CBC news

How Indigenous 'cultural burns' can replenish our forests

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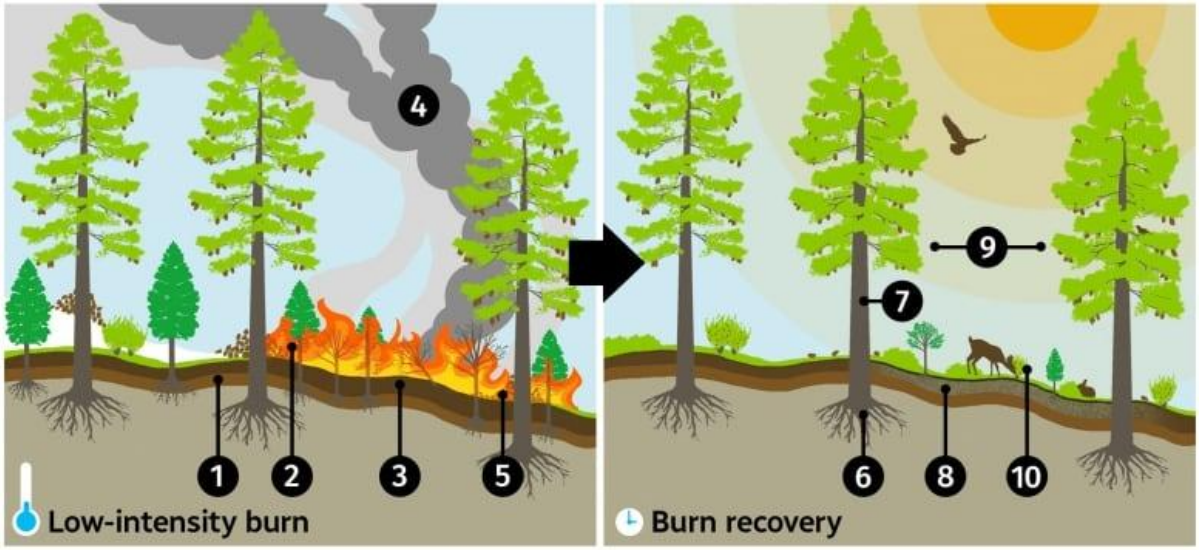

Low-intensity fire

1. Mineral soil
2. Ladder fuels (e.g. branches)
3. Duff layer intact
4. CO^2 release
5. Fine fuels (e.g. twigs, dead leaves)
6. Carbon storage
7. Thicker bark
8. Nutrient-rich mineral soil
9. Fire break
10. New plants

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For more than a century, Canadian wildfire suppression has stuck to the hit-it-hard-hit-it-fast motto — and has been highly effective in snuffing out the flames.

The paradox, said Prof. Lori Daniels, who specializes in wildfire and forest ecology at the University of British Columbia, is that we've been so good at putting out every fire possible that it has led to overly dense forests and a buildup of burnable material like branches and dry vegetation.

If sparked in the summer heat, these "ladder fuels" piggyback the flames up tree trunks and engulf the crown, resulting in high-intensity fires like those in Western Canada this year.

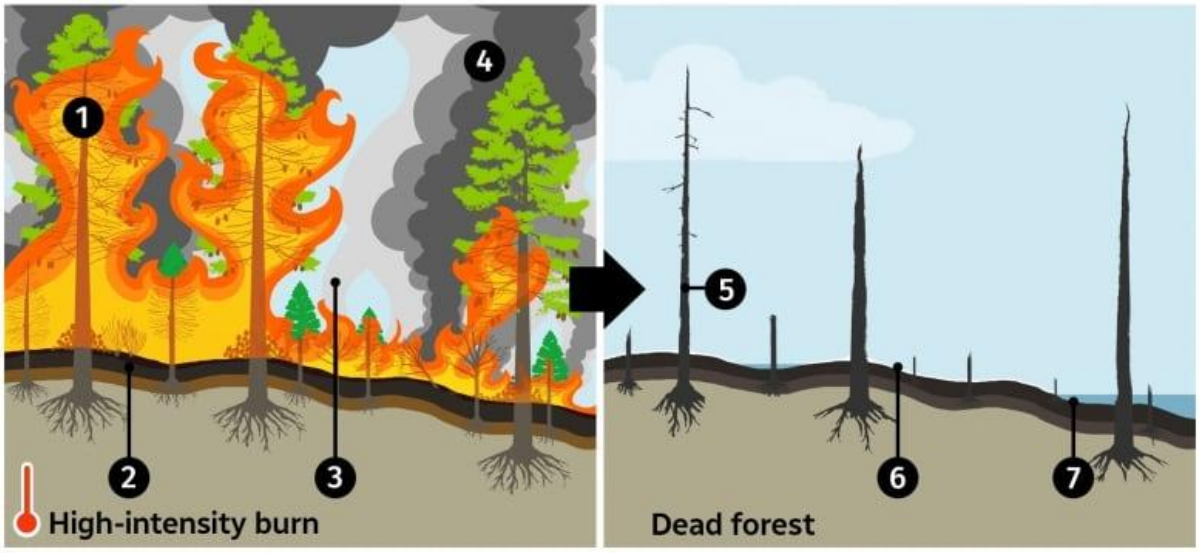
But overdrive isn't fire's only speed. In fact, when burning in a lower gear, the environmental benefits of fires in forested areas can be bountiful.

