LIVING WITH WILDFIRE

HOMEOWNERS' FIREWISE GUIDE FOR ARIZONA

ARIZONA FIREWISE COMMUNITIES™

NRCS

Cooperative Extension

LIVING WITH WILDFIRE

Much of the Southwest is considered a high-hazard fire environment. Based on recent history and experience, these areas possess all of the ingredients necessary to support large, intense and uncontrollable wildfires.

Within this hazardous environment are individual houses, subdivisions and entire communities. Many homeowners, however, are ill-prepared to survive an intense wildfire. It is not a question of "if" a wildfire will occur but when. As such, the odds of losing human life and property are growing.

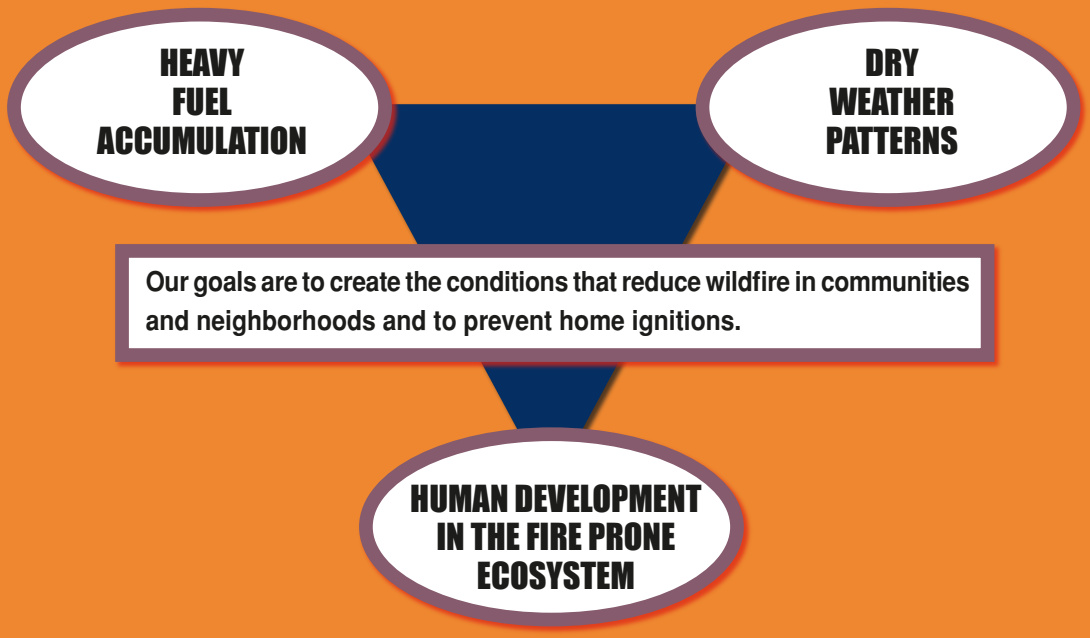
Our ability to live more safely in this fire environment depends on pre-fire activities. These are actions taken before a wildfire occurs that improve the survivability of people and homes. The National Firewise Communities/USA program administered by the State Forester helps communities to pursue a comprehensive approach to having a Firewise community.

The pre-fire activities implemented by this homeowner include a maintained landscape, use of Firewise plant materials, reduced vegetation around the perimeter of the property and fire-resistant roofing material.

The look of our Southwestern forests has changed dramatically during the Twentieth Century. In many instances trees are smaller but are far more numerous. This situation has led to destructive fires in recent years. The build-up of fuel coupled with recent insect and disease outbreaks has greatly increased potential for severe wildfires. Climatic factors such as drought and warmer temperatures also play a role.

This guide provides the homeowner with an effective approach to prevent home ignition in the event of wildfire, built on the Survivable Space concept (see Frequently Asked Questions at back). It features a series of management zones with prescribed treatments, a graphic summary for protecting a home from wildfire and a checklist of pre-fire activities. The reader will also find the wildfire emergency guidelines useful.

WILDFIRE CRISIS TRIANGLE

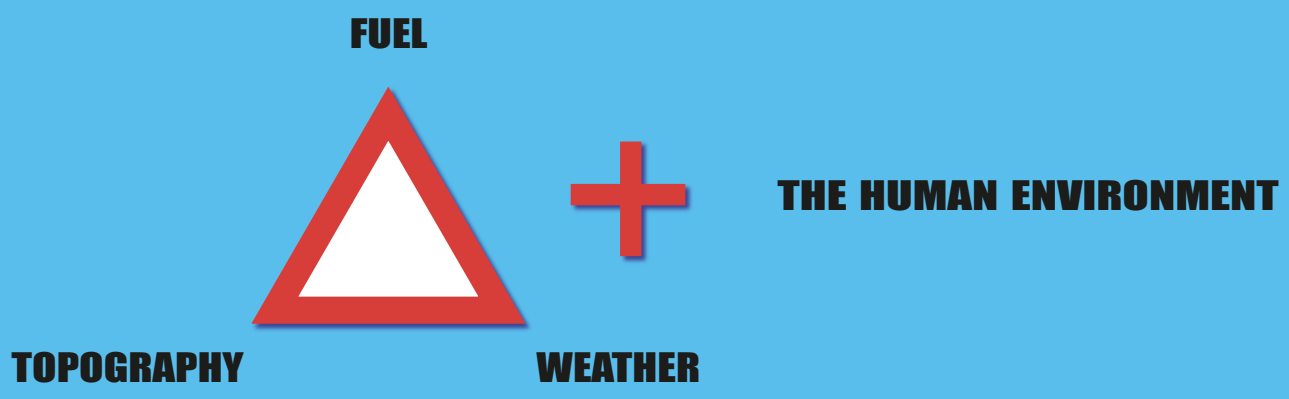


In May 1998, the University of Nevada (Cooperative Extension and Agricultural Experiment Station) and the Sierra Front Wildfire Cooperators initiated a program entitled "Living with Fire." One program product was a publication for homeowners. The Arizona Interagency Coordinating Group (AICG) has reviewed and modified, with permission, this publication for use in Arizona. Altered editions of this publication different from the official version as posted on AICG-affiliated websites are not endorsed.

Fire Behavior

THE FIRE ENVIRONMENT

Three factors influence wildland fire behavior: **WEATHER, TOPOGRAPHY AND FUEL**
These components affect the likelihood of a fire starting, the speed and direction at which a fire will travel, the intensity at which it burns and the ability to control and extinguish it. We cannot realistically change weather or topography, but fuels (or vegetation) can be modified. Opportunities to reduce wildfire risk lie in proper management of vegetation and use of building materials.



