

LIVING WITH FIRE

A GUIDE FOR THE HOMEOWNER



NEW MEXICO

Living With Fire

Helping New Mexicans live more safely with the threat of wildfire

Fact: Despite our best prevention efforts, much of New Mexico will continue to experience wildfire.

Fact: The number of homes located in New Mexico's high fire danger, wildland urban interface is greatly increasing every year.

Fact: Many of these homes, neighborhoods, and communities are not prepared to survive a wildfire.

Photo courtesy of Ben Hammack



Living in a High Wildfire Hazard Area

The potential for loss of human life and property due to wildfire across New Mexico is growing. In response, local, state, federal, private, and nonprofit organizations have banded together to create *Living With Fire*, a wildfire threat reduction program for homeowners.

The *Living With Fire* program is not about fire prevention. Its purpose is to teach people how to live more safely with the threat of wildfire. For many areas in our region, it is not a question of "if" wildfire will occur, but "when."



Photo courtesy of Nevada Appeal

Who Wins, Who Loses...

Why do some houses survive a wildfire, while others are destroyed? Research findings prove that house survival during wildfire is not random, miraculous, or "dumb luck." Rather, it is how the house is built, the characteristics of the adjacent vegetation and other fuels, and routine maintenance that often determine which homes burn and which survive. These types of actions are called "pre-fire" activities. Pre-fire activities are actions completed before a wildfire occurs which improve the survivability of people and the home. The "winners" will be the people who implement pre-fire activities.

The homeowner is the most important person in preventing a house from being destroyed by wildfire. It is the actions that a homeowner takes before a wildfire occurs that are critical.

HUMAN BEHAVIOR IS JUST AS IMPORTANT AS FIRE BEHAVIOR IN SAVING YOUR HOME!

BEFORE THE FIRE



DURING THE FIRE



AFTER THE FIRE



Prior to the fire, this homeowner changed the roof material from wood shakes to fire-resistant tiles and reduced the amount of flammable vegetation surrounding the home. These pre-fire activities helped this house survive the fire.

Wildfire will threaten your house in three ways...



Photo courtesy of Ben Hammack



Photo courtesy of Ben Hammack



Photo courtesy of Mike Dannenberg

CONTACT BY FLAMES

This type of threat occurs when vegetation and other fuels burning near the house produce flames that come in contact with the home and ignite it. Often, it happens when fire burns through a uniform layer of vegetation right up to the house. Direct contact by flames is probably what most homeowners visualize when they think of a house burning during wildfire.

RADIATED HEAT

Radiated heat melted the vinyl siding on this house. Flames never came in contact with it. Radiated heat is produced by invisible electromagnetic waves that travel out in all directions from a flame. When a house receives enough radiated heat for sufficient time, it will ignite. Sometimes radiated heat can burst windows and allow burning embers to enter the house.

FLYING EMBERS

More houses burn due to flying embers than any other reason. If fire conditions are right, embers can be lofted high into the air and transported more than a mile. Burning embers can also be carried by wind and fire whirls. If these burning embers land in easily ignitable materials, a new fire can start.

What can homeowners do to reduce the wildfire threat?

The Living With Fire wildfire threat reduction recommendations are presented according to fire zones.

Access Zone

This zone provides suggestions that help emergency responders locate your home in a timely manner.

Defensible Space Zone

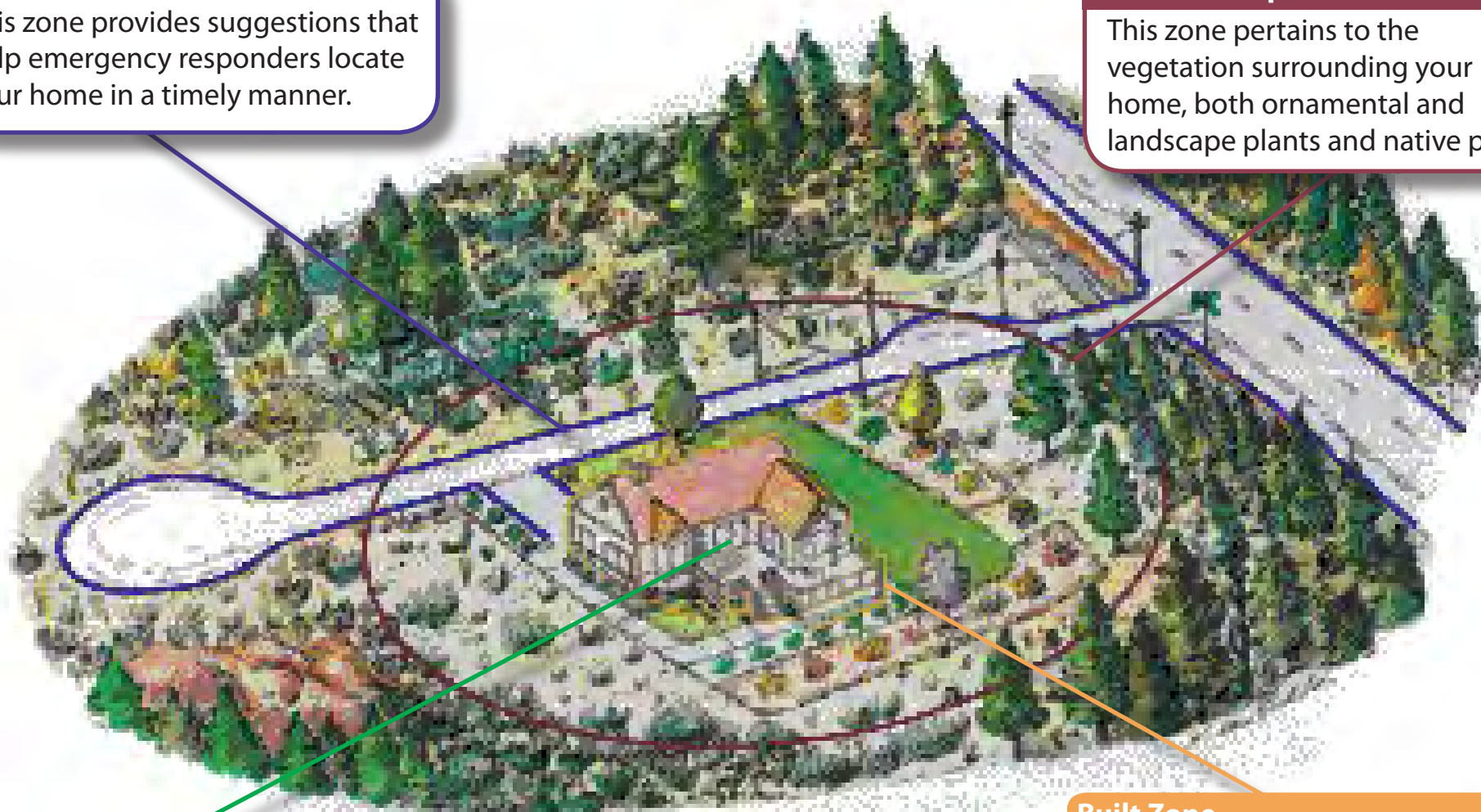
This zone pertains to the vegetation surrounding your home, both ornamental and landscape plants and native plants.

Interior Zone

This zone offers fire safety tips for inside the home.

Built Zone

This zone includes recommendations for home construction.

