

# Creating Wildfire-Defensible Zones in Crystal Park



Waldo Canyon Fire, 26 June 2012  
Photo by: Nick Gurin (CPVFD Firefighter)

**Prepared by the Crystal Park Volunteer Fire Department**

Disclosure: Due to its direct applicability to Crystal Park homes, the majority of this paper is taken verbatim from a Colorado State Forest Service -Colorado State University Fact Sheet 6.302 authored by F.C Dennis. The information is consistent with other sources across the country, directly applicable to Crystal Park wildfire risks, and include information provided by FireWise and has been tailored in places for Crystal Park's unique topography, aspect, weather, fuel load and characteristics, and overall state of health of the communities 2000 acre forest.

## PURPOSE

The purpose of this paper is to provide the residents of Crystal Park information supporting their desire to create defensible space around their homes thus increasing the likelihood that homes are defensible and even survivable. The information included in this paper represent industry standards and have been adjusted for the unique terrain, topography and forest characteristics in Crystal Park.

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## DEFENSIBLE SPACE

Two factors have emerged as the primary determinants of a home's ability to survive wildfire. These are the home's roofing material and the quality of the "defensible space" surrounding it. Use fire-resistive materials (Class A), not wood or shake shingles, to roof homes in or near forests and grasslands. When your roof needs significant repairs or replacement, do so with a fire-resistant roofing material. Check with the Crystal Park construction guidelines.

Defensible space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest. Defensible space provides *room for firefighters to do their jobs*. 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.

The measure of fuel hazard refers to its continuity, both horizontal (across the ground) and vertical (from the ground up into the vegetation crown). Fuels with a high degree of both vertical and horizontal continuity are the most hazardous, particularly when they occur on slopes. Heavier fuels (brush and trees) are more hazardous (i.e. produce a more intense fire) than light fuels such as grass.

Mitigation of wildfire hazards focuses on breaking up the continuity of horizontal and vertical fuels. Additional distance between fuels is required on slopes.

Creating an effective defensible space involves developing a series of management zones in which different treatment techniques are used. See Figure 1 for a general view of the relationships among these management zones. Develop defensible space around each building on your property. Include detached garages, storage buildings, and other structures in your plan.

The actual design and development of your defensible space depends on several factors: size and shape of buildings, materials used in their construction, the slope of the ground on which the structures are built, surrounding topography, and sizes and types of vegetation on your property. These factors all affect your design. You may want to request additional guidance from your local Colorado State Forest Service (CSFS) forester or the CPVFD.

### Defensible Space Management Zones

- ❖ **Zone 1** is the area of maximum modification and treatment. It consists of an area of 30 feet around the structure in which all flammable vegetation is removed. This 30 feet is measured from the outside edge of the home's eaves and any attached structures, such as decks.
  
- ❖ **Zone 2** is an area of fuel reduction. It is a transitional area between Zones 1 and 3. The size of Zone 2 depends on the slope of the ground where the structure is built. Typically, the defensible space should extend *at least* 75 to 125 feet from the structure. See Figure 2 for the appropriate distance for your home's defensible space. Within this zone, the continuity and arrangement of vegetation is modified. Remove all stressed, diseased,

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dead or dying trees and shrubs. Thin and prune the remaining larger trees and shrubs. Be sure to extend thinning along either side of your driveway all the way to your main access road. These actions help eliminate the continuous fuel surrounding a structure while enhancing homesite safety and the aesthetics of the property. Zone 2 can also extend into Crystal Park community property. Work with the HOA Forestry Committee to remove recommended trees.

- ❖ **Zone 3** is an area of traditional forest management and is of no particular size. It extends from the edge of your defensible space to your property boundaries or community property. As with Zone 2, work with the HOA Forestry Committee to remove recommended trees.

