



DEFENSIBLE

Landscaping

Create Defensible Space for Fire Safety

Wildfires burn hundreds of thousands of acres in the United States every year, force evacuations, burn structures, and claim lives.

Firefighting agencies do all they can, but their resources can be quickly overwhelmed by a large blaze. Only the homeowner can help guarantee his or her safety, the safety of family members, firefighters, and pets, and increase the chances your home, outbuildings, and landscaping survive a wildfire. For Wyoming homeowners, there are many things that can be done during a weekend to increase your wildfire preparedness.

The 3 R's of Defensible Space

Neighborhoods and subdivisions should work together to create defensible space when possible. Begin by inventorying the vegetation around you and your neighbors' houses.

Remove

- Remove dead vegetation, and clear weeds.
- Remove low tree branches.
- Remove ladder fuels (these are explained below).
- Remove firewood piles from near the house.

Reduce

- Breakup dense shrub fields and thick tree cover.
- Prune dead wood from shrubs.
- Reduce the amount of highly flammable native vegetation.

Replace

- Replace highly flammable plant material with less flammable, low-growing species within 30 feet to 100 feet of your house; check with your fire agency for local regulations.
- Consider replacing flammable roofing, siding, and other combustible building materials with

SPACE

steps to reduce the wildfire threat

fire-rated non-combustible materials, such as class A asphalt roof shingles, fiber cement siding.

- Replace attic vents and soffits that are plastic or can easily allow embers to pass into the attic or other parts of the house. Vents should be metal and less than ¼-inch mesh.

Following local regulations when creating defensible space is important. For example, the Casper Mountain Zoning District of Natrona County has regulations pertaining to fuel reduction requirements (see page 10 for Casper Mountain requirements). These requirements for homeowners on Casper Mountain are the only of their kind in Wyoming. If you live in an area without any requirements, these regulations may work as a guide.

Most people realize houses in or adjacent to wildland vegetation are at-risk for damage from wildfire. However, few people recognize that houses within urbanized areas are also threatened. During intense wildfires, burning pinecones, branches, and other material can be carried a half-mile or more beyond the fire front. Showers of embers are produced. If these embers land in spots where there are easily ignited fuels, such as wood shingle roofs, trash piles, or dried grass, new fires can start.

What is Defensible Space?

Defensible space describes an area of reduced wildfire threat around a home. You can modify a landscape to create defensible space by altering vegetation to decrease overall fuel volume and altering the arrangement and height of plant material. It is also important to ensure adequate space for firefighters to operate safely. These practices can make the difference between a structure surviving a wildfire or being destroyed. Factors affecting how easy it will be to create your own defensible space are:

- **The size of your property**
- **Types of vegetation**
- **Accessibility**
- **Slopes and steepness**

In some instances, a homeowner may already have an effective defensible space in place and need to perform only minimal additional work to contribute substantially to protecting a home from wildfire.



From Natrona County Firewise www.firewisewyoming.com

How To Create Effective Defensible Space

Make areas closest to the house lean, clean, and green – reduce the amounts of fuel, remove dead or high-risk vegetation, and keep the areas closest to the house well-maintained, green, and healthy. Many people find defensible space fits other landscape objectives as well. The area closest to the house is where you entertain guests, eat outside in good weather, and enjoy a lawn or flower garden. Many houses are adjacent to forests or prairie or on steep vegetated slopes, which are areas of high wildfire hazard. They need both the lean, clean, and green zone (first 100 feet) and an additional area outside of that.

Step One: Determine your defensible space

The amount and type of highly flammable wildland vegetation (grass, shrubs, or trees) growing on or adjacent to your property and how steep the slope of the area around and leading up to the house determines how much defensible space is needed. The minimum for most homes in Wyoming is 100 feet from a house, but a heavier amount of vegetation or steep slopes could mean at least 200 feet.

