



BCnature

*"Know nature and keep it worth knowing"*



**The Magazine of BC Nature**

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# BCnature

Volume 60 No. 3

## In This Issue:

### Regular Columns

Editorial .....	3
President's Perch.....	4
Conservation Committee Updates .....	5
Letter to the Editor.....	14
BC Naturalists' Foundation .....	19
North in the Spring #20 Cowichan Valley Part 2.....	39

### Features

Connectivity is Key .....	13
Princeton Residents Discover New Dragonfly Fossils ...	15
Looking Both Ways - Historical Data Capture in BC.....	16
Hummingbird Banding Program, Vernon BC.....	17
Keeping an Open Mind .....	18
BC Nature Seeking Board Members .....	22
Come and Join the BC Marsh Monitoring Program! .....	23
Spadefoot Monitoring is Underway.....	24
Glass Sponge Reefs - Update.....	25
<i>iNaturalists</i> Bioblitz .....	27
Mushrooms are Amazing.....	27
Rebecca's Restaurant.....	30
BC Nature Seeks a Host Club for AGM 2024.....	30
BC Nature AGM 2022 in Kelowna.....	33
Elders Council for Parks BC .....	34
The Race to Refuel.....	35
Book Review .....	36
Oyster Mushrooms.....	37
Bert Brink Scholarship 2022 .....	38
Rene Savenye Scholarship 2022.....	38

### Notices

BC Nature Annual Appeal for Donations.....	20
BC Nature Photo Contest Coming Soon .....	24
Langley Field Naturalists Host AGM 2023 .....	26

## BCnature Online

Thank you to all the members who have now switched to receiving an electronic copy of this magazine! More than 200 members switched from receiving a paper copy to receiving an electronic copy from our plea in the June 2022 *Nature's Voice* enews. Total now 700 members.

For those that missed seeing this plea here it is again: "Please email [info@bcnature.ca](mailto:info@bcnature.ca) if you wish to switch your version to the e-version. We are a membership of approximately 6,500 and would really appreciate help in switching over to the e-version. It is our single largest cost centre with an annual cost of more than **\$35,000** for print and postage costs. We currently have 500 of our members on this list and would really like to grow that number! Thank you for considering the switch!"

### 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.

Advertising and article submission deadline for the Winter edition will be November 1, 2022.

**Articles and advertising in *BCnature* magazine do not necessarily reflect the views of all BC Nature members.**

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# Editorial

## From International Treaty to Law - An Example of Biodiversity

Author - Ben van Drimmelen

Of all the Canadian provinces and territories, BC is home to the richest diversity in physiography, climate, flora, and fauna. Three-quarters of Canada's mammal species are found in BC, and 24 of those species are exclusive. There are 1,140 native species of vertebrates, including 488 species of birds, 480 of fish, 136 of mammals, 20 of amphibians and 16 of reptiles. There are also some 1,600 native vascular plants species, approximately 1,000 mosses and liverworts, 1,600 lichens, 522 species of attached algae, and well over 10,000 species of fungi. Invertebrate species probably number between 50,000 and 70,000, including 35,000 species of insects.<sup>1</sup>

That impressive biological diversity makes BC important from a national perspective, but loss of such biodiversity is not just a provincial and national concern. It is international, as affirmed by 196 countries in a United Nations Convention on Biological Diversity - "Conscious also of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere, affirming that the conservation of biological diversity is a common concern of humankind, for evolution and for maintaining life sustaining systems of the biosphere".

It was back in 1992 that Canada signed and ratified the UN Convention on Biological Diversity. Thirty long years ago! So why is it taking so long to get the province to pass a law to conserve biological diversity in BC?

Surprisingly, Canada's ratification of an international treaty such as the Convention on Biological Diversity does not make it Canadian law. It has to be adopted by the provinces, and this is the cause of major delay

because the Canadian government cannot do that for biodiversity. Our Constitution prevents the federal government from legislating in areas that are the exclusive responsibility of the provinces. Therefore, passing laws to implement international treaty provisions on matters of provincial jurisdiction can be done only by the province. And it is the province that administers most of the components of biological diversity - water, land, vegetation, and most of the organisms themselves<sup>1</sup>.

Hoping that provinces would get on board, the federal government slowly began to work toward specific, measurable biodiversity goals and started consultation with the provinces. That took until 2015, when Canada's federal, provincial, and territorial governments finally agreed on 19 Canadian biodiversity targets to reach by 2020. Targets, yes, but still no law. In its most recent report in 2018, Canada stated that it was making progress toward 11 of those targets. However, it was not making sufficient progress on eight of the national targets, four of which depend primarily on the provinces:

- Canadian Target #1 - Conserving at least 17% of terrestrial areas and inland water. BC is responsible for the majority of the 17%.
- Canadian Target #2 - Recovery of species at risk. Canada has a Species at Risk Act, but its habitat protection applies only to federal lands, a tiny portion of BC. The province has no comparable legislation. Thus, achieving this target in BC is also up to the provincial government.
- Canadian Target #14 - Enhancing the science base for biodiversity and making knowledge of biodiversity better integrated and more accessible. Both levels of



Photo: A.K. Marshall

Boreal Owl

government have a role here.

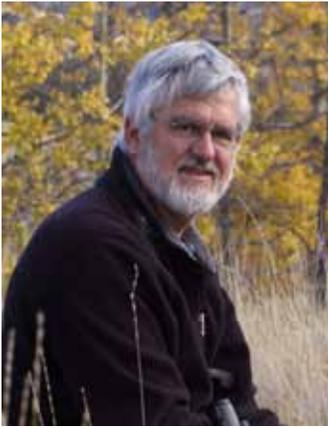
- Canadian Target #15 - Promoting traditional Indigenous knowledge in decision-making. The provincial government has a significant role here.

In 2019, BC passed provincial legislation to give effect to another more recent UN Convention - the Declaration on the Rights of Indigenous Peoples Act - <https://bit.ly/3C9Rb09>. Given the resultant provincial push for consultation and reconciliation with Indigenous peoples, the BC government is at last working toward the fifteenth biodiversity target.

That leaves three unachieved national targets that depend on the province. To adequately protect and conserve our biological diversity, BC Nature should focus on promoting long-overdue provincial achievement of those

- Conserving at least 17% of terrestrial areas and inland water (and ideally more, as exceeding that target will help Canada as a whole to reach the national target),
- Enacting legislation to protect and conserve hundreds more species at risk and their habitats, and Making biodiversity knowledge accessible for the public, so that biodiversity can be conserved and the impacts of biodiversity loss mitigated. ♡

<sup>1</sup>The provinces do not administer organisms that cross international boundaries such as migratory birds and marine mammals.



## President's Perch

Author - Alan E. Burger

**B**C Nature continues to consolidate our operations and expand our activities. Supporting member clubs remains BC Nature's primary focus. In the months ahead we are going to be in contact with all clubs to review

ways in which our staff and contractors can support clubs with their projects and operations.

The introduction of the International Key Biodiversity Area (KBA) program is an exciting new opportunity for clubs across the province to help identify and monitor potential KBA sites. KBAs focus on all wild organisms and are important for sustaining wildlife and biodiversity. Most of you are familiar with the existing Important Bird & Biodiversity Areas (IBAs). BC Nature has had the primary role of monitoring IBAs for more than 25 years. Our current IBA Coordinator, Liam Ragan has done an excellent (and ongoing) job of re-surveying many IBAs to ensure that recent monitoring data are available to assess whether the IBAs qualify as KBAs. Environment and Climate Change Canada funded a large part of this endeavour in April 2022. This work allowed Liam to develop close relationships with several First Nations. We are now at a point where some First Nations are approaching BC Nature for assistance in surveying key areas in their traditional territories in order to facilitate management and protection of critical habitats. As Canada and British Columbia move toward incorporating Indigenous values and traditional knowledge into land management and policies, BC Nature and our clubs are well positioned to be at the forefront of this movement.

On a related issue, BC Nature has established a partnership agreement with the Wildlife Conservation Society (WCS) of Canada to collaborate in identifying KBAs and increase partnerships with Indigenous groups. WCS Canada is the primary coordinator of the KBA program across Canada. WCS Canada is providing additional funding for Liam Ragan's contract, and we will be working closely with their staff as the KBA program develops.

BC Nature is also looking to increase our activities on Ecological Reserves. Many Ecological Reserves (ER) across BC have been sadly neglected by the provincial

government over several decades. We are in discussions with the non-profit Friends of Ecological Reserves to collaborate in invigorating the ER program by increasing the monitoring and protection of these reserves and greatly increasing their profile with the general public. Once again, our clubs across the province are well placed to be involved with this work.

It was wonderful to once more have an in-person AGM in May. Congratulations to the Central Okanagan Naturalists' Club for producing an excellent meeting. A striking feature of our in-person meetings is the predominance of grey-haired folks. Being one myself, I'm quick to acknowledge that this cohort does a lot to run our clubs and BC Nature. But it would be refreshing to have more participation and input from youth. So we are doing two things. First, we are seeking a young person (under 35 or close to that age) to fill a Director-at-Large vacancy on the BC Nature Board. See the notice in this magazine. If you qualify and are interested, please contact the office or me directly. Second, we are working on a suggestion from the Kamloops Naturalist Club to provide some financial and logistical support to enable more young members and those in under-represented demographic groups to attend our General Meetings. We plan to have something in place before next year's AGM.

Thanks again to our dedicated staff, contractors, and numerous volunteers who continue to build BC Nature and our clubs. It is an honour to work with all of you. Special thanks this fall to Simon Valdez-Juarez, who is stepping down as Conservation Coordinator to support his family, and Office Assistant Elham Oveisi, who has left us to return to Iran. Thanks also to Joanna Shan and Kephra Beckett, who both provided sterling service as summer students. ♡

### Dates To Remember

**September 25, 2022 - World Rivers Day**

**November 1, 2022 - Article/advertising deadline for BCnature Winter Edition**

**January 31, 2023 - Deadline for BC Nature Club Support Grants**

**March 15, 2023 - BC Nature Awards submission deadline**

**May 4, 2023 - AGM - Langley, BC**

# Conservation Committee Updates

Authors - Peter Ballin and the Conservation Committee

This introduction is short because the report is so long! We continue to collaborate with more environmental organizations and First Nations. Thanks to the conservation committee members, BC Nature staff, and club members who have contributed so much time and effort for conservation in BC.

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

- Roberts Bank Terminal 2
- Fortis Expansion Project: Tilbury Island
- Climate Change
- Open Net Pen Salmon Farms
- Herring Update
- Concerns about Environmental Regulations Enforcement on Waterways of the Lower Fraser Delta
- Strawberry Island
- The Salish Sea Indigenous Guardians Association Request for a Regional Assessment of the Salish Sea
- Gitdisdzu Lugyek's Marine Protected Area
- Coastal and Marine Strategy
- Species at Risk x 2
- Wildlife Killing Contests
- Wolf and Bear Updates
- Caribou Update
- Wildfire Control and Wildlife Values
- Important Bird and Biodiversity Areas

## **Roberts Bank Terminal 2 (RBT2) - Roger Emsley, BC Nature Special Representative for Roberts Bank**

Strong opposition to the proposal by the Vancouver Fraser Port Authority (VFPA) to build a second container terminal on Roberts Bank was expressed in submissions from BC Nature, conservation groups from Canada and elsewhere, scientist experts in wetland ecology, citizen scientists, and the cities of Delta, Richmond, and White Rock, among

16,000 sent to the Impact Assessment Agency. After the close of the most recent and final comment period (March 15, 2022), VFPA submitted rebuttals to the submissions. The last one (June 10) pushed back against the peer-reviewed science articles that demonstrate that the RBT2 project will negatively impact the salinity trigger. This change of salinity in the estuarine waters drives the production of diatoms in the biofilm. Migratory shorebirds rely upon this biofilm, rich in fatty acids, during their northward migration. It is the very foundation of the food web that supports the biological community of Roberts Bank.

The VFPA exercises a significant lobbying presence in Ottawa and continues to promote the myth that West Coast Canada will run out of container terminal capacity as early as 2025, in spite of evidence from terminal operators that sufficient capacity exists to meet trading needs into the 2030s. By that time, already planned container terminal expansions in Vancouver and Prince Rupert will ensure that RBT2 - at a cost of \$3.5 billion plus - will never be needed.

The federal government has maintained its silence since the latest VFPA submissions. Letters to the Minister of the Environment and Climate Change Canada and to other members of the federal cabinet remain unanswered. VFPA indicated that it expects a final decision from Ottawa by the fall of 2022. The Governor in Council (federal cabinet) will almost certainly make this decision. They will have to rule whether the project is likely to result in significant adverse environmental effects that cannot be mitigated, and if so, whether or not the project is nevertheless justified.

**Fortis Expansion Project: Tilbury Island - Anita den Dikken** - The BC provincial environmental assessment

recently concluded. The review group, it appears, did not consider upstream or downstream emissions in reaching its conclusion to recommend approval of the Fortis project.

They did, however, find that there would be significant residual effects:

- Effects on air quality negatively impacting human and wildlife health
- Increase in greenhouse gas emissions
- Loss of vital fish habitat
- Permanent damage to the river-bed
- Harm to endangered species including Southern Resident Killer Whales
- Adverse impacts on humans and wildlife from noise, light, water, and air pollution
- Serious disruption of commercial and recreational use of the lower Fraser River

Approval of their findings needs to be made by both the BC Minister of the Environment and the federal Minister of Environment and Climate Change.

On July 26 BC Nature received a reply from Kyle Ostman of the Environmental Assessment Office (EAO) of British Columbia to our April 12 letter regarding the potential negative impacts of Fortis' planned facility on the Fraser River; BC Nature's concerns are shared with many others regarding project-related risks to fish and fish habitat, greenhouse gas emissions, and climate change, captured in EAO's Summary of Engagement report - <https://bit.ly/3A4745A> July 14, 2022. The main themes that emerged from the comments received during the public comment period and published to Environmental Policy Impact Climate (EPIC), included:

- Climate change and greenhouse gas (GHG) emissions;
- Effects of the environment on

*Continued page 6*



Photo: B. Davison

*Yellow-headed Blackbird*

the Project including geological hazards;

- Species at risk, terrestrial wildlife, wetlands and their habitat including migratory birds;
- Marine mammals, fish, and fish habitat;
- Natural gas extraction using hydraulic fracturing (fracking) upstream effects; and
- Accidents and malfunctions including seismic and public safety concerns.

The next phase of the environmental assessment (EA) process for the Project is the Application Development and Review phase. FortisBC will develop its application and engage participating First Nations and Technical Advisory Committee members in accordance with the requirements of the Process Planning documents. Once the Application is submitted to the EAO, the EAO, participating First Nations, Technical Advisory Committee, Community Advisory Committee, and the public will have the opportunity to review and comment on the Application through a Public Engagement and Comment Period. There will be an additional final comment period during the Effects Assessment and Recommendations phase for the public to submit comments on EAO's draft assessment report and draft EA certificate including project description and conditions.

