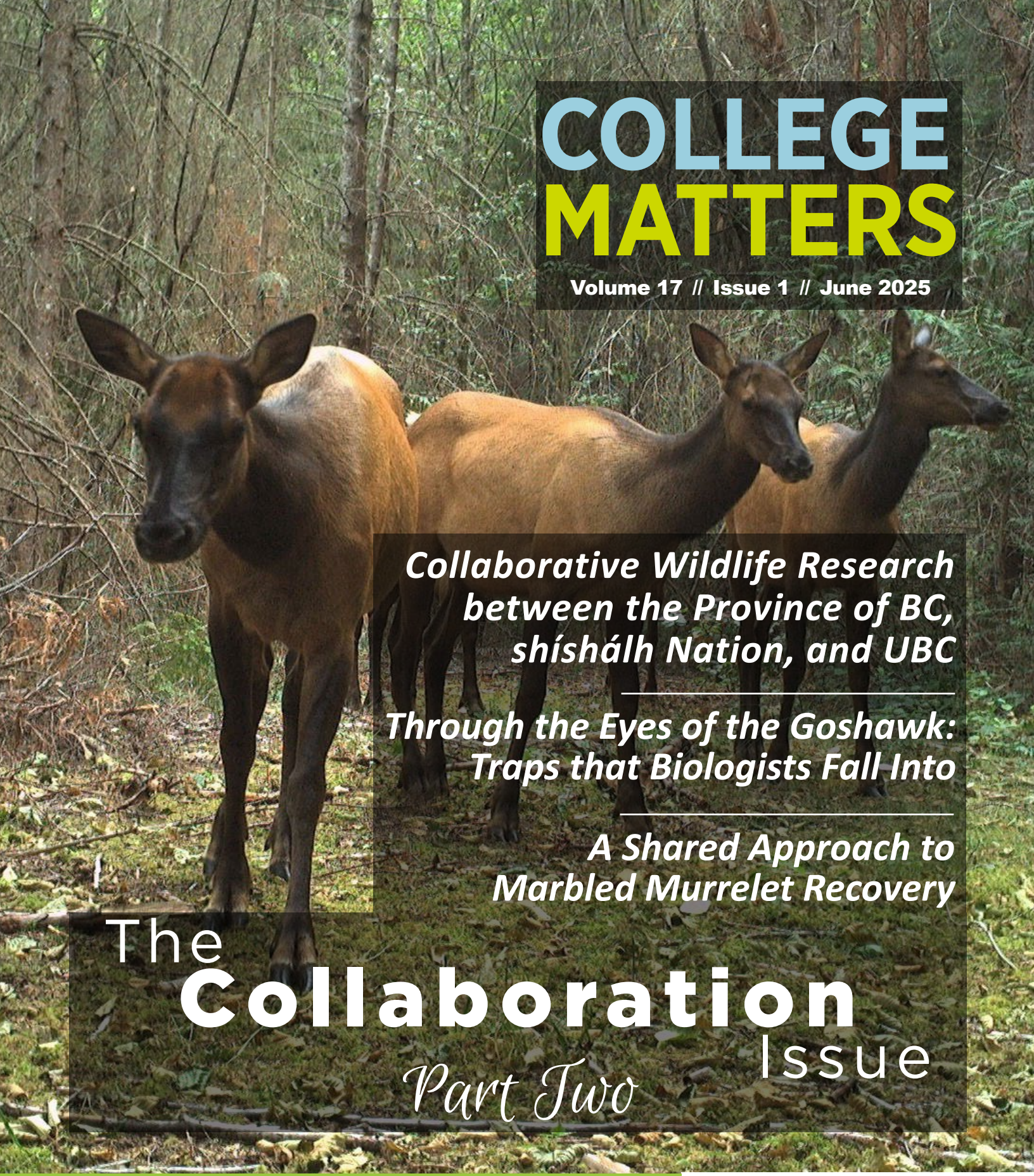

COLLEGE MATTERS

Volume 17 // Issue 1 // June 2025

Collaborative Wildlife Research between the Province of BC, shíshálh Nation, and UBC

Through the Eyes of the Goshawk: Traps that Biologists Fall Into

A Shared Approach to Marbled Murrelet Recovery

The Collaboration Issue

Part Two

We respect and acknowledge that the College's office and its registrants operate within the traditional territories of the Indigenous Peoples of BC.

COLLEGE OF APPLIED BIOLOGISTS
Professional Accountability

2025-2026 College Board

Top Row (left to right): Corinna Hoodicoff, Deborah Stanyer, Victoria Burdett-Coutts, Denis Dean, Kathryn Graham, Bob Redden.

Bottom Row (left to right): Gabrielle Hindley, Keenan Rudichuk, Mark De Croos, Jason Kuzminski, Susan Wells.

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The College of Applied Biologists
Suite #310 - 1207 Douglas Street
Victoria, BC V8W 2E7
TEL 250-383-3306
www.cab-bc.org

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ABOUT US

The College of Applied Biologists is the regulator of applied biology professionals in British Columbia. Established by government legislation in 2003, the College protects the public interest by ensuring that applied biology professionals—Registered Professional Biologists (RPBios), Registered Biology Technologists (RBTechs), Applied Biology Technicians (ABTs) and Applied Biology - Limited Licensees (AB-LLs)—meet rigorous standards of professional and ethical competency.

COLUMNS

Cover photo: A camera trap image of three female elk on the Sechelt Peninsula contributed by Tristen Brush

Back cover photo Hotel Grand Pacific, Victoria www.hotelgrandpacific.com

Christine Houghton's photo by Naomi Maya Photgraphy

***Disclaimer: the opinions expressed in *College Matters* do not necessarily represent those of the College, its Board or other registrants.**

Invest in Your Future and Ours: Volunteer at the College

By Victoria Burdett-Coutts, RPBio, *Past Chair*

AS THE COLLEGE we play a critical role in ensuring the integrity, accountability, and advancement of applied biology in the province of British Columbia (BC). As a self-regulating body, our strength lies not only in our mandate and legislation but in the dedication of our registrants, through their voluntary contributions of time and expertise, to support the staff to meet our primary mandate of protecting the public interest. I am interested in appealing to you share my insights and appreciation for the opportunities I have had as a volunteer to the College, where I sit on the Board, and have participated in several committees and working groups.

Service as a volunteer for over six years has provided me with exceptional opportunities to connect with colleagues, make friends, learn from the insights of other professionals, and visit communities within our wonderful province of BC. In my experience, there are the 'regulars': familiar volunteers who bounce around whose background and expertise are critical to the success of the organization. However, as with all things, there is incredible value in 'fresh blood' to gain new insights and perspectives from registrants who have not previously volunteered. Serving as a volunteer offers a chance to meet and collaborate with colleagues from diverse backgrounds, expand your professional network, and gain a deeper understanding of the regulatory framework that governs our work. You'll gain new skills, broaden your perspective, and contribute to safeguarding the integrity of our profession. Our volunteers play key roles in developing policy, upholding standards of ethics and competency, and ensuring transparent and fair governance.