If the recommended distance goes beyond the property boundaries, contact the adjacent property owner and work cooperatively to create defensible space. The effectiveness of defensible space increases when property owners work together. Do not implement defensible space practices on neighboring properties without first securing permission. The county assessor's office can provide assistance if the owners of adjacent parcels are unknown.

Once the recommended distance is determined, temporarily mark the outer boundary with survey flagging or paint on trees or shrubs. The land within this boundary is the defensible space you need.

Step Two: Make a list of what you need to do and do it

Clean Up

Look around – is there dead vegetation in your defensible space zone?

Dead vegetation includes dead trees and shrubs, dead branches lying on the ground or still attached to plants, dried grass and flowers, dropped leaves and needles, and firewood. Dead vegetation should be removed from the defensible space area. Two important exceptions are pine needles covering bare soil and downed trees embedded in the ground. Pine needles are good cover for bare soil but should be kept to a thickness of between 1 and 2 inches – more is a hazard and less promotes erosion. Be careful not to remove the duff area – the dark brown



This mountain cabin owner thinned and pruned up the trees and removed a significant amount of under-brush. Limbs and whole trees have been chipped.



This cabin owner followed up a year after the treatment with a native wildflower mix on the bare soil. Photo: Nick Williams

zone beneath the needles where the needles have begun to decompose. Remove all pine needles under decks and within 2 feet of any structure. Move firewood piles away from the structure during fire season.

Breakup the canopy

Within the defensible space, is there a dense, continuous cover of shrubs or tree canopies? Sometimes, wildland plants grow as an uninterrupted layer of vegetation as opposed to patchy or widely spaced plants. The more continuous and dense the vegetation, the greater the threat of wildfire. If the branches of neighboring trees or shrubs touch, break them up. There are two types of

dense, continuous vegetation that homeowners are likely to encounter in mountain areas – brush fields and crowded stands of coniferous trees.

Prairie and other brush fields

Create separation between shrubs based on shrub height and steepness of slope. The separation between individual or small groups of shrubs on flat to gently sloping terrain should be twice the height of remaining shrubs. For example, if the shrub height is 4 feet, then the recommended separation should be 8 feet (2 x 4-foot shrub height = 8-foot separation). Separation is measured from the edge of the canopy of one shrub to another and not from trunk to trunk. The separation between shrub canopies should increase as the steepness of the slope increases.

Crowded and dense stands of trees

In many mountainous areas, coniferous trees occur in dense, overcrowded stands where their branches are touching or interwoven. These conditions contribute to the risk of an uncontrollable and possibly catastrophic crown fire (wildfire burning through the tree canopies, independent of the understory vegetation). Create a separation between trees within the defensible space area. This is typically accomplished through tree removal or thinning of the stands. Note the photos on page 6; homeowners do not have to completely remove all the trees around their houses to have adequate defensible space.

Make sure there are no ladder fuels within your defensible space

Sometimes, plants serve like rungs of a ladder; they carry flames from fuels burning at ground level, such as dead grass and weeds, to taller fuels, such as shrubs, which ignite still taller fuels, such as tree branches. The ladder fuel problem can be remedied by removing the

Ladder fuels are created when vegetation of different heights is close enough to allow a surface fire to become a crown fire.



*From "A Landscape Guide for Mountain Homes,"
by University of Nevada Cooperative Extension*

lower tree branches or reduce the height of the shrub or both. Exceptions to this practice are:

- Removal of lower tree branches should not exceed one-third to half of the tree's total height.
- Lower tree branches should be removed to at least 7 feet in height when no understory vegetation is present.
- Lower branches on shrubs taller than 3 feet should be removed to provide at least 12 inches of separation from the ground.

Remember, if you create slash piles of dead material such as tree branches during your creation or maintenance of defensible space, these piles should be eliminated annually. Landowners should consult their local law enforcement and fire protection district on slash pile burning and disposal of slash. Some communities have publically designated slash piles that are burned by the local fire department or forestry agency on an annual basis. Take advantage of these opportunities if they are available in your community.