BC Nature submitted a letter in August, drafted by Anita, responding to a request for input about the enlarged

marine jetty proposed for the expansion project. This jetty lies across the lower Fraser River from the YVR airport jet fuel storage facility, very close to housing and industrial developments in both Richmond and Delta. The Fortis expansion proposal would increase the number of vessels using the jetty from 137 to 365 per year.

The jetty is in the lower part of the Fraser River, already heavily industrialized. LNG tankers would either need to navigate, a narrow 21 km dredged channel or tugs/barges would be required to transport the LNG to any of 18 locations (off Kitsilano, Point Grey, Stanley Park, or West Vancouver) for bunkering (transferring LNG to tankers). Transporting and bunkering of dangerous cargo such as LNG requires great care. Any puncture to an LNG tank would result in the explosive escape of LNG, thereby asphyxiating and flash-freezing any living being within a 500-metre radius of the puncture. And should the gas ignite, all living beings within an approximate two-kilometre radius would be incinerated.

The Society of International Gas Tanker and Terminal Operators (SIGTTO) is an organization whose members include nearly all of the LNG industry, but apparently not Canadian LNG companies. SIGTTO has established industry-wide safety standards to promote the safe transport of LNG. Among their key recommendations are:

- LNG ports must be located where LNG vapours from a spill or release cannot affect civilians
- LNG ship berths must be far from the ship transit fairway to prevent
  - ◊ collision with other vessels
  - ◊ surging and ranging along the LNG pier and jetty that may cause the berthed ship to break its moorings and/or LNG connection, as all other vessels must be considered ignition sources
- LNG ports must be located where they do not conflict with other

waterway uses - now and into the future

- Long, narrow inland waterways are to be avoided, due to greater navigation risks
- Waterways containing navigation hazards are to be avoided as LNG ports.

The proposed jetty meets none of these conditions. Consider also impacts upon fishes such as salmon and sturgeon, increase in vessel traffic and noise in the Salish Sea with potential impacts on endangered orcas (our Southern Resident Killer Whales), and on migratory birds. BC Nature considers this entire project - the massive increase in the Fortis facility and the location and potential negative impacts of the marine jetty - to be in conflict with current safety and environmental standards.

#### **Climate Change - Cheryl Lewis for the Climate Change Subcommittee**

- Thank you to everyone who submitted reflections to mark the one-year anniversary of the heat dome event. Published in the summer magazine, these stories were sobering and worth remembering. They included accounts of:

- Watching parent birds trying to keep their juveniles alive by constantly feeding them to keep them hydrated and shading them with their wings.
- Observing trees endure the extreme heat and then subsequently die.
- Listening to the unfamiliar rattling noise of empty mussel shells washed up on the beach, just a small fraction of the estimated one billion sea creatures that died as a result of the extreme heat.
- Witnessing cockles, clams, sea cucumbers, and many other species succumbing to the hot weather, and the sea birds that seemed to benefit at first, later finding that the sea life that supported them was simply gone.

The climate subcommittee is currently focused upon gathering climate-related educational resources such as links to podcasts, news items, publications, blogs, and webinars, to be hosted on the BC Nature website for our members. The materials will likely include:

- Nature-based climate solutions
- Conversations that matter with authors and individuals with significant expertise
- Resources about how to talk to politicians effectively
- Personal actions for your yard, and your life in general
- Recent news, reports, and upcoming events

Two subcommittee members are developing a webinar to help BC Nature members take climate action and support nature in their own yards. “Reimagining your yard: Landscaping to Support Biodiversity, Sequester Carbon, and be Climate Resilient” is planned for launch in fall 2022.

BC Nature is a member of the West Coast Climate Action Network (WE-CAN) <https://bit.ly/3SWAQBU>. WE-CAN is a powerful network of BC organizations urgently addressing the climate emergency. For weekly updates on climate news and action, subscribe to the **WE-CAN newsletter** <https://bit.ly/3AqvS9z>.

If learning more about science-based climate solutions and developing your own climate action plan interests you, [register](#) for the fall session of Drawdown BC’s “Getting into Action: 5-session Climate Solutions Course”, <https://bit.ly/3QseuqD>, starting on September 12<sup>th</sup>. Several climate subcommittee members are alumni of Drawdown BC and highly recommend these courses.

The climate sub-committee is delighted to have two new young members join - one in university and one in grade 11. We would love to have additional members to have province-



Photo: E. Van Ee

*Chicken of the Woods fungi.*

wide representation. Please contact [climatecommittee@proton.com](mailto:climatecommittee@proton.com)

### **Open Net Pen Salmon Farms: Media Release - Fish Farm Decision** <https://bit.ly/3SSr4kl> - **Larry Dill** - The Honourable Joyce Murray, Minister of Fisheries and Oceans, released an important pair of decisions on June 22, 2022 concerning the future of open net pen salmon farms in BC waters.

BC Nature has had a long-term interest in the health of wild Pacific salmon populations impacted by this industry and is cautiously optimistic that the Minister’s decision is an important step in getting these farms out of the ocean and onto land, where they belong.

Seventy-nine farms had their licenses renewed for a two-year term, instead of the usual six-year term. This will enable one complete grow-out cycle for the fish, but no re-stocking will be allowed until a decision is reached, following consultation with all affected parties concerning the future of BC’s aquaculture industry.

Not included in that number are the 19 net pen operations in the Discovery Islands, on the migration route of the critically endangered Fraser River Sockeye Salmon. These operations were shut down on order of the previous Minister, but the companies challenged this decision in court and won, forcing the Minister to reconsider after adequate consultation. She will now complete this consultation process and make a final decision on

these farms in January 2023.

We appreciate that to make her orders immune to further legal challenges, Minister Murray must conduct adequate consultation. We remain hopeful that following this, her final decisions will be to permanently close the Discovery Islands to salmon farms prior to next spring’s wild salmon outmigration, close all the remaining farms in 2024, and help the industry transition to fully closed containment by 2025, as promised in the Liberal’s election platform. This is absolutely essential to protect wild salmon from parasites and diseases emanating from the farms, and to aid in the recovery of BC’s wild salmon stocks. The science on this is very clear.

BC Nature received an invitation from Fisheries and Oceans Canada to attend upcoming virtual engagement information sessions on the Transition Plan for open net pens in British Columbia. The first engagement sessions were held in August 2022 and were open to all interested Indigenous Nations in BC, industry, local governments, and environmental non-governmental organizations. Larry Dill serves as BC Nature’s Official Representative at these meetings.

**Herring Update** - On April 19, 2022 BC Nature sent a letter (<https://bit.ly/3pnUpFO>) to Fisheries and Oceans Minister Joyce Murray, expressing our concern for the state of BC’s herring populations. Minister Murray replied on June 10, 2022 (<https://bit.ly/3JVORMp>) stating that Fisheries and Oceans Canada (DFO) is firmly committed to the conservation, protection, and regeneration of our marine environment and the lifeforms it sustains. Minister Murray agreed with our concerns, and added that in a number of areas, herring stocks have experienced significant declines or persistently low levels of abundance within the past 10 to 20 years. “The annual Pacific Herring Integrated Fisheries Management Plan

Conservation report continued from page 7

(IFMP) describes the scientific assessments and forecasts, harvest levels, areas open for fisheries, management measures, gear allocation, and fishery monitoring requirements. To protect future stock health, DFO has closed most commercial fisheries for Pacific Herring for the 2021-22 fishing season. As outlined in the IFMP, the Strait of Georgia was open with a 10% harvest rate to support fisheries for food and bait, special use, and roe herring. This decision was made with the goal to provide renewable fishing opportunities and increase stock abundance, to benefit the entire ecosystem. This is in line with the cautious approaches taken in recent years, with additional limits on harvest.”

### **Concerns about Environmental Regulations Enforcement on Waterways of the Lower Fraser Delta - Bob Puls, Conservation Chair, Langley Field Naturalists**

On July 22, 2022, representatives from Langley Environmental Partners Society, Langley Field Naturalists, Green Timbers/Surrey Natural Areas Partnership, White Rock Surrey Naturalists, Nicomekl Enhancement Society, Surrey Environmental Partners, Serpentine Enhancement Society, Surrey Natural Areas Partnership, Yorkson Watershed Enhancement Society, and Little Campbell River Enhancement Society met with Joyce Murray, Minister of Fisheries and Oceans, upon the invitation of John Aldag, MP for Cloverdale.

Langley and Surrey streams provide extensive spawning and rearing areas for salmon year-round. These watersheds are integral for the survivorship of the juvenile salmon, providing habitat to support their growth prior to marine migration. Streams in this riding flow through both residential and farm areas.

Most representatives expressed concerns about the failure of down-loading federal environmental regulatory enforcement to the province and



Photo: R. Taylor

*Turkey Tail (Trametes versicolor)*

municipalities. They suggested that DFO needs to regain its proactive role in enforcing environmental protection regulations as prevention and enhancement is more effective than prosecution post damage. Participants pointed out that municipalities were more interested in circumventing environmental rules than complying with them, and that professional consultant reports assisted development rather than protecting the environment.

Issues include:

- Lack of local habitat enforcement to uphold regulations (as opposed to 15-20 years ago when enforcement officers actively attended to violations)
- Lack of jurisdiction for stream protection in Agricultural Land Reserve lands
- No follow-up to reports of habitat disruption
- Design the new sea dam at the mouth of the Nicomekl to incorporate improved fish passage
- Necessity of stronger rules and enforcement to protect the habitat of anadromous fish
- Absence of fisheries officers at pollution events
- More acknowledgment of citizen scientists
- A reactive, rather than a proactive system
- Bureaucratic log jams
- Restore direct ability for DFO to act
- Concerns about the professional reliance model being flawed

John Aldag urged the participants to

keep him in touch with local issues of concern, and Joyce Murray urged them to keep up the good work.

**Strawberry Island - Simon Valdez-Juarez, BC Nature** - On August 8, 2022, BC Nature wrote to Joyce Murray, Minister of Fisheries and Oceans; Fin Donnelly, Parliamentary Secretary for Fisheries and Aquaculture; Josie Osborne, B.C. Minister of Land, Water and Resource Stewardship; and Ted White, Director and Comptroller of Water Rights, regarding the development of Strawberry Island for cranberry farming.

Strawberry Island lies between Hope and Mission, adjacent to the Bert Brink Wildlife Management Area (WMA) in what is known as the Heart of the Fraser. As the only large island of the Fraser River that remains without dikes, the flooded plains of Strawberry Island serve as prime feeding habitat and refugia for several species of Pacific salmon and red-and blue-listed bird species known to nest and/or feed in the adjacent Bert Brink WMA. The natural waterways in Strawberry Island are being altered and degraded to provide infrastructure for a cranberry farm, including a large dike to drain the floodplain, a road blocking a waterway, and the destruction of riverfront vegetation. One of the leading causes of declines in BC’s salmon runs is degradation and fragmentation of freshwater habitat by structures such as roads, culverts, and dikes. The ongoing diking and fragmentation on Strawberry Island will further contribute to the decline of salmon populations in the Fraser River. Additionally, we expressed concern about the increased vulnerability of communities downriver to cataclysmic flooding exacerbated by the removal of riverfront vegetation. This vegetation reduces flood risk by absorbing water and slowing water flow. In light of the recent catastrophic flooding of the Fraser and expected increases in flooding risk due to climate change, it is reckless to allow the removal of

*Continued page 9*

riverfront vegetation.

The proposed development is particularly concerning in a flood zone in close proximity to a WMA. Cranberry farms employ agrochemicals known to be highly toxic to fish. If a flood similar to that of 2021 were to occur it could lead to the release of these highly toxic compounds into the adjacent WMA with potentially catastrophic consequences for wildlife populations there and a negative effect on the human population downriver.

We believe that the transformation of the critical natural habitat of Strawberry Island does not comply with legislation: The Water Sustainability, Federal Fisheries, and Federal Migratory Bird Acts. We requested government to do due diligence; we are concerned about lack of oversight and guidance.

**The Salish Sea Indigenous Guardians Association Request for a Regional Assessment of the Salish Sea - Roger Emsley** - On July 27, 2022, BC Nature wrote to Steven Guilbeault, Minister of Environment and Climate Change; Jonathan Wilkinson, Minister of Natural Resources; and Terry Hubbard, President of the Impact Assessment Agency, in support of the Salish Sea Indigenous Guardians Association's (SSIGA) request for a Regional Assessment of the Salish Sea.

To manage the Salish Sea sustainably, BC Nature believes it is essential to better understand the Salish Sea ecosystem and its diverse and important connections, including those to the history, cultures, and livelihoods of the peoples who have lived here for thousands of years. The Salish Sea wetlands and tributaries were and remain essential to the ways of life and health of the Indigenous communities along and well beyond its shorelines.

The proposed assessment must consider the fundamental ecosystem changes of past, present, and future



Photo: C. Ace

Monarch Butterfly

industrial and port developments. A full cumulative effects assessment for the entire area, including relevant or connected terrestrial ecosystems and species of the Fraser River Estuary, many of which are at risk, must follow. Such an endeavour would serve as a model to display to the world how we might live sustainably.

The SSIGA letter refers to several large-scale industrial developments along the Fraser River and its Estuary. While these and other projects have performed stand-alone environmental assessments, none of these developments are known to have ever carried out comprehensive cumulative effect's assessments. Such assessments would include reference baseline understanding of the area with which to compare the present with past projects and the potential impacts of anticipated future projects.

The Fraser River Estuary - recognized by the Salish Sea Institute as the largest and most significant estuary in the Salish Sea - is at a tipping point. For example, Southern Resident Killer Whales continue to decline significantly. Salmon populations and 'forage' fish species such as herring, which form a critical base of the Salish Sea's ecology, have also declined significantly. Climate change and pollution pose serious risks to the stability of the Salish Sea, including the Fraser River Estuary. The requested assessment will, as SSGIA suggests, help to fill in many significant data gaps, allowing for a greater understanding of the Salish Sea's and Fraser River Estuary's status and how this relates to its past

and its future.

BC Nature is particularly concerned about the potential for further environmental damage in the Fraser Estuary, especially Roberts Bank. Yet here the Port of Vancouver wants to build a massive island to construct a second container terminal. That project plus a number of other large and significant industrial developments, including the proposed Delta-port Berth Four expansion, the Airport Fuel Storage terminal, the planned Tilbury Fortis LNG terminal and marine jetty, the potential for a second cruise ship terminal, the Puget Sound LNG project, expansion of port facilities in and around Nanaimo, and others, all threaten the sustainability of the Salish Sea and Fraser River Estuary. BC Nature supports a full and inclusive regional assessment prior to further project-specific environmental assessments and before approval of any of the proposed projects.

