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Source: “100 Thousand Years and Counting” by Miguel Tremblay and Julien Castanié. Full comic https://octet.ca/sgdn/index_en.html

Watershed Sentinel

December 2024 | January 2025

Vol. 34 No. 5

Features

A Way Through

Underground explorers are charting Canada's longest cave to protect a fragile karst landscape.

Survival

In these pages, we look at survival in an uncertain future – from Indigenous cultures that have already survived apocalypse, to visions of a livable future that allow us to "backcast" a way there, to efforts to bring creatures back from the brink of extinction.

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There's no place like home

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Watershed Sentinel

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Editorial

Zoe Blunt

Into the Unknown

If only we had a one-size-fits-all blueprint for survival. But there's no such thing as a foolproof roadmap to safety; there are too many variables and differences between one place and another. No one can make detailed predictions about the future. Every community and bioregion will have to forge its own solution based on local challenges and resources.

What we can offer is this urgent message: be prepared. Not just physically prepared with survival gear and supplies, but with courage and resilience to endure fear, danger, and torment.

Some may regress into mere animal survival: competing with our neighbours, looting, the dog-eat-dog mentality. This is counterproductive.

Social preparation is the key, because humans must pull together to build a future. We should brace ourselves for political chaos and envision ways to carry on if the authorities abdicate. To prepare mentally will mean gaining skills, knowledge, and information about the natural world and the risks we face. And ultimately, we should prepare to be humbled by the awesome power of the Earth, the atmosphere, and the oceans.

—Zoe Blunt, Sayward, BC, November 2024now:

What's new at the 'Shed

Making donations easier and more fun. We've streamlined the online donation process and set up an auto-renewal option so you don't have to worry about your subscription expiring at the end of the year. (And it saves us having to send out so many renewal notices.)

Don't miss the new Wild Canada calendar and subscription package for everyone on your list! The package includes a beautiful nature calendar, a full year of the *Watershed Sentinel*, a gift card with your message, and free shipping. Get the same deal for yourself while you're at it! To order, visit *www.watershedsentinel.ca*, call us, or send in the order form in this issue.

We're proud to sponsor the World Community Film Festival, now in it's 34th year! The fest returns to Courtenay on January 31 and February 1, 2025, and features the latest masterpieces from Velcrow Ripper, Maureen Gosling, Ed Carswell and many more. Tickets go on sale in December at the Sid Williams Theatre. Mark your calendars! *www.worldcommunity.ca/film-festival*.

Our newsletter is free! Sign up now for even more stories, videos, and events from the Sentinel and around the world. Add your email address to our list by visiting *www.watershedsentinel.ca* or emailing *terry@watershedsentinel.ca*.

Thanks so much to our subscribers! We see you when you slip an extra $10 or $20 into your renewal order. And of course our monthly donors keep us going during the slow months. Happy new year!

Energy projects delayed, canceled

Hydrogen Bust

The promise of a North American "green" hydrogen energy market is fading as complications pile up, leading to a rash of delays and cancellations in Canada and around the world. In Prince George, BC, an Australian mining company withdrew its hydrogen-to-ammonia project this year citing global market challenges, while climate campaigners pointed out its huge energy cost – up to 1000 megawatts, nearly the total output of BC's Site C Dam. On the Atlantic coast, shipments that were pledged to start in 2025 are postponed due to a "supply-demand mismatch." Ten "promising production projects" in the eastern provinces still lack final investment decisions. Globally, the market appears glutted with thousands of projects striving to deliver the lowest-cost bids. African companies are expected to deliver hydrogen for half the price of Europe and North America.

—www.theenergymix.com
October 22, 2024

Voters support fracking regulation

Fracking Divide

Pollsters who surveyed Pennsylvania voters found broad bipartisan support for tougher regulations on the fracking industry – encouraging news for environmentalists who have long raised the alarm about fracking's impact on public health, the environment, and the climate. The public opinion poll shows 94% of respondents want mandatory disclosure of fracking chemical ingredients, 93% supported safer fracking waste transport, and 90% want wells further away from hospitals and schools.

—www.apple.news
October 14, 2024

Alaska fishery shuts down

Bycatch Closure

A fishing fleet from Kodiak, Alaska was shut down this fall after unintentionally catching 2000 king salmon in one day. Federal managers closed the fishery for the season for exceeding its bycatch limit. This unusual event comes after tribal advocates and conservation groups spent years pleading with the government to enforce the rules on trawlers indiscriminately scooping up salmon and other protected species in dragnets while targeting pollock and other lower-value fish. Most of the bycatch salmon originate in BC, the west coast of the US, or the Copper and Kenai rivers in Alaska. King salmon in Alaskan rivers are in decline, leading to closures and restrictions on fishing and a petition to list Gulf of Alaska kings as endangered.

—www.alaskapublic.org
September 27, 2024

Drinking water contamination

PFAS in Water

Scientists say it is "crucial to protect public health" to monitor drinking water and regulate levels of per- and polyfluoroalkyl substances (PFAS), after finding widespread contamination in 112 water samples. Samples of bottled water from 15 countries and tap water from the UK and China all contained the "forever chemicals," although not in concentrations high enough to warrant "a major health concern," said the study's co-author Stuart Harrad. Fortunately, the research team found that boiling drinking water and filtering it with a simple activated-carbon filter is sufficient to remove most of the compounds.

—www.ecowatch.com
October 21, 2024

Hopes for a right whale baby boom

Whale Orgy

A mating frenzy caught on camera off Western Australia is a sign of hope for boosting the endangered southern right whale population. Video taken by an Albany resident shows six or seven whales mating in a group, a phenomenon that marine biologist Pia Markovic says is not uncommon among southern rights. "They look to be rolling over each other and rubbing up against each other, which is pretty typical of whale sex," Markovic said. Mating starts when a female puts out a call which travels underwater. "It's almost like a dance when there's physical stamina; they're agile and it's quite graceful actually," she added.

—www.abc.net.au
October 17, 2024

PetroChina drops its commitment

Quitting TMX

PetroChina has dropped its commitment as a shipper on the Trans Mountain Pipeline. The company has assigned its contracts to another party, according to a letter it filed with the Canada Energy Regulator in October. PetroChina holds six assets in western Canada, including the MacKay River and Dover oil sands projects and a stake in the LNG Canada project, which is expected to start production next year.

—www.reuters.com
October 11, 2024

Letters

Fair Voting System Required

We just survived an election that could have burdened BC with a government as dismal as those of Danielle Smith or Doug Ford. The dangers of increasing polarization are clear for all to see.

Remember how, when the NDP was first elected in BC, Dave Barrett asked his new caucus: Do we want to govern so we stand the best chance of being re-elected, or do we want to bring in much needed changes, even if it means we won't be re-elected next time? They chose the second option, and brought in things like the ALR, ICBC, public schools for kids with disabilities, and democracy reforms. They also banned corporal punishment in schools, introduced Pharmacare, and established the BC Ambulance Service.

Times have changed, but a minority government offers a rare opportunity to make some much-needed changes. BC must stop subsidizing fossil fuels. And we need a fair voting system.

Back in 2004, the provincial Citizens Assembly on electoral reform recommended BC adopt a single transferable voting system (BC-STV) similar to what Ireland has. Seventy-seven of BC's 79 electoral districts voted in favour of the proposed change in a referendum, and the overall level of support was just shy of the 60% that had been stipulated as a requirement for the change to be adopted.

One young person I know says the betrayal on implementing fair voting was the biggest political betrayal of her life. Our efforts have failed before, but the stakes are so high; we mustn't give up!

—Jan Slakov
Texada Island, qathet, British Columbia

Gulf Islands' "Unique Amenities"

Thank you so much for the light you shed on both problems and solutions when it feels like the voices of environmental reason are struggling. The article on the Gulf Islands Trust [in *WS* Oct-Nov 2024] highlights the concern so many of us have over the current interpretation of the term "unique amenities."

Words can be a double edged sword. Pressure from within the Trust by members striving to expand the definition of environmental protection to cover everything from housing to tourism is considerable on Salt Spring. Again, thank you for bringing attention at this critical time.

—Marian Hargrove
Salt Spring Island, British Columbia

Watershed Worthy of Protection

In this time of droughts, wildfires, heat domes, and floods, when do we realize saving a forested area is worth it?

The Chum Creek watershed flows from the Skimikin/Ptarmigan (S/P) Hills east into the Turtle Valley aquifer and west into Chase Creek. Both eventually drain into the South Thompson River. The subterranean streams or groundwater of the S/P Hills feed this watershed. BC Timber Sales plans to facilitate (put out to tender) the clearcutting of four individual cutblocks totalling 44 ha (108.8 acres) that overlap these streams. This disturbance will potentially reduce the water supply that supports local residents with domestic and agriculture water use.

Based on diversity and age, this area is one of the shrinking vestiges of a healthy forest and is more resistant to wildfire due to the wetlands and aquifers. The area is a stronghold for biodiversity and habitat of several species at risk, including the red-listed American badger, fisher, long-tailed weasel, the blue-listed western painted turtle, and pine grosbeak.

So, when do we recognize that this forest is important to save, and make the stand to protect this watershed? We need open discussion and further assessment regarding the future of this valuable watershed.

—A Grube & A McLaren
Chase, British Columbia

Seaweed Gets Its Fair Shake

Re: "BC Kelp Farms" in your Summer 2024 issue: The writer felt that "scientists aren't including kelp in any action plans for reducing atmospheric CO_2." However, Project Drawdown highlighted seaweed farming several years ago *(https://drawdown.org/solutions/seaweed-farming)*: "Expanding seaweed farming enhances carbon sequestration and boosts production of biomass that can be used for biofuel, bioplastic, livestock feed, and human consumption."

—Alex Jamieson
North Vancouver, British Columbia

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Read all unabridged letters for this issue online at *www.watershedsentinel.ca*

Close ocean-pen fish farms

Critics Are Right

An op-ed in *Intrafish*, the fish farm industry's top global magazine, is sounding the alarm about illnesses in ocean-pen farmed salmon that infect wild salmon in BC and elsewhere. The article says it's time to move from ocean-pen fish farms to land-based closed containment pens. The author describes out-of-control sea-lice infections causing serious financial losses. The costs are "astronomical" and likely to rise even further, the piece says, with climate change triggering changes in ocean temperatures and fueling outbreaks in salmon farms around the world.

—www.intrafish.com
October 3, 2024

Indigenous concerns over CO2 hub

Carbon Conflict

Cold Lake First Nation Chief Kesley Jacko says Pathways Alliance's proposed carbon storage hub on his nation's land is getting "rubber stamped" without proper consultation. Pathways Alliance includes giants like Cenovus Energy, ConocoPhillips Canada, and Suncor Energy, and comprises almost all tar sands production.Its signature project is a 400-km pipeline network designed to ship carbon dioxide from the Alberta tar sands to an underground storage hub near Cold Lake, AB. Jacko says the megaproject lacks an emergency management plan, and Pathways told him it would only be developed after the project was completed. The consortium currently is seeking regulatory approval from the Alberta Energy Regulator.

—www.readtheorchard.org
September 25, 2024

Questions raised about lobbying

Gas Ban Ends

Vancouver's mayor and city council have voted to repeal the city's ban on natural gas in new buildings. About 150 BC business people have asked city council to reinstate the gas ban, which was enacted in 2020 to block natural gas pipes and other infrastructure in new buildings. Vancouver was the first Canadian city to adopt this type of ban, drawing the wrath of Canada's gas lobby. Observers now are raising questions about links between natural gas lobbyists and the mayor's senior advisor. "There's a lot of concern right now about people's trust in politicians and government decisions, so in any case, you should err on the side of caution," noted councillor Adriane Carr.

—www.nationalobserver.com
October 15, 2024

Hundreds affected by brain disease

Glyphosate Link

Three years after it was first identified, 430 New Brunswick residents have fallen ill and 39 have died from a neurological disorder that mimics dementia. Officials are no closer to finding a cause for what doctors call "New Brunswick neurological syndrome of unknown etiology." Dr. Alier Marrero, a neurologist at the Georges L. Dumont University Hospital Center in Moncton, says that for political reasons, the government has turned its back on those who are suffering. Preliminary blood test results show drastically-elevated levels of glyphosate in 90% of patients. But to properly study and diagnose the syndrome will require the support of a government that may be unduly influenced by industry,

—www.beyondpesticides.org
September 3, 2024

More damage from logging after fire

Stop the Salvage

So-called "salvage logging" causes more harm than good overall, according to a scientific panel in Prince George, BC. "Nothing is saved or preserved" by logging forests damaged by fire and pine beetles, panelist Dr. Dominick DellaSalla charged. Scientists also say more carbon is released and biodiversity is diminished by these commercial logging operations. Dr. Diana Six, a forest entomologist and professor at the University of Montana, adds that logging hampers evolution in a changing climate by removing surviving trees that have the genetic potential to pass on insect resistance. Dr. Karen Price, an ecologist with the BC Ministry of Forests, noted that dead trees are extremely ecologically valuable. The best way to increase resilience in nature and communities is by "leaving primary forests alone," according to Conservation North spokesperson Michelle Connolly.

