

Learn to recognize hazard trees after a fire

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What makes a tree hazardous?

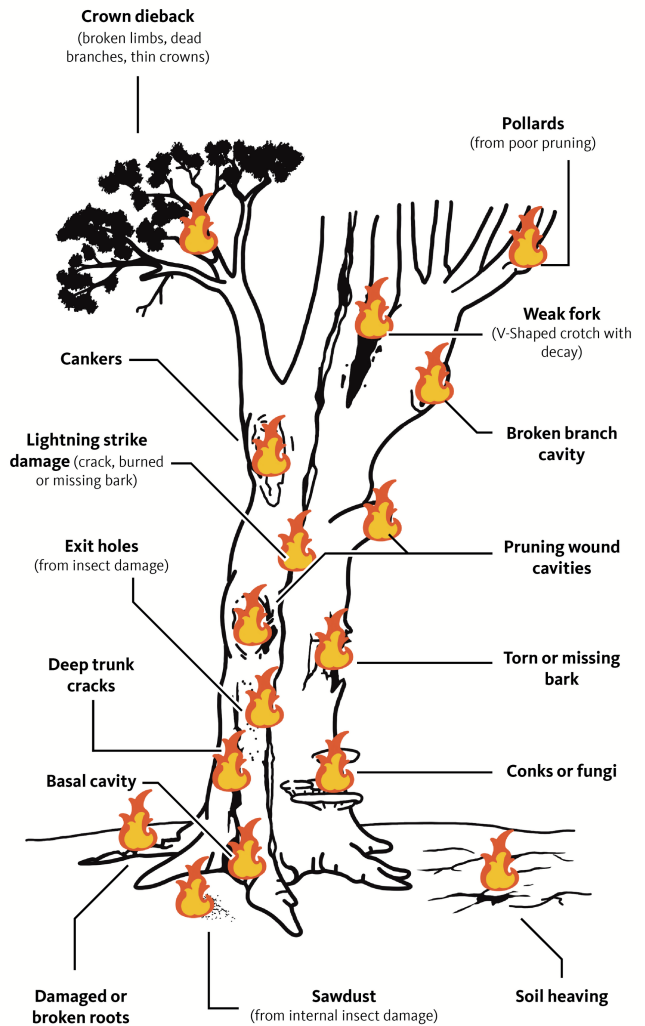
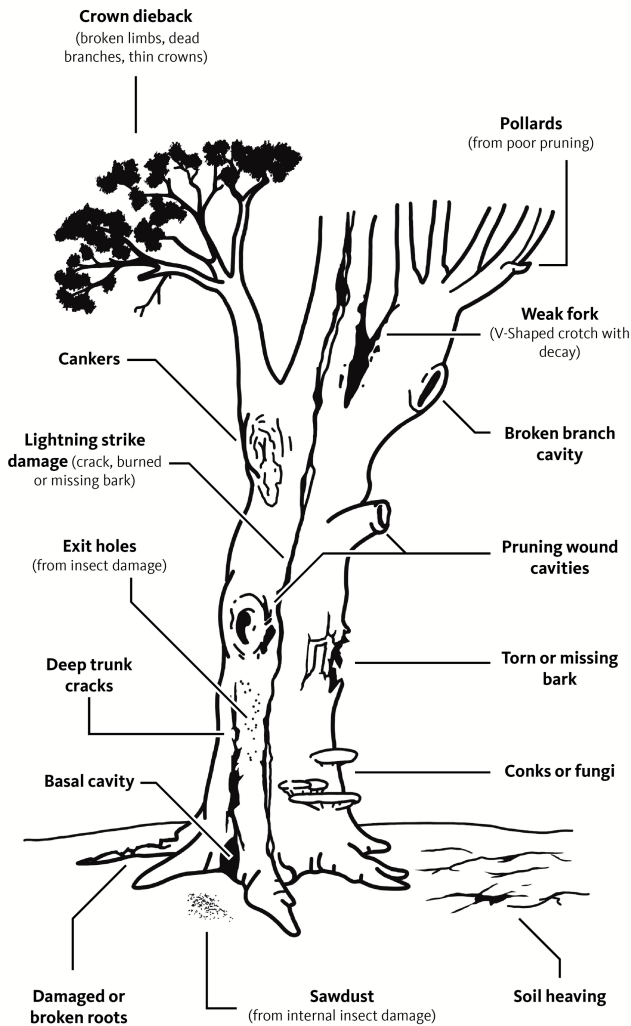
A tree is considered hazardous if it has defects or structural weaknesses that may cause failure, resulting in property damage, personal injury or death. The postburn environment surrounding a hazardous tree can be equally, if not more, dangerous than the tree itself.