FUEL

Fuel is required for any fire to burn. In regard to wildland fire, fuels consist of live and dead vegetation, such as trees, shrubs, grasses and their debris. Structures also become a potential source of fuel when they are in the vicinity of a wildfire. The amount of fuel, its moisture content, arrangement and other characteristics influence fire behavior.

WEATHER

Dry, hot and windy weather increases the likelihood of a major wildfire to occur. These conditions make ignition easier, allow fuels to burn more rapidly, and increase fire intensity. High wind speeds, in particular, can transform a small, easily controllable fire into a catastrophic event in a matter of minutes.

TOPOGRAPHY

Since heat rises, steepness of slope greatly influences fire behavior and rate of fire spread. Slopes with south and southwest aspects tend to be drier and more prone to ignition. Steep, narrow drainages and canyons act like chimneys when wildfires occur.

HUMAN

When people choose to build or buy homes in high-hazard fire areas their homes are potential fuel. Untreated wood shake and shingle roofs, narrow roads, limited access, lack of firewise landscaping, inadequate water supplies and inadequately planned subdivisions increase the risk of wildfire to people and their property.

EXAMPLES OF SOUTHWEST FIRE BEHAVIOR

Presented below are six types of vegetation common to the Southwest. Computer-generated estimates are shown to demonstrate how vegetation would burn under the following conditions: wind speed of 20 mph, flat terrain and typical moisture content of living and dead vegetation in the summertime. Fire behavior will vary as wind, slope and moisture change.

FLAME LENGTH 8 FEET
3,000 ACRES CAN BURN IN ONE HOUR
TRAVELS AT 4 1/2 MPH

GRASS & DESERT SCRUB: Native grasslands occur throughout the Southwest. Grasses can dry out rapidly and burn quickly, creating fast, low-intensity fires. Grasses and invasive plants (weeds) may act as a carrier of fire in the other vegetation types. Fire in desert scrub will behave similarly to grasslands when annual and/or invasive plants are contiguous and dry.

FLAME LENGTH 55 FEET
1,000 ACRES CAN BURN IN ONE HOUR
TRAVELS AT 3 MPH

RIPARIAN AREAS: Typically a heavy brush type consisting of cottonwood, willow, sycamore, mesquite, ash, alder, exotic saltcedar and/or other streamside vegetation. It occurs along water edges, floodplains and adjacent terraces. High-intensity fires are very common; however, low intensity fires in this type may also be destructive.

FLAME LENGTH 10 FEET
150 ACRES CAN BURN IN ONE HOUR
TRAVELS AT 1 1/2 MPH

PONDEROSA PINE FOREST: Depending upon the elevation and aspect, ponderosa pine can transition from pinyon-juniper to mixed-conifer and aspen at higher elevations. The ground cover often consists of tightly packed needles, twigs, old logs and grass.

FLAME LENGTH 16 FEET
500 ACRES CAN BURN IN ONE HOUR
TRAVELS AT 3 MPH

PINYON-JUNIPER WOODLANDS: Pinyon pine and juniper characterize this vegetation type. Usually found on slopes between 4,000-7,000 feet. When fires occur, they are typically moderate to high intensity, and have the potential to kill pinyon pine and juniper trees as well as other woody shrubs.

FLAME LENGTH 8 FEET
10 ACRES CAN BURN IN ONE HOUR
TRAVELS AT 1/4 MPH

MIXED CONIFER: This type consists of white fir, Douglas-fir and blue spruce. Found at higher elevations above 6,000 feet, this type usually consists of the densest forest with the heaviest fuel loading.

FLAME LENGTH 47 FEET
3,600 ACRES CAN BURN IN ONE HOUR
TRAVELS AT 8 1/2 MPH

TALL CHAPARRAL: Chaparral vegetation typically consists of a mix of shrub species, such as shrub live oak, mountain mahogany, manzanita, hollyleaf buckthorn, desert ceanothus and other shrub species. Grasses and half-shrubs may also be present. Dense chaparral is especially dangerous when it is growing down slope from a house.

THE LIMITATIONS OF WILDLAND FIREFIGHTING

Many people assume that when a wildfire starts, it will be quickly controlled and extinguished. This is an accurate assumption 97% of the time. For most wildfires, firefighters have the ability, equipment and technology for effective fire suppression. Three percent of the time wildfires burn so intensely that there is little firefighters can do. Even airtankers and helicopters cannot be expected to save every home in these cases. Presented below are firefighter tactics as they relate to wildfire flame length. Compare this to the flame lengths shown in "Examples of Southwest Fire Behavior" to the left.

FLAME LENGTH	EFFECTIVE FIRE SUPPRESSION TACTICS
Less than 4 feet	Fireline constructed with hand tools, such as shovels and axes, can be effective at the front of the fire.
4 to 8 feet	Bulldozers and other heavy equipment will be needed to construct an effective fireline. Where bulldozers are not available, fire engines with hoses and water will be required to "knock down" the flames before the fire crews with hand tools can be effective. Otherwise fire crews must construct a fireline at a considerable distance from the fire.
8 to 11 feet	Airtankers with fire suppressing retardant or helicopters with water are required to reduce the fire's rate of spread before fireline construction by crews or bulldozers can be effective.
More than 11 feet	Direct fire suppression efforts will be ineffective. Retreat to existing roads, streams and other barriers. Burn out fuels between the fireline and the advancing fire front.

SURVIVABLE SPACE

WHAT IS SURVIVABLE SPACE?

Survivable Space has evolved from the term Defensible Space (see Frequently Asked Questions at back). It is the modification of landscape design, fuels and building materials that make a home ignition caused by wildfire unlikely, even without direct firefighter intervention. The size of the survivable space area is usually expressed as a distance extending outward from the structure and all attachments such as a deck. This distance varies by the type of wildland vegetation growing near the house and steepness of the terrain.

On the "Vegetation and Slope Influence" chart presented on the next page, find the vegetation type and percent slope that best describes the area where your house is located. Then find the recommended survivable space distance for your situation.

For example, if your property is on flat land surrounded by grassland, your survivable space distance will extend out at least 30 feet from the sides of the house. If your house sits on a 25 percent slope and the adjacent wildland vegetation is dense or has tall brush, you will need to reduce hazardous fuels out to at least 200 feet of your home.