No junipers

Junipers are often planted around the foundations of homes. They are very flammable – not good choices for a firewise landscape.

Step Three: Plant choice critical for defensible space areas

You should keep your defensible space in mind when planning a landscape or planting. Poor plant choice and spacing can jeopardize your defensible space. In addition to choosing plants to meet needs, such as providing shade, producing wind protection, adding color, and controlling erosion, select plants that have a low fire hazard. There are no fireproof plants. Any plant can burn during extreme fire conditions. There are, however, important differences in flammability. Some plants are more difficult to ignite, burn more slowly, produce less heat, and have shorter flame length. See "Some native plants for use in Wyoming landscapes" for a list of native plants and other tips that can get you started on a landscaping endeavor.

As you conduct landscaping activities, preserve or create your concentric "rings" of protection around your home or cabin.

In the first ring – an area around the home at least 3 feet and preferably 5 feet – do not use any wood mulch or flammable plants. Choose short (less than 18 inches high), fire-resistant plants and keep them away from contact with the structure. Have no plants in this area if the structure is built of logs or flammable material.

In the next ring, a space 30 feet out from the structures, herbaceous, fire-resistant plants should dominate. For example, a lawn planted in this area can be a cool and relaxing place for family members to gather. For defensible space purposes, this lawn should be kept green, if possible, and short. Any shrubs should be deciduous and less than 2 feet high. Any fire-resistant trees, shrubs, or other plants in this ring or the final ring from 30 to 100 or 200 feet should meet the spacing requirements and other safety considerations listed above.

In addition to the right plants, hardscaping can help protect a home. Rock mulch is a very useful addition to landscapes where wildfire is a concern. Using pea-sized gravel mulches and/or larger rocks up to boulder-sized can be an attractive form of hardscaping that will not burn or carry flames to the home. Other forms of hardscaping to create firebreaks around a house include paved patio areas, walkways and driveways of gravel, concrete or pavers, and raised beds made of rock or brick.



This cabin appears at first glance to not have any problems but look closely at how thick and dense the forest is, how tall the brown grass is, and the firewood pile under and near the deck. See the photo to the right after the wildfire arrived.



Firefighters were unable to reach this home before embers entered the firewood pile and the cabin, which caused the cabin to become fully involved with fire. Wildland firefighters are often not equipped to handle structure fires once a house is fully involved with fire.

WELL-PLANNED HOME LANDSCAPE CAN REDUCE WILDFIRE DANGER

Many Wyoming families have homes or cabins in forested areas, which provide a get-away from the heat and cares of lower-elevation towns.

The defensible tips given here can help protect a cabin or home and the many memories these family gathering places hold; however, few want to go away for the weekend to a place with nothing around the building to beautify the site and make the structure seem part of the natural landscape.

A well-planned home landscape can reduce fire danger, protect your investment, and help the cabin fit in with the natural vegetation.

As mentioned, landscape plants, if not selected and placed well, can actually increase the fire hazard to a house. Evergreen trees are the most common plants around cabins and mountain homes. Unfortunately, these

are some of the most flammable plants. Even their needles are highly flammable after they fall from the trees at the end of the growing season.

What makes one plant less flammable than another?

Some characteristics of less flammable plants include: high moisture content, low growing, and lack of very flammable chemicals. Herbaceous plants (grasses, bulbs, annual and perennial flowers, and some ground covers) tend to contain the most moisture. Of the shrubs and trees, deciduous varieties (ones that lose leaves in fall) tend to contain the most moisture and lack many of the flammable chemicals found in evergreens. Many of the native plant species found in mountainous areas, such as sagebrush or ground juniper, are very flammable. Water plants well during the fire season to maximize their fire resistance. Inspect regularly for any dry or dead material and remove.

Step Four: Maintain for fire safety

Remember these three words – lean, clean, and green – when there is any potential of wildfire in your area. Keep your landscape lean by reducing, removing, or replacing the most flammable vegetation within your defensible zone. Keep it clean – make sure there is no accumulation of dead vegetation or other flammable debris. Keep it green – make sure plants are healthy and green during the fire season. Creating a defensible space should not

be viewed as a one-shot effort. Maintaining an effective defensible space is an ongoing process.