"If you want to cleanse the land, if you want to give back to the land, you burn it," said Daniels.

Low-intensity burns, also known as cultural burns, have been lit purposefully since time immemorial by Indigenous firekeepers around the globe to rebalance ecosystems. When woods are groomed this way by burns, Daniels said, the chances of a crown fire occurring in the hotter months decreases.

Brenden Mercer, a forest field management liaison for First Nations' Emergency Services Society of British Columbia, said cultural burns are traditionally carried out in the spring or fall, when mild conditions and favourable winds set the stage.

Mercer knows stories of firekeepers saying a prayer and introducing fire to the landscape from a smoking tree conk. The slow-moving flames engulf litter and dead materials, such as sticks and pine cones, and then flicker up to devour the intermediate saplings.



High-intensity fire

1. Canopy destroyed
2. Duff layer burned
3. Nutrients evaporate
4. CO^2 release
5. No CO^2 capture
6. Ash
7. Hydrophobic soil

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The heat creeps down, too, cooking bits of the spongy duff layer, where dormant, fire-adapted seeds — which could be waiting in the soil for decades — pop open.

By timing the cultural burn correctly, the fire extinguishes at the snow line, said Mercer. As the snow continues to melt, firekeepers return to light as often as necessary until they've burned to the top of the hill.

Post-burn, a thinned-out and spacious forest breathes new life. According to Mercer and Daniels, regeneration begins. Wild grasses bounce back with a vengeance. Old shrubs sprout new shoots. Native and medicinal plants bask in the sun. Elk, bison and big-horned sheep return to graze. Insects munch on fresh broadleaf plants and berry bushes.

Importantly, big trees grow bigger and develop thicker bark, becoming more resistant to surface fires. The canopy stretches out to provide habitat for insects, birds and animals. Down the tree, carbon sinks into the soil.

Mercer said that before colonial practices took over, Indigenous firekeepers treated dry forests, like those of B.C.'s Interior, with low-intensity burns every five to 25 years. Daniels's research of fire evidence in tree rings corroborates this history.

Brady Highway, a project manager of wildfire strategy for the Ottawa-based Indigenous Leadership Initiative, fought his first fire at the age of 15, and has fought hundreds since. He said today it's very rare that Indigenous people can actually carry out a cultural burn because of how hard it is to get permits.

"When it comes to prescribed fire, we must allow communities to revitalize those practices," said Highway, whose grandmother instilled in him the obligation to look after the land. "The stakes couldn't be higher. What we're talking about is the land, and without the land, we have nothing."

As Mercer looked out across the thousands of charred hectares in Lytton, B.C., earlier this year, he noted some of the consequences of a high-intensity fire: dead trees, nutrient-depleted soil and a disruption of carbon sequestration.

Mercer's master thesis focused on carbon storage and ecosystem management. His research found that prescribed burns promote carbon storage by burning off smaller trees and allowing big trees, which pull much more carbon from the atmosphere than saplings, to grow bigger.

High-intensity forest fires release a huge amount of carbon into the air, but even after the smoke has cleared, Mercer said the decaying forests lose their ability to absorb carbon, and, as the matter breaks down, the dead forest continues to release carbon into the air.

When the 1874 Bush Fire Act passed in B.C., Mercer said colonial practices took over and First Nations people were essentially banned from lighting cultural burns. He said without consistent burns treating forests for more than a century, wildfires today "can just run and run."

He said the American public service announcements featuring Smokey the Bear, which were launched in the 1940s, are responsible for skewing the issue.

"Some communities just are so afraid of fire … due to the propaganda that Smokey the Bear was pumping out for years, where fires are bad," Mercer said. "Some people just have that so ingrained, that all fires are bad. It's definitely not the truth. It's just high-severity fires that are bad."

Mercer said wildfire "needs to be applied back to the landscape in a meaningful fashion. The only realistic way to do that is to empower First Nations to be firekeepers on the landscape, and give them all the tools, the funding, all the resources that they need to be true partners and manage the landscape in partnership with everybody else."

Source: https://www.cbc.ca/news/science/what-on-earth-indigenous-fire-forests-1.6194999