If the recommended distance goes beyond your property boundaries, contact the adjacent property owner to work cooperatively on creating survivable space for both properties. The effectiveness of survivable space increases when multiple property owners work together. The local assessor's office can provide assistance if the owners of adjacent properties are unknown. Do not work on someone else's property without their permission.

Temporarily mark the recommended distance with flagging tied to shrubs, trees or stakes around your home. This will be your treatment area for survivable space.

Please note that these are recommendations made by professional fire managers and firefighters experienced in protecting homes from wildfire. They are not requirements nor do they take precedence over local ordinances.

VEGETATION AND SLOPE INFLUENCE

VEGETATION TYPE	SLOPE: 0 TO 20%	21 TO 40%	+ 40%
GRASS Wildland grasses, weeds, desert scrub and widely scattered shrubs with grass understory. Typically found between 1200 and 4500 feet elevation.	30ft.	100ft.	100ft.
SHRUBS Tall chaparral, riparian areas and pinyon-juniper mixed with chaparral type. Typically found between 3000 and 5000 feet elevation.	100ft.	200ft.	200ft.
TREES Forested areas such as mixed conifer, Ponderosa pine, and dense pinyon-juniper. Typically found between 5000 and 8000 feet elevation. If vegetation type is widely spaced and substantial grass or shrub understory is present, use appropriate vegetation type above.	30ft.	100ft.	200ft.

HOW TO DETERMINE SURVIVABLE SPACE FOR YOUR PROPERTY:

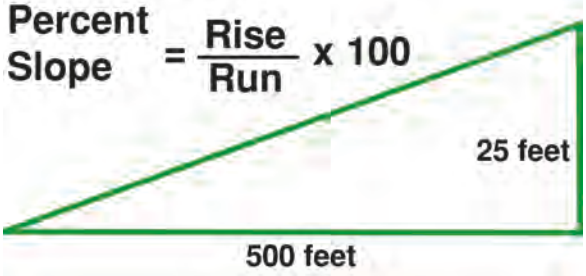
1. Using the chart below, find the percent slope that best describes your property, i.e. 0-20% (the slope below your home is the most critical).
2. Along the left side of the chart, find the vegetation type that best describes the vegetation on or near your property, i.e., Grass.
3. Locate the number of feet corresponding to your slope and vegetation type. i.e., 30 feet. The distance provided is the recommended survivable space for your property.

HOW TO CALCULATE PERCENT SLOPE

To calculate the percent slope, use the following formula:

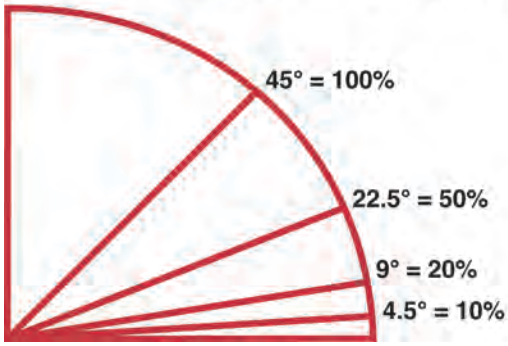
$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

$$\text{Percent Slope} = \frac{\text{Rise}}{\text{Run}} \times 100$$



FOR THIS EXAMPLE: PERCENT SLOPE EQUALS 25/500 X 100 = 5%

Conversion of Degrees of Angle to Percent Slope



IN THE ZONE

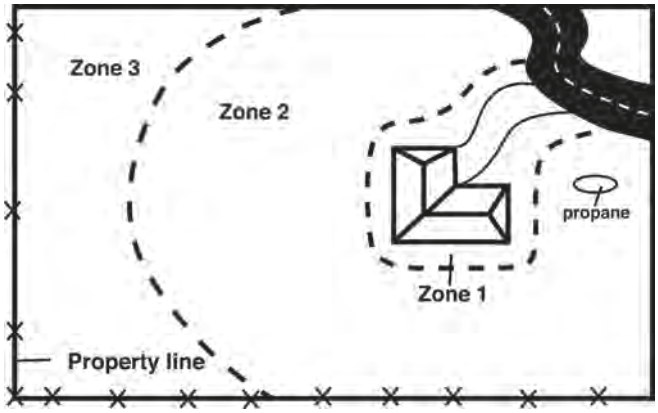


Figure 1: Forested property showing the three survivable-space zones around a home or other structure.

Your house is more likely to withstand a wildfire if grasses, brush, trees and other common forest fuels are managed to reduce a fire's intensity. **Survivable Space** is the modification of landscape design, fuels, and building materials that would make a home ignition caused by wildfire unlikely, even without direct firefighter intervention. Create a survivable space around your structures by removing, reducing, relocating and replacing fuels and vegetation to slow the spread of wildfire. Include detached garages, storage buildings, barns and other structures in your plan. Survivable space involves developing a series of management zones in which different treatments are used. Not all properties extend into each zone. See Figure 1 for a general view of the relationships among these management zones.

ZONE 1

INTENSIVE FUEL REDUCTION ZONE

This is the Intensive Fuel Reduction Zone. It is the area of maximum modification and treatment. It consists of an area of at least 30 feet around the structure in which flammable materials and vegetation is removed and replaced with non-flammable decking or decorative stone and well-placed fire-resistant plants and groundcover. This distance is measured from the outside edge of the home's eaves and any attached structures, such as decks or stairways.

- Trees here are considered part of the structure, the fewer the better, and are at least 10 feet from the structure. Choose deciduous trees over coniferous or fire-prone ones.
- Remove "ladder fuels" from beneath trees.
- Keep plantings within 3 to 5 feet of the walls to a minimum, especially if structure sides are flammable. Decorative gravel, flagstone or concrete decking is recommended in this area.
- Dry grass next to flammable structural components can easily ignite and carry fire that may cause a home ignition.
- Succulent plants and other low growing, fire-resistant plants and groundcover are acceptable.
- Do not stack firewood or store other combustibles in this zone.
- Remove branches overhanging or touching the roof to a distance of a least 10 feet. Remove all branches within 15 feet of the chimney.

In Zone 1, remove the "fuses" next to or near structures that provide opportunity for wildfire and embers to cause home ignition. Common fuses include dry grass, stacked fuelwood, ladder fuels and fire-prone plants such as juniper.

