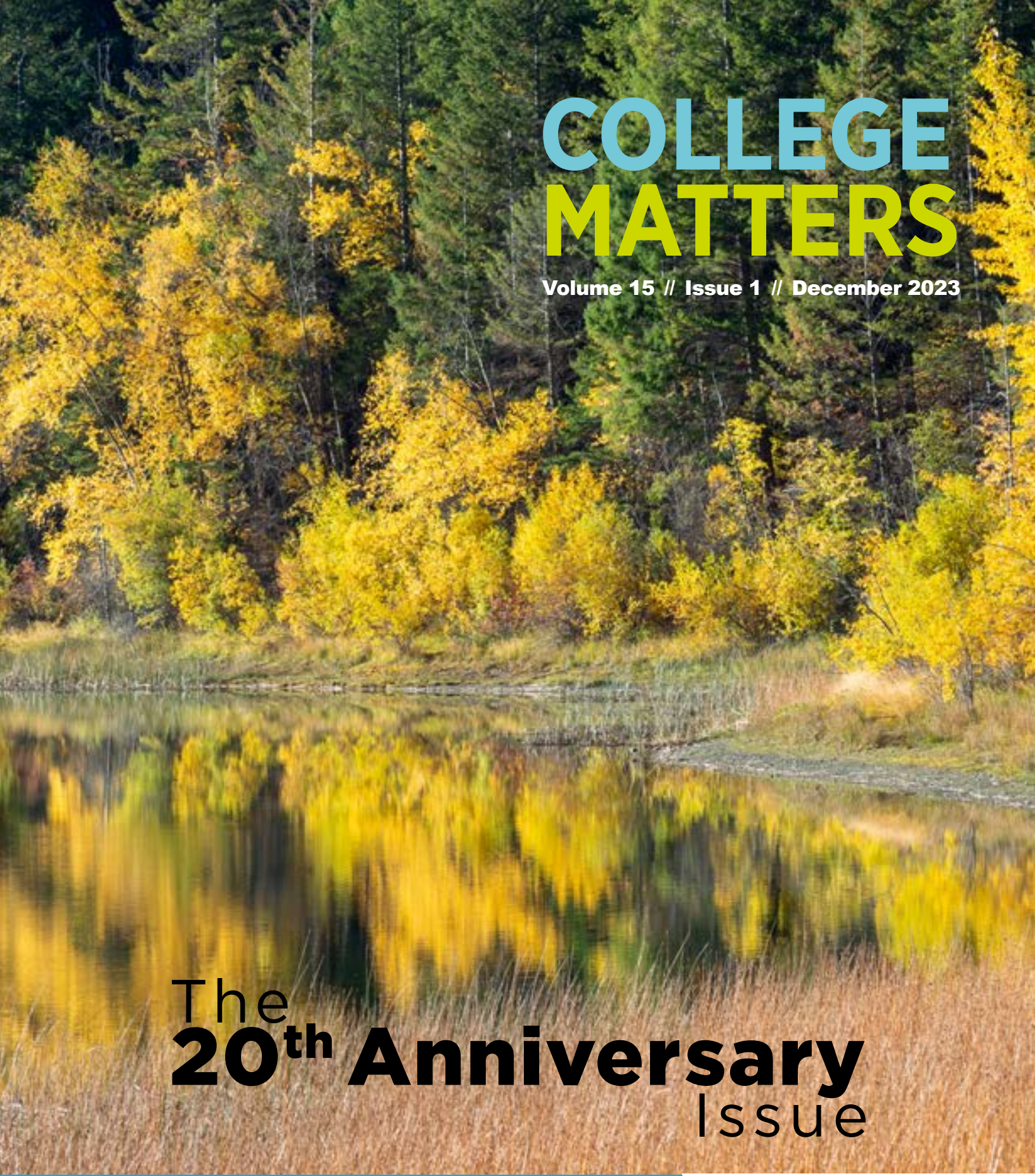

COLLEGE MATTERS

Volume 15 // Issue 1 // December 2023

The 20th Anniversary Issue

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

20 YEARS

COLLEGE OF APPLIED BIOLOGISTS

Professional Accountability

The College is seeking good communicators and team players that are interested in running for the Board. Board members contribute to the applied biology profession by upholding the public interest while further developing their skills in areas such as governance, financial literacy and strategy.

Nominations will be open until 4pm PST on January 15, 2024.

More information on:

https://cab-bc.org/about-the-college/2024-elections/

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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.

OUR VISION

Responsible resource management supported by accountable and trusted professionals.

COLUMNS

Cover photo: The bright autumn foliage along the shore of Turquoise Lake in Marble Canyon Provincial Park, British Columbia, by davidrh - Shutterstock
Back cover photos by Vancouver Island Conference Centre
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.**

A Journey of Self-Regulation: The College at 20 Years

By Seán Sharpe, RPBio, *Chair*

I MOVED TO BC in 1991 and began practice as a professional biologist with BC Parks in the northern region of our Province. I remember the discussion and debate among peers and colleagues over whether one needed to be a member of the Association of Professional Biologists. Most of the discussion of the day was around what the organization could do for members, but a growing proportion of biologists recognized that there was a greater purpose and role: that of developing an effective self-regulatory authority and means to provide public confidence in and accountability of our practitioners.

Almost 40 years ago, biologists in BC founded their professional association with the objective to lobby government for the right to title, self-regulation and a Code of Ethics to protect the public interest. Some 20 years later, biologists began to realize their objective when the BC government drafted the *College of Applied Biology Act*, a statute which came into effect on June 20, 2003, and established the College as a regulator to protect the public good and recognize the right to title of professional biologists.

> "In the last 20 years since it was established, the College has been a critical part of resource management, through the regulating of applied biology professionals that are competent, qualified and ethical."