> "Our volunteers play key roles in developing policy, upholding standards of ethics and competency, and ensuring transparent and fair governance."

I can appreciate that we all get busy with work, and the constant struggle for the balance with life. However, there is such significant value in the engagement and collaboration opportunities, in addition to helping drive our mandate and identify new goals. I appeal to registrants to consider joining us as a volunteer: reach out to the College, stay connected to the website and watch for email call outs for support. CM

Volunteer with the College of Applied Biologists

Because the College is committed to bringing diverse backgrounds and expertise to College activities, we invite all registrants to consider applying for open volunteer positions. Please review the ***positions available here*** along with their respective terms of reference.

Why Collaboration is Our Greatest Strength

By Chistine Houghton, *Chief Executive Officer*

It feels like we're living in an increasingly fragmented world. Every day, the news bombards us with stories of division, polarization, and seemingly insurmountable disagreements. Whether it is political factions entrenched in their positions, communities struggling with conflicting interests, or even just divisions within our own circles, the spirit of genuine collaboration often seems to be a casualty. Yet, paradoxically, in this very uncollaborative landscape, the ability to work together, to truly collaborate, has never been more critical.

The rationale for collaboration is clear. The challenges facing our natural resources – from the escalating impacts of climate change, biodiversity loss and the often-overlooked cumulative effects of various activities – transcend any single discipline or profession. No lone expert, however brilliant, possesses the complete understanding or the full suite of solutions needed. Interdisciplinary collaboration fosters a holistic perspective, allowing us to see the intricate web of connections that govern our ecosystems and economies. When professionals from different fields pool their knowledge, they unlock innovative solutions, enhance decision-making, and ultimately, build more robust and defensible strategies for resource management.

> "True collaboration is more than just working alongside someone. It's about a shared vision, mutual respect, and a willingness to genuinely listen and adapt."

Yet, the path to seamless collaboration is rarely smooth. Our natural resource sector, like many others, has historically operated in professional silos. Disciplinary biases - coupled with overlapping or even conflicting regulatory mandates between government ministries, and sometimes a lack of clarity with the legislation itself - can create significant hurdles for professionals and regulators alike. The unfortunate outcome of this can often lead to finger-pointing to the "other" when things go awry.

True collaboration is more than just working alongside someone. It's about a shared vision, mutual respect, and a willingness to genuinely listen and adapt. It requires recognizing that your perspective isn't the only one, and often, not even the most complete one. It demands understanding the motivations and concerns of others, even when they differ wildly from your own. And perhaps most challenging, it necessitates a willingness to thoroughly analyze the situation with an open mind so that the solution proposed addresses the real problem.

Consider the practical benefits. When people with different perspectives come together, they bring with them unique skill sets, knowledge bases, and experiences. A problem that may seem intractable from one viewpoint might have a surprisingly elegant solution when approached from multiple angles. Furthermore, collaboration builds trust. The act of genuinely working together, of finding a workable solution to a challenge with shared effort, can foster constructive and productive relationships.

Of course, fostering collaboration is no easy feat. It requires intentional effort and strong leadership that prioritizes a commitment to creating spaces where open dialogue can thrive. It means accurately identifying problems and hurdles and clearly articulating desired outcomes. It means celebrating wins and demonstrating that working together yields tangible, positive results. It means being a constructive member of a team.

Looking ahead, the need for collaboration will only intensify as we grapple with climate change, transition to a low-carbon economy, and explore new resource frontiers like critical minerals. The future of our natural resource sector, and indeed the well-being of our province, hinges on our collective ability to work together – embracing our diverse expertise, bridging our differences, and forging partnerships that are as resilient and interconnected as the ecosystems we work to sustain. By continuing to invest in integrated approaches, strengthening regulatory alignment, and fostering a culture of mutual respect and shared responsibility, British Columbia can truly lead the way with applied biology professionals being a big part of that leadership team. CM

Introducing New College Staff

Samuel R. Pittman, RPBio, Samuel (Sam) Pittman, MSc, RPBio, joined the College in September 2024 as the Director of Practice. Working closely with the Manager of Practice and the senior management team, Sam is responsible for the continued development and implementation of the College's Audit and Practice Review, Practice Guidance and Continuing Professional Development programs.

Sam has over 15 years of experience working as a trusted professional in the natural resource sector supporting Crown and Indigenous governments, academia, industry and environmental consulting firms throughout western Canada. His lifelong fascination with water and aquatic ecology means he's no stranger to getting his feet wet, going with the flow and diving deep (when needed).

Although employment and educational pursuits have taken him farther afield, Sam originally hails from the northeast region of BC and he resides in Smithers, BC, where you can find him enjoying sunny days after work with his partner, daughter, dog and, on occasion, the cat too. CM

Farzaneh Mousavi joined the College in September 2024 as an Administrative Officer. She enjoys supporting the College's administrative functions and finds great meaning in being part of a community that supports professional growth. A lifelong learner, Farzaneh brings a strong sense of curiosity and a deep commitment to understanding the "why" behind everything she does.

Farzaneh began her career in 2011 at Ahvaz JundiShapour University of Medical Sciences in Iran, where she worked in educational affairs. Her desire to better support students inspired her to pursue a Master of Science in Guidance and Counselling. Over time, her journey led her into international education, managing admissions and building academic partnerships, where she discovered a growing passion for diversity, inclusion, and equity. In 2022, Farzaneh moved to Canada to continue her studies, earning a Master of Education in Leadership Studies from the University of Victoria in 2024. She believes deeply in creating spaces of trust and mutual respect where people can learn from one another and grow together. CM

Josie Byington became an Administrative Officer at the College of Applied Biologists in October 2024, where she works closely with the Manager of Executive Operations-Communications. Her background includes administrative and data management roles within non-profit, community-based research, and educational organizations in Calgary, Tofino, Nanaimo, San Juan Island, and Maui. From 2012-2024 Josie supported the Marine Plan Partnership, a co-led initiative between coastal First Nations and the BC Government.

Josie is a founding member of the Canadian Pacific Humpback Catalogue collaboration and volunteers at the Shaw Centre for the Salish Sea in Sidney, BC. She enjoys watching whales, travelling with her husband, visiting their grandkids, and looking after feline friends. CM

The College Hosts Its First-ever Conference in the North: Prince George 2025 Conference Report

By College Staff

THE 2025 ANNUAL Conference took place in Prince George, BC, from April 9 – 11. We were thrilled to welcome a total of 323 attendees, making it a dynamic gathering filled with insightful discussions and valuable networking opportunities.

The keynote speakers were Ashish Anand, Founder and CEO of Workforce Wellness, whose insights into AI applications left the audience captivated, while Professor Timothy Caulfield from the Faculty of Law and School of Public Health at the University of Alberta, unleashed an engaging discourse on the escalating misinformation crisis in health research.

