home, regardless of construction material, because of its ability to ignite combustible siding, provide a flaming exposure to windows and break the glass, or climb to the eave and possibly enter into the attic.

Firewood should be stored at least 30 feet from the house, deck, and other structures during fire season. If the firewood stack is located uphill, make sure burning logs won't roll downhill and ignite the home. Don't place the stack under tree branches or adjacent to wood fences that are connected to the house. Bring just enough wood for the winter in close to the house after fire season is over. Another option is to store firewood inside the garage, but make sure embers can't enter your garage through gaps between the door and framing. Don't let your firewood stack be the kindling for your house fire.

### **Be Ember Aware Tip #4 - Deck Danger**

Decks are a common feature of Nevada homes situated in high fire hazard areas. They are also one of the parts of your home that are vulnerable to embers during wildfire. This applies to decks comprised of wood boards as well as those made from plastic and wood-plastic composite deck boards. If your deck ignites, the flames can ignite your combustible siding, break the glass on an adjacent window or sliding glass door, or climb to the eave and burn into your attic. If you have a deck and live in a high fire hazard area, you should consider the following tips:

- Keep the gaps between deck boards free of pine needles, leaves and other debris. This tip also applies to intersection between your deck and your house. Embers can become lodged in the gaps and ignite the deck. Also, don't allow fallen pine needles and other dead plant material to accumulate on the deck surface during fire season.
- The area underneath the deck is particularly susceptible to ember attack. Don't store firewood, gas cans, lawn mowers, cardboard or other combustible materials under the deck and keep it free of weeds, pine needles and leaves. Consider enclosing the deck with solid skirting, such as siding that is properly vented, or with 1/8-inch wire mesh to limit ember penetration and reduce maintenance. Don't enclose it with wooden lattice.
- Rotted or otherwise poor condition wood is more easily ignited by embers than wood in good condition. Replace deteriorated wooden deck boards and posts with new ones.
- Install metal flashing between the deck and the side of the house. Be sure the flashing is installed to allow proper drainage of water.
- If wildfire is threatening, remove combustible materials from the deck, including newspapers and magazines, baskets, door mats, dried flower arrangements, and place them inside the house or garage. Propane tanks should be placed at a distance 30-ft or more from the house.

Decks are an important and attractive feature to many homes in the wildland-urban interface. Unfortunately, they can also contribute to the wildfire threat to your home. Take steps now, before fire season, to reduce the deck danger.

### **Be Ember Aware Tip #5 - Vulnerable Vent Dilemma**

Vents play a critical role in the long-term preservation of your home by allowing excess moisture to escape from the attic and crawl space. If moisture was allowed to accumulate in these areas, the wood components of your home could be threatened by mold and decay fungi.

During a wildfire, vent openings have also been shown to be one vulnerable spots for ember entry into your home. The Wildfire Lessons Learned Center “Southern California Firestorm 2003” report concluded after reviewing the loss of 3340 homes destroyed by wildfire:

*Ornamental vegetation created an unpredictable and significant fuel source that blew into attic vents and eaves and spread through neighborhoods by torching, crowning, or throwing embers. Structures became involved from ember attack from the inside out rather than flame impingement.*

This creates a dilemma for homeowners. Many vents use wire mesh coverings. Some building codes set the minimum mesh size for these at 1/4 inch. Smaller mesh sizes can become clogged by paint, cobwebs, debris, etc. that will reduce air flow. Unfortunately, the 1/4-inch mesh is not effective in preventing ember entry into the attic, eave, and crawl space vents. For existing homes, consider the following:

- Replace 1/4-inch mesh with 1/8-inch mesh, if building codes and required air flow allow. Be sure to keep the mesh openings unclogged.
- Use metal wire mesh, not plastic or fiberglass.
- Don't store combustible materials, such as paper, clothing, etc. in the attic or crawl space.
- Clear fallen pine needles, leaves, dried grass and other debris from around vents (a particular problem with through-roof vents, such as a dormer or ridge vent).
- Do not plant shrubs in front of or underneath vent openings.
- Create pre-made covers out of plywood to install over vent openings if wildfire is approaching and there is time. In an emergency situation, it may help to fold several layers of aluminum foil and staple over vent openings.

New ember resistant vent designs are becoming available to consumers. Check with your local fire marshal for advice on these and other measures to reduce the potential of embers entering your home.