—www.conservationnorth.org
July 22, 2024

Greenwashing backlash continues

Fake Ads Banned

The Toronto Transit Commission (TTC) has banned misleading fossil fuel advertisements from transit stations, buses and trains, marking the first time a Canadian public transportation agency has adopted such a policy. After the Canada Action greenwashing scandal, TTC now requires fossil-fuel advertisers to verify their environmental claims with recognized scientific research. The TTC says the measure will help ensure the public is not misled further about the impact of fossil fuels.

—www.nationalobserver.com
September 27, 2024

Spray Down

A growing movement aims to end herbicide "poisoning"

by Zoe Blunt

First Nations and environmentalists have denounced the practice of aerial herbicide spraying on forestlands for decades. This year, Indigenous groups in Northern Ontario have announced a ban on blanket herbicide use, while in Nova Scotia, residents have resorted to peaceful direct action to enforce their own ban.

The forest industry routinely dumps tons of chemicals like glyphosate, the main ingredient in Roundup weedkiller, on logged areas to kill off naturally-regenerated trees and shrubs in favour of commercial tree farms. The problem is, these herbicides are lethal to frogs, lizards, and salamanders. They wipe out medicinal plants and berry bushes that Indigenous people and wildlife rely on. Glyphosate, a suspected carcinogen, contaminates rivers and groundwater far and wide through indiscriminate spraying.

In September 2024, a tanker truck overturned on a Northern Ontario forest road and spilled 600 litres of GlySil, a glyphosate compound, into the soil. Shocked by the accident, the Temagami First Nation (TFN) and the Teme-Augama Anishnabai community (TAA) responded by declaring a total ban on aerial herbicide spraying within their home territory.

"We are gravely concerned about both the immediate and long-term impacts this spill and this practice have had and will continue to have on our region. This practice must stop," said TFN Chief Shelly Moore-Frappier.

The problem is, these herbicides are lethal to frogs, lizards, and salamanders.

TAA Annike Ogimaa (Second Chief) John Turner notes Ontario has outlawed GlySil on private lawns, parks, and schoolyards because it is "an unnecessary risk to human health, especially children's health." Across Nova Scotia, community members have taken matters into their own hands and set up camps to block the use of toxic herbicides. For the past three years, grassroots volunteers from Don't Spray Us!, No Spray Bear River, Stop Spraying and Clear-Cutting Mi'kma'ki, and Allen Hill Anti-spray Coalition have put themselves in harm's way by camping in areas targeted for aerial spraying with banners warning pilots "Humans Are Here."

Groups declared victory this year at Allen Hill and two locations near Bear River (L'Sitkuk), Nova Scotia. Savanna Callison of Allen Hill Anti-Spray Coalition attributes its "small victory" to the peaceful nature of the occupation and the "civil discussions" she and the group had with company representatives. The Bear River sites included a drinking watershed and an ecological reserve, and both were canceled this year after campaigns of civil disobedience and letter-writing that targeted provincial decision-makers.

The Nova Scotia government permitted ARF Enterprises and J.D. Irving to spray over 1800 hectares of forest in September. It's unclear how many 2024 permits expired with no herbicide application.

Meanwhile in British Columbia, Timber-West quietly scrapped almost all 2023 herbicide spraying across a large area of Kwakwaka'wakw territory on northern Vancouver Island. This apparent change of heart followed public pressure from Indigenous leaders (see "Herbicide Victory," *Watershed Sentinel*, October-November 2024).

COP16 in Colombia

Key takeaways from this year's Conference on Biodiversity

by Zoe Blunt

When COP16, the 16th Biodiversity Conference of the Parties to the UN Framework Convention on Climate Change, sputtered to a halt on Saturday November 2, a lot of work was left unfinished.

Friday's marathon all-night session failed to yield a consensus on establishing a biodiversity fund to help less-developed countries protect habitat. By morning, many of the delegates had departed, and the session no longer had enough members to continue.

This year's Convention on Biodiversity in Cali, Colombia builds on the Global Biodiversity Framework adopted at COP15. That conference, held in Montreal in 2022, adopted a conservation goal of "30x30" – protecting 30% of land and water and restoring 30% of degraded ecosystems by 2030. An interim goal required the member countries to draw up plans showing how they would hit that target.

More than half the member countries did not submit those plans. Many less-developed nations stipulated that they lack the capacity to hire teams to conduct ecosystem surveys and research. Canada submitted its biodiversity blueprints earlier this year, along with a $15 million pledge for Birds Canada to support migratory bird habitat and healthy ecosystems with the Conserva Aves initiative in Central and South America.

Vancouver-based Ecojustice hosted a panel of Indigenous women leaders on implementing global biodiversity goals using a rights-based strategy that includes Indigenous legal traditions and safety for women. The panel included Lauren Terbasket, lead negotiator with the Lower Similkameen Indian Band, Yakawilas Coreen Child from Kwakiutl First Nation, and Cleo Reece, knowledge holder with Fort McMurray First Nation.

©GreenpeaceInternational

Vancouver Island's Awi'nakola Foundation took the opportunity to highlight the looming threat of biodiversity offsets. "We should be making leaps and bounds away from false nature-based solutions like biodiversity offsetting schemes and carbon markets and instead developing pathways for the rights of nature to respect flora, funga, and fauna," said campaign director Mark Worthing. The foundation calls for returning land to Indigenous people and a moratorium on logging primary old growth forests in Canada.

At the COP16 "Green Zone," dozens of groups held press conferences, rallies, and protests to raise awareness and press for change. Peace Brigades International reported on rallies denouncing biodiversity credits, dispossession of Indigenous people, and state-sponsored violence against environmentalists, for example.

Protected areas can come at a cost to Indigenous people, the Swift Foundation pointed out before Montreal's COP15. "How it's working right now is a militarized form of conservation. You have guards with guns, people imposing fines, building fences, and kicking people out of their traditional lands."

But by the end of the two-week conference, Indigenous environmentalists were celebrating the creation of a new Subsidiary Body for Indigenous Peoples on traditional knowledge, formalizing what was an ad-hoc working group for two decades. The new agency gives Indigenous people a standing committee at biodiversity COPs directly for the first time.

Blood In the Water

BC Ministry of Environment is now under investigation

©Tavish Campbell

by Alexandra Morton

In 2017, I was researching the spread of the Atlantic salmon blood virus piscine orthoreovirus, or PRV. Since I was not allowed to test Atlantic salmon in the farms, I bought them from Superstore, Costco, and sushi restaurants.

The majority of Atlantic salmon sold in BC tested positive for PRV. This meant millions of Atlantic salmon along the BC Coast were shedding a foreign, pathogenic, highly-contagious waterborne virus into the Pacific Ocean. I wanted to know which companies were infected.

Using *marinetraffic.com,* I saw a farm salmon harvest boat moving back and forth between Cermaq's Raza Island salmon farm in the Discovery Islands and the Brown's Bay farmed salmon packing plant. This meant salmon raised at Raza Island were being gutted in Brown's Bay. I asked Tavish Campbell, local underwater filmmaker, if he would dive on the plant's effluent pipe 90 feet below the surface. Tavish filmed the plume of blood billowing into Discovery Passage and then, placing a fine-mesh plankton net over the pipe, captured a sample, twisted it shut, carried it to the surface, and gave it to me. I sent it on ice to a lab – the blood was infected with PRV.

Containing the damage

A new disease began sweeping through salmon farms in Norway in the 1990s. It took ten years for virus sleuths to connect the disease, known as Heart and Skeletal Muscle Inflammation, to the virus PRV. By that time the salmon farming industry had imported 30 million Atlantic salmon eggs into BC. No screening for this blood

virus occurred. No one knew it existed. While Atlantic farm salmon may recover from PRV infection by remaining motionless in the pens for a period of time, DFO scientists found PRV invades wild Pacific salmon red blood cells, causing the cells to rupture en masse resulting in organ failure.

The disgusting footage of blood flowing into BC waters made international news. I notified the BC government that it was infected with an Atlantic salmon virus. DFO confirmed my results. BC Environment minister George Heyman responded; "the bottom line for us is we want to make sure anything dumped into our oceans is free of pathogens."

Great sound bite.

On April 19, 2019, the Brown's Bay Packing Company was granted permission to dump almost 20 times more blood than when the samples were taken. They were processing 32 million pounds of fish per year. That's a lot of offal and blood to get rid of. Pouring it into the ocean was probably beneficial to their bottom line, and the BC government quietly made it happen for them.

In 2022, a report by DFO revealed young salmon exposed to the Brown's Bay Packing Company effluent became infected with PRV.

Red flags raised

In 2023, Heyman attempted to assure me that DFO considered this a low risk to wild salmon. But this was not accurate. The DFO report said nothing about risk, only that further disinfection of the effluent would be required.

Then a Warning Letter written by Minister Heyman's own staff in October 2023 reported Brown's Bay Packing Company had breached its permit multiple times. For example, on August 3, 2022, during the peak of the Fraser sockeye migration past the Brown's Bay packing plant, the discharge of suspended solids was nearly five times the amount allowed in its 2019 permit. The company was threatened with a fine of up to one million dollars and imprisonment.

Does the minister know viruses are not visible? That the water was clear was meaningless.

Worse, the Warning Letter revealed Brown's Bay Packing Company was never even asked to test its effluent for PRV.

Despite having no test results to rely on, Heyman wrote and feebly suggested it's OK now because the effluent is "visibly clearer." Does the minister know viruses are not visible? That the water was clear was meaningless.

Getting to the bottom

Six years after provincial Environment Minister George Heyman told Canadians his bottom line was to ensure effluent going into the ocean was free of pathogens, I felt it was time to move past corresponding. I filed a complaint with the Office of the British Columbia Ombudsperson. After several months of review, they initiated an investigation in June 2024. Ombudsperson investigations are confidential, with no legal power to compel action. I was told it would take about six months to complete, then they would provide their recommendations to the Legislative Assembly. If our MLAs don't respond, the report becomes public.

The Heyman denial scenario has been on repeat since salmon farms arrived in the 1980s, as both provincial and federal governments continued allowing salmon farms to multiply despite evidence they were killing wild salmon. Finally, 30 years on, the federal and some First Nation governments reacted to the scope of evidence and closed nearly half the salmon farms on the BC coast.

Heyman, seemingly oblivious, offered up the ocean as a sacrifice zone – a dump for infected blood from the salmon farming industry. As a result, countless millions of wild salmon continue to absorb this foreign virus as they pass Campbell River.

I suspect the Ombudsperson's report will be ignored as much as I was, but this cannot be an excuse to stop trying to make government accountable. Heyman's "bottom line" was meant to protect the industry's bottom line.

As I see it, whomever we elect cannot be allowed to further destroy the fish that feed the trees that make the oxygen we breathe. Our elected governments require minding. I will be awaiting the Ombudsperson's report and go from there.

Dr. Alexandra Morton is science advisor for the 'Namgis First Nation. Follow this story and her work at *www.alexandramorton.typepad.com*

A Way Through

Charting Canada's longest cave to protect fragile karst

by Dave Flawse

"Glory team to Resonance team," Erin Bartlett speaks into her handheld radio. No response comes, so Bartlett wriggles a bit further down the cave's narrow passageway. Her 1100-lumen headlamp — the same brightness as the high beams on a car — explodes off golden-white calcite formations.

She's protected against sharp edges and teeth-chattering cold by a bright blue Cordura speleo suit. It's a trade-off. Caving is sweaty work. In the sealed-up suit, she feels as if everything below her neck is in a greenhouse. To get here, she and her team had to repel into black voids, contort around tight corners, and undertake a five-hour vertical rope ascent.

At least there's a breeze to cool her face. It smells fresh, like the taste of pure water. On a prior trip, Bartlett had noted that this particular tunnel was "breathing heavily," a caver term for strong air movement. It's a good sign and means this unexplored passage could connect the greater ARGO cave system. This connection, if it can be proven with a survey, would mark a new distinction: Canada's longest cave.