The conference was generously supported by 13 sponsors, including premier sponsors Dynamic Ocean Consulting Ltd. and EDI Environmental Dynamics Inc.

Seven sessions featured panels of speakers on the topics of forest fire preparation/restoration; mining sites planning; Indigenous internship programs; key information for regulated professionals; and Indigenous data, communications and protocols. Attendees identified the panel on environmental assessments using Indigenous and Western science as most applicable to their area of practice and the panel on conservation in the North as being most interesting to them personally.

The audience gave their full attention to the speakers. Photo by College of Applied Biologists.

BY THE NUMBERS

323 Attendees (157 in person, 167 online)
160 Organizations represented
28 Speakers
13 Sponsors
7 Sessions

Feline company for an online participant. Photo by Hannah Nieman.

College registrants at the 2025 Annual Conference in Prince George enjoyed ample opportunities to network with colleagues and trade show representatives. Photos by College of Applied Biologists.

COLLEGE MATTERS

The Collaboration Issue

Part Two

FEATURE ARTICLES

Article notes & references are on page 24

Collaborative Wildlife Research between the Province of BC, shíshálh Nation, and UBC

By Tristen Brush

ON OCTOBER 4, 2018, a first-of-its-kind agreement set in stone the long-overdue recognition of shíshálh Nation's self-governance, established in 1986[1]. Signed by shíshálh Nation and the Province of BC, the agreement commits the two governments to shared decision-making in land and resource management throughout the Nation's swiya (lands, birthplace, or territory) located on the Sunshine Coast of BC. As an immediate measure, the agreement established the k'ats'awattsut kwe sninishinmitit te ʔewkw' sʔayʔiy ni ʔe tems swiya, or Resource Management Table (RMT). The RMT makes recommendations to shíshálh Council and Provincial agents regarding the shared management of natural resources in the swiya, including wildlife[2].

A camera trap affixed to a tree. Photo by Joanna Burgar.

Roosevelt elk (*Cervus canadensis roosevelti*) are an emblematic species of the Pacific Northwest. Indigenous Knowledge tells us that these elk were once widespread and abundant throughout southern coastal BC, where many First Nations relied on the species for food, materials, and ceremonial practices. By the 1880s, European contact had led to displacement and market hunting of elk, causing local extinction in BC's southern mainland. In 1987, the Province began translocating elk from the species' last strongholds on Vancouver Island to the Sechelt Peninsula, a core portion of shíshálh Nation's swiya. The overwhelming success of these initial translocations allowed the Sechelt Peninsula population to become the primary source of translocations to much of the species' historical range on the southern mainland over the next 30 years[3]. Today, Roosevelt elk are abundant enough on the southern mainland to allow limited hunting by both First Nations and non-Indigenous residents. Still, First Nations and the Province are wary of repeating history, and groups like the shíshálh-BC RMT exist to improve wildlife management through collaboration.

Collaboration Generates Ideas

As a technician with the Ministry of Water, Land, and Resource Stewardship (WLRS), I had the privilege of working alongside members of the RMT from both shíshálh Nation and the Province of BC. The staff on the RMT are not only well-respected experts in their field(s) but also exhibit the utmost respect and honest teamwork as they communicate with one another. It is this prime example of government-to-government collaboration that resulted in the Sechelt Peninsula Camera Study in 2021.

To reach their shared goal of an improved understanding of the recently recovered k̲eyich (Roosevelt elk) population in the swiya and beyond, members of RMT worked together to place 60 cameras on the Sechelt Peninsula, a core portion of the swiya. Realizing the potential of camera traps to monitor several species at once, the cameras were positioned to capture additional species of cultural importance to shíshálh, including hupit, (Columbian black-tailed deer, *Odocoileus hemionus columbianus*) and schetxwen (black bear, *Ursus americanus*).

The general location of each camera reflected a 2km-by-2km grid design to establish equal coverage across the Peninsula. Expertise from both WLRS and shíshálh Nation

staff guided optimal camera placement at each site, ensuring locations were representative of the surrounding area and offering a field of view conducive to wildlife observation.

A WLRS biologist leading the project reached out to the University of British Columbia (UBC) Wildlife Coexistence ("WildCo") lab for help with the study. As an alumnus of the camera trap-focused lab, the biologist knew they had valuable guides, supplies, software, and analysis scripts that would make this project more efficient. These resources proved vital to the study's timely completion.

I joined the project as an undergraduate UBC student aspiring to a career in wildlife biology by volunteering to process the initial camera imagery from the first few months of deployment. By luck, I was approaching a twelve-month co-op work term for which I had not yet secured a position, and the WLRS lead biologist offered me an opportunity to work full-time on the camera project. Over time, the biologist moved on to different work and I became the technical lead on the project. I was now responsible for coordinating the many people involved, which was no simple task in a government-led project with collaboration at every step. I could not have succeeded without the unwavering support, insight, and dedication of every individual involved.

Working Together to Get Results

After establishing a shared vision for a collaborative camera study, cameras were acquired and deployed in the field. The cameras were obtained through a collaborative effort, with funding from the shíshálh Nation and additional equipment provided by the UBC Wildlife Coexistence Lab. In June 2021, the cameras were deployed following guidelines from WildCAM, a network of camera trap researchers based in BC and Alberta. Camera setup in the field involved staff and volunteers from WLRS, shíshálh, UBC, and local residents, whose local knowledge contributed to the project's success. Image processing began a few months later following the first camera visit (September 2021) using WildCo's online program.

When I became involved in 2022, I witnessed firsthand how these groups worked together and complemented each other's talents. While WLRS provided much-needed resources and personnel, the shíshálh Nation staff contributed vital local and traditional knowledge of the area, its wildlife, and potential questions and concerns to be investigated. While many WLRS and shíshálh staff were relatively new to wildlife camera work, WildCo's expertise helped ensure the study's scientific rigour. Multiple local residents generously volunteered their time to work in the field and they became instrumental in processing many thousands of images later on in the study when my responsibilities shifted. Each group excelled in its role as the project grew and changed over two years (2021 and 2022) of camera deployment.

Tristen checking a camera in the field. Photo by Cole Burton.

Working alongside such a dynamic and diverse team only reinforced my passion for conservation. As this project was my introduction to research, it was incredibly rewarding to participate in all aspects of the project from fieldwork to data collection to analysis. A major highlight of my year-long co-op term came near the end when I was given the opportunity to present our initial findings to the shíshálh-BC RMT. This was the first time the group saw the hard-earned results of their labour: maps of species occurrence; breakdowns of behaviour, age classes, and sex classes observed by species; and most importantly, elk abundance estimates that aligned almost perfectly with the number of elk thought to be on the Peninsula by WLRS and shíshálh experts. The study also produced preliminary estimates of bear and deer abundance, exemplifying what the data *could* be used for given the right resources. At the time, one of the methods used to produce these estimates, camera trap distance sampling (CTDS), was a brand-new concept and had limited published support.

