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Faculty of Forestry Announces New Degree and Certificate Programs for 2021 Pg. 9

Spinning Gold from Wood Pg. 20

Over a Century of Forestry in Alumnus Family Pg. 22
In this edition of *Branchlines*, we decided to take a look back at a few of the stories from this year. And what a year it has been. It started normally enough, and we were pleased to be able to host the Forests Summit, which brought together a wide range of interests in the forests of British Columbia to try to develop a vision for where we would like our forests to be 50 years from now. There was a remarkable level of agreement, despite the diversity of interests represented, and since the Summit, a number of groups have been preparing plans for how we might actually achieve this vision. They will be reporting back early in the New Year, and we will then combine the plans into a single overarching strategy, including how the changes might be financed.

Shortly after the Summit, the province declared the health emergency, and overnight, students, faculty, and staff had to adapt to online teaching. Under the leadership of our Associate Dean Academic and his team, Dr Rob Kozak ensured that the pivot to online learning went smoothly, although it was only possible through a huge combined effort by all involved. The Faculty of Forestry was one of the first units on campus to restart laboratory research, and was also one of the few to deliver face-to-face teaching this fall. This was only possible because our professional master’s programs can operate as a “bubble”. However, for many people, the last ten months has been spent at home alone, with partners, or with families, creating all sorts of problems.

Despite the difficulties, as you will see from the contents of this *Branchlines*, the Faculty’s activities continue, and there have been some remarkable successes. Our faculty members continue to win major awards and significant recognition, reflecting the very high quality of the work being done. Covid-19 presented many challenges for research, but our Associate Dean Research and Innovation, Dr Sally Aitken, has done a remarkable job to ensure that our research can continue safely. This was only made possible after detailed safety plans for the building and fieldwork were developed and implemented, and thanks should go to Ms. Leslie Fernandez and her team who ensured that this happened.

While I have singled out a few people whose efforts over the past year have really helped the Faculty keep going, I realize and acknowledge that this has been team effort. Everyone has played their part: Associate and Assistant Deans, faculty members, staff, postdoctoral fellows, and graduate and undergraduate students, often at great cost to their professional and private lives. However, together, we have succeeded in adapting to the biggest challenge that the Faculty has ever faced.

In fact, the changes in practices brought about by COVID-19 have encouraged us to look even more seriously at alternative ways to deliver education. This doesn’t mean that everything will be online in the future, and we look forward to returning to face-to-face education sometime in 2021. However, a few courses may be better delivered online, and educational offerings aimed at people who are unable to spend time coming to UBC are particularly suited to online delivery. A new graduate certificate program in forest management and conservation has recently been approved and will be delivered entirely online, and we are looking into how this might be extended into a formal master’s program. With financial assistance from the province, we have also developed a micro-certificate in climate vulnerability and adaptation, a program that can be completed remotely and within ten weeks. Finally, the Haida Gwaii Institute is offering a new, online program in co-management, based on the rich experience of co-management in the Haida Gwaii. These are all indications of a changing educational environment, and it will be fascinating to follow the evolution of this trend.

John L Innes
Professor and Dean
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THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Forestry
AWARDS AND RECOGNITION

University of British Columbia Faculty of Forestry’s Collaborative for Advanced Landscape Planning (CALP) group was honoured earlier this month with the esteemed Public Education Award from Tree Canada. The award recognizes excellence in furthering the understanding of urban forestry issues and/or encouraging best practices in the urban forestry sector.

CALP is a multidisciplinary research group focused on developing bridges between research and communities, with a focus on landscape planning and climate change issues.

“CALP is thrilled to receive this award from Tree Canada, and we deeply appreciate the recognition for this and our other work with communities. Our research lab is continuing to design and implement new methods for collaborative learning, using urban landscapes and interactive visual media to engage citizens. I would like to thank the entire CALP team for making this team award possible,” says CALP director and former Bachelor of Urban Forestry program director Stephen Sheppard.

CALP’s most recent project, Cool’Hood Champs, centres on training local residents to become “climate champions” who then go on to galvanize climate action amongst their neighbours. A pilot program held in early 2020 saw 37 volunteer champions developing local climate action plans and over 70% taking action, such as planting trees. This training program builds on CALP’s Citizen’s Coolkit, an innovative guide that empowers households and neighbourhoods to make more climate-conscious decisions, and educates people on British Columbia’s dynamic future in its efforts to meet carbon reduction targets.

Moving forward, CALP aims to scale up such training programs and toolkits across the city and province. CALP is also developing a Teacher’s Guide for the Vancouver School Board, to be launched in 2021.

Other CALP initiatives include the Green Design Project, which focuses on scalable evidence-based urban greening guidelines for improving the lives of human beings and the green spaces that enrich them, and the Our Future Community video game, designed to teach students about climate change solutions through fun, interactive quests.

NEW APPOINTMENTS

Sylvia Ho has joined the Faculty of Forestry’s Department of Forest & Conservation Sciences as Department Administrator. She arrives with an extensive University of British Columbia HR and finance background. She was most recently the administrator at the Life Sciences Institute, Faculty of Science and Medicine, and prior to that, the administrator of Biomedical Research Centre, Faculty of Medicine. Before her position at the Biomedical Research Centre, she was with the Department of Pediatrics, the second largest department within the Faculty of Medicine. Sylvia also has a business master’s degree from Queen’s University.
102 Fraser River estuary species at risk of extinction, researchers warn

Nov 26, 2020, published by The Star, thestar.com, Dr Tara Martin

More than 100 animal species in the Fraser River estuary, the largest on the Pacific coast of North America, could face extinction within a couple of decades without swift multi-lateral, multi-government action, a new University of British Columbia (UBC) study warns.

“There is currently no overarching plan to save them. If we don’t act quickly, many species, including species of salmon and southern resident killer whales, are likely to be functionally extinct in the next 25 years,” senior author Tara Martin, a professor of conservation science at UBC, stated in a paper published today in Conservation Science and Practice.

The biggest challenges of reversing species’ decline are climate change impacts, competing land uses from the industrial sector, impacts on migratory animals that occur outside the region, and the political willingness and stamina to adapt conservation strategies to new data.

Under a business-as-usual scenario, two-thirds of species in the estuary are predicted to have less than a 50 per cent chance of survival.