The ARGO system on northern Vancouver Island was a subject of the 2023 documentary film *Subterranean*, which follows a team of hobbyist cavers, including Bartlett, as they attempt to connect three cave systems – Arch, Resonance, and Glory 'Ole. They successfully connected Arch and Resonance but failed to connect Resonance and Glory 'Ole, something several groups of cavers have attempted over the last forty years.

Now, in the summer of 2024, Bartlett is close to achieving that goal. To confirm they are in the correct area, she attempts to make radio contact again. "Glory team to Resonance team."

"Hello?" A clear, surprised voice answers. "This is Resonance."

At the reply, Bartlett breaks into tears. Not only because it proves connection. Not only because she describes herself as an emotional person. And not only because this moment has been decades in the making. The reason tears are streaming down Bartlett's face is all these things put together, plus this: the distinction could mean protection. The superlative of "longest" brings public attention and a bargaining chip in a battle to save the sensitive karst landscape around ARGO from further deforestation.

That's the hope, at least. Superlatives are sticky. One look at the province of British Columbia's tourism website will show how this is exploited: the tallest mountain, rarest bear, most wintering bald eagles, highest waterfall, oldest tree.

The presence of Canada's tallest tree, a Sitka Spruce dubbed the Carmanah Giant, was instrumental in the formation of Carmanah Walbran Provincial Park on Vancouver Island. This area preserves the Carmanah Giant and a grove of equally impressive trees that lack nothing in significance besides an "-est" designation.

Like any karst landscape not in a park, the ARGO cave system has no direct environmental protection in BC. Unique karst landscapes all over the world like this one filter and hold onto water, are home to uniquely fat trees, and contain animal species unknown to science.

A formal provincial or federal cave protection act would see all parts of karst landscapes safeguarded. We understand only a sliver of the inner workings of karst landscapes, and the actual caves represent only one portion of these environments. The most important protections would focus on above-ground disturbances like mining and especially logging.

As a guide and coordinator at Horne Lake Caves Provincial Park, Bartlett takes children, teens, and adults deep underground. Here in the blackness, she explains we know more about the bottom of the ocean than the inside of caves – and we don't know much about the bottom of the ocean.

The Horne Lake Caves are where most Vancouver Island locals get their first taste of the underworld. After taking a guiding course here in the mid 2010s, Bartlett was hooked. Over the years, mentors showed her some of the Island's thousand-plus caves, including the ARGO system. Eventually, she took on a leading role in making the Glory-Resonance connection.

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And now, deep inside Glory 'Ole, Bartlett is in uncharted territory. With radio communication confirmed, she and another team member push into a tight tube, hoping to meet the other three-member crew in Resonance.

Humans have a need to see around the next corner, to reach places unknown. The desire to explore this particular passage has kept Bartlett up at night. Ever since her first visit here four years earlier, the idea has been eating away at her brain.

If they locate the other team, they can all return to the land of the living in only 20 minutes by exiting Resonance. To reverse and repel back through Glory 'Ole it would take four hours, at least. Eventually, an ever-tightening tube forces them to turn around. Bartlett and the two other team members exit at 2:30 am, after 18 hours underground. Still in darkness, they drive back down the logging roads that are punched through the landscape.

Almost the entire area around ARGO has been clearcut and replanted over the years. Once the big trees are gone on a karst landscape, it changes the way water flows into the system. Underground, in a place where the rate of change is measured in centuries and millennia, sudden changes to water flow can affect these fragile ecosystems.

Only six years ago, scientists discovered a new species of insect in an Island cave. When the trees are clearcut, the soil they once held slips through the cracks in the karst and can choke out life below. Above ground, a forest's soil can take thousands of years to accumulate. Without deep soil, plant life cannot return with the same vibrancy, or sometimes at all.

Weeks after the failed connection attempt, Bartlett returns to ARGO. She manages to scan a tight passageway between Glory and Resonance with a laser that links to an app on her phone. This survey confirms connection. At 25.4 km. the ARGO system is now Canada's longest cave.

During a phone conversation she tells me how she's a part of a group who will take this information to a meeting with the forestry company and 'Namgis First Nation to discuss saving the forest around ARGO from being clearcut once again.

A teammate of hers states it bluntly: "Now, the work really begins."

Dave Flawse tells stories at the intersection of history and science. Follow his work exploring Vancouver Island's history at *www.vancouverislandhistory.com*.

Radioactive Reality

Northern Ontarians resist nuclear waste storage plans

by Claire Gilmore

While techno-optimists dream of a nuclear-powered future, Ontarians are faced with the grim reality of storing and transporting the radioactive waste industry has already created.

In 2010, the Nuclear Waste Management Organization (NWMO), a group created by the nuclear industry in 2002 under the *Nuclear Fuel Waste Act,* started looking for a site for a "Deep Geological Repository" (DGR) – a permanent home for Canada's 3.3 million used nuclear fuel bundles, with room for an estimated 2.3 million more by the end of the planned operation of Canada's existing nuclear reactors.[1]

By 2020, the seach had been narrowed down to two sites: the Revell Site in Treaty 3 territory northwestern Ontario, 43 km from Ignace township and 21 km from the Wabigoon Lake Ojibway Nation; and the South Bruce Site in southwestern Ontario, 5 km northwest of Teeswater in the municipality of South Bruce.

First Nations close to the Revell site have been clear about their opposition. Treaty 3, Robinson-Superior, and Nishnawbe Aski Nation territories have declared blanket opposition to nuclear waste burial in northwestern Ontario. Former Grand Chief Diane Kelly, of the Grand Council of Treaty 3, wrote to NWMO in 2010: "The Elders had met regarding Manito Aki Inakoniaawin, our Great Earth Law for the Anishinaabe Nation in Treaty 3 over the past 12 months and at every occasion they are clear – there will be no way to authorize the long term storage of Canada's nuclear waste in the land that sustains us." Despite this strong "no," NWMO has continued test drilling at the Revell Lake site.

Every Labour Day weekend for the past five years, Indigenous and non-Indigenous allies have walked together along Highway 17 to peacefully protest the DGR proposal. In October 2022, the Grand Council Treaty 3 signed a $5.8-million "learn more" agreement with NWMO to become informed; however, the council stated in 2022 that it "does not consent or imply any consent… the Chiefs in Assembly continue to support the Elders Declaration of 2011, opposing the storage of nuclear waste in Treaty 3." In September 2024, nine northern Ontario First Nations signed a joint letter to the head of the NWMO stating: "Our Nations have not been consulted, we have not given our consent, and we stand together in saying 'no' to the proposed nuclear waste storage site near Ignace."

As We the Nuclear Free North stated in their March 2024 report to the Standing Committee on Environment and Sustainable Development, "No such facility has ever been operated in the world. In fact, no repository for nuclear fuel waste has ever been issued an operating license. There is a record of failed or withdrawn proposals; there is no record of operating success."

Shallow burial

In January, the Canadian Nuclear Safety Commission (CNSC) announced its decision to authorize a near surface disposal facility (NSDF) on the property of Chalk River Laboratories in Deep River, Ontario, on the unceded territory of the Algonquin Anishinaabeg peoples.

The Chalk River lab is run by Canadian Nuclear Laboratories (CNL), a subsidiary of the Crown corporation Atomic Energy Canada. It contributed to research that led to the 1945 bombings of Hiroshima and Nagasaki, and in 1952, North America's first nuclear reactor meltdown occurred there. The lab is now used for creating medical isotopes. The facility was built on the Kichi Sibi (Ottawa River) to provide water for reactor cooling.

In early 2024, the Kebaowek First Nation launched a judicial review of CNSC's decision to authorize the NDSF and transform 37 hectares of old forest into a facility for one million cubic tons of low-level nuclear waste, one kilometre away from the Kichi Sibi. It would operate for 50 years, but exclusion from the site would last 300 to 500 years (which, the Kebaowek note, is longer than European contact with Indigenous Nations).

RAVEN Trust notes that the case is "about much more than the NSDF ... These questions will have ripple effects throughout Canadian law when answered."

Nuclear crossing zone

Meanwhile, those in northern Ontario are keeping an eye on the nuclear waste traversing their land and communities.

In an October public hearing, Indigenous and public interest interveners presented their concerns to the Canadian Nuclear Safety Commission, which is considering Canadian Nuclear Laboratories' application to renew their decommissioning license for the Whiteshell Nuclear Laboratories in Manitoba.

If the licence renewal is approved, shipments of high-level radioactive waste through northern Ontario to the Chalk River site could begin in mid-2025 (shipments of low and intermediate level radioactive waste are already ongoing). The NWMO's Used Fuel Transportation Package has not been subject to full-scale testing, and is not yet in use anywhere else.

"We're requesting that the Commission convene additional hearings on the transportation package, the security plans, and the emergency response. That information is either not yet available or has been withheld from the public," commented Brennain Lloyd, project coordinator with Northwatch. "These decisions should not be downgraded to staff level within the CNSC. They should be made by the Commission, with public and Indigenous involvement."

While the industry-financed NWMO favours burying nuclear waste deep underground, several environmental watchdogs express support for "rolling stewardship" as a less-irresponsible approach. This would mean nuclear wastes are constantly monitored and retrievable, and each new generation receives the resources and information that would allow them to intervene if need be. Still – when considering new nuclear projects, we can't lose sight of the reality that there simply is no safe option for "disposal" of wastes that will remain radioactive for millennia.

Sources:

1) "The Anishinaabe community fighting nuclear waste dumping, one step at a time," Crystal Greene, Ricochet, September 23, 2024

2) "Kebaowek First Nation at the Federal Court of Canada," Levin Chamerlain, RAVEN, July 31, 2024

3) Northwatch News Release, October 23, 2024

Notes:

1:https://www.nwmo.ca/Canadas-used-nuclear-fuel/How-much-is-there

TMX Follow-Up

Diluted bitumen flows south and east

by David Huntley

On the first of May, 2024, the new Trans Mountain pipeline from Edmonton to Burnaby was put into service with a planned capacity to transport 590,000 barrels a day of "heavy oil" — diluted bitumen.

It is now being well-used – not to full capacity, but enough to increase the number of tankers loaded at the Westridge Marine Terminal in Burnaby from two to twenty per month.

The old pipeline, Line 1 as it is now called, carried about 300,000 barrels a day of a variety of light oil, heavy oil, and other petroleum products. A secondary pipeline connected to it at Sumas takes primarily light oil to refineries in Washington State. In recent years this has grown from 50% to 70% of the oil flowing in Line 1.

So what has changed?

The amount of oil sent to the Westridge Marine Terminal has increased. This is most evident in the dramatic increase in the number of loaded tankers traversing Burrard Inlet (shown in the figure). These primarily go to California and China, but oil has also been sent to South Korea, Japan, Brunei, and India.

When observing the tankers, I frequently get the impression that the process is inefficient. Tankers hang out for days, or even weeks, in the Pacific Ocean, apparently waiting for work. Even stranger is that a tanker that has discharged its oil in Washington State may travel all the way west through the Strait of Juan de Fuca and loiter in the Pacific Ocean before retracing its path to Vancouver, all the while reporting that it is coming to Vancouver.

Although we do not yet have a final price for construction of TMX, the current estimate is over $34 billion, and the provisional figure for the tolls oil companies are paying to use the pipeline, a little over $11 per barrel, will recoup only about half of this over the next 20-100 years.

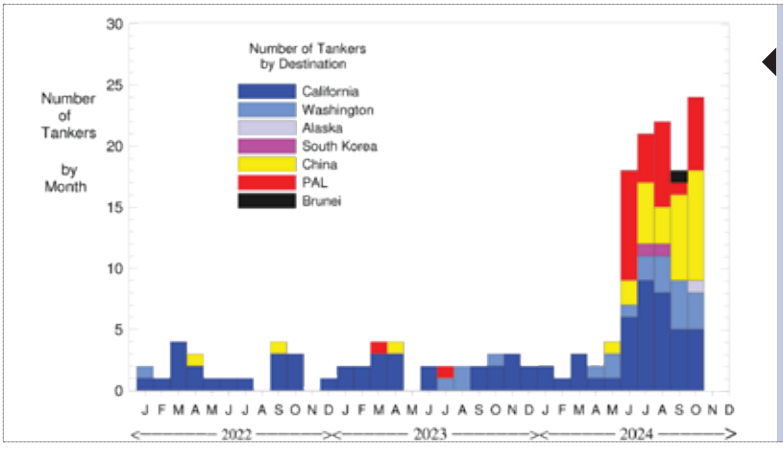
The biggest picture

Building the new pipeline was a mistake. A very large number of people knew that when it was first proposed. The National Energy Board allowed people to make submissions, and labeled them "interveners" or "commenters" or rejected them. Its main criterion for acceptance was "directly affected." All of those who wrote about the effect on climate were rejected; this included 26 climate scientists from across Canada.

