



"Know nature and keep it worth knowing"



The Fastest Bloom in the West

AGM 2022 - Kelowna

The Magazine of BC Nature

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Date to Remember

March 18, 2022 - Award submission closes

April 1, 2022 - AGM Registration closes

May 26 - May 28, 2022 - AGM 2022 - Kelowna

May 27, 2022 - Rene Savenye Scholarship and Bert Brink Scholarship submissions closes

"A true conservationist is a man who knows that the world is not given by his father, but borrowed from his children."

John James Audubon

Objectives of BC Nature (Federation of BC Naturalists)

- To provide naturalists and natural history clubs of B.C. with a unified voice on conservation and environmental issues.
- To foster an awareness, appreciation, and understanding of our natural environment, that it may be wisely used and maintained for future generations.
- To encourage the formation and cooperation among natural history clubs throughout B.C.
- To provide a means of communication between-naturalists in B.C.

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We reserve the right to edit submissions for length, style, and clarity.

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Changes within BC Nature

The BC Nature Board of Directors hereby notifies all members that President Harry Crosby resigned effective February 13, 2022. The Board thanks Harry Crosby for his hard work raising the level at which BC Nature contributes to addressing issues that concern naturalists, and to Karen Crosby for her leadership of and major contributions to the Climate Change Committee.

The Board appointed Alan Burger as the interim President, and they actively seek candidates to fill the

President's position and other vacancies on the Board.

The Board also appointed Stewart Guy as the interim Executive Director – this is the first time that BC Nature has an ED. Stewart has 25+ years as a senior administrator in environment and natural resource departments within the BC and Yukon governments. He began his career as a park naturalist and teacher, and has been a member of the Victoria Natural History Society since the 1970s. Welcome Stewart! 🐾



Editorial

The 'Environment' and the Canadian Charter of Rights and Freedoms

Author: Larry Murray

Go big or go home, is a quote often associated with innovation or idea generation. This essay tries to capture a very special 'go big' concept - include the Environment in the Canadian Charter of Rights and Freedoms. Yes, the famous 1982 Charter that has helped define what it means to be a Canadian. Yes,

the Provinces argue over the 'notwithstanding' parts of this document. Yes, the Courts continue to have their go at interpreting this keystone legislation. And, yes, there is room for the Charter to grow and encompass new directions as our democracy unfolds. Is it now time to define the Environment as a major right and freedom that Canadians deserve?

The keystone concepts include freedom of conscience and religion, thoughts and beliefs, and the press and media, peaceful assembly, and association. In all, there are 34 categories that define our rights and freedoms; yet there is no mention of the 'Environment' as a right or a freedom. These Charter statements act both as a foundation and filter for decisions and actions that we take as Canadians. Except the Environment is not in the Charter.

So why is that important? It seems that many issues, constraints, and problems we face today in Canada and worldwide are environmental. Yes, equality and language rights and minority rights are still evolving but they are already addressed in the Charter and are being worked through. The Environment does not benefit from such foundational authority; hence the debate, discourse, and challenges we face today.

What would it possibly look like to enshrine the 'environment' in the Charter? The right to a preserved and sustainable environment sounds fine. Or, how about ensuring an enduring legacy for future generations and to continuous enhancement of life for everyone. Any wording needs to understand future challenges and be robust enough to survive a 'watering down' of the intent.

The Environment, included in the Charter, would confer legal status and confirmation that the Environment is a reality in our lives. It would signal to everyone that this must be taken seriously as to how we build, repair, legislate, and respond to be in harmony with Nature. It would sanction what is beginning to happen as industry and businesses take the Environment into account in their planning and actions. A flood or wildfire is not a debate like an intangible concept like 'respect' or 'Democratic Rights'. A flood or wildfire is as real as it gets. In our current rush to be 'green', we will benefit from deeper directions through legislation. Yet, the Environment is not in the Charter.

Climate change impacts on so many lives – drought, fire, flood, heat, and air pollution are increasing disasters worldwide. Yes, great harm is caused by not respecting and acting upon the Articles already in the Charter; but at least, they are in the Charter. Often the harm is to groups or individuals. Harm from the Environment is widespread and involves not only economic hardship, but deep personal and emotional harm. After each storm or natural disaster event, statements of the costs for damage often reach dizzying heights and each new one brings even greater costs. The human costs are noted daily on the six o'clock news.

The financial and human costs

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confirm each successive year is hotter or wetter or colder or more destructive than the last one. Insurance is skyrocketing due to the coverage expected. Repair and reconstruction costs are exorbitant. Communities strive to create new or better legislation to keep ahead of the natural disasters. Note: the Environment is not in the Charter of Rights and Freedoms.

Gibsons, B.C. is one community that gets it right. It is the first in Canada to recognize and accept that the Environment offers Natural Resources and real tangible assets. It has partnered with the Suzuki Foundation and other groups to include this concept into its municipal financials. (See: Smart Prosperity, Town of Gibsons). This town has fostered others to begin to incorporate the Environment and Natural Resource Assets into their planning and budgeting. If small communities can do it, think of the impact if the Environment was part of the Canadian Charter of Rights and Freedoms.

Environment reporter, Kathryn Baum wrote that throughout history the land, air, and waters were used and abused. Most often with no regard for the damage that humans brought to these natural areas. Still today, developers and some municipalities will cover a wetland or build on a flood plain. Joni Mitchell got it right when she sang about 'paving paradise and putting up a parking lot'. Once an environmental problem occurs, a human engineering solution is used to try to resolve the problem. Big costs and big infrastructure to solve what might have been solved much earlier with much more forethought and less cost. Little regard is shown for supporting nature in being self-healing if left alone. Unfortunately, humans often damaged the environment so badly, even Nature could not repair it. So, what might happen if humans

worked in harmony with Nature and the Environment. If the Environment was in the Charter of Rights and Freedoms, no self-respecting community or company or industry would think about doing harm to Mother Earth.

Kevin Carmichael describes the 'dithering' over climate change and the need for banks to build risk-management infrastructure. Sanctions are ahead for banks unless they apply as strict standards to climate change, as they do to small business loans. Here is the cruncher that makes a case for the Environment to be in the Charter. Carmichael states that the Bank of Canada has little regulatory power but by lending its influence in this way, it becomes a neutral benchmark for environmental policy.

A friend has created a medical innovation called Samepage Health in which there is alignment in purpose and function for all those responsible for a patient's health - the patient, medical staff, the pharmacist, therapists, and administrators - all on the same page, thus offering better outcomes and more cost-efficient healthcare. What if the developers, the loggers, the First Nations, business, and industry, and Governments were all on the same 'environmental' page! Think of the influence from the Federal Government and Federal Courts to support respectful environmental policy throughout the land, if only the Environment was in the Charter of Rights and Freedoms.

Geoffrey Morgan, states that many Canadian businesses are already moving toward higher environmental standards in their practice. He cites COPE26 as a catalyst for the banks, asset managers, and industries such as Barrick Gold Corp and Teck Resources Ltd. coming on board with procedures more in line with doing business in a climate changed

Canada. What a boast it would be to have the Environment in the Charter of Rights and Freedoms.

This writer lives in an environmentally-sensitive community that is at the bottom of two major watersheds and two major rivers. One river was so powerful it pushed gravel ahead of itself, created a dam and then did a right-angled turn and joined the other river and left a blind channel in the lower outlet to the ocean. Right, the ocean, lapping at the edge of town...that ocean...the rising one. The dormant volcano, Mt Garibaldi, overlooking my community, is part of the Mount St. Helens chain. Then there are the tinder dry coniferous forests that defy logic during the summer heat domes. The town is surrounded by world-class steep mountain cliffs that occasionally just drop straight down. A new concept - an atmospheric river of rain has now arrived with some regularity. All of this with no public audible warning system in place. One must register with the municipality to be placed on the warning call list... what a mad idea. Would I sleep better if the Environment was in the Charter and guiding policy and decisions in my community? You bet.

Is there a case for including the Environment and natural resource assets into the Charter? Yes, a resounding case and growing in importance. Nudging, influencing, suggesting, and recommending all have their place, but hard copy statements in the Charter of Rights and Freedoms would clearly define an intent and an expected outcome. What more lofty goal would enable Canadians to know the natural world in which they live their lives and make their living will continue to contribute to their health and welfare.

Yes, it is time to put the Environment into the Canadian Charter of Freedom and Rights. 🌱

Conservation Committee Updates

Author: Peter Ballin and the Conservation Committee

Thank you to the clubs that have shared their advocacy letters with the conservation committee, so that BC Nature could write in support! It's great to see the work that you've been doing and allowing your concerns to become ours, so that we can add the voices of the rest of BC Nature. Keep it up! Recently, because of such sharing, it came to light that Nature Chilliwack and the BC Nature Conservation Committee were tackling the same issue. It's all good and complementary, but we can gain power by sharing in real time. The simple solution: place a member of your club on the BC Nature Conservation Committee.

I'm stealing from an article that I recently read by Rabbi Aryeh Cohen, about the speech Martin Luther King delivered in Memphis on the night before he was killed. King preached about the parable of the Good Samaritan. You may remember that in the story, a couple of people passed by an injured man before the Samaritan stopped to help. King commented upon the story as follows. The first question that the two who passed by asked was, "If I stop to help this man, what will happen to me?" The Good Samaritan reversed the question: "If I do not stop to help this man, what will happen to him?" Is it time to apply this parable to the ecosystems wherein we live?

Here are some topics of our activities in the last few months:

Twelve conservation letters sent from the beginning of November until the end of January and meetings attended

- Fraser River Estuary Action Plan
- Roberts Bank Terminal 2
- Species at Risk
- Climate Change
- CleanBC Roadmap
- Fossil Fuel Royalty Review

- Protecting Watersheds
 - > Salmon Parks
 - > Howe Sound
 - > Little Campbell River
- Important Bird and Biodiversity Areas
- Meeting with Minister of Fisheries and Oceans Joyce Murray

Fraser River Estuary Action Plan:

What do birds, salmon, and orcas have to do with one another? Lots.

One of BC Nature's focal issues currently is the Fraser River Estuary, which basically can't handle any more development without critical danger to ecosystem function. Migrating birds and salmon, and the endangered Southern Resident Killer Whales (amongst other creatures) rely upon a healthy estuary. We can't be spectators watching the further demise of this critical area, vital to most of British Columbia.

Simon Valdez, BC Nature's Conservation Coordinator, is working on an action plan about how clubs can coordinate their conservation activities in the Fraser River Estuary (FRE). The first step on that plan is the creation of a Fraser Estuary Working group with members of the clubs working on the FRE. We're poised to accept a summer student, funded through UBC, to facilitate coordinated monitoring of invasive species projects in the FRE. With the initiative by Harry Crosby, we have been communicating with others involved in the FRE, including Ken Ashley of BC Institute of Technology (Rivers Institute) and James Casey (Birds Canada), who both have a wealth of knowledge, experience, and wise counsel. BC Nature representatives (plus others) attended a meeting convened by Eric Balke of the Ministry of Forests, Lands, Natural Resource Operations, Public Outreach Program

in South Coast conservation lands, on January 27, discussing the future of stewardship in the FRE. The government won't take a lead, as the funding for their two staff members will cease, but it encourages collaboration amongst volunteer organizations such as ours. BC Nature has also integrated into the Adapting for Ecological Resilience Network (AFER), led by Raincoast Conservation Foundation. Meetings and workshops that facilitate coordination and collaboration of NGOs working in the Fraser Estuary are being held regularly. For example, several BC Nature representatives joined the workshop "Nature-based Solutions".

Roberts Bank Terminal 2 (RBT2):

In January a number of international scientists who conduct studies that include the Fraser River Estuary, salmon, or Southern Resident Killer Whales submitted an open letter to Steven Guilbeault, federal Minister of Environment and Climate Change Canada, detailing their opposition to the RBT2 development. Roger Emsley, our special representative, drafted a BC Nature letter sent on January 24 to Impact Assessment Agency Canada in response to an invitation for public comment <https://bit.ly/34sTUmS>. BC Nature registered its opposition, once again, to the RBT2 project and urged the federal government, once and for all, to deny project approval.