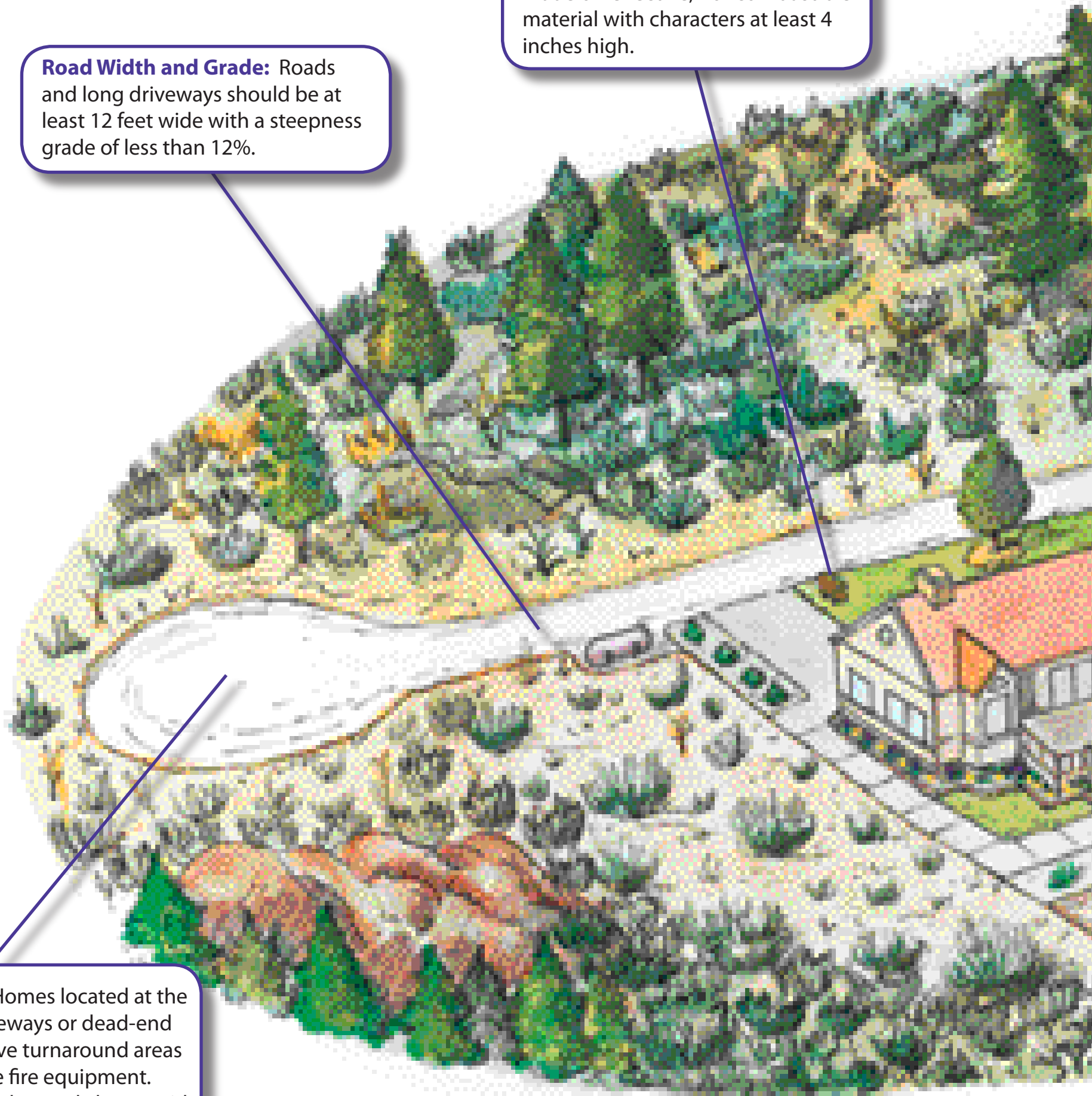


Access Zone

Road Width and Grade: Roads and long driveways should be at least 12 feet wide with a steepness grade of less than 12%.

Address: The home address should be readily visible from the street. The address sign should be made of reflective, noncombustible material with characters at least 4 inches high.

Turnarounds: Homes located at the end of long driveways or dead-end roads should have turnaround areas suitable for large fire equipment. Turnarounds can be a cul-de-sac with at least a 45-foot radius or a location suitable for a three-point turn.

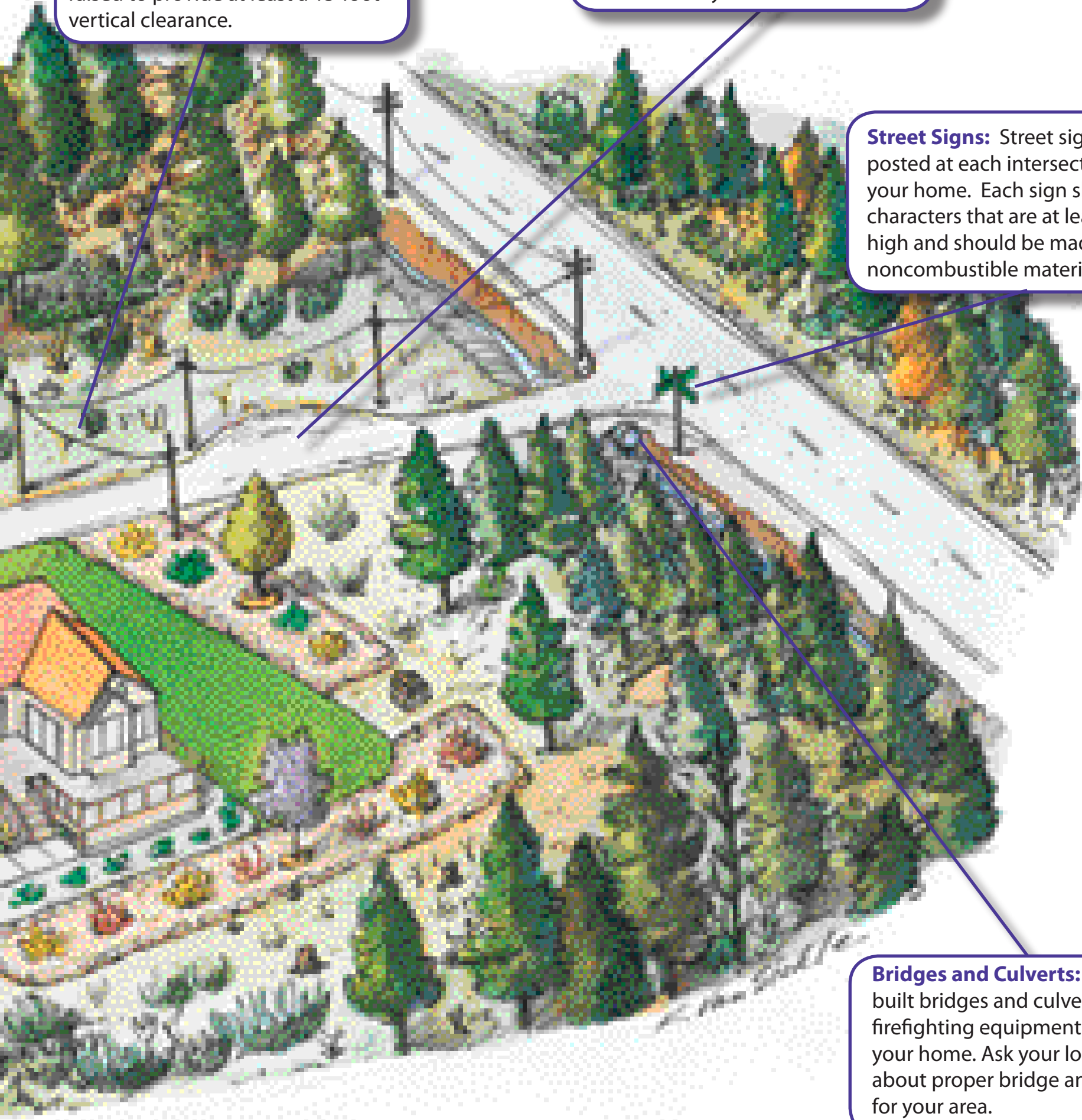


Driveway Clearance: Remove flammable vegetation extending at least 10 feet from both sides of the driveway. Overhead obstructions, such as overhanging branches and power lines, should be removed or raised to provide at least a 15-foot vertical clearance.

