



Newsletter *Spring 2023*

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Annual General Meeting

The 2022-2023 Okanagan Similkameen Parks Society's Annual General Meeting is scheduled for Friday, April 28, 2023, at 7:00 P.M. This year's Meeting will again be held online. It is open to registered members of the public as well as registered members of the society.

The Annual General Meeting will conduct the business of the society and will hold elections for society directors. In addition, there will be a video presentation. The video is of the author/scientist (ethnobotanist) Cassandra Leah Quave, who will speak about her book *The Plant Hunter, A Scientist's Quest for Nature's Next Medicine*. In the video she details her life, not only as a working researcher but as a female in science, a person with physical variability, and as leader and advocate for her own lab.

Should you wish to run for a position on the executive, please email your nomination to bremmer@Mtkobau.bc.ca. The Board of Directors can consist of up to thirteen members. We are looking for directors with vision and desire to make the Okanagan Similkameen a sustainable, protected, and welcoming habitat for indigenous flora and fauna.

Registration will be conducted on the OSPS website. The address for our website is <https://okanagansimilkameenparksociety.ca>. Following registration you will receive an OSPS email with your access code to the online meeting.

Please use the enclosed membership form on the back page to help us carry out our mission.

EDITORIAL

Looking at our society's diminishing membership list can cast a cloud over even the most optimistic South Okanagan or Similkameen activist. Over the past while there have been a number of newsletters returned in the post; though some are the result of people moving elsewhere, many come back marked deceased. Our rolls are being depleted as the result of time. The members of the Okanagan Similkameen Parks Society, the society initiated the development of iconic protected spaces such as Vaseux Lake Park, Okanagan Mountain Park, and Cathedral Park, and supported numerous endeavors such as the Cascades Recreation Area, and the Heritage Brigade Trail, are slowly being removed from the membership list. While we annually attempt to recognize the accomplishments of the earlier generation, it is evident that we need to attract new members to take their place.

Of course just when it appears that the young people of our nation are declining to become actively involved in some of the causes that our society is involved in along come a couple of examples indicating the contrary. Example number one is the huge February turnout at the legislature on behalf of protecting Old-growth forests. While a star of the event was octogenarian, Neil Young, hundreds of young citizens attended to show that they cared about the need to pay attention to how B.C.'s logging industry is impacting not only our environment but also our health and the economy.



A second, more local, example of young people's angst regarding the logging industry's disregard for ecologically friendly practices in our province occurred in Penticton. As March crept into town disguised as a lamb we noticed a three metre by three metre coloured chalk mural on the sidewalk in front of our M.L.A.'s office calling on the province to cease the practice of clear-cutting and pull the logging industry back into a position of following norms that support the governments stated goals. In both cases it appears that our youth are, or are becoming, active.

So, we know that the youth want to make an impact on the environment. In fact, the O.S.P.S. is currently negotiating to support wildlife workshops in a number of our regional schools. The idea is that our children need to appreciate the life that is still occupying our natural environment and how we can protect and enhance it. Of course, there are lots of older youth and young people who already have knowledge of what is happening in this regard. That said, what the O.S.P.S. needs to do is to offer these young activists a place where their ideas can work in conjunction with others to make a difference in the South Okanagan and Similkameen. This column should be considered as such an invitation. Become a member of a group that has been around since the 1970s when a group of citizens got together to save the Vaseux herd of Big Horn Sheep. There are still many causes that need attention, in fact there are possibly more now than there ever have been.

An activist recently left this tasteful piece of art outside the door of the office of the local MLA. While sure to be gone before long (it was done in multiple colours of chalk) the message is clear on a couple of points. It decries the nature of BC's industrial logging system and it indicates that creative, probably young, people care about our environment.

B.C. logging firm wants to avoid cutting old growth, but province said it must pay

BY BRENNAN OWEN

A British Columbia company that wants to avoid logging sections of at-risk old growth was told by the Crown corporation that manages B.C.'s public forests to cut the trees down or pay to leave them standing, its chief forester said.

Logging began in the two cut blocks north of Revelstoke in spring 2021, but Downie Timber halted the operations a few months later, when protesters blocked access to the sites. Kerry Rouck, chief forester for Downie's owner, Gorman Bros. Lumber Ltd., said it has remained on pause since the province launched the ongoing old-growth deferral process that fall.

He said the company values its relationships with local First Nations and the public, and doesn't want to jeopardize its social licence by logging areas that overlap with provincially recognized at-risk old growth, as well as caribou habitat. But BC Timber Sales, the provincial corporation responsible for auctioning the harvesting rights for about 20 per cent of B.C.'s annual allowable cut, told Downie it must fulfill its logging contract – or pay full stumpage fees for the trees left standing, Rouck said, referring to payments to the government for logging on public land. "If there's volume left in a timber sale block that is not logged or removed from the site, according to the terms in the contract, then the licence holder owes the province for that wood, in full value," he said in an interview.