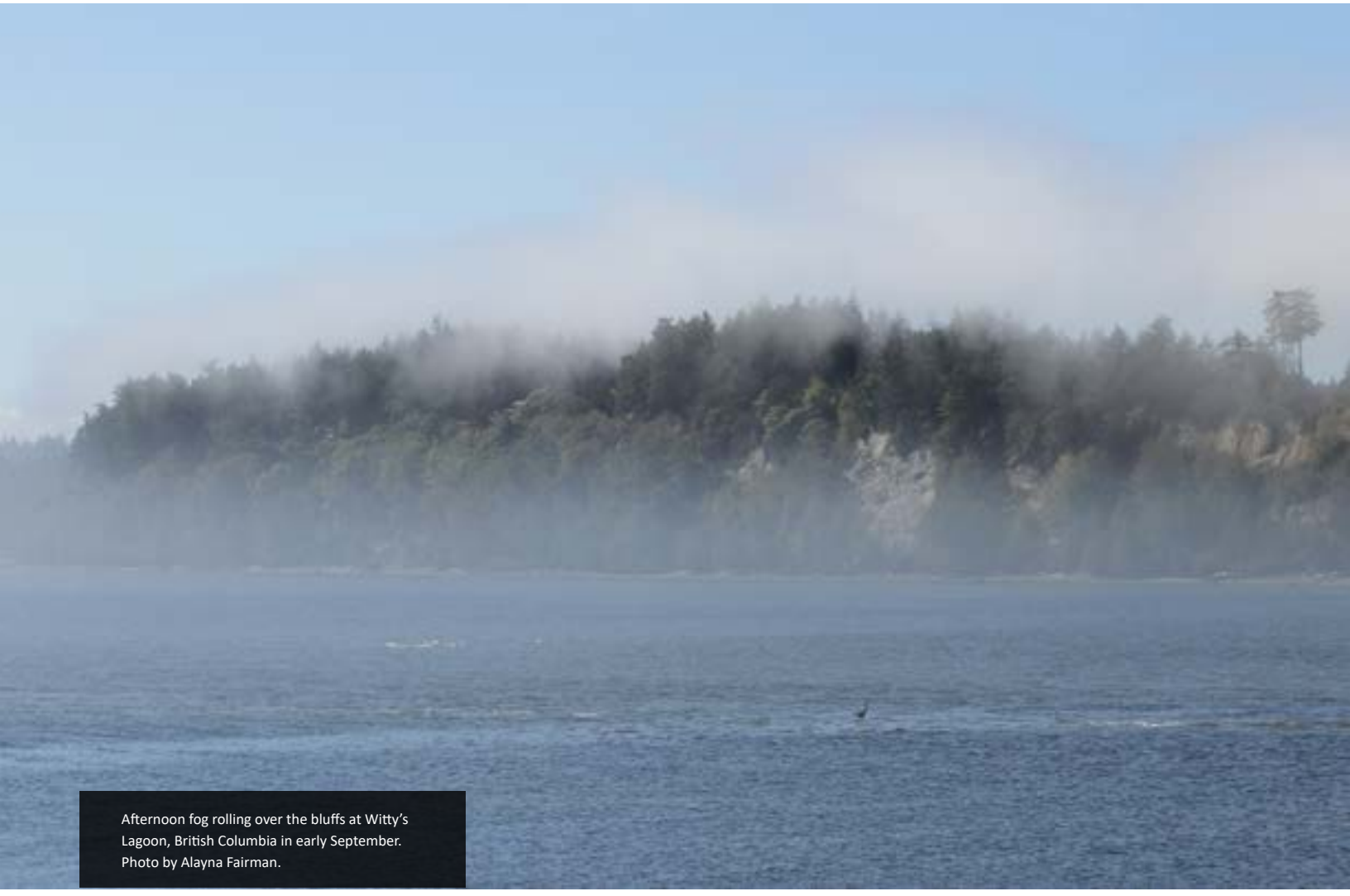
In the last 20 years since it was established, the College has been a critical part of resource management through the regulating of applied biology professionals that are competent, qualified and ethical. Now under the *Professional Governance Act*, practicing professionals registered with the College have reserved practice—the first jurisdiction in the world with such legislation. Reserved practice further enhances the public confidence in that all work that falls under the reserved practice definition in the ***Applied Biologists Regulation*** must engage a registered applied biology professional who has demonstrated competency and is held to the College's Code of Ethics and Professional Conduct. Practicing professionals include Registered Professional Biologists (RPBios), Registered Biology Technologists (RBTechs), Applied Biology Technicians (ABTs) and Applied Biology-Limited Licensees (AB-LLs). ABTs do not have reserved practice and AB-LLs only have reserved practice in their licensed area.

We're not finished this journey of self-regulation and are still growing in our understanding of the detail of areas of practice within reserved practice and developing levels of competence and training that we should strive toward as professionals. We've worked hard over the decades to include applied biology professionals in key natural resource decisions, and will continue in the coming years to educate organizations, firms, contractors, and even other professional regulators, that including the knowledge of applied biology professionals in their projects is both in the public interest and now the law in BC. Protecting the public interest is an evolving target and it will continue to be the primary objective of both the College and our professionals.

This summer, I have been reflecting on the changing environment that we are living and practicing in. In the past few weeks, our newscasts have been dominated by news such as BC setting all-time records for wildfire area burned; impacts to biodiversity and species at risk in almost every ecosystem in the province; legacy and ongoing racism impacts to our Indigenous Peoples and the need

to work with them to restore and manage our ecosystems. Some days, I must admit that I don't know where to start personally or professionally to address the issues facing us. Most days, however, I have a profound sense of hope when I see the dedication and commitment of people around me trying to make a difference. As professional biology practitioners, we have a unique opportunity to share our knowledge and love of the natural world by being engaged and working on the solutions that are urgently needed by governments, industry and society. Whether it is through our everyday work as professionals, volunteering with the College or other organizations, mentoring young biologists or working together with Indigenous Peoples and our neighbours to develop the policies and practices for the future, we all need to join our voices and efforts to help guide our society forward. I have always liked the quote attributed to Mahatma Gandhi "Be the change you wish to see in the world." My experience over the last 40 years working as a biologist is that it is the most interesting, exciting and challenging career I could have imagined. It is also a great responsibility and a great joy, and I have confidence in our future when I look at the skills and commitment of our registrants in the College of Applied Biologists.

Going forward, the College is moving toward enforcement of reserved practice and continuing to work with its regulatory partners to provide guidance and direction on areas of practice that align, intersect and, with the broader regulated practice definitions, overlap among professions. More information for the public and for practitioners can be found on the ***College website***.



Afternoon fog rolling over the bluffs at Witty's Lagoon, British Columbia in early September. Photo by Alayna Fairman.

How the College Has Transitioned from Association to Professional Regulator

By Chistine Houghton, Chief Executive Officer

THE TRANSITION FROM a member-driven association to a professional regulator over a relatively short period of time has been both inspiring and challenging. As with any challenge, there are opportunities. Finding those opportunities and then capitalizing on them while maintaining our core statutory duties was a reach for a small regulator like the College. The advantage to this is having a dedicated and committed team of staff and volunteers to take the key steps required to move forward at what (in regulatory development) felt like lightning speed.

When we started on the latest leg of our evolution, there was no existing model of professional regulation for applied biology. This meant we were charting a new course without the benefit of learning from how it was managed in other jurisdictions. It did feel at times that we "were flying the plane while building it."

> "Our objective was to have a clear, effective, transparent regulatory regime that would ensure that the College continued to put protecting the public interest at the centre of all its undertakings."

As applied scientists, the College approached the task systemically. We catalogued what needed to change to come into compliance with the *Professional Governance Act* (PGA), we assessed those things that could be improved regardless of the statute and we identified where registrants and potential registrants may need support as we moved forward. Our objective was to have a clear, effective, transparent regulatory regime that would ensure that the College continued to put protecting the public interest at the centre of all its undertakings.

The result has been a relatively seamless transition to the new requirements of the PGA and the implementation of reserved practice.

So why is it important that applied biology is regulated? We all know that we rely on professionals every day. We need to have confidence that the bridge we are crossing is safe, the diagnosis we are receiving is sound or the prescription we are filling is correct. We also need to be confident that the management of our precious and finite natural resources is sustainable.

The United Nations' Sustainable Development Goal 15 is to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss."

How we meet this goal—and it must be *how* not *if*—will require that we look beyond economic benefits to the long-term benefits of environmental sustainability.

While not perfect, here in British Columbia we have taken some important steps.

But applied biologists are only part of the answer. There is much we can learn from the Indigenous Peoples who have lived here for well over 10,000 years and who have successfully and sustainably cared for the lands and waters. That Indigenous Knowledge has been passed down from generation to generation and it plays a critical role in meeting the United Nations Goal 15.