A decision by the federal government is expected soon after February 13, 2022 - the closing date for this final round of public consultation. The underlying legislation requires a decision by the Minister of Environment and Climate Change as to whether the project will result in significant adverse environmental effects that cannot be mitigated. If he so decides, then it is up to the Governor in Council (Federal Cabinet) to decide whether the adverse environmental effects are justified in the circumstances, or to deny

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approval.

The additional information supplied by the Vancouver Fraser Port Authority does not resolve the substantive issues raised by the Environment and Climate Change Canada (ECCC) scientists. These scientists have repeatedly warned that if the project were to proceed it will result in adverse environmental effects that will be immediate, irreversible, continuous, and cannot be mitigated. ECCC and other independent scientists have provided compelling evidence that the project will affect both biofilm quality and quantity on Roberts Bank, thereby threatening Western Sandpipers.

The potential conditions as drafted by the Impact Advisory Committee Canada - an arm of Environment and Climate Change Canada - do not contain provisions that will mitigate these adverse environmental effects. These draft conditions assume incorrectly that:

- Biofilm quality and quantity will not be damaged, despite warnings to the contrary from ECCC scientists.
- If damage is detected then mitigation will be possible by creating an equivalent area of biofilm, despite ECCC scientists having proven that this is not possible on the scale required to offset the damage.

The draft conditions ignore the fact that biofilm in the Fraser River Estuary is the major source of polyunsaturated fatty acids to the entire coastal ecosystem. Damage to the supply on Roberts Bank will affect not only the birds, but will also negatively impact commercial salmon and crab fisheries as well as Indigenous important species such as eulachon.

Most importantly, if the project is approved and any of the draft conditions fail, there are no provisions to either stop the

project or to prevent permanent environmental damage to Roberts Bank wetlands and the wildlife that relies on them.

The Fraser River Estuary has already lost more than seventy percent of its natural habitat. BC Nature posits that the Estuary, and specifically Roberts Bank, simply cannot withstand any more industrial or port development.

Species at Risk - Ben van Drimmelen and the Wildlife Subcommittee

Four Conservation Committee members (Alanna Mackenzie, Harold Sellers, Jacqueline Sherk, and Ben van Drimmelen) got together last September to form a subcommittee focusing on where BC Nature could most effectively focus on wildlife and wildlife habitat issues. Joan Snyder and Greg Ferguson have since joined. The initial four had their first Zoom meeting on November 8, followed by meetings on November 29 and January 10. On November 8, they discussed the potential scope of the subcommittee and where it should focus its initial efforts. The members decided to explore species at risk, with the objective to focus in some depth on conservation of species at risk and provide a technically credible rationale to allow BC Nature to more effectively influence government. Each member accepted specific tasks – summarizing B.C. and federal species at risk legislation, summarizing the results of the B.C. government’s public species at risk consultations and the actions of other non-government organizations, and learning how to use BC Nature’s document library.

On November 29, members summarized their respective findings. They worked out subcommittee goals. Again, each member took up specific tasks: determining which provincial government staff were working on species at risk, finding B.C. government documentation on conservation of species at risk

and their habitats, and following up with interested non-government organizations to re-vitalize another push for species at risk legislation.

On January 10, a similar sequence: each summarized their additional findings. They then contacted an Assistant Deputy Minister in the Ministry of Environment and Climate Change Strategy. The initial response was not particularly encouraging. After several years of public consultation on an Endangered Species Act and a Species at Risk Act, those government initiatives appear to be either stalled or abandoned.

Overall, it appears as though many environmental organizations, including BC Nature, have put a lot of effort into consulting with government over the past five years on legislation for both endangered species and species at risk, but to no apparent avail. Various organizations seemed to have lost steam in the interim. The BC Nature Wildlife Subcommittee decided to look into either joining or resurrecting a coalition of environmental organizations to make one more coordinated and vigorous effort to convince the government that there has been enough consultation and talk – legislation is long overdue. Just do it!

The Minister’s Wildlife Advisory Council Meeting about the Together for Wildlife Strategy

- Attended by Peter Ballin on December 1, 2021.

This two-hour meeting was a follow-up to one attended by Anita den Dikken and Peter Ballin in Richmond: Improving Wildlife and Habitat Conservation Workshop on October 22, 2019. An advisory council was established after that meeting (Peter applied but didn’t make the cut), and the 18 members seem to have been hard at work. The majority of stakeholder/participants are Indigenous, hunters, trappers, and guides.

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The meeting began with an address from Katrine Conroy, Ministry of Forests, Lands, Natural Resource Operations, Minister and was moderated by Advisory Council Chair Nancy Wilkin. (Nancy and Peter worked together in the Wetland Stewardship Partnership, where Peter represented BC Nature). She reiterated the issue: declining wildlife and habitat loss. Here's the context:

The five goals of Together for Wildlife

- **Goal 1:** All British Columbians have a voice in wildlife stewardship
- **Goal 2:** Data, information, and knowledge drive better decisions
- **Goal 3:** Stewardship actions achieve tangible benefits for wildlife
- **Goal 4:** Accountability and transparency build trust and confidence
- **Goal 5:** Collaboration advances reconciliation with Indigenous peoples

The Together for Wildlife strategy was built collaboratively with the following groups: Indigenous peoples, rural communities, academic institutions, a wide range of resource industry stakeholders, and conservation, hunter, trapper, guide, recreation, and tourism stakeholder organizations.

Nancy stated the priority: ecosystem health. The process includes landscape management and policies, and regulations encompass all sectors, and includes Indigenous participation. The project is funded with \$10 million annually, with 100 past projects in 2020-2021. BC Nature is considered a stakeholder. Recommendations are ready to go to the ministry, and can be found on the website <https://bit.ly/34cNI2r>. Peter's comments about the need to educate about ecosystem integrity and connectivity to achieve the goals were well received. It's important that BC Nature's voice remains loud and

clear in this forum.

Mountain Caribou Conservation Report - Joan Snyder

Population estimates by Current Trends for B.C. Caribou Herds (as of October 2021): Extirpated: 7, Increasing: 7, Stable: 8, Unknown: 13, Decreasing: 19

The Caribou Recovery Program Map shows that five of the extirpated herds in B.C. lived in the southernmost part of the province: two herds in the Purcells, one in the South Selkirks, one in the Monashees, and one in the Central Rockies. The seven increasing herds are primarily in north-central B.C. and further north in Carcross (Yukon) and Atlin, which still have large numbers of 775 and 1,527, respectively. The eight stable herds are in the far north while the other 13 far north herd populations are listed as unknown. Most distressing are the 19 herds decreasing all across the province. The Central Selkirk herd has declined from 200 in 1994 to 28 in 2021. This disturbing data may indicate another extremely sad loss of caribou from the southern part of the province.

Interim aerial wolf reduction

procedure (2021) - The B.C. Caribou Recovery Program is identifying caribou herds in situations where wolf reduction could support caribou recovery. A detailed report and wolf reduction procedures can be found at this government site: <https://bit.ly/3Hk0pHa>

Update on Wolves - Jacqueline Sher - The provincial government announced on January 27 that it plans to continue the aerial gunning and trapping of wolves as part of its predator reduction program intended to protect mountain caribou herds in the south-eastern areas of the province. This announcement came as a shock to many who had participated in a government survey on the matter. Almost 60% of respondents in the



American Dipper

survey said they did not agree with the culling program. Pacific Wild conservation group was among those adding that they are still awaiting a decision in their court case against the government's cull.

The wolf cull program was initiated in 2015 and has been responsible for killing approximately 1,500 wolves at a cost of millions to B.C. taxpayers. Government insists that their predator reduction program is a short-term effort that is helping caribou to recover. They say that 'the culls will continue to take place until habitat restoration and protection overcome the legacy of habitat loss'. But scientists and conservationists say not enough is being done on that front. Every year, additional roads, gas pipelines, and clear cuts are all continuing to be approved in critical caribou habitat, even while the extermination of wolves continues.

Grants approved for 14 caribou habitat restoration projects

Some good news: the provincial and the federal governments have approved 14 grants from the Habitat Conservation Trust Foundation for new and ongoing projects in the restoration of caribou habitat in British Columbia. The 2021 grants allocated more than \$1.65 million. In 2018, the provincial government committed \$8.5 million for the Foundation's work, and the government of Canada contributed \$5 million over a five-year period that will benefit the Central Group of the Southern Mountain

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Caribou. The five approved projects will be co-funded by the provincial government and Climate Change Canada. More detailed information on grants is available at: <https://bit.ly/3Hk8wDj>

Climate Change Action Update -

Climate Action Subcommittee.

BC Nature Drawdown "Getting into Action" Course on Climate Solutions.

This course was facilitated in November 2021 for 20 BC Nature members from across the province, and participants continue to meet once a month.

MP Peter Julian agreed to present our Just Transition Petition in Parliament on behalf of New Westminister citizens. As part of a Canada-wide campaign initiated by the Council of Canadians, we gathered the required 25 signatures on a petition calling on the federal government to enact legislation for a just transition from fossil fuels to renewable energy. We then met with MP Peter Julian (New Westminister-Burnaby) and asked him to present our petition (and future ones we submit), and he said yes! By having multiple MPs present this petition multiple times, we create multiple opportunities for MPs to demand the legislation, thereby flooding Parliament with the message. We hope this will result in speedy action. You can do this too! Read the FLOOD PARLIAMENT Building Waves of Support for a Just Transition toolkit (which includes the link to the actual petition on page 3) and get started: <https://bit.ly/3gieOrw>. Council of Canadians information can be found at: <https://bit.ly/3ghCQCY>

CleanBC Roadmap for 2030:

BC Nature sent a letter responding to the CleanBC Roadmap for 2030 on December 16, 2021 to members of the B.C. Legislative Assembly. We supported these aspects of the CleanBC Roadmap:

- Increasing the carbon tax to \$170/tonne by 2030; it is

currently \$45 per tonne and is scheduled to increase to \$50 on April 1

- Further regulating the reduction of methane emissions
- Moving up the date for new light-duty zero-emissions vehicles
- Mandating zero-emissions for medium and heavy-duty vehicles
- Strengthening the low carbon fuel standard
- Lowering transportation emissions

BC Nature expressed grave concern about the disconnect between the Roadmap and our collective experiences, punctuated by the summer and fall of 2021, which demonstrated how deeply we have moved into the climate emergency. Some examples include:

- The June/July 2021 heat dome that resulted in record temperatures.
- The more than 1 billion sea creatures that died along the B.C. coastline.
- The wildfires that destroyed habitat and human settlements and released health-damaging smoke.
- The drought conditions that affected much of Vancouver Island and southern B.C.
- The early snowmelt that accelerated glacier melting.
- The November 2021 "atmospheric river events" that resulted in many disasters.

We made the argument that not enough is planned to be done soon enough! "The Roadmap response seems like an ambling stroll to get the non-maintained fire extinguisher from the back cupboard while the flames engulf your home." Read the letter in its entirety at <https://bit.ly/3L40jp4>

Environment and Climate Change Strategy Minister George Heyman replied the next day with a comprehensive general



Mountain Emerald Dragonfly

letter outlining the government's consultative process and its actions <https://bit.ly/3rjBH41>. Read the letter for details about B.C.'s environmental policies and actions.

Fortis Expansion Project: Tilbury Island - Anita den Dikken

Fortis is proposing to increase its production and storage capacity on Tilbury Island in the Fraser River by more than 50%. The expected operational life is expected to be 40 years.

This project was previously under environmental impact assessment in 2020. In September of 2020, Fortis requested that the time limit for the assessment be suspended while they adjusted the parameters of the project.

On January 10, 2022, the Impact Assessment Agency of Canada determined that this project would require an environmental impact assessment. The Minister of Environment and Climate Change Canada, agreed that a provincial assessment could be substituted for the federal one. The new assessment process is now underway, with no end date established.

The Cities of Richmond, Vancouver, New Westminister, Burnaby, and Port Moody have previously registered opposition to this project because the greenhouse gas emissions would be so large that it would render their environmental plans ineffective.