Common prefire factors in tree failure

- Tree species
- Age
- Decay
- Wounds
- Cankers
- Seams
- Lean
- Branch angle
- Branch type
- Crown vigor
- Crown form or shape
- Root condition

Common postfire factors in tree failure

- State of life
- Burned-out roots
- Limb weight
- Hollowed boles
- Leaning or root sprung (exposed roots)
- Loose overhead limbs ("widowmakers")
- Resinous vs. nonresinous
- Broken or uprooted trees supported by other trees
- Catfaces and other impacts to the percentage of sound bole wood
- Incineration or other indicators of weakness (conks, mushrooms, etc.)



These factors can predispose trees to further damage.

Credit: Kellen Grist, © Oregon State University

Trees affected by wildfire can become hazardous when they exhibit these characteristics.

Credit: Kellen Grist, © Oregon State University

Let's examine two significant hazard tree traits: whether it produces resin, and whether the tree is alive or dead.

Resinous vs. nonresinous species

Resinous trees secrete a sticky, decay-resistant substance that helps protect against injury or infection. Resin contains volatile oils that are flammable.

Douglas-fir, larch and pine are resinous trees.

Spruce is partially resinous, while fir and hemlock trees are not resinous.

Cedar is nonresinous but resistant to decay. Hardwoods are also nonresinous, but some are more decay-resistant than others.

Living vs. dead

Dead trees have a high potential for failure.

Live trees should not automatically be considered to have a low potential for failure if they have been damaged by fire or present other signs of failure.

Postfire hazard tree assessments

Based upon *probabilities* as well as some assumptions about the future:

- Is the tree *likely* to fail or fall?
- When is tree *likely* to fail or fall?
- Is a target likely to be present when the tree fails or falls?

Inspection and hazard assessments

- Check to ensure entry and exit from areas surrounding the tree are safe.
- Start at tree bottom or top, depending on height, damage and initial observations of potential failure
- Use binoculars
- Check from all angles
- Look for targets
- Document results
- Consider using a hazard assessment for decision-making

Seven steps to develop a tree risk rating

1. Identify the possible target.
2. Identify the tree part(s) that could strike the target.
3. Evaluate the likelihood of each part failing. Is failure improbable, possible, probable or imminent?
4. Evaluate the likelihood of the tree part striking the target. Is it very low, low, medium or high?
5. For each failure mode, identify the likelihood of tree failure impacting a specified target. Is it very unlikely, unlikely, somewhat likely, likely or very likely?
6. For each failure mode, estimate the consequences of failure. Are they negligible, minor, significant or severe?
7. For each failure mode, designate the risk — low, moderate, high or extreme.

Example of International Society of Arboriculture rating system

Table 1. Matrix used to estimate the likelihood of a tree failure impacting a specified target

	Likelihood of impacting target			
Likelihood of failure	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Table 2. Risk rating matrix showing the level of risk as the combination of the likelihood of a tree falling and impacting a specified target, and the severity of associated consequences

Likelihood of failure and impact	Consequences			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

References

- Field Guide for Hazard-tree Identification and Mitigation On Developed Sites in Oregon and Washington Forests. U.S. Department of Agriculture Forest Service, Oregon Department of Forestry and Washington State Department of Natural Resources. 2014.
- A Guide to Identifying, Assessing, and Managing Hazard Trees in Developed Recreational Sites of the Northern Rocky Mountains and the Intermountain West. U.S. Department of Agriculture, Forest Service, 2017.
- International Society of Arborists Tree Risk Assessment Manual, Second Edition, 2017.

About the author

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Related publications



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To salvage or not to salvage after wildfire?

<https://extension.oregonstate.edu/catalog/em-9553-salvage-or-not-salvage-after-wildfire>

Salvage logging aims to recover the economic value of trees killed by wildfire, insects and other uncontrollable events. Consider your goals and the economics of salvage in your circumstance.

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Will my tree live? Assessing postfire survivability

<https://extension.oregonstate.edu/catalog/em-9557-will-my-tree-live-assessing-postfire-survivability>

Trees can survive wildfire, but much depends on the tree species and the amount of damage to the crown, bark and root system. Sometimes, trees can die years later.

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