Turnouts: Homes located at the end of long, narrow streets and dead ends can discourage firefighters and complicate evacuation. If possible, create turnouts in the driveway that will allow two-way traffic.

Street Signs: Street signs should be posted at each intersection leading to your home. Each sign should feature characters that are at least 4 inches high and should be made of reflective, noncombustible material.

Bridges and Culverts: Inadequately built bridges and culverts may prevent firefighting equipment from reaching your home. Ask your local fire marshal about proper bridge and culvert design for your area.

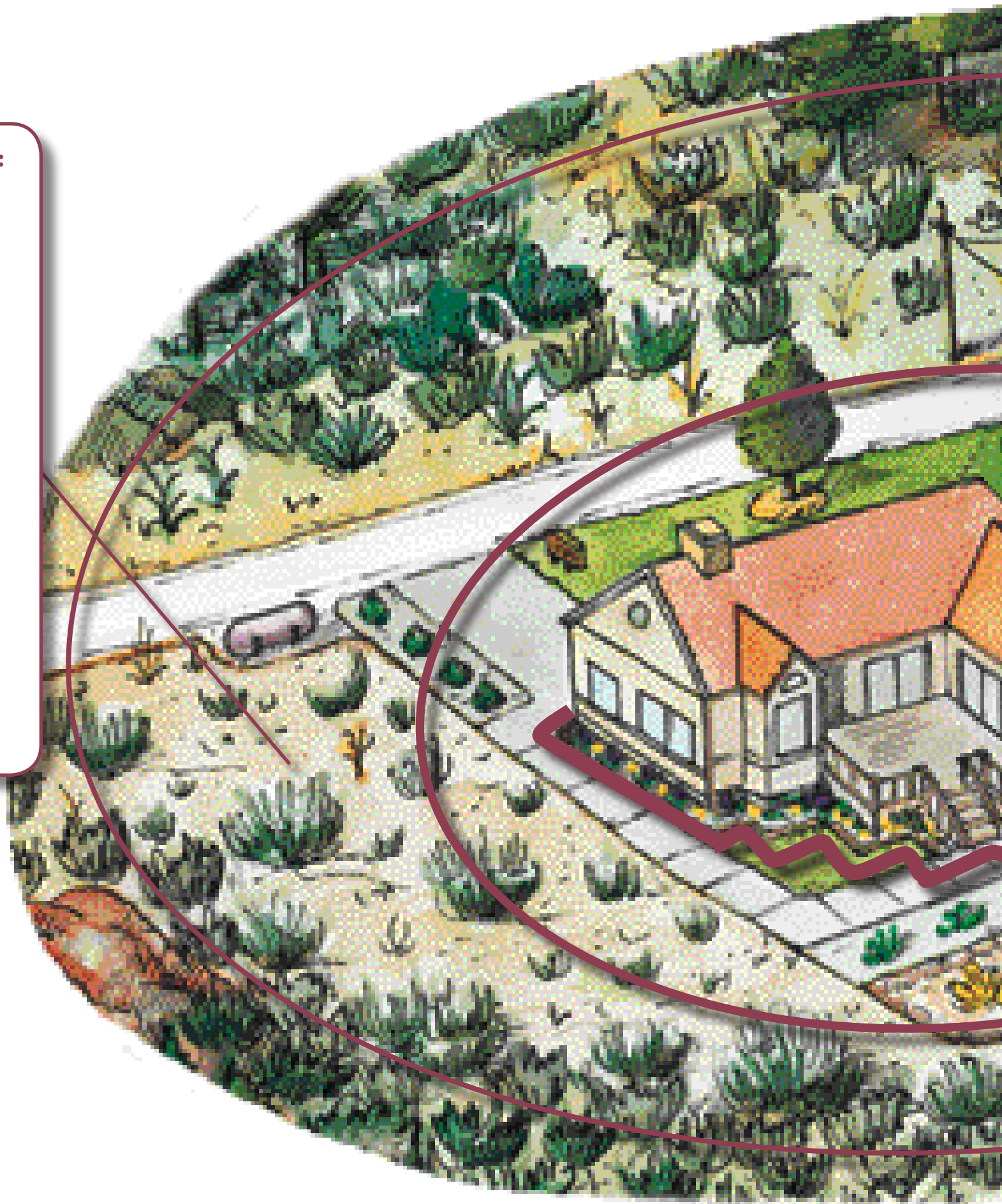


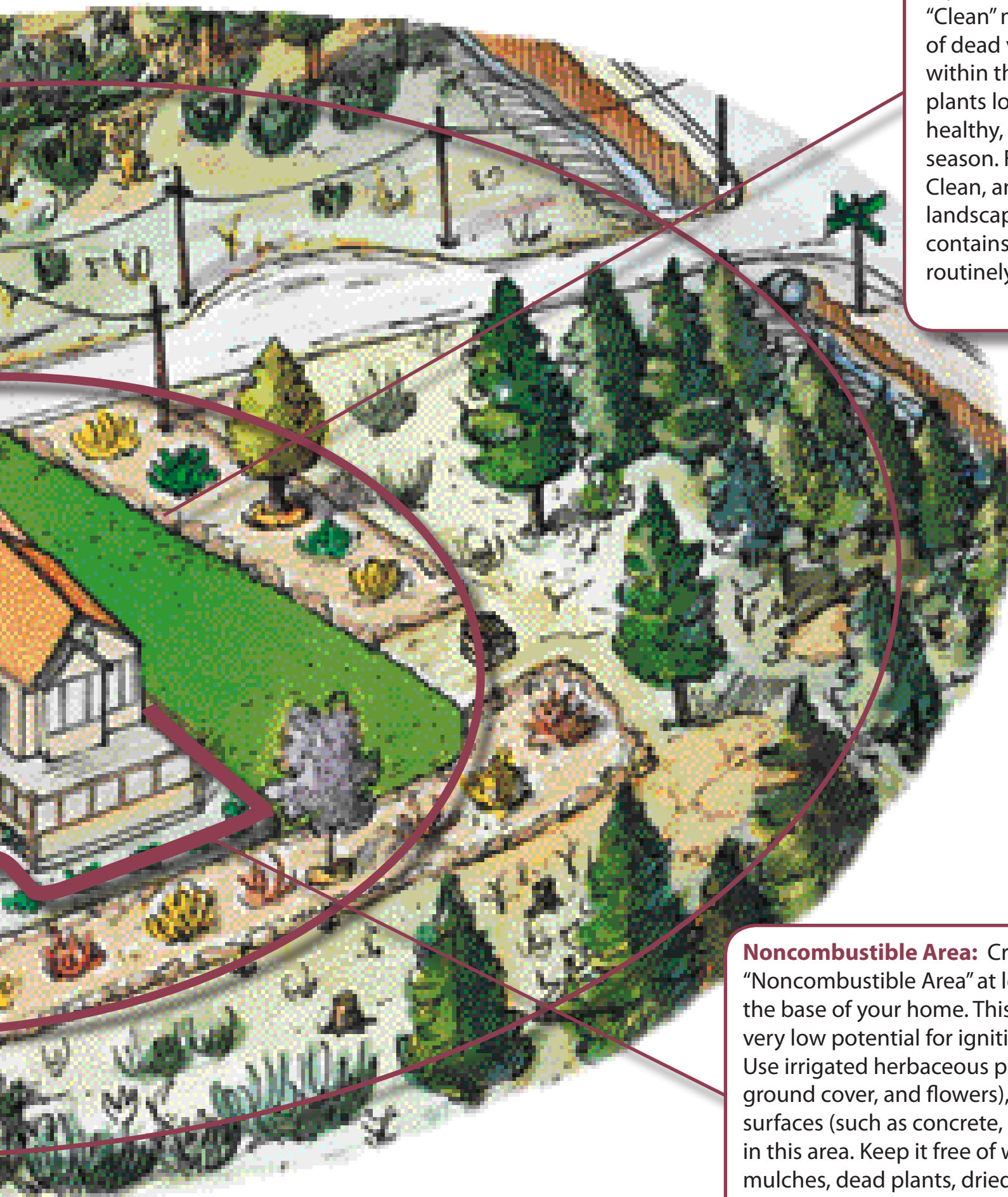
Defensible Space Zone

Wildland Fuel Reduction Area:

The Wildland Fuel Reduction Area usually lies beyond the residential landscape area and is where sagebrush, cheatgrass, piñon, juniper and other wild plants grow. Within this area:

- Remove all dead vegetation (dead shrubs, dried grass, fallen branches, pine needles, etc.).
- Thin out thick shrubs and trees to create a separation between them.
- Remove “ladder fuels” by removing low tree branches, removing or pruning the shrubs under the tree.