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Fossil Fuel Royalty Review: On December 9, 2021, BC Nature responded to a request from government for input on the current royalty system for fossil fuel extraction <https://bit.ly/3oiZYoR>. Current policy tips the scale in favour of fossil fuel production rather than the sustainable energy infrastructure required for a healthy future. Ever expanding gas production pollutes local ecosystems and groundwater, harms human health, undermines climate action, and encroaches upon Indigenous rights. Ongoing subsidies and tax breaks for fossil fuel companies incentivize fracking, gas pipelines, and LNG export facilities that are not otherwise economically viable. The public currently pays for the carbon pollution these companies and their fossil fuel products create. Royalty rates should reflect the societal costs of climate impacts. We asked that a new royalty framework place environmental protection, especially the need to reduce carbon pollution from the burning of fossil fuels, ahead of public revenues or economic development. That means a high royalty rate on B.C. fossil fuel projects that reflects their social, environmental, and climate impacts.

We asked government to share with us a positive vision of transitioning to renewable energy production with just job transition for those affected and in accordance with the United Nations Declaration on the Rights of Indigenous Peoples.

Salmon Parks: Larry Dill drafted a letter <https://bit.ly/3L4AXaX> to the Mowachaht/Muchalaht First Nation in support of their restoration plan to recover key watersheds and restore wild salmon within the Ha-Ha-Houlthee of the Northern Nuu-Chah-Nulth Nations in B.C. (Nootka Sound). The Chiefs added five estuaries in Tlupana Inlet to the conservation protection list in December. The projects include protecting riparian areas from logging and they are

looking for old-growth and ancient forest deferrals as they expand their project. The Canadian Parks and Wilderness Society also supports these efforts.

Howe Sound: Bev Ramey drafted a letter of support that BC Nature sent to the Squamish Environmental Conservation Society and Howe Sound Biosphere Region Initiative Society on Jan 21, 2022 regarding Ecosystem Corridor Mapping for Sea to Sky Biodiversity Conservation <https://bit.ly/3sGTKSc>

We recognized the efforts of these Societies and congratulated them on the designation of the Átl'ka7tsem Howe Sound UNESCO Biosphere Region and their ongoing efforts to protect and document nature in this area. BC Nature supports the proposal for detailed work in the District of Squamish and surrounding lands: identifying and mapping important natural habitat corridors. The work proposed in the Preliminary Scoping Report, *Habitat Connectivity Squamish B.C.* (October 2021), scheduled to take place over the next three years, will provide an excellent resource to protect connectivity of natural areas.

Little Campbell River: David Riley, President of the Little Campbell Watershed Society, drafted a letter to Metro Vancouver politicians (lots of them!) <https://bit.ly/3giudYC> protesting the Campbell Heights industrial plan, which threatens the watershed, including agricultural and natural areas.

For decades many organizations, including two of our member clubs, the Friends of Semiahmoo Bay Society (FoSBS) and the Little Campbell Watershed Society (LCWS), have worked as stewards of the Little Campbell River (Tatalu) watershed through habitat enhancement and environmental education. The Little Campbell River, in the Lower Mainland, requires conservation



Photo: V. George

Phantom Orchid (*Cephalanthera austinae*)

action to protect and enhance its biodiversity in the five jurisdictions it flows through, particularly the City of Surrey. Numerous wildlife species, some at risk, require the forests, greenfields, and wetland habitats along the Little Campbell for survival. The Little Campbell River is also the major target in cleaning up Semiahmoo Bay and Drayton Harbour for Indigenous and recreational shellfish harvesting.

Surrey Planning promised 'no smokestack' industry in Campbell Heights, yet now zinc compounds and other chemicals are being emitted from two industrial plants into South Surrey air and thence into the watersheds, impacting the river and aquifer. This compounds previous aquatic habitat damage that resulted from the early stages of Campbell Heights development.

BC Nature asked the Metro Board to deny this proposal until such time as the City of Surrey has presented a comprehensive environmental plan to ensure that the Little Campbell River and surrounding environments suffer no further degradation. On January 28, 2022, Metro Vancouver voted 64-61 to send the proposal back for more work.

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Important Bird and Biodiversity Areas - Liam Ragan

In 2022 the Important Bird and Biodiversity Areas (IBA) program is continuing its efforts to effectively monitor the most critical sites for wild birds in the country, and ensure they get recognition as Key Biodiversity Areas (KBAs) as the initiative expands to include other taxa (see *BCnature* Winter 2021 article for more info). This means supporting our volunteer IBA Caretakers and identifying new and existing partners to support survey efforts, such as First Nations, BC Field Ornithologists, Birds Canada, the Wildlife Conservation Society of Canada, and Environment and Climate Change Canada. If you have an interest in being part of our efforts to monitor and protect these sites you can see a map of all IBAs in Canada at ibacanada.ca, and email the provincial coordinator at iba@bcnature.org.

Meeting with Minister of Fisheries and Oceans Joyce Murray:

On January 28, 2022 Peter Ballin joined a small group of our MP's constituents to raise concerns about action on interrelated issues of fishes, forests, and people. The topics presented and discussed were:

- Scaling up federal funding to support B.C. old growth logging deferrals
- Federal support to delay harvesting B.C. 2nd and 3rd growth forests in support of Canada's carbon budget and COP26 commitments to end deforestation
- Federal action and funding for protection of salmon-bearing streams and surrounding forests, including salmon parks
- Ending open-net pen salmon farming
- Funding salmon-friendly Fraser Valley reconstruction

- Restoring herring stocks
- Deep ocean hydrothermal communities and abyssal plains Marine Protected Areas

The minister expressed agreement with our agenda; She spoke of the slow pace of policy changes due to the need to listen to all concerns and of her increasing awareness of the complexities of the issues, although she emphasized the government is moving forward. She asked us to submit a letter that she intends to share with other ministers. Minister Murray knows that Peter also represents BC Nature, and the letter will be supported by BC Nature. 🐟

Update: February 24, 2022 - A letter was sent to Minister Murray covering the topics of BC fisheries and old growth forests. Please view Letters and Briefs at bcnature.org



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The FWCP is a partnership between BC Hydro, First Nations, the Province of B.C., Fisheries and Oceans Canada, and public stakeholders to conserve and enhance fish and wildlife in watersheds impacted by BC Hydro dams.

Photo: Ben Weunier

Millipedes Mystery

Authors: Derek Killby and Al Grass

While on a nature walk with Al Grass in Burnaby's Central Park, our group paused by a cluster of Douglas-firs. All three trees on both sides of the trail had a sticky and syrupy resinous discharge and on the largest appeared to be 'worms' of some type in the flow of resin. As we looked closer, we could make out the unmistakable shape of a millipede. In fact, dozens or even, hundreds, were encased in the resin of the largest discharge; lesser numbers were on the other two trees which had correspondingly smaller discharges.

So, what was going on? The first step was trying to identify the millipedes and there we hit a bit of a dead end. There is surprisingly little information about millipedes in our area, the native Yellow-spotted Millipede being the easiest to identify and having the most information.

I sent the photos to the Entomology department of the Royal BC Museum in Victoria for their assistance and the photos made their way to a North American expert in millipedes. The reply was that they are likely a non-native species, (due to it being seen in an urban park) in the Julidae family and; that this was likely something that had occurred over a long period of time, not a mass 'extinction' event!

But, what would attract these millipedes to the resinous discharge in the first place? Millipedes are herbivorous or detritivores living in the leaf litter and decaying vegetation on the forest floor. Two possibilities emerged.

First, trees that are in some degree of decay or stress send out chemical signals which can attract various detritivores to consume and recycle the decaying material. Perhaps our millipedes were simply attracted to the resin as a food. Resin is a mixture of chemicals called 'terpenes', which have a chemical structure somewhat similar to gasoline. It is possible that these arthropods were recycling some of the material and the unlucky or unwary ones got caught up in the extremely sticky substance and were encased.

A second possibility is that there are some species of millipedes that live in the tree canopy rather than on the forest floor. (One example is *Brachyiulus pusillus* that can be found on bushes,



Photo: Derek Killby

An earthworm-coloured millipede encased in some sort of resinous discharge.

trees, walls, and fences, but it is very hard to find specific species information as this seems to be an understudied field). Were the millipedes making their way to the upper parts of the trees when they became entombed?

After our walk in Central Park, I was walking in Whytecliffe Park in West Vancouver and decided to check out a couple of Douglas-firs with resinous discharge to see if any millipedes were repeating what we saw in Burnaby and, indeed they were. Unlike the mostly grey appearance of our first sightings, at least a couple of these appeared fresher and were approximately the colour of an earthworm. The body segments were more clearly defined as were the legs. With this sighting we now know this wasn't some strange singular occurrence isolated to Central Park but, perhaps, something more widespread.

Two weeks later, after some poor weather had passed, I returned to Whytecliffe to try and get a better set of photographs. Upon my return many of the 'fresh' millipedes I saw before were gone. I checked amongst the leaf litter and fir needles below the tree but there was nothing to be seen.

The mystery now is: is something eating the millipedes that were encased in the sticky discharge? And, if so, what? A bird (perhaps, a Northern Flicker with its long tongue and beak picking them off the tree trunk), a small mammal taking advantage of the hapless millipedes? Or, with the passage of a couple of weeks and rainy weather, were they somehow just 'washed' away? If that were the case, why had this not occurred on the Central Park Douglas-firs?

This seems to have more questions than answers. 🐛

How many species of millipedes are there? If you guessed 7,000, then you are correct. 1400 species of millipedes can be found in the USA and Canada.

The Fastest Bloom in the West (and the East)

Author: Alan E. Burger

It is always fun to watch a time-lapse movie of a flower bud opening into a full bloom – something that takes a few hours condensed to a minute or less. But across Canada there is a well-known plant that holds the record for the fastest-opening flower known to science – the bunchberry *Cornus canadensis*. When one looks at a flowering bunchberry, what looks like a single white-petaled flower is in fact a cluster of tiny florets. The white parts are modified leaves, known as bracts, and these surround the minute flowers. The actual petals are tiny and nondescript, greenish-white tinged with purple. You need a magnifying glass to see them properly.

A few years ago, researchers used ultra-high-speed cameras to film the opening of these tiny flowers and they were amazed at the result. The cameras captured images at 10,000 frames per second. As a bunchberry flower opens, the petals flip back rapidly to reveal the pollen-bearing stamens. Within the closed flower the stamens are bent back creating an elastic force, which is released as the petals flip away. This all happens within 0.3 milliseconds – the petals flip open at speeds of 6.7 metres per second (24 km/h) and the stamens zoom up at 3.1 m/sec. (11 km/h). These stamens act like medieval trebuchets – the devices used to hurl rocks over castle walls. Their tremendous acceleration flings the pollen up into the air where any breath of wind will carry the light pollen grains away – possibly pollinating another bunchberry flower downwind. This explosive opening can also be triggered by a larger insect, like a bumblebee, resulting in the visiting insect receiving a dusting of pollen which could be carried to another bunchberry flower. No other flower is known to have such speedy pollination mechanisms.

I have had a long interest in bunchberries. In the 1980s when teaching at Grenfell College in Corner Brook, Newfoundland



Photo: Alan E. Burger

Cornus canadensis berries (L) *Cornus canadensis* flower (R)

and Labrador, I did a multi-year study looking at the dispersal of the red bunchberry berries. These are produced in late summer and persist until heavy frosts turn them into mush. As those who have tasted them know, bunchberries are rather bland. They don't have much sugar to attract seed-dispersing animals, unlike strawberries or blueberries, which also grow in the same ground layer. By marking the bunches of berries and visiting them at regular intervals I discovered that their disappearance coincided with the passage of large numbers of migrant birds, especially American Robins. Using chicken-wire cages to exclude birds, but allow small mammals to enter, I was able to show that almost no berries were taken by mice, voles, or shrews. Overall 94% of berry removals were attributed to birds. This shows that bunchberries are adapted for fall dispersal by migrating birds. Their bright red colour, visible to birds but less so to most mammals, is a signal to birds that the berries are ripe and ready to be eaten. The hard seed within each berry can pass safely through the digestive system of a bird, perhaps landing in a favourable patch to produce a new bunchberry plant. 🌱

What's in a Name?

The Meaning and Derivation of Common and Latin Names of Plants in British Columbia.

Author: Rosamund Pojar

Why lousewort? Why bastard toadflax? Why enchanter's nightshade?? Have you ever found yourself wondering why a plant would be given such a strange name? In this book, Rosamund describes the stories behind the common names and Latin names of many of the well-known plants found in British Columbia and adjacent jurisdictions. The meaning of many common names and their history can be fascinating, if not funny or rather weird and even raunchy at times. Many names were brought to our homeland by settlers from other countries, but some are derived from North American indigenous names, often relating to their use in everyday life.