## Prescriptions

### *Zone 1*

- ❖ The size of Zone 1 is 30 feet, measured from the edges of the structure or any attached portion of the structure such as a deck. Within this zone, several specific treatments are recommended.
- ❖ Plant nothing within 3 to 5 feet of the structure, particularly if the building is sided with wood, logs or other flammable materials. Decorative rock, for example, creates an attractive, easily maintained, nonflammable ground cover.
- ❖ If the house has noncombustible siding, widely spaced foundation plantings of low growing shrubs or other “fire wise” plants are acceptable. Do not plant directly beneath windows or next to foundation vents. Be sure there are no areas of continuous grass adjacent to plantings in this area.
- ❖ Frequently prune and maintain plants in this zone to ensure vigorous growth and a low growth habit. Remove dead branches, stems and leaves.
- ❖ Do not store firewood or other combustible materials in this area. Enclose or screen decks with metal screening. Extend the gravel coverage under the decks. Do not use areas under decks for storage. In Crystal Park, many residents store firewood under the deck which should be avoided.
- ❖ Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches that interfere with the roof or are within 10 feet of the chimney. Remove all “ladder fuels” from beneath the tree. Ladder fuels are vegetation with vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. Ladder fuels are potentially very hazardous but are easy to mitigate. In Crystal Park, ladder fuels can be small trees and juniper. No ladder fuels can be allowed under tree canopies. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/2 the height, whichever is the least).

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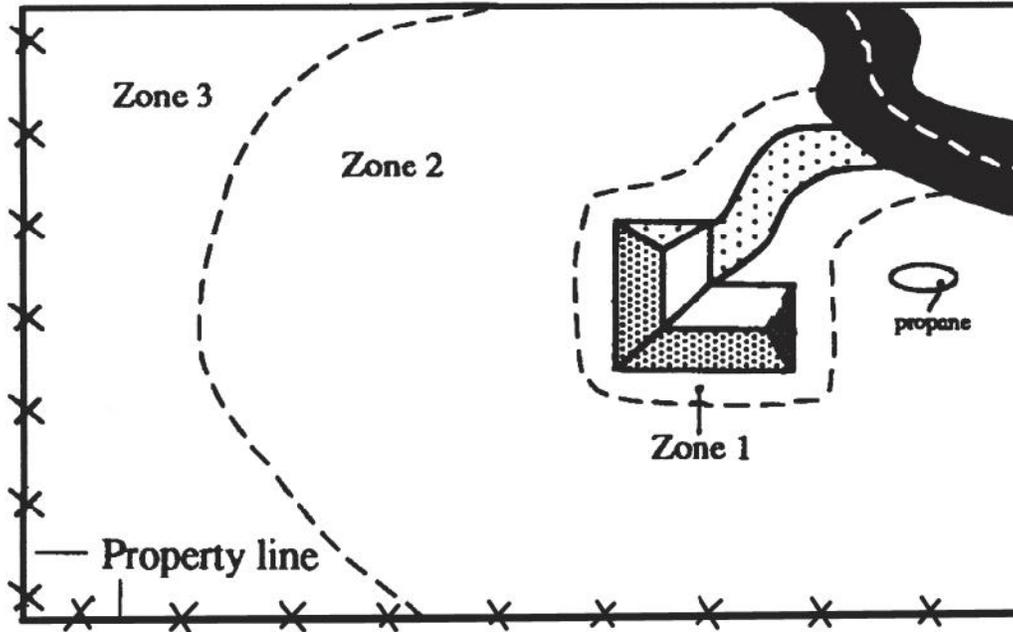


Figure 1 Forested property showing the three fire-defensible zones around a home or other structure

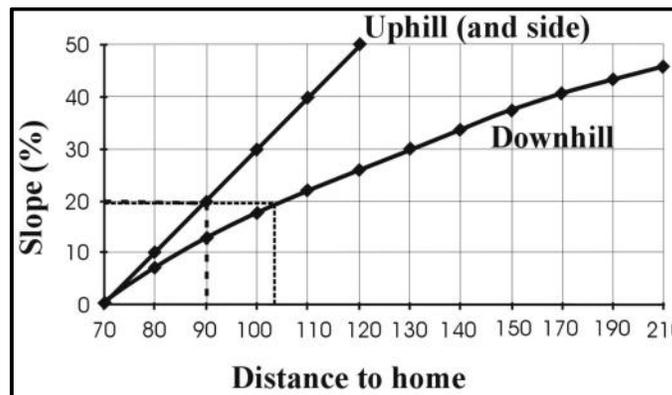


Figure 2 This chart indicates the minimum recommended dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill

### Zone 2

- ❖ Zone 2 is an area of fuel reduction designed to reduce the intensity of any fire approaching your home. Follow these recommended management steps.
- ❖ Thin trees and large shrubs so there is at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree

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(Figure 3). On steep slopes, allow more space between tree crowns. (See Figure 4 for *minimum recommended* spacing for trees on steep slopes.) Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of at least 10 feet.

- ❖ Remove any tree that is diseased, have dead tops or have insect kill.
- ❖ Small clumps of 2 to 3 trees may be occasionally left in Zone 2. Leave more space between the crowns of these clumps and surrounding trees.

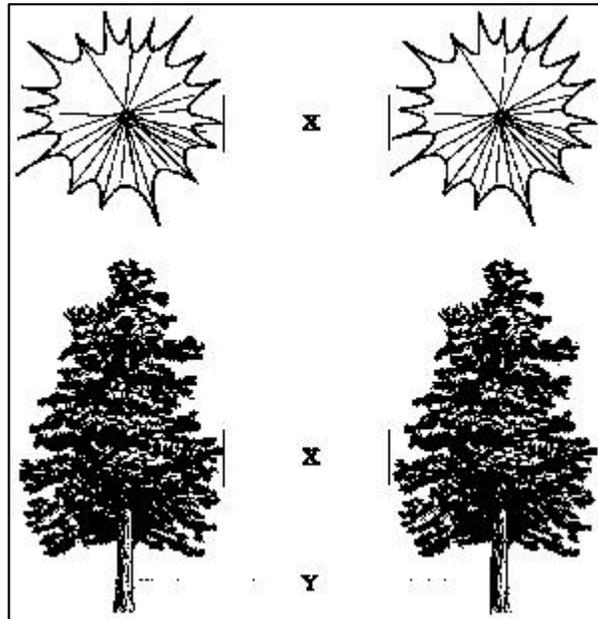


Figure 3: X = crown spacing; Y = stem spacing. Do not measure between stems for crown -- measure between the edges of tree crowns.

% slope	Tree Crown Spacing	Brush and Shrub Clump Spacing
0 -10 %	10'	2 1/2 x shrub height
11 - 20%	15'	3 x shrub height
21 - 40%	20'	4 x shrub height
> 40%	30'	6 x shrub height

Figure 4: Minimum tree crown and shrub clump spacing.

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- ❖ Because Zone 2 forms an aesthetic buffer and provides a transition between zones, it is necessary to blend the requirements for Zones 1 and 3. Thin the portions of Zone 3 adjacent to Zone 2 more heavily than the outer portions.
- ❖ Isolated shrubs may remain, provided they are not under tree crowns. Prune and maintain these plants periodically to maintain vigorous growth. Remove dead stems from trees and shrubs annually.
- ❖ Limit the number of dead trees (snags) retained in this area. Wildlife needs only one or two snags per acre. Be sure any snags left for wildlife cannot fall onto the house or block access roads or driveways.
- ❖ Mow grasses (or remove them with a weed trimmer) as needed through the growing season to keep them low, a maximum of 6 to 8 inches. This is extremely critical in the fall when grasses dry out and cure or in the spring after the snow is gone but before the plants green up.
- ❖ Stack firewood and woodpiles uphill or on the same elevation as the structure but at least 50 feet away. Clear and keep away flammable vegetation within 10 feet of these woodpiles. Do not stack wood against your house or on or under your deck, even in winter. Many homes have burned from a woodpile that ignited as the fire passed. Wildfires can burn at almost any time in Colorado.
- ❖ Locate propane tanks at least 30 feet from any structures, preferably on the same elevation as the house. You don't want the LP container below your house – if it ignites, the fire would tend to burn uphill. On the other hand, if the tank is above your house and it develops a leak, LP gas will flow downhill into your home. Clear and keep away flammable vegetation within 10 feet of these tanks. Do not screen propane tanks with shrubs or vegetation. For new construction, Crystal Park requires all propane tanks to be buried.
- ❖ Dispose of slash (limbs, branches and other woody debris) from your trees and shrubs through chipping. Burning slash piles is prohibited in Crystal Park. Avoid heavy accumulations of slash. Lay it close to the ground to speed decomposition. 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 defensible space.