ZONE 1 TIPS

- Avoid using high resin, fire-prone plant materials, as burning embers and ground fires can easily ignite them.
- Ice plants and other succulent ground covers are good choices as are flowerbeds and vegetable gardens.
- Broadleaf and/or deciduous trees are also good choices. Try to plant trees so that branches do not reach the structure, or prune branches back at least 10 to 15 feet away, especially near chimneys.
- Keep grasses and lawns mowed short and at least 3 to 5 feet away from structures , as they dry out quickly during fires and can be ignited easily by embers.
- Look for fuel ladders of any sort, from plants to building materials, and rearrange or remove plants or other fuels as necessary.
- Using gravel, flagstone, or non-flammable decking adjacent to structures can be an effective strategy to reduce the possibility of home ignition.

ZONE 2
MODERATE FUEL REDUCTION ZONE

The size of Zone 2 depends on the slope of the ground where the structure is built. Typically, survivable space should extend at least 100 feet from the structure. See Figure 2 for the appropriate distance for your home's survivable space. Within this zone, the continuity and arrangement of vegetation is modified. Remove stressed, diseased, dead or dying trees and shrubs. Thin and prune the remaining larger trees and shrubs. Be sure to extend thinning along either side of the driveway all the way to the main access road. These actions help eliminate continuous fuel surrounding a structure while enhancing fire safety and the aesthetics of the property.

- Thin trees and shrubs at least 10 feet between crowns, more if on a steep slope. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree.
- Prune under large trees to a height of 10 feet. Remove ladder fuels from under trees.
- Locate propane tanks at least 30 feet from any structures, preferably on the same elevation as the house. Keep flammable vegetation at least 10 feet away from of these tanks. Do not screen with shrubs or vegetation.
- Stack firewood and woodpiles at least 30 feet away and uphill from structure. Keep flammable vegetation at least 10 feet from woodpiles.
- Dispose of slash (limbs, branches and other woody debris) removed from your trees and shrubs by chipping or by piling and burning. If desired, no more than two or three small, widely spaced brush piles may be left for wildlife purposes. Locate these towards the outer portions of your survivable space.

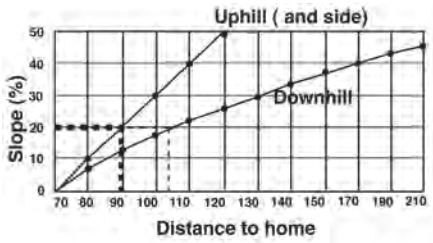


Figure 2: This chart indicates the minimum dimensions for survivable space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill from the home.

ZONE 2 TIPS

- Use broadleaf trees to replace or buffer native pines and junipers in this area. Having more deciduous trees than evergreens in this area is a good strategy to keep flames on the ground and out of the trees.
- Isolated or small groupings of trees or shrubs are best to create screening and privacy.
- Many species of cacti and succulents such as prickly pear or agave can thrive in mountain climates and should be considered for this area.
- Native grass lawns and recreated meadows are also possibilities for this zone. Use drought resistant and low water use species. Seed a cleared area with native species, combinations of warm and cool season perennial grasses as well as annual and perennial wildflowers.
- Keep grasses and wildflowers under eight inches high, especially when dry or dormant.
- Walkways and paths can be effective for breaking up fuel continuity so that it is difficult for a fire to carry.

SURVIVABLE SPACE MANAGEMENT ZONES

ZONE 3
MANAGED WILDLAND ZONE

This is the Managed Wildland Zone. This is an area of native vegetation. This zone may extend at least 200 feet from the structure. This area may also represent or be part of the community ignition zone discussed in Zone 4.

- Typical management objectives for areas surrounding home sites or subdivisions are: recreational use; aesthetics; maintain ecological health and vigor; barriers for wind, noise, dust and visual intrusions; and possibly limited production of firewood, fence posts and other natural resource commodities.
- Specific thinning requirements depend on species and land objectives. Thinning improves the forest stand by removing trees that are damaged, attacked by insects, infected by disease, or are of poor form or low vigor. The remaining trees should be the larger and healthier trees in the stand.
- A limited number of wildlife trees are appropriate in Zone 3. Make sure dead trees pose no threat to power lines or fire access roads.
- It is a good idea from the standpoint of personal access and safety to prune trees along trails and fire access roads. Pruning helps reduce ladder fuels within the tree stand, thus keeping a fire on the ground, instead of in the crowns.
- Any approved method of slash treatment may be acceptable for this zone, including piling and burning, chipping or lop-and-scatter.

BEFORE

AFTER

ZONE 3 TIPS

- Proper thinning and pruning in this zone will make a significant difference protecting your home structures.
- Re-sprouting of shrubs will happen and is acceptable. Monitor re-sprouting regularly to guard against the creation of ladder fuels, and thin and grub again when necessary.

SURVIVABLE SPACE MANAGEMENT ZONES

ZONE 4
COMMUNITY IGNITION ZONE

This zone usually includes the entire Wildland Urban Interface of a community and may be comprised of both private and public land. It requires joint community and public land planning to further assist wildfire mitigation. Communities may need to plan fire/fuel breaks and evacuation plans, appropriate infrastructure such as ingress/egress routes, emergency water supplies and other fire protection resources. Businesses that utilize local fuels (such as pellet and particle board plants, bio-fuels, as well as furniture and cottage industries) also help. By working together you can create survivable space for the entire community. Youth education is important to affect attitudes concerning what can be done to protect homes from wildfire. All residents and property owners have an important role to play.

Fire behavior makes Zone 4 important. For example, spotting often spreads wildfires. Spotting occurs when pieces of burning debris are picked up and carried ahead of the main fire, starting more fires.

The work within the community ignition zone is planned and implemented to create survivable space for the entire community. This work begins with the homeowner, but also includes potential greenbelt fuel breaks, adequate infrastructure and planning. Thinning landscape tree densities will significantly limit the potential for crown fire and flame front development across the community wildland urban interface. If the vegetation in this area is properly modified and maintained, a wildfire can be confined to the ground. This will limit flame length, intensity, rate of spread, and the heat produced. All of these will assist firefighters in defending the community, individual neighborhoods, and homes. Contact your local fire department, federal or state land management agencies, or the local County Cooperative Extension Office to learn how to make the entire community more capable of surviving wildfire.

BEFORE

AFTER

YOUTH EDUCATION

Billy Brushwacker is the mascot for a Firewise education curriculum for third and fourth grade students created by the Pine-Strawberry Fire Department. The curriculum is being offered throughout the state.

