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Dead Trees (Snags) Do Not Make Forests Burn More Intensely

Did you know that forests with high level of dead trees (snags) do not burn more intensely than forests that have fewer dead trees (snags). In fact, forests with high levels of snags tend to burn less intensely, as explained below.

Seemingly counterintuitive, yet true.
Shortly after trees die (the "red stage", when reddish-brown dead needles are still on the trees), the combustible oils that naturally occur in their needles begin to dissipate, reducing potential fire intensity slightly right from the beginning.

Within a year, dead needles and twigs start to fall to the ground (the "gray stage"), and quickly begin to decay, reducing potential fire intensity even further since there is less kindling-like material in the forest canopy, making it harder for crown fire to occur. This makes intuitive sense if you have ever made a campfire. It takes kindling-very small diameter material like small branches, twigs, and pine needles-to start a campfire. You cannot simply put a match to a large log and expect it to burn. Within two or three years after trees have died, the resulting snags are much like large logs with no kindling.

Examples of Scientific Findings regarding "Snags" and Fire.
Many scientists have investigated how fires burn in forests where the levels of snags were known prior to the occurrence of fire. Hart et al. (2015), in the Proceedings of the National Academy of Sciences, analyzed fires across the entire western U.S. and found that fires do not spread faster in forests with high levels of both recent snags and older snags.

"Contrary to the expectation of increased wildfire activity in recently infested red-stage stands, we found no difference between observed area and expected area burned in red-stage or subsequent gray-stage stands during three peak years of wildfire activity, which account for 46% of area burned during the 2002-2013 period."

More recently, Meigs et al. (2016) (Environmental Research Letters, Vol. 11, Article 045008) investigated whether forests with higher levels of trees killed by drought and native insects (bark beetles) burned more severely, and found the following:

"In contrast to common assumptions of positive feedbacks, we find that insects generally reduce the severity of subsequent wildfires. Specific effects vary with insect type and timing, but both insects decrease the abundance of live vegetation susceptible to wildfire at multiple time lags. By dampening subsequent burn severity, native insects could buffer rather than exacerbate fire regime changes expected due to land use and climate change."

Rare and comparable to "old growth" forest.
The basic concept underlying recent legislative proposals to log and remove snags is the goal of preventing higher-intensity fire. This concept is grossly outdated and inconsistent with science. There exists broad scientific consensus that we currently have a deficit of fire of all intensities in our forests, relative to natural historical levels that occurred before fire suppression policies, and equally broad scientific agreement that patches of high-intensity fire create "snag forest habitat", which is some of the best and most biodiverse wildlife habitat in the western U.S.-comparable to old-growth forest.

Groups of trees die periodically during cycles of drought and bark beetle activity. These beetles are native species, and in many ways they form the cornerstone of the entire forest ecosystem. Beetle larvae provide essential food for woodpeckers. Woodpeckers excavate multiple nest cavities each year in snags, which are softer than live trees, and create homes for dozens of other cavity-dependent animals that need tree-cavities to survive but cannot make their own.

Snag Forests Need Protection.
Legislation that eliminates environmental safeguards and prioritizes the removal of dead trees to improve forest health or reduce fire risk is untethered to science and is inappropriate public policy for our treasured public lands. Recognizing the tremendously high ecological value of snags and snag forests, and prioritizing protection for snags and snag forests is the scientifically supported direction for policy makers and land and wildlife managers.

For scientific citations please contact Chad Hanson, Ph.D., Ecologist, cthanson1@gmail.com