OKANAGAN SIMILKAMEEN PARKS SOCIETY

Newsletter

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The Climate Disaster Hidden in BC's Forests

MICHELLE GAMAGEI THETYEE.CA

The province doesn't count forest emissions in its global warming plan. That's a big, dangerous mistake, say advocates. Burning slash — the wood left unused during logging — produces more carbon emissions than BC's entire agricultural sector.

Here are two key words that have been largely left out of the broiling debate around British Columbia's old-growth forests: carbon emissions.

Even in the recent forest policy update, the provincial government only mentioned carbon emissions twice. And that was to say forests suck up and store carbon, which environmental advocates warn doesn't tell the whole story.

By B.C.'s own reporting, forests are the largest emitters of greenhouse gases in the province — 23 per cent larger than the total emissions from the energy sector.To talk about forests while ignoring carbon emissions is "climate denialism," says Torrance Coste, senior campaign director for the Wilderness Committee.

When B.C. reports its official carbon emissions, that number excludes emissions from forests. Coste says that's a huge problem, because "emissions associated with forests in some years surpass B.C.'s total emissions. Which is staggering. It's like a second B.C. we don't count." Coste says the province has a long history of siloing two ministries — the Ministry of Environment and Climate Change Strategy and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development — and acting like they never overlap.

The 2018 provincial climate change strategy, CleanBC, also skates around emissions from forests. But with the climate emergency it's urgent the two departments work together to tackle emissions from forests, Coste says.

B.C. counts and reports its annual greenhouse gas emissions in a methodology book.If B.C. included emissions counted under forest management in its official inventory total, the province's annual CO2 emissions would jump to 305.3 megatonnes in 2018, instead of 67.9 megatonnes.

The Tyee asked the Ministry of Environment and the Ministry of Forests why forest emissions are not included in the official total. In an email, a ministry spokesperson said it is not international practice to include forest emissions, they're really hard to accurately calculate, and that "including these larger, volatile emission sources in emissions totals can mask trends in emissions caused by human activity."

Jens Wieting, Sierra Club BC senior forest and climate campaigner, has heard that response before. He's called on B.C. to include forest emissions in its total count for a decade. He says the province keeps climate and forests separate so B.C. can maintain its narrative that logging is climate friendly. "This is a lie," Wieting says. "Industrial logging plays a big role in making forests carbon sources." Carbon sources are often calculated to either be net emitters, meaning they add carbon to the atmosphere, or net sinks, meaning they suck up and store more carbon than they give off. B.C.'s vast forests (and Canada's entire managed forests from coast to coast to coast) are net emitters.

Let that sink in for a second — our forests pollute more than they suck up pollution. Trees do pull carbon dioxide from the atmosphere that's then locked inside them. But that's only as long as they're alive. Wildfires, waste burning and discarded materials left to decompose all release that stored carbon.

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EDITORIAL

This past spring and summer we were fortunate to read four books authored by veteran female scientists. The four scientists, Suzanne Simard, Alexandria Morton, Katharine Hayhoe, and Robin Walls Kimmerer all had something besides being scientists in common. It is not their nationality, two of them are American and two are Canadian, two of them live in B.C., one in the Eastern U.S.A., and one in California. It is not their occupation or area of study, two work as tenured academics in forestry and ecology, another is a chief scientist for The Nature Conservancy (N.G.O.) and still another one works as part of an N.G.O. studying whales, salmon, and their environment. No, what these four scientists hold in common is their persevering belief in the value of nature in and of itself. They can recognize not only the ecological values found in our environment, note the incongruency between the socially imposed financially valued resources, and the need to maintain a planet where creatures, including humans, can viably live but also are able to perceive the fact that nature is a system with many intertwined components each dependant on the other. They all write that there is a value inherent in this system that surpasses all others.

This topic was recently broached with the provincial budget committee, composed of a number of M.L.A.s from around the province.

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...CLIMATE DISASTER continued

"Since 2002, forests have been net sources of carbon because the emissions from wildfires, slash burning and logging are greater than the sequestration from growth," Coste says. He adds that while wildfires make up the largest chunk of the emissions, slash burning and logging are "not insignificant."

The province's emissions inventory maps the steady increase of emissions from wildfires over the past three decades. In the 1990s, wildfires spat out a couple of hundred to a couple of thousand annual kilotonnes of emissions. By 2017 to 2018, that had jumped to around 200 megatonnes.

