

Saving communities: Science behind wildfire

By Victoria Metcalf

Staff writer

We know from elementary school science that in order to have a fire, we need heat, fuel and oxygen, explained Jerry Hurley, a coordinator with the Plumas Fire Safe Council.

Remove any one of these elements and the fire goes out.

"For a wildland fire, or a campfire, it is no different, you need all three elements," he said.

One of the components that make fire thrive—oxygen—can't be eliminated, Hurley said.

"Eliminating oxygen in a wildland fire is impossible due to the vastness of the forest and atmosphere," he said.

There is one area where humans do have some control, and that's the fuels that are available to feed a fire.

"By controlling the amount and type of fuel that is available through our land and residential management practices," there is a better chance that when fire is introduced it is low burning and remains confined to the forest floor. That's where pine needles and forest debris accumulate, and without additional fuels including ladder fuels, the fire won't burn for long or create the devastating impact.

Additional factors

In wildland fires, the factors that contribute to how a fire behaves—how fast it burns and how hot or intense it burns—include weather, topography and fuel.

Here again, only one of those can be controlled—fuels.

Weather elements such as temperature, humidity and wind are beyond human control.

Topography is the aspect, slope, elevation and unique features of the area. These include creeks, canyons, saddles and ridges that impact the way fire spreads.

"Changing or modifying topography, like the weather is impossible across our county," Hurley explained.

That leaves fuels such as forest, litter, brush and trees, that can be controlled to some extent.

"Fuel is the only element of both the fire triangle and the fire behavior triangle over which humans have control," he explained.

The amount and type of fuel

determines how easily the fire will light, spread, and how intense it will burn.

"For example, fuels on a southwest aspect retain less moisture so the fuel beds types are more flammable; they receive more sunlight causing them to be drier and easier for fires to light and carry; and are more exposed to the prevailing winds; all of which cause fires on that aspect to usually burn faster and more intense," Hurley said.

In looking at the nature of fire, Hurley explained that it spreads both horizontally and vertically from fuel particle to fuel particle.

When there is sufficient spacing between fuel particles, then the spreading will stop,

This happens when firefighters construct a fuel break around a fire. If there's nothing for the fire to consume, it dies out.

"A good rule of thumb is that the flames will be about two to four times the height of the fuel," explained Hurley who has more than 30 years fighting wildfire.

"We have all witnessed that the more fuel present, the hotter or more intense a fire burns, just like a campfire or woodstove," he said. "Fuels in the forest and around our homes are often in three layers, surface, ladder (brush and small trees), and aerial or larger trees."

To homeowners

Today, there is more fuel in the forest than there has ever been in Plumas County.

At the turn of the century, when wildfires were not aggressively suppressed and homes were not intermixed with the trees, wildfires spread across the surface consuming any accumulated fuel on a fairly frequent basis, usually every 7-15 years in the Sierra.

Wildland fire managers now refer to the great accumulations of forest fuels, and whether they are heavy accumulations of fuels on the surface, continuous fire ladders of brush and small trees, or dense overstocked stands, as hazardous fuels.

The current condition across much of the West, where thinning, pruning and forest floor cleanup hasn't occurred, is at constant risk of sustaining a catastrophic wildfire, according to Hurley.

Many of the fires in the West are sustained because of the hazard fuels.

"Placing homes and communities in these overstocked

forested stands aggravates the problem," Hurley said.

When thinning projects such as the one introduced at Plumas Eureka Estates are conducted, the majority of fuels are eliminated.

When only the healthy, large timber remains, a low intensity fire—that not reacting to the downed trees and accumulated brush—doesn't impact the forest.

In the areas of Southern California that were threatened or destroyed by last week's fires, the amount of fuels was so great that intense fires couldn't be prevented.

That's also true in many parts of Plumas County, and why the Plumas Fire Safe Council, Resource Action Committee and the Board of Supervisors have become involved in granting special funding to communities that want to reduce the threat of fire.

But homeowners can't look at the national forest and anticipate that the threat of wildfire will be handled entirely by thinning public lands. Homeowners need to remember to do their part to reduce fuel hazards on private lands.

Allowing trees to grow too densely, and not eliminating other fuel sources can also provide rich places for fires and their spread.

To eliminate these hazardous fuels, landowners should consider the three layers of fuel—surface, brush and ladder, and aerial or larger trees, according to Hurley.

To reduce surface fuels, they can dispose of the heavy accumulations of needles, limbs, branches and small down trees by chipping, hauling, or piling and burning in the fall when it is safe.

The goal is to have a surface fuel cover of mostly needles or grass.

Landowners can also remove large accumulations of brush by cutting and removing it, or having it piled with a tractor, crushed or mowed.

Most small trees should be removed by cutting them and disposing of them.

The objective should be to create a break between the surface fuels and the branches of the larger trees of about 15 feet, depending on the size of the trees to be retained.

Larger trees, usually greater than 12 inches in diameter should be spaced so that the crowns don't touch.

Depending on how many larger trees are present, a landowner can make money from the removal of some of them to help pay for

the work.

When considering hazardous fuel reduction in landscaping, it is important to understand that not every fuel particle must be removed, nor every bush or small tree. Clumps of trees can be acceptable, but there should be some separation so the fuel bed is not continuous, both horizontally and vertically.

The threat

Wildland fire is a component of the ecosystem and urbanization of forested lands—when people continue to build in

forested areas—has placed people, communities and the natural resources at risk for loss.

California experiences some of the worst fires in the world, according to Hurley.

California's wildland problem is enhanced by the continual spread of homes and communities into, the wild-land often referred to as the urban/rural intermix.

In many cases, these communities become part of the fuel load and add complexities for the fire agencies attempting to provide

protection.

Plumas County is no exception and there have been numerous fires, small and large that have threatened the county.

Examples include the Willow fire in 1987, Portola fire in 1988, Layman fire in 1989, Greenhorn fire in 1990, Cemetery fire in 1999, Mt. Hough Complex fires in 1999, Horton fire in 1999 and the Storrie fire in 2000.

There have also been numerous small fires that have threatened residents in the early stages of initial attack, Hurley said.



Photos by Victoria Metcalf

Through years of mismanagement or neglect, the national forest surrounding Plumas Eureka Estates looks much like this. Past logging and woodcutting activities left behind slash. Downed trees fell and remained, some making good animal habitat, but too much is plenty of fuel for a fire when it happens. Jerry Hurley said that the larger wood isn't likely to ignite from a spark, but a dense accumulation of pine needles is perfect for starting and building flames that can ignite larger fuels.



There's no shortage of fuels that can be removed from around the community. Downed tree and limbs are stacked, small trees and seedlings are removed. Homeowners are welcome to come in and remove the firewood before fire crews begin burning the piles.