

AREN'T CLEARCUTS JUST LIKE WILDFIRES?

Debate over forest management heats up again

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With the forest fires of Alberta and British Columbia raging, the age-old question resurfaced in a recent interview: "Aren't clearcuts just like wildfires?" Slightly off guard, I mumbled a response to the interviewer's question. As I left the studio, the wheels of 18 years as a tree physiologist in Australia, Canada, New Zealand and the United States began to turn, to properly address this question.

The first rule learned in forestry as a student -- arguably the most important -- is to avoid blanket prescriptions. Each forested site is different, so in forestry we talk in terms of site-specific descriptions. Just as each site is unique, so too is each forested ecosystem.

In Alberta and British Columbia, each terrestrial ecosystem is usually, but not exclusively, named after the dominant tree species.

When talking about wildfire (which scientists call a major forest disturbance in an ecosystem), tree scientists look at -- and now know rather accurately -- the intervals at which fire occurs, by means of radio-carbon dating and tree-ring analysis. All Albertan and British Columbian forests, and for that matter all Canadian forest ecosystems, have different frequencies of wildfire events. All Canadian forests have evolved and adapted wondrously to wildfire.

The fires in Alberta and B.C. are raging mostly in lodgepole pine forests, which are specially adapted to fire because their cones hold viable seeds for up to 25 years. Once a fire's heat reaches about 145F, the pine resin, which previously has held the cone scales shut tight, melts and opens, releasing the seeds. The forest floor, having been naturally and quickly cleansed by surface fires, is exposed. The mineral soil can now receive millions of seeds from the burnt parent lodgepole pine trees. The disturbed site is quickly recolonized.

A lodgepole pine forest -- in which fire has a natural frequency of about 40 to 60 years -- can live without a fire for about 125 years. Then it begins to die naturally or become victim to the voracious mountain pine beetle -- as is happening in the current epidemic in B.C., which is spilling into Alberta. Lodgepole pine cannot live in its own shade and thus requires wildfires to naturally regenerate.

Does wildfire consume, evenly and predictably, everything in its path? No! Forests are the most dynamic and chaotic systems on Earth and therefore the patterns are often erratic. Patches of older trees -- even in pine forests and especially along coastal B.C. forests -- remain undisturbed after a forest fire. These patches are

as important as the standing burnt snags (dead upright, sometimes snapped-off trees).

They provide specialized habitat for animals, such as on the B.C. coast, spotted owls and marbled murrelets, and, in the B.C. interior and Alberta mountains, woodpeckers and salamanders. After a wildfire, there is also a lot of standing or fallen charred wood. This wood eventually becomes soil, with the aid of billions of bacteria and millions of fungi and soil fauna, including beetles that help the burnt trees to break down.

Together, soil and the forest floor make up one of the most important commodities in a forest. It is analogous to a bank account, which you never want to run into overdraft. If you deplete a forest's soil by removing all the trees, not only do you squander the above-ground biodiversity, such as the animals that depend on it, but the next crop of wild or planted trees have fewer available nutrients to draw upon.

The concern about the present Alberta and British Columbia fires is that fire-suppression policies have kept natural wildfires from burning for the past 70 years or so. The resulting buildup of the downed wood -- in some cases doubled or more with the beetle kill -- has ignited the forest floor. Ground fires are indeed devastating (in fact, a ground fire can burn all winter long under a snow pack). They burn all the slow releasing agents: bacteria, fungus and soil fauna, in addition to the decaying wood. This is like withdrawing all the money from a bank account.

So is a clearcut (which is also a disturbance) like a wildfire? In a park, the management objectives are to manage for the wild system. Park managers are carefully reintroducing fire. Wardens and their scientists have the luxury of working with Mother Nature and thus naturally regenerating lodgepole pine forests. For a manager in the "working or commercial forest," it is critical to understand that ecosystem. That is, if you are in a coastal B.C. forest, the natural wildfire frequency may be from 300 to 600 years or more. In contrast to the 40-to-60-year frequency of the lodgepole pine forests of the interior, the coastal fire frequency can be ascribed to the fact that Douglas-firs can live for 1,000 years.

After clearcutting, should foresters burn the residual or fallen wood to mimic a natural fire (in what is called a prescribed burn to expose mineral soil)? Perhaps not. The fallen wood on the forest floor, not useable in commercial processing, is very important for slow nutrient cycling. The nutrients that are released after a fire, especially nitrogen -- the most limiting of tree nutrients -- are the first to

volatilize and may take up decades upon decades to naturally reaccumulate. Applying fertilizers en masse to the cut-over forest floor is both expensive and very often harmful to soil bacteria, fungi and fauna.

So what can a forest commercial manager do as an alternative to a clearcut in forests such as the ones on the British Columbian coast? Work with nature -- a process called mimicry -- is the answer. Scientists have observed and documented that in the ancient B.C. coastal forested ecosystems there are patches of old trees and patches of young trees and openings -- which foresters call "uneven-age forests."

Weyhauser, a progressive forest company, has begun to harvest some of its timber in coastal B.C. by removing patches or clumps of trees, and/or a process called selection. They have been careful to protect the soil by using designated skid trails to remove the fallen trees and not to disturb all of the forest soil. If heavy equipment is tracked haphazardly back and forth across the forest soil, it squishes soil particles -- "pedons" -- and removes their air space, causing irreparable damage. Air in the soil is just as important as air above the soil, because we -- human beings and trees alike -- are aerobic earthly creatures. The standing patches of older trees provide shade, which the B.C. coastal Douglas-fir requires as seedlings. The standing trees act as a natural seed source for new, recolonizing seedlings in addition to providing essential habitat for animals that depend upon old living and dead standing trees. This maintains essential biological diversity, which is of paramount importance for both park and commercial forest managers. After all, foresters, park or commercial, are all conservationists. They are responsible for the careful management of all natural resources.

So is a clearcut, which removes most or all the trees from a wild forested site, the same as a wildfire? No. But can foresters mimic the exquisite natural processes that Mother Nature created and humankind has been known to exploit? Yes.

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