ZONE 4 TIPS

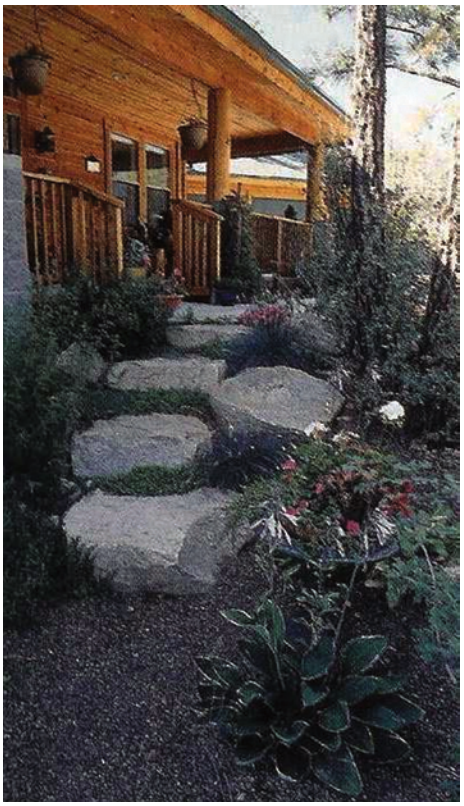
- Work with your community to develop a Community Wildfire Protection Plan (CWPP), which will provide a long-range plan for reducing community risk to wildfire.
- Stay engaged with neighbors and community efforts to support action in the community forest.

ZONE LANDSCAPING – FIREWISE PLANT MATERIALS

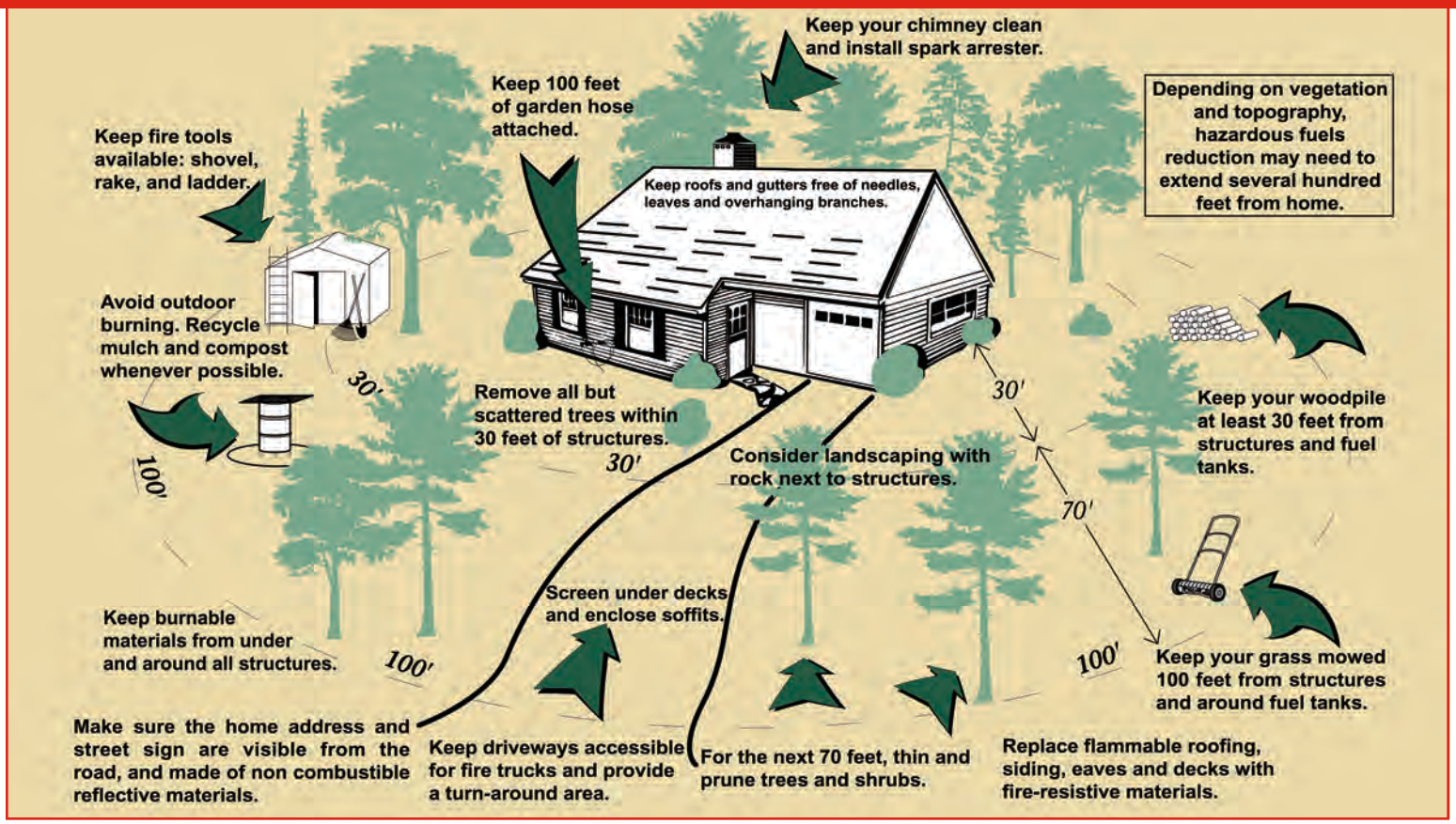
Creating survivable space around your home is one of the most important and effective steps you can take to protect you, your family and your home from wildfire. All vegetation, naturally occurring and otherwise, is potential fuel for fire. Plant choice, spacing and maintenance are critical; where and how you plant can be more important than which species you use. Some important things to remember about plants are:

- No plant species is totally "Fireproof".
- Moisture content is the most important factor influencing flammability.
- Plants with high resin content tend to be most readily flammable. Many native plants in arid environments, such as manzanita, juniper and pine, are resinous.
- Deciduous plants tend to be most fire resistant, because leaves have high moisture content.
- Salt tolerant plants show natural fire resistance, with the exception of saltcedar.
- Isolated or small groupings of trees or shrubs are best. Treat groups as individual vegetation units.

Contact your local county extension agent, fire department or public land management agency to get more information on Firewise plant species appropriate for your area.