### *Zone 3*

- ❖ This zone is of no specified size. It extends from the edge of your defensible space to your property lines. A gradual transition into this zone from defensible space standards to other management objectives you may have is suggested. Typical management objectives for areas surrounding homesites or subdivisions are: provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust and visual intrusions; or support limited production of firewood, and other forest commodities.

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- ❖ Specific requirements will be dictated by your objectives for your land and the kinds of trees present. See Figure 5 for the *minimum* suggested spacing between “leave” trees. Forest management in Zone 3 is an opportunity for you to increase the health and growth rate of the forest in this zone. Keep in mind that root competition for available moisture limits tree growth and ultimately the health of the forest. Work with the HOA Forest Committee for all areas in this zone that falls within community property.
- ❖ A high canopy forest reduces the chance of a surface fire climbing into the tops of the trees and might be a priority for you if this zone slopes steeply. The healthiest forest is one that has multiple ages, sizes, and species of trees where adequate growing room is maintained over time. Remember to consider the hazards of ladder fuels. Multiple sizes and ages of trees might increase the fire hazard from Zone 3 into Zone 2, particularly on steep slopes.
- ❖ A greater number of wildlife trees can remain in Zone 3. Make sure that dead trees are removed, especially if they pose no threat to power lines or fire access roads.
- ❖ While heavy pruning generally is not necessary in Zone 3, it may be a good idea from the standpoint of personal safety to prune trees along trails and fire access roads. Or, if you prefer the aesthetics of a well-manicured forest, you might prune the entire area. In any case, pruning helps reduce ladder fuels within the tree stand, thus enhancing wildfire safety.
- ❖ Mowing is not necessary in Zone 3.
- ❖ Any approved method of slash treatment is acceptable for this zone, including piling, chipping or lop-and-scatter.

Tree Diameter (in inches)	Average Stem Spacing Between Trees (in feet)
3	10
4	11
5	12
6	13
7	14
8	15
9	16
10	17
11	19
12	21
13	23
14	24
15	26
16	28
17	29
18	31
19	33
20	35
21	36
22	38
23	40
24	42

Figure 5: Minimum tree spacing for Zone 3.

### Maintaining Your Defensible Space

Your home in Crystal Park is located in a forest that is dynamic, always changing but heavily overgrown. Trees and shrubs continue to grow, plants die or are damaged, new plants begin to grow, and plants drop their leaves and needles. Like other parts of your home, defensible space requires maintenance. Use the following checklist each year to determine if additional work or maintenance is necessary.

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### *Defensible Space and FireWise Annual Checklist*

- Trees and shrubs are properly thinned and pruned within the defensible space. Slash from the thinning is disposed of.
- Roof and gutters are clear of debris.
- Branches overhanging the roof and chimney are removed.
- Chimney screens are in place and in good condition.
- Grass and weeds are mowed to a low height.
- An outdoor water supply is available, complete with a hose and nozzle that can reach all parts of the house.
- Fire extinguishers are checked and in working condition.
- The driveway is wide enough. The clearance of trees and branches is adequate for fire and emergency equipment. (Check with the CPVFD)
- Road signs and your name and house number are posted and easily visible.
- You have practiced family fire drills and your fire evacuation plan.
- Your escape routes, meeting points and other details are known and understood by all family members.
- Attic, roof, eaves and foundation vents are screened and in good condition. Stilt foundations and decks are enclosed, screened or walled up.
- Trash and debris accumulations are removed from the defensible space.
- A checklist for fire safety needs inside the home also has been completed.

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