Working with 65 experts in the ecology and species-management fields, Martin and her team have identified a string of action items as well as the benefits, costs and feasibility of species recovery.

To read the full article and Dr Tara Martin’s comments visit thestar.com/news/canada/2020/11/26/102-fraser-river-estuary-species-at-risk-of-extinction-researchers-warn.html

An Indian organization wants to grow urban forests and transform the cities we live and work in

Nov 18, 2020, published by CNBC, nbcphiladelphia.com, Dr Cecil Konijnendijk

A home to millions of people, the Indian city of Bangalore – officially known as Bengaluru – is the capital of Karnataka, a state in the south of the country.

Due to the large number of IT businesses that have offices there, some have dubbed Bangalore “the Silicon Valley of India.”

While it may be a hub for technology, the city is also home to an organization looking to green urban spaces with trees and plants.

A for-profit social enterprise set up in 2011 by former Toyota engineer Shubhendu Sharma, Afforestt, employs the Miyawaki Technique, which is named after the Japanese botanist Akira Miyawaki. In simple terms, it’s a methodology that emphasizes the importance of high-density planting and native species.

How long, then, can it take for a city to grow a forest and for the benefits – whether they’re related to the environment, cost-effectiveness or energy consumption – to be seen?

“It depends a bit where you are in the world,” Cecil Konijnendijk, from the University of British Columbia’s Faculty of Forestry, told CNBC.

“Sometimes, you’re lucky and there is already a forest and trees grow fast,” he added. “But usually – you have to be in it for the long haul: you have to develop policies, capacities, and definitely show the benefits of planting trees.”

To read the full article and Dr Cecil Konijnendijk’s comments visit nbcphiladelphia.com/news/business/money-report/an-indian-organization-wants-to-grow-urban-forests-and-transform-the-cities-we-live-and-work-in/2601668/.
Study: mountain bikes disturb wildlife more than previously thought

Nov 13, 2020, published by Men’s Journal, mensjournal.com, Dr Cole Burton

If a mountain biker rides through the forest, do the bears hear? Research out of British Columbia suggests they do and more than anyone suspected.

“We found that recreational activity is displacing wildlife and mountain bikers are doing it more than hikers and horseback riders,” says Cole Burton, the lead researcher on the study. “But we don’t know why.”

In fact, cyclists disturbed wildlife on par with dirt bikes and ATVs, says Burton, the head of the University of British Columbia’s Wildlife Coexistence Lab. The findings back up other research that suggests self-propelled recreation might not be as good for the wilds as many would like to believe.

To conduct the study, researchers set up 60 motion activated cameras in B.C.’s South Chilcotin Mountains. The region, a couple hours north of Whistler and partially protected in a provincial park, is popular with hikers, horseback riders, dirt bikes and ATVs and, increasingly, mountain bikers.

Metro Vancouver secures new conservation land, inching it closer to a regional park

Nov 9, 2020, published by CTV News, ctvnews.ca, Dr John Richardson

A large parcel of land that was originally designated for rural housing has now been acquired by Metro Vancouver, bringing the region one-step closer to creating a large, contiguous park, officials announced Monday.

The 56-hectare property, which is located north of the Codd Wetland Ecological Conservancy Area in Pitt Meadows, was purchased last year for $7.3 million.

*The task force is to bring new land parcels into the fold to protect and connect these lands along the North Alouette floodplain,” said John McEwen, chair of the Metro Vancouver Regional Parks Committee.

Metro Vancouver’s long-term vision is to create a regional park that shares borders with the Codd Wetland, Blaney Bog Regional Park Reserve and the North Alouette Greenway.

“This area, when possibly developing it fully, could rival that of Stanley Park,” McEwan said.

John Richardson, a UBC professor of forests and conservation sciences, said Metro Vancouver is taking the right approach by allowing the public to enjoy the land.

“If people are asked for their tax dollars to go into buying up land. If they see the value in it beyond just the conservation value, they will probably be more inclined to support that kind of activity,” Richardson told CTV News. “So, there are benefits to allowing public access to these areas. The downsides are, of course, if you don’t manage them correctly, they could also damage some of the sensitive areas.”

Metro Vancouver said members are developing a plan that strikes a balance between conservation and public access. A timeline has not been provided.

To read the full article and Dr John Richardson’s comments visit https://bc.ctvnews.ca/metro-vancouver-secures-new-conservation-land-inching-it-closer-to-a-regional-park-1.5181529.
Climate change has affected 2020 wine harvests around the globe. Growers are concerned

Oct 23 2020, published in The Washington Post, Dr Elizabeth Wolkovich

Years from now, when we savor wines from the 2020 vintage, what will we remember of the history captured in those bottles? A pandemic, to be sure. Social distancing, face coverings as political fashion statements in a weirdly contentious election season. The wines may carry memories of lost friends and loved ones, perhaps with a taste of PTSD on the finish.

Those wines will have been shaped by weather as tumultuous as our year has been. A mild winter led to devastating spring frosts. A hyperactive hurricane season brought heavy rains just before harvest in the eastern United States, while record-setting summer heat fueled extreme wildfires at harvest in the West. We’ve seen extreme weather phenomena before, but not so relentlessly all in one year — and with such intensity. It’s as though 2020 was the year climate change decided we weren’t listening, and it needed to throw a massive hissy fit to get our attention.

“It feels like 2020 came for the wine grapes, too,” says Elizabeth Wolkovich, an environmental scientist at the University of British Columbia specializing in how climate change affects wine. “It started with the announcement last winter of the complete failure of the ice wine harvest in Germany from the 2019 season, due to mild temperatures, to today with the fires still burning in California.

All crops are feeling the impact of this year’s weather, of course, but wine has long been a bellwether for the effects of climate change because of the sometimes subtle differences from vintage to vintage. There’s nothing subtle about this year, however.

To read the full article and Dr Elizabeth Wolkovich’s comments, visit https://www.washingtonpost.com/lifestyle/food/climate-change-has-affected-2020-wine-harvests-around-the-globe-growers-are-concerned/2020/10/23/4a111734-1476-11eb-ba42-ec6a580836ed_story.html

The Social Life of Forests


As a child, Suzanne Simard often roamed Canada’s old-growth forests with her siblings, building forts from fallen branches, foraging mushrooms and huckleberries and occasionally eating handfuls of dirt (she liked the taste). Her grandfather and uncles, meanwhile, worked nearby as horse loggers, using low-impact methods to selectively harvest cedar, Douglas fir and white pine. They took so few trees that Simard never noticed much of a difference. The forest seemed ageless and infinite, pillared with conifers, jeweled with raindrops and brimming with ferns and fairy bells. She experienced it as “nature in the raw” — a mythic realm, perfect as it was.