Eventually, the National Energy Board was disbanded and replaced by the Canada Energy Regulator, with a new set of people in charge but continuing to support the oil and gas companies as a captured regulator. We are sleep-walking into worse and more frequent catastrophes. Our governments know it but their only responses have been tinkering at the edges.

Excerpted from a longer article available at *www.watershedsentinel.ca*

David Huntley is Professor Emeritus in the Department of Physics at Simon Fraser University.

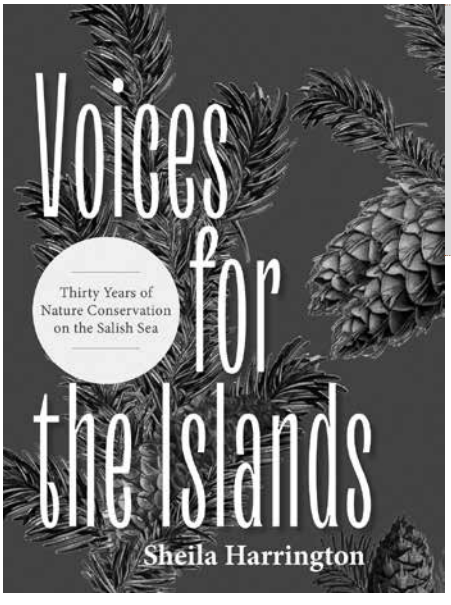


Number of Aframax tankers loading per month at the Trans Mountain Westridge Marine terminal, sorted by destination. PAL stands for the Pacific Lightering Area, a region west and south of the Mexico-USA border; from there tankers transfer their loads to larger tankers for delivery in Asia.

Data from the Marine Traffic and Vessel Finder websites
www.marinetraffic.com
www.vesselfinder.com

Voices For the Islands

Thirty years of nature conservation on the Salish Sea



Voices for the Islands: Thirty Years of Nature Conservation on the Salish Sea
By Sheila Harrington, with foreword by Briony Penn

Heritage House Publishing
ISBN 9781772034929
Softcover | Publication Date: July 9, 2024 | 288 Pages

by Jan Garnett

Sheila Harrington's *Voices for the Islands* is a visually pleasing and richly detailed record of BC coastal history that otherwise might have been lost.

One island at a time, we are drawn into Harrington's entertaining narratives about resident heroes on the islands in the Salish Sea who toiled together, sometimes for years, in the common hope of eventual success and celebration. Many places now taken for granted as parks and protected areas owe that status to sustained private efforts. Piece by piece, critically endangered island habitats have been permanently protected, although Harrington makes it clear that much still remains to be done.

In contrast to the ages when the Coast Salish peoples lived sustainably with no need for complicated and costly conservation projects, *Voices for the Islands* describes modern industrial-scale logging and an overall steep decline in biodiversity within the fragile island ecosystems. Sparks of discomfort became flames of fear as residents worried that the natural world that had drawn them to live there might soon be destroyed.

Over several years, Harrington sailed from her Lasqueti Island home to record the stories of the residents who led and participated in landmark island projects. She wisely includes some of the gory project details, failures, and descriptions of people who played critical roles but are now gone. We get a sense of steep learning curves and mistakes, and also of the resilience of the determined souls who persevered to see their projects through – often in the face of rising land values and falling funding opportunities.

Through my work with the Nature Conservancy of Canada (well before I became a Gulf Islander myself), I was occasionally able to play a support role in some of the projects. However, like other large conservation groups, NCC usually signs on to smaller-area projects only when a compelling case is made by local partners. I found the islanders' deep connection with the land was usually complemented by their wisdom in backing business and funding proposals with serious science, and fundraising a substantial amount of the cost.

Harrington provides the right amount of background and detail to make each project come alive, and even the most jaded reader will crack a smile at some of the happy endings.

Ideally, the publication of *Voices for the Islands* will trigger continued collective determination, inspiration, and guidance for a gentle passing of the torch to new generations of island conservation leaders and partnerships.

Jan Garnett was the Nature Conservancy of Canada's Regional VP for BC during many of the years described in *Voices for the Islands*, and is the author of the newly-published mystery novel *No Safe House*. *www.jangarnett.com*

Habitat for All

Urban forests, biodiversity, and livability

by Zoe Blunt

Protecting the urban forest is a greater priority with every passing year. Researchers say that the human livability of cities may be at stake, citing basic needs like fresh oxygen to fight smog and shade to keep streets cooler.

Equally important is the goal of livability for everyone else: natural habitat for birds, animals, plants, mosses, insects, and other living things.

Urban forests face more threats than ever from development, disease, and misguided policies. From Vancouver's Stanley Park to Toronto's Ontario Place, irreplaceable groves are wiped out with a stroke of a bureaucrat's pen.

Saanich councillor Nathalie Chambers is dedicated to preservation. Her Homes for Birds initiative comes in response to new BC housing rules. The Province passed Bill 44 in late 2023 in an attempt to address the housing crisis by rezoning single-family lots to four or more units in municipalities with over 5000 residents. It eliminates public hearings for most developments and overrides local zoning laws, including those that protect trees and green spaces.

The bill, which was rushed into law with minimal public consultation, comes at a time when many municipalities already lack adequate environmental policies and plans. But the pushback is growing, and not just on Vancouver Island, as Chambers observed in October at the Canadian Urban Forest Conference in Winnipeg.

With the theme of "Trees for All" and an emphasis on equity, ecology, and social considerations, the conference promoted strategic urban forest planning and public engagement for livable communities.

Days after the conference, Saltspring Island environmentalist Briony Penn launched a petition calling on Parliament to establish a new Salish Sea Migratory Bird Sanctuary in Greater Victoria. The federal government established three sanctuaries in the Capital Region as part of the *Migratory Bird Convention Act*. Petition 5182, sponsored by MP Elizabeth May, is open for signatures until December 27. *(www.ourcommons.ca/petitions/en/Petition/Details?Petition=e-5182)*

The latest *State of Canada's Birds* report highlights the urgency of this work, finding that over one-third of bird species have declined since 1974, mostly due to habitat loss. But, the report notes, human efforts to conserve and restore habitat are paying off, with some bird populations – including eagles, waterfowl, and wetlands birds – rebounding in encouraging numbers.

> Irreplaceable groves are wiped out with a stroke of a bureaucrat's pen.

On South Vancouver Island, the endangered coastal Douglas-fir ecosystem is a biodiversity hot spot. The region is a haven for birds: those that nest here, those stopping over on their long migratory journeys, and those that spend the winter in this mild climate. The significance of habitat in this region cannot be overstated; it is a lifeline for more than 400 bird species, from songbirds to shorebirds.

City planners, city dwellers, bird-lovers, and local representatives are among those putting together grassroots initiatives to restore crucial habitat, ensure the survival of fragile ecosystems, and offer hope to birds – and humans – who depend upon the urban canopy.

For more information on the Homes for Birds Initiative on Vancouver Island, email info@nathaliechambers.ca and visit the Homes for Birds Facebook page.

Gutting the Urban Forest

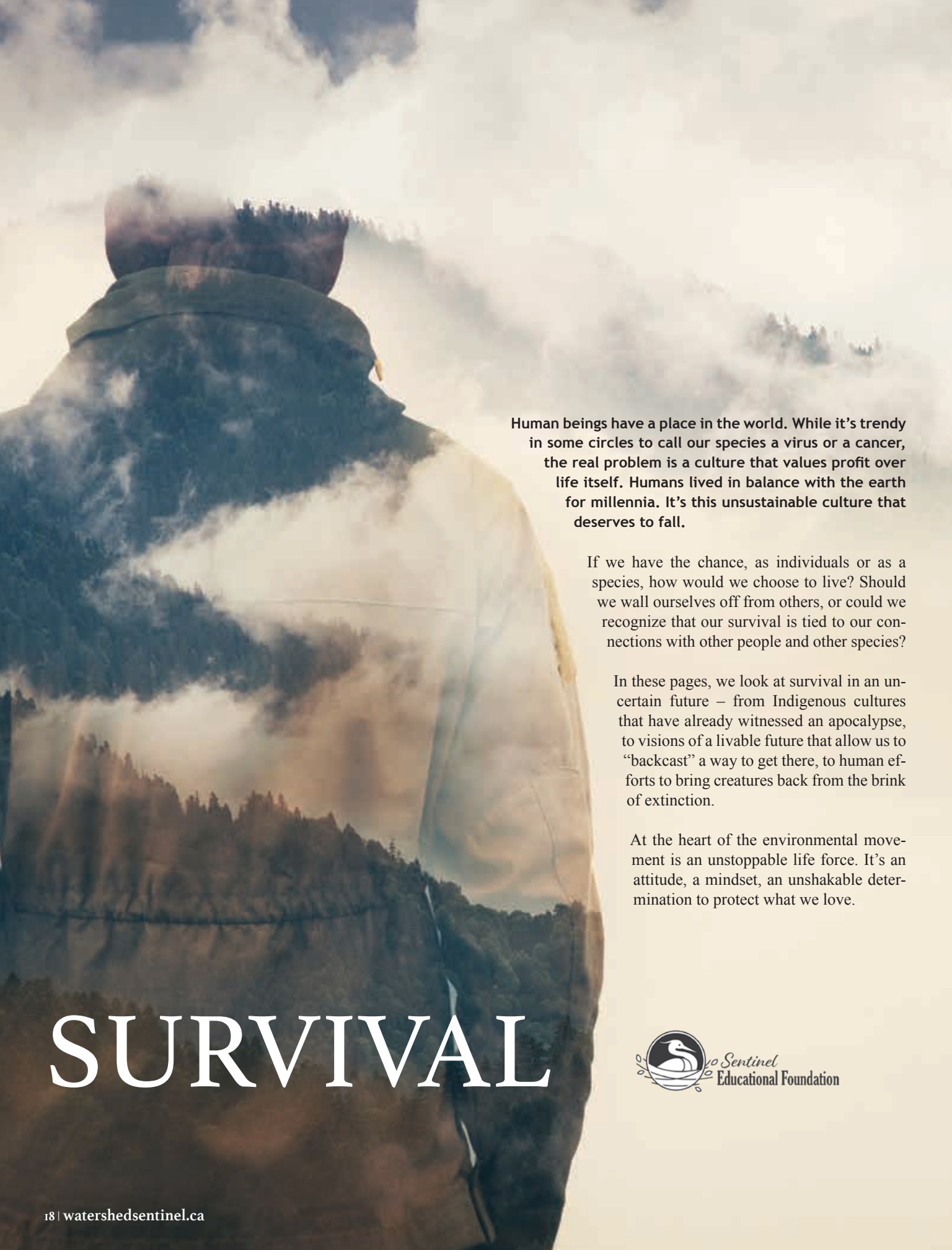
Ontario Place, Toronto's iconic waterfront park, has been decimated. 850 trees were cut down this year, leaving only a fraction still standing. As part of a "revitalization" effort, the City of Toronto has approved development of a $650-million spa and wellness centre to be owned and operated by a subsidiary of Therme Group, an international consortium based in Austria. Public admission to the spa complex would start at "around $40" per person. Since the project is privately owned, Therme was not required to submit an environmental assessment.

Logging Stanley Park

The City of Vancouver prefers to call it "tree removal," but contractors are logging thousands of Stanley Park's trees they say are damaged by the hemlock looper moth, citing a public safety "emergency." In fall of 2023, forestry consultants B. A. Blackwell reported to the City that 160,000 trees – about one-third of all the trees in the park – had to be removed. The City subsequently awarded Blackwell the logging contracts. After months of public outcry and a lawsuit, the company backpedaled and reduced the cull estimate to 16,000 trees.

Despite the $18 million cost, it is not clear how many trees actually need to be cut or whether the clearing will benefit the remaining forest. More info: *www.savestanleypark.ca*

Orthomosaic map images ©Helen Stopps, Assistant Professor, Toronto Metropolitan University



SURVIVAL

Human beings have a place in the world. While it's trendy in some circles to call our species a virus or a cancer, the real problem is a culture that values profit over life itself. Humans lived in balance with the earth for millennia. It's this unsustainable culture that deserves to fall.

If we have the chance, as individuals or as a species, how would we choose to live? Should we wall ourselves off from others, or could we recognize that our survival is tied to our connections with other people and other species?