CTDS is a method for estimating wildlife population size that combines distance sampling, a long-established modelling technique, with camera traps, a relatively new tool for collecting wildlife data. CTDS builds upon the

statistical rigour of distance sampling with the versatility and efficiency of camera trap data collection. When compared to existing methods CTDS is cost-effective, non-invasive, and statistically simple, making it an attractive option for groups with limited resources like many First Nations governments.

Being able to produce realistic abundance estimates with CTDS was a win that nobody expected, and enthusiasm for the study only grew following this finding. After my co-op term ended, I was able to return to my position with WLRS in between school terms throughout 2023 and 2024 to wrap up the project. When it came time to take down the cameras in 2023, many of us didn't want the study to end. We were seeing useful results that only made us want more, but government priorities had shifted, making it hard to justify funding a study that had largely achieved its goals.

On one of my final trips to the Peninsula, I went to lunch with Sid Quinn, a prominent shíshálh elder. I listened carefully as he shared his vision of all the things these camera traps could be used for throughout the swiya. He asked questions I had never considered, like how to integrate traditional knowledge in camera placement, inadvertently reminding me of how much I had yet to learn in my career and life. As we talked, I remembered an exchange with my WLRS supervisor where he suggested I do a master's thesis with our camera data. Sid discussed areas where he had once seen important species like grizzly bears regularly, but no longer. He wondered aloud about deer reproduction rates and elk behavioural patterns and asked me how we could use cameras to address concerns of population decline. I came out of that conversation with my mind buzzing. I was determined to use what I had learned about collaborative research to work toward solutions that centre Indigenous autonomy and complement traditional knowledge.

A New Direction

In 2024, I met again with the shíshálh-BC RMT. This time, I pitched my master's thesis ideas. I wanted to expand on this camera trap distance sampling idea that got everyone excited early on. With CTDS, I could help the Nation address their questions surrounding wildlife population health. To the RMT, I asked questions like "What information is needed to achieve shíshálh Nation's wildlife objectives?" and "What questions would you have when embarking on your own camera project?" I had heard across many conversations that, while elk are vital to the Nation, the Ministry had been pouring resources into elk for years and many feel that other species should be prioritized moving forward. In particular, the deer and black bears that continue to play a significant role in the Nation's culture and livelihoods are felt to be understudied. With GPS collars deployed and yearly surveys conducted for elk, many pieces are in place to monitor the elk population, but it's much harder to monitor a population without any marking (e.g. collars) and without a wealth of historical data. CTDS is capable of estimating population abundance without this information, making it a cost-effective method of multi-species monitoring. We were able to prove this by producing CTDS estimates of Sechelt Peninsula elk population size that matched estimates produced by the more expensive methods (e.g. aerial and camera methods requiring collar data) without reducing precision.

I began my thesis with WildCo at UBC in September 2024. Following recommendations from the RMT, I plan to not only provide population estimates to the shíshálh Nation but also create a guide that empowers them and other Indigenous governments to carry out their own studies on their land without needing the Province or any other non-Indigenous institutions. If a Nation desires precise population estimates, I hope to provide them with the framework to get that information with complete autonomy. By centring Indigenous autonomy in my research, I hope that the Nations that use CTDS will scrutinize the resulting estimates alongside their complementary Indigenous Knowledge and weave both into their wildlife management. As shared decision-making agreements begin to take shape in other parts of the province and Indigenous self-government is increasingly recognized, I believe that this work will allow for more effective collaboration that benefits all those involved, namely the Indigenous People and the wildlife inhabiting their land.

Every step of this project, from conceptualization to camera placement, analysis, and now my forthcoming thesis has been a collaborative effort made possible by the unwavering commitments of shíshálh Nation, UBC Wildlife Coexistence Lab, and WLRS. As an aspiring wildlife biologist, this experience has instilled in me an optimism for a future of resource management rooted in collaboration. In this future, promises of reconciliation are put into laws that hold each of us accountable. In this future, shared interests are not only celebrated

but actively pursued, and differences are opportunities for learning. That future is now within reach, and I feel privileged to be a part of it.

Acknowlegments

I would like to acknowledge the many incredible people who made this work possible long before I was involved. From shíshálh Nation, I must thank skenaw (Sid Quinn, shíshálh Resource Management Director and elder) who has not only been integral to the project's planning and implementation but has shared with me invaluable learnings from his culture that I will keep close to me forever. Similarly, this project could not have been successful without the support and expertise of Isabelle Houde, RPBio (shíshálh Environmental Policy Advisor and Senior Biologist). I also want to thank Chad Paul and Mike Majik for their assistance in the field, and Dave Bates, RPBio for his support in the forms of editing, expertise, and fieldwork. From WLRS, I want to thank Joanna Burger, RPBio who had a crucial part in theorizing the project and putting it into action. Dan Guertin, RPBio also had a significant role in overseeing the work and I additionally thank him for affording me countless opportunities that have been instrumental in my professional growth. Darryl Reynolds, RPBio, our in-house elk expert, completed a major portion of the legwork on this project along with John Kelly, RPBio and they both deserve many thanks. There are too many others to name who contributed to this project, but I have unique gratitude for each one of the people who made it come to fruition. All research within the reserved practice of Applied Biology was conducted under the supervision of an RPBio.

A camera trap image of three female elk on the Sechelt Peninsula.

Through the Eyes of the Goshawk: Traps that Biologists Fall Into

By Frank I Doyle, RPBio and Amanita Coosemans, RPBio

THIS ARTICLE IS an offshoot of "You Are Part of the *Community of Practice* Needed to Save the Goshawk from Regional Extirpation," (Doyle and Buirs 2024) previously published in College Matters (Volume 16, Issue 1, November 2024). Here we delve into two issues, or "traps," that particularly impact the work and practice professional biology in BC, through the lens of goshawk science and management. We dub the first of these, "the suitability trap," and the second, "the information gap trap." In our experience, both of these issues have negatively impacted our ability to conduct our work and share it appropriately and effectively, and it also impacts our ability to have professional and equitable relations with fellow RPBios. We believe these issues impact nearly all of us practicing applied biology in BC.

The Suitability Trap

The "suitability" trap is a habitat modeling - management trap. The goshawk has highlighted for us some of the practical and scientific issues with assigning suitability rankings. From years of study, and because we observe that goshawk territories are regularly spaced, we have come to understand that all natural forest landscapes are suitable for this species. This idea is counter to much of our work as biologists and habitat managers, where we instead use the concept of a gradation of habitat suitability as a key species management tool. For example, we often aim to conserve high suitability habitat and focus disturbance on areas with low suitability habitat. Sure, it may work for some species, for some of the time, but long-term ecosystem studies are starting to make it clear that habitat suitability and function are constantly fluctuating within and between seasons and years. Due to the dynamic and complex relationship of many variables, areas that are productive source habitat in one year may not be sustained in a subsequent year, and thus suitability ratings prove over-simplistic and unhelpful. In addition, if we are to manage for a species requirement in a "resource extraction world," the "how much" and "where" changes subtly and constantly across the mosaic of our watersheds, forest types, and site series. With the above complexity in mind, it is not surprising that within goshawk territory areas, attempts to manage through

Juvenile goshawk 2023. Photo by Matt Kerr.

targeted clearcut harvest of "low-value" habitat (using the suitability ranking system of High, Medium, Low, Nil) have so far failed to be successful; that is, they haven't revealed that there is any predictable area of harvest that can be conducted which reliably prevents the loss of birds from these territory areas (or, in other words, that prevents a "suitable," active territory from becoming "unsuitable").