To read the full article and Dr Suzanne Simard’s comments, visit https://www.nytimes.com/interactive/2020/12/02/magazine/tree-communication-mycorrhiza.html
As federal and provincial governments work to advance reconciliation and renew relationships with Indigenous peoples, co-management has become an area of increasing interest. Co-management – the shared administration of natural resources and areas by Crown and Indigenous governments – brings together multiple perspectives, such as western science and traditional knowledge, and may help to build more durable solutions to resource management conflicts.

In 1993, the landmark Gwaii Haanas Agreement was signed, which committed Canada and the Haida Nation to cooperative management of Gwaii Haanas National Park Reserve and Haida Heritage Site. Over the following decades, various co-management arrangements in Haida Gwaii have advanced to include marine and terrestrial resources and areas around the islands. This makes Haida Gwaii an ideal case study for co-management.

This online professional development program is an opportunity for representatives from diverse sectors and communities of practice (e.g., Indigenous, federal, provincial and municipal government; industry; non-government) to develop the understanding, tools, and strategies required to begin and/or advance co-management initiatives, based on experiences in Haida Gwaii.

By the end of the five-day program, participants should be able to: explain what co-management is and how it has been applied in Haida Gwaii and elsewhere; summarize and analyze various approaches to co-management as they have been applied in Haida Gwaii; critically assess the perspectives, assumptions, and legal foundations underlying co-management practice; explain and analyze how power, trust, relationships, and consensus-building influence the success of co-management; and reflect on their own experience as it relates to co-management (e.g., opportunities and challenges).

Participants will need to reserve time for the classes, happening daily from 10am-1pm PST, Monday, February 8th to Friday, February 12th, 2021. Participants will also need to plan about an hour each day for time on their own to do activities that will prepare them for each daily session.

For more information, and to register, please visit: https://hginstitute.ca/professional-development/
With an eye on addressing the demand for innovative training to address global issues, the Faculty of Forestry is proud to be launching new degree and certificate programs beginning in 2021.

**Master of Urban Forestry Leadership (MUFL) Degree Program**

Applications are now being accepted for the Master of Urban Forestry Leadership (MUFL) degree program for the first cohort to begin in July 2021. This 14 month online program will be directed by world renowned expert in the field, Dr Cecil Konijnendijk, and provide students with the practical and theoretical knowledge necessary to excel as leaders in urban forestry.

“As the population of urban centres continues to grow, cities worldwide are increasingly faced with the challenge of creating and maintaining urban forests and green spaces that mitigate social, health and well-being and climate change issues,” remarks Faculty of Forestry Dean, Dr John Innes.

The program takes a multi-disciplinary approach, as the courses will be offered by UBC’s Faculty of Forestry, the Sauder School of Business, and the School of Public Policy and Global Affairs. Graduates from this program will have a combination of skills rarely offered by a single degree program.

For more information about MUFL, visit: https://forestry.ubc.ca/programs/graduate/professional-masters-degrees/master-of-urban-forestry-leadership/.

**Graduate Certificate in Forest Management & Conservation (FMC)**

Today’s sustainable forest management practices must factor in political, legal, administrative, business, scientific and First Nations land stewardship considerations. UBC Forestry’s new Graduate Certificate in Forest Management & Conservation (FMC) program addresses the need for global learners looking to advance their knowledge and expertise in this area.

With classes to start in September 2021, this fully digital, customizable, graduate-level certificate will allow working professionals to complete their training in two years or less. Students will leverage new technology and use science-based practices to learn how to sustainably manage forests in rapidly changing social and political environments.

To learn more about the FMC, visit https://forestry.ubc.ca/graduate-certificate/.

For questions or more information about this program, contact Julie Morey, Admissions Coordinator, at forestry.gradcertificates@ubc.ca.

**Climate Vulnerability & Adaptation (CVA) Micro-Certificate**

With government and certification agencies requiring more accountability in meeting climate change vulnerability and adaptation standards, the Climate Vulnerability and Adaptation (CVA) program offers working professionals a great option. Only 10 weeks in duration, the micro-certificate will deliver training for those who wish to advance their knowledge base in the area in a convenient, online format.

Ideal for natural resources professionals, the micro-certificate has been designed and will be taught by seasoned experts who have worked extensively with the resources sector and governments and organizing training and workshops on the topic area. Students will leave with an interdisciplinary understanding gleaned from real-world application, such as industry case studies in sustainable forest management and linkages between the science-management-business case interface.

Applications are now open until January 31, 2021 for the program starting on February 15, 2021. To learn more about the CVA, visit https://forestry.ubc.ca/micro-certificate/.

For questions or more information about this micro-certificate program, contact Jorma Neuvonen, Assistant Dean, Professional Education and International Collaboration at Jorma.neuvonen@ubc.ca.
This year, UBC Faculty of Forestry developed new Equity, Diversity & Inclusion initiatives such as workshops, webinars and more.

In March, the Faculty hosted Forests Summit 2020, an event which brought together experts from diverse backgrounds from around the province to create a shared vision for BC’s forests. Former BC Premier Mike Harcourt pictured.

The Faculty started a research webinar series featuring the faculty’s professors such as Dr Suzanne Simard who spoke about The Mother Tree Project. The series will continue in 2021.

Fall Branchlines featured a research piece, also picked up by media, on community forest perspectives and engagement in wildfire management.

The Faculty announced the launch of the Master of Urban Forestry Leadership (MUFL) program as well as 2 new online certificate programs. Applications are now open for 2021 classes.

The 2020 Marcus Wallenberg Prize Awarded to Dr Nicholas Coops for his work in satellite imagery analysis and modelling.

Dr Nicholas Coops, professor and Canada Research Chair in Remote Sensing, is part of a research team that won the 2020 Marcus Wallenberg Prize (MWP). Considered the ‘Nobel Prize of Forestry,’ the MWP is the world’s highest recognition for excellence in forestry research.