Lean, Clean, and Green Area: For a distance of at least 30 feet from the home, there should be a “Lean, Clean and Green Area.” “Lean” indicates that only a small amount of flammable vegetation, if any, is present within 30 feet of the house. “Clean” means there is no accumulation of dead vegetation or flammable debris within the area. “Green” requires that plants located within this area are kept healthy, green, and irrigated during fire season. For most homeowners, the Lean, Clean, and Green Area is the residential landscape. This area often has irrigation, contains ornamental plants, and is routinely maintained.

Noncombustible Area: Create a “Noncombustible Area” at least 3 feet wide around the base of your home. This area needs to have a very low potential for ignition from flying embers. Use irrigated herbaceous plants (such as lawn, ground cover, and flowers), rock mulches, or hard surfaces (such as concrete, brick, and pavers) in this area. Keep it free of woodpiles, wood mulches, dead plants, dried leaves and needles, flammable shrubs (such as juniper), and debris.

See page 12, **Six Steps to Creating an Effective Defensible Space**

Built Zone

Eaves: The eaves of a home act as a heat trap for hot air and gases, greatly increasing the chance of ignition. Covering the underside of the eave with a soffit, or “boxing in” the eave, allows the heat to escape.

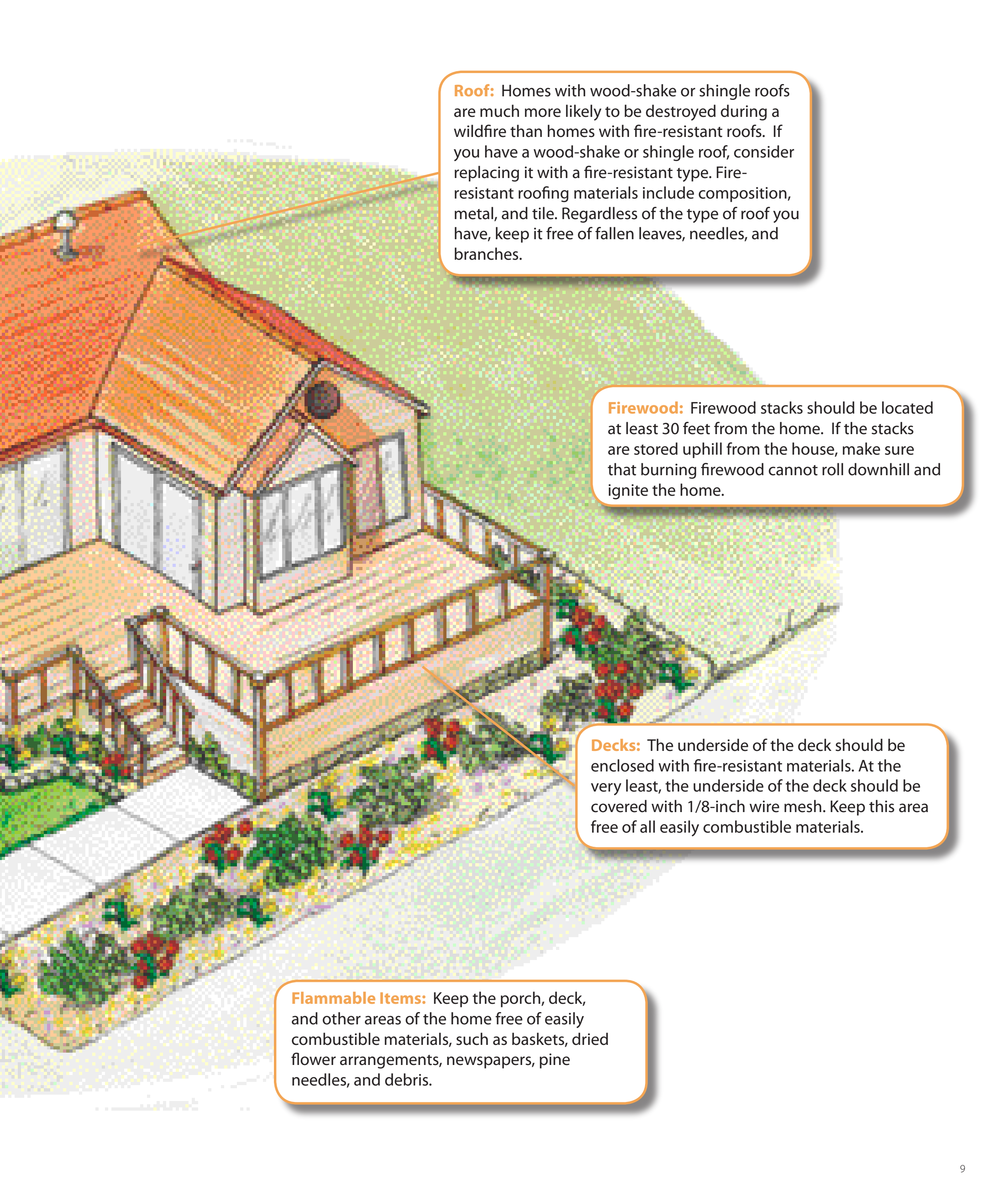
Chimneys: Chimney and stovepipe openings should be screened with 1/2-inch or smaller wire mesh or an approved spark arrestor cap.

Exterior Siding: Wood products, such as boards, panels and shingles, are common siding materials. However, they are combustible and not good choices for fire-prone areas. Noncombustible siding materials, such as stucco, brick, and cement board, are better choices.

Windows: Windows are one of the weakest parts of a home and usually break before the structure ignites. This allows burning embers and heat to enter the home, which may lead to internal ignition. Single-paned and large windows are particularly vulnerable. In high fire hazard areas, install windows that are at least double-glazed or tempered glass. Windows with aluminum frames and sashes are better choices than those with wood or vinyl frames.

Vents: Vents on homes are potential entry points for flying embers. All vent openings need to be covered with 1/8-inch or smaller wire mesh. Do not use fiberglass or plastic mesh because they can melt or burn.

Rain Gutters: Rain gutters trap flying embers. Always keep your rain gutters free of leaves, needles, and debris. Check and clean them several times during fire season.



Roof: Homes with wood-shake or shingle roofs are much more likely to be destroyed during a wildfire than homes with fire-resistant roofs. If you have a wood-shake or shingle roof, consider replacing it with a fire-resistant type. Fire-resistant roofing materials include composition, metal, and tile. Regardless of the type of roof you have, keep it free of fallen leaves, needles, and branches.

Firewood: Firewood stacks should be located at least 30 feet from the home. If the stacks are stored uphill from the house, make sure that burning firewood cannot roll downhill and ignite the home.

Decks: The underside of the deck should be enclosed with fire-resistant materials. At the very least, the underside of the deck should be covered with 1/8-inch wire mesh. Keep this area free of all easily combustible materials.

Flammable Items: Keep the porch, deck, and other areas of the home free of easily combustible materials, such as baskets, dried flower arrangements, newspapers, pine needles, and debris.