But wildfires aren't the only thing dramatically increasing forest emissions. Another provincial inventory category outside the official total is "forest growth minus decay," which tells its own story. When a tree grows, it sucks CO2 from the air, exhales the oxygen and uses the carbon as a building block in its trunk, roots, branches and leaves. The forest keeps the ground cool so even when trees die, the rotting process, which releases CO2 back into the environment, is slowed down by up to hundreds, if not thousands of years, according to a 2019 report by forest ecologist Jim Pojar. An undisturbed forest will keep sucking up and storing carbon for several centuries or even millennia, Pojar notes.

B.C.'s forests used to be powerful carbon sinks. In 1990, B.C.'s forest growth minus decay was calculated to absorb an annual 90 megatonnes of CO2. For comparison, Metro Vancouver produced 14.7 megatonnes of CO2 in 2019 with its population of just under three million people. But starting in 1997 that number began steadily decreasing, to just over seven megatonnes in 2018.

In an emailed statement, the ministry said, "This lower sequestration is largely due to mountain pine beetle and global climate change rather than B.C. action." That shift isn't part of the province's official emissions total because it's outside of human control, according to the Ministry of Environment. "Emissions estimates from forest management involve a high degree of uncertainty relative to other sectors due to a number of factors," the statement said. "This includes the difficulty in accounting for complex ecological process such as carbon uptake by vegetation and carbon release through decomposition — both through natural processes in the forest and as harvested wood products."

Ecologist Pojar calculates that when a forest is clear cut, up to 60 per cent of the stored carbon is immediately thrown back into the atmosphere. This is partly from slash pile burning. During a clearcut, everything in a set area will be cut down. Valuable logs are trucked away, still storing carbon. The rest of the fibre — small trees, the tops of trees, bushes, branches and roots — are burned in piles. This is the cheapest and easiest way for a logging company to clear the land so it can be replanted, Coste says.

The provincial inventory says emissions from slash burning peaked in 1995 at 8.9 megatonnes of CO2 and steadily decreased ever since, to 3.3 megatonnes in 2018.That's small compared to wildfire emissions, but larger than emissions from the entire agricultural industry (2.5 megatonnes in 2018). It's even similar to fugitive emissions from coal mining and the oil and gas industry (4.3 megatonnes in 2018).

Coste says the province could immediately reduce emissions from slash burning by applying the carbon tax to burns. The B.C. carbon tax applies to all fuels sold in the province, and to all peat, tires and asphalt shingles when burned. Forest companies currently get a "massive free ride" by avoiding the carbon tax, he says.

Torrance Coste of the Wilderness Committee says the day after he was told by a forester that the industry 'doesn't really do slash burning anymore,' he was able to count 135 burning slash piles on northern Vancouver Island. Image via Torrance Coste. In the recent forest management policy update, the province says it plans to decrease slash pile burning by encouraging local companies to use the leftover fibre. But Coste says logging companies won't willingly stop slash burning if it's the cheapest way to clear the land for replanting.

The Sierra Club's Wieting says a carbon tax would encourage less destructive logging practices, because companies could choose to leave trees with low economic value standing instead of cutting them down and burning them.In his 2019 report, Pojar recommends turning slash piles into biochar to fertilize the logged site, or to leave the piles to slowly decompose.The Tyee asked the Ministry of Environment if it was considering applying the carbon tax to slash burns. In an emailed statement, the ministry says it already has policies in place to reduce emissions.

When asked why counting emissions from forests is important, Coste and Wieting point to the UN Intergovernmental Panel on Climate Change, which says humans have nine years to keep the planet from warming more than 1.5 C to avoid the worst impacts of global warming.That means B.C. needs to do everything it can to cut carbon emissions, even in areas where it chooses not to count the numbers in its official totals.

Temperate forests can capture two tonnes of carbon per year per hectare, and old-growth forests can store over 1,000 tonnes of carbon per hectare, according to a 2019 study by the Sierra Club BC. That same report says when a forest is clear cut, it becomes a net emitter for 13 years, even if re-planted.

The current forest industry creates a vicious emissions cycle, Coste says. Cutting down more trees means releasing more emissions, and having fewer trees left to absorb those emissions. That accelerates climate change, which means more weather, like drought or lightning, that increases wildfires. B.C. needs to stop feeding into that loop and start thinking of forests as a shield against climate change, Coste says. Wieting says to do this, B.C. needs to immediately change when and where harvesting happens. "Protecting old growth and allowing second-growth forests to grow old again would allow some of the forests to sequester a lot more carbon in the short term. We're talking 50-to-100-year-old forests, that's the age class when things are just getting exciting in the annual uptake of carbon," he says.

In his report, Pojar echoes a similar warning that B.C.'s forests are worth more standing. "Keeping forests buys us time to develop alternative energy strategies to reduce CO2 emissions, to change our behaviour, and also to establish a lower greenhouse gas base level, thus reducing the ultimate impact from warming on the forests themselves," he says.