Rouck wouldn't estimate how much the company would have to pay for the trees it wants to leave standing, but he said it's a "significant" amount, in addition to roughly \$200,000 that Downie has spent building forestry roads into the two areas. "The irony is that we're trying to work toward a balanced conservation result, and we stand to be penalized," he said.

In response to a request for comment, the Forests Ministry said Downie could choose to resume harvesting and cut around the old growth, which was identified as part of B.C.'s

process to defer logging in the most ecologically at-risk areas. Or, the company could declare the harvest over, remove already felled trees and apply for waste relief for those left standing, the ministry statement said. But those options would carry significant costs, either financial or social, Rouck said. Cutting around the old-growth deferral areas would not address concerns about caribou habitat raised by First Nations and conservation organizations, he said. Still, Rouck said he's optimistic Downie and the province will find a way forward. Downie's contracts to log the two areas expire later next year, he said, so there's time to find a way to leave the trees standing while avoiding significant costs.

In a followup email on Thursday, Rouck said he's since had further discussions with Forests Ministry staff, who indicated they would be open to creative solutions. "Perhaps we can change the harvesting prescription from clearcutting to an innovative partial cut that is more caribou-friendly," he wrote.

Downie and BC Timber Sales will explore options over the coming months, he said.

Eddie Petryshen, a conservation specialist with the Kootenay-based charity Wildsight, said Downie is showing it wants to be part of the shift that's needed to manage B.C.'s forests in a way that preserves the integrity of irreplaceable old-growth ecosystems and the species that depend on them. But government, not a logging company, should be leading the way, he said. "If the province is serious about preserving old growth and keeping public credibility ... then they need to start coming to the table with solutions."

Petryshen said he's walked through the forests within both of Downie's cut blocks, describing the valley-bottom areas as particularly "spectacular." Some of the cedar and hemlock trees measure more than

two metres in diameter, he said. They're part of the inland temperate rainforest, a globally significant

ecosystem that was the subject of a peer-reviewed study published in 2021 by an international team of researchers, including several from B.C. They warned the ecosystem is at risk of collapse within two decades in some areas, largely due to clear-cut logging.

First Nations whose territories encompass B.C.'s proposed old-growth deferral areas – of which there are 2.6 million hectares across the province – must indicate their support before any deferrals are implemented for an initial two-year period. Provincial officials have said the temporary deferrals are meant to preserve at-risk old growth while allowing time for planning around longer-term management.

B.C. government mapping shows 50 per cent of one of Downie's cut blocks north of Revelstoke overlaps with an old-growth deferral area. The second block also overlaps, but by a smaller amount. The Forests Ministry would not confirm whether First Nations have approved the deferrals in the areas Downie wants to avoid, saying the province is not disclosing their responses to respect confidentiality.

However, The Canadian Press has seen a letter from the acting director of the ministry's forest analysis and inventory branch, which states, "I am aware that as of Aug. 18, 2022, priority old growth deferrals are being implemented throughout the Selkirk Natural Resource District, including the Revelstoke (timber supply area)." The two cut blocks are located in that same area, provincial mapping confirms.

The letter was sent to Petryshen after he submitted concerns during the comment period for the ongoing review of the Revelstoke timber supply area. Rouck said Downie works with First Nations on whose territory the company operates, and his understanding is that they all support old growth preservation.

The Okanagan Nation Alliance issued a statement last August demanding that the

province protect old growth and caribou throughout its territory. Another nation, Splatsin te Secwepemc, has also voiced support for deferrals around Argonaut Creek, the same area where one of Downie's cut blocks is located. Throughout the old-growth deferral process, the province has indicated deferrals are going ahead in areas where First Nations have signed off on the plans.

But the Forests Ministry said Downie bought the rights to the two cut blocks before the start of the deferral process, and the B.C. government is not using legislation to enforce deferrals in areas with pre-existing timber supply licences in place. Instead, it said B.C. is working with companies, including Downie, to voluntarily defer harvesting in deferral areas with First Nations' support.

"We appreciate the challenges that come when companies like Downie voluntarily defer old-growth harvesting," the ministry said. As of last month, the ministry said 1.16 million of the 2.6 million hectares

of old growth identified as being at risk of irreversible loss have been deferred.

Rouck said Downie wants to follow the spirit and intent of the New Democrat government's policy direction on old-growth and long-term forest management. That's why the company paused logging in proposed old-growth deferrals shortly after the province launched the process in November 2021, he said. "The Gorman group has always been, you know, let's figure out what works for the public. You give up a little bit here and there because it's in the greater interest right? Try to keep wood flowing to the mills, but it's not at all costs."

Quoted

Mike Morris, B.C. MLA

"We have reached the point where we have run out of harvestable wood. Fundamental changes are required in forest policy in BC!"