Interior Zone

Carbon Monoxide Detectors: Carbon monoxide (CO) detectors are the only way to alert people to dangerous levels of carbon monoxide before tragedy strikes. Carbon monoxide is a byproduct of combustion from gas appliances or automobiles. Only use detectors that are officially approved and are clearly marked with the American Standard – UL2034 symbol.

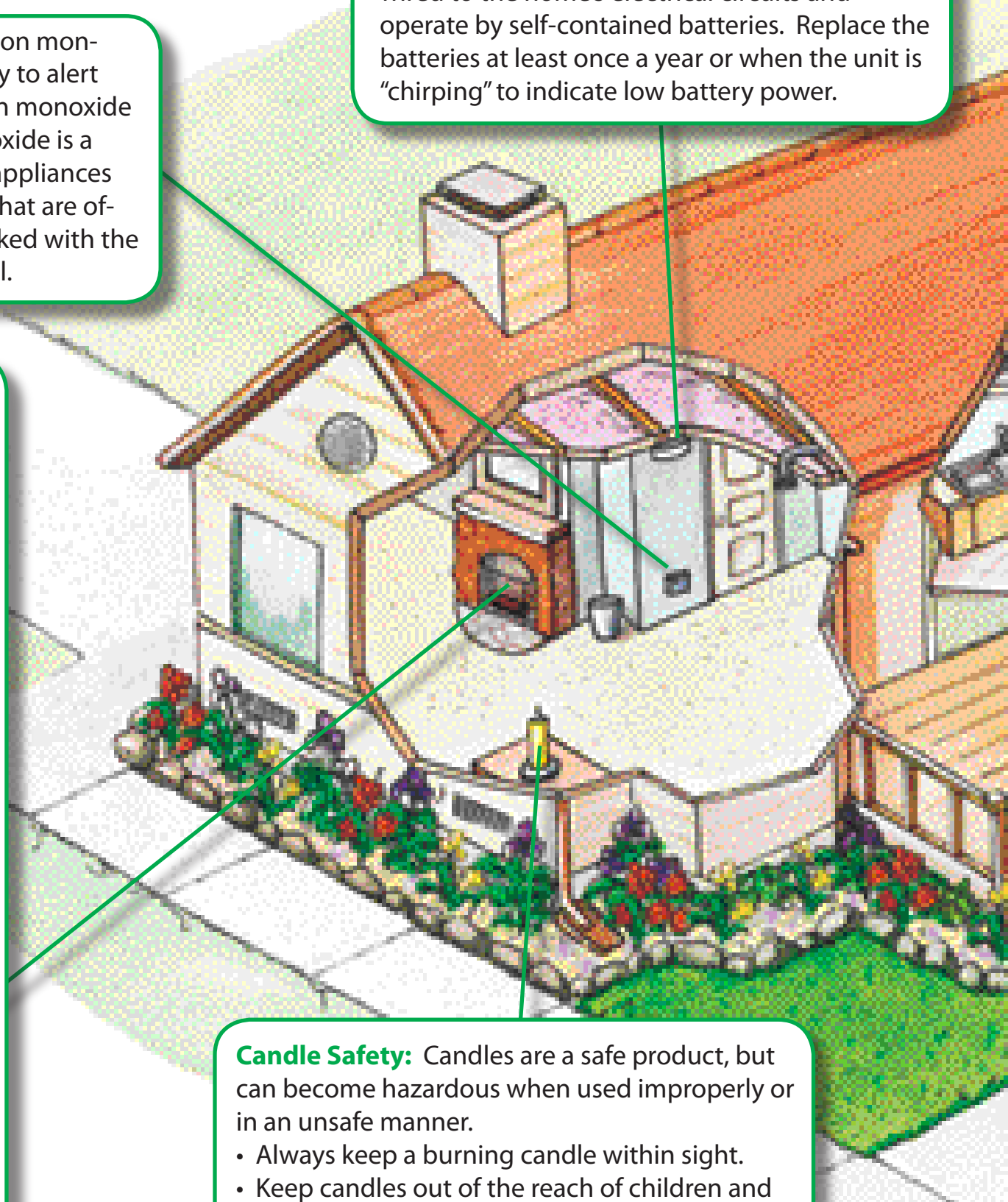
Smoke Detectors: Smoke detectors are inexpensive devices that save many lives. Current fire codes require a smoke detector in every bedroom and in common areas. Many older or retrofitted smoke detectors are not wired to the home's electrical circuits and operate by self-contained batteries. Replace the batteries at least once a year or when the unit is "chirping" to indicate low battery power.

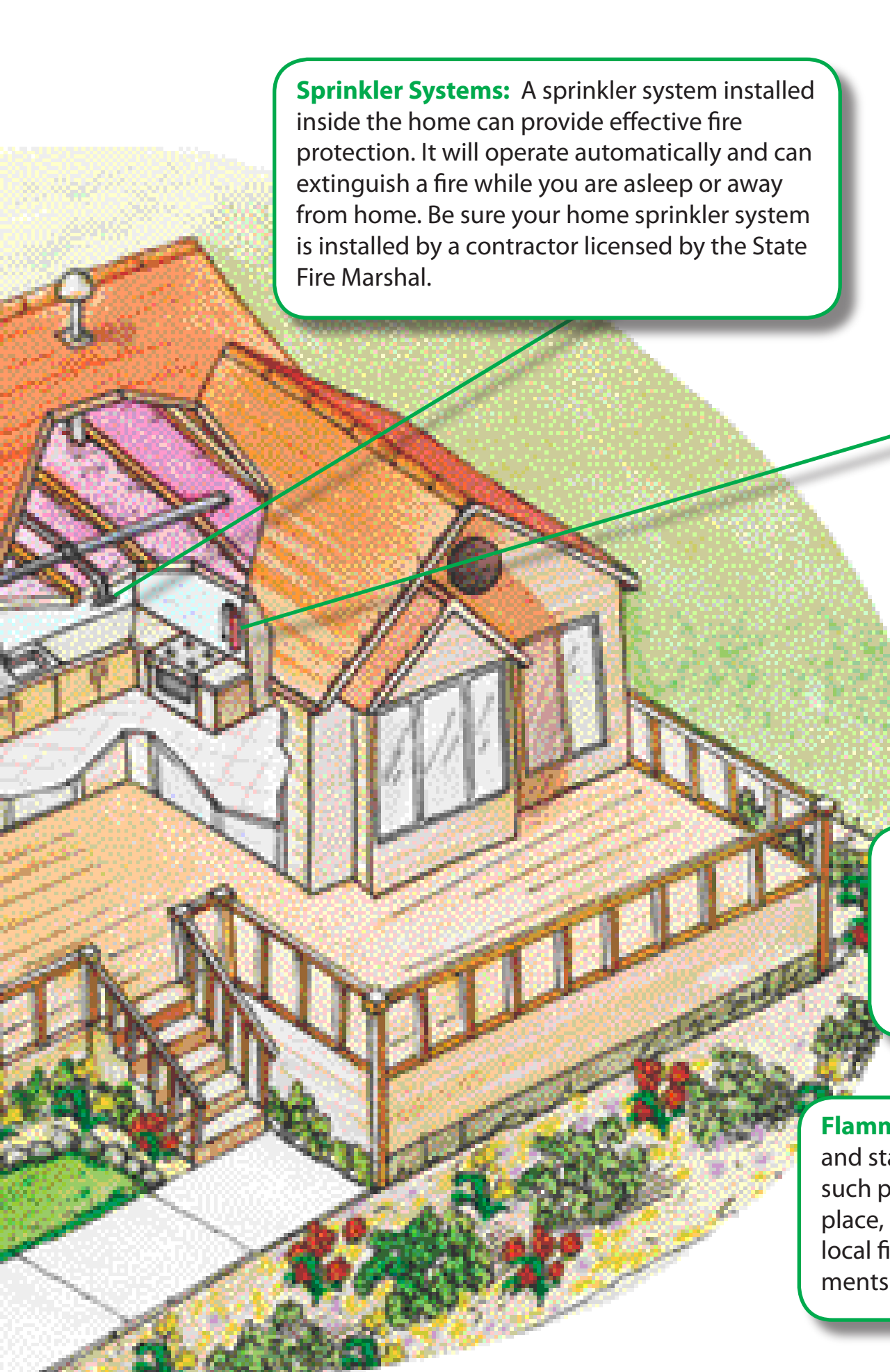
Wood Stove and Fireplaces: Heat your home safely by following these tips concerning wood stoves and fireplaces.

