



We Stand for Wildlife



Our Fellows hit the ground running

Early career scientists studying everything from acid rain recovery in northern lakes to polar bear population shifts in response to climate change are helping to expand our knowledge of the natural world and how to protect wildlife and wild places in Canada.

WCS Canada's Weston Family Boreal Research Fellowships program supports the work of early career conservation scientists. These graduate-level students are undertaking scientific research projects in northern Canada that help answer important questions about the health of ecosystems, wildlife populations and how nature is responding to a rapidly changing climate. WCS Canada scientists help mentor these students and provide advice and feedback on research based on their own deep field experience. The Fellows' research also helps to advance WCS Canada's conservation goals.

Thanks to the support of The Weston Family Foundation, this program is now in its 12th year of supporting the next generation of conservation field scientists. This year, we have 13 fellows working on projects from British Columbia to the far north in Ontario. Below are some brief descriptions of their research projects. Be sure to check out WCS Canada's [Instagram](#), [Facebook](#) and [Twitter](#) feeds as our fellows share more about what they are up to and their encounters — from bugs to bears.

We are also profiling the work of one of our former Fellows — Dr. Clayton Lamb — to illustrate how supporting the work of early career scientists can pay rich conservation dividends.

Juliana Balluffi-Fry (PhD candidate, University of Alberta) is studying the diet and nutritional ecology of the snowshoe hare — a keystone boreal herbivore — in the southern Yukon. Populations of generalist herbivores like the snowshoe hare are limited by the availability of multiple types of nutrients and minerals,

but the complexities of their dietary requirements are not yet fully understood. With climate change warming the boreal forest, nutrient availability and plant communities are expected to change. By understanding the exact nutritional requirements of the diet-sensitive snowshoe hare, we can better anticipate the effects climate change will have on this keystone species.



Jocelyn Biro (MSc candidate, Wilfred Laurier University) is studying moose habitat in the aftermath of wildfires and forest harvesting in central British Columbia. Her focus is on how the amount and nutritional quality of food for moose develops through time after these disturbances. Moose population changes in BC have implications for cultural and economic harvest opportunities, as well as the management of other species like caribou. Jocelyn's research will be used to better understand the factors contributing to moose population changes and inform moose habitat management in light of increasing disturbances driven by climate change and resource development.



Brooke Carroll (MSc candidate, Laurentian University) is studying the potential impacts of highway and transmission line developments on turtles and plants in the Indigenous traditional lands of the Magnetawan First Nation. Using radio telemetry, Brooke will investigate the presence of turtles in disturbed and undisturbed sites while also looking at plant diversity within these sites (including medicinal plants). Her project will provide site-specific data that can be used to inform decision-making, habitat protection and recovery actions for these turtle and plant populations. This research will be done collaboratively with the First Nation community and will employ a [two-eyed seeing approach](#) to maximize the combined strength of Indigenous and Western science ways of knowing.



Nicole Corbiere (MSc candidate, Laurentian University) is looking at the links between permafrost thaw and changes in the amount of inorganic mercury and methylmercury in soils. Her research is focused on the Old Crow Flats area in Yukon and will assist the Van Tat Gwitchin as they develop traditional-knowledge-based climate and environmental change monitoring programs.



Rachael Grove (MSc candidate, University of Western Ontario) is investigating the transfer and accumulation of methylmercury in migratory songbirds in two Boreal wetlands in northern Ontario. Long-distance migratory songbird populations are declining and methylmercury (the most toxic form of mercury) exposure is a potential contributing factor. Billions of songbirds spend their summer breeding season in the Canadian boreal forest and feed upon insects living in wetlands, where methylmercury can form. This project is looking to see if climate warming will increase the amount of methylmercury birds are exposed to in boreal wetland environments.



Oliver Holt (MSc candidate, University of Northern British Columbia) is looking at the relationship between predator diets and caribou distribution in northwest British Columbia and southern Yukon. His research is designed to improve our understanding of how shifts in predator diet and caribou distribution signal underlying ecological changes within the northern boreal mountain ecosystems that could lead to future declines of Northern Mountain caribou. Oliver is working in partnership with Indigenous and non-Indigenous governments to support ongoing efforts to better understand the influence of landscape alterations (e.g. resource development) and climate change on the future of Northern Mountain caribou.



Nicole Humeniuk (MSc candidate, University of Alberta) is using ethnographic methods to document traditional ecological knowledge from the Champagne and Aishihik First Nations and the Kluane First Nation with the goal of braiding together this knowledge with the extensive Western scientific information that has been gathered through long-term monitoring in the Kluane Lake area. This project will have a particular focus on traditional ecological knowledge regarding snowshoe hare and lynx in hopes of broadening our understanding of this important predator-prey cycle.