The book also gives direct translations of the Latin names, and, where relevant, who they are named after.

Rosamund chose to only include the accepted names of the best-known plants featured in five of the Lone Pine Plant guides that she and her husband Jim were involved in producing.

To order, please send a cheque for \$25.00 (\$20 for the book and \$5 for shipping) to:
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Conservation and Forestry – Shackled by Policy

Author: Ben van Drimmelen

Forest management is very complicated. This, in part, is because there is no clear separation between government's management and protection of the full range of forest resources and the regulation of the forest industry. In B.C., the protection of non-timber resources such as wildlife and fish, their habitats, water, and biological diversity is not allowed to reduce the amount of timber available to industry by more than 6%.

This 6% cap is a challenging constraint, one that sets a rigid barrier on the protection of biodiversity generally and on conserving the essential habitats of endangered and threatened species at risk throughout the province. It is a significant problem with forest management in B.C.

And here's the peculiarity. This barricade to protection of the public's resources is not found in the law. You won't find it in the Forest and Range Practices Act, nor the Forest Act, nor the Environmental Management Act. Neither will you find it in any of the regulations made under any of those Acts. So, if this block was not imposed by our elected officials in the B.C. Legislature, where does it come from?

It turns out that a short phrase, repeated in one regulation under the Forest and Range Practices Act, has for the past 20 years allowed the imposition of this arbitrary, but ecologically crippling, timber supply cap. The key is in the *Forest Planning and Practices Regulation*.

For wildlife, that regulation provides that government will conserve sufficient wildlife habitat for the survival of species at risk, regionally important wildlife, and specified ungulates (e.g. deer, moose, elk, and their relatives). Sounds great, but there's a subtle catch. That can only be done "without unduly reducing the supply of timber from B.C.'s forests". The government also promises to conserve water quality, fish habitat, wildlife habitat and biodiversity along streams, rivers and lakes. Except... yes, you guessed it... that must all be done "without unduly reducing the supply of timber from B.C.'s forests".

Beyond the general conservation of fish habitat, the government also has an objective in some "fisheries sensitive watersheds" of making sure that the cumulative impacts of forestry activities do not have a "material adverse effect" on that habitat. But this again applies "only to the extent that it does not unduly reduce the supply of timber from B.C.'s forests". The same for cumulative effects of forestry activities on community water supplies; there is to be no adverse effect – as long as that doesn't unduly reduce the supply of timber. And for soils; forest soil productivity must be preserved... but must do so "without unduly reducing the supply of

timber from B.C.'s forests".

The key question, of course, is "What is an undue reduction in timber supply?" Turns out that this is the job of the chief forester who, by policy, has for decades interpreted the phrase "unduly reducing the supply of timber from B.C.'s forests" as requiring that non-timber forest values cannot have more than a 6% impact on timber supply.

It goes back to the early 1990s, when the government was worried about the impacts of the new Forest Practices Code of B.C. Act (the predecessor of the *Forest and Range Practices Act*) on timber supply. The Code included some new things – management of biodiversity and conservation of species at risk. No one knew what the impacts of these progressive new restrictions on timber supply might be. Therefore, government agencies were simply told to ensure that the impact not exceed 6%; otherwise, those initiatives would not be implemented. A timber supply analysis was conducted and determined the 6% target could be achieved with a bit of tinkering. Detailed policy ensured that these provisions were achieved, and that policy continues to this very day. (Cabinet can, of course, decide to ignore mere policy, and has done so for Mountain Caribou, Spotted Owls, and old-growth reserves, but that is a cumbersome and rare occurrence.)

The last twenty years have shown that the cap on timber supply impact continues to subtly but effectively encumber the management and conservation of the full range of non-timber resources on the public's forest land. This issue was flagged by B.C.'s Auditor General a decade ago: "Government's objective for (endangered, threatened, or vulnerable vertebrate and invertebrate species and endangered or threatened plants and plant communities) is "to conserve sufficient wildlife habitat" but "without unduly reducing the supply of timber from B.C.'s forests." So, for example, government limits the amount of area that can be designated as wildlife habitat to 1% impact on the provincial land base for forest and range activities. We found no scientific rationale for this policy."

Still, the arbitrary constraint on timber supply persists. Until it is removed, or at least recalculated, it is very difficult for government agencies to meet the overall objective of managing our forests for future generations by ensuring that the public good comes before timber harvesting. 🦋

Glass Sponge Reefs and Bottom-Contact Fishing in Howe Sound

Author – Sheila Byers

Glass Sponge Reefs (GSRs) are ancient and unique living structures that form undersea habitats of historic significance¹ and they are globally rare. To date, GSRs are only found in fjords and on the continental shelf of the Pacific coast of Canada.

The Marine Life Sanctuaries Society (MLSS) has been an important citizen science participant in the discovery of the majority of the GSRs in Átl'ka7tsem/Howe Sound and in documenting their ecological and economic value. Although the GSRs occupy elevated areas of the deep, dark, and cold seafloor, five of the Howe Sound reefs are accessible by experienced air-gas SCUBA divers; thus far, the only diveable GSRs in the world. These 'living laboratories' enable citizen science data collection and observation, scientific research experiments, and recreational diver experiences. MLSS collects GSR data using diver photography and video, bathymetric mapping, drop-down video, and larval settlement plate experiments. These data are submitted to the Canadian Scientific Advisory Secretariat of Fisheries and Oceans Canada (DFO) in support of its science-based decision-making process to identify and mitigate impacts of bottom-contact fishing on the sensitive benthic GSR habitats. But why do they need protection?

Ecological and Economic Value

The GSRs are not only beautiful but are intricate structures that provide food, shelter, and nursery grounds for many species of commercial, recreational, and cultural fisheries (e.g., rockfish, lingcod, crab, shrimp, prawns, and sea cucumber) in what is generally a low-diversity area of the seafloor.

To build their homes, glass sponges rely completely on the ability to pump and filter seawater to obtain food, oxygen, and silica (silicon dioxide, SiO₂); the latter being the basis of the sponge's internal skeleton. As the sponges die naturally, their textured skeleton becomes an ideal surface for juvenile sponge larvae to settle on and grow into the next generation. Over time, the collapsed skeletons and organic matter entrapped from the seawater gradually build the reef foundation higher, while also forming carbon and silicon 'sinks' or reservoirs within.

The pumping action of the sponges is so efficient that the GSRs can move vast quantities of water and nutrients from the seafloor to the surface of the ocean, thereby providing nutrients to the plankton in a process called benthic/pelagic coupling. DFO estimated that the



Photo: Adam Taylor

Some Glass Sponge Reefs have been found to be up to 9,000 years old.

filtration capacity of nine GSRs in Howe Sound would clear over 17 billion litres of water daily. When combined with the volume of nine reefs inhabiting the Salish Sea, these 18 reefs have the capacity to filter all the Salish Sea and Howe Sound water in 82 days; a turnover capacity of four times per year. Glass sponges and GSRs may appear primitive in structure and function but they have incredible value in maintaining a healthy, productive ocean.

Vulnerabilities

The silica-based skeleton of glass sponges is an exceptionally fragile structure. Not unlike glass, the skeletal structure is vulnerable to physical damage from bottom-contact apparatuses like traps (crab, prawn, and shrimp), downrigger lead balls, fishing trawls, and boat anchors. Furthermore, resuspension of surrounding sediments from deployment of any of these apparatuses can clog and prevent the sponges from carrying out their essential pumping and filtering activities. Interruption of pumping for a prolonged period could lead to death. As with many living organisms, industrial contaminants and pollutants can cause damage or death. Climate change, with warming ocean waters, also has the potential to impair the pumping ability of the sponges.

Damage to Howe Sound Glass Sponge Reefs

MLSS was very pleased with the 6 May 2019 DFO announcement that eight GSR complexes were designated as Marine Refuge Conservation Areas; as well as the January 17, 2022 announcement that the five remaining unprotected reef complexes were designated Glass Sponge Reef Fishery Closures. Further conservation measures of the latter may follow if consultations with Indigenous groups identify potential risks from cultural fishing activities. These 2022 closures will contribute to the Federal Government's Marine Conservation Targets to reach the goal of 25% marine and coastal protection by 2025: to date at 13.81%.

Marine Refuges and Fishery Closures

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fall under the Marine Conservation Targets of 'Other Effective Area-based Conservation Measures'. The degree of management and protection varies with the sensitivity of the species and habitat and is not permanent. The current Marine Refuge protective conservation measures in Howe Sound are NOT working. During the past two years of the COVID-19 pandemic there is evidence of increased fishery violations within Howe Sound. No sooner were the Marine Refuges established than it appeared as though the GSRs were specifically targeted.

Photographic evidence of damage from bottom-contact fishing apparatus gathered by MLSS divers includes shattered, dislodged sponges within several of the Marine Refuges. Major damage was inflicted to the Halkett Reef in October 2021. Unpleasant oral interactions with fishers dropping lines in the middle of Marine Refuges and video evidence of fishing vessels deploying and retrieving traps from within Marine Refuges (four licensed commercial prawn vessels) were documented. In 2021 alone, MLSS recorded more than 32 similar, purposeful violations - all within protected areas. These were reported to the DFO toll-free line and video clips were emailed. Responses from DFO have been disappointing.

These irresponsible actions are very short-sighted, disturbing and frustrating for the MLSS team. From the damage to the sponges and GSRs observed by divers, the "usual suspects" could include multiple passes with downriggers, vessels anchoring to fish, and/or traplines (crab/prawn/shrimp) deployed within the sponge reef; all are prohibited.

Several factors are in play with the occurrence of violations within the Marine Refuges:

- the proximity of Howe Sound to Metro Vancouver and short distance to access;

- high-demand May/June spot-prawn fishery season;
- court backlog to process and bring the perpetrators to justice involves years (incidents dating back to 2016); and
- the lack of sufficient DFO Fishery Enforcement Officers available to patrol and act on these violations in Howe Sound.

MLSS has approached DFO on numerous occasions about the lack of action including a July 2021 letter to the Honourable Minister Bernadette Jordan, then Minister of Fisheries, Oceans and the Canadian Coast Guard, expressing our concerns and suggested solutions regarding the 2021 Prawn Fisheries Season and Damage to Sensitive Habitats. The response letter described the "150 front-line fishery officers in the Pacific Region who are responsible for the Department's enforcement and compliance capabilities". A meeting held with DFO on 15 February 2022 provided some optimism for MLSS. There may be two additional Fishery Officers hired to enforce and monitor the conservation areas in the Salish Sea Fisheries Management Areas 28 and 29: Howe Sound to Vancouver to Indian Arm; Sechelt to Steveston (including Tsawwassen) to Thraser Rock (off Gabriola) and Galiano Island. The positions would not, however, come into effect until 2023. Two extra bodies are a promising expectation given the current number of violations in Howe Sound, let alone the challenges of the vast expanse of Area 29 to patrol.

No matter how we look at this, the sponge reefs are being destroyed. This is a shameful legacy to leave behind. The GSRs are not only a rare natural Canadian treasure but a world class treasure. 🌿

Sheila Byers has volunteered with the Marine Life Sanctuaries Society since 2007 as an educator and researcher to protect marine life diversity and sustainability in Howe Sound, especially the rockfishes and glass sponge reefs. All references for this article can be found in this article on the online version.

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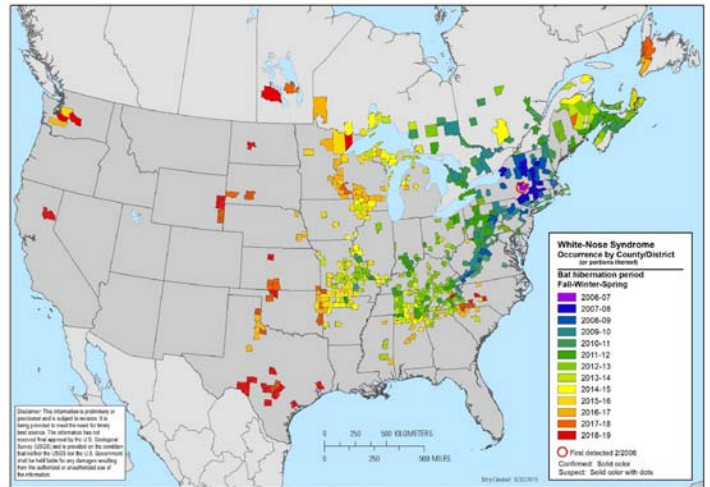
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White-nose Syndrome Still a Threat to B.C.'s Bats

Author – Chris Currie, BC Community Bat Program

Looking into the summer sky at dusk, you're likely to catch a glimpse of bats acrobatically swooping through the air catching their prey. As the primary predator of night-flying insects, the fifteen species of bats found in B.C. are sometimes underappreciated for their crucial contribution to maintaining healthy ecosystems. Their value as pest control is estimated at several billion dollars per year and they are they are vital to controlling insects that can impact our forests.

