WILDFIRE

Best Management Practices for Creating and Maintaining Wildfire Fuelbreaks in New Jersey's Wildland Urban Interface

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Increasing fragmentation of New Jersey's rural landscape has made it extremely difficult to manage land for wildfire protection and preparedness. As residential communities and development continue to spread into new, previously undisturbed natural areas, *"Wildland Urban Interface"* (WUI) - where rural land and developed areas meet - is created. Increased interface leads to greater ignition sources, more frequent fires, and reduced ability to manage forest resources in these areas. This problem can be seen throughout the country and in New Jersey, especially with the state having such a rapidly growing population. In a study done by the American Planning Association, 46% of homes in New Jersey are located in the Wildland Urban Interface. This percentage ranks New Jersey in the top 5 nationally, and stresses the importance of the problem in New Jersey.

Fuelbreaks should be designed to minimize ladder fuels and to thin canopy fuels as part of sustaining a healthy forest.

Controlled or prescribed fire has long been a useful tool of the Forest Fire Service in managing land to prevent and minimize loss from wildfire. Today this technique is still effectively used to reduce fuel loads (accumulated leaves, brush and vegetation) in an efficient and cost-effective manner. Sometimes, burning in the WUI is difficult because smoke can be a problem for nearby homeowners. Also, burning of dense fuels requires extra control lines and added fire fighting resources in order to safely and effectively conduct the prescribed burn. Effectively, a fuelbreak provides a change in the structure and arrangement of the forest or other vegetation, to minimize fire intensity and spread adjacent to a community.

The Forest Fire Service is working with communities and other local and state government agencies to implement management programs that will create fuelbreaks in high risk WUI communities.

TERMINOLOGY 101

For many years the terms used to describe natural and manmade obstacles to prevent wildfire from spreading were often lumped into one category referred to as "firebreaks." Over time other terms such as firelanes, firelines, and fuelbreaks also became common terms. In order to understand their applicability and use, it is important to distinguish between the various terminology and meaning. Provided below is a brief description of each:

Fireline: A containment or control line that is scraped or dug to mineral soil. This may be used for a wildfire or prescribed burn.

Firelane: An existing cleared path that needs continuous maintenance to a minimum of 10 feet in width, which is used to gain access for emergency traffic.

Firebreak: A natural or constructed barrier used to stop or check fires that occur, or to provide a control line from which to work. A firebreak shall consist of non-flammable type materials such as gravel, sand, paved roads, irrigated lawns, gardens and orchards, ponds, lakes, and other watercourses that meet a specified width. This width is to be measured outward 1½ times the height of fuels available to burn directly adjacent to the object. When used in conjunction with a fuelbreak, the size of the firebreak may be reduced.

Fuelbreak: A natural or manmade change in fuel characteristics that affect fire behavior so that fires burning into them can be more readily controlled and managed.

A fuelbreak can be created in conjuction with defensible space as part of a planned development or during preparation of a homesite; and if done simultaneously with it, be better configured to compliment the aesthetic value of the surrounding landscape. Fuelbreaks also serve to break up large, vast areas of undisturbed forest.

To be functional a fuelbreak should be maintained periodically (annually in some ecosystems) to prevent significant fuels buildup.

Fuels

Fuels are anything that can burn. Fuel load is a term used to describe the amount and types of fuels present. Ladder fuels are materials that can enable a ground fire to climb into the tree canopy and increase wildfire spread and intensity. Ladder fuels include: low dead branches, dead shrubs, briars, brambles, vines, and/or dead wood on the ground.

Defensible Space

The area around a home or structure that is modified in order to protect it from damage by a wildfire. It is also needed to provide safe areas for firefighters to work.

Top left: Fuelbreaks are often created next to a road. The road in this photo serves a firebreak. The right side of the road has been treated to create a fuelbreak. The left side of the road remains untreated.

Bottom left: Healthy vegetation, appropriate landscaping and good defensible space can mean the difference in a home surviving a wildfire.

When, Where and How to Create A Fuelbreak

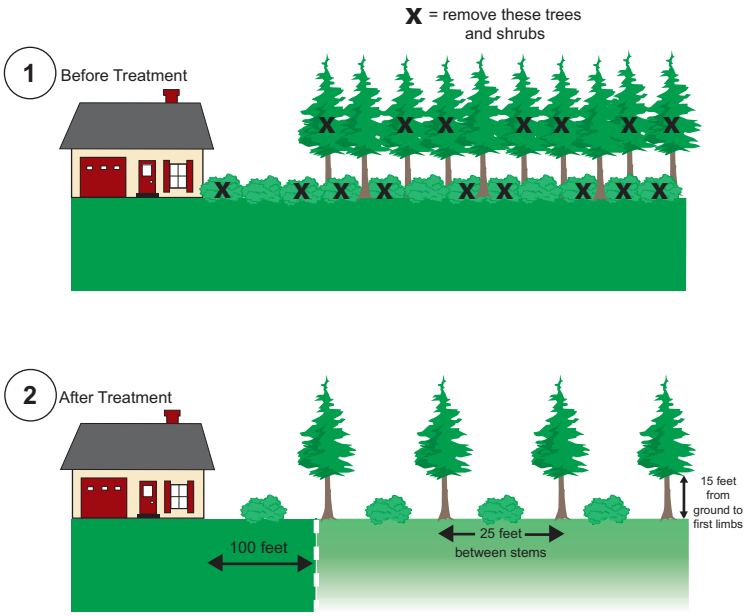
The main goal of a wildfire fuelbreak is to change the continuity of the vegetation so that as a wildfire enters the fuelbreak treatment area, the fire behavior changes, becoming less intense and slower to spread. To accomplish this, existing vegetation should be treated to reduce its density and distribution.

