"I keep forgetting to water my Christmas tree. Just how important is this in terms of fire safety?"

One look at a dried Christmas tree on fire www.fire.nist.gov would answer this, but that would make for a short article and little understanding of "why" this is so important for one's safety. To answer this question, we will look at some basic fire science and direct you to a video demonstrating the benefits of a well watered Christmas tree.

A Christmas tree which is properly watered will stay green longer and lessen the number of falling needles, which can be a real mess. But even more importantly, is the need to keep moisture in the needles to reduce fire danger.

Now for a little fire science…
In order for fire to occur, four components must be present. Most of us are aware of three of these, often referred to as the "fire triangle": oxygen, heat, and fuel. The fourth component is a self-sustaining chemical reaction. All of these elements must be in place for combustion to occur or continue.

The combustion process involves two key fuel related (needles being the fuel) factors: the physical state (size and shape) of the fuel and how it is distributed (its position).

The shape and size of needles significantly affect how easily they can ignite. The primary issue with pine and fir needles is the surface-to-mass ratio. To put more simply, something with more surface area will ignite much easier than something of similar mass but less surface area.

For an example, let's think of the common campfire using firewood as the fuel. A round log has high mass but a relatively small surface area. Split that log into kindling and you have the same mass but now the surface area exposed is far greater, giving you a much higher surface-to-mass ratio. These sticks can now ignite with much less heat energy.

A Christmas tree has thousands of needles with high surface area when compared to their mass, making them very easy to ignite. Dry needles will burn even faster with little moisture to slow down the process.

The second factor of a solid fuel's ease of ignition is how it is distributed (positioned). With a Christmas tree, the branches are laden with needles stacked next to and above each other. Once ignited, dry needles will almost "explode" through rapid ignition. If your dry Christmas tree were to catch on fire you would be faced with a large supply of extremely hot, rapidly burning fuel. This equates to a ball of fire within seconds.

By keeping your tree well watered, you significantly decrease the chance of it catching on fire. This, along with the safe use of lighting decorations and keeping your tree away from heat sources, such as heaters and candles, will reduce the possibility that it will ever ignite in the first place.

Stay safe out there and have a wonderful holiday season.

If you have a question about emergency services in your area, please submit your question to "Ask Firefighter Jim" at askffjim@kootenaifire.com. Visit our web page at www.kootenaifire.com for additional information and to read archives of previously answered questions under the link, "Prevention".