SUMMARY: PROTECT YOUR HOME FROM WILDFIRE



SURVIVABLE SPACE CHECKLIST

SURVIVABLE SPACE CHECKLIST

THIS CHECKLIST IS A GUIDE, NOT AN EXHAUSTIVE LIST. ANY "NO" ANSWERS SHOULD REQUIRE TREATMENT.	YES	NO
1. HAS DEAD VEGETATION WITHIN THE RECOMMENDED SPACE BEEN REMOVED?	☐	☐
2. HAS CONTINUOUS DENSE COVER OF SHRUBS AND/OR TREES BEEN BROKEN UP?	☐	☐
3. HAVE LADDER FUELS BEEN REMOVED?	☐	☐
4. IS THE AREA SURROUNDING STRUCTURES "LEAN AND CLEAN" TO A DISTANCE OF AT LEAST 30 FEET?	☐	☐
5. ARE VEGETATION AND OTHER FUELS SURROUNDING STRUCTURES REGULARLY MAINTAINED?	☐	☐
6. IS ROOFING MATERIAL FIRE-RESISTANT?	☐	☐

1. RECOMMENDATIONS FOR DEAD VEGETATION

Dead vegetation includes dead trees and shrubs, dead branches lying on the ground or still attached to living plants, dried grass, flowers and weeds, dropped leaves and needles and stacks of firewood. Most dead vegetation should be removed from the recommended survivable space area. However, a thin layer of pine needles, leaves and twigs may be desirable to allow for soil mulch and erosion control. The actions below are recommended:

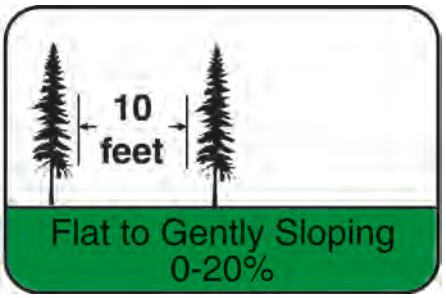
REMOVE	• Standing dead and downed trees and shrubs. • Dead leaves, branches, twigs and needles on mature trees to a height of 15 feet. • Debris from roof and rain gutters. • Dried out and "cured" grasses and wildflowers.
REDUCE	• Layers of pine needles, leaves, twigs and cones to a depth of three inches or less.
REPLACE	• Replace dead vegetation with fire-resistant plants that lower fire intensity and reduce soil erosion as appropriate.
RELOCATE	• Firewood and other combustible debris (wood scraps, grass clippings, leaf and compost piles,etc.) to at least 30 feet uphill from structures.

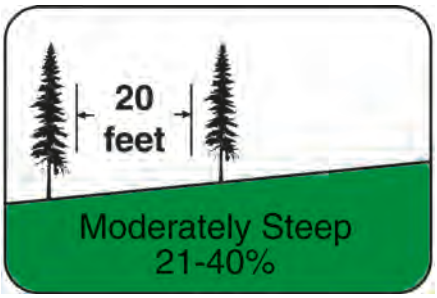
SURVIVABLE SPACE CHECKLIST

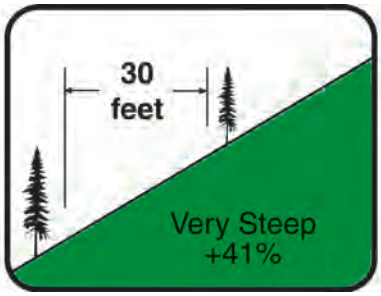
2. BREAK-UP CONTINUOUS VEGETATION

Sometimes vegetation occurs in a continuous layer of fuel. The possibility of wildfire increases as the vegetation becomes more continuous and dense. To reduce fire intensity, adequate spacing needs to be created in the vegetation. The recommended practice is to remove and "break-up" vegetation to provide separation between plants. Whether you have grass, shrubs or trees around your home, you need to consider the influence of slope. Regardless of vegetation type (grass, shrubs or trees), slope is an important influence.

For example, in a forested area, consider the following examples as a reference:







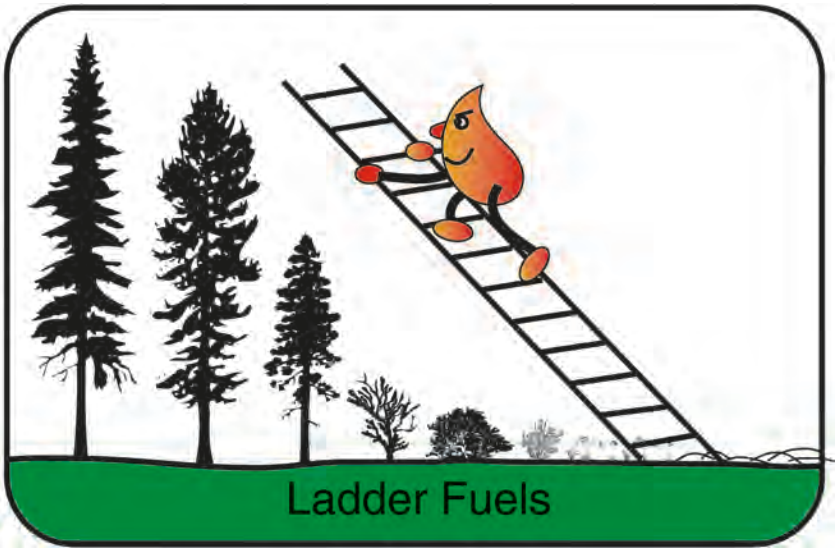
NOTE: **Spacing distances are measured between canopies (outermost branches of a plant), not between trunks or stems.**

Not only do steep slopes affect fire behavior, they are more vulnerable to erosion. When removing shrubs and trees from steep slopes, try to keep soil disturbance to a minimum. To reduce soil erosion, it may also be necessary to replace the vegetation you remove with fire-resistant plants.

3. LADDER FUELS

Vegetation is often present at varying heights, similar to the rungs of a ladder. Under these conditions, flames from fuels burning at the ground level, such as a thick layer of pine needles, can be carried to shrubs that can ignite branches and trees above. Vegetation that allows a fire to move from lower plants to taller ones is referred to as “ladder fuel.” The ladder fuel problem can be corrected by creating a separation between the vegetation layers.

This may be accomplished by removing lower tree branches, reducing shrub height, or both. Shrubs may also be removed. A common rule of thumb is a vertical separation of three times the height of the lower fuels.



SURVIVABLE SPACE CHECKLIST

4. "LEAN AND CLEAN"

The area adjacent to your house is particularly important in terms of an effective survivable space. It is also the area that is usually landscaped. Within an area extending at least 30 feet from the house, the vegetation should be kept:

- Lean –small amounts of flammable vegetation and plants are kept healthy.
- Clean – no accumulation of dead vegetation or other flammable debris.