Indigenous stewardship of the lands and waters goes back from time immemorial; regulated applied biology professionals have only been around for twenty years (and with reserved practice only since September 1, 2022). However, by listening and learning from Indigenous People, and working collaboratively, we can all play a part in ensuring our children and our grandchildren have a future they can look forward to and a past they can be proud of. The next twenty years are going to be critical. CM

Introducing New College Staff and Editorial Board Members

Eva (Ava) Boehringer, MSc, RPBio, is an environmental consultant based in Kimberley, BC. Ava holds a Master of Resource Management from Simon Fraser University with specializations in soil science and forest ecology. Over the years, she has worked in many other fields, including fish, wildlife and contaminated sites.

In 2021, Ava retired from BC Hydro, where she worked as a Natural Resource Specialist for the previous 20 years. In the course of this rewarding career, she had the opportunity to explore every corner of the province and work on many interesting and challenging projects. Not quite ready to hang up the biologist hat, she founded Riparia Resource Consulting in 2022 and joined the Editorial Board Working Group. Her consulting work focuses on environmental management of exploratory mining projects, while her contribution to the working group will be to support the editorial review process and to either write or solicit articles from potential contributors for *College Matters*. She also works as a freelance editor and enjoys reading the large variety of documents that come across her desk.

In her free time, Ava enjoys rock climbing, mountain biking and hiking, as well as traveling internationally.

Jaewoo Kim, PhD, RPBio, PBiol, is a senior fisheries scientist with Ecofish Research Ltd., based in Calgary, AB. He recently joined the College as an RPBio, and currently serves as a member of the Editorial Board. In 2022, he was also part of the Conference Planning Working Group that put together the College's Conference & AGM in 2023.

Jaewoo is a senior fisheries scientist, environmental scientist, senior statistician, and data scientist, with over 20 years of experience. He has authored over 20 peer-reviewed publications, 50+ technical reports, and 50+ conference presentations.

Jaewoo has led, advised and contributed to over 70+ environmental projects with study design, permitting, statistical/data analyses and reporting including aquatic effects monitoring programs (AEMPs), environmental effects monitoring programs (EEMPs), environmental impact assessments (EIAs) and risk assessments (RAs) for a variety of disciplines including fish and fish habitat, fish health, aquatic ecology, benthic invertebrates, plankton, water quality, sediment quality, wildlife biology (caribou, bison), lichen, vegetation and air quality, for clients in mining, hydro, infrastructure, oil & gas, and nuclear sectors across Canada. Prior to consulting, he also led an R&D analytics team, where he developed machine learning models and data analytics solutions for software development and client needs in the agriculture tech sector.

Previously, Jaewoo had led two large-scale field telemetry studies examining fish movements of ~300 fishes over 3 years within the Great Lakes and evaluating effectiveness of non-permanent barriers such as electric barrier, water gun, sound bubble light barriers and alarm cue. He also examined the impacts of climate change on fish community biodiversity in relation to lake morphology of over 1000 Ontario lakes and taught an environmental biology course. For his PhD work, Jaewoo examined the ecological and behavioural implications of predation risk in wild juvenile Atlantic salmon in New Brunswick.

Sue Owen was appointed Manager of Practice with the College of Applied Biologists in August 2023, after being the College's Regulatory Officer for the past three years. As the Manager of Practice, Sue oversees the College's Audit and Practice Review, mandatory training and Continuing Professional Development programs, professional standards and guidelines.

Sue is a graduate of Mining Engineering Technology from Northern College of Applied Arts and Technology, Ontario, and a graduate of Business Administration from York University, Toronto. She previously worked for the Capital Regional District (CRD) as a document control specialist assigned to the Wastewater Treatment Project. Before moving to Victoria from Saskatoon in 2019, Sue worked as a research assistant for Agriculture and Agri-Food Canada and a community educational assistant in research with the Saskatoon Open Door Society.

Sue enjoys reading about horticulture and nutrition, gardening, sailing and spending time with her family and dog in her free time.

Sharon Stewart was born in Stockport, Greater Manchester, UK. She moved to Canada when she was two and has lived here ever since, apart from a seven-year period where she ran a hotel with her parents in Newtown, Wales, called Dolforwyn Hall.

She worked at Victoria Women's Transition House (VWTH) for 16 years before beginning her time with the College. Sharon mostly handled the bookkeeping for the organization and rose to the position Finance Coordinator after having started out at VWTH as a volunteer. Sharon has always tried to occupy her time with social endeavours, including volunteering at the Vancouver Island Crisis Line and Greater Victoria Police Victim Services. She's been the College's Bookkeeper since April 2023.

Sharon enjoys the people, the weather and the friendships in Victoria, reasons why she returned after her sojourn to Wales. In her spare time, she likes to read and explore new vegan recipes. She also enjoys paper crafts like art journaling. Her favourite colour is blue, like the ocean, another reason that she moved back to the coast. Sharon has two children, a son that lives in Nanaimo and a daughter who's attending university in Vancouver. She lives in Saanich with her black golden doodle Koda in the same house she's lived most of her life and with the same guy she's been married to most of her life.

Faith Brown started working at the College in late July 2023 as Registration Officer. In this role, she supports the work of the College's registration and accreditation programs and processes. Specifically, Faith is the primary point of contact for potential and new applicants, regarding application and registration process and requirements. She maintains and updates application and accreditation documents, manages documentation for the registrant database and coordinates Credentials Committee activities, among other duties.

Faith comes from both academic and corporate backgrounds. She worked as an academic writing and business communication professor at universities in Nigeria, Botswana and Canada. She also worked in administration as Writing Centre Coordinator at the University of Botswana, Online Exams Liaison at UBC Sauder School of Business, and Member Services Officer at the Canadian Bar Association. She is passionate about providing topnotch client service in areas such as business correspondence, meeting logistics, registration, technical support, professional development, workshop facilitation, volunteer coordination and other stakeholders relations.

Faith moved to Canada as a permanent resident in 2010 and became a Canadian citizen after three years. She is an avid reader and writer who also enjoys exciting conversations about various sports. She likes taking long walks, exploring new locations, watching movies and sports, and reading Regency novels.

A Summary of the Recent Amendments to the Migratory Birds Regulations, 2022

By Eva-Maria Boehringer, MSc, RPBio

1. Background

The objective of Canada's Migratory Birds Regulations is the conservation of migratory birds, including their eggs and nests. The regulation first came into force in 1918 and was comprehensively updated for the first time in 2022 to be more responsive to current challenges facing migratory birds in Canada. Details on the changes to the Migratory Birds Regulations 2022 (MBR 2022) were published in the ***Canada Gazette, Part II on June 8, 2022***. A summary of the changes that are most likely to affect the practice of applied biology is provided below.

2. MBR 2022 changes

2.1. Nest protection

The previous regulations protected the nests of all migratory birds, at all times, for as long as they existed. The updated regulation provides protection to migratory bird nests when they are considered to have a high conservation value for migratory birds, which means nests are no longer protected when they do not benefit migratory birds (i.e., they do not contain a live bird or viable egg).

As of July 30, 2022, it is prohibited to damage, destroy, disturb or remove migratory bird nests when they contain a live bird or viable egg (i.e., generally during the nesting period). For 18 species of migratory birds identified on Schedule 1, the MBR 2022 provide year-round nest protection until the nest can be deemed abandoned (i.e., the Minister must be notified via the online ***Abandoned Nest Registry*** that the nest does not contain a live bird or viable egg, and the nest is to remain unused by migratory birds during the designated wait time for that species). Schedule 1 includes both species of migratory birds who either re-use their own nests year after year and species of migratory birds whose nests are used by other species.

For more information, refer to the fact sheet "***Nest Protection under the Migratory Birds Regulations***."