Alexander von Humboldt

Long before Rachel Carson, The Sierra Club, or even Charles Darwin there was an extremely influential naturalist, ecological conservationist, activist, and visionary. His name was Alexander von Humboldt's, he was a Prussian and lived in the late 18th and early 19th centuries. In her 2015 biography, *The Invention of Nature: Alexander von Humboldt's New World*, the researcher and author Andrea Wulf, invokes a team of famous scientists and pioneer ecologists to assist in portraying, not only the life of Humboldt, but also the formation of our present way of understanding the natural world and the evolution of ecologically critical observation and thought.

Wulf spins the tale not only of Humboldt's travels, relationships and view of the world, but also incorporates the effect that he, and his twin preoccupations of art and science, had on subsequent thinkers and their efforts. In fact, in her story we are privy to the work of such luminaries as Thomas Jefferson, Henry David Thoreau, John Muir, and Darwin, among others. Her impeccable research, and the compelling manner in which she writes have depicted an individual that, even with all of his foibles, deserves to be recognized among the heroes of the conservation movement.

Humboldt, raised along with his brother Wilhelm, an accomplished member of the Prussian bureaucracy, was raised by his emotionally distant mother on the outskirts of Berlin. Born, before the age of the great western revolutions, in September of 1769, he revered nature and subsequently became an intrepid explorer and probably the most famous scientist of the time.

Journeying to South America and Russia, and subsequently writing and presenting his observations to the audiences that read or came to hear him, Humboldt discovered and shared such concepts as climatic and vegetation zones, rudimentary human caused climate change, and the interconnectedness of ecosystems. He had a penchant for writing in poetic and narrative form which allowed for a wider audience in the classical centers of Europe.

Whether read with an eye to conservation, history, or just as a very readable biography, this book is well worth delving into. It is engrossing, both as a story of the original flowering of ideas which we now recognize, or as a set of shorter interconnected tales of famous people and their roles in developing our view of the world. Wulf has done the environmental community a great service in publishing this work.



The Piliated Woodpecker is an example of the fauna seldom seen in the towns or suburbs of our region, but that exist in wilder environments conducive to their survival. These areas still exist where human contact is limited by accessibility or where the space has been preserved with the intention of species propagation and biodiversity. The OSPS strives to support these spaces.

Industrial Logging is Canada's Hidden Climate Problem

BY MICHAEL POLANYI AND JENNIFER SKENE

October 31, 2022

A new analysis of government data shows that industrial logging is one of Canada's highest-emitting sectors, and that by ignoring logging's emissions, Canada is heading to COP27 with a forest-sized gap in its climate plan.

Logging in Canada is a climate polluter at least on par with oil sands operations. That is the main finding of a new report, *Lost in the Woods*, which calculates for the first time, using the federal government data, the net greenhouse gas (GHG) emissions associated with logging in Canada.

The report, published this week by Nature Canada and the Natural Resources Defense Council, debunks the widespread myth that industrial logging is carbon-neutral, and exposes a massive hole in Canada's climate plan. It shows that the logging industry, which clearcuts hundreds of thousands of hectares of carbon-rich forests each year (the equivalent of six NHL hockey rinks a minute), is one of the highest-emitting sectors of the Canadian economy. In 2020, logging's net emissions totalled 75 megatonnes of carbon dioxide (Mt CO₂e), a figure on par with the emissions from all oil sands production in Canada (81 Mt CO₂e).

In other words, even accounting for carbon stored in long-lived wood products and absorbed by replanted trees, logging produced more than 10% of Canada's total emissions in 2020, or the equivalent of all GHG emissions from the province of Quebec. But these numbers might still be underestimating logging's full climate impact. Because the *Lost in the Woods* analysis relies solely

on government data, the calculations are limited by flaws and omissions in the government's own accounting and reporting. The government, for instance, does not include the carbon impact of "logging scars," areas where, even decades following logging, the forest has failed to grow back.

Canada neither reports – nor has a plan for reducing – logging emissions. Canada has action plans to reduce emissions from other high-emitting sectors, but has no such strategy for the logging industry. In fact, the federal government doesn't even report logging emissions in its annual GHG inventory. Instead, emissions data is scattered across government materials and buried under the reported carbon sequestered by older, greenhouse gas-absorbing forests the logging industry has never touched.

The federal government has, laudably, committed to cut GHG emissions by at least 40% (from 2005 levels) by 2030. If Canada is serious about meeting this target, it cannot ignore a sector that emits more than 10% of Canada's GHG emissions.

The government can fix this glaring hole in its climate plan.

First, Canada must start to transparently report GHG emissions associated with logging – and thereby publicly recognize that logging is a high-emitting sector.

Second, it should develop and implement a clear strategy – with timelines and targets – to reduce emissions from logging. This plan should include regulating logging emissions,

just as the emissions from other sectors are regulated.