The "Lean and Clean" checklist provides actions necessary for the areas adjacent to your structures:

THE "LEAN AND CLEAN" CHECKLIST

- ☐ Use low growing herbaceous (non-woody) or succulent plants near structures. Herbaceous plants include succulent ground covers such as ice plant, bedding plants, bulbs and perennial flowers.
- ☐ Use mulches, rock and non-combustible hard surfaces (concrete sidewalks, brick patios, pavers and asphalt driveways). Break up continuity of vegetation with hardscape features such as decorative rock, gravel and stepping-stones to slow the spread of fire.
- ☐ Space deciduous ornamental trees and shrubs as individual plantings or as groups of plants. The plants nearest to structures should be more widely spaced and smaller that those farther away. Use small, irregular clusters and islands, not large masses.
- ☐ Most wildland shrubs and trees should be removed from this zone and replaced with the above practices.
- ☐ Minimize the use of fire-prone and resinous shrubs and trees (such as juniper, manzanita, pine and most species of arbovitae) and tall exotic grasses.
- ☐ Tree limbs within 15 feet of a chimney, encroaching on power lines, or touching the house should be removed.
- ☐ Keep plants free of dead leaves, branches and ladder fuels.
- ☐ Check with your homeowners association or community to see if permits are required. If codes interfere with fire protection, they should be updated.

SURVIVABLE SPACE CHECKLIST

5. VEGETATION MAINTENANCE

Keeping your survivable space effective is a continual process. Before fire season, review the survivable space checklist and take action accordingly. Follow the "Four R's of Survivable Space" to maintain your property:

- **Remove**

  – Rake up leaves and litter before and during fire season, but leave layer of decomposing plant matter (duff) if present.

- **Reduce**

  – Prune or trim trees and shrubs annually as needed.

- **Replace**

  – Add non-flammable hardscape elements such as boulders, pathways, and other features.

  – Replace fire-prone plants with fire-resistant plants.

- **Relocate**

  – Firewood, fuel tanks and other combustible debris (wood scraps, grass clippings, leaf and compost piles, etc.) to at least 30 feet from structures.

6. ROOFING MATERIALS

Fire-resistant (not readily flammable) roofing material is rated by the National Fire Protection Association. These ratings are dependent upon proper installation. Rating categories include:

- Combustible or non-combustible
- Classes: A, B and C
- Time: 20-minute, 1-hour, 2-hour and 4-hour

Non-rated roof materials (such as combustible wood shakes and shingles) should be replaced with class A roofing. Examples of class A roof materials are:

- Least expensive include fiberglass reinforced asphalt shingles
- Fiber-cement shingles, galvanized metal undelaid with gypsum, slate and tile shingles

Embers have been known to enter through melted skylights and ignite structures. It is recommended to build covers for skylights. For more information on roofing and construction materials, see Firewise Construction: Design and Materials by Peter Slack (Colorado State Forest Service; available at: http://www.firewise.org/co/construction.html).

WILDFIRE EMERGENCY GUIDELINES

Should a community be threatened by wildfire, the occupants may be advised to evacuate by law enforcement or fire officials. The purpose of evacuation is to protect people from life-threatening situations. Homeowners have the right to "shelter-in-place", or stay on the property if they so desire. However, homeowners that shelter-in-place and then change their minds and wish to evacuate later, have often hindered firefighting efforts.

WHEN A WILDFIRE APPROACHES

WHERE TO KEEP THESE GUIDELINES:

- **Refrigerator Door**
- **Home Bulletin Board**

BEFORE THE FIRE:

- Collect valuables, important documents, medications and other personal items in one place and be ready to evacuate if necessary.
- What you can fit into your vehicle is what you can take (make priorities by what is replaceable and what is not).
- Maintain a mobile survival kit. This includes first aid kit, emergency tools, battery powered radio and flashlight, extra batteries, car keys, credit cards, water and non-perishable food. Also consider blankets and sleeping bags.
- Determine need to have coverings for skylights and windows to increase fire resistance. Have coverings visible and readily accessible.
- Make sure your children's needs are met.
- Clearly post name/address so it can be seen from the street.
- Establish and practice a family evacuation plan and meeting location. Know whom you will notify about the evacuation. Know where you will get fire updates.
- Have means of transporting pets and livestock readily available.

WHEN FIRE IS NEARBY

- Park your vehicle facing out. Put your valuables in the car. Place the car keys where you can find them.
- Dress appropriately. Have sturdy shoes, long pants and shirt, gloves and handkerchief.
- Confine or secure pets to one room or area. Prepare them to be transported.
- Move all flammable furniture (including outdoor furniture) to the center of the home or storage.
- Leave your electricity on and leave some lights on.
- Close shutters, blinds and heavy drapes. Remove lightweight window dressings.
- Close fireplace dampers and fireplace screens.
- Shut all doors, exterior and interior. Leave doors unlocked.
- Place a note attached to front door stating names of all evacuees, time and date of evacuation, destination and contact information.
- Connect garden hose to faucet and leave buckets full of water around the house.
- Place a ladder outside for roof access.

WILDFIRE EMERGENCY GUIDELINES

EVACUATION

Notification

Residents will be advised of potential hazards and the possibility of evacuation. Residents should prepare for the following alternatives and will be given instructions as to travel routes and safe locations.

Advisory

Applies to areas in the influence zone of the fire. Changes in weather and/or fire conditions could rapidly cause a threatening situation to occur. Only individuals with proper identification may be allowed in the affected area.

Shelter in Place

This would be for a low intensity fire where structures have adequate survivable space, are made of fire resistant materials, and the Fire Department feels it is safe to stay.

Immediate Threat

Issued when the fire is moving toward an area and there is an immediate threat to life and property. Whenever an area is under "Immediate Threat", roads in the area will be closed.

Planning Your Escape Route:

The direction of your escape will be dictated by the location of the fire in relation to your home and the direction and speed it is spreading.

IF YOU ARE UNABLE TO EVACUATE WHEN A FIRE APPROACHES:

INSIDE YOUR HOUSE

- Stay inside your house away from outside walls.
- Keep all doors closed but leave them unlocked.
- Keep your entire family together and REMAIN CALM. Remember if it gets hot in the house, it is four to five times hotter and more dangerous outside.

TRAVELING

- Be prepared to be directed by law enforcement or traffic control personnel: Follow their directions.
- Drive travel routes in advance so that you will be prepared.
- Have checklist and map ready.
- If you become trapped in your car, park in an area clear of vegetation, close all vehicle windows and vents, cover yourself with a blanket or jacket and lie on the floor.
- If you are trapped while on foot, select an area clear of vegetation or lie face down in a ditch.