UBC Forestry
This fall, Dr Scott Hinch was named a Fellow of the Royal Society of Canada in the Life Science Division. The award recognizes scholars, artists, and scientists, peer-elected as the best in their field.

Dr Richard Hamelin and his team received wide media attention this summer due to a DNA portable detection device they developed. The device can be used in the field to identify invasive species in Canadian forests.

The research behind the story in this Branchlines issue, Fraser River Estuary in Need of Intensive Urgent Care was featured across Canada in the Globe and Mail this fall.

In 2020, Dr Lori Daniels continued to be a sought-after, internationally recognized media expert on wildfire management and environmental protection.

In Fall Branchlines, UBC Forestry researcher Jacqui Sunderland-Groves detailed her work in Indonesia where she investigated the long-term survival success of endangered Bornean orangutans.

Featured in Fall Branchlines, UBC Forestry researcher Jacqui Sunderland-Groves detailed her work in Indonesia where she investigated the long-term survival success of endangered Bornean orangutans.

Dr Kathy Martin received the Nancy B. Cutler Citation of Excellence: Women in Science and Technology award, recognizing her invaluable role in furthering conservation science in Canada.

Summer Branchlines featured the work of Dr Orlando Rojas and his team who developed what was thought to be the first locally sourced biodegradable N95 mask in Canada and possibly the entire world.
The 20th Commonwealth Forestry Conference will be unlike any other in its 100 year history. For the first time ever, delegates will be able to join the Conference virtually from their home locations throughout the Commonwealth and beyond to share forestry knowledge and experience.

The Conference, held every four to five years, was originally slated to next occur here at the University of British Columbia at our Vancouver campus. However, due to the COVID-19 pandemic, organizers decided to hold the conference online to ensure the safety and convenience of all participants.

“We are welcoming the general forest community from government, industry, academia, and other civil and environmental organizations from all corners of the globe, and thus believe it is the wise and responsible choice to hold the Commonwealth Forestry Conference virtually in 2021. It will make planning easier and more certain for the delegates, and open up some exciting, new opportunities for information sharing, participation, and connection that in-person conferences simply cannot offer,” says Dr John Innes, Commonwealth Forestry Association president and Dean of the Faculty of Forestry at UBC.

The CFA Conference originated a century ago and was the precursor to many of the global forestry meetings we see today. The Conference has brought widespread awareness of forest resources around the globe, and introduced strategies for its use and long-term sustainability. Today, the Conference has a reputation of being a global forestry event which brings together a wide representation of forest practitioners and natural resources managers, scholars, decision makers, and change influencers.

“We are in an era of both great change and vast opportunity. The CFA is extremely excited about celebrating 100 years of advancing forestry knowledge with the Conference while looking forward to the many possibilities that future such Conferences will bring,” remarks John.

The Conference will be held online between August 16-19, 2021. Please visit cfc2021.ubc.ca for more information.
Coastal ecosystems are increasingly threatened by climate change, and human activities in the oceans and on the land, yet significant gaps still exist in managing the impacts of these pressures around the world.

Efficient conservation investment requires linking dominant pressures to management actions that best address the particular drivers of impacts.

In recent research, we rebuilt global cumulative impact maps by stressor (climate change, marine, and land) to identify regions and ecosystems where existing coastal marine management may be insufficient in the face of global climate change or land-based human activities. We found average cumulative impacts from non-marine stressors (climate and land) are double those of marine impacts at a national level, largely driven by pressures from climate change.

Pacific Island countries showed the greatest impacts for climate stressors; West Asian nations bordering the Caspian Sea and Russia for land-based stressors; and European, Caribbean, and African countries for marine activity impacts. Across stressors, coastal ecosystems are the worst affected, with total impacts twice those of offshore ecosystems. More than 11 million km² of coastal ecosystems are currently affected by intense levels of impacts from land-based development alone. Some of the worst impacts from combined land and climate stressors are experienced by coastal wetland ecosystems – saltmarshes and mangroves – suggesting management is needed to maintain these highly efficient natural carbon storage environments.

Dr Vivitskaia Tulloch is a postdoctoral fellow in the Faculty’s Department of Forest and Conservation Science. She can be reached at v.tulloch@ubc.ca.
The ever-increasing impacts of climate change are degrading ecosystems, disturbing the economy, and leading to the loss of lives and livelihoods. Considerable resources are being invested globally towards managing and conserving biodiversity and ecosystems – humanity’s first line of defense against climate change and environmental risks. However, conventional conservation strategies focused on resisting changes and maintaining historical or current ecological conditions may be ineffective in dealing with changing environmental conditions. For example, protected old-growth forests are at risk from more frequent wildfires and insect outbreaks, and endangered species reintroduced to historically occupied areas are more likely to encounter unsuitable (or less suitable) climate and habitat conditions.

Scientists and practitioners worldwide are proposing new, transformative interventions aimed at managing for changes and, when appropriate, driving or even accelerating transitions towards new, more climate-adapted ecological conditions. Examples of such novel interventions include the design of transitory protected areas, the creation of new migration corridors, and species translocation. However, while these propositions could help ecosystems and society adapt to climate change, they also involve uncertainties, risks, and complexities that make them contested within the conservation community.

Proponents of transformative conservation are increasingly concerned that the changes required to conserve biodiversity in the context of climate change have not yet been integrated into practice. The little evidence available suggests that most conservation actions still focus on conventional goals to resist climate change impacts. However, few efforts have been made to categorize on-the-ground adaptation projects to assess which actions are being implemented and how these actions vary by ecosystems. None have assessed how transformative (or not) these actions are in adopting a future-looking approach.

