

UNDERSTANDING WILDLAND FIRES

It helps to understand how fire works. You can then be more aware of the things around your home and property that may catch fire. Every fire needs three things to burn: fuel, oxygen, and heat. Heat comes naturally from lightning, or it may come from man-made sources, such as chimney sparks, barbecue, incinerator coals, and matches. Oxygen is always in the air. Fuel is the trees, shrubs, and ground cover (including your lawn); it can also be your house or outbuildings.

Heat Transfer

Heat transfer is heat passing from one place or substance to another. It is the main way that fire spreads. There are four ways heat can pass.

Radiation is where heat moves out from the source in all directions. You feel radiant heat when you sit beside a campfire. As a fire gets hotter, more heat is radiated. This type of heat can make wood foundations catch fire when nearby plants and debris are burning.

Conduction is the movement of heat through an object. When a fire starts at one end of a log, the heat is conducted through it and the whole log catches fire. You depend upon conducted heat to cook foods in a pan on your stove.

Convection occurs when heated air rises from the heat source. Convection causes fire to spread up hills, into treetops, and to roofs. Strong winds bring convective heat into contact with unburned fuels, causing pre-heating.

Sparks can be carried for up to a mile ahead of a forest fire. They leap over any barrier and cause the fire to spread even faster. Sparks make the spread of fire very difficult to predict and control.

Fuel

Fuel is any living or dead material, above, on, or below the ground that will burn. With enough heat, almost anything burns. Fuel is described in terms of loading and distribution.

Fuel loading is the size of the material and the amount available. Fine leafy or woody debris, such as that found on forest floors, acts as kindling. It easily catches fire, and, as it burns, it creates heat that dries out, preheats, and sets fire to larger fuels such as trees.

Fuel distribution includes the fuel on the ground and above the ground.

- ◆ Fuel that lies evenly on the ground lets fire spread easier.
- ◆ Fuel that spreads upward, such as shrubs, small trees, and low branches, is called a fuel ladder. Fire climbs to treetops on fuel ladders.
- ◆ Crown fuels are the branches and leaves to treetops.

Wildfire can spread from tree-top to tree-top in areas where the crown fuels are close together and where there is a lot of ground fuel. For protection against this type of fire, create fuel breaks and get rid of most of the growth beneath the trees.

Weather

Weather is the most important factor influencing how a fire behaves and therefore its potential to threaten your property. Weather includes temperature, wind, relative humidity and precipitation.

Weather influences wildland fire by the way it affects the moisture content of forest fuels. The drier the fuel, the less heat is needed to start a fire and keep it burning.

Wind can act to dry fuels. It also affects the size and direction of a spreading fire.

Relative humidity affects the moisture content of fuels. The lower the relative humidity, the easier fuels will ignite.

Precipitation increases the moisture of forest fuels. A dry spring, or even a few days of drying after a rain, can leave forest fuels very dry, creating hazardous conditions.

Topography

Topography describes land feature such as rivers, hills, etc., and their relationship to one another.

Fires spread faster uphill due to heat radiation and convection. The greater the slope of a hill the faster the fire will spread.

How fires burn is complex and influenced by many uncontrolled factors; however, understanding basic fire behavior can help homeowners to assess their home's risk and its most unprotected areas.