2.2. Prohibitions on causing harm

The MBR 2022 protect migratory birds, their eggs and their nests by prohibiting activities that can cause them harm. Unless authorized by a permit or the regulations, all persons are prohibited from:

- capturing, killing, taking, injuring or harassing a migratory bird or attempting to do so;
- destroying, taking or disturbing an egg; and
- damaging, destroying, removing or disturbing a nest, nest shelter, eider duck shelter or duck box, unless the nest does not contain a live migratory bird or a viable egg and the nest was not built by a species that is listed in Schedule 1.

For more information, refer to "***Guidelines to Avoid Harm to Migratory Birds***."

2.3. Temporary possession of a migratory bird

In the following situations, it is now authorized to temporarily possess dead, injured or live migratory birds without a permit as the circumstances allow:

1. When a dead migratory bird is encountered to dispose of the carcass in accordance with applicable laws or deliver the carcass to the lab for analysis;
2. To transfer an injured migratory bird to an authorized rehabilitation facility for migratory birds; or
3. To temporarily help an injured migratory bird with an imminent threat to its life.

For more information, refer to "***Possession of Migratory Birds***."

2.4. Indigenous Peoples

The MBR 2022 contain language to ensure that regulations more fully represent Indigenous Peoples and their Aboriginal and treaty rights. Recent amendments now support Indigenous Peoples' use, gifting, sale or exchange of feathers, the right to hunt, gift or exchange migratory birds, and the right to harvest their eggs.

2.5. Other migratory birds permits

The MBR 2022 contain updated requirements for obtaining a Scientific Permit whereby more people who have the relevant skills are now eligible. A Scientific Permit may be issued by the Canadian Wildlife Service under the MBR 2022 for scientific purposes, which includes banding, or for the purposes of rehabilitation or education.

For more information, refer to "***Scientific Permits***."

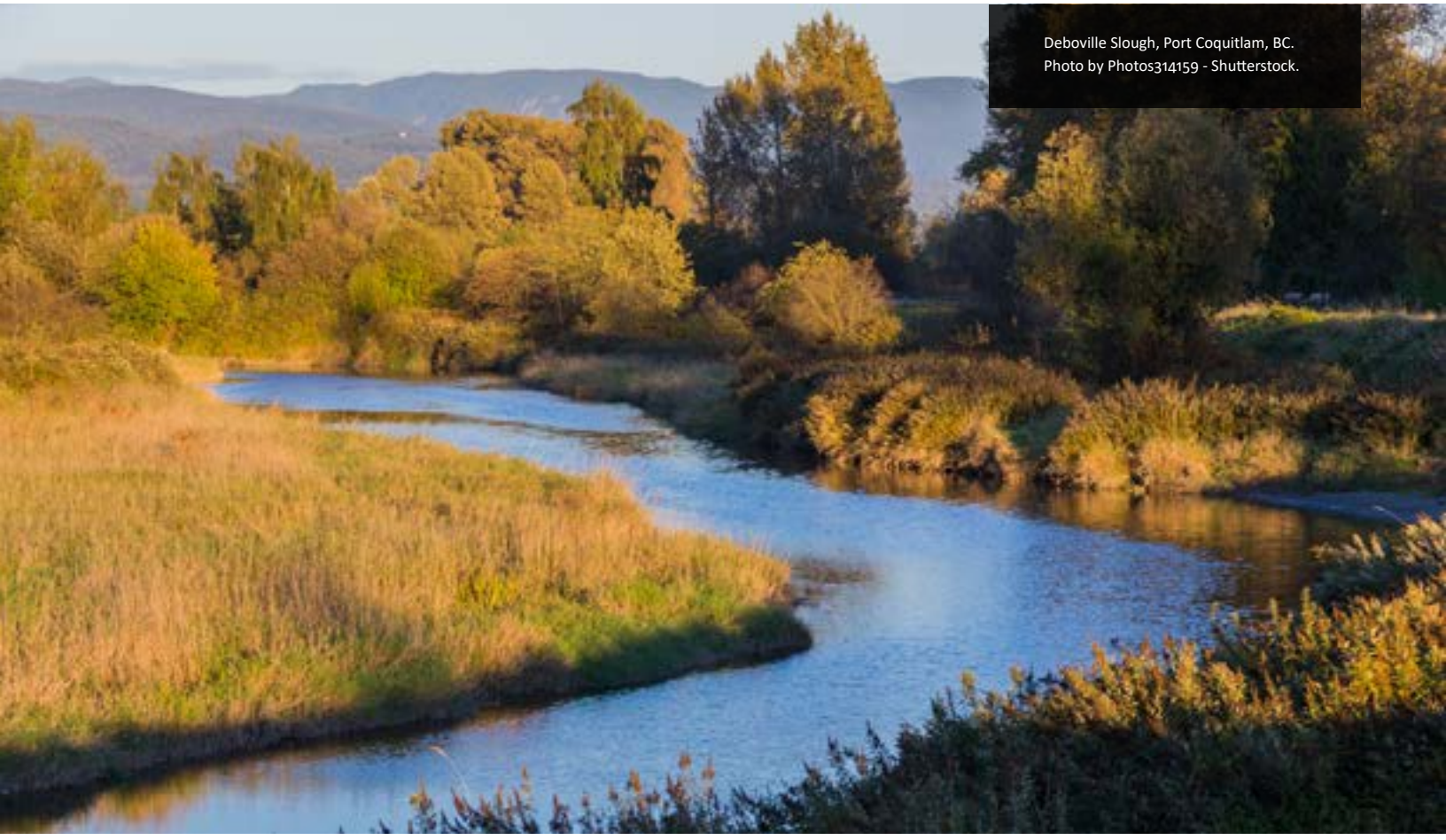
3. Anticipated future amendments

Several additional regulatory amendments are currently being considered. Potential future amendments include those part of the regular process in addition to those which deal with long-standing issues and other more recently identified priorities.

4. Further information

A comprehensive FAQ for the MBR 2022 can be found ***here***. Questions about the MBR can be directed to ***ReglementsFaune-WildlifeRegulations@ec.gc.ca***.

Source: ***https://www.canada.ca/en/environment-climate-change/services/migratory-game-bird-hunting/status-update-modernization-regulations.html***



Deboville Slough, Port Coquitlam, BC.
Photo by Photos314159 - Shutterstock.

COLLEGE MATTERS

The 20th Anniversary Issue

FEATURE ARTICLES

A Path of 20 Years

By the College's Editorial Board

The College's Editorial Board reached out to former Council/Board members and asked them to talk about their experiences in the past 20 years. Here is what Jocelyn White and Mel Kotyk shared about their time and challenges while serving on the College's Council/Board.

Approaching professional governance

I HAD THE pleasure of serving on the College of Applied Biologists (previously "Biology"; CAB) Board, or Council at the time, from 2015 to 2022. Prior to serving on the Board, I started out as a member of the Credentials Committee, and I continue to be active as a Credentials Assessor and as a member of the Environment Practice Panel, a joint group with the Forest Professionals BC. A lot of changes have happened over that time, progressing from a dedicated group of registrants (previously members), who served on Council and were supported by a small but equally dedicated group of staff, to an organization on par with the other major natural resource professions in BC. During my time, I worked with three registrars, three CEOs, two financial staff, and a host of other staff members.