White-nose Syndrome (WNS) is a disease caused by a fungus that attacks bats during hibernation and has killed millions of bats in eastern North America since the first detection in 2006. It has spread steadily since then and, in 2016, a bat with WNS was found near Seattle, only 150 km from B.C. Alarmed scientists in B.C. and Washington State have tried to track the spread of the disease using the same polymerase chain reaction (PCR) tests that we have become familiar with during the pandemic—though the bats only need a swab rubbed over their wing, instead of up their nose! The fungus has now been found in six counties in Washington State. Though the arrival in B.C. is imminent, it has not yet been detected, despite typically spreading 200 km per year in other regions.



This map represents areas where the disease white-nose syndrome (WNS) has been confirmed or is suspected in North America in accordance with the WNS case definition criteria. Map Courtesy of Canadian Wildlife Health Cooperative

One possible reason for this surprising development is that we simply haven't tested enough bats. Small, fast-flying, nocturnal creatures that spend their days tucked away in hidden roosts, bats can be a challenge to study. That challenge has led the BC Community Bat Program to engage citizen scientists to help answer many questions about the size and distribution of B.C.'s bat populations. By reporting bats roosting in buildings, participating in annual bat counts, and submitting guano for DNA analysis, public participation has substantially increased our understanding of bat ecology in recent years.

To understand how to respond to this wildlife health crisis, we once again are asking for help in gathering information—by reporting dead or sick bats found from November to May, when bats are vulnerable to the disease. Promising treatments are being developed and we may be able to mitigate anticipated population declines if we can understand how bats in B.C. are responding to this new threat.

For detailed information on WNS surveillance and programs that include: assistance for landowners with bats in buildings, roost monitoring, bat house workshops, presentations, and other conservation efforts, contact us at 1-855-9BC-BATS info@bcbats.ca, www.bcbats.ca 🐼

About us: "Got Bats?" is a network of 20 community bat projects across B.C. that promotes bat conservation through the detection and protection of bat roosts, education to counter negative attitudes towards bats, installation of bat-houses, and a province-wide Citizen Science bat count. We are funded by Habitat Conservation Trust Foundation (HCTF) and Environment and Climate Change Canada, with support from the B.C. Ministry of Environment and Climate Change Strategy and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development and many other partner groups.

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BC Naturalists' Foundation – Case study: Williams Lake Field Naturalists Scout Island Nature Centre: New Management Plan

Author: Stephen Partington

Conceived in 1972 and delivered in 1977, Scout Island Nature Centre was the product of efforts exerted by informed grassroots activism that spurred governments and agencies to implement established policies designed for the conservation of natural treasures and the betterment of society. Both the preservation of a wetland and the construction of an educational facility were achieved within the City of Williams Lake. In 2003, some twenty-five years after establishment, the Scout Island Nature Centre reviewed its first management plan. Almost twenty years later, in 2021-2022, the time came to develop a new management plan.

The BC Naturalists' Foundation leapt at the chance to help fund this planning process. The deal that created Scout Island Nature Centre in Williams Lake was complex and ambitious. Since inception,

management of the multiple facets of Scout Island has at times been fraught. For the current new management plan development, a contract was signed with the Fraser Basin Council to provide facilitation services. Under the facilitator's assistance and direction, the volunteer committee designed and implemented a community survey and then incorporated its analysis within the format and content of the new management plan.

Scout Island is located in the lake of Williams Lake at the point where the Williams Lake River flows out of Williams Lake into the drainage that leads to the Fraser River. The island is separated from the lakeshore by a marsh. It was purchased from the Pacific Great Eastern Railway in 1966 by the City of Williams Lake. A causeway on fill was built to provide road access to the island where a popular tourist campsite and public

beach was established. Subsequent expansionist aspirations for increased camping and parking facilities sparked proposals for more infilling of marshland. These were met with objections from local naturalist Anna Roberts who complained to city council. Her complaint triggered an environmental review.

The environmental review flagged the ecological importance of the marsh. Furthermore, a valuable educational opportunity was recognized for the city should the site be conserved as a nature reserve. The authors recommended a land purchase application to the Second Century Fund of British Columbia, later to be called The Nature Trust of British Columbia.

Between 1972 and 1973 The Nature Trust of BC paid the City of Williams Lake \$99,000 for 10.14 hectares,

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encompassing most of Scout Island plus three adjacent blocks. This real estate was expressly acquired to protect habitat for wildlife as well as for nature education. The lease agreement signed between The Nature Trust of BC and the City of Williams Lake assigned to the city the responsibility for protecting the natural vegetation and preserving the premises as a site of ecological interest. The lease terms included the removal of the campground within five years and stipulated that a nature centre would be built.

A city council-appointed volunteer committee consisting of naturalists and others was struck and from 1973 to 1978 the committee oversaw the building of the nature centre. In 1977, the City of Williams Lake's responsibilities were delegated to the Williams Lake Field Naturalists via a sublease management agreement and the club assumed operational control in 1978 of Scout Island Nature Centre.

In 1984, the marshland was granted Reserve status through a B.C. Government Order-in-Council.

Operation, development, and maintenance of Scout Island Nature Centre since 1977 by the Williams Lake Field Naturalists has support from the City of Williams Lake by way of an annual fee-for-service (\$12,500 in 2017) but otherwise the club has shouldered the task of securing funds to employ staff, maintain the Nature

House, and to purchase educational services and supplies. In addition, interpretive materials including signage, kiosks, trails, and wildlife viewing structures have needed constant renewal. Ecological restoration and habitat enhancement have been comprehensively never-ending.

The results of the 2021 new management planning survey of the community and users of Scout Island Nature Centre showed 'great support for the current management practices and programs, a clear attachment to the wild and natural aspects of Scout Island Nature Centre, and support for the staff and volunteers that have built Scout Island to what it is today' (Nola Dainthith, personal communication). Overwhelmingly, the survey respondents wished to learn more about the pre-colonial occupation of Scout Island as part of a Secwépemc village site. The new management plan commits to working with the Williams Lake First Nation to increase public awareness of T'exelcenc history and traditional knowledge through interpretive signage, guided tours, and educational presentations for youth and adults.

This management plan will be an important document for guiding the operations of the Nature Centre for the next 10-15 years. Williams Lake Field Naturalists gratefully acknowledge the support provided by the BC Naturalists' Foundation and BC Nature 🦅.



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Shelter from the Storm

Author: Margo Hearne

Spring is on the way to Haida Gwaii. Migrant birds will start moving through soon, although the resident waterfowl will remain for a while yet. Why leave? The food is free, the temperature mild, and there's enough for all. Part of the reason for this is, of course, the sea's bounty. In spite of all the prognoses of doom, the tides bring new things in daily.

There is a lot to be thankful for on Haida Gwaii. The rain cleans the air and keeps the rain forest healthy. The winds blow away any stagnant air and, while we may get a little tired of their constancy we can remember what Sam Simpson, the first Mayor of Masset once said, 'We don't live here because of the weather, we live here because of access to the fishing grounds.'

The ocean is as rich for humanity as for the wild world. It's riches have been bartered and traded for eons. Island people knew that some seafoods, while plentiful, did not have the oils necessary for a completely rounded diet so the 'grease trail' was developed. Dried halibut from the islands was traded for Oolichan grease from the mainland. It was a co-operative venture; grease was essential for survival and dried halibut was a luxury. When the riches of the islands were combined with the wealth from the mainland rivers, healthy civilizations grew and thrived. People need food, and Europeans, fleeing the exigencies of war, migrated to where it could be found. And here we all are.

The riches of the sea also provide for migratory and wintering birds, and it is also why they are here. Last November more than 1,000 geese landed in Delkatla Wildlife Sanctuary when a dark storm blew in and the rain sheeted down. The murk got murkier and the geese, almost a personification of the storm itself and just as dark and lovely, streamed in, row on row. As the storm strengthened, bird numbers increased until they had

Why Volunteer?

Author: Betty Davison

If you are reading this, chances are, you are already a willing participant in volunteering, either with your naturalist club or in another capacity in assisting nature. (streamkeepers, citizen science, invasive species, building bat boxes etc.) This is great as it already gives your volunteering résumé a huge boost. If you have approximately four hours extra in a month to spare, we would like to hear from you!

As your BC Nature office manager, I am in the enviable position to see all the good work that has been accomplished by the membership, both with "boots on



Photo: Margo Hearne

A large flock of resting Canada Geese, resting up for the next part of their trip.

landed in layers along the water's edge. They sat and waited it out. When the storm eased, they began to splash and preen in the rising tide, feed on grass seeds, and poke about in the short stubble.

There were more than 1,100 Aleutian Cackling Geese, those small geese whose numbers are rebounding after years of depredation by blue foxes that were dropped off on the Aleutian Islands for the fur trade. The foxes have now been removed, and the goose population is recovering. One hundred fifty Lesser Canada Geese, a handful of Greater White-fronted Geese and more than 100 Snow Geese also tucked themselves in. The major migration of Snows is on the Prince Rupert side; these islands are just on the edge of it. An interesting feature of the mixed flock was the high-pitched calls they made. They all sounded alike. Perhaps, as they travel together, they learn from each other. The 'local' Canada Geese have their own distinctive, familiar call, so when the migrant flocks go through, their different voices tell us that migration is underway and the seasons are unfolding as they should. There are riches enough for all. Long may it continue. 🦢

the ground" at your club level and volunteering time with all of our nature club boards (Including the BC Nature board).

Volunteering has so many benefits that I would have to add another eight pages to this magazine to cover all the goodness you receive from volunteering ("service with no pay".) To name a few; volunteering builds community; you gain knowledge and understanding (especially in Nature); promotes good mental and physical health. Did I mention the social aspect? (the best COVID-weary solution from all that isolation).

Writing from a BC Nature point of view, it ensures that the momentum created within BC Nature in the last 77

years continues, to “Strengthen our Voice for Nature.” I would say that this is certainly your lucky day as we have some openings on our board and would welcome your expressions of interest. Please read on and do not hesitate to call or email if you would like further information. info@bcnature.ca. 🐾

Positions available for the BC Nature Board

BC Nature is actively seeking members to step up to the board for the following vacant positions. We welcome any and all expressions of interest. Email: info@bcnature.ca

President

Responsible for carrying out or delegating following activities:

- Chairs Board of Directors, Club Representatives, Fall and Annual General Meetings.
- Appoints BC Nature representatives to provincial committees, commissions etc.
- Is ex officio on all Board of Directors Committees and with Major Projects.
- Is ex officio on the Board of the BC Naturalists' Foundation.

Vice President Responsibilities:

- Assists the President in his/her responsibilities
- Chairs the Human Resources Committee and, at the discretion of the Board, other committees.
- Assists with the preparation of the agendas for meetings.

Regional Coordinator Vancouver Island

- Chairs Regional Meetings, including Zoom meetings, with the Club Representatives or their alternates in their area.
- Liaises with the region's clubs on issues of concern.
- Serves on the Awards Committee

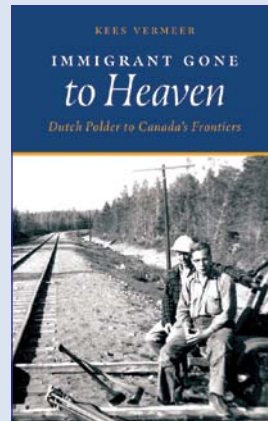
Alternate Secretary

- In the absence of the Secretary, assumes the roles in recording minutes for the Board of Directors, Annual and Fall General Meetings and Club Representatives meetings, including teleconference meetings.