In these pages, we look at survival in an uncertain future – from Indigenous cultures that have already witnessed an apocalypse, to visions of a livable future that allow us to "backcast" a way to get there, to human efforts to bring creatures back from the brink of extinction.

At the heart of the environmental movement is an unstoppable life force. It's an attitude, a mindset, an unshakable determination to protect what we love.

Sentinel Educational Foundation

Facing Reality

We can't prepare for a crisis we deny is happening

by Zoe Blunt

The future that's bearing down on us is so terrifying, the rational mind recoils. We can be forgiven for trying to invent new narratives to make sense out of the unthinkable. Some scoff at climate change, call it "impossible," or blame it on the government.

Who do you trust in a crisis? The top cognitive bias is the non-event feedback loop; meaning if something has never happened before, it's not happening now. This house has survived dozens of hurricanes, so we won't worry about this one.

In order to make rational decisions, we need accurate info. In North Carolina after the hurricanes, people with satellite internet and generators opened their doors to neighbours who offered to trade food, water, and gas for a chance to check their messages. The communications link provided crucial data about current conditions and emergency response, counteracting dangerous misinformation about government plots to seize homes or abandon communities.

Survival courses teach a mnemonic for survival priorities: "Please Remember What's First" – Protection, Rescue, Water, and Food. Immediate protection from the elements is the top priority. But living alone in a fortified bunker is not survival. To survive, we need communities and ecosystems.

Can we rescue ourselves? What about the places we love, that we depend on for life? Without water, humans die in a couple of days. Without springs, rivers, creeks, and groundwater, communities dry up, forests wither away, everything turns to dust. Without food, people die in a few weeks, along with insects, birds, and animals.

Living alone in a fortified bunker is not survival. To survive, we need communities and ecosystems.

What would you save? Is there a place you would protect no matter what? An artesian spring, a herd of elk, a river estuary, a forest of songbirds?

The signs of environmental collapse are unmistakable: drought, fire, floods, storms, heat waves, polar vortexes, and jet stream destabilization. Many of us will have to flee from the places we love. We will have no choice. But we can choose how we face the future: bearing witness, building community, bracing for the worst, sharing what we can, investing in seeds, low technology, and old ways of living.

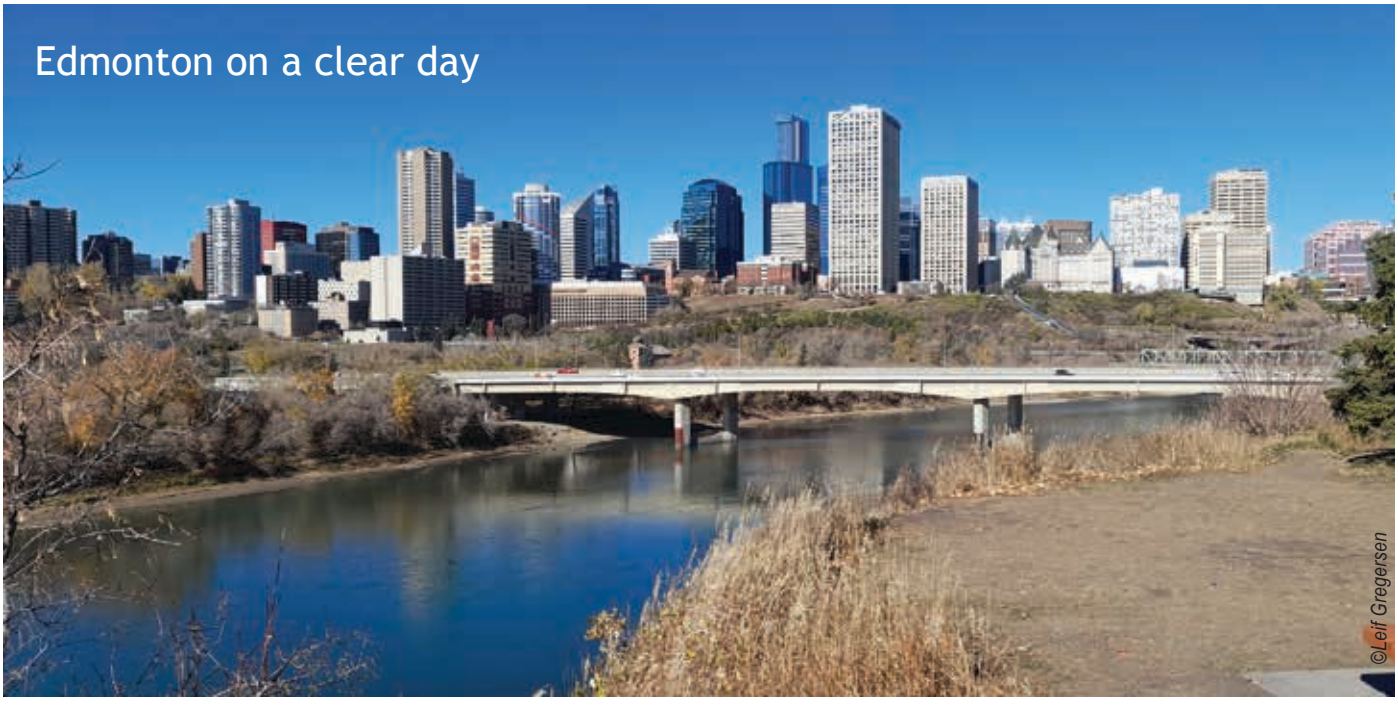
Grieve now; later we may not have the luxury. Recognize that this comfortable standard of living is fleeting, ephemeral, passing away even as we gaze upon it. Hold onto our love for the world and each other; speak to the trees, the rivers, and the mountains. We will bear witness to what is vanishing. The mountains themselves will bear witness to our era.

We are talking about the opportunity to make sure we are not the only ones left.

There is no turning back the clock. We can't refreeze glaciers or repair broken ice shelves. This new industrial world is ending, and a much older world is returning.

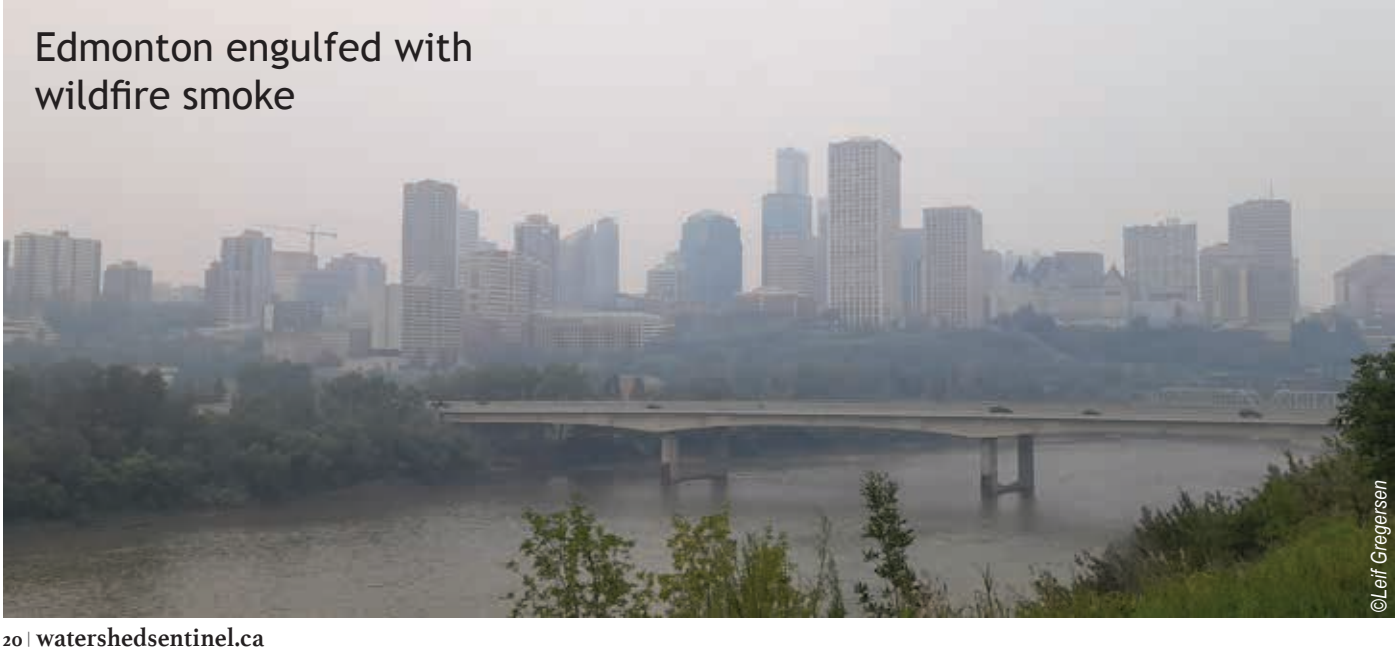
Denial and Survival

When reality trumps delusion



Edmonton on a clear day

©Leif Gregersen



Edmonton engulfed with wildfire smoke

©Leif Gregersen

by Leif Gregersen

Going through my teenage years was hell. I had all the outward appearances of someone who was happy and healthy. I had a sports car, nice clothes, a few cool friends, and even a little money to throw around.

I thought none of the threats I heard about would really affect me or my family.

But inside my fancy car, I was experiencing crippling depression. I was going through the motions of daily life, not understanding there was anything wrong. I thought everyone experienced depression. But I was having nightmares; I was drinking frequently. I couldn't seem to maintain any kind of friendships or relationships.

I like to think I was in a perfect storm of stress. In my second year of grade twelve, a close friend died by suicide. I was fighting all the time with my dad, who was a heavy drinker, and I was experiencing the pressure of working a night shift job that came with a lot of backstabbing and office politics. On top of it, I was trying to finish high school. All these things came together, and I slowly started to slip into psychosis. Soon, I would literally go raving mad and have to be taken to the psychiatric hospital.

Anosognosia

Despite all these problems, including developing delusional thinking and hallucinations, I didn't see that there was anything wrong with me. The condition of not understanding you have an illness is known as anosognosia. I didn't believe I had an illness, so when I left the hospital, I stopped taking my medications, leading to disaster.

I now see how anosognosia applies on a mass scale. Our planet is dying, climate crises are increasing year by year. Hurricanes have become more powerful, mass sheets of ice are melting and separating from both poles. Weather has become more violent; winters have become shorter and heat waves more frequent. And insufficient action among the whole population seems to be leading us to even worse disaster.

As I read books and watch videos on YouTube, the ignorance I can see among the media and the public is astounding. They spend hours talking about the personal failings of one presidential candidate or another while ignoring the big questions, like which politician will do the most to reverse climate change.

When the crisis comes home

As a child, I recall staring out the window of one of my classrooms. We lived across an alley from the school, and I could see our home through the window of my class. I thought to myself that all the things I hear about – the threat of nuclear war, the looming climate crisis, horrible crimes that I saw on the news – none of these would really affect me, my family, or the city I lived in. Last year, as wildfire smoke engulfed Edmonton, I documented just exactly how wrong I was as a kid – how the problem was coming right to our front door.

As a child, until I was around twenty, I had an acute fear of nuclear war. I also felt horrible deep down about our natural environment slowly giving way to development, while in other parts of the world wars were taking hundreds of thousands of lives. My eventual solution to this grief was to join the Air Cadets. It started out being about good citizenship and personal development. I took some courses in public speaking, and another in first aid. But it wasn't until I took a summer course called Air Crew Survival that I became obsessed with not being a victim of the things going on around me.

Coping strategies

That two-week course taught us everything about surviving a plane crash or disaster. I saw this education as a way to cope with the knowledge that, one day, the missiles would come. Many people use similar coping strategies to ease their worries about the dangerous direction our world is taking. They read magazine articles. They recycle. They buy electric cars. These small things help, but what we need is massive change from everyone, and solid leadership not just from our leaders, but from all concerned citizens.

We are in denial of a devastating problem, and it will lead to horrible outcomes. It is estimated that by 2050, the average world temperature will rise by 1.5 degrees Celsius. This will raise the level of the oceans, cause major floods, storms, unbearable heat waves, and massive melting of the polar ice caps, and initiate irreversible damage.

Continued on Page 22 ⇨

⇦*Denial and Survival continued*

The gravity of the situation with the environment and how we respond to it has become a major controversy, despite scientists all over the world agreeing that in the near future, human life as we know it could end. Climate deniers are spurred on by misinformation, such as false claims on social media that there has been no actual global warming. Others see the problems, feel the problems, understand the problems. But just as I was in denial of my mental illness and couldn't properly deal with it until I had fully accepted it, so much more public awareness is needs to happen.