Michelle Gamage is a Vancouver-based journalist with an environmental focus who regularly reports on climate for The Tyee. Find her on Twitter @Michelle_Gamage.

BARLEE BENCH

A permanent memorial to two of the south Okanagan Similkameen's most recognized environmentalists has been installed in Summerland's Adams' Bird Sanctuary. The father and daughter duo of Bill and Gwen Barlee are recognized on a plaque adorning a bench in one of the quiet areas of the natural sanctuary. Bill was celebrated as one of the OSPS pioneers, while Gwen worked throughout British Columbia protecting natural landscapes.

...EDITORIAL CONTINUED

The message to them was that it is time to begin to invest in ways that nature can not only be protected and maintained but also enhanced. Our natural world supplies us with too many resources that we rely on for survival. Whether carbon sinks, fresh water, 'green' space or any of a multitude of other benefits, nature provides them for us free of charge. For too long nature and the resources that come with it have been seen as a way to make money with no consideration to the damage that comes with this form of thinking. Now is time to reinvest in nature.

The O.S.P.S. hopes to play a role in a discussion around such reinvestment. In this newsletter we are fortunate to be able to include some of the work produced by Dr. Simard whose recent book, Finding the Mother Tree, is a good blueprint for studying the interconnectedness of our forests. Along with three other very good forestry conservation books it is reviewed by Emily Donaldson in the article Four Books on Why Protecting Trees is a Matter of Survival. Likewise, Luanne Armstrong reviews Simard's book in depth in Communication Not Competition. In addition, there are a couple of articles on the forest sector and climate change, another on the forest sector and jobs and still another on Caribou and Wolves. Hopefully a little something for everyone.

Please share these ideas with others within our group or outside of it. Encourage people to read the books mentioned and send them to people for birthdays and holidays. Now is the time to pay attention to these hard working scientists.

TEAL SHAKE AND SHINGLE MILL

This aerial view of a Surrey shake and shingle mill provides us with a glimpse of some other industries besides logging that use our trees. This one happens to belong to the same company that is devastating the old growth forests of Fairy Creek. A small operation like this one could be, and should be, sustained by employing forestry methods such as those outlined by Suzanne Simard in her book, In Search of the Mother Tree. No clear cutting is required.

West Kootenay forests may never be the same, says ecologist

Those forests now burning south of Fauquier and Edgewood, and northeast of Winlaw? They're not coming back. That's the stark assessment of Greg Utzig, a Kootenay-based conservation ecologist who has studied how climate change affects forest regeneration for 20 years.

"The forest in some places won't be back at all, and in other places it will be very different from what is there today," he told the Valley Voice.

Utzig says the temperate forests of the Arrow, Slocan and Kootenay Lakes areas that locals love are going to be replaced in the next few decades by rock, scrub grass and dust, as a result of human-driven climate change.

It won't happen all at once, and not everywhere. But by 2080, it will be a very different looking Kootenays.

That's because the fires burning this year aren't part of a usual cycle of destruction and forest regrowth, but the signal of a wholesale change in the ecosystem. A change to a climate likely much dryer, and certainly much hotter, he says. One that will far more closely resemble the southwest US, rather than our familiar temperate rainforest.

AFTER THE FIRE

We're taught that fire is good for a forest. But that's not completely true, all the time. Fire is certainly a regular part of the natural order, and in places like the East Kootenay the forest has adapted to thrive with fire every few decades.

But Utzig has also studied forests near Revelstoke where there's no evidence of fire affecting the ecosystem for hundreds of years. So when climate change-driven fires hit those areas, the forest isn't adapted to it – and that ecosystem doesn't recover.

The size, frequency and intensity of the fires is also increasing. Trees may not have a chance to regrow to full size before being wiped out again.

That is, if there are seedlings to replace the burned trees in the first place.

"If they're high intensity fires – which many of them are – because it's so hot, it kills all the trees so there's no seed source," he says. "And so the forest doesn't come back because there's no seed."

With the canopy gone, and hotter-than-usual fires burning deep into the soil, the next generation of trees is being decimated, says Utzig. Those that do survive will wither away in the heat and parched conditions as average temperatures slowly climb 5-7°C in the coming decades.

"They all need water to survive. So there's incredible competition for water in a year like this, and the ones that don't make it die," he says.

Other problems are complicating and reinforcing the destruction. Drought-weakened trees are prey to beetle infestation, killing them and increasing fire fuels; clearcutting reduces ecosystems' resiliency; extreme weather events mean more blowdowns and lightning to spark fires in the dying woods.