It was during this time that the concept of professional governance was introduced, and as a Council, we had a decision to make—provide direction and input into the process or get steam-rolled over and live with the government's proposed changes. To paraphrase our CEO, that was the summer that never happened. I recall weekly conference calls from wherever I could find cell service on the side of the road in the field to keep updated on the proposed changes and where we wanted to provide alternative options. Fast forward two years, the College has a completely updated set of bylaws, updated credentials process, updated and new training modules, and countless other changes to the structure and organization. The budget also had to grow to support all these changes. One of the most important changes was Reserved Practice, with a lot of work ahead for the new Board for its implementation.

I thoroughly enjoyed my time on Council and met some truly dedicated, amazing people along the way. The fast pace of changes with the *Professional Governance Act* (PGA) would not have been possible without our CEO, Christine Houghton, leading the charge with her staff, and under the guidance of Vanessa Craig and Brian Clark. CAB, with a staff size of five, was expected to do the same amount of work as the Forest Professionals BC with a staff of 20, and the Engineers and Geoscientists of BC with a staff of over 100. The College succeeded in keeping pace and, in many cases, surpassed the other organizations and developed strong relationships with the other professional organizations along the way.

"I recall weekly conference calls from wherever I could find cell service on the side of the road in the field to keep updated on the proposed changes and where we wanted to provide alternative options."

I encourage everyone to volunteer for a committee, task force, or even the Board and be a part of this organization tasked with regulating applied biology professionals. It was great to be involved through the PGA changes to get a better understanding of how these changes apply to me as a professional biologist. CM

Jocelyn White, RPBio

The College Past — rejoicing in our successes

LOOKING BACK OVER 20 years of the College of Applied Biologists, it is valuable to reflect on how far we have come. Prior to 2003, biologists were loosely organized through the Association of Professional Biologists of BC (APBBC). The APBBC had two primary objectives: 1) to advocate for and support biologists in their practice; and 2) enhance public confidence in the practice of biology by a) regulating who can be called a Registered Professional Biologist (RPBio) through admissions; and b) implementing a Code of Ethics. Although these two primary objectives are not mutually exclusive, the former is member focused whilst the latter is public focused. Having both interests within one organization was like a pair of co-joined twins who share vital organs, while each of them has their own goals, objectives and personality.

The passing of the *College of Applied Biology Act*, creating the College as a self-governing body but leaving the APBBC in place, necessitated a separation of these co-joined twins. Prior to 2003, all assets (e.g., the bank account, membership list, tenancy agreement, phone number, website, etc.) were in the name of the APBBC. In 2003 I, as President, and the rest of APBBC Board were appointed by the government as interim President and Board of the College of Applied Biology. There was clear separation in foci, with the APBBC remaining as the main voice for advocacy of its members and the College having a responsibility to protect the public interest.

To implement this new organization, the College modified the relevant APBBC Rules into College bylaws, developed an election process, converted the APBBC membership list to the College, generated new stamps and certificates to be issued to all existing registrants, developed new criteria for new registrants, and established a new Code of Ethics. The tenancy agreement for the office, the phone number, website, including logo, stationery, personnel contracts, etc., were converted to the College, and finances previously held by the APBBC were transferred (by agreement) to the College. After about one year, both the College and the APBBC held new elections establishing their individual Councils and Boards. I was honoured to be elected as the inaugural President of the College of Applied Biology and, with the assistance of the Board and hard work by an incredible staff, we were able to accomplish these tasks. Therefore, the individual personalities of the two organizations took hold.

The core mandate for the two organizations had to take on very different paths. The APBBC remained as a member-focused organization advocating for the members' interests, including workplace standards, environmental interests and training. The College was commissioned to protect the public interest by ensuring that its registrants are duly qualified in their field of practice in which to provide opinion, adhere to a Code of Ethics and maintain continued competency. By doing so, elements in the practice of applied biology became the domain of the College registrants and, a person's livelihood came to depend upon being a registrant in good standing. Therefore, the self-governing nature of the College in making these determinations is critical and the weight of responsibility very significant. Membership in the APBBC was optional and discretionary, requiring its members to undertake an examination of its purpose and direction. As such, the creation of the College by the BC Government had a very significant impact and much care needed to be taken during this transition.

As regulating the practice of biology was unprecedented in BC (and throughout North America), and with no model to emulate, the College worked with other professional associations to define what constituted the practice

Mel Kotyk during a presentation at the College's 2023 Conference & AGM in Kelowna, BC. Photo by Shona Lawson.

of biology vs activities governed by other regulatory bodies (e.g., forestry, agrology, engineering, etc.). Defining the fields of practice that were unique to a particular discipline and those which are more common was crucial to demonstrate the relevancy of our organizations and the practice of applied biology. Similarly, staff worked closely with the provincial Ministries to identify which government positions fell within the practice of applied biology, thereby requiring registration in the College.

Over the past 20 years, the College clarified the language of the Code of Ethics and Professional Conduct (CoEPC) to ensure the intent and objectives for protecting the public interest were clearly articulated, understood and applied, assisting registrants to recognize that providing sound scientific advice in the public interest is different than providing advocacy on a topic of concern. Registrants increasingly recognize that to provide impartial, scientifically sound advice is their duty and obligation irrespective of personal perspectives and preferences. Consistent with other professional organizations, College registrants were also becoming more aware that the CoEPC applies not only in their professional duties but also in the way they conduct themselves in their private lives.

The College Future — seizing the opportunity

Over the next 20 years, it is my view that College registrants will play an ever increasing and critical role in meeting the public interest. As changes to climate are increasingly affecting our natural resources, such as water, forests and species diversity, and through natural disasters, such as flood, fire and drought, the advice from registrants will become increasingly important. Our traditional reliance on having years of scientific data and replicability will become strained, and in some circumstances is likely to fail us. Incorporating Indigenous values, views and perspectives into scientific advice is a new consideration that requires a paradigm shift that many may not be accustomed to. The College is well positioned to take a leadership role nationally and lead other jurisdictions in Canada in recognizing the need for sound biological advice from accountable biologists.

For biologists to grow in our influence and leadership during scientific uncertainty and nebulous times, we need to step up when providing forward thinking, solution-based advice. A key element for the success of those who practice applied biology and protect the public interest is to provide this advice based on scientific principles, in areas that we can demonstrate competency, apply prudence and caution in our analysis, void of bias or conflict of interest, and without damaging another's reputation. College registrants can be true leaders in addressing the multitude of environmental issues resulting from climate change, as the foundation of authority and accountability have now been laid, and the opportunities before us are unlimited.

> "As changes to climate are increasingly affecting our natural resources, such as water, forests and species diversity, and through natural disasters, such as flood, fire and drought, the advice from registrants will become increasingly important."

Mel Kotyk, RPBio

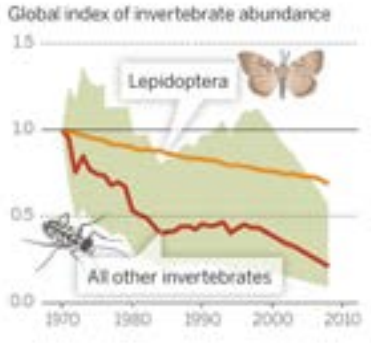
Have a favourite field photo? We're seeking cover shots for *College Matters*.

