

Fire Injured Trees: Making an Initial Assessment of Whether a Tree is Likely to Die
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September 2012

Although it can be difficult to discern when a conifer tree actually dies and many systems exist for assessing whether fire injured conifer trees are likely to die, making an *initial* assessment of tree injuries can be very simple. These steps are intended to give affected landowners a place to start. They aren't the whole story.

1. Were any of the needles consumed or "set" in one direction by the fire?

If so, the tree likely received a lethal injury and is dead or will die.



Ponderosa pine with 100% of its live crown scorched and some of the needles consumed. This tree is unlikely to survive its injuries.



Ponderosa pine sapling with needles "set" in the direction the heat and fire moved past it. This tree is unlikely to survive its injuries.

2. How much of the crown volume was scorched?

Calculate a percentage of the crown that was alive prior to the fire and is now scorched. An undamaged tree has 0% crown scorch. A tree with its entire crown changed to a reddish color has 100% crown scorch. Here are some samples of calculating crown scorch volume. Record each tree's species and DBH when observing the crown scorch.



Just about everything above the beige line is fine, so about 75% fine and 25% crown scorch.

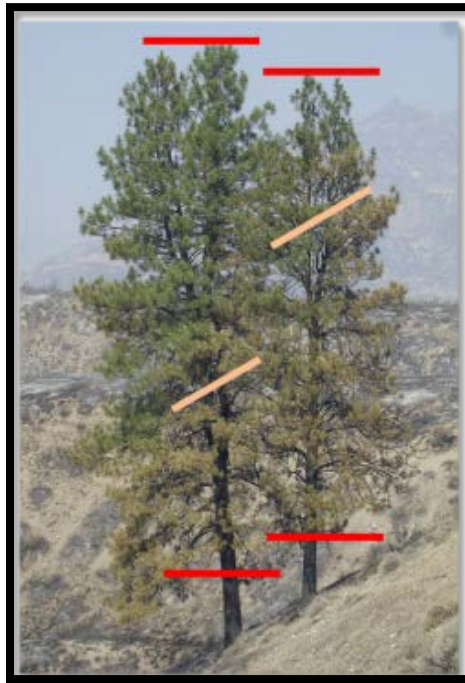
First, if that low branch (in the green oval) is mentally moved up above the lower red line, then about 50% of the tree canopy is below the beige line and 50% is above the beige line.



Second, the top half of the crown is pretty much ok. So the tree is at least 50% fine.

Third, of the bottom 50%, about 35% is scorched and 15% is ok. So the tree crown is about 65% fine and 35% scorched.

Tree on the left:
Just about
everything above
the beige line is
fine, so about
60%-70% fine
and 30%-40%
crown scorch.



Tree on the right:
Just about
everything above
the beige line is
ok, so about 25%
fine and 75%
crown scorch.

3. Interpreting what the crown scorch levels mean for tree mortality.

- Large diameter trees have thicker bark and can endure more crown scorch than smaller diameter trees.
- Ponderosa pine (with large buds and very thick bark when it's mature) can endure more crown scorch than other conifer trees of similar size that have smaller buds and thinner bark.
- Use a more detailed reference such as http://www.google.com/url?sa=t&rct=j&q=after%20the%20burn%20idaho&source=web&cd=1&ved=0CCIQFjAA&url=http%3A%2F%2Fextension.oregonstate.edu%2Fsites%2Fdefault%2Ffiles%2Fcommunity_pgs%2Fwild_fire_after_the_burn_2011.pdf&ei=pXNbUOrPOqKRiAKU1YG4CQ&usg=AFQjCNEFJfKSucuTVsn-OZ7GIBTIT8NDvQ (tables that chart the probability of mortality by tree species, size and crown scorch start on page 51) to interpret the likelihood a given tree species, size and scorch amount will die.
- In general, trees with less than 50% crown scorch are more likely to survive. Trees with greater than 75% crown scorch are more likely to die.
- Note, this is a VERY rough assessment system and does not take into full consideration the amount of injury that the stem or roots received. Even

a tree with little crown scorch can die if there was a lot of duff or nearby wood debris that burned causing significant root damage or stem char.

- If they were in good health prior to the fire and have good growing conditions during the first few years after the fire, trees are more likely to survive more severe injuries.
- Sometimes landowners want to be more conservative, and wait/monitor even the iffy trees. This is appropriate especially if the land was heavily damaged and there aren't many trees left or if he/she can be attentive to the stand, watching it over time, and removing dying trees as the symptoms manifest themselves. If a landowner really just wants to get all the work done in one operation or the stand was heavily overstocked to start with, he/she might choose to simply remove more of the borderline-survivor trees in a single entry.
- Every forest management activity, including salvage, is an opportunity to improve forest health, address deficiencies that contributed to the damage, and make progress toward your long term goals.
- Give as much thought to the condition you are leaving the forest as to what you are taking away.
- Mimic the effects that idealized natural fire would have had such as increasing the proportion of pine and larch; reducing the proportion of Douglas-fir and other fir; removing the smallest, weakest trees; reducing the impact of dwarf mistletoe and other diseases.