Our interdisciplinary research team – Dr Lauren Oakes and Dr Molly Cross from the Wildlife Conservation Society (WCS), and Prof Shannon Hagerman and myself from the Faculty of Forestry at the University of British Columbia – took a critical first step towards addressing this gap. In a recent study, supported by the Doris Duke Charitable Foundation and in partnership with the International Union for Conservation in Nature (IUCN) Species Survival Commission—Climate Change Specialist Group, we developed a novel typology that enables the empirical assessment of whether, and to what extent, a shift toward transformative action is occurring in practice. Our typology, referred to as the R-R-T (Resistance-Resilience-Transformation) scale, consists of six categories representing a continuum spanning from actively or passively resisting changes to maintain current or historical conditions; to increasing resilience by improving the capacity of a system to return to desired conditions after disturbance; to allowing, directing, or accelerating transformation towards new, more climate-adapted conditions. Our team applied the R-R-T scale to 104 climate adaptation projects funded since 2011 by the Wildlife Conservation Climate Adaptation Fund – the largest funding program focused solely on implementing adaptation actions for biodiversity conservation in the United States (USD $2-2.5 million/year).
Our results, recently published in *Nature Communications Biology*, suggest a shift towards transformation over time and differential responses across ecosystems. Projects supported in the early years of the Fund focused primarily on conventional goals (i.e., resistance or resilience). In contrast, recent projects were more likely to involve transformative actions. More resistance projects occurred in deserts, grasslands, savannahs, and inland aquatic ecosystems, whereas most transformation projects involved the translocation of trees or other plants in forest ecosystems. That said, we observed transformative actions across all ecosystems, for example, the translocation of seabird species to habitats where they are expected to prevail.

There is no doubt that conservation strategies aimed at resistance or resilience are valuable in specific contexts. However, it is becoming clear that the conservation community needs to adopt future-looking practices to help ecosystems adapt to a changing world, where warmer temperatures, more frequent and intense natural disasters, and shifts in species distributions are the new normal. There will always be risks associated with intervening in ecosystems, but business-as-usual approaches that fail to consider climate change may ultimately become the riskiest conservation options.

Our application of the R-R-T scale to the case study of WCS-funded projects provides evidence of a shift towards transformative conservation that adopts a future-looking approach. Whether this trend is becoming mainstream in the broader field of conservation remains an unanswered question. Our research team is interested in creating an online platform for tracking conservation projects assessed with the R-R-T scale worldwide — we warmly welcome collaborations with other conservation scholars and practitioners.

Guillaume Peterson St-Laurent is a postdoctoral fellow with the Faculty’s Social-Ecological Systems Research Group which is led by Dr Shannon Hagerman. He can be reached at guillaume.peterson@ubc.ca.
In the early morning hours of October 29th, we debuted our book *Operationalizing Landscape Approaches in the Tropics* at the Global Landscapes Forum (GLF) Biodiversity Digital Conference. We were joined by over 600 researchers from around the world who attended the virtual launch.

Chronicling two years of research in Ghana, Indonesia, and Zambia, the book details Collaborating to Operationalise Landscape Approaches for Nature, Development and Sustainability (COLANDS) – a joint initiative between the Centre for International Forestry Research (CIFOR), the University of Amsterdam, and the University of British Columbia’s Faculty of Forestry that highlights how integrated landscape approaches can address the challenges of land and resource management in multi-functional rural landscapes.

Simply defined, landscape approaches facilitate multiple stakeholders coming together to identify and negotiate synergies and trade-offs at each site, ideally resulting in more sustainable and equitable land and resource management. The approach recognizes the need for integrated solutions to interconnected social and ecological challenges, such as biodiversity loss, food security, and poverty.

The COLANDS initiative seeks to operationalize landscape approaches in three tropical landscapes in Zambia, Ghana, and Indonesia. A team of local scientists and government and community partners work together in each country, with support from team members in Canada, the United Kingdom, and the Netherlands.

Context is key. Each landscape has a unique set of social and environmental needs, meaning landscape approaches will likely manifest differently in each site and are dependent on the objectives defined by the local context and
stakeholder needs. However, some of the overarching questions we are exploring include: what are the priorities of stakeholders and how do they align? Will increased collaboration lead to sustainable use of natural resources? Do existing governance structures and policies enable and foster collaboration between stakeholders? How do we monitor and evaluate these processes? What are the major trends across sites that contribute to land use change?

We hope the sum of our activities, as presented in our recent publication, provides guidance and lessons learned for other initiatives alike given the ubiquity of landscape approaches in the current academic and development narrative. In essence we are seeking to report confidently on what has worked in terms of implementation, but just as importantly, what has not.

Download the book here: https://www.cifor.org/knowledge/publication/7800/

Alida O’Connor is a PhD student in the Sunderland Lab and member of the COLANDS team. Dr Terry Sunderland is a professor in the Department of Forest and Conservation Sciences and Senior Research Associate at CIFOR. He can be reached at terry.sunderland@ubc.ca.

“Context is key. Each landscape has a unique set of social and environmental needs, meaning landscape approaches will likely manifest differently in each site and are dependent on the objectives defined by the local context and stakeholder needs.”

Multi-stakeholder workshop in Kalomo District, Zambia
Across ecosystems, whether rain forests or deserts, species are experiencing dramatic environmental change. Alpine habitats, along with the Arctic, are experiencing climate change at a greater rate than anywhere else on earth. These habitats, with fluctuating temperatures and frequent storms, are already a challenging environment for breeding birds. Under a changing climate, these challenges are becoming more pronounced and unpredictable. For the future of alpine birds, two pressing questions are: how do birds breed successfully under current conditions, and what capacity do birds have to respond to increasingly variable weather?

Field research conducted on horned larks (*Eremophila alpestris*) in northern British Columbia has demonstrated that understanding the resilience of alpine breeding birds requires context. Breeding behaviour and success are influenced by conditions such as the timing, severity, and duration of weather events. During incubation, female birds must balance warming eggs with leaving the nest to forage for survival. Previous work by Elizabeth MacDonald (MSc, University of British Columbia, Faculty of Forestry) showed that severe storms can drive some females to leave the nest for prolonged periods, shifting investment to self-maintenance and leading to nest failure. Cold storms (precipitation and extreme cold) produce an 800% increase in nest failure compared to "warm storms" (Kathy Martin, Professor, UBC Forestry). During the nesting stage, larks can cope with single day storms, but multi-day storms are associated with a decrease in offspring growth. In all cases, the threshold dictating when, or if, a shift from parental care to self-maintenance occurs varies. Thus, individuals within a population show pronounced variation in resilience to suboptimal weather.