Working with your community, neighborhood, or homeowners association will improve the chances that structures will survive a wildfire. Ask a forester or local fire department about how your community could become a nationally recognized Firewise Community. For more information about Firewise communities, including additional tips on preparing your home for wildfire season, go to www.firewise.org/.

Some native plants for use in Wyoming landscapes

Scientific Name	Common Name	Water Needs	Sun/Shade	Height
Flowers and Groundcovers				
<i>Antennaria parvifolia</i>	Small leaf pussytoes	Low – Moderate	Sun	3”– 8”
<i>Antennaria rosea</i>	Rosy pussytoes	Low – Moderate	Sun	3”– 8”
<i>Aquilegia</i> spp.	Columbine	Low – Moderate	Part Shade/Shade	18”– 24”
<i>Arabis</i> spp.	Rockcress	Low	Sun/Part Sun	6”
<i>Campanula rotundifolia</i>	Common harebell	Low – Moderate	Part Sun/Part Shade	4”– 5”
<i>Claytonia lanceolata</i>	Spring beauty	Moderate	Part Sun/Part Shade	6”
<i>Echinacea purpurea</i>	Purple coneflower	Moderate	Sun	2’– 3’
<i>Erigonum umbellatum</i>	Sulphur flower	Low – Moderate	Sun/Part Shade	6”–12”
<i>Gaillardia aristata</i>	Blanket flower	Low – Moderate	Sun/Part Shade	12”– 20”
<i>Geum triflorum</i>	Prairie smoke	Moderate	Sun/Part Shade	8”– 18”
<i>Ipomopsis aggregata</i>	Scarlet gilia	Low – Moderate	Sun/Part Sun	18”– 24”
<i>Liatis punctata</i>	Dotted gayfeather	Low – Moderate	Sun/Part Sun	6”–18”
<i>Penstemon</i> spp.	Penstemon	Low – Moderate	Sun/Part Shade	6”– 36”
<i>Sedum</i> spp.	Stonecrop	Very Low – Low	Sun	1”– 6”
Shrubs				
<i>Mahonia repens</i>	Creeping grape holly	Low – Moderate	Sun/Part Shade	4”– 6”
<i>Philadelphus microphyllus</i>	Little-leaf mockorange	Low – Moderate	Sun/Part Shade	18”– 40”
<i>Rosa woodsii</i>	Wood’s rose	Moderate	Sun/Shade	2’– 3’
Trees				
<i>Amelanchier alnifolia</i>	Saskatoon alder-leaf serviceberry	Moderate	Sun/Part Shade	6’– 8’
<i>Crataegus</i> spp.	Hawthorn	Moderate	Sun	6’– 8’
<i>Acer grandidentatum</i>	Bigtooth maple	Low	Moderate Sun/Part Shade	10’– 20’
<i>Populus tremuloides</i>	Quaking aspen	Moderate	Sun	8’– 25’

Other or more extensive plant lists are available from local extension, USDA Forest Service, or Wyoming State Forestry Division offices. Plant lists are also available on the Internet but be sure plants are cold hardy enough for your location.

Remember, fire-resistant landscaping requires annual maintenance to be effective! Pine needles should be raked away from the house in the closest zone, gutters cleaned, plants pruned or thinned, dead material removed, and slash piles disposed of by legal means.

By taking these steps, time spent at mountain cabins or rural homes can be much safer. Nothing can guarantee a cabin or house will survive a wildfire, but steps to modify the natural vegetation and create an attractive, less-flammable landscape near your forest sanctuary will help.

Obtaining More Information

Wyoming State Forestry Division and most counties have Firewise and fuels reduction programs to assist landowners who live in the wild-land-urban interface. Some counties even have federal assistance grants for landowners to help offset some of the costs of creating defensible space. For more information, please contact Nick Williams, fire resource forester, with the Wyoming State Forestry Division, at nick.williams@wyo.gov or 307-777-7586. Or, go to www.firewisewyoming.com.