This lack of certainty as to the specific area of "suitable" habitat required has led us into a science-assisted management trap: Managers and decision makers demand

certainty, not just a notion of the precautionary principle, before they commit and make hard choices that may impact timber supply and jobs (e.g., what is the critical habitat? how much is needed?). This lack of management certainty causes decision makers to simply put off that decision until it is too late. Now, add in a changing climate, and anthropogenic-impacted landscapes that are far removed from any baseline! It is an unfair ask indeed of both the forest practitioners and our decision makers as to how much and what type of habitat to keep.

Given this backdrop of uncertainty, and not wanting to impact jobs, how do we then manage for the goshawks, a species that needs large areas of intact forested landscape? They, like most terrestrial and aerial species in BC (apart from active nests and denning sites), have no automatic legislative protection, and, because they are not a harvested or a trapped species, they are not managed as such. In this reality in BC, successful management is reliant on goodwill and community buy-in.

The Information Gap Trap

As applied biology professionals, where do we obtain the best scientific knowledge? There is no easy answer here, but we must be aware that much of understanding of ecosystems, species needs and linkages runs very much along a continuum of knowledge, constantly accruing over time. Also, very rarely will you be able to draw on tested scientific knowledge from the specific landscape or habitat type(s) on which you have been tasked with providing your professional advice. Most often, biologists working in BC do not have easy access to local species specialists or current, local/regional information (e.g. monitoring information, habitat studies, local "unpublished" literature). Simply put, we must be wary of the web of information, be wary of the Web [editor's note: world wide web], and focus on the defensible caveat of the "precautionary principle."

From hard lessons learned, we want to touch on just two examples from the goshawk story:

Typical clearcut harvest pattern (brown polygons) within a goshawk's annual home range area (average = 6,000 ha = red circle). This harvest system results in territories that no longer support goshawk success over the medium- to long-term.

Story 1: Some 30 years ago now, and based on our work on goshawks in the Skeena Region, I (Frank) was an author on peer-reviewed, published research that clearly showed that—up to three years post-harvest—a 24-hectare breeding area was all that was required to maintain goshawk breeding area occupancy. This article is still available online, and all those breeding areas with harvest have long since been abandoned. **Lesson: Once published there is no easy way to unpublish a manuscript.** The goshawks were far more site-faithful than we expected, and three years' post-harvest was far too early to detect a harvest impact.

Story 2: Blackflies kill goshawks. Observed in the field some 35 years ago, published and available on the Web: it remains true that blackflies can kill nesting goshawks and other raptors and birds, and this observation can be linked in part to climate change-related warmer spring weather. So what? This information has been shared with foresters, landscape managers, and others in our communities, and now frequently comes back to us as an argument, "Why should we manage for goshawk habitat, if the birds are dying anyway from blackfly linked to climate change?" **Lesson: Once observations are shared, they are in the public domain, so we must always both check the source and also broadly consider the caveats of the knowledge.** In this case, the caveat is that we have no evidence that blackflies have resulted in the loss of any avian species, and the idea distracts and delays meaningful habitat management action.

Finally, **we do not have a mechanism in place to share ecosystem / species related research in BC.** From a "community of practice perspective" we need a way of ensuring that all that hard-won knowledge—often involving community funding and multiple partners—is available and shared within the community. The status quo right now results in many well-designed and implemented studies failing to reach the practitioners for which they were intended. **Lessons learned: Writing pieces for journals is time-consuming and typically un-funded work. Further, journals only publish articles if they choose to, i.e., not only do studies need to be well designed, but they also must be "of interest to their readers."** Without this guaranteed outlet, relevant research in BC needs dissemination, such as was (in part) once provided by Forest Research Extension Partnership (FORREX) in BC. Biologists working even in the same community may be unaware of important work/knowledge that directly impacts decisions on species and habitats we are tasked to manage. Without this sharing/dissemination of our collective work, our ability to practice as applied biology professionals is weakened, and our species and ecosystem management as a province is, likewise, compromised.

We've written this short piece in hopes of resuming greater conversation among applied biology professionals. Ironically, in a time of "unlimited connectedness," we feel the profession in BC has perhaps never been more disconnected. It is rare for us to be able to share our work and discuss ideas that may be hampering our professional endeavours. Through raising the idea of these two "biologist traps," perhaps we've touched on something you have been ruminating on yourselves. CM

Skeena River shoreline - Shutterstock.

A Shared Stewardship Approach to Marbled Murrelet Recovery

By Eloise Rowland, MSc, RPBio

EARLY IN MY career as a consulting Environmental Scientist and Wildlife Biologist, my work on marbled murrelet began under the mentorship of a colleague. We worked collaboratively to conduct audio-visual surveys and habitat assessments as part of a baseline study to support the evaluation of potential impacts of a proposed resource development project on terrestrial wildlife, including marbled murrelet. These surveys involved the collaborative efforts of local boat captains experienced in navigating BC's coastal waters to access survey sites before dawn; Indigenous field technicians whose knowledge of the local study area was indispensable in refining the scope of our assessments; and trained wildlife monitors who were attentive to any wolf or bear activity as I was preoccupied with staring at the sky and tree line ready to record any fly overs or occupied detections of marbled murrelet travelling from the coast to their inland nest sites.

Eloise conducting low-level aerial surveys in the South Coast Region of BC using standard methodology to assess habitat suitability for marbled murrelet. Photo by Eloise Rowland.

Fast forward nearly a decade to the summer of 2022, when I started with the Ministry of Water, Land and Resource Stewardship (WLRS) as a Wildlife Biologist in the Terrestrial Wildlife Resources section. Shortly thereafter, I took on the lead role for marbled murrelet in the South Coast Region, joining a coast-area team with Ecosystems Biologists in the West Coast Region and Species at Risk Biologists in the Terrestrial Species Recovery Branch.

Marbled murrelets are a small seabird of the Pacific Northwest that depend on coastal old-growth forests, nesting at low densities within 50 km of the coast on moss-laden branches high in the tree canopy. In Canada, marbled murrelets are designated as Threatened under the Species at Risk Act and provincially Blue-listed, only breeding in BC. The greatest terrestrial threat to BC populations is the loss and fragmentation of suitable old-growth nesting habitat. As such, WLRS has taken a spatial habitat management approach to guide the design and implementation of spatial reserves with the goal of maintaining functional nesting habitat.