My recent work suggests parents can protect their nestlings from the prevailing conditions. Early in the season, when conditions are particularly harsh and unpredictable, high-quality females raise larger offspring quickly. However, females in poor condition have nestlings with slower growth and reduced survival. Predation risk is another environmental stressor. Adults leave the nest to avoid attracting predators, disrupting the amount of food supplied to nestlings. Once the threat has abated, high-quality parents increase the amount of food they provide to make up for lost time, allowing normal offspring growth to resume. Poor-quality parents do not or cannot compensate, resulting in smaller offspring with reduced probability of survival. Having evolved in a fluctuating environment, alpine birds appear to have impressive flexibility. However, if this is dependent on individual condition, then climate stressors that influence parental condition prior to breeding could limit the ability for birds to respond to climate change effects.

Most alpine breeding birds are migratory, spending about 70% of the year at lower elevations and latitudes (i.e., non-breeding sites). Climate stressors during this season have the potential to impact parental condition and thus their ability to cope with a challenging environment upon arrival at the breeding site. During northward migration, larks spend considerable time at stopover sites in the northern Columbia plateau and southern Okanagan. If they encounter extreme cold, the negative impacts carry over to the alpine breeding site, resulting in reduced nest success and nestling growth. Cold-stressed adults arriving in poor condition may need to reduce reproduction efforts. This mismatch in environmental conditions at breeding and non-breeding sites may reduce the ability of alpine songbirds to respond to climate change.

Alpine bird communities are special, with diverse species and characteristics shaped by unique evolutionary histories. What will future conditions be like for alpine birds? Currently, alpine birds show impressive coping abilities. Flexible behaviours and warmer conditions that prolong breeding seasons may be beneficial for species in the short-term. However, long-term changes in climate will eventually reach a threshold where alpine birds can no longer persist without significant adaptation or novel conservation efforts.

Devin de Zwaan is a former PhD student from Kathy Martin’s lab in the Forest and Conservation Sciences department and is currently a postdoctoral fellow with Environment and Climate Change Canada. For more information drdezwaan@gmail.com.
Estuaries are some of the most at-risk places in the world – and the Fraser River estuary is no exception. Our study found that there are 102 species at risk in the Fraser River estuary, but it’s not too late to save them. Historically, the Fraser River was home to the largest salmon runs in the world. These days, an impressive number of fish still frequent this rich ecosystem. Millions of juvenile salmon spend weeks to months in the estuary before embarking on their ocean migration (however most do not successfully make the return journey home). Above the water, 1.4 million birds stopover in the estuary’s shores at peak season. However, everything is not well in the Fraser – annual salmon returns and bird numbers have been declining for decades and are at record lows.

This region isn’t just crucial to wildlife, humans need healthy estuaries too. Coast Salish First Nations communities have lived in, and found both spiritual and physical nourishment, from the Fraser’s natural resources for millennia. Today, this resilient and diverse estuary is host to the busiest port in Canada; home to half of British Columbia’s rapidly expanding urban population; and is particularly vulnerable to sea-level rise and continued industrial development.

The need for a costed prospectus to deliver long-term ecological resilience to this highly contested region has never been more urgent. Our study delivered exactly that. We found that there are 102 species at risk of extinction in the Fraser River estuary, and that a suite of conservation strategies from aquatic habitat restoration to better farmland management are needed to save them from extinction.

The comprehensive action plan that we developed is estimated to cost $381M over 25 years, or $15M a year to implement. This might sound like a lot, but it is only $6 per Vancouverite annually – the cost of one measly beer a year. It’s a drop in the ocean compared to the $26M per year that whale tourism earns in the Salish Sea and the $300M per year that fisheries in the estuary were estimated to be worth in the 1990s. If we all raised a toast to the Fraser, we could save it.

On the other hand, if we don’t take strong action to conserve the Fraser River estuary, two-thirds of the species at risk in this region are predicted to have less than a 50% chance of survival. Many of the region’s most iconic species could disappear, including the Southern Resident Killer Whale, salmon, sturgeon, and a raft of internationally recognized migratory birds.

Our action plan also includes an environmental co-governance model that sees First Nation, Federal and Provincial governments working together with municipalities to implement these cost-effective strategies and ensure their success. We found that co-governance was critical to successful conservation outcomes – as it increased the feasibility of all of our conservation actions.

Our research shows that conservation combined with strong governance is a pathway for a brighter future in highly contested regions and that the return on investment likely offsets the cost of management. In a world of rapid urban sprawl and ongoing biodiversity declines, our methodology identifies the most cost-effective strategies to conserve nature in areas important to both humans and wildlife. We have the tools to conserve the many wonders of the natural world, but we must employ them while there is still time to act.

Dr Laura Kehoe is a former postdoctoral fellow in the Conservation Decisions Lab, and is now at Oxford University and The Nature Conservancy. Dr Tara Martin is Liber Ero UBC chair in Conservation, and head of the Conservation Decisions Lab. For more on what we do visit https://www.taramartin.org.
We are all familiar with the Brothers Grimm story of a goblin that can convert a biobased resource, straw, into gold. This action would be the prototypical definition of upcycling – taking a lower value resource and creating new, higher value materials. While this fairytale of gold from plant materials is far from reality, the idea of upcycling is an important one for the emerging bioeconomy. For example, during the chemical pulping of wood for papermaking, lignin is removed from the cell wall and transferred into the pulping liquor. Lignin has an important structural function for the tree, but once extracted it is typically burned in the pulping liquor to recover the energy content. This process helps in the recycling of pulping chemicals and provides energy for the paper-making process. However, many companies have been considering recovering a portion of this lignin from the pulping liquor to upcycle it. Industry is looking into new biobased materials that could help the bottom-line of the company by providing a suite of potentially carbon neutral bioproducts. Moreover, stored carbon in materials is increasingly being recognized as an important component when addressing climate change.

In the Advanced Renewable Materials Laboratory, we have been spinning lignin into fibrous materials with interesting characteristics. For example, by using a process of electrospinning – where high voltage is used to help draw fibre smaller than a spider silk filament – the lab forms tissue-like nonwoven materials with lignin that is 100-1000x smaller in diameter than a human hair. Nonwoven fibre is a type of entangled fibre material usually used in applications such as medical gowns or some reusable grocery bags. It has recently been of global interest because nonwoven fibers are a critical layer in N95 masks. Post-doctoral fellow, Dr MiJung Cho has been leading the effort of spinning lignin since doing her PhD when she studied the spinning and carbonization of lignin for composite applications. After completing her PhD, she went on to create an ingenious method to make shape-memory 3-D foam-like materials from this fibre, requiring no other additives. She currently holds a fellowship to work with a consortium of B.C’s pulp and paper companies (BC BioAlliance) and has been conducting research on the conversion of lignin from B.C. pulp mills into filtration media to determine if they would be effective in blocking the passage of small particles.