Finally, Canada should take action to fix the serious biases and omissions in its accounting of forest carbon emissions.

Reducing logging emissions is key to tackling climate change and protecting nature

Canada is home to some of the most ecologically important primary forests in the world, including the boreal forest, which stores twice as much carbon as the world's oil reserves. These forests are integral to ensuring a climate-safe future, not just for Canadians but for the entire world. Accurately and transparently measuring the climate impacts of industrial logging is a key first step to putting in place effective policies and programs that will fully value our irreplaceable primary forests and recognize the true cost of losing them.

Accurate emissions reporting – and regulation – will also help advance, with Indigenous leadership, a truly sustainable logging sector that will remain competitive in an increasingly climate-conscious marketplace. As the reality of the climate crisis hits home for more and more communities across Canada, policymakers can't afford to ignore one of the country's largest climate polluters. The atmosphere sees the industry's impact, whether the government chooses to acknowledge it or not.

Michael Polanyi is Policy and Campaign Manager (Nature-based Climate Solutions) at Nature Canada. More by Michael Polanyi

Competition Bureau to investigate industry claims of sustainable forestry management

BY BOB WEBER, CANADIAN PRESS

February 1, 2023

The Competition Bureau has opened an inquiry to see if forestry industry claims of sustainable management on vast stretches of Canadian woodlands are false advertising.

The inquiry, announced late last year, comes in response to a complaint filed by the environmental law firm Ecojustice on behalf of eight environmental groups. Ecojustice says that forest industry ads claiming the Sustainable Forestry Initiative sets rigorous harvesting standards are dishonest and misleading.

“The (standard) does not prescribe, require, assure, command, mandate, or in any form certify sustainable forest management,” says the complaint filed to the bureau. “It allows aspirations, stated intentions, and programs to be conflated with actual outcomes.”

Jason Metnick, spokesman for the initiative, denied those allegations Wednesday. “(The initiative) has a forest management standard that is based on objective performance measures and indicators,” he said.

At stake is Canada’s most commonly used method of assuring consumers that the wood and paper products they buy are harvested in accordance with modern ecological principles. It is promoted by the Forest Products Association of Canada and purports to certify sustainable forestry on more than 120 million hectares. But the Ecojustice complaint calls on the Competition Bureau to force the industry to retract those claims and pay a \$10 million fine. It says the initiative uses vague language that is too woolly to create any sort of measurable standard. Terms like “rare,” “ecologically important,” “significant” and “at risk” are not defined.

Ecojustice says companies are allowed to define for themselves what constitutes an old-growth forest. The initiative defines long-term as up to 80 years — too short to mea-

sure real sustainability and more in line with harvest schedules. The system allows forests to be converted from one type to another with “appropriate justification.” Ecojustice says while the system suggests clearcuts be limited, it allows too many exceptions. As well, it criticizes the initiative for focusing on process. The complaint says the system assumes that if adequate policies are in place, the results on the ground will be good.

“(Sustainable Forestry Initiative) employs no means of assuring that certification to the SFI standard achieves sustainable forest management,” the complaint says. Ecojustice points out there are no cases of certification being withdrawn for non-compliance. “In the absence of mandatory requirements, there is no standard against which performance could be judged inadequate,” it argues.

Metnick said the complaint is based on outdated and misleading information and that the standard does contain specific targets. “We have ... 114 indicators that speak to both

an outcomes-based as well as a systems-based approach,” he said. “We believe we are sound and based off of science.” Metnick said certification is only awarded to companies that have passed a third-party assessment. Companies are audited annually, which includes a field inspection component, he said. “The auditor will go into the forest and make sure that what the organization says they are doing is backed up by the field visit.”

The Competition Bureau inquiry, which is not conducted in public, has the power to use the courts to compel evidence. A spokesman for the bureau said the Ecojustice complaint was assessed before the decision to hold an inquiry was made. “When the bureau receives such a request, the information provided is reviewed to determine whether it meets the technical requirements of the section,” said Yves Chartrand in an email. “If so, the bureau is obliged under the (Competition) Act to launch a formal investigation to determine the facts.”



Agur Lake

Forty years ago, Bonnar Dowler vowed to build a camp for children with special needs and their families. The Penticton man made the promise while his own terminally ill son was a patient at BC

Children's Hospital. Mark Wayne Dowler died on December 19, 1974 at the age of six months. I remember seeing all those children in hospital and thinking how much it would mean to them and their families to spend time in nature," Bonnar recalls. Following Mark's death, he turned his

attention to providing for his wife and other son, Michael. Over the years, he worked as a welder and later as an auctioneer. Time passed but Bonnar did not forget his vow. In 2002, he officially introduced the idea of a children's camp to the Summerland Kiwanis Club.

