

Prevention of Wildland Fires

Prevention of wild-land fires is not a simple issue. Wildfires are natural phenomena. Therefore complete suppression will never be possible. Also, although fire suppression has been very successful over the years, a consequence has been that many areas have accumulated large amounts of fuel (see following discussion). This is part of the reason that forest fires in some cases have become increasingly difficult to extinguish. A solution is controlled burning of areas (prescription burning), which prevents uncontrolled destruction of the environment and allows regeneration of wildlife habitat and new growth of vegetation. Livestock and horses can also play a significant role in the prevention of wildfires because they can be used to graze pastures that are at risk of wild-land fires.

Wildland-Urban Interface

As population increases, it invariably encroaches upon wild-land. This increases the risk of exposure to wild-land fires. In California alone it is estimated that over 6 million people live in wild-land areas and an additional 3 to 4 million live in the urban-wild-land interface. In this state between 1980 and 1995 over 5000 buildings were destroyed in wild-land or in the urban-wild-land interface. This is more than three times the number destroyed in the 15-year period between 1965 and 1980.

Studies have shown that additional factors play a role in wild-land-urban interface fires. These features are important to recognize because many of them are common to many horse and livestock farms. Knowledge of these can help identify potential fire hazardous sites and the need for measures to mitigate the risk of fire. Wild-land-urban interface fires appear to result from common risk factors that can be mitigated:

- Poor access for emergency vehicles and vehicles used for evacuation
- Sloping topography
- Buildup of wild-land vegetation
- Lack of defensible space
- Buildings constructed of combustible materials
- Lack of appreciation of the risks of fire by developers and the public
- Understaffed or rapidly overwhelmed firefighting services

Another risk factor is the weather condition. Wild-land-urban interface fires occur most commonly during hot, dry, and windy conditions. When these weather conditions are present, special vigilance should be applied to fire prevention.

Currently there are few codes to help municipalities develop the wild-land-urban interface. However, several states (such as California, Colorado, Michigan, and Missouri) are developing risk ratings that may serve as national guidelines for risk assessment someday. Factors that are taken into account include topography, fuels, building construction, land use, fire history, water supply, and other potential risk sources.

Fuel

Firefighting experts look at the potential risk of fire in an environment by the amount of fuel

that it contains. Light fuels are things like dry grass and shrubbery. These are relatively easy to ignite but burn at low temperatures and in relatively controlled fashion. Heavy fuels are things like timber and trees. They are relatively difficult to ignite but once burning are also difficult to extinguish and burn at high temperatures. Fire safety principles mandate that fire fuels not be allowed to accumulate in the environment.

Deciduous trees are a primary source of ground fuel. They can prevent adequate air circulation between the ground and tree canopies. Inadequate air flow can lead to preheating of fuel when fires break out, making the fuel easier to ignite. This can be prevented by limbing up trees to approximately one third of the tree's height or 4 to 5 feet above the ground. Where appearance is important, an arborist may be consulted.

Coniferous trees present a different type of hazard. Their needles contain sclerophyll, a waxy turpentine that normally helps the tree retain moisture but is explosive when heated. Coniferous trees can be limbed up too, and selected trees can be thinned out.

Firebreaks

In the past, straight-line firebreaks were often used to prevent fires from spreading from one part of a forest to another. These are usually constructed 1.5 to 4 times as wide as the fuel is high. However, prevention of wildfires also has to take the visual impact of fire suppression measures into account. Straight-line firebreaks are often considered unsightly and are damaging to topsoil.

Newer methods to prevent the spread of forest fires increase edge space and therefore reduce the rate at which a fire can spread. These are usually referred to as fuel breaks and take landform, visual lines, and color and texture of the land into account. A fuel break is usually 100 to 300 feet wide. The increased edge space also encourages more wildlife to frequent the area.

Topography

The steeper a slope is, the faster a fire will ascend it. Canyons act like chimneys; they trap heat and lead to combustion of fuel and area ignition (i.e., the heat of the fire ignites fuels at a distance). The slope of the area surrounding buildings should be taken into consideration when defining the amount of space to be kept free of fuels.

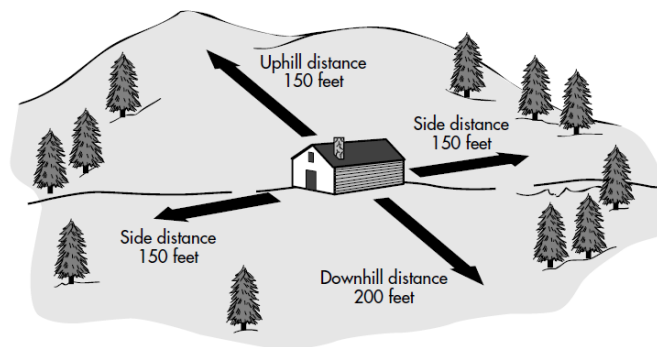


FIG. 10-6 Recommended defensible space distances for a 30% slope. (From International Association of Fire Chiefs, Finance Department: *Development strategies in the wildland/urban interface*, ed 2, Fairfax, Va, 1996, IAFC).

Table 10-3 Recommended defensible space on inclines

Percent slope of land	Distance from edge of vegetation (feet)		
	Uphill from house	To side of house	Downhill from house
≤ 20%	100	100	100
21%-40%	150	150	200
41%-60%	200	200	400

Modified from Simmeran, Fisher: Wildland home fire risk meter. In International Association of Fire Chiefs, Finance Department: *Development strategies in the wildland/urban interface*, ed 2, Fairfax, Va, 1996, IAFC).

Defensible space

Defensible space is the amount of space needed around buildings to allow fire services to succeed against a fire and to prevent the spread of flames from structure to vegetation and vice versa. The amount of defensible space that is recommended depends on the topography surrounding the buildings. Defensible space should be at least 30 feet between the buildings and trees. Within the defensible space grass should be kept to below 6 inches in height, no combustible material or vegetation should be under decking, aerial canopies should be at least 10 feet from the chimney spark arrester, and no firewood should be stored within 10 feet of the building. If plants are placed within the defensible space, they should be drought and fire resistive.

Roads

Vegetation should be cut back from roads to the following dimensions:

- Roads should be at least 20 feet wide.
- Vegetation should be cut back to greater than 10 feet from the shoulder and greater than 4 feet from the shoulder clearance.
- Tree limbs should be cut at least 6 feet up.
- At least 14 feet of clearance should be left above the road for emergency vehicles to pass.

Areas where streams flow under roads through pipes should be kept free of fuel because these can ignite in fires and act as wind tunnels that blow heated and burning ash through to the other side of the road.