While tiny electrospun fibres are known to be excellent for filtration media with their large amount of surface area, the Advanced Renewable Materials Laboratory received a NSERC COVID-19 Alliance grant to research if lignin fibres have anti-viral capacity. The Lab includes collaborators in Wood Science, Chemistry, Chemical and Biological Engineering, CHBE and Biochemistry. If successful, the Lab is excited to contribute research that may help create personal protection equipment. Canada’s pulp and paper sector would have a specific application that could quickly turn lignin into “gold”. Hence, if the fibres are shown to be effective in filtration and can be scaled-up efficiently, the research would meet the triple bottom-line of sustainability by impacting the social, environmental, and economic outcomes.

Scott Renneckar is the Canada Research Chair in Advanced Renewable Materials and program director of Forest Bioeconomy Sciences and Technology. He can be reached at scott.renneckar@ubc.ca. MiJung Cho is a postdoctoral fellow at the Advanced Renewable Materials Lab. She can be reached at mijung.cho@ubc.ca.
Since the turn of the century, cities have grown upward and outward as urban populations increased. Although urban development can enable prosperity, education, and culture, it may also negatively impact human health with increased levels of air pollution, noise, and crowding. Green spaces, which are urban areas that include trees or other vegetation, can mitigate negative impacts of urbanization by providing various ecosystem services, such as heat reduction and air purification, as well as improve public health and wellbeing.

Despite ongoing research that continues to emphasize the importance of green spaces, the understanding of long-term urban vegetation (i.e. greenness) dynamics across Canadian cities is limited. Studies to date have typically focused on the current state of urban greenness in individual cities, using variable methods that limit regional comparisons.

In partnership with Dr Nicholas Coops in the Integrated Remote Sensing Studio and colleagues at the Canadian Forest Service, I developed the urban greenness score, which is a comprehensive and accessible framework to understand the current state of urban vegetation and its historic change. The data used for this framework is based on regionally calibrated green vegetation fractions extracted on a yearly basis from the open and longstanding Landsat satellite imagery archive. Using these annual fractions, the multi-decadal change in greenness was calculated and classified as either a negative, positive, or no change. The current state of greenness describes the most recent green vegetation fraction and is classified as a relatively low, moderate, or high level.

I applied the urban greenness score on the neighbourhood level to 18 major Canadian urban areas from 1984 to 2016. My results showed that Canadian urban greenness overall decreased since 1984 and exhibited a moderate level of greenness in 2016. However, greenness changes were mostly located along the city’s edge with localized pockets within the urban core, which emphasizes the close link between urban development and vegetation.

Regional differences in urban greenness and its long-term change were also apparent using the urban greenness score, whereby the Prairies observed the greatest increase in greenness while Central Canada experienced the greatest loss. Despite a decrease in greenness on the west coast, including in Vancouver, greenness levels generally remained relatively high by 2016. Further city level patterns of the urban greenness score highlight the complexity of intra-urban greenness dynamics that are influenced by varying historical and ongoing factors, such as municipal planning, housing demands, or individual homeowner decision making.

At a relatively low cost the urban greenness score provides succinct and reliable information about long-term urban vegetation dynamics across Canada. It is also readily available to implement in cross-regional interdisciplinary research, such as epidemiological studies that analyze changes in health status in relation to urban vegetation dynamics.

City officials can also take advantage of this otherwise unavailable Canada-wide urban vegetation information to enhance strategic, evidence-based, and sustainable urban plans and policies. Residents are able to access the urban greenness score information to see how vegetation in their own neighborhood and city has changed over the past thirty years. With continued updating, the urban greenness score has the potential to serve as an open-access and consistent monitoring tool to better understand how cities and its vegetation change over time.

Agatha Czekajlo is a recent MSc graduate of the Integrated Remote Sensing Studio with Prof. Nicholas Coops. She can be reached at a.czekajlo@alumni.ubc.ca.
Faculty of Forestry alumnus Charles Backman, BSF 1976, MBA 1986, is currently working on his sixth university degree, despite retiring in August 2020. Charles is also the third generation of a B.C. forestry family with a history going back to the early 1900s.

Charles’ grandfather Carl Backman emigrated from Sweden in 1906, and worked in the coastal forest industry. UBC alumnus Gerry Burch, BASc 1948, recalls meeting Carl in 1947. “All falling was done by hand and paid by piece work. Carl’s reputation was that his team earned the highest wages in any camp they worked.”

Carl’s son Bill received a Bachelor of Applied Science (specializing in Forest Engineering) from UBC in 1943. In his final year at UBC he was elected treasurer of the AMS. Bill took a job with Bloedel Steward and Welsh Ltd. after graduation and began a long and successful career.

In 1947 Bill married Elizabeth Anderson, BA 1946, BSW 1947. Charles, their only child, was born in 1953.

Later in his career, Bill became chief forester of Columbia Cellulose, and in his final year before retirement also served as president of the ABCPF. Bill returned to UBC to obtain an MSc Forestry in 1993, at the age of 74.

Bill’s son Charles considered studying science or engineering at UBC, but, “I guess family influence led me into forestry,” he says. Charles received a BSc in Forestry in 1976 and started working for MacMillan Bloedel, coincidentally at the same camp his father had managed 20 years before.

Later, management training led Charles to return to UBC for an MBA, which he received in 1986. In the late 1980s, as Perestroika and glasnost took hold in the Soviet Union, Charles became interested in the impacts on Russian forestry and international trade. Working with faculty members at the University of Washington, he developed a program of graduate research that would take him to Russia and many other countries.

He received an MA in International Studies in 1990 and a PhD in Forest Resource Management in 1993. He then worked in Austria on a sustainable development project focusing on Siberian forest resources for nearly four years, returning to Vancouver after his father had had a stroke.

After Bill died in 1998, Charles accepted a position in the forestry program at Grande Prairie Regional College (GPRC), where he remained for the rest of his career. “The program was very practical and hands-on, and as a result most of our students had job offers before the start of their last term,” he says.