"I had been talking about the possibility but had never made a definite proposal," says Bonnar, a long time member of Kiwanis. A year later he placed a postage stamp sized ad in the Penticton Herald asking for a donation of land. Florence McArthur of the Penticton

Indian Band saw the ad and phoned Bonnar to say Robin Agur of Summerland might be able to help. Bonnar recalls the day he and Robin visited the future site of the camp 15 km west of Summerland. "At the far end of the lake was a herd of wild horses.

The stallions were rearing and challenging each other. It was like in a movie."

In July 2007, three years after the incorporation of the Agur Lake Camp Society, a 99-year lease on Agur family land was signed. In the summer of 2013 the camp welcomed its first overnight campers. They enjoyed the two barrier-free cabins built in cooperation with Okanagan College, trails designed to

accommodate wheelchairs, a portable dock, and a pavilion and fire pit. A third cabin is nearing completion. "I hope we'll eventually need at least 10 cabins," says Bonnar.

Over the years the camp project has been generously supported by the provincial government, local businesses, individuals and organizations, and a host of hands-on

volunteers who readily rollup their sleeves to tackle whatever task is at hand. "There have been a handful or people who were solid and

made the camp happen. Beth and Maarten Bontin, Dave and Linda

Morgenstern and Brad Hope come to mind immediately," says Bonnar. Among his memories Bonnar places near the top the receipt of an anonymous donation of \$1,000 with a note saying "we were in a similar situation to you." Reflecting on his journey, Bonnar says, "I was driven. Unbelievably driven."

Quotable Comments

"If we want to protect water and provide for water/watershed security, watersheds need to be protected from development, in particular timber exploitation, mining, and oil & gas. "Improved watershed governance" will do little to nothing to protect water without removing control of watersheds from timber tenure holders and permits for mining and oil and gas. To effectively mitigate, or help to mitigate climate change, watersheds need to consist largely of intact, old forests. Watersheds with this composition are rapidly becoming rare."

HERB HAMMOND
Forester, Author, and Activist



Trout Creek Revitalization – In recent years the traditional Kokanee migration routes throughout much of the South Okanagan/ Similkameen have been restored and revitalized through the efforts of indigenous governments and partnerships. Trout Creek, below the federal governments Research Station in Summerland, is currently being worked on to enhance its suitability as spawning grounds. Vegetation, rocks and gravel, and waterflow are all part of the equation.

Clearcuts Release Carbon

The logging industry counts primary, direct harvesting emissions such as trucks and chain saw gas used, which was recently 42 million tonnes of CO2. They count slash burning at 4 million tonnes, but do not include that anywhere, such as in the 42 million tonnes.

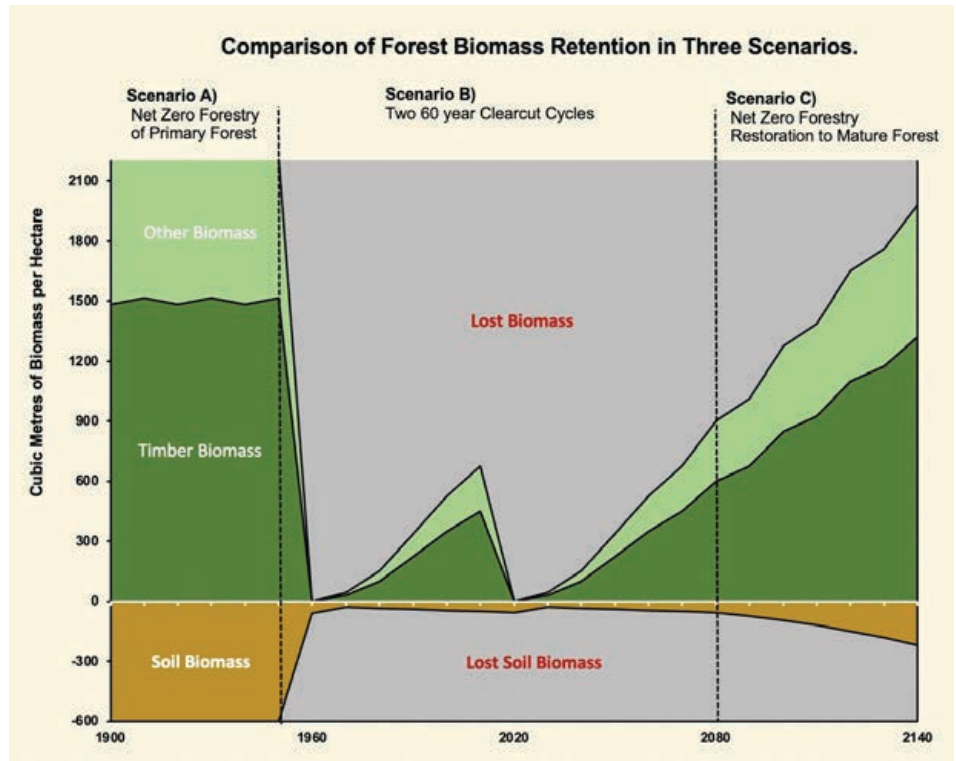
Unfortunately, neither of these numbers appear in BC's total official carbon footprint. The Sierra Club wrote a good report on that.