We'd like to display our registrants' talents by featuring their photos or artwork in future editions of *College Matters*. Contributors will be attributed and should be prepared to grant both copyright and moral rights to the College for the use of the submissions, in the event that editing is required. Please submit your images in as high a resolution as possible (ideally at least 300 ppi) to admin@cab-bc.org.

eButterfly: Harnessing Technology to Build a Global Community of Butterfly Enthusiasts

By Rodrigo Solis-Sosa
eButterfly

THE WORLDWIDE DECLINE in insect populations, commonly called the "Global Insect Collapse," is causing serious concern among biologists and conservationists. The fragile state of these crucial creatures, including butterflies, has tremendous ecological implications that affect vital processes such as pollination and food chains. In response to this urgent need for action, eButterfly emerged as a transformative initiative that harnesses the power of community science[1] and technology to address the challenges posed by insect decline and foster a truly global community of butterfly enthusiasts. eButterfly has existed for over a decade and has significantly benefited from technological advancements, including the integration of artificial intelligence (AI), modern web development frameworks, real-time data sharing and mobile technologies. As a result, it has become a reliable data source that can provide better support for researchers worldwide.



Global insect collapse. Dirzo et al, 2014.

In 2012, eButterfly was founded by Maxim Larrivée in Montreal. He noticed that the traditional methods of butterfly monitoring and data collection needed to be revised to combat the widespread decline in butterfly populations. To address this, he drew inspiration from his father's experience with the Étude des Populations d'Oiseaux du Québec bird checklist program, established over 60 years ago. With the help of local butterfly experts and collaboration with Prof. Jeremy Kerr from the University of Ottawa, a small Canadian eButterfly program focused on Canadian butterflies was created, recognizing the potential of community science in tackling insect decline. A few years after, following a collaboration with Kent McFarland from the Vermont Center for Ecostudies and Prof. Katy Prudic from the University of Arizona, eButterfly extended into the United States.

Maxim Larrivée, eButterfly founder and Director of the Montreal Insectarium. *La Presse*, 2022.

eButterfly has gained popularity among community scientists, increasing checklists, observations and reported species. Its coverage has expanded from solely Canada to encompassing the United States, followed by Central America and, most recently, the entire world. Presently, the eButterfly database holds 513,167 recorded observations of 1,360 unique species from 121,158 checklists. However, eButterfly's growth has not been without hurdles, and we have learned valuable lessons along the way. In this journey, we faced challenges and gained insights into data quality, data availability and balancing appeal vs complexity. In the following sections, we will delve into the challenges we encountered, our strategies and the lessons we learned to establish eButterfly as a reliable source of high-quality butterfly data.

Data quality

eButterfly initially aimed to gather information on butterfly species observed at specific locations through a checklist-based data collection method. This approach was implemented to ensure that the data collected was accurate and comprehensive, addressing the limitations of selective reporting and reporting of vital details about sampling efforts, a critical yet often overlooked aspect. By capturing comprehensive information, eButterfly sought to minimize biases and improve the completeness of the data. However, the thorough and robust sampling protocols included at the beginning required a considerable amount of information, which was very exciting for the experts, but proved overwhelming for beginners. As a response, eButterfly started to evolve its sampling protocols, giving considerably more flexibility, adding different sampling protocols, such as incidental observations, traveling surveys, area surveys, timed counts, and even bait trapping, and making all non-essential fields optional to fill out.

Community scientists from Vermont building an eButterfly checklist.

Similarly, the initial vetting system employed by eButterfly followed an expert-based approach. Volunteer regional experts meticulously reviewed thousands of records to verify reported species. However, as eButterfly grew exponentially, the number of recruited regional experts increased linearly, resulting in a widening gap between submitted records and vetted ones. Recognizing this challenge, eButterfly took a bold step in 2019 by transitioning from its original vetting process to a crowd-sourced approach.

eButterfly empowered all users to review, verify and provide valuable feedback on each other's observations by adopting a crowd-sourced vetting process. Drawing from the experiences of other community science platforms that utilized crowd-sourced vetting, eButterfly's system acknowledged users' varying levels of experience. This approach granted greater significance to individuals with more expertise, addressing concerns of taxon experts who may have felt underappreciated in other crowd-sourced platforms. This collaborative data validation method significantly improved data quality and bridged the gap between record submissions and vettings, narrowing the emerging disparity.

Interestingly, the crowd-sourced vetting system yielded an unexpected positive consequence. It facilitated knowledge transfer from experts to the general public, empowering and educating a new generation of butterfly enthusiasts. This democratization of expertise enhanced data accuracy and fostered the development of butterfly experts within the wider user community.

Looking towards the future, eButterfly continues to innovate and adapt. The platform is now exploring cutting-edge technologies, such as computer vision and machine learning, to introduce AI pre-vetting. This system will automatically leverage automation to identify butterfly species and flag potential errors. By taking advantage of these emerging technologies, eButterfly aims to strengthen the integrity of its data further and maintain its high standard of data quality. This continued commitment to technological advancements ensures that eButterfly remains at the forefront of butterfly research, contributing to a deeper understanding of biodiversity worldwide.

Data availability

Data availability has been a foundational principle for eButterfly since its inception, demonstrating unwavering commitment to transparency and accessibility. Initially, the data-sharing process involved directly sharing a spreadsheet whenever researchers requested access to eButterfly's dataset. However, as time passed, the volume and specificity of these requests experienced significant growth, leading to a substantial burden on the staff who had to compile these records. It became evident that a more efficient and standardized approach was necessary to keep up with the evolving needs of the scientific community.

Around the same time eButterfly emerged, another vital initiative was taking shape: the Darwin Core Metadata Standards (DCMS). This framework provided a reliable and consistent reference point for exchanging knowledge about the wide variety of life forms on Earth. Major projects, including the Global Biodiversity Information Facility (GBIF), recognized the value of these standards and began adopting them. In this context, eButterfly saw an opportunity to improve its data-sharing procedures by integrating the DCMS protocols into its database architecture. After several years of active development and fine-tuning, eButterfly successfully migrated its entire dataset, which had grown to around 300,000 records, to the DCMS structure by the end of 2018. This migration marked a pivotal moment in the evolution of eButterfly's data management practices, ensuring a more streamlined and efficient process for sharing vital information.

eB Labs will be a platform where community scientists can direclty see how their observations are turned into science.

With data stability now proven, eButterfly took the initiative to make its dataset even more accessible by uploading it in real time to GBIF. This move allowed researchers worldwide to access the data through a standardized method and provided each dataset with a specific digital object identifier (DOI) for easy referencing. This level of accessibility and integration with a globally recognized platform like GBIF represented a significant leap forward in eButterfly's journey towards fostering collaborative efforts to fight species decline. Researchers can now access the dataset in real-time using the provided link: GBIF-Dataset.

Furthermore, eButterfly is developing its online platform, eB Labs, to enhance data exploration and analysis. This platform will offer users a range of customizable tools for working with eButterfly's data. Through eB Labs, users will be able to create custom maps, charts and graphs based on specific filters and parameters, such as species, location, time period or observation type. This functionality will empower users to explore and visualize the data in ways that suit their research or educational needs. Additionally, eB Labs will provide a wealth of resources for users to deepen their understanding of butterfly ecology, behaviour and identification. Guides, quizzes, videos and articles will be available to support users in expanding their knowledge and fostering a greater appreciation for these remarkable creatures.

Appeal vs complexity

In the early days of eButterfly, striking the right balance between data collection protocols and user-friendliness was a daunting challenge. The platform initial approach revolved around traditional data collection methods, requiring manual submission and identification of butterfly species primarily by seasoned experts. While it allowed for data accumulation, the process was time-consuming and limited the engagement of the wider community.