**Gitdisdzu Lugyek's Marine Protected Area** - On August 14, 2022, BC Nature wrote a letter of support to Chief Neasloss and the Kitasoo/Xai'xais Nation Stewards congratulating them on the designation of Gitdisdzu Lugyek's as a Marine Protected Area. IBA/KBA Provincial Coordinator, Liam Ragan, worked briefly with the Kitasoo/Xai'xais Stewardship Authority this past April as part of our work as the BC stewards of the global Key Biodiversity Areas (KBA) Program. The area impressed us with its biodiversity and abundance of birdlife, including globally significant numbers of Surf Scoters, and Thayer's, Glaucous-winged, and Short-billed Gulls. BC Nature expressed its hope that the provincial and federal governments step up to support the designation of Gitdisdzu Lugyek's as a Marine Protected Area, and recognized it as an MPA based upon "inherent and Aboriginal rights and title and from [your] connection to this land for thousands of years"

Continued page 10

**Coastal and Marine Strategy** - On August 8, 2022 Peter Ballin attended a follow-up meeting (see the Summer issue of *BCnature* magazine) now under the new Ministry of Lands, Water, and Resource Stewardship (LWRS), to elaborate upon a 2020 mandate to establish a Coastal and Marine Strategy. The mandate totally meshes with the objectives and values of BC Nature. There's a lot to iron out, since jurisdictional overlaps between municipal, provincial, and federal government abound, not to mention the role of First Nations. An intentions paper should be released in October 2022, and the LWRS staff is open to meetings with BC Nature.

**Species at Risk: Wildlife Subcommittee Report - Ben van Drimmelen** - The Wildlife Subcommittee attempted to form a coalition of some 45 organizations that made representations to government for species at risk legislation several years ago. Perhaps due to failed past efforts, this coalition would not come to pass. Therefore, the Wildlife Subcommittee looked into supporting several larger organizations that already have initiatives under way related to legislation for biological diversity and species at risk:

The Wilderness Committee has several campaigns under way - for a BC species at risk law <https://bit.ly/3QQKqEz>, for conservation of biodiversity and protected areas <https://bit.ly/3Ao5m0m>, and for conserving old growth (<https://bit.ly/2FAHMDq>). It asked that BC Nature members engage in their online campaign to send pre-written letters followed by prompting to take a series of actions leading to meet with one's MLA and planning an event.

Ecojustice is calling for a law to protect biodiversity (<https://bit.ly/3pm5IDM>). However, it is still developing a broader advocacy strategy for a biodiversity law (planning, research, etc.) and is waiting to see how the new Land,

Water and Resource Stewardship ministry plans to deal with biodiversity.

The BC Wildlife Federation's 24-member Fish, Wildlife and Habitat Coalition advocates for biodiversity and ecosystem health (<https://fwhbc.ca/>). It invited a Wildlife Subcommittee member to attend bimonthly meetings of their Coalition.

The subcommittee developed a potential strategy for BC Nature that would complement these initiatives. It involves helping each BC Nature member club develop an ongoing relationship with their respective MLAs. (The West Coast Climate Action Network has compiled straightforward training in that regard, and we are exploring offering such online training to members.) The result would be that the various federated clubs around the province would be able to meet regularly with their MLAs to explain the need, and desire, for legislation on matters important to their club and to BC Nature, including protection of species at risk and their habitats and protection and conservation of biological diversity. That work does not require meetings of a subcommittee; one or two individuals can do the organizing. Adding that to a couple of resignations, the Wildlife Subcommittee has therefore been dissolved.

**Species at Risk Update** - Greg Ferguson

The Stewardship Pemberton Society seeks to protect the rare and endangered Sharp-tailed Snake in the Pemberton Valley: <https://bit.ly/3zXOcW5>

**McKee Neighbourhood Plan** - Abbotsford: McKee Peak of Sumas Mountain in Abbotsford is home to many species at risk, including Pacific Water Shrew, Oregon Forest Snail, Phantom



Photo: J. Forster

*One of these is not like the others.*

Orchid, Northern Red-legged Frog, and Mountain Beaver. A Neighbourhood Plan has been created that tries to balance extensive housing development with trails and natural spaces. If you think that this balance is not sustainable enough to allow the organisms on the mountain to survive, you have a chance to speak: <https://bit.ly/3c4VYFz>. Information on the area's importance: <https://bit.ly/3dwqaKc>

**The South Coast Conservation Program (SCCP)** - SCCP will be hosting its Conservation Connects event online on September 27th from 1-3pm. Please check in on the SCCP website <https://bit.ly/3K0nr7X> or Facebook <https://bit.ly/3bWlYm> for more details as they become available.

**Status update on the modernization of the Migratory Birds Regulations, 2022.** - An important change to this legislation is that bird nests not in use are no longer protected year around except for nests of 18 species (listed in Schedule 1 of the regulations) whose nests are reused by migratory birds, unless there is evidence of abandonment. For more information visit <https://bit.ly/3AqAtZi>

**Wildlife Killing Contests** - BC Nature signed on to an open letter from ENGOs and other organizations to Forests, Lands, Natural Resource Operations and Rural Development

Conservation Report continued from page 10  
Minister Katrine Conroy, asking the BC government to prohibit wildlife killing contests under the BC Wildlife Act.

The letter states “wildlife killing contests embody and promote a deplorable lack of respect for BC’s wildlife and do nothing to contribute to wildlife management. Notably, scientists have repeatedly warned that killing contests can disrupt stable breeding structures, creating further wildlife conflict and population imbalances”. Such contests are already banned in California and Washington, and soon will be banned in Oregon.

Conservation Committee member Greg Ferguson noted that organized killing seems acceptable in fisheries, trapping, and the livestock industry... something to think about.

#### **Wolves and Bears – Jacqueline**

**Sherk** BC wolves had their own day in court this past summer when Rebeka Breder, a Vancouver animal law lawyer, argued against the legality of the province’s aerial gunning of this much-maligned species. Breder represented the conservation organization Pacific Wild and argued that the province stands in violation of Canadian aviation security regulations, therefore making the killing of wolves from the air unlawful.

Although their case wasn’t successful and the government’s aerial gunning and wolf cull program continues, Breder said that the fact that Pacific Wild’s case was allowed to be heard in the Supreme Court of Canada was in itself a win for environmental advocates everywhere.

The wolf cull has been ongoing for seven years in the provincial government’s Predator Reduction Program, which is part of an effort to protect declining mountain caribou herds. The Mountain Caribou Recovery Plan was implemented in 2007; since then, six sub-populations of endangered



Photo: C. Keen

Chukar

herds have been declared extirpated. The greater issue facing caribou is clearly the loss of their critical habitat in old-growth forests as a result of widespread industrial development.

With reports of so many Black Bears being euthanized in this province, questions arise over whether the BC Conservation Officer Service (COS) is actually fulfilling its mandate to protect wildlife. The COS’s own program, WildSafeBC, is intended to provide the education and community solutions needed in order to reduce and prevent human-wildlife conflicts, but a report issued by the Auditor General in 2017 stated that the BC conservation service had not shown itself to be effective.

Between 2006 and 2015, COS staff destroyed 389 Grizzly Bears in non-hunt conflicts with humans. The COS then reported that it had revised its procedures to evaluate each conflict so as not to automatically assume that a bear should be destroyed. Following that declaration, COS reduced the number of grizzlies killed between 2015 and 2021, under the same circumstances, to 151 .

The number of Black Bear deaths by COS is far greater. In the six years between 2015 and 2021, 3,779 Black Bears were killed. Black Bears are by far the most-killed animal by the COS whose mandate, we are reminded, is to protect them.

The Vancouver-based conservation

and advocacy group, The Fur Bearers, says that annual trends show there is no reduction of black bear deaths by the COS in BC. The Fur Bearers say this reflects a *status quo* where lethal force against black bears is “being deployed at a much higher rate than preventative measures such as compliance and enforcement actions are”. The Fur Bearers has written a letter to the Auditor General of BC calling on the Auditor to conduct a further review of the COS to ensure they are fulfilling their wildlife protection mandate and also to ensure that the taxpayers of BC are receiving value for their dollars to fund the BC Conservation Officer Service.

**Caribou - Joan Snyder** - This year’s maternity pen experiment was deemed a success. On July 22, 2022, the Arrow Lakes Caribou Society (ALCS) released seven females and six calves from a pen above the hot springs in Nakusp. The animals dispersed up into the alpine, where they will stay until the fall; they will migrate to lower elevations when the snowpack is sufficiently deep for them to reach lichens in the trees.

The Southern Mountain Caribou herd contains about two dozen animals Cows and calves all have GPS/VHF radio collars. GPS data show that all calves but one are with their mothers. True success will be determined in the winter, when the provincial Caribou Recovery Program monitors calf survivorship. Source: John Boivin in *The Valley Voice 11 August 2022: p13*

**Wildfire Control and Wildlife Values - Glenda Hanna** - BC Nature submitted a letter that grew from the concerns and actions of the Shuswap Naturalist Club in Salmon Arm. Where forested areas such as woodland parks and reserves within/near urban areas or municipalities have been subject to long-term fire suppression efforts, a very high fuel load increases the risk of catastrophic wildfires that may spread to infrastructure includ-

*Conservation Report continued from page 11*  
 ing residences, businesses, roads, railways, etc. Many, if not most, communities in BC that are located in or near forested areas should be considering “fire-smarting” parks and reserves (e.g., by reducing fuel loads, and addressing fuel laddering issues). BC Nature supports wildfire protection projects that help protect nearby residences and other community infrastructure near these forested areas.

However, negative impacts of wildfire mitigation to the vitality and health of the forest ecosystem and to the park users’ experience may be significant. We therefore ask that they be considered and addressed when planning and implementing these projects. A fire-smart forest is not mutually exclusive from one that has a healthy, diverse ecosystem that is aesthetically attractive and experientially pleasing to users.

To accomplish this, BC Nature recommends the following approaches:

1. That all future wildfire mitigation work undertaken in urban/near-urban parks and reserves be planned and implemented in a manner that maintains/enhances forest ecological and park user values while significantly reducing the potential for catastrophic wildfires
2. That the governing authorities secure expert independent scientific and accredited professionals such as Registered Professional Forester (RPF) with input/review of all wildfire protection work proposed for parks/reserves, evaluating strategies to ensure that they maintain/enhance the health and biodiversity of plants, animals, and soils
3. Supporting fire-resistant broad-leaved growth in the treated areas, including:
  - Selectively removing non-deciduous trees of various age/size rather than removing many small/mid-size trees

- Pruning only the lower branches on mid-size trees rather than removing them, to allow more light penetration while simultaneously helping return the forest to a more diverse composition
  - The judicious removal of some mature trees to create light openings
  - Planting some fire-resistant broad-leaved trees and shrubs in treated areas to hasten understory development in lower light penetration areas, including along trail margins
  - Recognizing that a more natural forest with variety in tree species and size, including a deciduous understory, enhances wildlife diversity, ecological processes, aesthetics and park users’ experience
4. Clear, standardized, forest management FireSmart criteria included in relevant statutes, funding application processes, and project supervision, because the government of BC funds, directs, and/or supervises many of these projects
  5. That the governing authorities implement a meaningful public consultation process to educate the public and secure citizens’ input.

BC Nature would be pleased to provide more detailed suggestions about the planning process, technical issues, and public consultation. We look forward to hearing from, and working with you, to manage our forested areas in ways that support healthy ecosystems and communities.

**Important Bird and Biodiversity Areas (IBA)** – By Liam Ragan - The primary focus of the IBA program this summer has been to strengthen and build partnerships to ensure we continue to deliver on our mandate to monitor and protect the most important areas for avian biodiversity in BC. This is particularly important as we expand our IBA network to Key Biodiversity Areas and consider



*Photo: R. Rudland*  
 A pair of North American River Otters

a wider swath of biodiversity. While I was in Ottawa meeting with partner NGOs and Environment Canada, our new Executive Director, Stewart Guy, was in B.C. making progress toward new partnerships. Most notably, the Wildlife Conservation Society of Canada has stepped up, providing large amounts of support to the program.

A few wins since the last magazine: This June, students from the University of Victoria Birdwatching Club partnered with the IBA Program with funding from BC Field Ornithologists (BCFO) and radar equipment from Environment Canada to conduct the first survey of Marbled Murrelets in the Hesquiat IBA since that of Alan Burger in 1997. Though our numbers were shy of historic counts, likely due to increased logging in the area, they still met national IBA thresholds, demonstrating an at-risk but still nationally-significant population. Huge thanks to IBA Caretaker and Hesquiat Harbour resident Dianne Ignace, her son Jeff, and the Hesquiaht First Nation for making this possible. See the upcoming *Journal of the BC Field Ornithologist* for details.

IBA Caretaker Matthias Bieber led a group of volunteers to survey Osoyoos Oxbows IBA, also with funding from BCFO. The fifth of five south Okanagan IBAs to be surveyed in the last few years, it had a remarkable 47 Yellow-breasted Chats, making up an estimated 16% of the entire endangered BC population. ♡

# Connectivity is Key

Author - Judith Holm, Wildlife Connectivity Project Lead, Squamish Environment Society

Ramifications of strong development pressures in Squamish are proving challenging for the District of Squamish and surrounding jurisdictions and for the biodiversity whose survival depends on this land. The effects of climate change will exacerbate the problems. Hence, the Wildlife Connectivity Project - <https://bit.ly/3QvzbSf>, initiated in 2021 by the Squamish Environment Society in response to voiced concern from our community and in collaboration with the Atl'ka7tsem/Howe Sound UNESCO Biosphere Region. This name is meaningful to our Skwxwu7mesh partners. Terms such as 'habitat connectivity', 'wildlife habitat connectivity', and 'ecological connectivity' express the same concept. The goal of this project is to enable solid scientific research to guide the District and surrounding jurisdictions to plan for ecological connectivity before further fragmentation makes it too late.

Thank you, BC Nature and the BC Naturalists' Foundation, for your grant in support of this project. Thank you, Squamish-Lillooet Regional District, for your substantial financial support in recognition that there is time-sensitive urgency for connectivity research. Together with private donations, the funding was obtained for CoastRange Environmental to begin the Scoping Stage on April 1, 2022. Goals are to:

- Form a stakeholder committee and continue stakeholder consultation
- Conduct a detailed review of the methods and policies utilized by other communities.
- Refine the Landscape Modeling Method to be used for identifying corridors within the Sea to Sky.
- Refine the spatial scope of the study area.
- Identify data gaps.
- Refine policy options for protecting corridors.
- Refine future phases of the project plan.

A stakeholder committee has been formed. A Skwxwu7mesh Nation representative accepted our invitation to be part of this committee right from the start.

Two methodologies were explored, the Empirical Wildlife Data method and the Landscape Modeling Method. The latter was chosen as the more suitable for the Sea to Sky. Empirical wildlife data will add support as it becomes available.