- Install according to the manufacturer's directions.
- Never use a flammable liquid such as gasoline to start a fire.
- Carefully follow directions when using synthetic logs.
- Keep a glass or metal screen in front of the fireplace opening to prevent embers or sparks from escaping.
- Keep flammable materials off the mantle and at least 3 feet away.
- Do not use excessive amounts of paper to start your fire.
- Do not burn colored paper, which can accelerate creosote buildup and increase the likelihood of a chimney fire.
- Avoid burning wood slowly for long periods of time, which contributes to soot and creosote buildup. Instead, allow the wood to burn rapidly for 10 to 15 minutes several times a week to help reduce creosote buildup. Use dry wood for more efficient burning.
- Screen chimney and stovepipe openings with 1/2-inch or smaller noncombustible mesh or an approved spark arrestor cap.
- Inspect and clean chimney at least once a year.

Candle Safety: Candles are a safe product, but can become hazardous when used improperly or in an unsafe manner.

- Always keep a burning candle within sight.
- Keep candles out of the reach of children and pets.
- Before burning, trim wicks to 1/4-inch.
- Always use a heat-resistant, sturdy candleholder that is large enough to contain any melted wax.
- Keep burning candles away from drafts, vents, air currents, and easily combustible materials.
- Always burn candles in a well-ventilated room.
- Extinguish the flame when 2 inches of wax remains, or when 1/2-inch remains if in a container.
- Use a candle snuffer to extinguish candles.





Sprinkler Systems: A sprinkler system installed inside the home can provide effective fire protection. It will operate automatically and can extinguish a fire while you are asleep or away from home. Be sure your home sprinkler system is installed by a contractor licensed by the State Fire Marshal.

Portable Fire Extinguishers: Portable fire extinguishers enable you to quickly respond to a fire. Extinguishers are rated by the type of fire they can effectively extinguish: "A" – wood or cloth fires, "B" – liquid fires, "C" – electrical fires, and "D" – metal fires.

- Be sure all family members know the extinguisher's location and its operation.
- Get the extinguisher serviced annually and recharged after each use.
- The term P-A-S-S will help you remember the right way to use the extinguisher:
Pull the safety pin
Aim the extinguisher
Squeeze the trigger
Sweep the extinguisher at the base of the fire

Plan Your Escape: Even with early warning from a smoke detector, escaping a house fire can be difficult. By planning and practicing exit drills, you can better prepare your family for a fire emergency. Contact your local fire department for advice.

Flammable Paint and Stain Products: Paint and stain products are hazardous materials. All such products should be stored in a cool, dry place, away from any heat source. Contact the local fire marshal for specific disposal requirements in your area.

Other Heating Systems: Kerosene and other fuel-fired heaters should be used properly. Follow manufacturers' instructions when using these devices.

- Be sure they are approved by an independent testing laboratory. Heaters should turn off if accidentally tipped over.
- Use only the fuels specified by the manufacturer for each particular heating appliance.
- Refuel heaters outdoors.
- Keep children away from heaters.
- Never burn charcoal indoors.

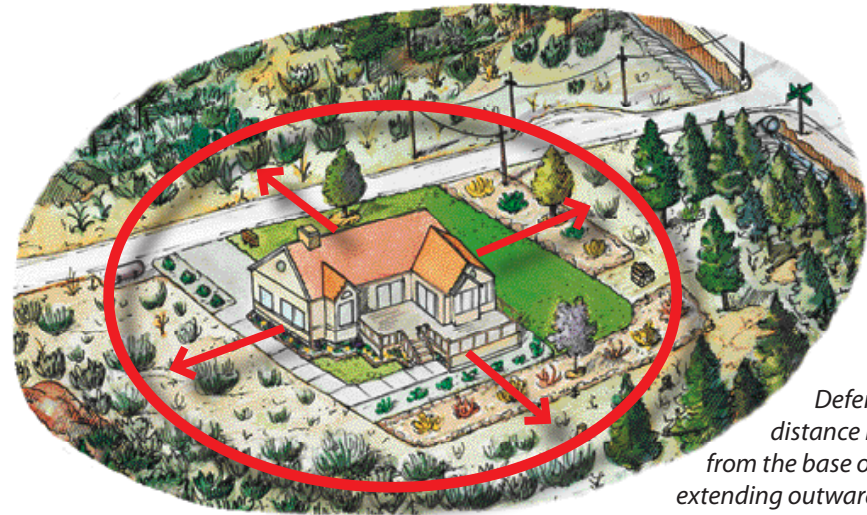
6 Steps to Creating an Effective Defensible Space



A homeowner can have both an effective defensible space and an attractive landscape.

The term “defensible space” refers to the area between a house and an oncoming wildfire where the vegetation has been managed to reduce the wildfire threat and allow firefighters to safely defend the house. In the event that firefighters are not available, defensible space also improves the likelihood of a home surviving without assistance.

Unfortunately, when some homeowners hear the term “defensible space,” they envision a large expanse of bare ground surrounding their home. While this is certainly effective at increasing home survivability, it is unacceptable for aesthetic reasons and can contribute to soil erosion. It is also unnecessary.



Defensible space distance is measured from the base of the house, extending outward.

Recommended Defensible Space Distance

	Flat to Gently Sloping 0-20%	Moderately Steep 21-40%	Very Steep +40%
Grass Dry grass such as cheatgrass and weeds	30 feet	100 feet	100 feet
Shrubs and Woodland Sagebrush, piñon, juniper, etc.	100 feet	200 feet	200 feet
Trees Forest trees, such as ponderosa pine. With a substantial shrub understory, use those values stated above.	100 feet	100 feet	200 feet



Photo courtesy of Mike Dannerberg

Make your house safe for firefighters to defend.

Step Two

Remove dead vegetation: Within the recommended Defensible Space Zone, remove:

- dead and dying trees
- dead native and ornamental shrubs
- dead branches
- dead leaves, needles, and twigs that are still attached to plants, draped on live plants, or lying on the ground within 30 feet of the house
- dried grass, weeds, and flowers

Step One

Determine the size of an effective defensible space: The size of the defensible space is usually expressed as a distance extending outward from the house in all directions. The recommended distance is not the same for every home. It varies depending on the dominant vegetation surrounding the home and steepness of slope. Use the Recommended Defensible Space Distance table to determine the right size for your home.

Once the recommended distance for defensible space is known, mark it by tying strips of cloth or flagging to shrubs. This becomes the “Defensible Space Zone.”

If the Defensible Space Zone exceeds your property boundaries, seek permission from adjacent landowners before doing work on their property. It is important to note that the effectiveness of the Defensible Space Zone improves when entire neighborhoods implement defensible space practices.



Remove all dead trees from within the Defensible Space Zone.