My work has focused on implementing the **Marbled Murrelet Land Use Objectives Regulation Order** and **Section 7/9 Notice** through design and establishment of Wildlife Habitat Areas (WHAs) as spatial reserves to support habitat objectives of the **Implementation Plan for the Recovery of Marbled Murrelet in BC.** This work hinges on a shared stewardship approach to marbled murrelet recovery that involves collaboration of multiple parties, including First Nations partners, internal and external stakeholders, and cross-ministry engagement to work towards achieving population and distribution objectives. As part of this approach, my role in planning for marbled murrelet in the South Coast Region has included active representation and participation in tables and forums established for the purposes of collaborative planning, management, and habitat stewardship, including initiatives within the framework of Integrated Stewardship Plans, Land Use Plans, Forest Stewardship Plans and Integrated Resource Management Plans. My contributions involved providing

technical input and guidance to advance habitat protection and recovery efforts for marbled murrelet.

An integral part of my work towards establishing WHAs for marbled murrelet has included consultation and engagement with First Nations partners, Forest License Holders and other natural resource tenure holders and stakeholders. This engagement was facilitated through collaboration with colleagues from the South Coast Natural Resource Districts in the Ministry of Forests and First Nations Advisors in the Strategic Initiatives section of the Land Use Planning and Cumulative Effects Division within WLRS. The spatial habitat management approach aims to maintain functional nesting habitat with consideration of both socioeconomic factors (impacts to resource development) and shared objectives for species recovery. Co-location of spatial reserves with areas of interest identified by First Nations and overlap with existing protections and candidate reserves for other wildlife species are important factors in guiding the design and location of WHAs for marbled murrelet, in addition to assessments of habitat suitability and functionality.

Recovery planning for marbled murrelet in the South Coast Region is part of a wider effort of establishing land designations and stewardship measures for species at risk, regionally important wildlife, and culturally important species to First Nations in BC. Application of the Cumulative Effects Framework, including initial current condition assessments for select species values, supports habitat management efforts, and informs land use objectives and environmental outcomes. Management of other species and ecosystem values under this framework has the potential to also support habitat management efforts for marbled murrelet through assessments for keystone species, old-growth forests, and forest biodiversity that report on ecological risk associated with old and mature forests. Conversely, spatial reserve planning for marbled murrelet contributes to multiple objectives, including priorities identified by First Nations, old-growth

A view of mature forests of coastal BC that provide suitable nesting habitat for marbled murrelets. These small seabirds nest as solitary pairs at low densities within 50 km of the ocean, commuting between nest site and ocean at high speeds to provide food for the single nestling. Photo by Eloise Rowland.

forest protection, biodiversity conservation, and habitat management goals for other species and ecosystem values.

The implementation of conservation objectives for marbled murrelet in BC helps to protect healthy and resilient coastal ecosystems that are also important for keystone species such as salmon and bears, and that support rich gathering and harvesting sites and provide recreational connections to the outdoors. Raising awareness of the importance and uniqueness of marbled murrelets and their nesting habitat encourages a shared stewardship approach to habitat management and retention of old-growth forest with wide-reaching benefits for species recovery and conservation of biodiversity in BC.

A view of moss-covered platforms on the branches of mature cedar trees, highlighted gold by the autumn sun. Marbled murrelets do not construct a conventional nest, instead laying their egg in a depression on a moss-covered branch. Suitable nesting habitat consists of old and mature trees with large diameter limbs that have a high amount of moss development to provide a nest platform and a variable canopy structure to allow flight access and provide overhead shelter. Photo by Eloise Rowland.

Mobilization of Many Mussels

By Jillian Stewart, ABT

THE PROVINCE'S INVASIVE Mussel Defense Program (IMDP) was initiated in 2015 as a response to the increasing threat of aquatic invasive species, or AIS. The most destructive of these species are the zebra (*Dreissena polymorpha*) and quagga mussels (*Dreissena rostriformis bugensis)*. They would have the biggest impact on BC's streams and lakes should they ever be detected in BC.

These zebra and quagga mussels, or ZQM, are small as a single organism, but when clustered together, they easily overwhelm freshwater systems, watercraft components, and infrastructure (Figure 1). The IMDP aims to "prevent the introduction of zebra and quagga mussels (ZQM) into BC. The program's prevention efforts are focused on inspecting boats, monitoring lakes, educating the public and coordinating actions with neighboring jurisdictions." (Government of BC, 2025)

Watercraft inspections are conducted across BC at various entry points and by roaming crews who inspect popular boat launches and busy lakes seasonally from March to October. In 2024, efforts were made to work more closely with federal counterparts in Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), and the Canadian Food Inspection Agency (CFIA). AIS Inspectors also increased their outreach efforts by engaging with regional and municipal governments, watercraft vendors, tourism offices, BC Parks, not-for-profit organizations, and many interested members of the public.

Throughout the season, the crew in the Lower Mainland worked more closely with federal counterparts near our Canada-USA border and often completed dual inspections at the same site. Both crews would ask pertinent questions about the work of each department and work together to complete inspections. Several members of the public were encouraged to see the mix of uniforms working closely together to complete searches in shared interest areas and many recommended that the collaboration continue in future seasons.

Not only were these efforts great to show the greater public that these departments are working together, but they also gave all enforcement staff an opportunity to learn from each other. In between inspections, there were discussions about lessons learned from the inspection processes over the years, methods used to identify species, and keywords to pick up during our interviews with the public. Educating one another also enables departments to be lookouts for each other while at individual inspection sites. Then they can contact one another if there's something that might need to be reported to the other agency. For example, an AIS inspector can only inspect watercraft and watercraft trailers, but if they see evidence of live fish in the back of a pickup truck that might require a wildlife inspection, they can report what they observe to DFO's Fishery Officers.

Building these professional partnerships not only helps build knowledge and skillsets but enables BC Conservation Office Service to work together with other professionals in ways that better protect the natural resources in British Columbia.

Find additional information from the Government of BC about the invasive mussel defense program in BC and regulatory updates and important information for watercraft owners/drivers.