A fuelbreak serves several valuable functions, it:

1. Imposes an obstacle to prevent fire from spreading;
2. Creates a safe means for firefighters to access the fire;
3. Provides separation between large areas of forest;

The effectiveness of a fuelbreak is dependent upon its location, space between canopy trees, separation between ladder fuels and treetops, and frequency of follow up treatments. In general, a wider fuelbreak with less residual vegetation will be more likely to slow a fire. A basic rule of thumb is that the width of a fuelbreak should be equal to 2 to 3 times the height of the tallest trees present or a minimum of 200 feet.

Some variables that may affect the size and shape of a fuelbreak include: land ownership patterns, individual landowner's goals for management of their forest, and the wildfire hazard rating of the surrounding forest and available fuels.[1] We recommend that a fuelbreak be constructed in conjunction with a firebreak. Based on the following three wildfire hazard ratings the following fuelbreak standards are recommended:



Management of fuelbreaks should include:

1. Maximizing distance between the lower limbs of forest canopy trees and shrubs.
2. Maximizing distance between the crowns of canopy tree.
3. Reducing the density and height of shrubs and other ground vegetation.

a. Moderate Fire Hazard:

- a minimum fuelbreak of 30 feet is recommended as measured outward from any structure
- reduce existing canopy trees by 25-35 % of original amount, on average across the site by preferably using site-adapted, native species, with healthy stems and crowns
- remove dead standing trees
- prune lower limbs of canopy trees to 15 feet
- reduce and maintain existing shrub layer below 6 feet

b. High Fire Hazard:

- a minimum fuelbreak of 75 feet is recommended as measured outward from any structure
- reduce existing canopy trees by 35-45 % of original amount, on average across the site by preferably using site-adapted, native species, with healthy stems and crowns
- leave a minimum of 25 feet between stems of remaining trees
- remove dead standing trees
- prune lower limbs of canopy trees to 15 feet
- reduce and maintain existing shrub layer below 6 feet

c. Extreme Fire Hazard:

- a minimum fuelbreak of at least 100 feet (200 feet if it protects a community of 100 or more homes) is recommended as measured outward from any structure
- reduce existing canopy trees by 50-60 % of original amount, on average across the site by preferably using site-adapted, native species, with healthy stems and crowns
- leave a minimum of 25 feet between stems of remaining trees
- remove dead standing trees

[1] The wildfire hazard classification and risk rating can be determined for a particular area of the state by visiting the NJ Forest Fire Service's website at njwildfire.org. The wildfire hazard classification is based on *NJDEP Land Cover/Land Type* GIS data. Buildings located on steep slopes need additional space. If a structure is on a slope greater than 30%, it will increase the fuels hazard ranking to the next level.

In general, it is recommended that logs of cut trees be removed from the site. Tops should be chipped or cut into pieces and spread out. Chips should be removed or spread so that they remain no more than 8 inches thick in any one area. Chips should not be left in piles.

Keep in mind, that prescribed burning is a cost-effective technique that can be used to create and/or maintain a fuelbreak. The Forest Fire Service can determine the feasibility of prescribed burning on a particular site.

Visually, a fuelbreak will vary in its appearance, at minimum it is a strip of land where trees and shrubs have been removed or reduced. It may have a herbaceous layer that contains grasses, perennials and/or low shrubs; the main shrub layer (4 to 10 feet in height) is sparse with vegetation as these are the primary ladder fuels; and the canopy is sufficiently separated to prevent crowns of individual trees from touching.

Creating and maintaining a fuelbreak should be performed over a period of several years. Some immediate steps communities and homeowners can take to protect themselves from wildfire include:

- maintain wide and easy driveway access
- ensure your house number and address are clearly visible
- maintain a healthy, green lawn and landscape
- utilize fire resistant plants in the landscape
- install fire-resistant roofing and siding materials
- enclosing spaces under porches and decks
- replacing mulch with decorative stone
- pruning trees and shrubs to remove dead and dying plant life
- reduce the density and change the arrangement of landscaping

Establishment of a fuelbreak can mean the difference between a structure surviving a wildfire or being damaged and destroyed. Given that a wildfire in the NJ Pinelands can destroy the average home in 10 minutes or less, the usefulness of a fuelbreak cannot be overemphasized as a technique for protecting life and property.

Remember - The New Jersey Forest Fire Service is available to assist with the layout and design of a wildfire fuelbreak.

www.njwildfire.org