Unfortunately, they don't even recognise logging as causing the secondary CO2 issues, such as wildfires and lost carbon sequestration. I have summarised the whole issue in this chart.

Every year, by clearcutting 200,000 hectares (and rising), we delete 60% of the biomass on that area permanently. They say "it grows back". Only 40% grows back, and that only much later. Every year, that new loss of biomass doesn't sequester another 40 million tonnes of CO2, cumulatively.

	Clearcutting Practice	Net CO2 emissions caused
+	The cumulative effect of lost annual carbon sequestration caused by periodic biomass removal.	40 million tonnes
+	Industrial slash burning (mysteriously reported as 8 then reduced to 4)	4 million tonnes
+	Harvesting itself: building roads, extraction, trucks etc.	42 million tonnes
+	BC's annual wildfire CO2 emissions have skyrocketed from historical baseline averages around 10 million tonnes, to...	190 million tonnes
=	Net annual CO2 emissions from clearcutting	276 million tonnes
>	Total BC emissions from burning fossil fuels	67 million tonnes

Vegetation, specifically trees, are a carbon sink. It makes perfect sense that if you clearcut a forest to make way for a dead space then you release the carbon in the new dead trees, or as the logging industry calls them fiber, and there are no trees left to capture the new carbon present in the atmosphere.



The carbon absorbing biomass is an important tool in our fight against climate change. The graph shows the difference in stopping clear cutting now (restoration) and taking another wack at the forest after a 60 year period of time.

Scientists Tangle Over ‘Wood Wide Web’ Connecting Forests and Fungi

BY SARAH KAPLAN

February 14, 2023

People once saw forests as arenas of fierce competition. It was every tree for itself, each organism perpetually battling its neighbors for access to water, nutrients and light.

But when scientists dug deeper — literally — they found that the ecosystems are buttressed by an underground partnership between trees and threadlike fungi called mycorrhizae. These fungi link into plants’ roots, providing nutrients pulled from the soil in exchange for a supply of photosynthetic sugars. In some cases, the fungal filaments have been shown to connect the roots of multiple trees — providing a pathway for nutrients to shuttle between organisms.

The discovery of these mycorrhizal connections yielded a booming new body of research on what the academic journal *Nature* once called “the Wood Wide Web.” Studies from British Columbia, Switzerland and elsewhere have suggested that trees use mycorrhizal networks to exchange messages and share resources with struggling seedlings. Books, movies and news articles (including a recent story from *The Washington Post*) have helped popularize the concept, celebrating forests as models of cooperation in a world riven by human conflict, consumption and climate change.

Yet some researchers say their field has swung too far in the wrong direction — embracing

the idea that shared mycorrhizal networks are widespread and beneficial without sufficient evidence to back up their claims.

“It’s such an appealing story, that forests are these cooperative places, that big old trees are taking care of kin ... I think many people are drawn to it,” said Justine Karst, a forest ecologist at the University of Alberta who studies mycorrhizae. “But the story is ahead of the science.”

In a new perspective piece for the journal *Nature Ecology and Evolution*, Karst and two fellow ecologists reviewed hundreds of studies from labs and forests around the world. They found that just a handful of experiments actually used genetic analysis to map mycorrhizal networks and show fungal links between trees. In the studies that found signs of resource transfer, the scientists say experimenters usually failed to consider alternative explanations — for example, that the nutrients may have flowed through the soil, instead of via the fungal network.

“There’s actually a lot of variability in outcome of these experiments, and that is interesting scientifically,” said co-author Jason Hoeksema, an ecologist and evolutionary biologist at the University of Mississippi. “If we want to actually understand how forests work, we need to embrace that variability.”

The perspective published Monday is especially skeptical of claims that mature trees send messages and sugars to their offspring via mycorrhizal connections, which they say is not supported by any published, peer-

reviewed research. One oft-cited greenhouse study that showed carbon flowing between related seedlings also found that the nutrient was transferred through the soil even when fungal filaments were blocked — suggesting that direct mycorrhizal links weren’t the only pathway for resource exchange. A graduate thesis that examined how seedlings grew when planted next to related trees found that unrelated seedlings fared better in real forests.

Suzanne Simard, a forest ecologist at the University of British Columbia who has been at the forefront of research on forest-fungi cooperation, pushed back against Karst and her colleagues’ interpretation of her lab’s work. For example, the greenhouse study they criticize also found that the majority of carbon flow was concentrated in fungal hyphae — indicating the fungi played a prominent, if not exclusive, role in connecting related seedlings.