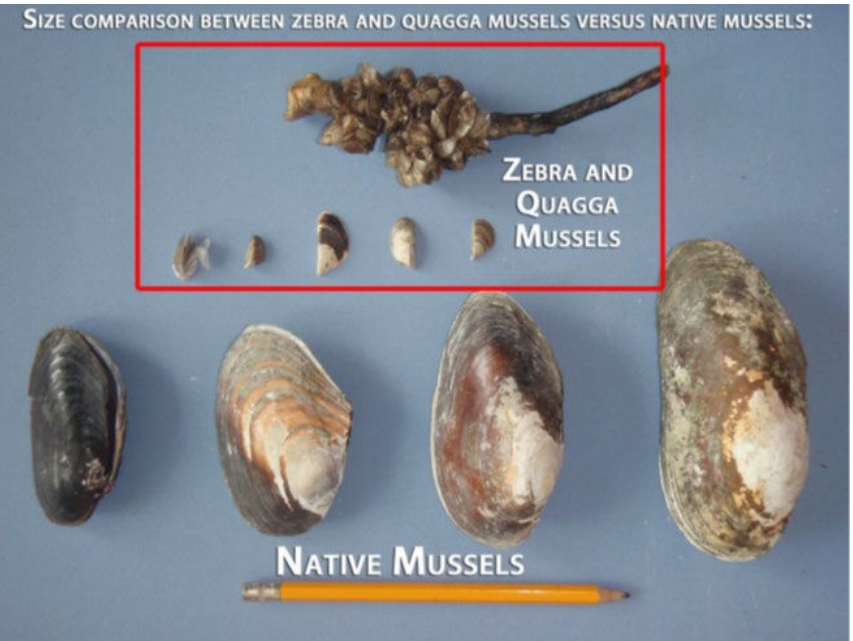

Figure 1: From Zebra and Quagga Mussel Early Detection and Rapid Response Plan for British Columbia, Government of BC (Figure 4 – Size range of zebra and quagga mussels (top) compared to native mussels (bottom).

Fostering Interdisciplinary Collaboration in Applied Biology: A Pathway to Sustainable Solutions

By Dr. Vidya Padmakumar, RPBio

IN TODAY'S RAPIDLY changing world, addressing environmental challenges requires a concerted effort that encompasses various professional disciplines. As a Registered Professional Biologist (RPBio), I have always witnessed firsthand the transformative power of interdisciplinary collaboration in applied biology.

Interdisciplinary collaboration is paramount for navigating the intricate landscape of environmental regulations and permitting processes. By bringing together professionals from diverse backgrounds such as biology, engineering, and policy, we can approach projects with a holistic perspective that considers both scientific and regulatory imperatives. This integrated approach not only streamlines permitting processes but also ensures that projects are environmentally responsible and sustainable over the long term.

Vidya Padmakumar in field work at Stewart, BC.
Photo by Vidya Padmakumar.

A key aspect of effective collaboration is the early involvement of applied biology professionals in the planning stages of projects. By incorporating experts who possess a deep understanding of ecosystem dynamics, we can proactively address potential environmental concerns and implement robust mitigation strategies. This proactive approach not only enhances project outcomes but also underscores our commitment to environmental stewardship and sustainability.

Moreover, collaboration fosters innovation by blending the unique insights and expertise from various fields. This synergy often leads to the development of novel solutions that might not emerge within the confines of a single discipline. For instance, coupling biological insights with engineering techniques can result in more resilient and sustainable infrastructure designs, while collaboration with policy experts ensures regulatory compliance and promotes public interest.

The responsibility that comes with this collaborative approach cannot be overstated. As professionals, we must remain engaged and accountable, ensuring that our practices not only meet but exceed the standards of excellence expected in our field. The duty to report unprofessional practices and champion excellence within our discipline is now more critical than ever. This commitment to professional integrity is essential for maintaining public trust and advancing our collective goals.

The essence of interdisciplinary collaboration lies in its ability to harness the collective strengths of various professionals to tackle the complex environmental challenges we face today. As we continue to evolve and adapt, it is crucial that we remain committed to fostering collaboration, upholding professional integrity, and ensuring regulatory frameworks support the scientific and stewardship goals of applied biology. The path forward may present challenges, but through collective effort and a shared vision, we can achieve sustainable solutions and continue to make significant contributions to the natural resources sector. CM

Conversation with Environmental Consultant Nick De Carlo on Cross-Jurisdictional Collaboration

By Elizabeth Zajc, RPBio

Nick De Carlo is a Senior Vegetation Ecologist and Technical Lead for Vegetation, Wetlands and Soils at Stantec Consulting Ltd. with over 23 years' experience in the consulting industry. He is an RPBio and PBiol. Working independently and as part of a team, he has assessed potential effects to vegetation and wetlands from various development sectors, including roads, flood diversion, rail, oil and gas, wind and solar energy, electrical transmission, and urban development. He has participated in Biophysical Inventories and Environmental Impact Assessments (EIAs) in the Northwest Territories, Alberta, Saskatchewan, Manitoba, Newfoundland and Labrador, and British Columbia, including the Low-Arctic, Subarctic, Boreal, Parkland, Foothills and Grassland regions.

Q: How many years have you been collaborating across jurisdictions in your practice?

A: I believe it's been three, maybe four years.

Q: How frequently do you collaborate with other applied biology professionals or other areas of practice like forestry or engineering?

A: Daily, as that is the requirement of our work on large projects.

Q: How has working across jurisdictions changed in recent years?

A: There is a much greater focus on process transparency and defensibility of the work. There's a greater concern from both regulatory bodies and the public to have confidence in the work we do.

Q: You mainly work in the environmental assessment sphere, right?

A: Correct, yes.

Q: What are some of the biggest challenges you experience when working across jurisdictions?

A: The availability and accessibility of guidance documents can be a challenge. Although they may be publicly available, comprehending the document and understanding the larger application framework can be difficult. Documents may not always align, requiring almost a mini-research project to understand how they apply and should be used. Over time, revisions help remove some of that opaqueness.

Q: Do you find differences in the way practices are explained in different jurisdictions or the amount of direction given?

A: It's not necessarily the amount of direction but the manner of presentation and approach. For example, BC has historically focused on forestry, which doesn't always translate well to other sectors like Indigenous concerns or oil and gas projects. Alberta focuses more on cattle grazing, which also doesn't always translate well to other concerns. This can be a limitation and challenge in providing a cohesive assessment.

Q: Are there challenges with using guidance documents in the field?

A: Yes, particularly when transitioning from hard copy to digital documents. Some digital documents are difficult to navigate on a tablet in the field, like Land Management handbooks.

Q: Do you think these barriers affect recruitment or supporting clients?

A: Yes, it's more of a barrier for individuals to learn and grow, leading to frustrations when they make errors as the reasons aren't always readily clear. For example, the prominence of plants in different communities can be confusing, leading to differing opinions among specialists.

Q: What advice would you give to someone new to working across jurisdictions?

A: Organization is important. Have your own library of documents, start broad, and dig into specific regions where you do more work. Build a network with other biologists and don't be afraid to communicate and share knowledge. Join regional groups and attend workshops to learn and network.

Q: Have there been any technical solutions to help with cross-jurisdictional collaboration?

A: We use MS Teams sites now. We have a national MS Teams site accessible to all practitioners in our vegetation, wetlands, and soils group where we share key documents and CDC listings. This helps us see how different jurisdictions approach things and gain additional insights.

Q: Do you think there's a need for greater alignment across jurisdictions?

A: Yes, particularly for projects that cross boundaries. Ecological boundaries don't follow jurisdictional lines, and there's a need for cohesive information, especially for Indigenous groups. There's variability in taxonomy across the country, which also proves challenging.