The cycle of destruction continues until there's nothing left. And all that is happening so fast that traditional forest recovery is impossible.

"So I'm not going to say all these areas are not going to re-forest," says Utzig. "Some of them will, but the ones that are in the driest sites won't."

And the species that do come back won't be the familiar pine, cottonwood, birch and hemlock either, but ones more adapted to drought conditions and fire.

"It won't slowly transition," he says. "A major burn will happen, then we may get two to

THOMAS CREEK FIRE

Forest fires raged during the springs and summers of 2020 and 2021. We need to get a grip on the correct way to address these fires which promise to be prevalent as the climate continues to change. There are always lots of suggestions on a solution. Our government needs to look at the science, the resources and the historic knowledge and come up with a long-term plan on how to address these fires. This photo is a shot of the Thomas Creek fire, which ironically depicts two of the destructive forces affecting forests; logging and fires.

three years of dry, and those areas won't come back. Or, if the next two or three years are wet, well, they will come back for a while – until they burn next time."

KNAPWEED

So are we looking at an Okanagan-style landscape in the future?

"No, that's too easy," says Utzig. "Our models had to go much farther than that to find a similar climate match to where the Interior is heading. And it's more like southern Idaho, Wyoming, even Nevada."

So what vegetation will likely replace the fires in those burn areas this year?

"Knapweed," says Utzig. It doesn't sound like he's joking.

HOPE

It pays to have a gallows humour if you're a climate scientist these days. But Utzig bristles at the suggestion there's nothing that can be done to avoid the climate catastrophe.

"There's lots of things that could be done," he says. "The first thing is, we can stop making it worse.

"To say there's nothing we can be doing is ridiculous. But finding the will to do it: that is the problem."

Utzig points to the sale of coal from our region for industry as our biggest 'contribution' to the greenhouse gas problem. That has to end for the sake of the planet, he says, as do new pipelines and fossil fuel development.

And Utzig says the Province has to change its entire approach to logging to keep ecosystem resiliency at the forefront.

"We could be redirecting forestry harvesting to increase resilience to ecosystems to climate change. We know what kind of treatments need to be done… those came out of our work 10 years ago and nothing has been done."

The FireSmart program, he says, has to be reimagined to try to save more than homes and infrastructure.

"What I'm talking about is saving ecosystems," he says. "Its basically changing the way we log to help ecosystems adapt to the changing environment. And that means stopping clearcutting, treating stands to increase the resilience to change – change that has already begun."

It's a different kind of logging, and a different kind of forest management that he says is facing stiff opposition from government and industry.

"People worry about people, but the fact is every living thing is being affected by this," he says of climate change. "And it's going to come back to bite us."

Utzig's theories on managing fire in a changing climate are being tested this summer. SIFCo, the Slocan Valley's community forest, has been following his recommendations for FireSmarting with an eye to forest regeneration. In several blocks near Winlaw, they've been leaving Ponderosa pine and Douglas fir spaced well apart on south slopes that are most prone to fire and the first to convert into grasslands.

The theory is now being tested by the 5,200-hectare Trozzo Creek fire that's been burning for the last month.

"It'll be interesting to see how well they did," he says. "Those areas may have been able to carry the fire without killing the trees."

But it will take much more work, on many fronts, if Kootenay forests will have a chance of surviving past the next couple of decades.

"The hope is we do what we need to do," says Utzig. "We need to get on with it, we need to wake up. Change is coming. We have elections coming, we need to put people on the spot and vote accordingly."

John Boivin, Local Journalism Initiative Reporter, Valley Voice

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1175 Communication Not Competition

Finding the Mother Tree: Discovering the Wisdom of the Forest by Suzanne Simard

JULY 12, 2021
Reviewed by Luanne Armstrong

What a truly brilliant book. What a gift to the world both the book and its writer are. I came out of this book so happy it existed, so happy I had read it. The book is impressive on many fronts, not just because of the content, the research, the findings about how trees in the forest cooperate and communicate, but also by the triple achievement of this writer: to write a book that is a powerful and moving memoir about love and loss and illness and achievement; to make complex scientific research accessible and available to the general reader; and to write a moving testimony to the enduring power of family and belonging. Whew!

Dr. Simard has spent much of her life working to find out how the forest truly works, in part because it became clear to her when she first began working in forestry as a tree planter, and watching the young trees she had planted, die. She had to find out why. This spurred her through a research journey in university and her PhD thesis, the main findings of which were subsequently published in the prestigious Naturemagazine, in which she wrote about how she had discovered that trees communicate their needs and send each other nutrients through the mycelium in the soil — in other words, she found, they "talk" to each other. Since then, her research has shown that trees not only converse, they send warning signals about environmental change, they search for kin, they transfer their nutrients to neighbouring plants before they die. Trees, Simard writes,

… form mycorrhiza (literally meaning "fungus-root"), which are symbiotic relationships between trees and fungi. These mycorrhizal fungi have many branching threads (called mycelium) that grow out from the root tip of a tree and connect with the roots of other trees and plants to form a mycorrhizal network. The mycelium spans vast areas connecting trees and plants across a forest in an expansive underground network.