Development Permit Areas were identified as a suitable policy instrument for protection of corridors, as utilized by other communities in BC, such as the District of Lake Country and the City of Kelowna.

We attended an excellent Connectivity in Washington webinar to learn about the results of the Washington Wildlife Habitat Working Group <https://bit.ly/3C8ccbN>. Their scientific approach is being used as a model in planning for connectivity. With permission, here is the link - <https://bit.ly/3RthFOK> to the recorded version



Photo: Brian Aikens

*Bobcat in the Squamish Estuary.*

of this webinar. Keynote speaker Dr. Gary Tabor, whose work on Connectivity Conservation spans the globe, gave the overview. Gary coordinated the International Union of Conservation of Nature guidelines document *Guidelines for Conserving Connectivity Through Ecological Networks and Corridors (2020)*.

## Why is connectivity so important?

Fragmentation of habitat is preventing many species from completing their life cycles. Human-caused fragmentation continues to increase because connectivity is not yet part of the planning process for roads and other developments. Climate change is exacerbating fragmentation.

Increasing the number of protected areas will be ineffective if they are islands. Biodiversity is not always found in protected areas. Networks of linked wildland that include various forms of ownership enable connectivity. The challenges involved enable opportunities for different groups and individuals to work together for the shared goal of connectivity.

There is growing understanding that connectivity is vital for the resilience of the agriculture and forestry sectors. Connectivity is a resilience strategy. In addition to enabling the movement of wildlife, connectivity helps sustain the flow of the many natural processes which enable life on earth and buffers the effects of natural hazards such as floods, fires, and landslides.

*Continued page 14*



Photo: Brian Aikens

Roosevelt Elk in the Squamish Valley.

Open-source data are *essential* for effective planning. With open-source data, researchers world-wide can build on each other's work, rather than having to re-create research that has already been done. This will speed up our progress.

Since 2000, connectivity conservation planning has dramatically increased in response to bottom-up concern from firsthand experience of the cumulative effects of fragmentation and climate change. International organizations are now prioritizing connectivity. In the 2021 budget, Canada announced a new \$2.3 billion national program for ecological corridors to accelerate action to reduce biodiversity loss, protect ecosystems and help Canada adapt to climate change. ♡

*Inspiration to persist in working toward the above comes to me when I am outdoors exploring and connecting with nature; appreciating with awe and wonder the mysteries, complexity, and beauty of this dynamic world, and sharing small discoveries with friends and family. Judith*

## Letter to the Editor

Dear Editor,

Just a short note to thank Kees Visser and all those who contributed to nominating me for the 2022 Elton Anderson Award. I am deeply honoured to be associated with so many amazing naturalists, thank you. I would like to clarify two points in the nomination, concerning others who collaborated with me and should be acknowledged.

When the BC Education Committee developed the 2014 survey of all the BC Nature member clubs to share their achievements and needs in nature education, the skill and support of Kristine Webber, former Executive Director of NatureKids BC, was essential.

Also, the Bert Brink Scholarship was developed by the Bert Brink family with thoughtful advisement by Bev Ramey. My input was peripheral to theirs.

Everything for which I was acknowledged has been accomplished with the help of volunteers participating on the BC Nature Education and Awards Committees and our respective naturalist member organizations.

Sincerely, Margaret Cuthbert



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# Princeton Residents Discover New Dragonfly Fossils Along the Similkameen River

Authors - Bruce Archibald (paleontologist, Beaty Biodiversity Museum, University of BC), Rob Cannings (Curator Emeritus of Entomology, Royal BC Museum)

Two new fossils of Odonata, the order of insects containing dragonflies, have been discovered near Princeton, BC. One is a darner, in a dragonfly family still common in our times - the insect would look rather ordinary flying beside a pond in BC today. The other is an extinct dragonfly relative that would be a tremendous surprise to see in the modern world.

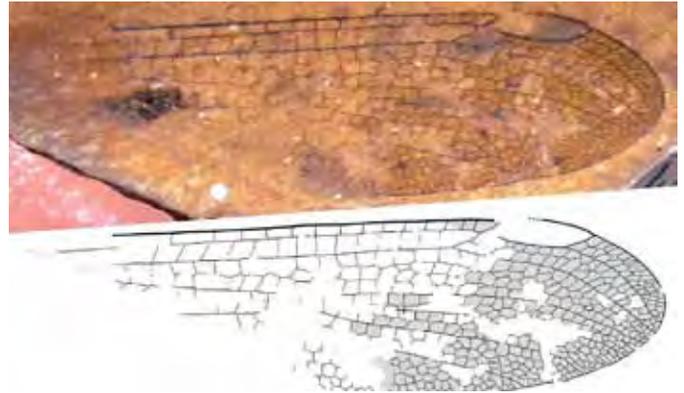
We recently published the descriptions and names of the fossils in the scientific journal, *The Canadian Entomologist*. A free PDF of this paper, *The first Odonata from the early Eocene Allenby Formation of the Okanagan Highlands, British Columbia, Canada (Anisoptera, Aeshnidae and cf. Cephalozygoptera, Dysagrionidae)* can be downloaded at [brucearchibald.org](http://brucearchibald.org).

George Mercer Dawson of the Geological Survey of Canada first reported fossil insects in BC in 1877 - on the banks of the Similkameen River and its tributaries near Princeton. There were no fossil insect experts in Canada in those days, and these specimens found their way to Samuel Scudder of Harvard University and Anton Handlirsch at the Natural History Museum in Vienna, who described them in scientific publications.

Several other paleontologists collected along the Similkameen over the next 150 years. They wrote about the rich record of many kinds of fossil insects from these beds, but no one ever found one belonging to the Odonata. That all changed through the efforts of Princeton residents Kathy Simpkins, manager of fossil collections at the Princeton Museum, and Beverly Burlingame, an avid collector who regularly brings fossils to the museum.



Kathy Simpkins (left) and Beverly Burlingame (right) of Princeton, BC are finding fossils important to science around Princeton. A century and a half after George Mercer Dawson pioneered fossil discoveries in the area, the two friends continue this scientific tradition.



The wing of the new species of dragonfly relative, *Allenbya holmesae*, found by Beverly Burlingame of Princeton, BC.

When one of the authors (Bruce Archibald) visited the Princeton Museum in 2021, Simpkins pulled out a fossil of a torn and folded part of a wing that she'd found. "The wing was so messed up I had no idea what kind of insect it belonged to", she explained. By its preserved intricate net-like venation, however - Bruce excitedly recognized it as part of a dragonfly wing - no dragonfly had ever been found in this geological formation before. At the time, the two of us were working on some other fossil Odonata of the region, and we quickly decided to publish a description of the wing.

We knew that it belonged to the darner family (*Aeshnidae*), but the insect remains were too incomplete to tell what species it might be. Still, knowing that darners flew in the Princeton area about fifty million years ago is a big advance in our knowledge. They are diverse in BC today and now we know that they were doing well in the region way back then.

A few months later, Beverly Burlingame texted Bruce an image of another insect wing fossil. It turned out to be a member of an extinct relative of dragonflies and damselflies that we had named the "*Cephalozygoptera*" earlier that year. These insects look superficially like damselflies but, among other differences, their globular, rather than hammerhead-shaped, head and the ancient pattern of the wing veins set them apart. This insect would certainly look strangely weird flying along the shores of a modern pond, lake, or stream.

We named this new species *Allenbya holmesae*. *Allenbya* refers to the Allenby Formation, the geological strata where the fossil was discovered; *holmesae* recognizes Burlingame's mother, Dorothy Holmes, who worked with entomologists at Agriculture Canada for many years and

*Continued page 16*

Continued from page 15

instilled a love of insects and fossils in Beverly during her youth.

What's next? "Kathy and Bev have found a series of important fossils whose descriptions will be published over the next few years. It's amazing what they discover. Their fossil finds are wonderful examples of the contributions that naturalists and keen amateurs can make to our

understanding of biology."

Simpkins and Burlingame will be splitting more rock in search of ancient life. Burlingame says: "Finding these fossils is exciting and learning their significance to science is incredible!"

So, watch for more. ♡

## Looking Both Ways: Historical Data Capture in BC and Why It's Critical for Conservation Decision Making.

Author - Liam Ragan, Provincial Coordinator, BC IBA Program

Tucked away between heirlooms and memorabilia, an innocuous box of papers is considered, rifled, disregarded, and promptly set aside to be recycled. Written on those papers, unbeknownst and unappreciated, are tens-of-thousands of unique observations amounting to a lifetime of appreciation of the natural world. In an era of easy data storage where we have the ability to preserve information for posterity into the next millennium, discarding data seems unconscionable.

While my job (IBA Provincial Coordinator) consists largely of looking ahead (where we'll survey next season, who is well-positioned to effectively keep tabs on a critical biodiversity site), I often find myself most intrigued by what's come before; Ralph Fryer's snapshot of five American White Pelican huddled together at Esquimalt Lagoon 1964,<sup>[1]</sup> the first photo preserved on *eBird* from BC, or a preserved Carolina Crane's-Bill (*Geranium carolinianum*) by Thaddeus Haenke aboard the late 18<sup>th</sup> century Malaspina Expedition,<sup>[2]</sup> the first specimen recorded in the Global Biodiversity Information Facility. Minor on their own, these historical observations, combined with guidance from Indigenous land stewards, whose understanding stretches back thousands of years, allow us to answer key questions critical to effective conservation decision-making. Is the surge in Bald Eagle populations an issue that needs to be addressed, or are

they slowly returning to pre-DDT numbers? Is what I, with just over a quarter-century's experience, consider a "huge" flotilla of scoters as unprecedented as it seems, or is it a far cry from their once sky-darkening numbers? Without adequate historical data, we're left second guessing while simultaneously unable to provide accurate narratives to policy makers and the public as they seek to take the pulse of their environment.

For those of you who, like me, recognize both the tremendous value of historical data and the ongoing tragedy that is its all-too-frequent loss, I have good news. Whether you have in your possession journals and records from a late friend, family member or colleague, are wondering yourself what to do with your own decades of field notes, or are at the beginning of your career, there are options. For those lucky few who already have observations in a digital format, huzzah, your odyssey begins and ends with some file formatting and upload. Options exist for both bird (*eBird*)<sup>[3]</sup> and non-bird (*iNaturalist*)<sup>[4]</sup> to upload your data as an excel.csv file, also known as a pared-down Excel sheet. How-to's are available at the links below. That leaves the rest of us sweating over mountains of paper. You could take the Herculean route, as David Fraser did when he transcribed the late Tom Brigg's 2,154 bird records into *eBird* (who, note, subsequently holds 246, or more than half, of all first observations of bird species in the



American White Pelican - painting by John James Audubon

Capital Regional District). Another, less time-consuming option, is to apply for a Data Rescue Intern<sup>[5]</sup> from the Canadian Institute of Ecology and Evolution: if selected, they will pair you with a Master's student learning about conservation data management and fund them to help preserve your data. At a minimum, if you have data and are worried about it being lost but don't have the time to work through it, make sure to specify in your will what you'd like done with it so it doesn't meet the fate described above. If you're able, consider setting money aside to allow it to be transcribed.

Special thanks to David Fraser, Stephen Partington, and Rosamund Pojar for helping me to learn about this issue and for taking steps to ensure many lifetimes of observations are honoured. ♡

<sup>[1]</sup> <https://bit.ly/3AvwYPZ>, <sup>[2]</sup> <https://bit.ly/3wEbKOY>, <sup>[3]</sup> <https://bit.ly/3ArBVcG>  
<sup>[4]</sup> <https://bit.ly/3Q0GA1q>, <sup>[5]</sup> <https://bit.ly/3ArBZcq>

# Hummingbird Banding Program, Vernon, BC

Author - Karen Siemans

Our program, which is headed by Gail Loughridge, is part of the North Okanagan Naturalists' Club (NONC). Under the guidance of Cam Finlay, Gail started the banding program in 2004. We report our findings to Dr. Alison Moran, director of the "Hummingbird Project of BC", based at Rocky Point Bird Observatory (RPBO) in Victoria.

We have two sites. One is located in a valley just north of Lumby. This site follows the protocols of the Hummingbird Monitoring Network of North America ([savehummingbirds.org](http://savehummingbirds.org)), based in Arizona. The statistics from this site are sent to RPBO for Dr. Moran's project; she in turn forwards them to the Hummingbird Monitoring Network. There has recently been some clear-cut logging above the banding site, so we are watching to see what effects this may have on our counts. In the 13 years we have been banding in Lumby, we have captured a total of 1,272 birds; 58 are recaptures. These are birds that already have bands attached. We use their band number to check when and where that bird was banded.

The second site is on the northwest shore of Okanagan Lake, approximately 30 minutes from Vernon. This area was ravaged by the 2021 White Lake Fire. Thanks to the border of deciduous trees the banding site was saved. Here, we are monitoring the effects the fire has had on our counts.

Over the eight years we have been banding at Okanagan Lake, we have captured 579 birds; 31 of those are recaptures. It is encouraging to see the birds returning to their place of breeding and birth. The birds are



Photo: K. Siemans

Male Rufous Hummingbird.

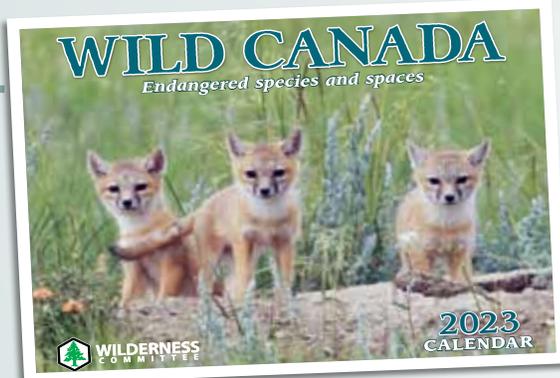
captured in a specially designed trap and removed by the bander. They are taken to the table and a "blanket" is put around the bird to keep it calm. We identify the species and sex and then measure its tarsus (wrist) and apply the correct band. The tarsus in the female is larger during the breeding season so females have larger size bands to accommodate the fluctuations in tarsus size. The bird is examined for pollen, parasites, fat, molt, and general wear and tear on feathers, then measured, weighed, and released. The welfare of the bird is the most important factor and if a bird is stressed it is immediately let go.

A note of interest: a female Calliope banded by Gail in Vernon in June 2011 was captured in Fort Worth Texas in July 2011.

Every two years we have a 2-3-day workshop with all the provincial banding groups to share information and techniques. We learn about new information that will help us to be the best caretakers while banding these amazing little birds and gathering the information needed to protect them.