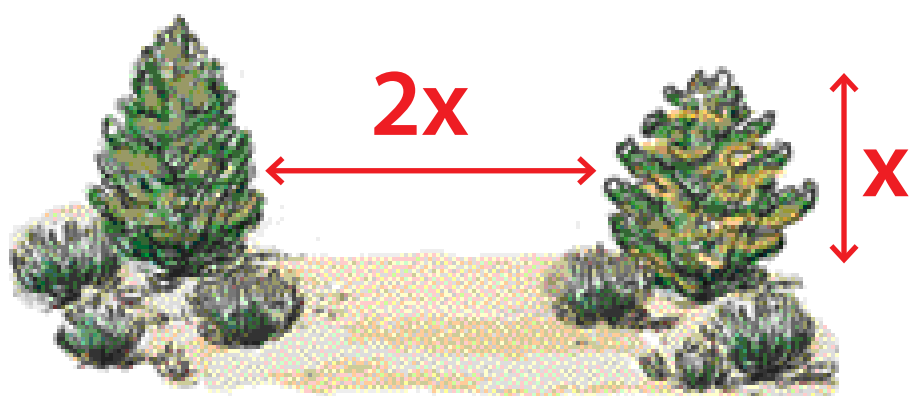
Step Three

Create a separation between trees and shrubs:

Within the Defensible Space Zone, native trees and shrubs, such as ponderosa pine, piñon, juniper, and sagebrush should not occur in a dense stand. Dense stands of trees and shrubs pose a significant wildfire threat. Thin dense tree and shrub stands to create more space between them.



Dense stands of living and dead piñon poses a high fire threat.



Sagebrush, other Shrubs, piñon and Juniper: On flat to gently sloping terrain, individual shrubs or small clumps of shrubs within the Defensible Space Zone should be separated from one another by at least twice the height of the average shrub. For homes located on steeper slopes, the separation distance should be greater. For example, if the typical shrub height is 2 feet, then there should be a separation between shrub branches of at least 4 feet. Remove shrubs or prune to reduce their height and/or diameter. In most instances, removing big sagebrush is the preferred approach. It is a very flammable plant, is easily removed, does not resprout, and is typically abundant.

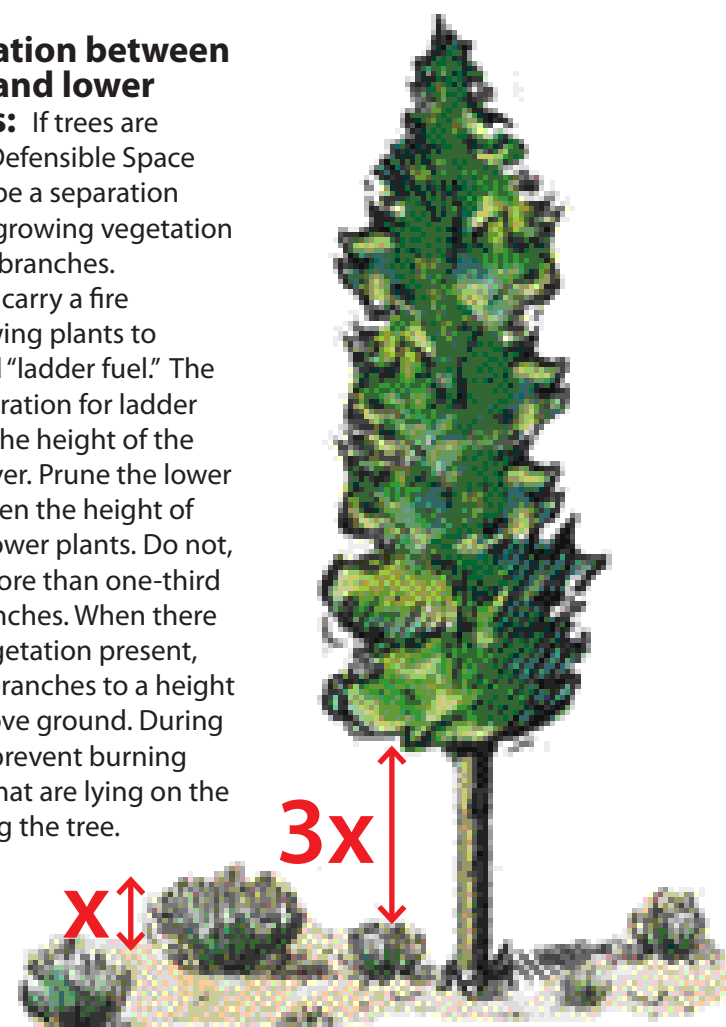


Jeffrey Pine and White Fir: On flat to gently sloping terrain, Jeffrey pine and white fir should be thinned to provide an average separation between canopies of at least 10 feet. For homes located on steeper slopes, the separation distance should be greater. When selecting trees for removal, consider cutting unhealthy, damaged, or weak trees.

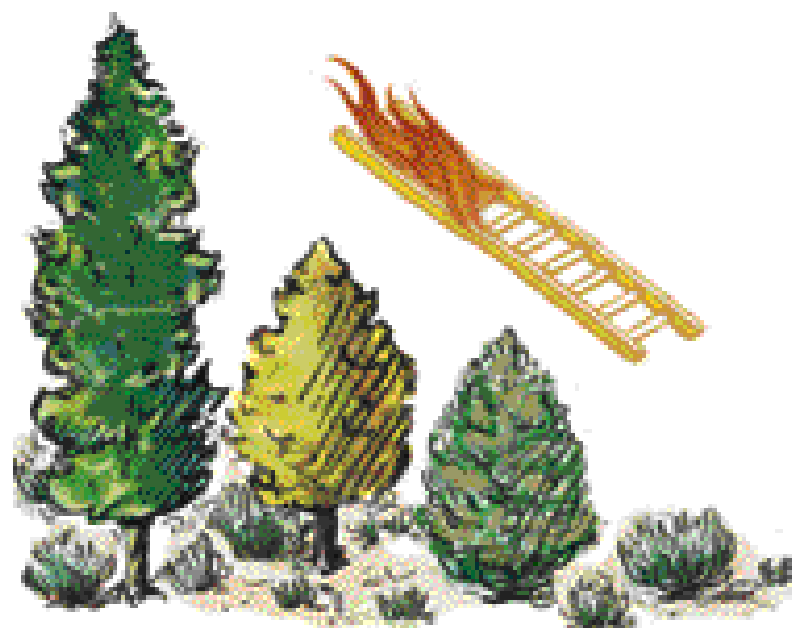
Step Four

Create a separation between tree branches and lower growing plants:

If trees are present within the Defensible Space Zone, there should be a separation between the lower growing vegetation and the lowest tree branches. Vegetation that can carry a fire burning in low growing plants to taller plants is called "ladder fuel." The recommended separation for ladder fuels is three times the height of the lower vegetation layer. Prune the lower tree branches, shorten the height of shrubs, or remove lower plants. Do not, however, remove more than one-third of the total tree branches. When there is no understory vegetation present, remove lower tree branches to a height of at least 2 feet above ground. During a fire, this will help prevent burning needles and twigs that are lying on the ground from igniting the tree.



A piñon tree before and after ladder fuel removal. Removing ladder fuel will help prevent a ground-level fire from reaching the trees.



Step Five

Create a Lean, Clean, and Green Area extending at least 30 feet from the house:

There are two goals for the Lean, Clean, and Green Area. The first goal is to eliminate easily ignitable fuels, or “kindling,” near the house. This will help prevent embers from starting a fire in your yard. The second goal is to keep fire intensity low if it does ignite near the house. By proper management of the fuels near the house, a fire would not be able to generate enough heat to ignite the home.

For most homeowners, the Lean, Clean, and Green Area is also the residential landscape. This area often has irrigation, is planted with ornamental vegetation, and is regularly maintained.