Some believe science will soon find a clever way to reverse global warming; others are so ignorant they welcome global warming, thinking shorter winters and longer summers are a benefit to their lives. It all reminds me so much of my years of living in denial.

Survival mode

My Air Crew Survival course taught me how to put myself in a survival mode when needed and gave me real, practical ways to deal with just about any problem that came my way. I was given not only strict instructions on what to prioritize when I was in an emergency, but detailed training on things like broken bones and other injuries.

Some believe science will soon find a clever way to reverse global warming.

Soon, the climate crisis will plunge billions of people into a dire situation that will be irreversible. Survival training could be beneficial when the situation worsens, but the best wisdom I can offer people is what my commanding officer always said in Air Crew Survival: "Hope for the best but prepare for the worst."

The public needs to be educated and to take part in solutions. Many people see global warming as a problem for leaders or a problem for activists, or even a problem that doesn't exist. We need to bring this problem right into our homes.

During the time I was coming to terms with my mental illness, I was starting a lifelong journey of recovery. I never fully realized my need for medications and consultations with a therapist and a psychiatrist at first, just as vast numbers of people don't feel a personal need to do their part in finding a solution to climate change.

Fortunately, my anosognosia didn't last forever. Once I came to understand something had gone desperately wrong with my mental state, and that accepting help could restore me to sanity, my illness took a whole new direction. I was able to work, able to write books, able to make a change.

Everyone who wants a future for generations to come should be voting for and supporting candidates who can articulate ambitious, detailed, and practical policies to deliver change. We all need to seek out information we can trust and educate ourselves. This means acting against the daunting enemy of denial.

Mass delusion is a difficult enemy to conquer. It starts with influencing where we place our votes and donations, but it doesn't end there. One of my personal causes is to convince people to grow food rather than grass in their yards, in combination with composting as much waste as they can to fertilize the garden. A small step, but an achievable one. Hopefully after people take small steps, they will be more likely to accept the need to take larger ones.

Ignorance, anosognosia, and denial can be conquered, I just hope we can conquer them before the climate situation is completely out of control and irreversible.

Leif Gregersen is an Edmonton-based writer, teacher, and public speaker who has written 12 books. *https://edmontonwriter.wordpress.com*

Rare Species Recovery

Back from the brink

by Watershed Sentinel Staff

Within the gloom of endangered species population counts lurks some very good news. It has taken a variety of factors — time, work from humans, luck, money, and sometimes just solitude — but here is a quick survey of survival stories from our fellow critters.

Vancouver Island marmot

This endangered mammal, which only lives in the high mountains in open alpine habitat, has been the subject of recovery efforts, especially captive breeding, for a couple of decades. In 2003, the population was down to 27, but this year 86 pups were born. The Vancouver Island Marmot Recovery Foundation says over 300 marmots are currently living in the wild in 17 colonies, most of which are interconnected.

—www.cbc.ca
September 7, 2024

Pine martens

Conservationists are hailing the release of 15 pine martens from Scotland at secret locations in Dartmoor, southwest England. The return of pine martens is the work of the Two Moors Pine Marten Project, and is the first phase in plans to establish a resident population of the cat-sized, tree-climbing members of the weasel family. Pine martens were extirpated from the southwest of England more than 100 years ago after centuries of loss of their favoured woodland living places, and as the result of hunting and trapping. The project's second phase will see a similar release of the animals in Exmoor during 2025.

—www.somersetwildlife.org
October 1, 2024

Sunflower sea stars

Researchers have begun releasing lab-raised sunflower sea stars into the ocean near the San Juan Islands off the BC coast to rebuild their dwindling populations. Between 2013 and 2017, more than 90% of sunflower sea stars died, possibly from ocean warming and a mysterious plague called sea star wasting syndrome. Sea stars play a key role in maintaining the balance of coastal ecosystems by feeding on a variety of invertebrates, including sea urchins. Sea urchins destroy kelp forests which are needed as nurseries for other species.

—www.washington.edu
February 16, 2024

Wood bison

Buffalo and wood bison once roamed the great plains in countless numbers, much like the passenger pigeon flew in the skies. Both species were hunted relentlessly for European clothing, although in the case of the bison, it was most likely to clear the plains of Indigenous Peoples and make them available for farming.

But the bison were luckier than the hapless pigeons. At the turn of the 20th century, the Canadian government purchased one of the last herds of bison, and between 1907 and 1912 shipped over 700 wild bison by train to Elk Island National Park in Alberta. Bison have found a protected (and fenced) sanctuary at Elk Island for over a hundred years. The park is very careful to keep the herd disease-free, so that excess population can be transferred to other sanctuaries.

In total over the past century, Elk Island has translocated over 3500 plains and wood bison to conservation sites around the globe, including two herds to Alaska. The US National Wildlife Federation says that there are roughly 31,000 wild bison in North America (20,000 plains bison and 11,000 wood bison). There are hundreds of thousands more that have been crossed with cattle.

—State of Alaska press release and other sources
May 2024

Bak̓wa̱m Ways of Life

Matriarchs, teachings, and cultural survival

by Desiree Mannila

The *Bak̓wa̱m* (Indigenous) Kwakwa̱ka̱'wakw people of the Pacific Northwest embody an innate relationship with the natural world, woven through their creation stories, oral traditions and intricate expressions of culture. *Watershed Sentinel* was welcomed by two 'Na̱mgis matriarchs to embark on an uplifting experience of sharing the relationship between humans and the natural world, through storytelling and the transfer of Bak̓wa̱m teachings.

The heart of Kwakwa̱ka̱'wakw culture lies in the ancient art of storytelling, the perpetual gift from one generation to the next, carefully expressed by the storyteller to bring *sanala* (to be whole, to have oneness). Storytelling is manifested through words, songs, dances, art, and language. Stories are preserved over time by transferring knowledge through ceremonies such as *k̓wił* (feasts) and *p̓a̱sa* (potlatches), artwork, and recognition of the teachings of lived experiences – each deriving from the gifts of the natural world.

Thunderbird + Sisiutl by Waławidi Joe Peters Jr. (1992)

Badidu (Shelley Cook) shares, "I think all of us are having these experiences all the time. It's just whether or not we pay attention.That's all we have to do, is pay attention to the communication that's happening."

Nusa: tell a story, legend, or myth

The connection of the Kwakwa̱ka̱'wakw to the natural world is expressed across the different tribes, stemming from the various creation stories of how their first ancestor came to be. Each tribal group of the Kwakwa̱ka̱'wakw originates from a different ancestor; there is an understanding among the descendants that beings such as *t̓lisa̱la* (sun), *kwa̱nkwa̱nxwa̱lige'* (thunderbird), *ga̱la* (grizzly bear), and several others took off their masks to become human.

"In our language, we say 'Awi'nokola,' which means the land, the sky, the sea," 'Namnasolaga (Andrea Cranmer) says. "There was so much interconnection with those ways of being. Trees weren't just trees; those were [our] brothers and sisters. The plant medicine is [our] brothers and sisters. The animals are our ancestors. Those are the things that hold dear to my heart."

'Namnasolaga reflects on how the greed of industry and the infiltration of a colonial mindset does not reflect the morals of the Kwakwa̱ka̱'wakw. "Greed is not our natural way of being. If anyone knows our potlatch system, our people had ceremonies; the more you gave, the higher your wealth." She offers a teaching of Bak̓wa̱m people: "If you're going to do something, do it well. Preserve. Know what to leave, and what not to leave."

'Namnasolaga recalls, "In the old days, everyone was taught nighttime was used to tell stories to young children before they went to bed. These are the things my mom said. Our granny used to gather us and tell us stories at night – we didn't have TV."

She continues, "Learn the history, learn the truth about our history. Be willing to tell young people: yes, there's technology today, but it does not replace learning culture in a natural environment, which is being together, sitting together. We have to

Grizzly Bear by Waławidi Joe Peters Jr. (1991)

> Be willing to tell young people: yes, there's technology today, but it does not replace learning culture in a natural environment. The medicine is in that.

go back to the simplest ways of doing things … the medicine is in that."

Gwa'nalalis and K̲anik̲i'lakw

'Namnasolaga shares a story from the 'Na̲mgis, detailing how the Gwa'ni River was created through the transformation of a first ancestor, Gwa'nalalis.

> When K̲anik̲i'lakw, the transformer (creator) visited Gwa'nalalis, K̲anik̲i'lakw asked if he would like to become a mountain. Gwa'nalalis replied, "No, because mountains can crumble and fall, as long as the days dawn in the world." K̲anik̲i'lakw asked if he would like to be a boulder. "No, because boulders can crumble and fall, as long as the days dawn in the world." K̲anik̲i'lakw asked if he wanted to be a cedar tree. "No, I don't want to be a cedar tree, because when hit by lightning, it will split and it will crumble and fall, as long as the days dawn in the world."
>
> K̲anik̲i'lakw asked if he wanted to be a river. "Yes, so I can flow for my people as long as the days dawn in the world." K̲anik̲i'lakw placed his hand on Gwa'nalalis' forehead, stating, "You will be a river and many kinds of salmon will come to you to provide food for your descendants, for as long as the days shall dawn in the world." (U'mista Cultural Society, 2024).

'Namnasolaga explains the Gwa'ni River is now the home of a salmon hatchery, an initiative to keep wild stocks alive. She adds, "It's poorly funded, while the Canadian government funnels heaps into fish farms. But the strength that I have is knowing that Gwa'ni is still there."

K̓ak̓utɬa: to learn

Badidu opens up with a teaching from her grandparents. "They knew whether the year would be plentiful with how the moon came at the beginning of the year, how it moved in the seasons. They learned, at the beginning of the year, if the quarter *'mɑ̓kwɑ̓la* (moon) tipped upwards, it would be a good year for harvesting, and if it tipped downwards, it would not. So that's big in my family. We all get excited when we see the moon tipped up."

Badidu describes how she spent the day preserving salmon. "It brought back some memories. [When my gran] was doing fish, it was like a ceremony. It's the connection that makes me remember how and why they did it. [My gran] was just a part of the whole fish, she was amazing."

Through remembrance of her passed loved ones, Badidu offers her favourite story to teach, the story of Sisiutl, a two-headed sea serpent. "It talks about your good choices and your bad choices and the face in the middle… We use [both sides] to teach the right and the wrong." She adds that the choice between right and wrong affects the chooser and those around them. "The face in the middle (you) always has the ability to choose. It teaches us about being uncomfortable [and] being connected and aware of not just us, but how our voices are going to affect those around us and the environment. Everything we do is cause and effect."

Badidu reflects on the grief of losing her son, remembering a story in which she ventured to the water's edge for cleansing. "It was one of the most beautiful mornings that I've ever been down there. The glistening in the night moving into the morning, into the dawn, was so magical."

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⇦*Story continued*

She recounts praying for the protection of her loved ones. "All of a sudden I felt talons right around my head like a crown, and the feathers – I wasn't scared, so I never thought anything bad was gonna happen." Badidu and her water-cleansing student realized that an owl had landed on her head during her prayer. "My son died [days] later." She describes her long healing journey and how recognition of the natural world's message helped her survive her great loss.

Badidu recalls a lesson bestowed upon her by her ancestors – "There's always a metaphor that you'll be told, but you have to pay attention." On the importance of water cleansing, she says, "You're going to cleanse your hair because your hair is like a net. It's like a web that's catching all the energies. It's a teaching; every person gets what they need from the water, whatever it is. Water is so powerful. You have to have to be mindful, and get connected to spirit."

During the interview, Badidu described several occasions in which leaning into the natural world provided the strength and understanding to survive hardship. She explains how spirit lived through the natural world. "One thing that really helped, that turned my life around, is that moment when I connected with spirit. Once you connect to spirit, you connect to everything. I was never alone again." She expresses how in the darkest of times, solace can be found through regaining a connection to the natural elements.

Once you connect to spirit, you connect to everything. I was never alone again.

Gwayi'le'las: Bak̓wa̱m way of doing things

"We need to use our Gwayi'le'las, *maya'xa̱la* (to respect people, property, yourself)," says 'Namnasolaga. "Mother Earth does not need us. We need her. That's what people need to remember, she will reproduce on her own if we stop abusing her, and we as humans need to realize that we need her, she doesn't need us."

As a dedicated cultural teacher, 'Namnasolaga asserts countless teachings learned not only from her ancestors, but also through her experience in post-colonial life. "The basic human connection is needed with humans, our land, our animals and our awi'nokola. Our world needs us to make a paradigm shift. Why are we letting darkness override our light? The gifts come from the light, not the dark. So every day is a new day. Bring love."