Other focal species will be determined by community members. A deeper understanding of the roles different animals play in the boreal forest will help us to create more informed management strategies to better protect this important ecosystem.



Adam Kirkwood (PhD candidate, Laurentian University) is researching the effect of permafrost thaw and related landslides on mercury release to aquatic ecosystems like rivers and lakes. Specifically, this research looks at the transformation of mercury from its inorganic form to its organic and neurotoxic form of methylmercury. By sampling soils from landslides and other permafrost thaw features throughout Far North Ontario and Manitoba, this research will help to indicate if thawing permafrost features and landslides may release significant amounts of mercury to aquatic systems.



David McGeachy (PhD candidate, University of Alberta) will use DNA darting to study how changing sea ice conditions are influencing population dynamics and leading to distributional shifts of polar bears between neighbouring subpopulations around western and southern Hudson Bay. With the Arctic experiencing unprecedented rates of sea ice loss due to global warming, ice-dependent species such as polar bears are under increasing pressure. This will be a broad scale research project that will use multiple sources of information to obtain new estimates of polar bear populations and makeup to better inform conservation management of the species.



Haley Moskal (MSc candidate, Laurentian University) is studying aquatic biodiversity recovery in Killarney Provincial Park in Ontario. These lakes have faced multiple stressors including historic acidification from Sudbury smelter emissions as well as the current effects of climate warming, browning and invasive species. A detailed biodiversity study from 1995-1997 will be repeated using the original sites and sampling methods to assess the recovery of various sensitive indicator species, including crayfish, benthic and pelagic fish, amphipods, and mayflies, within the

Killarney Wilderness Park watersheds. The goal of Haley's research is to assess the trends in recovery of aquatic biodiversity.



Jessica Norris (MSc candidate, McGill University) is studying the environmental drivers and impacts of population growth among a population of muskoxen on Yukon's North Slope. These muskoxen were reintroduced in the 1900s and the population has grown significantly since. A need to better understand how muskoxen are affecting the North Slope has been raised by the Inuvialuit, who have strong traditional connections to the region. The project will assess the influence of environmental factors on muskoxen demographics using existing demographic data, harvest information, traditional knowledge, and remotely collected data; design a community-driven, integrated ground and aerial based monitoring approach; and establish a population model that integrates all the information collected.



Stephen Paterson (PhD candidate, Saint Mary's University) is studying non-native species of earthworms introduced from Europe with the arrival of European settlers. While they can benefit agricultural production, earthworms negatively impact biodiversity, ecosystem function and carbon storage in Canadian forests. Ranges of non-native earthworms are now expanding northward in the boreal zone and their spread may be accelerated by climate change and increasing development. Despite concern about the potentially detrimental effects of non-native earthworms, mechanisms driving spread, and patterns of future spread remain poorly understood. Stephen is looking to better understand the factors behind earthworm spread in the Yukon.



Tabatha Rahman (PhD candidate, Laval University) is examining how past environmental conditions and earth surface processes have controlled permafrost and ground ice formation in the Hudson Bay Lowlands of northern Manitoba. She is also interested in determining how current ground ice distribution will influence landscape change in this region under a

warming climate. Permafrost and ground ice research in the Hudson Bay Lowlands remains scarce, reducing northern communities' abilities to predict and mitigate the risks associated with ground thaw, making conservation efforts more difficult.



Claire Singer (PhD candidate, Saint Mary's University), is researching the spread and impact of non-native plants in the Northwest Territories. Claire is interested in the role of human disturbance in facilitating changes in species communities, how natural disturbances like forest fire burns and riverbank erosion or flooding facilitate species invasions, and broader changes in northern plant communities over time. Her research is interdisciplinary, drawing on both scientific and Indigenous knowledge approaches.



Spotlight: How our former Fellows are shaping conservation



Clayton Lamb has a passion for understanding how people and wildlife can better coexist. His research on large predator movements began, in part, with the help of a WCS Weston Fellowship. Now Clayton is well known for his work as a wildlife scientist with Biodiversity Pathways and the University of British Columbia on everything from population ecology to endangered species recovery. Clayton points out how his WCS Canada Fellowship work helped to spur the development of a ground-breaking wildlife crossing plan for busy Highway 3 in British Columbia. Having recently completed a Liber Ero post-doctoral fellowship, his research continues to overlap strongly with areas of conservation interest for WCS, including caribou recovery in southern British Columbia and the sustainability of wolverine trapping in southern Canada. We are pleased to have played a role in launching the career of this innovative young scientist.

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Top banner image: Brown bears in water by Susan Morse