Over the years, eButterfly has undergone a transformative journey, leveraging emerging technologies to adapt and thrive. The team realized the potential of AI and embraced it as a pivotal strategy to revolutionize the user experience. The groundbreaking eButterflAI feature was born, marking a turning point in the platform evolution.

eButterflAI was initially introduced as a tool to aid users in identifying butterfly species through AI-powered analysis of uploaded photos. This innovative addition allowed instantaneous feedback and comparisons with other user results, fostering greater engagement within the eButterfly community. The AI model uses geolocation data and species distribution models to improve its predictions, further enhancing the accuracy of butterfly identification; the next release version of the model, coming in just a few months, will even enable species suggestions without a photo, making the platform more accessible and appealing to a broader audience. Furthermore, the team is diligently working on integrating a Generative Text AI model to provide users with detailed human-readable outputs for a richer experience. Personalized recommendations based on user interests and preferences are also on the horizon, adding a personalized touch to the platform offerings.

The development of eButterflAI was a collaborative effort involving a diverse team of over 40 researchers from

various nationalities and with close cooperation with academics from Mila - Quebec AI Institute (originally Montreal Institute for Learning Algorithms). This partnership led to side projects like AMI, an automated moth monitoring system. AMI uses video recording and image recognition algorithms to identify moth species in real time, showcasing the potential for AI-driven advancements beyond butterflies.

eButterflAI output showing in warmer colours the parts of the image that inform the model about the species ID. We are working on turning these heatmaps into human-readable text, so users can learn how to identify butterflies based on the pointers given by the AI model.

Recognizing the importance of community building and knowledge exchange, eButterfly integrated a vibrant discussion forum within the platform. This addition provided users with a space to interact, ask questions and share experiences with fellow enthusiasts and experts alike. Through these meaningful discussions, users can learn from each other, improve their skills and expand their butterfly knowledge.

To further encourage collaboration, eButterfly introduced project opportunities within the platform. Users now have the option to create or join projects centred around specific topics, goals or themes. The projects could be public or private, open or closed, moderated or unmoderated, offering flexibility to cater to diverse interests and needs. As an ongoing development, eButterfly is working on integrating the discussion forum with projects to enhance communication and collaboration among participants.

Acknowledging the rise in mobile device usage, eButterfly has invested in creating a dedicated mobile app. This app leverages the features of mobile devices, such as GPS and camera functionality, to provide users with a seamless and user-friendly experience. The mobile app empowers users to submit observations on the go, eliminating the need for internet connection or a computer. The integration of eButterflAI within the mobile app further amplifies the platform ability to identify butterfly species instantly. Users should have access to the first version of the mobile app later this year.

Conclusion

The remarkable evolution of eButterfly illustrates how technological progress has elevated it from a butterfly enthusiast's passion project to a trusted and indispensable resource for applied biology practitioners across the globe. By harnessing the power of AI, modern web development frameworks, real-time data sharing and mobile technologies, eButterfly has evolved into a dynamic global community science platform, playing a vital role in addressing the concerning decline of butterfly populations.

From its inception in 2012, eButterfly has utilized the power of technology to confront the urgent need for comprehensive data collection and monitoring. The platform data quality has significantly improved by incorporating crowd-sourced vetting, enabling users of all expertise levels to contribute and verify observations. This approach not only enhanced the accuracy of the data but also facilitated knowledge transfer and empowered a new generation of butterfly enthusiasts.

Moreover, eButterfly's commitment to data availability has been unwavering. Through the adoption of the DCMS and integration with GBIF, the platform now provides real-time access to its dataset for researchers worldwide. This accessibility has solidified eButterfly as a reliable source of high-quality butterfly data, contributing to a deeper understanding of biodiversity and aiding researchers in their vital work.

Striking the right balance between complexity and user-friendliness was a challenge for eButterfly in its early days. However, with the introduction of eButterflAI, the platform revolutionized the user experience. AI-powered butterfly species identification, personalized recommendations and the upcoming mobile app have made eButterfly more accessible and appealing to a broader audience. eButterfly has fostered a strong sense of community among its users by creating a vibrant discussion forum and project opportunities, promoting collaboration and knowledge exchange.

As eButterfly continues to innovate and embrace cutting-edge technologies, such as computer vision and machine learning, it remains at the forefront of butterfly research. The platform's dedication to technological advancements ensures it can adapt to future challenges and continue its essential role in preserving and understanding butterflies worldwide.

The evolution of eButterfly from a butterfly enthusiast's hobby to a dependable and innovative community science application underscores the transformative impact of technology in tackling pressing ecological challenges. We hope this brief account inspires other biology practitioners to draw from our successes and learn from our mistakes, continually enhancing the presence and quality of essential tools like community science within the biologist's toolkit. CM

More information:

> ***https://www.e-butterfly.org/***

Notes

1. Community science, formerly known as citizen science, entails the active involvement of non-professionals in scientific research and data collection.

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View of fresh green trees with moss in Golden Ears Provincial Park, Maple Ridge, BC. Photo by EB Adventure Photography - Shutterstock.

The Transition from an Environmental Science Student to a Regulated Professional

By Cheng Kuang, RBTech, MSc

EARLIER THIS YEAR, I was asked to share my experience as an early career professional with a group of secondary students at the 2023 Association for Mineral Exploration (AME) Roundup. At the time, I had been working as an environmental consultant for three years after completing a graduate degree in chemical oceanography. As I reflected on my academic and career paths, I asked myself, "What would I have done differently to facilitate a seamless transition from school to a career in science?".

My undergraduate program provided the foundational science background in various disciplines, including biology, ecology, and earth and ocean sciences. While the interdisciplinary learning experience was unquestionably valuable, the broad range of science courses fell short of the academic requirements for professional designations that are tailored to a specialized area of practice. From hindsight, having some understanding of the following aspects of professional regulation would have been beneficial in my early stage of career planning:

- Individuals need to recognize the importance of professional accountability and be aware of the current regulation governing qualified professionals.
- Should one decide to pursue a career as a registered biologist, geoscientist, engineer, etc., understanding the requirements for different designations and streams of entry will allow for better course planning and career development.
- It takes a collaborative effort between universities and regulatory bodies to provide the necessary education, training and pathways for qualified professionals to obtain the right to practice in their respective fields.

I became a registrant of the College of Applied Biologists in May 2022, a few months after the scope of practice for RBTech and ABT was approved. Since then, the College has been working on increasing awareness and recognition of the RBTech and ABT designations to other registrants, the employment sectors (e.g., government, consulting, research) and the public. On an individual level, it is prudent for professionals to recognize the limitations associated with their designations and to only provide statements and opinions that they are qualified to make. As I embark on this journey, I look forward to the continuing professional development and opportunities for interdisciplinary collaboration this profession has to offer. CM

Cheng Kuang speaking to a group of secondary students and teacher/volunteers at the 2023 AME Roundup. Photo published with MineralsEd's permission.

Attending the College's Conference & AGM as a BIT

By Kaitlyn Legeard, BIT

AS A NEWLY registered Biologist in Training (BIT), attending the College of Applied Biologists 2023 AGM & Conference in Kelowna was an exciting experience. The two days were packed full of engaging presentations, panels and keynote speakers. The conference was also a great opportunity to reunite with colleagues and expand my network among a diverse group of professionals.