Pa̱xa̱la, Desiree Mannila is a proud member of the Da'naxda'xw Nation and staff reporter for the *Watershed Sentinel*.

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Human Grief

In the Anthropocene, we must not be the sole survivors

by Sidney Coles

The word "Anthropocene" describes a geological age in which humans, through their activities, have an outsized impact on climate and the environment. Paradoxically, because of these same impacts, humans can no longer rely on living within the predictability of natural systems.

Recent flash flooding in Europe and Asia, massive wildfires throughout the Amazon, the devastation wrought by hurricane Helene, and the rise in mean planetary surface and ocean water temperatures that are bringing some places to the edges of habitability, all throw into stark relief the meaning of survival.

The acceleration of climate change forces us into a fundamental revision of the planet's condition and overturns our concept of survivorship. Our capacity for innovation allows us to adapt rapidly to changing natural and modified environments, but the limitations of our physiological and metabolic realities are more implicated in our survival than the ways we may hope to use innovation to surpass them.

Since the Enlightenment, Western civilization's confidence in its dominion over the physical world has outpaced its willingness and capacity to protect it. The Promethean successes of the sciences in explaining and manipulating the natural world has formed a distorted understanding of it, constrained by their purpose, methods, and principles.

The origins of that hubris emerged some 200,000 years ago, when Homo Sapiens began to use language to communicate. Despite our lack of a protective coat, scales, large teeth, sharp nails or powerful mandibles, the power of abstraction and future-thinking facilitated our emergence as an apex predator and reset the probabilities of our survivability. The consequence of those abstractions, in non-Indigenous cultures, however, has led to a disconnect and dislocation from the natural world and put us in a relationship of antagonism.

To outwit and outlast

In this context, we might reflect on what survival means, as industrialized nations continue to contaminate earth, water, and air on a global scale. Who and what survives? What survives of us under our current and forecasted circumstances? Industrialized nations make this calculus on behalf of infinitely complex systems of organisms, hydrology, and human and animal relations who have not consented

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⇦*Human Grief continued*

to their placement in the balance of risk. In the West, we admire most those who outwit and outlast. Our valorization of the nobility of perseverance and resilience explains the fixed place of Homer's *Odyssey* in Western literarature, the proliferation of endurance running and multistage cycling events, and the perennial popularity of survivor-type reality shows.

We do little moralizing about sole survivors, however lucky or depraved their means to stay alive. We seldom register that score, because the sole survivor represents a breach of natural law and so is beyond its recrimination. In the face of the miracle of persistence against all odds, we tend to forgive a lot.

There are plenty of things people survive: cancer, sexual or physical assault, torture, vehicular accidents, genocides, natural disasters, animal attacks, drug overdoses, falling from significant heights, lightning strikes, wars. To call someone a survivor is to declare the value of their continued existence. The Global North does not refer to those seeking refuge from the most climate-impacted countries in the Global South as survivors, but as "economic migrants," valued only in terms of their capacity to participate in a global economy.

How do we grieve for entire species and ecosystems?

Grieving non-humans

Beyond the animals we own and domesticate, we seldom see individual animals in the natural world as grievable, as survivors. We don't count them as survivors of natural disasters, hunting, poaching, or our devastating incursions into their habitats. We count the number that remain rather than those that have ceased to exist – until they are gone. And even then, their ceasing is something our imaginations can ill conceive of or fathom.

To survive is to exist beyond one's past. To survive is to grieve a world left behind. Our dominance has led to the accelerated diminishment and disappearance of countless plant and animal species. This erasure of the more-than-human extends to other humans whose survival is measured as less worthy or worthwhile.

The call of the last Kaua'i 'ō'ō bird was recorded for the Cornell Lab of Ornithology. That lone bird sang for his mate that would never come. How do we grieve that one bird? How do we grieve for entire species and ecosystems? In this realm, we are grief-illiterate.

African elephant survivors on this planet number roughly 415,000. Only 5000 eastern gorillas survive. There are currently somewhere between 23,000 and 39,000 lions in the world. In North America, 60,000 grizzly bears have survived, 14,000 of them in BC. The numbers and names assigned to each of the surviving 79 southern resident orcas in BC represent the anthropomorphizing of their extinction. L25 Ocean Sun is the oldest southern resident orca. Tokitae (Lolita), his last surviving relative, died in captivity in 2003 at the Miami Sea Aquarium.

Survival can be generative and transformational only if the survivor rejects becoming solely an historian to their survival and rejects becoming dead to their own lifetime. Survivor shows would have us believe we are watching something spontaneous and authentic. Their deception is very much a reflection of the corporate and political drivers of our climate emergency.

Actual survivorship is neither scripted nor performative. In the Anthropocene, it demands nothing less than a rupture, a revolutionary restructuring and decolonization of our minds, economies, and societies to align our collective impact with the planet's natural constraints. In this era, we must not be sole survivors.

Sidney Coles holds two PhDs. She is a journalist and writer and lives in Victoria on the traditional territory of the lək̓ʷəŋən people.

A Vision of the Future

Preparing for a best-case scenario in the Shuswap

by Jim Cooperman

Four years ago, after the New Year's Eve "snowmageddon" storm, I predicted the beginning of "the new Roaring Twenties, with the roar coming not from wild dance parties, but instead from wildfires, intense storms, rising social upheavals, and yet more wars."

Sadly, most of these predictions are coming true, combined with social stress from the pandemic that refuses to go away.

Think back to how different our world was in 1992 when personal computers were just being developed, cellphones looked like large walkie-talkies, there were few homeless people, homes were affordable and massive forest fires, storms, and intense droughts were a rarity. Considering the massive societal and environmental changes occurring now, what might the Shuswap be like in 2052?

Key to our ability to thrive in the future will be pre-emptively adopting climate change adaptation measures that will minimize impacts from fires, heat, drought, storms, and other emergencies. The second prerequisite is overall, societal and economic stability from the world level down to the regional level. The third would be achieving equitability, with co-operation replacing competition, the wealthy paying their true fair share, and poverty eliminated.

Provincial and federal governments will have their hands full coping with the coastal flooding crisis, thus local communities will need to take on greater responsibilities. Fortunately, the Shuswap is well suited for self-sufficiency as we have ample farmland, water, and a warm climate. One value of considering what a better future might look like is that it enables backcasting to identify what policies and programs are needed to reach a future desired state. By imagining an ideal future condition, one can better understand what is needed to get there.

What follows is excerpted from my initial exploration, written in the form of notes from 30 years in the future – "What Does the Future Hold: A visionary series about a best-case scenario future in the Shuswap."

Adaptive land management

By 2031, after a decade of increasing impacts on society due to the rapidly warming climate, it became incumbent upon all levels of government to change how the land is managed – including water, soils, biodiversity, and forests.

The next decade was a transition period, as decision-making shifted to local com-

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⇦*A Vision of the Future continued*

Thwaites Glacier, the "Doomsday Glacier"

munities rather than distant bureaucrats. The main goals for forestry became carbon sequestration, watershed protection, and ecosystem health, rather than lumber and fibre.

The loss of lives and homes to wildfires prompted intensive forest management near communities that included developing fire-resistant stands and converting coniferous forests to ones mixed with deciduous trees. Canada's Earth Corps, staffed by young people as part of their education and public service, handled most of the physical work.

While the number of fires continued to increase, the damage to property decreased as fire control became a high priority. Wildfires are now extinguished quickly thanks to high-tech satellite detection, locally stationed aircraft, drones, and Earth Corps firefighters.

Key to this success is the contribution that improved water management has made. Nearly every creek in the region has a series of run-of-river reservoirs that capture the spring run-off, which varies greatly due to climate instability. In addition to fire control, the stored water is used for human consumption and agriculture. Extra attention is given to watershed management to meet community water needs and to help prevent flooding and landslides.

The only timber that is harvested comes from ecological restoration activities and thinning for fire resistance. All timber is all used locally for construction, with any excess shipped within the province. Some forests are also managed for food production using Indigenous techniques. Berries, mushrooms and some native plants are harvested to augment local agriculture.

As the sea level rose and flooded coastal areas, including large cities, people were forced to move to the interior of the province. In order to accommodate the increased demand for housing, tracts of suitable Crown land were opened up for development and logging roads were upgraded to provide access for new communities.

In recognition that climate change mitigation must include protecting biodiversity, community-led ecosystem-based planning identified networks of land and aquatic areas that are now protected for water conservation, wildlife habitat, cultural activities and/or recreational use.

Feeding ourselves locally

Local agriculture is fully integrated into Shuswap communities, where there are many food hubs for cold storage, industrial kitchens, seeds, and advice. While the goal remains for most food to be grown and processed locally, already in 2052 nearly half of residents' dietary needs are provided by local producers, and food waste has been nearly eliminated.

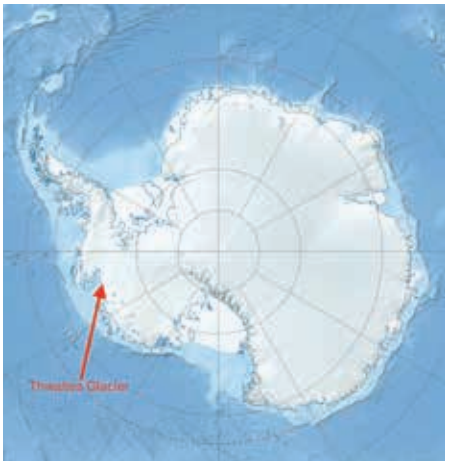
Farms are now much smaller and farming is more intensive, as increasingly more food is produced here to feed the rapidly growing local population. During the much shorter and less-intense winters, crops are grown inside in vertical gardens under energy-efficient LED lights.

Some of the best farmland in the river valleys is used for grain production, with harvests milled locally for flour and cereals. Agri-forestry has also advanced so that more food is grown in partial shade in nearby forests. Marginal farmland now produces hemp.

When carbon taxes were applied to cattle that belch methane, the prices for meat and milk products became too expensive, and most people switched to locally-grown alternatives such as legumes and oats. The Shuswap became known as the Romano bean capital, as the growing conditions are perfect here for this "King of the Legumes" that can grow upwards of six metres tall. New recipes were created locally for Romano-bean meat alternatives made popular by restaurants.

Farming methods no longer rely on vast amounts of chemical fertilizers or pesticides and instead focus on regenerative,

Location of Thwaites Glacier, Antarctica



organic practices that create healthy soils. Cover crops that create "green manure" are now the norm, as well as crop rotation and no-till farming. Adapting to the changing climate is a key goal, given the increased number of heat waves and intense storms. Shade structures are needed for more crops, planting times have shifted, and greenhouses use solar-powered fans to reduce temperatures.

Given that much of the food needed for local consumption is now grown and processed locally, diets for most people have adapted to include more fresh produce that can be cultivated over an extended season. During the winter months, most produce, other than that grown indoors, consists of vegetables such as cabbage, carrots, beets, and kale that are stored in solar-powered underground coolers.

Housing and infrastructure

The population of Shuswap communities has increased exponentially due to migration from coastal areas and southern countries that became uninhabitable due to rising temperatures and harsh weather.

To accommodate the population increase, people adjusted to smaller living spaces, while enjoying more time spent outside and in community spaces. Many mega-homes were converted to multi-family or group homes, with carriage houses in backyards and vegetable gardens replacing front yard lawns. Solar-powered heat pumps provide heating and cooling, along with geothermal systems.

New home construction utilizes hemp products such as hempcrete blocks, hemp wallboards, and hemp insulation, as well as steel from recycled vehicle frames. Conventional concrete has been mostly replaced by earth-friendly concrete that is made with a technique that releases far less carbon dioxide. Many new homes are built into hillsides with the first floor mostly underground, which provides a place to avoid the heat during the summers and takes advantage of the natural warmth of the earth in winter.

Co-operative group housing is very popular, as there are lower costs and more social benefits when people share living arrangements and transportation. Working spaces are often combined with living spaces to minimize commutes.

When the demand for living spaces outstripped the supply, new designs for housing developments were created that allowed for greater self-sufficiency. New, small communities were developed on crown land with off-the-grid homes that utilized water recycling systems, composting toilets, and geothermal heating and cooling.

> By imagining an ideal future condition, one can better understand how to get there.