Essentially, Simard disproved the central assumption upon which much of plant biology, and particularly forestry, has been based for far too long, the idea that plants compete with each other, and therefore, the idea that the best way to grow trees is in plantations, each tree trapped in its small tube of roots with nothing around them but barren ground. The British Columbia Forest Service is still spraying "weed" trees — such as birch, alder, and willow — with RoundUp because they might compete with such plantations of new trees. But Simard's work shows that when fir trees grow up in a natural forest, where they interact with each other and receive nutrients through the mycelium, adjacent birch and alder trees both add nitrogen to the ground and protect young fir trees from disease. So, why is Forestry still carrying on such a destructive and short-sighted policy of exterminating these "weed" trees?

Dr. Simard conducted much of her groundbreaking research while dealing with her own personal difficulties: the death of a beloved brother, the births of her two daughters, her marriage ending, and breast cancer and recovery. Through it all, she retained her focus on her research and her family in equal measure. When I finished Finding the Mother Tree, I was in awe of her incredible research and discoveries, but even better, I really liked her as a person. I liked her values, her ideals, and her way of being in the world.

Even though I was aware of Simard's work before reading this book — and, full disclosure, my grandson works for her doing research — this book still contained many revelatory sections for me. Finding the Mother Tree contains deep insights, including how forgiving and resilient a forest can be when given a chance; that a forest communicates in many ways and along many fungal pathways;' and that previous forestry work made many wrong and unresearched assumptions.

When I was a child and spent much of my time in the forest, I always knew enough to stop at the edge of the trees to wait; I always knew there was a vast intelligence there that was somehow aware of me, and that I should go slowly and listen and watch. I am so glad to have my childhood intuition reinforced.

Dr Simard began a new research project in 2015, The Mother Tree Project, which will study "connections and communication between trees, particularly below-ground connections between Douglas-fir Mother Trees and seedlings, which could influence forest recovery and resilience following various harvesting and regeneration treatments."

Climate change and the present high concentrations of carbon dioxide in the atmosphere make this work, these discoveries, and this knowledge crucially important for now and for the future.

Perhaps someday soon, foresters will look up from their plans for clear cut logging and replanting lonely plantations of single tree types, to realize that what they doing actually goes against the nature and inclinations of a true forest and they will finally begin to work in a new and more aware way. One can only hope. The research is clear. They only have to read Suzanne Simard's book and actually pay attention.

I am quite sure that this is one of those books that, like Rachel Carson's Silent Spring, will come to anchor a turning point in our somewhat blind and reckless destruction of the natural world. If people can finally begin to see the world around us as alive, as having value beyond being merely "resources," and that we need to do more than save "nature" in a few parks, within a desert of houses, lawns and industrial expansion, we may yet save ourselves.

Four books on why protecting trees is a matter of survival — ours and the planet's

JULY 30, 2021
Emily Donaldson

The study of trees requires a temperament that's comfortable skewing toward the long game, which is perhaps why three of the following recently published or forthcoming books are also memoirs. Identifying arboreal patterns can take a lifetime – a tree's or a human's (which are sometimes of similar duration). But as the world's forests increasingly become front lines in the battle over climate change – and the west burns and towns are literally bursting into flames – protecting trees has taken on global urgency. None of these authors entered their field with the intention of becoming an activist, but each has been forced to jump into the fray in some way.

Even a decade ago, the notion that trees communicate with each other would have struck many as a fringe, if not completely crackpot idea. That it's now well established is thanks in no small part to Suzanne Simard, who can draw a straight line from the observations she made about the forests near her childhood home in British Columbia to the experiments she conducted as a professor of forest ecology. Those showed that trees of different species share resources, and even warn one another, through a subterranean "wood wide web" of fungi.

Simard, who comes from an impressively long line of loggers, got her first jobs in silviculture in the early 1980s, one of her first assignments being to determine why replanted clear-cuts were faring so poorly. Her discovery – that commercially valuable pine performs better when grown alongside native species such as birch – landed like a lead balloon with her bosses, who had gone all in on their belief that herbicides were necessary to give money crops the room they needed to thrive. That she was a woman critiquing the entrenched methods of a predominantly male industry didn't help her cause either. Like so many who find irrefutable evidence only to have it ignored, she eventually became disillusioned and left for academia, a move that led, indirectly, to the implosion of her marriage.