Thank you to our 16 dedicated volunteers, many of whom have been with the program for more than 10 years for their time and expertise. NONC has been a great advocate for many years, supporting us with both financial assistance and volunteers from within their club. ♡

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# Keeping an Open Mind

Author - Margo Hearne

Canon John Henry Keen and his wife arrived on Haida Gwaii aboard the steamer *The Islander* in 1890. He began work as a missionary in Old Massett right away. Of his arrival, he wrote “we arrived here at mid-day on Sunday, in time for an afternoon and evening service in the pretty little Mission Church.” After the services “following a wooden pavement which led to the back of the settlement, we made our way to the mission-house. We were genuinely thankful to find ourselves at last in the mission-house, and to feel that our journeyings here and there, which had been almost incessant for some months past, had ceased, at any rate, for a time.” (*Church Missionary Gleaner* 1891).



A Grammar of the Haida Language, still available today on amazon.ca

Keen started work immediately. Mary Ridley and Chief Edenshaw's son, Henry, taught him the Haida language and together they wrote *A Grammar of the Haida Language*. They also translated several books of the Bible into Haida, and Keen gave all his sermons in the language of the people.

Keen, however, was more than a missionary. He was an internationally known entomologist and committed naturalist who

wanted to know all he could about the world around him.

In an essay entitled *Out of Doors*, he wrote that “our work lies largely indoors, and it is so easy to become absorbed in the engrossing work of school and home and hospital and cottage. Happy, up to a point, is one who can find healthful recreation in boating, gardening, carpentry or the like. I plead for a long walk. Know something about that marvelous world that lies between the tidemarks.....” “Make yourself acquainted with the flowers of the locality. Before long the knowledge you will have acquired will quite transform the walk you once found so dull...you will recognize the face of familiar friends, each with its own wonderful history, while you will be ever on the alert for fresh acquaintances.”

He spent many hours in search of mammals, birds, plants, and insects. He wrote to the directors of the B.C. Provincial Museum, especially Newcombe, admitting that “the only branch of natural history about which I really know anything is Coleoptera (beetles)” but he found and identified, in Massett, the first Sharp-tailed Sandpiper for



Photo: Margo Hearne

“.....make yourself acquainted with the flowers” John Henry Keen. Gumweed *Grindelia* growing along the water's edge in Delkatla Wildlife Sanctuary.

Canada and, in 1891, compiled the first checklist of birds for the islands in both the Haida language and English.

On September 23, 1897, he sent a list of Haida Gwaii mammals to Newcombe: Black Bear, River Otter, Sea Otter, Pine Marten, weasel, mouse, shrew and three species of bat. He wondered why there were no wolf, porcupine, mink or squirrel here as they were common on the adjacent mainland. As he had never seen a deer in his years here, he was convinced that there were none. When Dawson's Caribou were discovered around 1906, he wrote again to Newcombe, “I had for years so stoutly denied the existence of deer that the discovery brought me great personal humiliation. It taught me how dangerous negations are in the realm of science.”

Keen, a naturalist and thinker, reminds us to keep an open mind and not to fall prey to ‘dangerous negations’ because there is always something new to learn.

After Keen left in 1901, raccoons, deer, and squirrels were introduced, along with Pacific Chorus Frogs and Northern Red-legged Frogs. Their impact on the island's ecosystem is not fully understood. ♡

An advertisement for "SASKATOON CUSTOM BIRD TOURS". The background is a blue sky with a white Whooping Crane in flight. The text is arranged around the crane. At the top, it says "SASKATOON CUSTOM BIRD TOURS" in white on a dark blue background. Below that, "WHOOPING CRANES" is written in blue. To the left of the crane, "DANCING GROUSE" is written in blue. To the right, "PRAIRIE BIRDS" is written in blue. At the bottom, the contact information "birdtours@sasktel.net 306.652.5975" and the website "WWW.BIRDTOURS.CA" are listed in white on a dark blue background.

# BC Naturalists' Foundation - Elizabeth Walker

Author - Stephen Partington

Elizabeth Walker was a self-starter who loved life, people and nature. Typical of her personality, she bought a Life Membership directly upon joining the Vancouver Natural History Society (VNHS) along with her sister in 1965. Elizabeth believed in the future and recognized the value of a good investment. With her club and the Federation of BC Naturalists, Elizabeth traveled, hiked and advocated for conservation and education for more than half a century. Over the years Elizabeth gave generously to the VNHS and to the BC Naturalists' Foundation. Elizabeth 'gave with a warm hand'. She enjoyed seeing the difference she made with her 'pay back' and 'pay forward' contributions to her community. Elizabeth was committed to her ideals.

I met Elizabeth at my very first VNHS Conservation Committee meeting in April 1988. She had recently divested herself of the role of Recording Secretary, graciously passing the reins to Daphne Solecki who, like me, was about to embark

on a fantastic journey into the wild landscapes of conservation, education and the naturalist community. Elizabeth reported then that she was progressing with her effort to compile a Directory of Lower Mainland Conservation Organizations. Later that week, she intended to check her list at a meeting of the BC Environmental Network.

Vital elements of Elizabeth's character were revealed that evening and more so in my subsequent reading of previous minutes. She loved to compile information, an activity she pursued professionally as a librarian in the Northwest History Department of the Vancouver Public Library. Her passion for history and data organization shone clearly in the past minutes. Therein, she recorded her own initiative to assemble annual lists of the Conservation Committee's out/in correspondence. Elizabeth submitted these collations to the Vancouver City Archives along with the committee's cumulative minutes. It mattered to her that we were creating history.

Elizabeth stayed active with the Conservation Committee throughout the full succession of personnel that occurred during around 1990. She was always engaged in multiple issues simultaneously, often organizing site visits with bureaucrats, politicians, members of sister naturalist clubs and related organizations such as the BC Wildlife Federation. Fittingly, when Elizabeth departed the committee (to write a compendium entitled *Street Names of Vancouver* in conjunction with the Vancouver Historical Society) she had just recently taken it upon herself to write a comprehensive set of guidelines for the business proceedings of the VNHS Conservation Committee including protocols for data management and preservation.

Elizabeth presented her final correspondence list at her last committee meeting on my birthday in 1996. She remains a tremendous fount of inspiration for me. I too believe strongly in 'pay back', 'pay forward' and 'give with a warm hand'.



**The BC Naturalists' Foundation  
celebrates the generous bequest from**

*Elizabeth Walker*

**Naturalist, adventurer, historian, librarian,  
archivist, humanitarian, visionary**

**Elizabeth's bequest adds to her many  
earlier contributions to The BC Naturalists'  
Foundation. She invested generously in the  
future of our naturalist community.**



# At BC Nature, everything we do is driven by the desire to know nature and keep it worth knowing.

We are fortunate to live in beautiful British Columbia, a region that has some of the highest biodiversity in North America. With its rugged coast, grasslands, ancient forests, and characteristic fjords and islands, BC's unique land and climate systems provide an environment that promotes biodiversity. Our role as naturalists is to celebrate and protect this biodiversity.



Thanks to you, our members and supporters, BC Nature is entering an exciting phase in its development. Our new Executive Director, Stewart Guy, has been on board for only seven months and is already making a huge difference in our operations and programs. We are on the cusp of entering new and far-reaching alliances with other non-profit groups to tackle important conservation, education, and stewardship issues across the province. Our Board of Directors is working hard to achieve a comprehensive governance model to set BC Nature up for success. We are so glad that you are here with us and, as we head towards the end of the year, we're asking for your help.

## How can you help?

Now is a great time to make a tax-deductible donation to help support our vital work into 2023. BC Nature has always been a minimalist, fiscally prudent organization, with just a handful of paid staff and contractors. We serve a big province with more than 50 nature clubs, of which many are dealing with numerous conservation and wildlife management issues. You can support conservation and stewardship by making a donation today. Your gift will help to fund these priorities:

- **Key Biodiversity Areas** – As part of an international initiative, the focus is expanding from Important Bird & Biodiversity Areas (IBAs) to Key Biodiversity Areas (KBAs) incorporating all wild organisms. We are collaborating with the Wildlife Conservation Society of Canada to take the lead in B.C. on this exciting development which will involve our clubs across the province.
- **Liaison with Indigenous groups and bands** – BC Nature is collaborating with several First Nations to survey Important Bird Areas and undertake bioblitzes. We embrace Indigenous values in land management and continue to learn from these vital partnerships.
- **IBA surveys** – Our IBA Coordinator Liam Ragan is leading numerous field surveys to ensure that current IBAs have the necessary data to allow them to transition to Key Biodiversity Areas.

- **Ecological Reserves** – We are working closely with Friends of Ecological Reserves to re-vitalize and publicize the program and improve protection of these important areas.
- **Invasive Species Management** - We will continue to work with clubs, government agencies and other groups to deal with this widespread and persistent problem.

**Donate to BC Nature** –Support the staff who manage the conservation, education, and stewardship programs, and provide logistical support to the many volunteers who are the backbone of our work. Our priority is to expand the Conservation Coordinator to a full-time position, provide full support for IBA/KBA Coordinator, and to cover the travel and field support for many of the vital conservation programs.

**Donate to the BC Naturalists’ Foundation – Donate to the BC Naturalists’ Foundation** – The Foundation is responsible for managing and building our endowment funds. Having solid long-term investments is key for providing annual support for club projects, our two scholarships and other awards. Each year the Foundation puts more than \$20,000 back into these very worthy causes.



- Only earnings from investments are available for Club Support Grants and scholarships.
- All donations to the BC Naturalists’ Foundation are added to a capital base that is indexed to inflation and is preserved within the Foundation’s portfolio.
- Cash donations, bequests, in-kind transfer of securities (stocks and mutual funds), trust-to-trust transfers, and insurance contract payouts ranging from \$5 to \$100,000+ have enabled the BC Naturalists’ Foundation over 30 years to generate investment earnings of more than \$270,000 for grants and scholarships.
- Your donations invested in your BC Naturalists’ Foundation’s conservative multiplier portfolio ensure that your money may forever be a gift that keeps on giving.

Please visit our website <https://bcnature.org/donate/> or fill in the attached form and return it to us today to support nature in beautiful BC. ♡

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Alan Burger, President  
BC Nature

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Stephen Partington, President  
BC Naturalists' Foundation



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Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

BC Nature # **118913912RR0001** works to know nature and keep it worth knowing. It represents 56 regional nature clubs throughout B.C. and leads vital programs to protect nature such as Ecological Sites and IBAs and other Key Biological Areas.



## BC Nature is seeking applications from younger members for the BC Nature Board

Recognizing the need for input from younger members, the BC Nature Board is seeking applications from younger members (near or under 35 years of age) to fill a vacancy for Director-at-Large on the BC Nature Board.

The time commitment is modest, and adaptable to working folk and those with family responsibilities; the Board meets by Zoom approximately once every two months and in-person at the Spring and Fall general meetings. Travel expenses to these general meetings may be covered by BC Nature. Many decisions are also made by email.

Details of the role of Board directors are available in the Policies & Procedures Manual and in the BC Nature Bylaws at <https://bcnature.org/mission/>

To request more information or to receive a copy of the Policies & Procedures Manual, please contact the President Alan Burger (see below).

We would love to have you involved in helping to decide BC Nature's priorities and activities. To apply for this position, please submit a short résumé emphasizing your experience in nature stewardship and education and participation in one of our federated nature clubs. Send to President Alan Burger at [aburger@uvic.ca](mailto:aburger@uvic.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](mailto:info@bcnature.ca)

### Vice President

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

### Harassment Officer

BC Nature is looking for a volunteer Harassment Officer for those very rare occasions when a member of a club, club director, member of the executive, BC Nature employee, or volunteer feels they are being harassed or discriminated against. We are looking for a member of a BC Nature club who possesses training and appropriate background to investigate complaints of harassment. ♡

# Come and Join the BC Marsh Monitoring Program!

Submitted by Sarah Town

Launched in 2021, the British Columbia Marsh Monitoring Program (BCMMP) is a collaboration between WildResearch and Birds Canada that seeks to monitor amphibian and bird diversity at marshes across the province through community science. The survey information collected by the BCMMP will be used to track long-term trends in species presence and abundance, in hopes to guide conservation, restoration, and land management.

There are three ways you can become involved in this rewarding opportunity:

**Site Surveyor** - For those who want to spend time outdoors monitoring marsh-dependent birds and/or amphibians during the spring and early summer. The time requirement varies from three to six visits per station per season. You do not need to be an expert in species identification. However, you will be expected to learn certain amphibian and bird vocalizations, so some experience does help.

**Join a Regional Team** - For those who want to get more involved, we are always looking for volunteers to join our already established coordination teams (Lower Mainland



and Thompson-Nicola). This could be right for you if you have an interest in wetland conservation and management, volunteer engagement and coordination, public outreach, and/or grant-writing.

**Become a Regional Coordinator** - For those who want to take on a leadership role, you can help with the expansion and facilitation of the BCMMP program in other regions of British Columbia such as the Central Coast, North Coast, Kootenays, Okanagan, Cariboo-Chilcotin, Vancouver Island and the Omineca.

If you want to join us, visit the BCMMP NatureCounts webpage, <https://bit.ly/3eaR3n8> to read more about the program (see Resources tab). To view available marshes and request a station to monitor, create a NatureCounts account and request to join the program. You can also email [bcmmp@wildresearch.ca](mailto:bcmmp@wildresearch.ca) (Lower Mainland) or [bcmmp.kamloops@wildresearch.ca](mailto:bcmmp.kamloops@wildresearch.ca) (Thompson-Nicola) with any questions. We look forward to hearing from you!



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# Coming Soon

# BC Nature Photo Contest 2023

Details in the *BCnature* Winter Edition 2022

Prizes will be awarded to the following six categories

1. Wildlife	2. Botany, Landscape	3. Naturalists in Action
4. Weird and Wonderful	5. Youth 12-18	6. Child 11 and under

Start saving up your Summer, Fall, and Winter photographs. Details of the BC Nature Photo Contest to be published in the *BCnature* Winter edition. Start researching your subject matter: names of all organisms must accompany your entry.

## Spadefoot Monitoring is Underway

Author - Alan Burger, President Nicola Naturalist Society (NNS)

Re-printed with the permission of the Nicola Naturalist Society - Newsletter 37



A male Great Basin Spadefoot calling from a local pond.

In 2011-2015 our club undertook an ambitious amphibian mapping and monitoring project (see details on our website). This project included surveys for Great Basin Spadefoot (*Spea intermontana*), a species that has a highly restricted range in BC and is listed as Threatened in Canada. The grasslands of the Douglas Lake Plateau, are one of the few places in the province that support a significant, but poorly known breeding population of this little amphibian.

Spadefoots spend many months hibernating up to 2 metres underground, using a unique spur on their hind feet to dig down. They need sandy soils for hibernation and shallow warm ponds to breed in spring and summer. Our club's project now is a repeat of the spadefoot surveys that were done a decade ago, in order to track population changes, and also to expand these surveys to map additional areas where they might be breeding. We have received a grant of \$10,000, spread over four years, to cover equipment, stipends for students, and travel expenses (very useful with today's gas prices!). The money comes from a generous anonymous donor to BC Nature, our parent organization.