Q: How do you keep up with the rapidly evolving scientific literature?

A: When doing an assessment, I conduct a literature search to see what current studies say on a particular topic. It's also important to be transparent if the literature is scant and acknowledge uncertainties. Attending workshops and conferences also helps. I also belong to the Society of Wetland Scientists and receive lists of articles published by the Society.

Q: Is there anything else you'd like to add?

A: British Columbia and Alberta have good systems in place, but many provinces do not, which makes it difficult for the public to have confidence in the documents. I feel privileged to work in the BC. CM

Next Issue: The Evolving Landscape

By College Staff

The next issue of ***College Matters*** will focus on covering challenges, opportunities and adaptations due to the current economic climate affecting cross-border research and funding, as well as considerations around evolving technologies such as Artificial Intelligence. Topics may include:

- Current US-Canada collaborations (e.g., white nose disease, chronic wasting disease, whirling disease) in an evolving political climate
- Updates to the BC Wildlife Act
- Considerations for the use of Artificial Intelligence in biological work and projects CM

If you're interested in contributing to *College Matters,* contact the College at *cab@cab-bc.org* with your proposed topic. Submissions that are printed in an issue of *College Matters* can be claimed for Continuing Professional Development points!

Be the Driver in Your Network

By Jillian Stewart, ABT

ONE OF THE lessons I learned early in my post-secondary education was to establish good connections and maintain them throughout your career. Building partnerships and positive working relationships not only shows professionalism in your role but also benefits you with access to knowledge beyond your training and years of experience for mentorship to learn from. Many of us have taken this to heart and over the years have a great network of colleagues to reach out to with questions and peer reviews, but how do you start? I didn't have a guidebook when I was in university and had to start on my own. Almost 14 years later, I'm now at the point where I can offer suggestions to others looking to get started.

1) Attend networking events and conferences:

Easily the best place to meet like-minded individuals and experts in the subject areas you're interested in, these are gathering places for so many in the field. I was told to have copies of my CV on me in case I was asked to pass one over if requested, but even a professional business card with contact information will help when trading cards with someone else.

2) Send follow up communications to build on initial conversations:

At every event I attend, there's almost never enough time to continue a good conversation or an initial meeting before the next presentation or workshop is ready to go. Make note of what you talked about, then use the contact information to send a follow-up email to the person with a summary of your conversation and what you'd like to continue to discuss. When I've done this, I've been able to set up virtual meetings and see their work, presentations, or just continue an exchange by asking a lot of questions about their work to learn more. This level of engagement on a topic not only shows that you're keen to learn more but builds a great rapport and even eventual working relationship.

3) Don't be afraid to ask someone how they got started:

I don't know why I was afraid of asking this early on, but it's a fantastic way to break the ice. You'll also learn quickly that so many people haven't progressed along a straight line of predictable job progression to get to the role they have today. As an example, I've worked in a funeral home, a restaurant, on election campaigns, and in a call center on the road in my career. These experiences have all given me valuable transferable skills that can readily apply to my practice in applied biology; you'll see that others have experiences in common with you as well. If you've both worked a lot of administrative roles, you can relate on commonly used office software and technology that can benefit the office work aspect of applied biology. If you've given public presentations on unrelated topics, you still have public speaking experience that might prepare you to participate in a conference yourself at some point!

4) Take the opportunity to work with someone new on a project:

This is the best way to grab a challenge and showcase not only what you've learned but also that you can work together with other professionals. Working together in the field enables you to connect with colleagues on the ground and build active working partnerships and take on opportunities together. For me, these partnerships have proven the most effective for building networks of references when competing for higher-level opportunities!

There's truly no "one right way" of building a network and for most of us it comes naturally over time as our confidence and levels of experience grow. Taking these steps early in your career can help you set the stage for success for yourself as a professional with a network of supportive individuals that you can call upon if you're uncertain, need clarification, or want to collaborate on work together. CM

Notes, References & Links

Collaborative Wildlife Research between the Province of BC, shíshálh Nation, and UBC — Page 9

Notes

1. Find more information about the shíshálh Nation on their website: https://shishalh.com/
2. The Foundation Agreement can be found at https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/shishalh_nation_foundation_agreement_-_final_-_redacted-_signed.pdf
3. This history of Roosevelt elk in BC is paraphrased from the 2015 management plan, located at https://www.env.gov.bc.ca/fw/wildlife/management-issues/docs/roosevelt_elk_management_plan.pdf

A Shared Stewardship Approach to Marbled Murrelet Recovery —Page 16

Notes

1. Marbled Murrelet Land use Objectives Regulation Order: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/biodiv-hab-mngt/mamu/mamu_luor_2dec2021.pdf
2. Section 7/9 Notice: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/biodiv-hab-mngt/mamu/mamu_fppr7_wlppr9_2dec2021.pdf
3. Implementation Plan for the Recovery of Marbled Murrelet in BC: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/species-ecosystems-at-risk/recovery-planning/implementation_plan_for_the_recovery_of_marbled_murrelet.pdf

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Invasive Mussel Defence Program: https://www2.gov.bc.ca/gov/content/invasive-mussels/invasive-mussel-defence-program
Stop the Spread of Invasive Mussels: https://www2.gov.bc.ca/gov/content/invasive-mussels 7

Other Links Featured in This Issue

- College of Applied Biology website (page 2): https://cab-bc.org/
- Past *College Matters* issues (page 2): https://cab-bc.org/college-matters-digital-edition/
- Hotel Grand Pacific (page 2): www.hotelgrandpacific.com

Joan Snyder

JOAN ELIZABETH MONTGOMERY SNYDER was a champion for education, environmental protection, and the progress of women.

Joan was born in 1930 in Florida and as a young woman earned her pilot's license and joined the Civil Air Patrol and the Ninety-Nines, an international organization for women pilots. Joan earned a BSc from Jacksonville University, followed by an MSc and PhD in Biology, Ecology, and Plant Ecology from Emory University. She secured a post-doctoral NSF grant in Microbial Biology at the University of Utah.

In 1973 Joan became the first woman Professor of Biology and related fields at Notre Dame University, Nelson. She was an instructor in Biology and Wildland Recreation at Selkirk College from 1976-1980. She was the first female instructor in Biology, Botany, Ecology and Environmental Science at Grande Prairie Regional College from 1981-1998 and Adjunct Professor in Forestry at the University of Alberta from 1989-1997. Joan was awarded Instructor Emeritus status by Grande Prairie Regional College when she retired. The courses and labs she taught, and especially the field courses that she led, inspired generations of students to pursue their own academic and professional interests in Biology, Botany, Environmental Planning and the welfare of mountain caribou. She was involved in extensive consultation with government agencies, forestry companies, and environmental and advocacy groups.

Joan loved animals and music, and expressed herself creatively through poetry, macrame, pottery, and jewelry-making.

Joan passed away in Castlegar on June 3, 2024. She is greatly missed by her husband, family, and friends.

Submitted by Vince Salvo.

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