Finding the Mother Tree (Allen Lane, 368 pages) artfully unspools what Simard herself sees as the uncanny interweaving of her personal and professional lives. A falling out with her beloved bull-riding brother went unresolved before tragedy struck. Later, there was a cancer diagnosis, possibly related to the pesticides and radiation she handled in the field. Readers will no doubt see a poignant parallel between Simard and the so-called mother trees that have been the focus of her recent work on forest regeneration: matriarchs whose role is to pass on wisdom to their offspring before they die (though Simard, to be clear, is still relatively young and vigorous). The book doesn't shy away from hard science, and those who come to it ready to learn a little ecology will find themselves richly rewarded.

As a rare tree book to sells in the millions, Peter Wohlleben's The Hidden Life of Trees (2015) became a phenomenon. With success, though, came criticism. While the German forester often says similar-sounding things about tree sentience as experts such as Simard, or Diana Beresford-Kroeger, some view his relationship with science as less fully committed and more friends-with-benefits. (In The New Yorker, Simard recently confessed she found his anthropomorphizing "over the top.") Sensitive, clearly, to such critiques, Wohlleben points to his rationalist bona fides early on in this follow-up volume, The Heartbeat of Trees (Greystone, 264 pages), noting that, as a child, he consciously eschewed church for science. And yet the title essay could be taken as a doubling down, asking, as it does, whether trees can be said to have heartbeats (not really), and whether they can feel our hugs (the answer, basically, is no, but the query does allow Wohlleben – future Scripps Spelling Bee participants take note – to work in the term "thigmomorphogenesis").

The book reads as a kind of sampler, its brief chapters exploring, in the author's relentlessly earnest tone, tree-related topics including forest-bathing therapy, the medicinal value of plants, how the destruction of old-growth forests fuels climate change, and Wohlleben's visit with B.C.'s Kwiakah First Nation, who contacted him about their struggles with the logging industry in their traditional territory. Some will find the limbs he goes out on a little long. The contention that dogs' sense of smell might not really be that much better than humans', say, or that walking in forests at night heightens the senses (in Ontario, that sense being the insatiable itch from a thousand mosquito bites). But it's hard to dispute the book's overall message; namely, that time spent in nature can serve as both a balm for anxiety and a bulwark against despair.

As an undergraduate biologist in the early 1970s, Meg Lowman spent most of her time at ground level, measuring trees with a dendrometre in Massachusetts' temperate forests. When she moved to Australia to do her graduate work on that country's rainforest, however, her adviser told her that to get the data she wanted she'd need to go up. Way up. Thus goes the origin story of Canopy Meg, who fashioned herself one of the world's first "arbornauts" when she jury-rigged a harness and, using a homemade slingshot, hoisted herself into a place she would come to call the "eighth continent"– a world of mind-blowing din, brimming with insect and bird activity completely different from that below.

In The Arbornaut (Farrar, Straus and Giroux, 368 pages), Lowman details a career that embodies the word "trail-blazing," both in terms of the science (when she started out, only spelunkers and sea divers had experience relevant to hers), and gender-wise, in her breaking of what she class "the glass canopy." Frequently the sole female in her various pursuits, Lowman endured, seemingly, even more sexism than Simard (not to mention the gropings of a creepy taxidermist and an attempted assault), 1980s Australia not being known as a feminist Xanadu. And it wasn't just men. After she and her sheep-farmer husband had children, Lowman's mother-in-law (from whom she hid her copies of Ecology inside Woman's Weekly) echoed her academic colleagues by insisting that mother and professor were mutually exclusive roles. The marriage, like Simard's, eventually fell apart under the weight of these tensions, but it wasn't until one of her boys told her that girls couldn't be doctors that she decided she

CONTINUED ON NEXT PAGE…

...FOUR BOOKS CONTINUED

needed to bring them with her to the United States. From start to finish, the word that best describes The Arbornaut (forthcoming in August) is "spirited": Lowman, who built North America's first canopy walkways, partly to educate the public about the importance of forest preservation, is as unafraid of heights as she is of exclamation marks. She's earned each one.

In her job as a lookout observer, Trina Moyles works a few elevator stops up from Lowman, in the cramped steel cupola of a fire tower 100 feet above Canada's vast boreal forest. Moyles applied for the work when her life hit an impasse. She'd spent much of her 20s doing international development work, partly in Uganda, where she'd gotten engaged to a local man but reluctantly broken things off when the reality of a long sponsorship process sunk in. Despite growing up the daughter of a wildlife biologist in Peace River, Alta., nothing in Moyles's past prepared her for the reality of living alone for months in a modest cabin, inaccessible by road, with only her rescue dog and the odd crew of on-call firefighters for company. Her daily interactions with neighbouring lookouts through radio and text became a lifeline.