A key part of this work is to undertake call surveys. In spring, breeding spadefoots aggregate in shallow ponds on the grasslands, and at night the males give loud and distinctive "snoring" calls from these ponds to attract females. These calls are audible to humans for up to a kilometre. The call survey protocol is to sample 10 or more stations spaced 800 metres apart, on each evening road survey, listening for calling spadefoots. This survey method allows mapping of locations where breeding occurs, and also gives relative numbers at each breeding location. Using only

*Continued page 25*

Continued from page 24

public roads, the method allows monitoring without having to intrude on private ranchland or First Nations reserves.

To kick off the project this spring, we completed five nights of surveys, with 10 NNS members participating, some for two or more surveys. Most people had not taken part in the 2011-2015 surveys, so this was a valuable training period.

We covered the two routes regularly sampled in 2011-2015 and extended the surveys to three additional areas. The surveys covered Douglas Lake Road, Pennask Lake Road, and Lauder Road, all on the Douglas Lake grasslands. Overall we sampled 60 stations and had spadefoots calling at 16 sites (27%). That includes four stations not previously sampled, so extending the known location of this species in our area. We also had Pacific Chorus Frogs (*Pseudacris regilla*), the most common amphibian in our area, calling at two stations.

Next year, with more time to prepare, we will be doing many more surveys, mapping and monitoring this enigmatic little critter. Think of joining us for enchanting evenings, hearing not only spadefoots but also coyotes, nighthawks, and owls calling in the still of the night. ♡

## Glass Sponge Reefs - Update

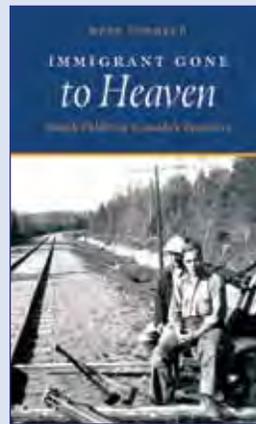
Author - Betty Davison

In the spring 2022 edition of *BCnature* magazine, we published an article from Sheila Byers - *Glass Sponge Reefs and Bottom-Contact Fishing in Howe Sound*.

As a life-long mariner, with infinite-interest in all things in, on, and under the sea, I found it fascinating to read about the Glass Sponge Reefs (GSRs). Knowing that some of these GSRs were up to 9,000 years old and right in my back yard was mind boggling. What beauty nature safeguards by having them inaccessible to most people!

To my surprise, I read a news article (May 2022) not long after we published Sheila's article, that one commercial fisherman was fined \$40,000 for setting a string of prawn traps on top of a GSR in Howe Sound and another one was charged \$25,000. This area has been closed since 2015 for commercial fishing and prawning. It is both sad and heartening to read the article, very sad that a section of GSR was destroyed, happy that Department of Fisheries is now patrolling this area on a much more frequent basis and that offenders are being charged with hefty fines. The dollars won't bring the GSRs back, but will hopefully prevent others from illegally fishing and destroying these ancient reefs. ♡

## 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  
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## iNaturalists BioBlitz

Author - Liam Ragan

During this year's AGM in Kelowna, BC Nature decided to try something new and organized its first ever BioBlitz using the *iNaturalist* platform. The premise was simple: give members the chance to compete with one another to see who could document the most species over the course of the event. This was, of course, aided greatly by the many trips organized by our hosts, the Central Okanagan Naturalists' Club, whose birders, botanists, entomologists, and ichthyologists ensured all those in attendance were given the chance to appreciate the area's unique biodiversity.

All in all, we made 350 unique observations representing 193 species. The leading taxonomic group with just over half of all species was plants, followed by insects, then birds. Ian Walker took the trophy with 61 species and was awarded a clip-on macro-lens for their phone (an absolute must for those expanding their *iNaturalist* horizons beyond the naked-eye!). Congratulations Ian!

## Mushrooms Are Amazing!

Author - Roseanne Van Ee - North Okanagan Naturalists' Club

Wild mushrooms are incredibly fascinating and important. If you think they are weird, scary, confusing, or wonderfully amazing, read on.

First off, a primer on mushrooms: they are *not* plants. Mushrooms are the "fruiting" spore-bearing, reproductive incubator, and dispenser of some fungi species. The word mushroom refers to the macrofungi "fruits" that you can see without a microscope. The actual organism that produces the mushrooms is an often huge, unseen fungal network of fine, thread-like mycelia which thrives in soil, under bark, or in the decomposing organisms or organic waste that it's consuming.

Plants make their food using the



Photo: L. Ragan

Yellow-pine Chipmunk

Like this idea? Interested in seeing what else we can do with *iNaturalist* and perhaps doing a BioBlitz for your club or region? Go to [naturechallenge.ca](http://naturechallenge.ca) to see how BC Parks is using *iNaturalist* to document biodiversity in our province and how you can get involved.

Once you're registered, check out the *iNaturalists* BC Nature page - <https://bit.ly/3CepzXQ> to see BC Nature's own *iNaturalist* project where members can compare sightings and see what naturalists (and naturalist clubs!) are seeing. ♡

sun's energy (photosynthesis), while animals eat their food then digest it internally. Fungi mycelia grow into and around their food source, excrete enzymes that digest their food externally, and then absorb the nutrients. When the mycelia are mature and environmental conditions are suitable (cool and moist), out pops the mushrooms. Mushrooms are formed above ground while truffles form in the soil.

More than 1,000 species of mushrooms are documented in BC, and there are many more that haven't been classified yet. BC has an incredible diversity of mushrooms sprouting from old, mossy forests especially those near lakes and rivers, in fertile meadows and moist

*Continued page 28*



Photo: Rosanne Van Ee

Orange Coral Fungi

grasslands. Fungi are very ancient organisms fitting into various environmental niches. BC's amazingly diverse landscape, from coastal to interior, and hot, dry south to cold north climates combined with its extremely varied topography, has created innumerable microclimates that are perfectly suited to mushroom diversity.

Most wild mushroom neophytes look for the typical mushrooms with caps, gills and stalks. But those are only a few of the mushroom families that are mostly related to the familiar, cultivated agaric button mushrooms from stores. Wild mushrooms display an amazing array of sizes, shapes, colours, textures, and aromas from spiky, white, pink, or yellow Coral Fungus to huge, bright orange Lobsters, jelly-like blob gel fungi, round puffballs, straps, conks, and so many others that it's hard to believe. Mushroom families are identified by their characteristics; are they capped with gills, teeth, or spongy underneath? Do they have a stalk with or without a ring? Or are they other shapes or textures? Only eat correctly and absolutely positively identified edible mushrooms.  
**If in doubt, throw them out!**

Mushrooms are often mistaken for fallen leaves at first glance; they really are camouflaged. If you want to while away a warm fall day with a real challenge get a mushroom field guide and learn to identify them

### Neat Mushroom Facts

*Mycorestoration is used to break down and digest toxic waste. Paul Stamet's book Mycelium Running: How Mushrooms Can Help Save the World explains this new science.*

*85% of BC's Red Squirrel's diet is mushrooms!*

*Edible wild mushrooms are great food sources: They are low in calories; contain protein, fibre, B vitamins, selenium, rare trace minerals, and vitamin D; help digestion and boost the immune system.*

*The Chinese revere many wild mushrooms for their health and medicinal benefits.*

*Toadstools commonly refer to poisonous mushrooms.*

*Historically, the Irish believed mushrooms served as umbrellas for leprechauns.*

The simplest way to learn about wild mushrooms is by starting to identify the ones that may grow in your yard or neighbourhood using a good, locally reliable mushroom field guide. My favorite guide for BC is *All That the Rain Promises* by David Arora. It is pocket-sized, simple to use, and fun to read.

What are mushrooms doing in the forests? Scientists are discovering the vital roles fungi play in our forests. Fungi function as ecological components in BC's forests by: breaking down and recycling nutrients from dead and decaying matter (saprophytic), thinning out living organisms (parasitic), coexisting in a vital mycorrhizal relationship with trees by breaking down organic matter and helping them to absorb nutrients through their roots (symbiotic), providing important food sources

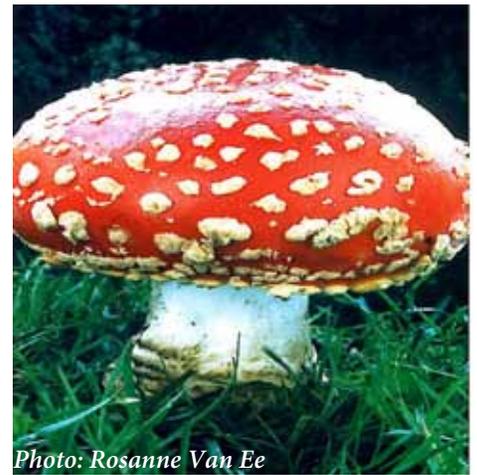


Photo: Rosanne Van Ee

Red Amanita Death Cap

for many animals from worms, to rodents, to people and more (animal predation). Of course, they also provide inspiration, education, and a renewable economic resource (human commensalism).

Go on a Thanksgiving walk into a forest to start classifying mushroom families. What a great way to celebrate the well-being of our forests! ♡

*Roseanne Van Ee is The Okanagan's Nature Nut. She enthusiastically shares her extensive knowledge of the outdoors to help readers experience and enjoy nature. Follow her on Facebook to discover amazing wildlife, exciting and adventurous natural events, best trails and wild places in and around Vernon.*

### Neat Mushroom Activities

*For family fun - head on out into a forest on a nice fall day for fresh air and mentally relaxing exercise to enjoy mushrooms. The good news is you don't have to eat mushrooms to enjoy them! They make great photos with a digital camera or phone. And this helps to identify them. Enjoy!*

*Try growing safe, edible mushrooms. It is easy and fun to watch; just mist and keep cool. Paul Stamet's Fungi Perfecti is the best source for prespawnd mushroom kits.*

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*Cherry Creek along Kootenay River, BC. Photo by Graham Osborne*

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# Rebecca's Restaurant

Author - Claudia Copley, Victoria Natural History Society

We knew we were somewhere special when Rebecca came to talk to us in the dining area of the lodge shortly after our arrival and she asked "Now, would you like to see bears every day?"

Who wouldn't! We laughed and then realized she was serious- if we were interested, we would indeed have opportunities to view Andean (Spectacled) Bear every day we were staying at Maquipucuna Lodge in Ecuador's Chocó Andino bioregion. When reading about places in South America, how many times do you read that this incredible but rare animal "has been seen in the area"? So, although the information about this lodge indicated that the bears could be seen, we never really expected to see one.



Photo: D. Copley

Andean (Spectacled) Bear

But, exactly as advertised, we did have an opportunity to see this species every day, especially because we were there in November, the time when a favourite fruit is ripe: the wild avocado tree (*Persea caerulea*). Birders will know that it is this same tree that draws in quetzals throughout its range, and many other animals are drawn to its energy-rich fruit.



Photo: D. Copley

Maquipucuna Lodge in Ecuador's Chocó Andino region.

Parts of the 5,665 hectares of land that owners Rebecca and her partner Rodrigo have protected for conservation were previously farmed and have reforested naturally with this sought-after tree. Watching a 200 kg bear almost 20 metres up a tree, literally biting off large branches to get to the tiny avocados growing at the tips, was something none of us will ever forget.

Even though the bears really are a spectacle (pun intended!), this incredible region is ranked as one of the earth's top five biodiversity hotspots, so a visit any time of year is warranted.

New species are discovered on the property every time scientists come looking. Protecting habitat like this contributes to global biodiversity protection, but it needs visitors to be viable. All around the reserve, habitat is being lost to logging and farming. Read more about Rebecca and Rodrigo Justicia's incredible con-

servation efforts (<https://www.maquipucuna.org/>) and feel free to reach out to me about our experience ([dccopley@telus.net](mailto:dccopley@telus.net)). ♡

## BC Nature Seeks a Host Club for 2024 AGM and 2024 FGM

We are fortunate to have Langley Field Naturalists step up to host our AGM in spring of 2023 and Victoria Natural History Society step up to host our FGM in fall of 2023. Thank you for doing so! We look forward to great field trips, presentations, and the opportunity to learn more about the natural history in your area.

There are many reasons to host a conference. One of the main reasons to host is to showcase your area and projects your club may be involved with. The general members have a lot to offer in the way of problem solving if there are local concerns you may need input with. It is also a golden opportunity for our membership to learn more about your local natural history.

Continued page 31

Continued from page 30

For clubs that have not hosted an AGM/FGM in recent years (more than 10 years ago), as an added incentive, we offer \$500 to your club to start your conference fund.

The Spring Conference and Annual General Meeting is held sometime in April or May. This conference highlights the work of BC Nature in the previous year, while the Fall Conference highlights the work of the clubs/groups that form the Federation.

If your club is considering hosting a conference in 2024, please make time to participate in the Langley Field Naturalists Conference and AGM in May of 2023. This will give your club a good idea of the expectations of the membership as to how the event is run. Conversely, if you are entertaining hosting a Fall Conference, then please make plans to attend the Victoria Natural History Society FGM in September/October of 2023.

Hosting either, of these two events, is financially rewarding for your club and the nature education is beneficial for the whole membership.

Conferences in the past 10 years have been hosted by:  
Delta Naturalists (2011)  
Williams Lake Field Naturalists (2011)  
Central Okanagan Naturalists' Club (2012, 2018 and 2022)  
Arrosmith and Nanoose Naturalists (2012) Parksville  
Abbotsford-Mission Nature Cub (2013)  
Rocky Mountain Naturalists (2013)  
Victoria Natural History Society and Rocky Point Bird Observatory (2014)  
Shuswap Naturalists (2014)  
Salt Spring Trail and Nature Club (2015)  
Comox Nature (2016)  
Prince George Naturalists (2016)  
Lillooet Naturalists (2017)  
North Okanagan Naturalists (2017)  
Vancouver Natural History Society (2018)  
Cowichan Valley Naturalist's (2019)  
Burke Mountain Naturalists - Tri cities (2019)

If your club is not listed above (or even if it is!) please consider chatting with your board about your club stepping up to host a conference in 2024! ♡

### *Know Nature and Keep it Worth Knowing*

*"Earth and sky, woods and fields, lakes and rivers, the mountain and the sea, are excellent schoolmasters, and teach of us more than we can ever learn from books."*

*John Lubbock*

## LAND TRUST ALLIANCE OF BC



Cape Conservation Area, Bowen Island  
PHOTO: Owen Plowman

**PLEDGE**

*"British Columbia is home to some of the world's most treasured natural habitats – support the land trusts of BC as they work to conserve the lands we love for future generations!"*

*Bryan Adams*

The Land Trust Alliance of BC invites you to pledge your support for the preservation and conservation of our environment. The lands and waters of British Columbia are home to some of the most diverse and delicate ecosystems in the world. We want to do everything in our power to make sure they stay safe and protected for years to come!