This document was modified from the University of Nevada's Cooperative Extension document "A Landscape Guide for Mountain Homes."

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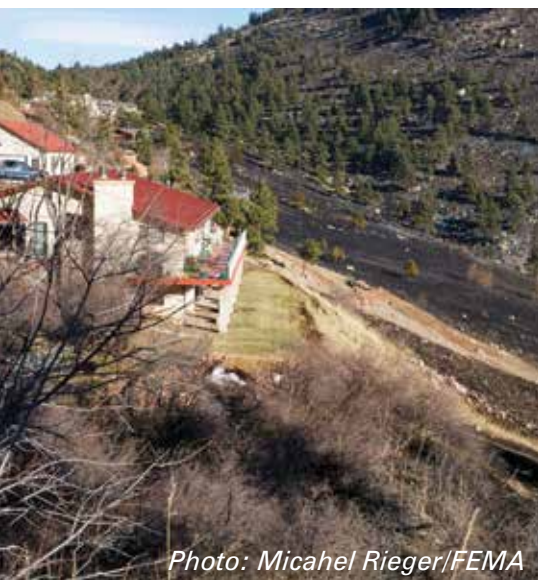


Photo: Micahel Rieger/FEMA

Vegetative Management and Defensible Space

Public agencies and some local homeowners associations have fuel-reduction requirements. Below are those for the Casper Mountain Zoning Area of Natrona County (2011).

Casper Mountain Zoning Fuel Reduction Requirements for Building Permits

(a) A mitigation plan for vegetative management and defensible space/fire safety shall be submitted with site plans for principle building construction. Zoning certificates shall be issued after approval by the reviewing officials (fire inspector or other designated official, and building official).

(i) Vegetative Management Recommendations:

(A) Fuel breaks: This can be implemented along access roads, driveways, and subdivision boundaries. The fuel break should be a minimum of 10 feet wide, and all material should be removed as well as all live brush and trees under 20 feet tall. A few larger trees (20 feet tall and larger) can be left, although all branches should be pruned to a height of 10 feet.

(ii.) Defensible Space Zones:

(A) Zone 1 – This area is the first 30 feet from the structure.

- (I) Remove all dead material from this area and firewood piles and other combustible materials.
- (II) Maintain an area of non-combustible material 3 to 5 feet away from structure.
- (III) Remove all shrubs and trees except for a few individuals. (Minimum spacing between crowns of trees is 10 feet.)
- (IV) Prune branches off of remaining trees to a minimum height of 10 feet. If a tree is less than 20 feet tall, prune it to half of total height.
- (V) Plant species in this zone should be of a fire-resistant variety, which is mostly leafy species. These plants need to be watered well to maintain adequate moisture content.
- (VI) Keep all vegetation mowed to a height not exceeding 2 inches.
- (VII) Prune away any branches within 10 feet of structure and 15 feet away from any chimney outlets.
- (VIII) Clear pine needles, leaves, limbs, and other debris from roofs and gutters.

(B) Zone 2 – This zone extends 70 feet beyond the outer edge of Zone 1.

- (I.) Thin all trees to a spacing of 8 feet between tree crowns.
- (II.) Prune all remaining trees to a minimum height of 10 feet
- (III.) Remove dead trees and downed combustible materials. Firewood and other combustible material can be stored here, but keep it at least 15 feet away from trees.
- (IV.) Control ground vegetation.

(C) Recommendations for remaining lot area:

- (I.) Mark all fire protection equipment and water sources so they are clearly identified.
- (II.) Inspect power lines on the property and ask the utility company to remove any trees within 15 feet of the lines.
- (III.) Place propane tanks at least 50 feet from structures and maintain a clear 10-foot area around the tank. Also, locate tanks at same or lower level as structure.