Engineering innovation

Shade trees are growing along existing and new streets, which are built narrower to minimize their footprint. Vehicles are smaller, fewer in number and have hemp-plastic bodies and hemp-lithium batteries that last longer and hold a charge longer than the original batteries developed four decades earlier. Most people use bikes and scooters for local transportation, while electric cars and trucks are often shared between a number of families.

Thanks to innovative engineering, wastes have largely been eliminated, with recycled goods re-manufactured locally and many products are designed for re-use. Single-use containers are composted and then used as soil additives.

Despite the warmer, more unpredictable climate and the much larger population, life in the Shuswap has improved, thanks to greater cooperation and lifestyles that are more in tune with the natural world.

Jim Cooperman, author of *Everything Shuswap*, is a longtime environmental activist and bioregionalist. He and his wife Kathi live in a big house they built above Shuswap Lake.

Read the original, unabridged version of this article at *www.shuswappassion.ca/shuswap/what-does-the-future-hold.*

The Paradox of Fire

Balancing regeneration and risk

by Leslie Anne St. Amour

I have a love-hate relationship with forest fires. They are one of the most beautiful and powerful manifestations of our environment and the force of nature. They are a source of rejuvenation and new life, but as we know, they can also cause immense harm and pain.

In Canada, each province is responsible for managing the fires on their land. The main exception is federally-held land like national parks, which Canada manages. All the provinces and Canada work together to manage fires every year and share resources and information.

When we talk about battling forest fires, we often talk about "values" – things or areas within the forest that are viewed as valuable, like homes, businesses, camps, lodges, infrastructure (like electrical lines), and industry assets such as mines or forestry areas. Values can determine how a fire is managed. For decades in Ontario, the main fire strategy was suppression. This practice focused on preserving industry values, mainly forestry resources. To put it plainly: keep forests from burning so that they could be logged.

Ontario and other provinces are moving away from this strategy as they realize that fire is an important part of the landscape, and that preventing all fires just leads to bigger and more dangerous fires. We have also seen changes to forestry practices. For example, for many years logging companies were able to simply leave "slash" – waste products such as stumps, rejected logs, tree limbs and more – on the land. This led to slash fires, which grow rapidly, fed by these abundant fuels. As the industry shifted to better waste management and a more science-based focus, the types of fires changed.

More fires are allowed to burn on the landscape in natural ways and as part of cultural burns led by Indigenous peoples, with more focus on protection and management than on suppression. This isn't always a perfect solution; fire management programs are required to look at the values in an area near a fire and make a decision on when to intervene and how.

Sometimes they get it right; sometimes they get it wrong. And sometimes the guidelines and policies aren't what they should be.

In northern Ontario, the catalyst point to intervene on a fire approaching a First Nation community is different from the point when approaching a municipality. We tend to see First Nations evacuated earlier or more often than municipalities. The timing of when to intervene on a fire is important because the earlier the intervention, the more likely you don't have to be evacuated at all. When the catalyst to intervene is delayed, First Nations face higher risks and more evacuations and damage to their communities and territories.

Evacuations are not easy for anyone, but many Indigenous communities already face high levels of mental health challenges, medical concerns such as diabetes, addiction, and food insecurity, not to mention the hurdles that come with evacuating a remote community. Individuals can be sent to areas across the country and province. For example, people from Pickle Lake in Northern Ontario can be sent to Cornwall, ON, 2000 km and 20 hours away. These evacuation destinations are decided based on municipalities' facilities and willingness to accept evacuees. We are grateful for that, but it doesn't make it easier.

> Preventing all fires just leads to bigger and more dangerous fires.

Some fire management programs are working with Nations to identify cultural values to be protected alongside those identified by government and industry. They work to train First Nation members to help protect their communities from fires and to work within the fire management system.

It's hard to say any given fire season is the worst ever. We don't have good records dating back beyond the 1970s, or consistent metrics of what "worst" means. Is it the size of the area burned? Number of fires? Estimated cost of damage? Loss of wildlife habitat or unique ecosystems? We do know that the contributing factors required to make a bad fire season – drought, lack of rain, or lots of lightning – can result from changes to weather from climate change.

We also know that when human and industrial presence increase, we see more fires, whether from direct human causes like campfires or cigarettes, or from machinery or railroads. Resource extraction throughout northern Ontario exacerbates the risks of fire to the region.

This threat extends to one of the most crucial carbon sinks on the planet. The Breathing Lands, located primarily in the Hudson Bay Lowlands, are home to one of the world's largest carbon stores – as globally significant as the Amazon Rainforest. Over millennia, these wetlands have accumulated peat, a type of soil made from decomposed plant matter that stores carbon incredibly efficiently. Peatlands can hold almost twice as much carbon as a forest does, with over 35 billion tonnes of carbon stored in the Breathing Lands alone.

Canada has 25% of the world's remaining peatlands, and disturbing them has the potential to release 1.9 gigatonnes of carbon dioxide into the atmosphere. This is a massive carbon threat poised to be unleashed into the warming climate by unchecked industrial development and out-of-control fires.

A coalition of Nations is standing together and saying "no" to unrestricted industry access to the Breathing Lands. Learn how you can stand with them and help protect the Breathing Lands at *www.raventrust.com/campaigns/breathing-lands*.

Leslie Anne St. Amour is a member of the Bonnechere Algonquin First Nation and is the campaigns director for RAVEN Trust.

Hands and Handwork

Holding onto the natural language of the senses

©Dianne Bersea

by Dianne Bersea

Many years ago, my work associate Donna mentioned her concern about the impending loss of handwork as technology replaces the rough and tumble of varied implements and processes.

Together, we pondered the silent stream of changes entering our lives as computers, email, and digital operations began to arrive on our desks and doorsteps.

Would there be unexpected implications for our emotional, mental, and physical health? Would we lose our sense of touch? These days, we can add the potential impact of an electrical failure that could leave machines inoperable.

It's interesting that the word "digital" is used to describe our computerized new world order. Digital it certainly is. But it's hardly what I'd call handwork. Handwork requires a wide range of sensitive hand, palm, and digit skills that respond to an equally vast range of physical and mental activities.

Try pressing palms against tree bark to feel unexpected differences in natural surface temperatures. Gently brush fingertips through crisp fall leaves, or attempt to remove a prickly pear cactus spear from your sock. The magnitude of rich sensory experience our hands provide is thanks to one of our most critical senses: touch.

A 2017 study at the University of California-San Diego reported on "The amazing sensitivity of human touch." The researchers explored the ancient importance of touch receptors that process skin sensations, and commented on the long period of evolutionary time required to produce the precise blueprint needed to sense and respond to physical surfaces, whether a baby's skin or the rough physicality of stone, wood, or earth.

The tactile experience

Post-COVID, more of us are out walking, hiking, and gardening again. Perhaps we're down on our knees, holding a tender plant we started in a boot-room window, now carefully introduced to the soil outside, in the tactile experience of planting and yard work. In anything but mechanized agriculture, that can mean carefully counting precious seeds into the palm of my hand or serious labour with fingers clamped around a shovel handle.

On the other hand, Donna's anxiety about digital transitions references the conversion from metal typesetting to computer layout. This change involves more than just replacing physical, hand-involved processes with the flat, undifferentiated surfaces of the digital world. One of the first losses involves the skill and touch sensations that set special neuron synapses to their work.

In the late 1980s, annual reports were beginning to be digitally designed and printed. As a countermeasure, one inventive fellow created awards for documents that were reproduced and assembled by non-digital technology. I remember one financial

report bound in burlap with board and batten binding. Amusing perhaps, but it invited touch and provided me with a tactile memory imprint.

I had a similar response to a restored hand-operated letterpress. My heart skipped a beat when I saw, felt, smelled, and heard the press in action. Noisy clanking and rattles accompanied an inked plate as it was brought into contact with handmade paper.

The printer grinned as he pulled the paper away and held it out to me. As I touched the indentations of the metal type scored right into the paper's surface, I felt eerily and unexpectedly nostalgic. I realized I missed the creative hand-intensive manipulation of oils and inks, the smells and sounds of an old-fashioned printing shop. Perhaps even more, I missed the skills involved.

The hand of the artist

Our physically-impressible technologies have been around for a very long time, beginning with cuneiform marks pressed by hand-held stylus into soft clay tablets held in the palm of the hand. Add in wood block, silkscreen, lithography, etching, or simply pressing a painted leaf against a sheet of paper – all of which require creative, knowledgeable, attentive handwork. As an artist, I'm partial to the subtle grip and give of canvas as I bring a lightly grasped, loaded paintbrush into contact with my painting.

Over breakfast one morning, my partner Jodi contributed her thoughts on the dexterity and capabilities of hands. Pencil in hand, Jodi pondered the novelty of words in her crossword puzzle book. With mental acuity, creativity, and patience, she can usually solve word challenges quickly, although she says, "It would be so much faster to look this up on an iPhone."

Renowned Tofino wood sculptor Henry Nola instructing novice carver Jodi Forster.

> The rich sensory experience our hands provide is one of our most critical senses.

I could see Jodi's eyes shift from the crossword puzzle to focus on her remembered wood-sculpting work, which at one time was the chief focus of Jodi's creativity. It usually began with the splitting of a timber round with an axe and maul, then applying a well-sharpened hand adze to cut away additional wood.

Using finer and finer hand tools, which required a well-developed skill, the sculpting and carving would progress and expose the form within.

Eons of knowledge

I am fascinated with handwork and the range of hand operated tools, implements, utensils, gadgets, and gizmos that have made life possible since the human form evolved. That's a startling period of handwork encompassing more than 2.5 million years. By my reckoning, Gutenberg's printing press mechanization and digital processes account for less than six hundred years of our human experience.

This suggests an incredible bank of handwork knowledge enduring in the hands of our predecessors of eons ago, or among those only a generation two behind us, and especially among our Indigenous neighbours who work hard to maintain hand skill and knowledge.

Thankfully, hand skills are still practiced, especially in the creative and natural arts; from painting to planting, food preparation to music. All we require are the tools and incentive to maintain, retrain, re-apply, and rebuild simple hand operated solutions for positive well-being.

Dianne Bersea has been a professional artist for more than 35 years, with creative beginnings in the wild places of Canada's westernmost province. She lives in Penticton, BC. *www.diannebersea.com*

Wild Times No place like home

by Joe Foy

Every city has its own unique personality.

Manila, Philippines, where my wife was born, was overwhelming the first time I visited. Super friendly people. Roosters calling in the morning everywhere. Warm rain. Amazing street food and small eateries. Cool air-con shopping malls. Sweltering open-air markets. Chaotic traffic. A metro area of about 15 million people that feels like a bunch of close-knit neighbourhoods. Many people actually know the folks on their street in Metro Manila.

Whenever I leave Manila, I find myself counting the minutes and hours until the day I can get back.

But, as they say, there is no place like home.

I was born in Metro Vancouver. Back then our family lived on our ten-acre chicken farm in the sleepy farm town of 1950s Langley. These days, my wife and I live in the geographic heart of Metro Van – in New Westminster, with dozens of family members living in various Metro Van communities.

Metro Van is approaching three million people. It's a cooler, quieter town than Manila.

People here are not always acquainted with the folks living on their street, but they often have a circle of family and friends that they do outdoor activities with. This city and surroundings are superb for a walk in a neighbourhood park, a picnic, BBQ, soccer, softball, lacrosse, urban cycling, mountain biking, running, bird-watching, hiking, winter and summer camping, downhill and cross country skiing, snowshoeing, backpacking, canoeing, kayaking, paddle boarding, sailing, swimming, scuba and free diving, rock climbing, mountain climbing, hang gliding and many other wild and not-so-wild adventures waiting within day-trip distance of where they live.

One outdoor experience says a lot about Metro Van's special personality, because it is not possible in most other cities.

I am talking about experiencing roadless, trail-less, ancient forested, intact valleys within day-trip distance. Walking into the unknown for an hour, or a day, or backpacking for a week, and not seeing another human being the entire time. Some of these valleys are in protected areas. Some are threatened by various industrial proposals, mainly logging. These special places are part of what makes Metro Vancouver unique.

Metro Van people consistently show up to protest industrial projects that threaten wild nature. This has resulted in strong partnerships with Indigenous nations that have protected amazing wild areas like Stein Valley Nlaka'pamux Heritage Park, and the Squamish Nation's Wild Spirit Places.

This past summer a friend and I backpacked for a week into the Teapot Valley, a side drainage of the Nahatlatch River in Nlaka'pamux tribal territory.

We experienced a fantastic ancient landscape, the likes of which is long gone in the vicinity of most major cities of the world. Proving once again: there really is no place like home.

Joe Foy is the protected areas campaigner for the Wilderness Committee.

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