### JOIN US TODAY!

**I pledge to:**

- Respect and care for ALL wildlife, ecosystems and habitats in my environment and beyond.
- Make decisions that support sustainable land and water conservation efforts in BC.
- Understand how my actions today will affect future generations.
  - Share my knowledge and passion with others, to inspire change and to make a difference.
  - Encourage governments, at all levels, to financially support land trusts in their efforts to protect the natural habitat of BC.



Take the pledge online at

[change.org/landtrustsBC](https://change.org/landtrustsBC)



[ltabc.ca](https://ltabc.ca)



**TOWNSEND'S WARBLER**

*(Setophaga townsendi)*

*Photo: Michael Ashbee*

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# BC Nature AGM 2022 in Kelowna

Author - Marjorie Gonzalez, CONC Outreach and Communications Director

The Central Okanagan Naturalists' Club (CONC) hosted the BC Nature AGM 2022 in sunny Kelowna. The conference took place at the UBC Okanagan Campus on May 26-28 and it was the first in-person AGM since the COVID-19 pandemic started.

The pandemic created an added layer of complexity for the organizing committee, and forced one of our main organizers to miss the conference entirely. However, the conference went ahead as planned and CONC is happy to have hosted over 100 naturalists from across BC.

The conference featured many excellent speakers and presentations, and while we cannot describe them all in detail, some examples of the speakers and topics covered are below:

- Richard Gregson, who advocates for green wildlifing, provided many great ideas and inspiration for being naturalists in our own backyards.
- Judie Steeves and Sigrie Kendrik, representing the Okanagan Xeriscape Association, provided an introduction to gardening using plants that thrive in low water conditions. In the Okanagan, almost 1/4 of all water is used for landscaping and our garden choices can aid in water conservation efforts.
- Dick Canning, MP for the South Okanagan-West Kootenays, was the keynote speaker for the banquet on the last day of the conference. He gave an overview and status update of the proposal to have a National Park Reserve in the South Okanagan-Similkameen. The area is a great candidate due to its diverse ecology and high conservation value. After several decades of work, the next step is to negotiate a formal agreement between all stakeholders – stay tuned!
- Other speakers included Don Guild who discussed ecological reserves in the Okanagan-Shuswap, Les Gyug who described the colony of American Avocets in Kelowna, Liam Ragan who provided an update of the Important Bird and Biodiversity Area programs, and Pam Laing who shared a photographic overview of birding in the Okanagan Valley.

During the conference, several groups set up Information Tables with pamphlets and display boards that shared a lot of important information regarding their work in conservation and advocacy. Some of the groups that participated included BC Nature, Friends of Robert Lake Society, Langley Field Naturalists Society, BC Naturalists' Foundation, and the Vermilion Forks Field Naturalists (who also had a giveaway of Eocene fossils from 30 to 50 million years ago!).

The conference featured 12 field trips to many local parks, favourite birding spots, a Xeriscape Demonstration Garden and a pontoon boat offering the opportunity of birding from the beautiful waters of Okanagan Lake. The field trips were one of the highlights of the conference and, despite some challenges in organizing the different meeting times and locations, participants had a great time.

*In June 2022, CONC celebrated their 60<sup>th</sup> anniversary as a naturalists' club and an early celebration was held during the AGM. CONC was one of the founding member clubs of the Federation of BC Naturalists (now BC Nature) and they have been instrumental in establishing green areas in and around Kelowna.*



*Current CONC President, Douglas Graham, with the cake to celebrate the 60<sup>th</sup> Anniversary of CONC.*

One of the sessions held on Saturday was a roundtable discussion with NatureKids BC, and topics included the challenges being experienced in restarting many activities after the forced hiatus due to COVID-19. There is also a desire to create more connections between the children and adult naturalists' clubs across BC. As a result, a key initiative that CONC took during the conference was to reach out to the local representatives from NatureKids BC more often and have shared events whenever possible.

Overall, the conference gave participants a great opportunity to connect with fellow naturalists in-person again. There were many great discussions, shared experiences and plans for the future. If you would like to see some pictures and videos taken during the conference, an online album is available at this link <https://photos.app.goo.gl/W3greVF4YkSddFbJ8> or by using the QR code shown here.



There were many people who made the conference possible. We would like to give

*Continued page 34*

Continue from page 33

special thanks to Fran Fisher (CONC's BC Nature Director) and Rick Gee (CONC's Past President) for their hard work over the last year. In addition, the AGM would not have taken place without the many CONC volunteers who helped at the registration desk,

organized and lead excursions, set up and ran presentations, helped with accommodations and food, etc. We also want to thank UBC Okanagan who worked with us to provide accommodations, food services, conference rooms, and IT help.

Finally, we would like to pass on the torch to the club who will organize the next BC Nature AGM in 2023: the Langley Field Naturalists Society. See you in Langley in 2023! ♡

## Elders Council for Parks in British Columbia

Author - Mel Turner

For more than 15 years, BC Nature and the Elders Council for Parks in BC have enjoyed a symbiotic relationship working out of the Elders Council's Heritage Centre in Mount Seymour Provincial Park. More recently, The Elders Council became a member of BC Nature.

The Elders Council provides office space for BC Nature at the Centre and, in return, BC Nature provides administrative assistance to the Elders Council.

The Elders Council's mission is to:

- *Recognize the heritage of the regional, provincial, and national park systems;*
- *Build citizen understanding, engagement, and support for all public parks; and*
- *Enable the effective sustainable management, both ecologically and financially, of parks in British Columbia.*

To achieve these outcomes, the Elders Council has developed programs and activities to educate the public, governments, and the news media about public parks in British Columbia, by:

- *Providing outreach programs including: courses, seminars, and workshops about public parks;*
- *Supporting the long-term well-being of public parks and their preservation, use and enjoyment by the public through direct communications with government;*
- *Recognizing persons and organizations that have made an*

*extraordinary contribution to the creation and stewardship of public parks;*

- *Acquiring, protecting, and displaying artifacts related to the history of parks.*

Most recently, the Elders Council and our patron, the Honourable Janet Austin, Lieutenant Governor of British Columbia, recognized another nine British Columbians for their dedication to conservation in the Province at Government House in Victoria.

Vladimir Krajina was recognized in the Pioneer category for his work on establishing the province's ecological reserve system. Scott Benton, Phil Dearden, Tom Lee, Johnny Mikes, Paddy Stewart, Derek Thompson, Frances Vyse, and Guujaaw were recognized for their dedicated efforts towards making protected areas real and relevant in the province.

Please take a minute to visit the Elders Council's website, developed and maintained by BC Nature, and consider joining. [elderscouncilforparks.ca](http://elderscouncilforparks.ca) ♡



Front row- (L) Scott Benton; Frances Vyse; Derek Thompson, and Derek also representing Guujaaw, and Terry Lee for Tom Lee  
Back row- (L) Paddy Stewart; Jerymy Brownridge, LG. Principal Secretary; Her Honour Janet Austin, Lieutenant Governor of British Columbia; Johnny Mikes; Phil Dearden; Vladimir Krajina accepting for his Dad

# The Race to Refuel

## Using Community Science to Understand Stopover Behaviour in Migrating Songbirds

Authors - Devin R. de Zwaan, Kiirsti Owen, and Andrew Huang

Whether a seasoned bird watcher or a budding naturalist, the phenomenon of migration never ceases to capture a person's imagination. Every spring and fall, billions of birds travel thousands of kilometres between their breeding and wintering grounds along distinct migratory routes. One such route, the Pacific Flyway, runs the length of BC Pacific Coast. Birds from high-latitude breeding habitats move to winter habitats in the U.S., Mexico, or Central and South America in the fall, and vice versa in the spring.

While migrating through BC, birds must often stop at specific sites to recuperate and refuel for the remainder of the journey. Conditions at these stopover habitats that affect refueling rates can significantly impact a bird's energy levels and ultimately its breeding success in the summer or its survival during the winter. For example, in the spring, arriving early at the breeding site can carry a competitive advantage to obtain a good breeding territory and may mean the difference between a successful or failed breeding season. Refueling efficiently along the migration route may therefore allow birds to minimize time spent at stopover sites and gain sufficient energy to continue migration and initiate breeding early. This also means that high-quality stopover sites, or habitats where birds can forage safely for abundant resources, are a necessary component of conservation strategies in an era of habitat loss and climate change.

WildResearch (A BC Nature club) has been monitoring migrating birds since 2010, at Iona Island Bird

Observatory (IIBO). This location is strategically placed within the globally significant Pacific Flyway. Collecting data from captured birds during both spring and fall migration, members noticed that birds varied greatly in their body mass and fat deposits. Additionally, some birds were only captured once before they continued migration, while others were captured repeatedly over several days.

With these observations, we started to wonder what was driving this variation in refueling rates and length of stay or these 'stopover dynamics' among individuals and species. Underlying these questions, we also wondered whether Iona Island represented a 'high-quality' stopover site for songbirds. IIBO is the site of a sewage treatment plant for the Greater Vancouver area, characterized by several invasive plant species within an extensive matrix of farmland and urbanization. It is also home to a natural mix of marshland, regenerating deciduous forest, and sand dune ecosystems. Under these conditions, we wondered whether songbirds were able to gain mass quickly and how other environmental variables such as weather or even competition with other migrating birds may impact refueling rate.

In a recent paper in *Ornithology*<sup>1</sup>, we used a decade of mist-netting data (2010-2019) to investigate how ten of the most common migratory warblers and sparrows in the area use Iona Island as a stopover site and what factors influence their refueling rates. We demonstrated that refueling rates vary among species with different dietary niches and



Photo: B. Toews

*A Yellow-rumped (Myrtle) Warbler captured at Iona Island Bird Observatory (IIBO) during banding operations. This species tends to be a short to moderate length migrants and responded less strongly to environmental conditions at the stopover site than long-distance migrant like a Wilson's Warbler.*

migration distances, and are influenced by precipitation, temperature, season, and density of competitors. As expected, poor weather such as heavy precipitation and colder temperatures resulted in slower refueling rates, particularly for insectivores and long-distance migrants during spring migration. Insectivorous long-distance migrants were also negatively influenced by densities of other insectivorous species with which they would have to compete for food resources (i.e., density-dependent refueling rate). Finally, body condition upon arrival was an important predictor of stopover duration. In other words, how long a bird remained at the stopover site was partly influenced by how much fat it had when it arrived at the site. This suggests that there is a mass threshold that birds must reach before they continue their spring migration. Interestingly, this relationship was only evident during spring and not fall migration, likely because songbirds are under greater pressure during the spring to arrive early at their breeding grounds, set up territories, and reproduce.

Overall, we highlight the importance of high-quality stopover sites for migratory songbirds, particularly long-distance, insectivorous species and recommend that conservation plans prioritize intact stopover habitat, particularly habitat used during spring migration. We also underline how long-term bird-banding datasets

Continued from page 35  
 can be used to answer important questions about stopover dynamics and migration ecology. Considered as a whole, the many migration monitoring stations in British Columbia should be considered as an important network of information with the potential to greatly inform conservation during the critical migration periods. We wish to especially thank our incredible volunteers and supporters who have devoted time, energy, and funding to the Iona Island Bird Observatory over the past 12 years. This kind of research would not be possible without their efforts.♥

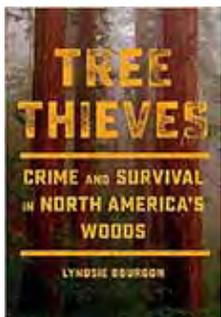
<sup>1</sup> de Zwaan, D.R., Huang, A., McCallum, Q., Owen, K., Lamont, M., & Easton, W. (2022). Mass gain and stopover dynamics among migrating songbirds are linked to seasonal, environmental, and life-history effects. *Ornithology* 139: 1-16.



Photo: J. Heavyside

A Wilson's Warbler captured at IIBO. Long-distance migrants like these warblers rely heavily on high-quality stopover sites to refuel and continue onwards to their northern breeding sites.

## Book Review



*Tree Thieves: Crime and Survival in North America's Woods*

By Lyndsie Bourgon

Greystone Books - \$34.95

Hardcover

Reviewed by - Larry Pynn

**T**ree theft is big business — and a global threat to ecosystems.

From the tropical Amazonian jungles to the towering Redwoods of northern California to the massive Western Redcedars and Douglas-firs of Vancouver Island, trees have great commercial and intrinsic value.

Sometimes, timber poaching involves sophisticated crime networks operating on an international scale and other times it is performed by unemployed local residents who need the cash from firewood sales to pay the rent and feel an inherent right to resources on public lands.

In North America alone, an estimated \$1 billion worth of wood is poached yearly, writes Lyndsie Bourgon, author of *Tree Thieves: Crime and Survival in North America's Woods*. "Globally, the black market for timber is estimated at \$157 billion, a figure that includes the market value of the wood, unpaid taxes, and lost revenues."

Timber-poaching investigations are not easy. Trees cannot testify in court, which means the best tactic is to catch the culprits in the act. That is easier said than done in vast, remote, and poorly patrolled swaths of forestland.

Technology is starting to level the odds. Among the new crime-fighting tools, DNA evidence is making it possible to match wood removed from a forest

Continued page 37

## Interesting Facts About Wilson's Warbler

- The majority of Wilson's Warblers nest on the ground, except for populations in coastal California and Oregon where they nest up to 1.5 metres off the ground. These birds also tend to lay fewer eggs per nest compared to their ground-nesting relatives.
- The Wilson's Warbler is found in a large diversity of environments in the winter. It is the only migrant warbler regularly found in tropical high plains (paramo).
- When most songbird nestlings are ready to leave the nest, they hop out and don't return to the nest, but some Wilson's Warbler fledglings head back to the nest for a night or two after fledging.
- Wilson's Warblers tend to be brighter yellow in the West and paler yellow in the East. Pacific Coast populations have the brightest yellow, almost orange, foreheads and faces. Rocky Mountain and Alaskan birds tend to be slightly larger than the Eastern and Pacific Coast populations.
- During spring migration, Wilson's Warblers en route to Alaska to breed are the last ones to pass through the southwestern U.S. Birds that eventually breed in coastal California pass through Arizona first, followed by birds headed to the Pacific Northwest and BC, and the Sierra Nevada Mountains, and finally birds headed to Alaska.
- For decades biologists grouped Wilson's Warblers into three subspecies, but a recent genetic study indicates that there could be six distinct breeding groups of Wilson's Warblers and these six groups tend to segregate on the wintering grounds. Birds breeding in eastern Canada spend the winter mostly in the Yucatan Peninsula, while those breeding in the Pacific Northwest, the Sierra Nevada, and coastal California spend the winter in Baja California Sur and along the west coast of Sinaloa, Mexico.
- The oldest recorded Wilson's Warbler was a male, and at least 8 years, 11 months, when he was recaptured and rereleased during banding operations in California in 2008. He was originally banded in the same state in 2000

From: All About Birds: [https://www.allaboutbirds.org/guide/Wilsons\\_Warbler/overview](https://www.allaboutbirds.org/guide/Wilsons_Warbler/overview)

Continued from page 36

with timber left behind. That's what happened in 2021 when a poacher of maple trees in the Olympic National Forest of Washington state received a 20-month federal sentence.