There was a variety of topics discussed at the conference each day. The conference sessions challenged my knowledge while helping me recognize other topics that I would like to learn more about. Personally, I enjoyed the first session titled "How professionals stay out of trouble." I was happy to see this session listed on the agenda

Kaitlyn Legeard doing field work in BC.

because as a new registrant who is learning to navigate the profession, I have had some questions and uncertainties regarding this topic. During the session, Mel Kotyk, Thomas Lutes and Craig Nichol spoke of "staying in your own lane" while conducting biology work and explored situations where it may be necessary to seek additional training or another professional opinion. Following the discussions in the session, I feel more confident in reflecting on my own practice to better define my competencies and to recognize practice areas that may be outside of my professional scope.

The networking breaks and evening receptions provided an opportunity to make new connections with numerous other registrants from different professional backgrounds. I had inspiring conversations with individuals who have been practicing biology for many years and learned more about the various areas of practice within biology. In addition, I had a long conversation with another BIT, and we shared our experiences about how we got to where we are today in our professional careers and where we hope to be in the future.

Throughout the conference, I was able to learn more about the College itself and how it operates to protect the public interest. I met numerous College staff, Board, committee and task force members. In conversations with these individuals, I was able to gain a better understanding of the various committees and task forces, such as the Nominations Committee and the Areas of Practice Task Force, and the ways in which I could get involved in these in the future.

I understand that, as a young professional, it can be intimidating to attend a conference where the majority of attendees are people that you have never met before and have more experience than you. However, now that I have attended a conference and can speak from my own personal experience, I will certainly encourage other BITs or young professionals to attend these kinds of events and get more involved in their respective professional associations/regulatory organizations. Overall attending the conference was a major learning opportunity, and I look forward to participating in future events organized by the College. CM

From Grassroots Biology to a Fully-Regulated Profession: Pros and Cons in Our Evolution

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

By Guy Gilron, RPBio

AS I LOOK back to 1992, when—during my early career—I enthusiastically joined the Association of Professional Biologists of British Columbia (APBBC), at the time eight years since inception (1984), I recall a grassroots organization with a proud vision of aligning a multi-disciplinary profession with a united front. Unique to Canada at that time, the APBBC had varied objectives, including information-sharing, advocacy for the profession and development of frameworks for registering members to ensure professionalism in applied biology in the province. In my 30 years as an RPBio, working mainly as an environmental consultant, I have watched the organization evolve from an association (not yet a legal entity) to a self-regulating professional College (a legal entity operating under the *College of Applied Biology Act*; June 20, 2003) to its current incarnation as an accrediting College under the *Professional Governance Act* (PGA) (September 1, 2022), the latter administered by the Office of the Superintendent of Professional Governance (OSPG), which also oversees other professions—foresters, applied science technologists and technicians, architects, agrologists, engineers and geoscientists.

> "The integrity of the organization was always solid throughout and focussed on protecting the public interest."

The memory of the journey that got us here had me reflecting on my own evolution as an RPBio. Throughout the years, I was involved in College committees (i.e., Credentials, Audit and Practice Review), College Council (now Board) and the Task Forces that transitioned us to the PGA. These rewarding experiences gave me unique opportunities to influence the College's direction to its current incarnation. The evolution from the early days—a relatively small, grassroots assemblage of volunteers with little infrastructure and basic organization—to a more governance-based College with a physical office in Victoria, annual meetings, consistent liaison with provincial ministries, now with over 3,000 registrants, came with its challenges! There were growing pains along the way, the most notable being the formation of the College and its departure from the Association (with associated delineation of the respective roles of the two organizations), the efforts expended in getting the *College of Applied Biology Act* passed in the BC legislature and the various challenges of establishing and implementing governance principles, policies and procedures. The integrity of the organization was always solid throughout and focussed on protecting the public interest.

Knowing the various challenges, and like every other organization that has evolved over this length of time, there are always pros and cons to reaching the milestone of becoming a fully-regulated profession, which now affords us the ultimate privilege—right-to-practice or reserved practice. From my historical vantage point, I am pleased to share my perspective on the pros and cons of where we have arrived.

The pros

I generally look for silver linings and am sometimes told that I tend to look at the world through the proverbial *rose-coloured glasses*; picking some major pros of where we've landed—full regulation of the profession—was effortless:

- **With regulation, comes profile and professionalism.** Going from an association to right-to-title or reserved title to reserved practice, will, without a doubt, increase the profile of our profession in society and the level of professionalism in conducting ourselves within our respective practices, and integrating our expertise with other disciplines. Together with our colleagues in associated professions, particularly in the environmental

assessment field, we will become more visible in the many aspects of applied biology, through supporting environmental and social sustainability principles, particularly in natural resource development sectors.

- **With regulation, comes responsibility and engagement.** CAB colleagues with whom I have worked over the years have always been *responsible and engaged*. Our status as professionals throughout the evolution of the College, and most recently, in the realm of reserved practice, has only served to elevate the commitments that we have made as responsible and engaged practitioners in protecting the public interest.

- **With regulation, comes the *duty to report*.** While reporting of unprofessional practice or practicing outside our areas of practice has always been encouraged in the past, it has now become a duty of our profession to report. This ensures that we all k*eep each other in check*, champion excellence within our discipline, in particular, through the requirements of reserved practice.

The frameworks of the College—specifically, the governance of our Board and the various committees tasked with ensuring a high level of professional integrity—have been established and continue to develop and to support these aspects.

The cons

There are some significant challenges that come with our new incarnation, and these are in the realm of cons related to the regulation of the CAB under the relatively new PGA. Some of the most notable of these are as follows:

- **With regulation, comes some relinquishment of self-regulation.** We are now currently regulated under the auspices of the Ministry of Post Secondary and Future Skills, rather than the Ministry of Environment and Climate Change Strategy. This is a major shift, given that our new regulators are more knowledgeable in law and governance, rather than science and technology. This has the potential of creating legalistic and administrative structures that aren't familiar to us, and in some cases, don't necessarily support registrants in maintaining and improving their practice—with a focus on the scientific and stewardship aspects of our disciplines.

- **With regulation, comes the potential for *over-administration* of the profession.** Another aspect that comes to mind with the new PGA structure, and the fact that our regulation is under the auspices of the OSPG (this applies to professions other than just the CAB), is the relative volume of bureaucracy (or *over-administration*) that we will continue to experience. This is something to which we have not been accustomed as we evolved from grassroots and limber approach to a more formal and structured governance paradigm.

- **The regulation has not balanced practitioners and reviewers: a requirement for registration of staff reviewing the work of Qualified Professionals (QPs) is not yet in place.** A critical requirement for many provincially-regulated programs and processes is that registered or qualified professionals (such as RPBios) be retained to conduct applied biology work requiring specific expertise and experience. This is, of course, one of the key aspects supporting the need for the PGA, and the importance of establishing sound technical competence in specific areas of expertise. However, we have not yet seen the same requirement for regulatory staff reviewing the work of QPs to be registered.

Some parting thoughts…

While we have come a long way in the evolution of the CAB, we clearly still have more work to do to ensure that we are regulated appropriately. Specifically:

- despite the need for consistency in professional governance across the province, registering of professionals should still stay focussed on the technical areas of expertise within each of the various disciplines;

- that we don't *get tangled up in red tape*; and

- that requiring expertise in the conduct AND review of the applied biology remains consistent.

Congratulations to the CAB on its 20th Anniversary as a regulated profession in the province of British Columbia! It's been a long and winding road that will continue to challenge us as we grow into the future. CM

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