Director-at-Large

- A Director-at-Large has no prescribed role within the BC Nature Board but provides input on all the matters that the Board deals with and is sometimes charged with specific duties by the Board. They generally also participate in one or more of the BC Nature standing committees, like Governance, Finance etc. depending on the person's experience and interests.

IMMIGRANT GONE TO HEAVEN by KEES VERMEER



Immigrant Gone to Heaven is a remarkable book. It grips the reader from the moment the author joins an Emigration Training Centre in the *Biesbosch* region of the Netherlands with the goal of moving to Canada. We follow his experiences as he lands in Canada and works his way up from farm-hand to obtaining a doctorate in Zoology. The section of the book detailing his explorations in ornithology are as fascinating as the stories of immigration and the memories of World War II. The book takes the reader on a riveting journey of exploration in many facets of social history and science as viewed through the lens of an inquisitive and always optimistic upbeat man. I strongly recommend this book to anyone interested in learning more about World War II, immigration, bird behavior or even just in how a life's journey can unfold with all its unexpected twists and turns.

Tom Bijvoet

Publisher, DUTCH the Magazine – De Krant

Brimming with charming personal anecdotes and fascinating ornithological research in equal measure, Kees Vermeer's *Immigrant Gone to Heaven* paints a vivid picture of an adventurous and fearless life. Vermeer's curiosity and insight into the natural world are evident from his descriptions of childhood nest-hunting in the Dutch polder, to his pioneering work with seabirds on British Columbia's windswept *Triangle Island*. His stories of everyday life under Nazi occupation are enthralling in their own right. Naturalists, scientists and history buffs alike will enjoy this book.

Annie McLeod

Editor, Nature Saskatchewan's Blue Jay

To order, please send cheque for \$34

(\$27 book and \$7 shipping) to:

Kees Vermeer

8968 Mainwaring Rd. North Saanich, BC, Canada, V8L 1J7

For more info, phone 1-250-656-6237 or go to:
www.immigrantgonetoheaven.com

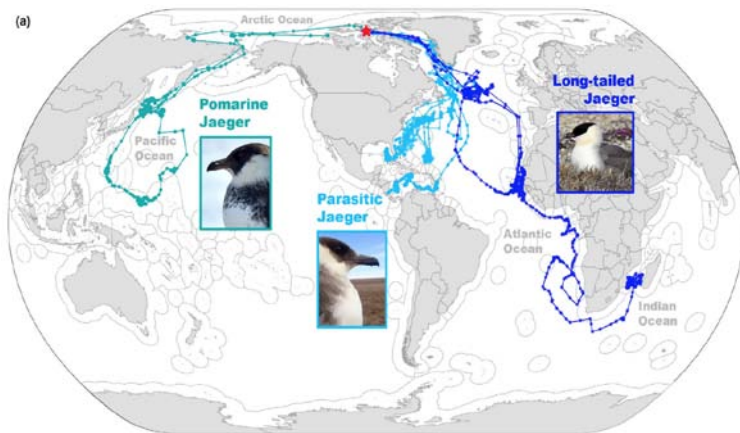


Migration: Conserving Birds Where They're At

Author: Liam Ragan, Provincial Coordinator, BC Important Bird and Biodiversity Areas

It is a well-known fact that birds migrate, with everyone from Aristotle to Samoan mythology making frequent reference to it. For some it has become so assumed that many overlook both the herculean feat of endurance migration represents, as well as the intertwined network of habitats species rely on throughout

the changing seasons to breed, feed, refuel, rest up, safely ride out the winter, then turn around and do it all over again. Like a tenuous "Jenga" tower, these habitats, at times as geographically dispersed as the two arctic poles, form critical stepping stones in a species' life history. The disturbance of any one of which can lead to population declines, regional extirpations, and even full-scale extinction.



Migration paths of three species of jaegers recorded using electronic tracking devices from *Sympatrically breeding congeneric seabirds (Stercorarius spp.) from Arctic Canada migrate to four oceans* by Harrison et al., 2021.

The story I find best illustrates just how little we know about migration is of how and when Europeans found out about it in the first place. Up until the early 19th century, Europeans believed that many species of bird either retreated to the bottom of lakes and overwintered under the ice or, as suggested by one Harvard professor, retreated to the moon. It took the discovery of a White Stork on the Baltic coast of Germany with a stylized spear made of African wood sticking out of it to spark the realization that many populations were flying south for the winter. Laugh as we might 200 years later, numerous questions still abound, with discoveries being made every year of where species we consider ourselves familiar with in Canada are spending the winter. Just this past November the first comprehensive study of Canada's three jaeger species was published, demonstrating how each species spends their winters in different oceans, from Madagascar to the Philippines. How then do we ensure a species' well-being if it breeds in

Canada, migrates through key stopover points in the U.S., and spends the winter in Mexico, which itself is even one of the simpler examples? Important Bird and Biodiversity Areas (IBAs) provide a solution in the form of an international set of standards which don't bother with political boundaries but instead focuses on identifying sites of critical significance to a species at some point during the year. (see the Fall issue of *Bcnature* for an explanation of those standards and the volunteer Caretakers who support them).

The piece that's required to make this system work however, is community support. While solar-powered satellite tags such as those used in the jaeger study provide an unprecedented of where individual birds go throughout the year, the cost makes wide-scale deployment prohibitive, and they don't inherently show where large congregations of the species are occurring throughout their migratory path. To achieve the latter, we need boots on the ground, aka skilled birdwatchers such as our IBA Caretaker, willing to show up and conduct surveys during the appropriate season to get a sense of how many individuals are using a site, when they're using it, and how that's changing year to year. With that information we can better understand how populations are coping with the plethora of threats they face throughout their range, and plan conservation interventions accordingly, be they policy, nest box, or public education.

If you feel passionate about bird conservation and agree IBAs are a useful tool to support it, you can help by going to ibacanada.ca to find out more about IBA sites near you. Ways you can support them include using eBird to submit sightings of birds within IBAs, contacting me, the Provincial Coordinator, at iba@bcnature.ca, and donating to BC Nature so we can continue to support the monitoring, stewardship, and education to ensure these sites remain useful for wild birds well into the future. 🦅

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The Canals of Delft

Author: Terry Taylor

A few years ago, Rosemary and I were on a tour of Belgium and the Netherlands. The one thing I really wanted to see was the canals in Delft. For most people that probably does not make much sense, but I will get to that shortly.

Microbiology began in Delft in the late seventeenth century. It was started by Antonie van Leeuwenhoek, a draper with no scientific background, but the discoveries he made led to advances in medicine and biology, resulting in the lifestyles we all live today. Leeuwenhoek made lenses to check for defects in his textile threads. He continued to improve those lenses and began to look at other things besides textiles.

Microscopes had already been invented but the quality of their optics was poor. Leeuwenhoek was a good optician, and he produced tiny spherical lenses that he fashioned into simple microscopes, some of which magnified more than 300X. He eventually began to send his observations to the Royal Society of London. The first drawings were of organisms people could already see, such as insects, but showing details that nobody had seen previously. He then began to look at water samples. That is where the canals come in. He collected many of these from the canals that still drain Delft.

He then sent his observations of the protozoa and bacteria swimming in these samples to London, referring to them as animalcules. That was when his credibility became questioned. Today you can take a water droplet from a ditch, look at it with your home microscope and easily see what Leeuwenhoek saw, but 300 years ago nobody else had seen such organisms, and could not believe that they actually existed.



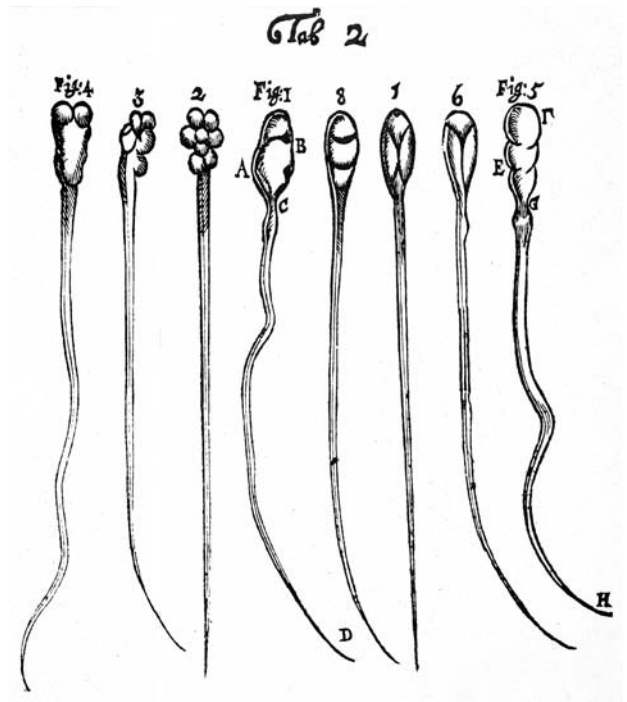
Leeuwenhoek Microscope
Courtesy of the Science Museum,
London.

Members of the Royal Society tried without success to see the animalcules, but failed to do so. Leeuwenhoek's microscopes took a lot of skill to make and a lot of skill to use. Other scopes were not of this quality, and their users lacked this level of skill. Claims were made that these observations were fraudulent. They were, however, vindicated a few years later.

Leeuwenhoek was very secretive as to how he made his lenses, but several of his microscopes still exist, and research has shown how he was able to make such small spherical lenses. He drew out fine filaments of glass over a flame, and produced tiny globules of glass, instead of grinding his lenses.

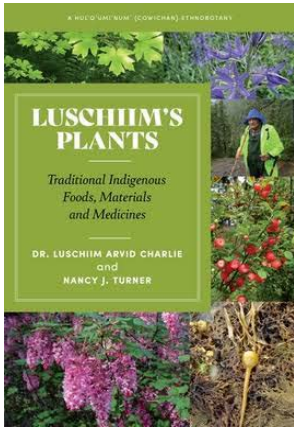
One of his microscopes was dredged from a canal in 2014. He probably dropped it during one of his field trips, and was unable to retrieve it. The sides of these canals are vertical, and if he was collecting samples from shore, it would be difficult to get it back. I have looked at protozoa since my parents gave me a small microscope 60 years ago. This was why the canals of Delft were so interesting for me.

To a certain extent you can repeat what Leeuwenhoek did three centuries ago. If you have a microscope it is easy to look at water samples and see the types of organisms he saw. Protozoa and alga cells are easily seen at 100X, and the larger motile bacteria are visible at 400X. If you do not have a microscope you can still get a glimpse of this microscopic world. Your digital camera or hand lens has enough magnification to see details on an insect skeleton or the teeth on a moss capsule. A glass of water held up to the sky can show the animalcules swimming in it. 🐾



An image of Animalcules by Antonie Van Leeuwenhoek.
Drawing courtesy of Wellcome Library

Book Review



Luschiim's Plants, Traditional Indigenous Foods, Materials, and Medicines
A Hul'q'umi'num' (Cowichan) Ethnobotany
 Authors - Drs. Luschiim Arvid Charlie and Nancy J. Turner
 Published 2021.
 Harbour Publishing, Madeira Park, BC
 275 pages, soft back, \$29.95
 Reviewed by – Genevieve Singleton

This extraordinary and much awaited book on Quw'utsun (the Hul'q'umi'num' word for Cowichan) ethnobotany is written by two experts. Luschiim Arvid Charlie is an esteemed Elder in the Cowichan Tribes community, Vancouver Island, and is known for his deep cultural knowledge, which

he began learning at a young age in the oral tradition from his Elders. He is one of the few people that is fully fluent in Hul'q'umi'num', which is spoken in parts of Vancouver Island and the mainland. Nancy Turner, an internationally respected ethnobiologist and botanist, is well-known to BC Nature members for her many books.

Luschiim and Nancy worked on this labour of love together more than 22 years. This beautifully laid out plant field guide makes easily accessible, for the first time, information that was shared in the past only orally. It has fabulous photos taken by Nancy's husband, Bob Turner, botanical

descriptions, where to find the plants and the most interesting section on cultural knowledge. Helpful appendices are also included. Luschiim is quoted directly throughout the book. The information is detailed and much of it will be unfamiliar to most readers.