The 2004-05 economic downturn led to the program’s closure, so Charles pivoted to his skills in international trade and resource development as an instructor in the Business Administration program. By 2006 he was keen to learn more, so he began a PhD in Strategy and Global Management at the University of Calgary.

In 2017 Charles received his fifth degree, after many years of juggling the obligations of family, college, and university. Charles’ mother Elizabeth died in 2016.

During their lifetime Bill and Elizabeth established the Backman Scholarship in Forest Resource Management and the Elizabeth Backman Scholarship in Natural Resources Conservation. Charles has been proud to contribute to these awards since his parents’ deaths.

In August 2020 Charles retired as Chair of the Business and Office Administration Department at GPRC. Today, he is pursuing a Master of Science in Quantitative Finance at the University of London, using online learning. “I wanted a program that would be robust, that would force me to focus,” he says. “This degree allows me to keep learning.”

Charles is proof that learning is both limitless and ageless. And through the two-family scholarships, he is supporting other students in following their dreams.
Two graduate students researching forest entomology and pathology are the inaugural recipients of the **Imre S. and Irena Otvos Graduate Scholarship in Forestry**. Debra Wertman is researching bark beetle fungus associations in red alder, and Brian Duarte is studying the structure and behaviour of white pine blister rust fungus.

Debra is in her third year of PhD studies, having received a BFA, BSc, and MSc from University of Victoria. "I was in the co-op program at UVic, and got a placement at the Pacific Forestry Centre. I was working on bark beetles, and it was a wonderful intersection of my interest in insects and the visual and physical work of unwrapping layers, dissecting, using tools, and building equipment;" she says.

Debra’s research investigates a potential mutualistic relationship between the alder bark beetle and a fungus that is a unique bark beetle associate as it is unlike typical “blue-stain” fungi. “One of my hypotheses is that the fungus is nourishing beetle larvae – we see this in conifer-infesting species – but so far that’s unclear. I’m also investigating a possible function of the fungus in weakening the tree so it’s easier for beetles to invade,” she says.

Brian Duarte is a recent transplant from Toronto, where he received a BSc from U of T, majoring in evolutionary biology and neuroscience. “I really enjoyed the undergraduate research I did, and I wanted to go further,” he says. “I discovered Prof. Richard Hamelin’s lab and was really excited by what’s happening there.”

Brian’s research involves microscopic documentation of the morphology and behaviour of white pine blister rust fungus. “I’m working on a photographic series that documents a timeline of fungal behaviour and host specificity” he says. “This is an important steppingstone, because it will help other scientists better understand how this pathogenic fungus infects its hosts.”

Dr Imre Otvos established the scholarship, which also honours his late wife Irena, in 2018. Imre is recognized as one of the foremost forest entomologists in Canada, and is the author of over 115 publications.

He is an alumnus of the Sopron Faculty at UBC, a cohort of 200 students and 14 faculty members of Sopron University who fled Soviet-occupied Hungary in 1957 (after the failed uprising in 1956). The faculty operated alongside the Faculty of Forestry, but with instruction primarily in Hungarian. Imre received a BSc Forestry in 1961, the last class graduating from the Sopron Division.

Imre says his future in forest entomology was cemented during a small group oral exam on the subject, in which he not only answered all his questions correctly but also answered those of other students when they were stumped. “I had been planning to get a master’s degree in forest products. The professor said I should consider forest protection instead, since it seemed I had some talent in entomology!”

Imre continued his studies at the University of California Berkeley, receiving an MSc and PhD in entomology. While at Berkeley he met his wife Irena, who was originally from Poland and had studied at the University of London, the Sorbonne in Paris, and University of Madrid.

“I want to thank the Otvos family for this opportunity, and the Faculty of Forestry for their support.”

After a long and successful career, Imre retired in 2009. He and Irena had long considered establishing a scholarship, but after she passed away in July 2018, “my intention crystallized more,” he says. "I wanted to include Irena’s name in the title because we were equals in education, intellect, and in our marriage.” The Faculty of Forestry has provided matching funds for this award.

Both Brian and Debra are grateful recipients. "It means the work I am doing is valuable," Brian says. "It also gives me some breathing room in my budget." Debra agrees. "I want to thank the Otvos family for this opportunity, and the Faculty of Forestry for their support.”

*Your gift to the Faculty of Forestry can have an enduring impact on the lives of students, decades into the future. To find out more about establishing a student award, please contact Marie Labitte at marie.labitte@ubc.ca or 604-827-2314.*
The traditional approach to conservation science is to observe and model the impacts of threats (e.g., logging, mining, fishing, climate change) on species and their habitats, publish a paper of the findings in a peer-reviewed journal, and hope that policymakers will take action.

Tara Martin believes this approach is not enough, and that scientists must go further to offer practical solutions and blueprints for conservation action. With hundreds of species at risk and limited amounts of time and money, policymakers need expert guidance on how to use resources most effectively and invest where the likelihood of success is greatest.

Since 2018, Tara’s research has been transforming the way conservation research happens in British Columbia and beyond. Using a tool called Priority Threat Management, Tara and her team have combined robust empirical data with expert knowledge to offer prospectuses for conservation in B.C., Saskatchewan, New Brunswick, Australia, Indonesia, and Antarctica.

In this webinar, Tara will use her recent work on the Fraser River Estuary as an example of this innovative approach. With 102 species at risk in the estuary, Tara and her colleagues have studied the impacts of current and future development projects and created a clear action plan – with price tags – for conserving each of them.

Take part in this presentation from the UBC Faculty of Forestry’s Professor Tara Martin, followed by a Q&A moderated by UBC’s President & Vice-Chancellor, Professor Santa J. Ono. By the end of this webinar, you should have a better understanding of how to frame conservation problems as well as the research and decision-making processes used to successfully solve them.

Registration will open January 6, 2021.

About the Speaker
Dr Tara Martin is the Liber Ero UBC Chair in Conservation and a Professor in Conservation Decision Science in the Department of Forest and Conservation Sciences. She leads the Martin Conservation Decisions Lab in the Faculty, where she supervises 12 graduate students and works with a wide range of collaborators and supporters.

Tara is a member of the International Union for Conservation of Nature Climate Change Specialist Group and co-leads the Climate Adaptation Theme. She holds a PhD in Ecology from the University of Queensland, Australia.

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