### **Be Ember Aware Tip #6 - A Noncombustible Must**

During a wildfire, thousands of windblown embers may pelt your house like hail during a storm. Many of the embers that strike the side of the house can fall to the ground and accumulate next to your home. If your neighborhood is asked to evacuate as wildfire approaches, the embers can

lie there, glowing unattended for hours or even days. If the embers are in contact with a wood or other combustible material sided house, or something that can ignite in the flowerbed, your home could be in jeopardy.

The vegetation, landscape materials and other items located immediately adjacent to your home have critical influence on house survival during wildfire and ember attack. Homeowners living in high fire hazard areas need to create a “noncombustible (or low combustible) area” within 3 -5 feet of their houses. Some of the important “do’s” and “don’ts” of a noncombustible area include:

Dos...

- Do use hard surfaces such as concrete, brick and rock
- Do use green, healthy well maintained lawn
- Do use gravel or rock mulches
- Do use irrigated herbaceous plants such as annual and perennial flowers and groundcovers
- Do use short, less than 18” in height, deciduous shrubs, but don’t locate them in front of foundation vents

Don’ts...

- Don’t locate the firewood pile, or other combustible materials such as lumber in this area
- Don’t use wood, bark or rubber mulches
- Don’t have uncovered garbage cans or recycling bins here
- Don’t have dried grass and weeds, fallen pine needles and leaves or dead branches located in this area
- Don’t use ornamental evergreen plants, such as shrub junipers

Having a noncombustible (or low combustible) area next to your home is an important part of protecting it from wildfire. Don’t wait - take action now before the embers arrive.

## **Be Ember Aware Tip #7 – Green Gas Cans**

Ornamental junipers are one of the most popular plants in northern Nevada landscapes and for good reason. Juniper shrubs are drought tolerant, stay green year-round and require little care.

Unfortunately, ornamental junipers have also earned the nickname “green gas cans” by Nevada’s firefighters. This is because they can burn very intensely during wildfire. They also have the ability to harbor burning embers undetected in their crowns and in the plant litter underneath, only to ignite the shrub hours later after the fire front and firefighters have passed through the neighborhood.

Several plant attributes contribute to the juniper’s reputation as a fire hazard. These include:

- They are dense plants. There is usually a lot more plant material, i.e., potential fire fuel, in a 3-foot tall juniper than there is in other similar sized shrubs. For example, compare a juniper to a red twig dogwood.
- Junipers have a bad habit of retaining clumps of dead leaves and twigs within their crowns. Pull back the branches of a mature juniper and see for yourself. These little “jackpots” of fuel can be ignited by embers. Thick layers of dead plant debris also build up underneath the shrubs. Since

the juniper branches are so thick and the leaves can be irritating to the skin, most people don't remove the plant litter.

- Like most coniferous plants, junipers contain oils and resins. These chemicals can cause the juniper to burn intensely.

Junipers are a valuable plant in Nevada landscapes, but they are also a fire hazard. Locate junipers at least 30 feet from the home and keep them healthy and well maintained.

## **Be Ember Aware Tip #8 - Much About Mulches**

Mulches play an important role in northern Nevada landscapes. They can reduce the water requirements of plants, cool soil temperatures, reduce the occurrence of weeds, control soil erosion and dust, and can visually enhance the landscape. Unfortunately, some popular mulches are also combustible, a bad attribute for residential landscapes located in high fire hazard areas, and can be easily ignited by embers during a wildfire.

Organic mulches are made from plant materials. Examples include pine needles, wheat straw, pine bark nuggets of various sizes, shredded western red cedar and redwood sometimes referred to as "gorilla hair" mulch, and wood chips from recycled pallets or wildfire fuel reduction projects. These materials vary considerably in terms of size, shape, and texture; factors that also influence their flammability.

Experiments conducted by the University of Nevada Cooperative Extension, Nevada Tahoe Conservation District, Carson City Fire Department and the University of California Cooperative Extension, indicate that pine needle and gorilla hair mulches pose the greatest fire hazard of the organic mulches. Test results show that they are easily ignited, burn fast, and produce considerable heat. Other organic mulches, such as bark nuggets and wood chips, burn somewhat slower but also produce considerable heat. Partially composted wood chips produce very little flame and burn much slower than the other mulches, but burn hot via glowing combustion.