In her engrossing – at times raw – memoir, Moyles elegantly unfurls an unanticipated personal evolution: After the humiliation of early false alarms that send crews scrambling unnecessarily, she slowly gains confidence in her smoke-spotting ability and, after alternating bouts of exhilaration and depression, comes to embrace her solitude. She surprises herself by returning to the job the next year, then again the one after. Lookout (Random House Canada, 328 pages) can feel novelistic in its combination of evocative descriptions of jaw-dropping nature and Jack London-esque touches: a lightning strike that hits the tower, a spine-chilling close encounter with a black wolf, and another with a mother grizzly that compels Moyles to grab her rifle (she used rubber slugs, the bear was fine). Most fearsome, though, are the fires themselves. Fire, Moyles notes, is as necessary to the boreal's regeneration as rain is to the Amazon, but what's happening now in dry-as-matchsticks forests is of a different order. Indeed, rarely has the term "baptism by fire" seemed so apt: In her first few days on the job, Moyles bears witness to the massive Horse River Fire south of Fort McMurray, Alta. That, before most of us learned what a "heat dome" was.

In some way, Simard, Lowman and Moyles bring to mind the so-called "Trimates" – Jane Goodall, Dian Fossey and Canadian Biruté Galdikas – three women who worked in isolation with primates in different parts of the globe, and whose passion eventually transitioned into activism (in the case of Fossey and Galdikas, with tragic results). What unites them all is their dedication to protecting the natural world from human-caused loss of habitat and diversity. What's different now, of course, is the scope of the problem, and the fact that one of the species now facing its reckoning is us.

Prince George was only one of the many locations around our province where citizens took a stand protesting the decimation of old growth forests.

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...CONTINUED FROM BACK

"Wolf reduction has been shown to be an effective short-term approach to recovering caribou populations while the long-term solutions, such as habitat restoration and protection, are planned and implemented," they said.

At the same time there were doubts within the ministry about what could be concluded from Keim and his team's findings.

"Although the authors of this paper found a reduction in wolf-caribou interactions along restored seismic lines in a very small area over a short period of time, there was no caribou population-level effect measured," the spokesperson said.

"Nor did the researchers suggest how much restoration would need to be done to increase the number of caribou," the government statement said. The research may not apply to the majority of caribou populations "where forestry is the primary driver of the disruption in predator-prey dynamics, which has ultimately led to unsustainable rates of predation by wolves across many caribou herds," it added.

The statement also referenced other research identifying challenges with habitat restoration and suggesting that in the short term, caribou herds may not stabilize without other measures like predator reduction to slow or halt population decline while habitat is restored.

The government introduced the current wolf management plan in 2015. While the plan met heavy criticism from many environmentalists and conservationists, others said it was an unfortunate but necessary step to address a desperate situation.

Laurie McConnell, the director of community and systems for the advocacy group Pacific Wild, said public opposition to the wolf cull remains strong.

In 2020, Pacific Wild filed a lawsuit trying to stop the cull on the grounds that it contravened wildlife regulations and federal aviation laws, as wolves are tracked and shot from helicopters. Court dates were unavailable due to the COVID-19 pandemic. Dates have now been set for July 7 and 8.

McConnell said she had spoken with Keim and read the study. "He's very aware of the complexity of how these landscapes are affected by humans."

