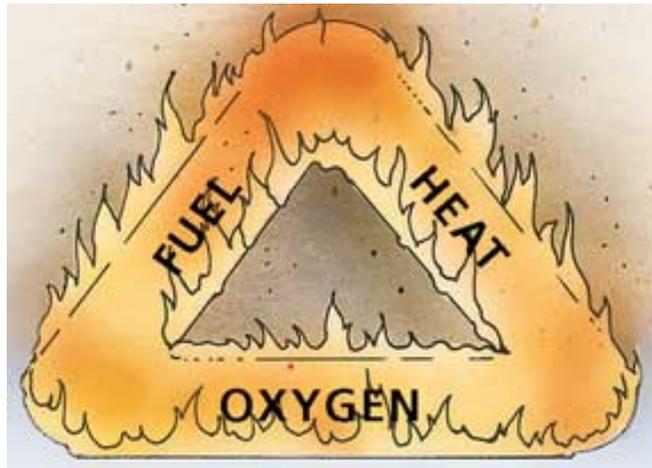


## Las Conchas Fire Behavior

On June 22, 2011 at 1:00 pm a falling tree ignited the Las Conchas fire. On that day, high winds gusting up to 40 miles per hour toppled a mature aspen tree onto an uninsulated power line sparking the power lines. The sparks ignited the tender-dry forest and the high winds quickly spread the fire to over 40,000 acres in the first hour, eventually becoming one of the largest fires in New Mexico history.

What do fire fighters need to know about the behavior of fire?

**Chemical Reaction:** Fire is a chemical reaction in which **fuel**, **oxygen** and **heat** combine in a process called combustion. In order for a fire to burn all three sides of the triangle must be available: **heat**, **fuel** and **oxygen**. Firefighters will often take out one of the sides of the fire triangle by back burning or creating a fire line to remove **fuel**; using a retardant dropped from slurry bombers to take out **oxygen**; and using water to cool the fire and take our **heat**.



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**Moisture:** The fuel moisture before the Las Conchas Fire in the Valles Caldera National Preserve was 6% --- approximately  $\frac{1}{2}$  the moisture of lumber at a hardware store. The surrounding atmosphere was hot and dry as well.

**Fuel Size and Arrangement:** The Valles Caldera National Preserve was surrounded by old growth forest that had not been lumbered. The forest floor was covered in branches and forest litter making the understory highly flammable due to the loosely spaced fuels. Fuels that have more exposure to air burn faster than tightly packed fuels because there is more surface area for the combustion/oxidation reaction. In addition, high resin trees such as pines burn hotter than hardwoods and Aspen trees.

**Forest Density:** The Las Conchas fire burned at different rates due to the different densities of the forest. In some areas the trees were closely spaced and the fire was intense. In other areas such as grasslands or where the fuel load was reduced due to a previous fire or clearing the fire did not become as intense.

**Weather:** The Las Conchas fire started on a dry and windy day when the relative humidity was extremely low. The dry forests resulting from the recent drought were vulnerable to fire and in some cases complete stand replacement took place (all trees were burned). Some of the canyons had all the vegetation vaporized as the hot gases reached “flash-over point.” The fire was so hot that it didn’t “lie down” at night as normally happens, but continued to rage.

**Topography:** Fire burns more quickly up hill due to the preheating of fuels as it moves up-slope. Rivers, lakes and grasslands can slow the fire down thus creating the mosaic burn pattern seen in the Jemez Mountains.