Inorganic mulches are derived from non-plant materials and include rock, stone, and gravel. Most inorganic mulches are noncombustible and are good choices for homes located in high fire hazard areas. The important exception would be ground or shredded recycled rubber. Rubber mulch products, which are often used in playgrounds, burn very intensely and are difficult to extinguish.

Some important mulch tips for homeowners living in high fire hazard areas are:

- Do not use organic mulches within 3 to 5 feet of the house. This is particularly important for wood or other combustible material (e.g, vinyl and other plastic materials)sided houses. During a wildfire, burning embers may accumulate in this area, thus providing ample sources of ignition for wood and bark mulches.
- Keep organic mulches at least several feet away from combustible materials such as wood posts, firewood stacks, wooden fences, decks, stairs, etc.
- Irrigating organic mulches, as in a flowerbed, may improve their ignition resistance, although the surface layers of mulch will dry out quickly during wildfire weather conditions.
- Do not allow thick layers of pine needles to accumulate within 30 feet of the house.
- Do not use ground rubber mulches within 30 feet of the house or deck.

- Near the home, emphasize the use of inorganic mulches such as rock and gravel.

### **Be Ember Aware Tip #9 - Don't Be "Fuelish"**

In recent years, there has been a lot of effort put into the creation of fuel breaks around some of western Nevada's high fire hazard communities. Fuel breaks are usually a strip of land where flammable vegetation has been removed and less hazardous vegetation has been retained or planted. In our area, this often means mowing sagebrush and bitterbrush with machinery and leaving the grasses and wildflowers. Fuel breaks vary in width, ranging from 30 feet or less to more than 100 feet.

Surprising to many people, the primary purpose of a fuel break is not necessarily to stop an oncoming fire. Typically, fuel breaks are created to improve the ability of firefighters to control an advancing wildfire. A fuel break can reduce fire intensity, provide an area to light a backfire, improve access for firefighters, and improve the effectiveness of fire retardants dropped from aircraft.

Unfortunately, fuel breaks can also provide a false sense of security to the members of a community. Some homeowners assume that once the fuel break is created, they are fire safe and that no further action on their part is required. This is not true. Wind driven embers can be transported over the fuel break and ignite new fires on the other side. Homes that have not prepared for the ember threat are vulnerable despite the presence of the fuel break.

While community level fuel breaks are important in reducing the wildfire threat, they are not enough. Homeowners must continue to do their part by creating defensible space around their home and making their properties resistant to ignition from embers.

### **Be Ember Aware Tip #10 - Window Warnings**

Typically, the weakest parts of the exterior walls of your home during a wildfire are windows. Radiant heat and direct contact by flames can break window glass. This happens because the window glass that you can see heats to a different temperature than the glass protected by the window frame. This difference in temperature causes the glass to crack. If the broken glass falls out during a wildfire, embers can enter your home and ignite it from the inside. An open, screenless window, is the most vulnerable to ember attack. Our "Be Ember Aware" window tips include the following:

- Install windows that are least dual paned with tempered glass. It will resist greater fire intensities than single pane windows. The type of frame material used, such as vinyl, wood, or metal, is not as important as the type of glass.
- Remove wooden flowerboxes from under windows or construct them of fire resistant materials and use fire resistant plants. Do not use wood or bark mulches in the planter boxes.
- Do not plant large, dense shrubs such as ornamental juniper under windows.
- Do not place the firewood stack under windows.
- Prepare 1/2-inch plywood covers that are sized and labeled for your windows. If there is time, you can attach these covers before you evacuate. Shutters (instead of the plywood covers) can also be used.
- Decayed wood window sills should be replaced. Decayed wood is easier to ignite than wood in good condition.

- Move easily ignited materials, such as curtains and overstuffed furniture, away from the window. If the window glass breaks and falls away, embers could enter the house and ignite them.

Before evacuating, make sure all your windows are closed. These include basement, garage, and vehicle windows.

### **Be Ember Aware Tip #11 - Don't Wait**

Most homes are destroyed by wildfire because wind driven burning embers come into contact with something easily ignited on, in or near the home. When evaluating your home and property's vulnerability to embers, you should do it in the context of wildfire conditions. You should assume:

- Hot temperatures, very low humidity, and strong gusting winds.
- Poor visibility due to smoke.
- No electricity.
- Little or no water pressure.
- No telephone, including cell phone service.
- Panicking people acting irrationally.
- Firefighters will not be protecting your home and will likely not even be in your neighborhood.
- You and your family will not be present.
- Thousands of burning embers coming from burning pieces of bark, pine cones, branches, and construction materials are being driven by winds into your house and onto your roof.