The relationships undergirding forests complex, Simard said, and she agreed more experiments are needed to untangle them. But in the meantime, she added, scientists know enough about the importance of mycorrhizal networks to forests to know that both trees and fungi need to be protected.

“Reducing ecosystems to their individual parts hinders us from understanding and appreciating the emergent relationships and behaviors that make these complex ecological systems thrive,” Simard said.

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A Dream Coming True

The dream of creating a single 370 km long hiking and cycling trail from Sicamous B.C. to Brewster Washington is approaching reality.

A number of groups are involved including Okanagan Rail Trail, Sicamous to Armstrong Rail Trail, Gellatly Bay Trails and Parks Society and the Trail of the Okanagans Society.

The Trail of the Okanagans Society, located in B.C., is an advocacy group focused on securing trail sections between the Bennett Bridge in Kelowna and the Canada/U.S. border.

The route tracks the traditional trading routes of the Okanagan First Nations skirting lake edges, winding thru forests and hillsides and bordering vineyards and fruit orchards connecting our valley communities. Of the 125 km from Bennett Bridge to the U.S. border 91 km or 73% can be cycled or walked at this time.

Interested? For more information on efforts to complete this trail along with a descriptive map go to:

www.trailoftheokanagans.com

Your participation is very welcome.

To better understand how claims about the “wood wide web” were spread, the authors examined how 18 “influential” studies were cited by other researchers. They found that citations often left out caveats and alternative interpretations that were included in the original studies. Like messages in a game of “telephone,” the takeaways from the original studies changed subtly with each citation — often in ways that made the findings seem more conclusively positive than they actually were.

Karst and her colleagues include their own work in their critique, pointing out times when they themselves failed to rule out alternative explanations or thoroughly back up their claims. “All three of us have papers that, if we were writing them today, we would not say the same things,” said co-author Melanie

Jones, a professor of biology at the University of British Columbia who studies how mycorrhizal associations function in ecosystems.

Stanford University mycologist Kabir Peay, who was not involved in writing the perspective piece, applauded the authors’ call for more rigorous standards.

But Peay said the analysis also overlooks some meaningful findings about the importance of shared mycorrhizal networks. It de-emphasizes lab experiments and studies involving plants other than trees, which have provided much stronger evidence that plants can exchange information and nutrients via their fungal connections, he said. It also disregards the benefits of these networks that go beyond resource transfer — for example, making it easier for new seedlings to form

fungal partnerships via a preexisting network.

Toby Kiers, an evolutionary biologist at Vrije Universiteit Amsterdam who has tracked resources flowing through fungal networks in her lab, said it would require an immense investment to develop tools capable of doing the same analysis in real forests. But it’s vital to understand how these networks really work, she added, because both forests and their underground fungi are vital to the health of the planet.

“The story is even more interesting than altruistic-trees-sharing-resources,” Kiers wrote in an email. “My hope is that [Karst’s paper] will help motivate more researchers to study these dynamics because they are way more complicated than people assume.”

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The researchers then cut several older pines and treated the cut trunks with dyed water. The dye showed up in the seedlings, despite the lack of connections between roots, indicating that fungal hyphae had done the transfer.

That is suggestive of trees transferring water, Jones says, but still leaves open the question: Does any of this matter for the seedlings? If mycorrhizal networks have evolved to allow older trees to help their younger kin survive, the resource transfer must improve seedling survival. There, too, Karst and Jones claim some of the evidence is shaky. “In the really well-controlled experiments, less than 20 percent show that the seedlings performed better,” Jones says. In the remaining 80 percent, she adds, the hyphae-connected seedlings performed either equivalently or worse than the ones cut off from the fungal network.

Meanwhile, the idea that trees send underground warnings to one another about herbivorous insects or other dangers is predicated on a single greenhouse study in which a Douglas fir and a Ponderosa pine were connected only by fungal networks. When researchers stressed the Douglas fir by exposing it to insects, the Ponderosa pine also started pumping out defense chemicals. However, the effect disappeared when the firs and pines were connected by both roots and fungi, which is what happens in the wild. “The main message

is that this hasn’t been tested in a forest,” Karst says. “When you see those pictures of ancient forests, big trees and they’re passing signals to each other, it just hasn’t been tested.”

The idea of forests as cooperative, rather than competitive, also conflicts with the fundamentals of natural selection, says Kathryn Flinn, a plant community ecologist at Baldwin Wallace University in Ohio, who was not involved in the new analysis. The argument for cooperation is that trees in a healthy forest survive better than trees in a sickly one, but such instances of group natural selection are rare in the wild, Flinn says. And in forests, individual selection favors resources in a way that would prevent any group benefits. “I find this whole controversy really interesting because it’s an example of people wanting to project their own values onto nature and or wanting to see in nature a model for human behavior,” Flinn says.