This is an essential book for all BC Nature members to read. It includes plants found throughout B.C. More importantly, it provides an opportunity to start on the path of reconciliation and to learn from an Elder who, despite attending residential school and experiencing many effects of colonization, is willing to share with us a different way of knowing the land. 🌿
Genevieve is a beginning Hul'q'umi'num learner and is honoured to work with Luschiim. She met Nancy as a child when both were Junior members of the Victoria Natural History Society.

Correction from Winter 2021 BCnature Magazine

Re: Photo, page 8, attributed to J. Forster

I think this animal is an American Black Bear, Cinnamon phase, and not a Grizzly Bear, as labelled.

Cinnamon-coloured Black Bears occur throughout the RDOS (South Okanagan - Similkameen), which is probably where the picture was taken because J. Forster is a SONC member.

To my knowledge, there has not been a Grizzly Bear in the RDOS since the mid-1970's. Then, an old sow was said to live up Carmi Avenue east of Penticton, just opposite the Penticton Speedway. I regularly collected butterflies in that area and had a close encounter with it one spring day. I heard it growl at the entrance to its den - quite a memory.

A. Garland



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Reminiscing Mitlenatch Island

Author: Jan O'Brien

From a distance, Mitlenatch Island (just south of Quadra Island in the Salish Sea) can fool people into thinking that it is nothing but a barren rock. My annual visits to the IBA that I was responsible for, along with about 75 other volunteers, prove otherwise. The Mitlenatch Island Stewardship Team (MIST) all relish our week on the island. It is a Nature Provincial Park offering protection to its meadow ecology and nesting birds. Visitors, including the MIST volunteers, are restricted to trails on the northeast side of the island.



Two juvenile Glaucous-wing gulls with parent. One is camouflaged by a rock.

This year our team of myself, husband Geoff and daughter Claire, who first came to the island as a 10-year-old in 1997, were assigned to the last week of July. As we approached Mitlenatch on a water taxi at about 9:30 am, two gigantic Humpback Whales put on a show: breaching and slapping the water with their large pectoral fin. What a great start to the week! We've been observing the recovery of the Humpback Whales for the last five years.

Mitlenatch is located in a rain shadow, so it is generally very dry -- brittle cactus are found on the island. This year, the lack of rain was especially evident: the meadow grasses were brown and flat. From a blind we could observe nesting Glaucous-winged Gulls and we were glad to see that four pairs were caring for triplets. Like all young birds, gulls have a perilous first year. As they stand on the rocks in the heat relying on their camouflage and the strength of the colony to scare off predators, they seem particularly vulnerable. The island also supports nesting Pelagic Cormorants, Double-Crested Cormorants, Pigeon Guillemots, and Black Oystercatchers.

Virginia Rails began to breed on the island in 2011 and have been observed on the island in each of the subsequent 10 years. Early in our visit we encountered a Virginia Rail juvenile that was acting lethargic and weak. We left water out but the following afternoon we came across a dead juvenile on one of the trails. We made room in the freezer of our tiny camp fridge and another volunteer arranged for a necropsy. In the meantime, we came across a second juvenile that fell over on the trail before scuttling into the brush. We continued to leave water out in different locations, a practice that other volunteers carried on in the subsequent weeks. From time-to-time volunteers would see a juvenile

Virginia Rail standing in a shallow water container. Nonetheless later in the summer, another team of volunteers found a second dead juvenile. On the positive side, it is great to see that the rails are successfully breeding, but the necropsy of the first juvenile revealed that it was emaciated and dehydrated, an apparent victim of our especially dry summer and the climate emergency unfolding around us.

One of the jobs that MIST volunteers undertake is the removal of invasive plants from the meadows that support a profusion of spring flowers – camas, Chocolate Lily, Tiger Lily, Sea Blush. Our focus is on the Himalayan and Evergreen Blackberries. The thorough and consistent work is paying off, with these two plants retreating from the meadow. But in their place the native Service or Saskatoon Berry is flourishing and now dominating the meadow. BC Parks intends to open up a consultation with First Nations about a plan to carry out a controlled burn. The last fire on the island was ignited by lightning in 1959. There is evidence that Mitlenatch was managed by Indigenous people for thousands of years before contact. The remnants of fish or clam gardens are prominent in one bay and there are big fields of camas. MIST volunteers are very interested in supporting reconciliation efforts and the burn plan could be a step in that direction. 🌱



A dead, juvenile Virginia Rail. The necropsy revealed dehydration.



BOBOLINK
(*Dolichonyx oryzivorus*)

Photo by Jeremy Barstette



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 For changes/updates visit our website: www.okanagannature.org



Online registration open effective March 1, 2022

<https://okanagannature.org/bc-nature-agm-2022/agm-registration-2022/>

Name _____ Club _____ Director Executive
 Address _____ City _____
 Postal Code _____ Tel _____ Email _____

**** Non-members must join BC Nature (\$25 annual membership) or a Member Club to attend events ****

Options (GST & gratuities included where applicable)	By March 31	After March 31	Amount
Full Registration – all presentations, field trips, birding Note: does not include Friday Barbecue, Saturday Banquet or Pontoon Boat	\$150.00	\$175.00	\$
or Thursday Evening only: speaker, coffee, tea, cookies	\$20.00	\$20.00	\$
or Friday only: early morning birding, speakers, field trips	\$60.00	\$70.00	\$
or Saturday only: early morning birding, field trips, buffet lunch, AGM	\$80.00	\$90.00	\$
Friday Barbecue	\$35.00	\$35.00	\$
Saturday Banquet - Guest Speaker, silent auction, awards	\$55.00	\$55.00	\$
Pontoon Boat field trip (Saturday)	\$30.00	\$35.00	\$
Amount Due - Please enter the total here			\$

Will You Attend?
Board Retreat on (Thursday morning) Yes <input type="checkbox"/> No <input type="checkbox"/>
Board/Council of Club Representatives Meeting on Thursday afternoon: Yes <input type="checkbox"/> No <input type="checkbox"/>
NatureKids BC meeting (Saturday morning) Yes <input type="checkbox"/> No <input type="checkbox"/>
Early Morning Birding: <u>Friday am</u> - <input type="checkbox"/> <u>Saturday am</u> - <input type="checkbox"/>

Field Trips

Please rank trip choices each day (1, 2 or 3) – will be assigned by order of registration and preference.
 Waitlists will be maintained to accommodate participants, but spots cannot be guaranteed once trips are fully booked.

Field Trip Locations (offered on both Friday and Saturday, unless otherwise specified)		Rated	Rank Choices	
			Fri	Sat
1)	Beaver Lake Road - botany	Easy		
2)	Black Mountain/sntsk'il'ntən Regional Park - hike	Moderate		n/a
3)	Geology of Kelowna (by car)	Easy		n/a
4)	Johns Family Nature Conservancy Regional Park	Moderate		
5)	Mission Creek/Sutherland Hills Regional Park - birding	Easy	n/a	
6)	Myra Canyon Trestles - bicycling. Bike rental available	Moderate		
7)	Okanagan Rail Trail - bicycle	Moderate	n/a	
8)	Pontoon boat (extra cost)	Easy	n/a	
9)	Robert Lake - birding	Easy		n/a
10)	Scenic Canyon Regional Park - hike	Moderate		n/a
11)	Xeriscaping (lecture plus field trip)	Easy	n/a	

We recommend good walking shoes/boots; bring water, snacks, and hiking poles (moderate-difficulty levels).

Carpool. Are you willing to share rides in your vehicle? Yes No

Further information available on page 28

AGM registration continued

Registration and Waiver Forms - available for download on CONC website: <http://www.okanagannature.org> - please complete one form per person.

Payment - E-transfer to bcnatureagm2022@okanagannature.org. Send registration form and signed waiver to the same address or mail to: Central Okanagan Naturalists' Club, P.O. Box 21128, RPO Orchard Park, Kelowna, B.C. V1Y 9N8

Cheques - Cheques payable to **Central Okanagan Naturalists' Club** (NSF Cheques will be charged \$45.00)

Registration will become effective on the date the payment and all completed forms are received.

Registration confirmations and receipts will be sent by email when possible.

Cut-off date for registration – April 25 or when maximum capacity is reached.

No refunds after April 25. Note that earlier refunds are subject to a \$10 administration fee.

Accommodations – UBCO Residences - advise them when booking that you are part of the BC Nature Group 🐝

Red Columbine

Author: Lee Larkin, Nature Chilliwack

One of Nature Chilliwack's members, our bee aficionado, explained that the native Red Columbine (*Aquilegia formosa*) is one of the plants that co-evolved along with its North American hummingbird pollinators. It has long nectar-rich tubular spurs, suitable for hummingbird bills. He also explained that unlike the European Columbines, the flower dangles on a flexible nodding stem. This way, the hummingbird can approach the flower from underneath and when it inserts its bill, the nodding stem allows the hummingbird to tip the flower slightly upward when nectaring. In contrast, there are no hummingbirds in Europe and Asia. Thus, European Columbines depend mainly on bees so the flower does not dangle and they tend to have short spurs so bees can reach the nectar.

The long nectar-rich spurs of North American columbines also attract hawk moths and long-tongued bees, although some short-tongued bees rob the nectar by chewing through the spurs.

As I read about columbines, I found out that they arrived on the European and North American continent in the Pleistocene era around three million years ago. The ancestors of both lineages are assumed to have occupied the mountains of south-central Siberia. Shifts in habitat types influenced the development of the European columbine species, while pollinator specialization influenced the development of the North American columbines.

Here is a short excerpt on our North American columbines and adaptations for a hummingbird pollinator from the US Forest Service <https://bit.ly/3HI613H>. "Another concurrent development in the adaptation of *Aquilegia* to southwest North American ecosystems was the development of red flowered columbines and increased sugar content in the nectar (*A. triternata*, *A. schockleyi*, *A. grahamii*,



Photo: Lee Larkin

Aquilegia and bee about to chew through the spur to reach the nectar.

A. eximia, *A. elegantula*, *A. desertorum*, *A. formosa*, and *A. canadensis*) of flowers pollinated by hummingbirds. Increased sugar content in the nectar evolved to satisfy the higher energy needs of hummingbirds compared to other columbine pollinators such as hawk moths and bees.

The differing floral shapes of red flowered columbines, especially the spurs, have resulted from their adaptation and selection to different species of hummingbirds as pollinators. *Aquilegia canadensis* is the only columbine east of the 100th meridian and found throughout the entire range of the Ruby-throated Hummingbird.

Bumble bees also pollinate red flowered columbines. This is important because in some instances, *Aquilegia canadensis* and *Aquilegia formosa* have both moved further north than the range of their pollinating hummingbirds. This has occurred because of the availability of bees to pollinate their flowers. *Aquilegia formosa* has extended its range north through coastal British Columbia and Alaska. Plant biogeographers speculate that if the Bering land bridge surfaces once again, a red flowered columbine may become established in the Old World; and thus, the journey of the columbines would come full circle." 🐝

Climate Solutions 101: Part 2

Author: Karen Crosby

In this article I will summarize two videos from Drawdown's Climate Solutions 101 in the hopes of inspiring you to watch them at <https://bit.ly/3AYFI16>. Understanding this information might also inspire you to enroll in a Drawdown BC online course—registration information can be found at: <https://bit.ly/3IYOrDk>

Unit 3: Reducing SOURCES: Electricity, Agriculture/Food, Industry, Transportation, Buildings, and Other Sources:

This 24-minute video is exciting in that it focuses on solutions to the climate crisis, solutions that humans already know how to do. The key message is that a lot of different actions and changes together will help us solve climate change. There is no silver bullet, and we will need to apply solutions on many fronts. The advice is to **start by implementing solutions that reduce waste and increase our efficient use of resources**. Next, **we need to progress switching to low-carbon alternatives like renewable energy**.

A few definitions first:

CO₂ = carbon dioxide = one of the greenhouse gases causing climate change

kWh = Kilowatt hour = the amount of electricity used by a hairdryer in one hour.

Electricity (25% globally, 8.4% in Canada): Electricity is mainly used in buildings and industry. It is often produced by burning coal, which produces approximately 1 kilogram of CO₂/kWh or burning gas and oil, which produces .54 kilogram of CO₂/kWh. Solar, wind, and nuclear energy produce 0 kilograms of CO₂/kWh. Hydroelectricity, B.C.'s main source, is also usually seen as "clean energy", but this is controversial because damming results in the flooding of land, causing emissions

from decomposing plant material. Still, current research indicates that hydroelectricity likely produces .02 kilograms of CO₂/kWh, relatively small compared to fossil fuel options.