Lean, Clean, and Green Area Tips

- Remove most or all flammable wildland plants, including big sagebrush, bitterbrush, rabbitbrush, cheatgrass, pinyon, juniper, and manzanita. If you wish to retain a few of these as specimen plants, make sure they are free of dead wood and leaves, pruned to reduce the amount of fuel, and separated from adjacent brush fields.
- Select less flammable plants for the home landscape. Some rules of thumb in selecting landscape plants for the Lean, Clean, and Green Area are...
 - Shorter plants, less than 2 feet tall, are better choices than taller plants.
 - When green, herbaceous plants, such as grass and non-woody flowers, are better choices than shrubs and trees.
 - Deciduous shrubs and trees are better choices than evergreen types. Avoid planting juniper, mugo pine and arborvitae.
- Emphasize the use of hard surfaces and mulches. Hard surfaces include materials such as concrete, asphalt, and brick. Mulches include rock and wood types. Wood mulches should not be used within 3 feet of the house.
- Clear all flammable vegetation from within 10 feet of the propane tank.
- Remove tree limbs that are within 10 feet of the chimney, touching the house or deck, within 6 feet of the roof, or encroaching on power lines.
- Create a noncombustible area at least 3 feet wide around the base of the house. Emphasize the use of irrigated herbaceous plants, such as lawn, ground covers, and flowers. Also use rock mulches and hard surfaces.



Photo courtesy of California Department of Forestry and Fire Protection

Miracle House? This home survived northern California's Forty-niner Fire and has been referred to as the “Miracle House.” That title, however, is misleading. The reason this home survived was not due to a miracle. It survived because the homeowner was proactive and created a Lean, Clean, and Green Area, had a fire-resistant roof, and provided good access. It was designed to survive.

Step Six

Maintain the Defensible Space Zone:

Maintaining a defensible space is an ongoing activity. Plants grow back and flammable vegetation needs to be routinely removed and disposed of properly. Before each fire season, reevaluate your property using the previous five steps and implement the necessary defensible space recommendations.



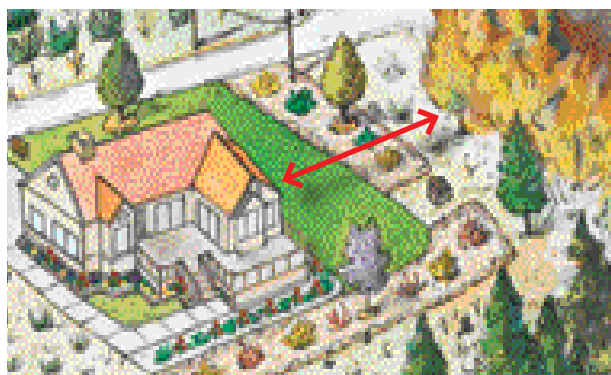
Remove flammable vegetation and dispose of properly.



Little Green Gas Cans

Firefighters often refer to ornamental junipers as “little green gas cans.” During a wildfire involving homes, embers can smolder undetected under ornamental junipers. The junipers can then ignite and burn intensely after firefighters have left your property. Planting ornamental junipers next to your house is never a good idea. Keep these “little green gas cans” at least 30 feet from the house or replace them with low-growing deciduous shrubs, herbaceous flowers, rock mulches, and hard surfaces.

FREQUENTLY ASKED QUESTIONS ABOUT DEFENSIBLE SPACE

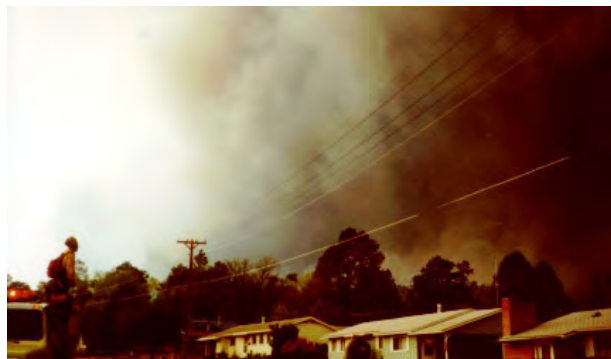


WHAT IS DEFENSIBLE SPACE?

Defensible space is the 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 firefighters to effectively defend the house. Sometimes, a defensible space is simply a homeowner's properly maintained backyard.

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, the vegetation adjacent to their homes can have considerable influence upon the survivability of their houses. All vegetation, including plants native to the area and ornamental plants, 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.



THE FIRE DEPARTMENT IS SUPPOSED TO PROTECT MY HOUSE, SO WHY BOTHER WITH DEFENSIBLE SPACE?

Some individuals incorrectly assume that a fire engine will be parked in their driveway and firefighters will be actively defending their homes if a wildfire approaches. 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 most safely and effectively protect. Even with adequate resources, some wildfires may be so intense that there may be little firefighters can do to prevent a house from burning. The key is to reduce fire intensity as wildfire nears the house. This can be accomplished by reducing the amount of flammable vegetation surrounding a home. Consequently, **the most important person in protecting a house from wildfire is not a firefighter, but the property owner.** And it is the action taken by the owner **before** the wildfire occurs (such as proper landscaping) that is most critical.

DOES DEFENSIBLE SPACE REQUIRE A LOT OF BARE GROUND IN MY LANDSCAPE?

No. Unfortunately, many people have this misconception. While bare ground is certainly effective in reducing the wildfire threat, it is unnecessary and unacceptable due to appearance, soil erosion, and other reasons. Many homes have attractive, well-vegetated landscapes that also serve as effective defensible space.

DOES CREATING A DEFENSIBLE SPACE REQUIRE ANY SPECIAL SKILLS OR EQUIPMENT?

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



HOW BIG IS AN EFFECTIVE DEFENSIBLE SPACE?

Defensible space size is not the same for every home, but varies by slope and type of wildland vegetation growing near the house. See "Step One" on page 12.

DOES DEFENSIBLE SPACE MAKE A DIFFERENCE?

Yes. Investigations of homes threatened by wildfire indicate that those with an effective defensible space are much more likely to survive a wildfire. Furthermore, homes with both an effective defensible space and a nonflammable roof (composition shingles, tile, metal, etc.) are many times more likely to survive a wildfire. Defensible space also allows firefighters to effectively and safely defend your home.

DOES HAVING A DEFENSIBLE SPACE GUARANTEE MY HOUSE WILL SURVIVE A WILDFIRE?

No. Under extreme conditions, almost any house can burn. However, having a defensible space will significantly improve the odds of your home surviving a wildfire.

WHY DOESN'T EVERYONE LIVING IN A HIGH FIRE HAZARD AREA CREATE A DEFENSIBLE SPACE?

The specific reasons for not creating a defensible space are varied. Presented below are responses to common excuses for not creating defensible space.

What's your excuse?

"I don't have the time or money": If you live in a high fire hazard area, creating defensible space needs to be a high priority use of your spare time. Many defensible space activities require little or no money to implement. For bigger, more expensive tasks, consider forming community groups and work with local agencies for assistance in acquiring grant funds.

"It's wrong to cut trees": In many areas, New Mexico's ponderosa pine, piñon and juniper trees occur in unnaturally dense stands. Thinning of these thick stands of trees not only reduces the fire threat, but often promotes forest health.

"It won't look good": There is a misconception that defensible space has to be ugly and barren to be effective. Through proper planning, a homeowner can have both an attractive landscape and an effective defensible space.

"It's not my responsibility": The manner in which a house is built, characteristics of the adjacent vegetation, and maintenance often determine survivability during wildfire. The homeowner, not the firefighter, is usually responsible for these factors.

"I don't have an easy way to dispose of the unwanted vegetation": Check to see if there is a free community cleanup day in your area, ask your fire marshal if they have a fuels reduction chipping program, or join several other neighbors and rent a chipper and trailer for a weekend.

"It's not going to happen to me": If you live near areas of dense sagebrush, cheatgrass, piñon, juniper, ponderosa or other pine trees, it is only a matter of time before these areas burn.

"It's against the law to remove vegetation": If there are regulations that prohibit the removal of vegetation necessary to create defensible space, contact your local fire official and ask for help in resolving the conflict.

"I've got insurance": While insurance can rebuild a house, it cannot recreate a home. Photo albums, heirlooms, and other memorabilia are often irreplaceable.

"I don't know what to do": For more information about creating defensible space, go to www.livingwithfire.info, www.firewise.org or contact your local firefighting agency, New Mexico State Forestry or other local, state, federal and tribal natural resource agencies.