Simard, whose research on forests has provided much of the basis for the arguments that trees cooperate, declined to answer specific questions about the new analysis but said in a statement that she stands by her research. “Forests provide crucial support to life on our planet. Reducing ecosystems to their individual parts hinders us from understanding and appreciating the emergent relationships and behaviors that make these complex ecological systems thrive,” she says. “For decades,

a compartmentalized approach has hindered us from better understanding why forests help regulate global climate and harbor such rich biodiversity. Applying reductionist science to complex systems accelerates the exploitation and degradation of forests worldwide.”

Karst, Jones and their study co-author Jason Hoeksema of the University of Mississippi agreed that a reductionist view of the forest—in which individual parts of the network are tested individually rather than in context—is not the only way to study ecology. However, these reductionist studies have been used to make big claims about mycorrhizal networks, they said, adding that they wanted to focus their analysis on what the results really showed. They limited their analysis to studies conducted in real forests, they said, because these are most relevant to the real world.

Karst says that she and her colleagues are not intending to put a chill on research in this area, but to push it into new types of forests and encourage investigation of the most promising areas, such as water transfer between trees. For her part, Karst believes there may still be truth to the idea that mycorrhizal networks are involved in at least some tree-to-tree networking, and better-designed experiments could get at that truth. “I want to have another go at it,” Karst says.

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Do Trees Really Support Each Other through a Network of Fungi?

Trees communicate and cooperate through a fungal web, according to a widespread idea. But not everyone is convinced

The tips of tree roots are intertwined with filaments of fungus, forming a hidden underground network that seems to benefit both organisms: the filaments, known as hyphae, break down minerals from the soil that trees can then take into their roots, while the fungus gets a steady source of sugar from the trees.

More poetically, research has hinted that these connections—known as mycorrhizal networks—can extend between trees, enabling one tree to transfer resources below-ground to another. Some researchers even argue that trees are cooperating, with older trees passing resources to seedlings and nurturing them as a parent might.

This idea of forests as cooperative, caring places has caught on both in the scientific literature and popular culture, notably in the 2022 book *Finding the Mother Tree: Discovering the Wisdom of the Forest*, by forest ecologist Suzanne Simard of the University of British Columbia. There is even a punny popular name for the phenomenon: the “wood-wide web.”

A new analysis published in *Nature Ecology*

& *Evolution*, however, argues that the evidence for mycorrhizal networks facilitating tree cooperation is not as strong as the popular story would suggest. It’s not that relationships between trees and fungi don’t exist, says co-author Justine Karst, an ecologist who studies mycorrhizal networks at the University of Alberta. Rather, in many cases, suggestive evidence or studies with many caveats have been taken as more definitive than they really are. “We don’t want to kill anyone’s joy or curiosity or wonder about the forest, but we just want to tamp down on some of the misinformation,” Karst says.

The problem with researching mycorrhizal networks is that they’re very delicate: dig up a root, and you’ve destroyed the very web of fungi and wood you wanted to study. That makes it hard to tell if a particular fungus is really connecting any two trees. The best way to get around the problem is to sample fungi from different locations, sequence their genetic information, and make a map of where genetically identical fungi are growing. This is a tremendous amount of work, Karst says, and she and her co-authors could find only five such studies across just two forest types, comprising only two tree species and three types of fungi.

Making these studies even more challenging is the ephemeral nature of fungal networks. Fungi can grow as individuals after being split, says Melanie Jones, a plant biologist at the University of British Columbia and a co-author of the new analysis. Even genetic samples provide only a snapshot and can’t reveal whether the bits of fungi collected at two different trees are still actually connected. They may have been severed by part of the fungus dying or by something taking a bite

out of it. “It’s a very thorny issue,” Jones says.

These limitations raise questions about how widespread mycorrhizal networks are, and how long they last.

It is clear that substances from one tree can end up being taken up by a neighboring tree in the forest. Researchers can test this by providing one tree with a chemical compound tagged with a certain marker. In a 2016 study in a Swiss forest, researchers sprayed some trees’ leaves with a particular isotope of carbon and found that isotope showed up in unsprayed neighbors. However, it’s not clear that fungi are necessarily responsible for this transfer, Jones says. Resources can also move directly root-to-root and through the soil, and it’s very difficult to separate out those pathways in a real forest. Researchers try to set up barriers between trees so that fungal hyphae and roots can’t connect them, leaving only the soil pathway as a possible means of transmission. But these barriers themselves (usually made of fine mesh) can affect tree growth, complicating the picture.

To test the effect of mycorrhizal networks, researchers also often set up wide-mesh barriers, allowing fungi but not tree roots through. But Karst and Jones contend that in such cases, some researchers have rarely checked to make sure a connected mycorrhizal network has actually formed. The strongest evidence for trees sending resources via fungal pathways versus roots or soil came from one 2008 study in which mesh was used to allow only fungus, but not roots, to connect *Ponderosa* pine seedlings to older pines in a real forest, Karst and Jones say.

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