Now assume that your home is exactly as you left it this morning when you left for work. Would it survive under these conditions? Did you leave a window open? Did you forget to close the garage door? Is the firewood pile stacked next to the house? Are the garbage cans on the back porch full and not covered by lids? Take steps now to reduce the ember threat to your home. Waiting until the fire starts may cost you your home.

### **Be Ember Aware Tip #12 - Have You Got It Covered?**

As discussed in the first Be Ember Aware Tip, one of the most effective things a homeowner can do to improve the ember resistance of their home is to install a Class A fire rated roof. However, the use of a fire rated roof covering is not always enough. Roof openings and gaps can also make your roof vulnerable to an ember attack. This is particularly relevant to barrel or "Mission" tile roofs.

Barrel tiles are often made of clay, are red, orange or brown in color, and half-cylinder in shape. They are commonly used on Mediterranean-style homes. The first row of barrel tiles creates a half-circle opening at the roof edge, which can serve as an entrance for birds, rodents, bats, and other small animals that could build nests using dried grass and other debris in the space between the roof covering and sheathing. These materials can also be simply blown into the tile openings by the wind.

As wildfire approaches, thousands of burning embers may be striking your house. If these embers enter through the barrel tile openings and become lodged in easily ignitable debris, your home would be in jeopardy. The open ends of barrel tiles should be covered to minimize the accumulation of debris, help deter ember entry, and deny unwanted animals access into this space. Some options to cover the tile openings include:

- Install 1/8-inch wire mesh.
- Fill the opening with mortar.
- Use prefabricated “bird stop” pieces which are specially made to cover barrel tile openings (and openings in roof types) .

Don't forget to cover other roof openings, such as along the ridge, as well.

### **Be Ember Aware Tip #13 - Dead or Alive?**

Dead vegetation poses a much greater fire hazard than living plants. Actively growing plants can control the amount of water in their tissues by drawing on moisture from the soil to get more or by transpiring moisture to reduce the amount. Through irrigation, we can ensure that living plants in our landscape have plenty of moisture in their leaves and stems, which is a good thing during fire season.

On the other hand, the water content of dead vegetation is largely controlled by the amount of moisture in the air. If it is a hot, sunny, windy day, with low humidity, dead vegetation will be very dry. The drier the vegetation, the more easy it will be to ignite it and the faster it will burn. Dead vegetation should be routinely removed from around the home, roof, deck and wooden fences during fire season.

Dead vegetation includes:

- Dried grass, such as cheatgrass, and dried weeds
- Fallen pine needles and leaves
- Dead branches on the ground or still attached to living plants
- Dead shrubs and trees

The presence of dead vegetation on or near your home greatly increases your vulnerability to ember attack during wildfire. Keep your landscape plants healthy, green, and irrigated during fire season.

### **Be Ember Aware Tip #14 - Will Your Home Survive When the Embers Arrive?**

The most common reason homes burn during wildfire are because windblown embers become lodged in something easily ignited on or near your home. This summer we provided a weekly tip describing the different areas of your home and property that are vulnerable to ember attack. In this last article of the “Be Ember Aware” series, we summarize the tips.

- Replace wood shake or shingle roofs with fire resistant types.

- Keep rain gutters and roofs free of pine needles, leaves and other debris.
- Move your wood pile at least 30 feet away from the house.
- Remove pine needles and other plant debris from between deck boards and from the surface and enclose the undersides of the deck, making sure to provide adequate ventilation when you enclose.
- Cover vents with 1/8-inch wire mesh or install ember resistant vents.
- Create a noncombustible, or low combustible, area within five feet of the house.
- Avoid planting evergreen shrubs adjacent to the house, and particularly not in front or below vent openings or in front of windows.
- Do not use wood, bark or rubber mulches near homes, especially houses that have wood, vinyl or other plastic siding.
- A fuel break around your neighborhood is not enough.
- Replace single-pane windows with at least double-paned types.
- Cover open ended barrel roof tiles.
- Remove dead vegetation from around the home.
- Assume extreme fire conditions when assessing your home's vulnerabilities to ember attack.

During wildfires, your home may be exposed to thousands of embers that rain down on your home. Take action now to reduce the ember threat.