Bourgon is a Kamloops-area writer, oral historian, and 2018 National Geographic Explorer who takes an even-handed and methodical

## Oyster Mushrooms

Author: Terry Taylor

During October, when the mushroom season has arrived, look at some of the deciduous tree snags in your local woods. If you are on the coast, investigate some Red Alders. In the interior, look for some Cottonwoods or Aspens. Some of these trees may have clusters of mushrooms growing from them. But because they are growing from a vertical surface, they grow as shelves with no stems or short stems that appear on the side of the fruiting body. Such mushrooms are usually Oyster Mushrooms in the genus *Pleurotus*. The ones on alders are *P. pulmonarius*, and the ones on poplars are *P. populinus*.

The mycelium that produces Oyster Mushrooms is a white-rot fungus. Its main food source is lignin, the substance that holds wood fibres together. Left behind is cellulose, which is whitish in colour. Most of the fungi that attack conifer wood produce brown rot. They take out the cellulose, leaving behind the lignin, which oxidizes to a brown colour. Either way, the fungi involved are recycling dead wood back into the soil to be used by future generations of trees. Most of the trees do not have any mushrooms. Only occasional ones do. Even though the snags look identical, why do only a few possess mushroom crops? Oyster Mushrooms are one of the fungus species that occur in initial stages of wood decay. There is succession of different fungi involved in wood decay. It could be that the other trees are occupied

approach to her work, providing as much insight into the perpetrators of these crimes as the officers seeking to catch them.

Knowing why someone would resort to timber poaching is as important to Bourgon as discerning the environmental impact of the theft itself. Ultimately, she believes that local solutions — rather than

by fungi in a later stage of decay. Some of them may be in a very early stage, before fruiting bodies have been produced. But it is strange to see many dead trees, often with only having one that has Oyster Mushrooms.

Oyster Mushrooms are now well known as a popular edible mushroom and are eagerly sought out by mycophagists (people who eat mushrooms). However, a bit of a warning if you are not familiar with mushrooms: they are not the only shelf mushrooms on the wood of deciduous trees. It is best for the inexperienced to do their foraging in the grocery store.

Oyster Mushrooms are cultivated on such substrates as sawdust and straw. You can buy bags that have been inoculated with spawn and grow your own Oyster Mushrooms. Some commercial growers even raise exotic pink and yellow species for special gourmet dinners.

In coastal alder stands there is both a spring and an autumn fruiting of Oyster Mushrooms. The spring fruiting in May produces the most mushrooms, but then they re-appear in October. I have wondered if the same tree produces oysters in both seasons and whether the ones in May are on different trees than those in October but have never checked that

ones imposed by outsiders — offer the best hope for a way forward. “Community forests provide one solution for how forest-management practices might better represent forest communities themselves.”

Larry Pynn is a veteran environmental journalist who has written about timber thefts in North Cowichan in his blog, [sixmountains.ca](http://sixmountains.ca).



Photo: Rosemary Taylor

Cluster of Oyster Mushrooms.

out. This could be a little research project for naturalists on the coast.

There is also something else about Oyster Mushrooms, although you cannot actually see this for yourself. They are carnivorous. The hyphae (threads that make up the mycelium of a fungus) within the wood produce chemicals that kill and digest microscopic organisms, such as nematode worms. Wood is low in nitrogen, and the fungi supplement their diet with animals. Several different groups of fungi trap and eat, using several different techniques.

There are several thousand different species of mushrooms in our province, all of them with fascinating features and lifestyles. But remember that the mushroom is just the fruiting stage, the flower of the hidden fungi that are proliferating unseen below the surface. A good way to start studying our local mushrooms is with the new Royal BC Museum handbook, *The Mushrooms of British Columbia*.

## Bert Brink Scholarship 2022 - Taylor (Tay) Powrie

The BC Nature Education Scholarship Committee is pleased to award Taylor (Tay) Powrie the 2022 Bert Brink Scholarship as he pursues his academic journey in the footsteps of Bert Brink with a focus on his connection to BC Nature, habitat conservation, and academic excellence.

Tay tells us, “I’ve had the privilege to grow and learn in the Interior of BC, on the unceded territory of Tk’emlúps te Secwépemc, exploring the diverse landscapes and observing the natural world. My youth was filled with camping, fly fishing, and hiking... and these experiences developed my appreciation for wilderness, a place of complexity, of beauty, uninfluenced by human development. Continuing

to explore, through backcountry skiing and backpacking, I was able to observe the amazing diversity of flora and fauna throughout the province. This piqued my interest to study the dynamics of these environments, within the context of the Anthropocene epoch, and work to develop place-based management strategies to conserve critical ecosystems. I became interested in how water moved naturally through the landscape, creating habitat, and shaping our landscape. Research into the topic intrigued me to study the ecologically defined borders of watersheds within an academic setting and follow a career path that allows a pursuit of my passion for nature.

“I was able to secure funding and connect the Kamloops Naturalist Club with professors at Thompson Rivers University to facilitate a summer student research position that will collect the necessary data for developing a restoration project.

“As a member of Kamloops Naturalist Club (KNC), I became involved in their initiative, Grow Wild, a program that works to promote biodiversity of native and pollinator friendly species on private property. I have taken on the volunteer position of regional coordinator at KNC and helped to develop a restoration project within the Lac Du Bois grasslands.” 🌱

**The Bert Brink Scholarship honours the memory of Dr. Bert Brink, a past president of BC Nature and strong advocate of nature stewardship and conservation. Awarded to a student working towards a post-graduate degree.**

## Rene Savenye Scholarship 2022 - Matthew Syvenky

The BC Nature Education Scholarship Committee is pleased to award the Rene Savenye Scholarship to Matthew Syvenky as he pursues his academic and naturalist efforts in BC.

In Matthew’s words, “I have been a volunteer with the Invasive Species Council of BC (ISCBC) for two years, dedicating 1,000 hours to the program. Also, I’ve collaborated with the ISCBC’s social media team to write catchy, informative, social media posts published on the ISCBC’s social media platforms and to distribute bi-weekly newsletters for the rest of the council’s volunteers to enjoy. As a part of the digital media team, I upload photos of invasive and non-invasive species in BC to be used in the ISCBC’s promotions, website, and social media. As a part of the Environmental team, I am committed to connecting with and mentoring new ISCBC volunteers and attend frequent in-person ISCBC events, where volunteers participate

in Indigenous-led workshops, host garbage clean-ups, explore the Lower Mainland’s biodiversity, and restore ecosystems in places like Lynn Canyon, Pacific Spirit Park, Everette Crowley Park, Burnaby Lake, and Queens Park.

“Upon moving into my home two years ago, I discovered a local creek covered in Himalayan Blackberry, inaccessible to wildlife and lacking biodiversity. Working for more than two years to remove more than 1,000 kg of invasives, restore the riparian corridor with 60 native species, clean up garbage and remove blockages that have built up from storms, the creek is now more biodiverse and accessible than it has been in decades. The effort earned the Canadian Wildlife Federation’s Wildlife Friendly Habitat designation.

“As the youngest board member of the Cariboo Heights Forest Preservation Society (A BC Nature

Club), I attend regular meetings to discuss and brainstorm topics concerning the preservation of the Cariboo Heights Forest, visit the forest regularly to participate in invasive plant pulls, garbage cleanups, biodiversity surveys, and water quality monitoring and participation in city-wide events that celebrate Burnaby’s greenspaces and advocate for their protection.

“I am an active *iNaturalist* user and have logged more than 5,500 observations and 22,000 identifications to the online database. I believe citizen science is critical to advancing our understanding and conservation of nature.

“I have worked eagerly and tirelessly to steward British Columbia’s ecosystems and will continue to spread awareness, appreciation, and understanding of nature to those around me”. 🌱

**The Rene Savenye Scholarship is awarded to a student enrolled in an undergraduate degree program that contributes to awareness, appreciation, and understanding of our natural environment.**

# North in the Spring: #21 Cowichan Valley Part 2

Author - John Neville

Taking Highway #18 on a cold, windy, sunny day in February, we headed through Cowichan Valley to the mountains and Cowichan Lake. The arctic winds were blowing furiously on the Salish Sea. On a warmer day we might have seen Bald Eagle, Red-tailed Hawk, and Turkey Vultures riding the thermals. Today, we had to be content to view the road signs that cautioned us to look out for elk, though none were to be seen.

At the town of Cowichan Lake we followed the left fork around the south side of the lake. At a T-junction we turned right; if you turn left you can follow the Pacific Marine Circle tour to Port Renfrew, Sooke, etc., (see the *BCnature* Fall 2020 - Big Lonely Doug). After passing several small communities, we reached Gordon Bay Provincial Park. It has an attractive sandy beach, boat launch and trails into the forest. The campsites are nestled amongst the trees. Some of the trees to look for in this area are Western Redcedar, Sitka Spruce, Western Hemlock and Bigleaf Maple. There are clear views of the snow-clad mountains all around! When salmon reach the lake, they spawn in the Robertson River and other nearby creeks.

Back at the townsite, we read the noticeboards listing the names of animals and plants around Cowichan Lake and some of its history. The weir was nearby, which controls the outflow of water from Cowichan Lake into the Cowichan River. It is particularly important when the summer droughts cause the river to be too shallow for the returning Coho, Chinook, and Chum salmon.

**"...rivers are the veins of the earth through which the lifeblood returns to the heart."  
Roderick Haig-Brown**

Descending back down the valley we took the Cowichan River Road which closely followed the river. At Cowichan River Provincial Park, we walked a rough but short trail to Marie Canyon. The river is closely confined and roars down a series of rapids!

Our final destination was the Cowichan estuary to the east of Highway #1. There are still rich wetlands in the lowland approaching the sea. However, quite a lot of the land has been diked for housing and industrial activity. The Koksilah River joins the Cowichan before flowing into the bay. One of the access points to the shore is at Hecate Park. A ship called the Hecate arrived in the estuary in 1862 and landed a number of European settlers. That same year one of the worst smallpox epidemics swept through the indigenous populations in BC; reducing their population by at least 30%.



Photo: H. Neville

Gordon Bay, Cowichan Lake.

Marine life in the estuary was a source of food for the local people for millennia. One of the key reasons for the abundance is the upwelling of cold ocean currents meeting nutrient rich fresh water from the river.

A few of the critters found in the intertidal area are: algae, plankton, rockweeds, clams, limpets and barnacles. Barnacles are crustaceans like crabs and shrimp. They are hermaphrodite, (both sexes being present in each individual). Barnacle larvae are part of the food web for Pacific Herring, in turn are eaten by salmon and other larger fish. Beyond the tideline Eelgrass provides food and shelter for many species.

Under rocks tiny octopi hide. We once witnessed an adult Giant Pacific Octopus swimming across a large tank. At that moment it was in a translucent form and very difficult for any enemy to see. Then it settled onto a crab and used its beak to penetrate the shell. Over a four-hour period, it sucked out all the crabmeat. While engaged in its meal it changed its appearance to various shades of brown, exactly matching the surrounding sand. The Giant Pacific Octopus has the most highly developed brain of all invertebrates and, despite its large size, is a shy retiring animal.

A channel called Sansum Narrows separates the Cowichan estuary from Salt Spring Island. From time to time animals swim across to the island. In the summer and winter of 2021, a Roosevelt Elk was appreciated browsing his way through the woods of Salt Spring.

The city of Duncan, the town of Cowichan Lake, the industrial development along the seashore, and the highway system initially challenged my understanding of the geography and natural history of this area. My sincere thanks to the input of members of the Cowichan Valley Naturalists Society, especially Genevieve Singleton and Bruce Coates, for their help and pride in the area. ♡

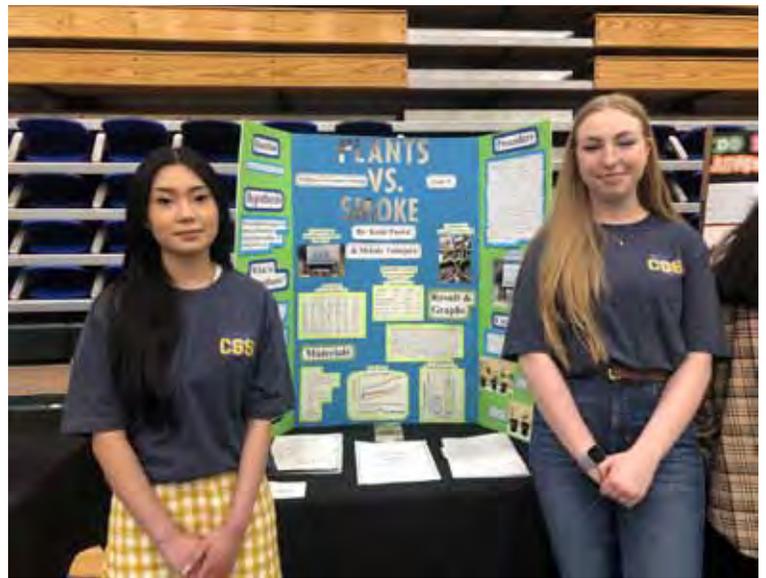
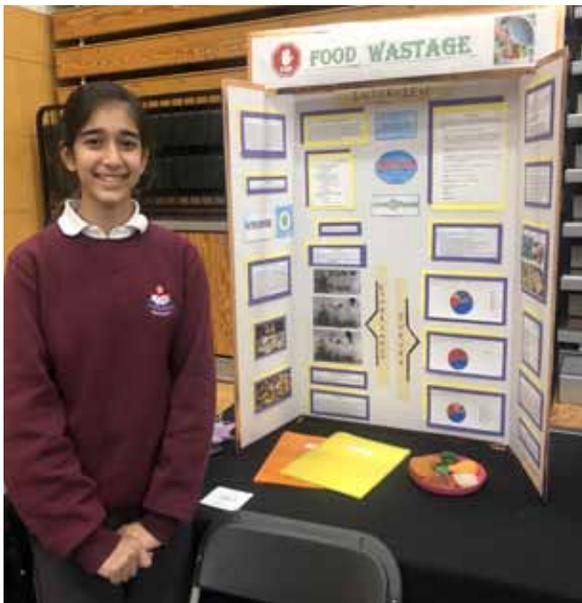
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**BC Nature Science Fair Awards - 2022**



**Congratulations to students from the Abbotsford School District on their Science Fair projects.**