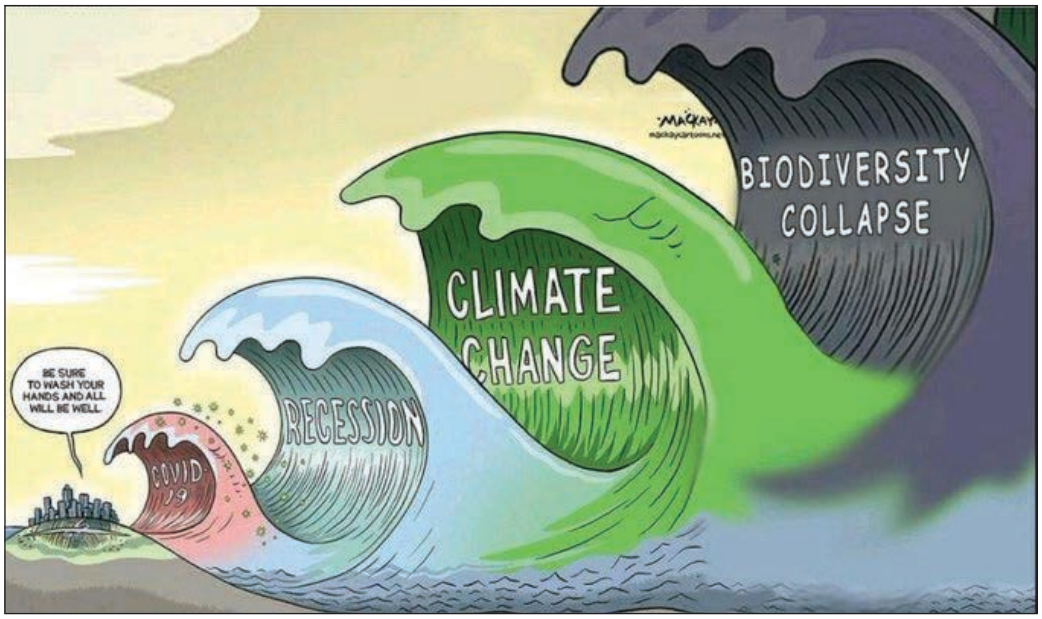
It's time for the government to take a new approach that takes into consideration the value of ecosystems and all species, McConnell said. "There's plenty of science that shows how we manage wolves is so archaic."

The focus needs to be on protecting large corridors as the Yellowstone to Yukon Conservation Initiative advocates, she said. "These solutions exist, and these possibilities exist, we just have to choose it."

According to Pacific Wild, since 2015 the B.C. government has spent more than $3 million on aerial snipers and trapping to kill more than 1,000 wolves.

As with the logging of old-growth forests, culling wolves is contrary to the international reputation the province cultivates, McConnell said.

"This is not what people think happens here."



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Keep Killing Wolves to Protect Caribou? No, Says New Research

But the province says the annual cull is still the most effective and efficient way to preserve vulnerable herds.

21 JUN 2021
Andrew MacLeod | TheTyee.ca

The British Columbia government could reduce or end its controversial wolf cull and instead make small habitat changes to give mountain caribou herds a chance to recover, according to new research.

But the province — which last winter shot or trapped 237 wolves in areas where caribou are under pressure — says that large-scale habitat restoration is complex, expensive and may take decades before it makes a difference.

Jonah Keim, an independent biologist and data scientist and lead author of the study, said the research found smaller interventions could protect the caribou while the habitat recovers over time.

"There's overwhelming agreement that loss of habitat is the key, if not the ultimate issue surrounding woodland caribou conservation," Keim said. "The greater question is, how do we recover habitat effectively? How do we do it fast enough? Can we scale it?"

For the study "Managing animal movement conserves predator–prey dynamics," published this month in Frontiers in Ecology and the Environment, Keim and his five co-authors used 100 cameras over two-and-a-half years to monitor interactions between animals in 92 square kilometres of the Parker Caribou Range west of Fort Nelson in northern B.C.

The research was funded by the BC Oil and Gas Research and Innovation Society, a non-profit with funding from industry and governments.

Halfway through the study, the researchers made it more difficult for animals to travel on some of the routes they used to move through the area, including by felling trees across oil and gas seismic lines or by mounding soil on old access roads.

They found the changes reduced the number of encounters between wolves and caribou by 85 per cent. Encounters between black bears and caribou dropped by 60 per cent.

"Our study is grounded in the concept of encounter management," Keim said, comparing it to the steps people around the world have taken to reduce contacts during the COVID-19 pandemic. In the same way that social distancing has saved millions of human lives, reducing encounters with predators could help save the lives of threatened caribou, he said.

Caribou do well in low-productivity ecosystems that other prey and predator species would normally avoid if it weren't for the introduction of roads, seismic lines, snowmobile trails and other human-made changes to the landscape.

"If we didn't have these features, the use by wolves and bears... isn't going to be nearly as intense in the caribou range as it's going to be outside in upland habitats and river valleys," Keim said. "That's where they're going to spend the bulk of their time." The human interventions open the habitat to predators.

An advantage of managing animal movement is that it has an ongoing effect, unlike interventions like culling wolves or penning caribou that need to be repeated year after year to be successful, Keim said.

"We spend a lot of money on those things, but we're not investing in the things that are going to give us the best return."

The researchers found the small changes they made reduced the ability of predators to travel through the landscape and therefore made it easier for the caribou to avoid contact.

The success of the mitigation effort provides an alternative to culling predators, they wrote. As the authors put it in their report, "culling predators to benefit vulnerable prey is socially, ethically, and ecologically tenuous."

According to a spokesperson for the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, wolves were culled in the 2021 winter season to protect 13 of the 54 caribou herds identified in the province.

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