The average American house uses about 1000 kWh of electricity per month for a total of 7620 kilograms of CO₂/year, more than an average car. How much does your home emit?

Solutions to electricity emissions include: increased electrical energy efficiency could cut emissions significantly, including smart thermostats, better insulation and windows, green roofs, and efficient LED lighting. Shifting to renewables like wind and solar potentially cuts emissions to zero or near zero. In addition, countries need improved electrical grids and energy storage so electricity can be available where and when we need it.

Agriculture and Food (24% globally, 10% in Canada): This source of emissions is split into several subcategories. The global facts are:

- 8% from deforestation of lands so it can be used for agriculture
- 5% from cows and other animals (methane burping!), and rice fields
- 4% from nitrous oxide from overuse of fertilizer and manure
- 5% from other agricultural sources

Solutions to agricultural emissions: Because the world throws away about 1/3 of the food produced, we need to address food waste. Eating a more plant-rich diet would also make a significant difference because fewer livestock will be raised. Protecting ecosystems from being cleared for agriculture would help as would improving agricultural practices (for example: regenerative annual cropping and conservation

agriculture, farm irrigation efficiency, improved rice cultivation).

Industry (also known as making stuff!) (21% globally, 37% in Canada, including 26% from oil and gas): Again, this source of emissions can be broken down into subcategories using global data:

- 5% from metals, especially steel
- 3% from cement
- 3% from chemicals (including 1.5% from plastics)
- 3% from waste
- 7% from other

Solutions to industrial emissions: We need to replace refrigerants with climate friendly ones because our current refrigerants (hydrofluorocarbons) don't hurt the ozone layer but still contribute to climate change. Continuing to improve our use of industrial waste as a resource will also help. Making cement emits greenhouse gases so we need to implement alternatives to traditional cement. Bioplastics may also prove useful in reducing the use of fossil fuels in the production of traditional plastics. In addition, particularly in Canada, stopping the production of oil and gas will reduce greenhouse gas emissions significantly.

Transportation (14% globally, 25% in Canada): These emissions mainly come from burning fossil fuels from road transport but flying and other types of transportation account for about 2% each. About 9 kilograms of pollution is released from 3.8 litres of gas (about 3.17 kilograms) and lasts for centuries. This means that, if the average car gets 40 kilometres per 3.8 litres at 24,140 kilometres/year, it releases 5334 kilograms of CO₂/year (80.5 kilometres/3.8 litres = 2631 kilograms of CO₂/year). The average commercial plane gets 80-97 kilometres per 3.78 litres per passenger.

Solutions to transportation

emissions: We need to enhance fuel efficiency so that cars, trucks, planes, and ships get more miles to the gallon of fuel. Also, alternative modes to fossil fuel transportation (walk, bike, e-transportation, public transit, teleconferencing) need to be used more often. Finally, we can switch fuels, so we use electric cars and trains, for example.

Buildings (6% globally, 12% in Canada): Overall, residential buildings account for more emissions (4%) than commercial and other buildings (2%). These emissions are mainly from heating and cooling air as well as heating water, often from burning natural gas, which is methane! The average home emits 5897 kilograms of CO₂ for heating, often more than a car.

Solutions to building emissions:

Building efficiency matters so we need to retrofit existing buildings and construct new buildings to higher efficiency standards. We also need to shift energy sources to renewables, for example, by replacing our gas-powered furnaces to electric heat pumps. In addition, we need to make sure refrigerants are not leaking out of air conditioners.

Other (10% globally, 7.6% in Canada): These are mainly emissions from the fossil fuel industry like flaring/fugitive emissions from gas/oil production. We have the technology to solve these, so we need to demand that the energy sector shut these down right now.

Unit 4: Supporting SINKS (Land and Ocean) and Improving Society

It is imperative that we support nature's carbon cycle. Forests and oceans are absorbing about 41% of CO₂ so we need to enhance the health of these natural sinks and make sure we are not harming them further.

What are the main types of greenhouse gas sinks? Land removes 24% of the greenhouse gases, followed by oceans at 17%. The other 59% stays in the atmosphere. We need to give nature support because nature is already giving us 41% of CO₂ removal while we are doing zip to remove these gases! Land removes the largest portion of these gases, so forests are pretty important here. Land sinks drawdown carbon through photosynthesis, the accumulation of biomass during plant growth, and increasing soil organic matter as vegetation dies and the carbon moves into the soil.

What can we do to support **LAND SINKS**? Many things! The most impactful include reducing how much food we need to grow by reducing our food waste and eating a more plant-rich diet. We can also protect and restore our ecosystems. Further, we can implement more regenerative agricultural practices so farming actually absorbs carbon.

OCEAN SINKS absorb carbon in three ways. One is called a solubility pump because CO₂ dissolves in water. However, warmed water absorbs less CO₂ so we can't expect this sink to get larger; it might even get a little smaller as climate change results in warmer ocean waters. Another way is through what is called a carbonate pump because the oceanic animals use CO₂ and calcium to build shells. The third way is called a biological pump because plants in the ocean photosynthesize, pulling carbon out of the atmosphere.

What can we do to support ocean sinks? We can protect and restore coastal and marine ecosystems, especially carbon dense mangroves and marshes. In addition, we might be able to add new ocean-based sinks by farming kelp or creating new coral reefs.

Can we build machines that will create human-engineered sinks?

Right now, we are nowhere near the point where we can do this to pull down CO₂ in any significant amount. When you hear of carbon capture and storage, that means using machines to pull CO₂ out of the atmosphere and then storing it or using it in products. We cannot bank on this as a significant sink because there is no "sure thing" in engineered sinks at this time.

Sinks all have limits and cannot take infinite amounts of greenhouse gases out of the atmosphere. As well, sinks take time to absorb greenhouse gases. For example, trees may take 30 to 100 years to grow fully and absorb CO₂ most effectively, so there is a significant time lag. Shutting off our carbon emissions will be much faster. Sinks can be useful but biological ones may not be permanent. For example, trees may burn down, or a farm many change owners with the new owner using too much fertilizer. Some sinks are more geological: If we can lock up carbon in rock or coral reefs, that will be more permanent.

Improving society is the third principle of Drawdown. It turns out that actions that foster equality can be climate solutions too. For example, improving access to education and health care, especially for women and girls, can spur long-term climate benefits. Educated women tend to have fewer but healthier children, so this action reduces human population growth. Population growth isn't really responsible for the bulk of climate change, because most of the emissions are from rich people, not poor people. Future population growth slowing down will help us out in the long run because population growth and economic development drive up emissions. This represents a win/win opportunity to improve human well-being as well as improving our future climate solutions. 🌱

North in the Spring: #19 Tseax Volcano

Author: John Neville

About two and a half centuries ago (1750-1775) a volcanic eruption took place in B.C. The Tseax Cone (also known as the Aiyansh Volcano) exploded, pouring molten lava down its slope into the Nass River. The lava flow is about 12 km long. Originally, it almost blocked the Nass River. It may have been the worst natural disaster in Canadian history because it is estimated that at least 2,000 Nisga'a people were killed by the poisonous gases. If you visit Nisga'a Memorial Lava Bed Provincial Park (Anhluut'ukwsim Laxmihl Angwinga'a sanskwahl Nisga'a), you will be asked to not remove rocks or stones as they are respected as the tombstones of the Nisga'a ancestors. <https://bit.ly/3Ge33Na>

The total area covered by the lava flow is 39-square-kilometres and in some places is 12-metres thick. The hot lava not only swallowed up many trees but also set them on fire. As the lava cooled it left perfect "casts" of tree trunks behind, including the features of the bark. Cinder cones are created when gas-charged lava explodes out of volcanic vents. The pieces of lava cool in mid-air and land as cinders around the vents. One cone stands 100-metres high and has a crater 80-metres deep.



Photo: Mel Coulson

A lava tube is a type of lava cave formed when a low-viscosity lava flow develops a continuous and hard crust, which thickens and forms a roof above the still-flowing lava stream. Tubes form in one of two ways: either by the crusting over of lava channels, or from pāhoehoe flows where the lava is moving under the surface.

The lava flow isolated five kilometres of Vedder Creek from the Tseax River and the Steelhead trapped in the creek gradually evolved into what are known as "phantom" fish with snake-like bodies with large heads. We were unable to find any fish when we walked the trail. Due to the rocky surface, nature is only now re-establishing itself on the lava. Many of the trees are more than a century old but less than a metre in height.



Photo: Mel Coulson

In 1982 the newly formed Buckley Valley Naturalists visited the Tseax Volcano. In the foreground you can see Evi Coulson (on the left) and Gisela Mendel (on the right) at the rim of the crater and the lava flow stretching away into the distance. Today a Nisga'a guide will take you to the maw of the crater.

Since the signing of the Nisga'a Treaty in 2000 there have been some infrastructure improvements. For example: we crossed the river in earlier times on a very shaky rope suspension bridge in the village of Gitwinksihlkw (the Place of Lizards) on the bank of the Nass River; now there is a substantial concrete bridge and pedestrian walkway with totems representing the four clans at each corner.

A world-class museum has also recently been established, allowing the Nisga'a Nation to display their rich cultural heritage and many fine works of art. The harmony of the people with nature and the respect Nisga'a have for the world around them is fully depicted. Our respect for the people was enhanced by their code: "Be kind, generous and humorous."

To visit this incredible site, turn north at Terrace and travel approximately 80 km on Hwy 113 into the Nass Valley. This road is an ancient travelling corridor for the Kitsum Kalum people: passing Kitsum Kalum, Sand, Lava, and Gainer Lakes, with coastal mountains just off to the west. <https://www.nisgaanation.ca/volcano>

Naturalist Mentor: Bob Scafe

Author: Alan E. Burger

The Nicola Naturalist Society (NNS), based in Merritt, is pleased to recognize Bob Scafe as an enthusiastic and valuable nature mentor in our community. With no formal training as a biologist, Bob has developed his interest in butterflies and moths to an exceptional level. By photographing moths that arrive at night at his porch light on the edge of Merritt, he has identified 633 moth species in just six years – a total that amazes even the expert lepidopterists that Bob regularly consults. He has become an important participant in the Butterflies and Moths of North America (BAMONA) web-group.

Bob has generously shared his newfound knowledge: leading several butterfly outings for our club, and giving presentations to our club (twice), to the BC Nature AGM in Lillooet in May 2017 and to the public at the Merritt Library (twice). The web-pages that he provided on butterfly and moth identification in the B.C. Interior are among the most popular on the NNS website. Bob has been a director of our club for many years and is a prolific contributor of wildlife photos to the “Nature News” section of our monthly meetings. Bob is a regular and very popular elder mentor at Grade 3-4 classes at the Bench Elementary School in Merritt. Thanks for all your contributions Bob! 🐛



Honouring Naturalists Mentor Bob Livsey

Author: Greg Ross

Our friend “Nature Bob,” passed away on December 13, 2021. Bob Livsey was born in Toronto Ontario on Sept. 10 1939. His grandfather was a grounds keeper at High Park in Toronto and I believe that he must have had a big impact on young Bob’s life as he explored the outdoors and studied all the nature books he could find.

Fortunately for the people of Fernie and the East Kootenays, Bob and his wife Linda moved to Fernie in 2001. In 2006 he had contacted me, the BC Nature Regional Director for the Kootenays, asking for my help in setting up the Fernie Nature Club. Soon afterwards he was leading large groups of like-minded people to explore the nooks and crannies within the Rocky Mountain areas of Fernie.

Bob worked part time for the Fernie Alpine Resort (FAR), teaching skiing in the winter and leading hiking groups through the old-growth cedar forests and up into the alpine. FAR later created the new Nature Bob Interpretive Centre, located in a Yurt at the top of the Elk Chair. The interpretive centre is full of picture boards and nature information, including fossil displays.

Nature Bob was a humble man and has left a mark on our community with a twinkle in his eyes, a grin, a chuckle and always a story about nature. Bob was honoured to have been featured in BC Nature magazine’s “Naturalist Mentors” in the Fall of 2018. 🐛