AFTER THE FIRE PASSES

- Check the exterior, roof , and under deck immediately, extinguish all sparks and embers. If you must climb on the roof, use caution.
- Check inside the attic and underneath decks for hidden burning embers.
- Check your yard for burning woodpiles, trees, fence posts or other materials.
- Stay clear of all downed power lines.

LIFTING THE EVACUATION NOTICE

- Evacuation notices may stay in effect for several days. They will be rescinded when it is determined that the threat is over.

RETURN TO YOUR HOME

- The county sheriff or local law enforcement will determine when it is safe for citizens to move back into their homes.
- Be alert for downed power lines and contact your gas or electric company before turning utilities back on.

THE FIVE "P'S" OF IMMEDIATE EVACUATION:

- People and Pets! → And other livestock too
- Papers → Important documents
- Prescriptions → Pills and eyeglasses
- Pictures → Irreplaceable memories
- Personal Computer → Information on hard drives and disks

FREQUENTLY ASKED QUESTIONS

WHAT IS DEFENSIBLE SPACE?

Defensible space refers to that area between a house and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and to provide an opportunity for structural protection without risking homeowner or firefighter lives. Sometimes, a defensible space is simply a homeowner's properly maintained yard.

WHAT IS SURVIVABLE SPACE?

In the 1980's the term "defensible space" was coined to describe vegetation management practices aimed at reducing the wildfire threat to homes. The focus of defensible space was to provide greater opportunity for structural protection by firefighters. However, in many cases, firefighting resources are not always available to defend every home. Survivable Space is therefore the modification of landscape design, fuels and building materials that makes a home ignition caused by wildfire unlikely, even without direct firefighter intervention.

WHAT IS THE COMMUNITY IGNITION ZONE?

As homeowners, we have the most power to modify fuel conditions on our own properties, but it is not enough to only treat personal property. We need to work together to create survivable space for the entire community, including potential greenbelt/fuelbreaks, adequate infrastructure and planning in preparation for wildfire, and other measures. Call your local county extension office, fire department or federal land management agency to learn how you can help to play a role in making your community better able to survive wildfire.

DOES HAVING SURVIVABLE SPACE GUARANTEE MY HOUSE WILL SURVIVE WILDFIRE?

No. Under extreme conditions, almost any house can burn. But having survivable space will significantly improve the odds of a home withstanding a wildfire.

WHAT IS FIREWISE?

Firewise is a mind-set and action of overcoming the challenges necessary for communities in fire-prone ecosystems to live with wildfire. Our goals are to create conditions that reduce wildfire intensity in communities and neighborhoods and to prevent home ignitions. It is a multi-agency program that encourages the development of defensible and survivable space and the prevention of disastrous wildfire.

WHAT IS THE RELATIONSHIP BETWEEN VEGETATION AND WILDFIRE THREAT?

Many people do not view the plants growing on their property as a threat. But in terms of wildfire, what is growing adjacent to their homes can have considerable influence upon the survivability of their houses. All vegetation, including naturally occurring native plants and ornamental plants in the residential landscape, is potential wildfire fuel. If vegetation is properly modified and maintained, a wildfire can be slowed, the length of flames shortened, and the amount of heat reduced, all of which assist firefighters in defending the home against an oncoming wildfire.

DOESN'T THE FIRE DEPARTMENT PROTECT MY HOME FROM WILDFIRE?

During a major wildfire, it is unlikely there will be enough firefighting resources available to defend every home. In these instances, firefighters will likely select homes they can safely and effectively protect. Even with adequate resources, some

BEFORE

FREQUENTLY ASKED QUESTIONS

wildfires may be so intense that there may be little that firefighters can do to prevent a house from burning. The key is to reduce fire intensity as wildfire nears the house. Consequently, the most important person in protecting a house from wildfire is not a firefighter, but the property owner. And it's the action taken by the owner before the wildfire occurs (such as proper landscaping) that is critical.

WHAT IS HARDSCAPE?

Hardscape is the use of non-organic materials when landscaping. It includes use of boulders, rocks, stones and gravel in the landscape design to create different aesthetic results. In addition, the use of rock materials can provide a natural looking, low-maintenance, water wise landscape and buffer zone that are resistant to wildfire.

WHAT IS XERISCAPE?

Xeriscape is a landscape design that concentrates on water conservation favored by many homeowners in the arid Southwest. By using proper plant materials and design concepts, Xeriscape and Firewise landscaping are easily compatible.

DOES CREATING A WILDFIRE SURVIVABLE SPACE REQUIRE ANY SPECIAL SKILLS OR EQUIPMENT?

No. For the most part, creating a wildfire survivable space employs routine gardening and landscape maintenance practices such as pruning, mowing, weeding, plant removal, appropriate plant selection, and irrigation. The necessary equipment consists of common tools like a chain saw, pruning saw, pruning shears, loppers, weed-eater, shovel, and a rake. A chipper, compost bin, or a large rented trash dumpster may be useful in disposing of unwanted plant material.

AFTER

DOES SURVIVABLE SPACE MAKE A DIFFERENCE?

YES! Investigations of homes threatened by wildfire indicate that houses with effective survivable space are much more likely to withstand a wildfire. Homes with both effective survivable space and a nonflammable roof (such as composition shingle, tile, metal, etc.) are many times more likely to survive a wildfire than those with flammable roofs (wood shake or shingles) and no survivable space.

HOW IMPORTANT IS ROOFING MATERIAL?

Very important. The roof is the largest surface area of most structures and the most vulnerable part to wildfire. It can easily catch fire from wind-blown embers of a wildfire. Use Uniform Building Code class A roofing materials, such as fireglass reinforced asphalt shingles, slate or clay tile, or metal. Roof eaves extending beyond exterior walls are also susceptible to flame exposure. Limit them in length and box or enclose them with fire-resistive materials.

WHY DOESN'T EVERYONE LIVING IN A HIGH WILDFIRE HAZARD AREA CREATE SURVIVABLE SPACE?

The specific reasons for not creating a survivable space are varied. Some individuals think "it won't happen to my home." Others do not believe the costs (time and money) would outweigh the benefits. Others have failed to implement survivable space practices because of lack of knowledge or misconceptions.

Visit These Websites

for more information on how to enhance the protection of your community from wildfires:

www. AzStateFire.org
www.Firewise.org
cals.arizona.edu/firewise/