

Session 11: Inventory, monitoring and modelling

Session Moderator: Libby Ehlers

Location: TBC

Date/Time: Wednesday, December 14, 10:30 am to 12:15 pm

- [Mirjam Barrueto](#) - Protection status, human disturbance, snow cover and trapping drive density of a declining wolverine population in the Canadian Rocky Mountains
- [Jenny Heron](#) - Native Bees of BC's Parks and Protected Areas
- [Laura Stewart](#) - ~~Wildlife Monitoring in Indigenous Protected Areas in the Northwest Territories~~—PRESENTATION CANCELLED
- [Siobhan Schenk](#) - Long-term monitoring of algal biodiversity in Stanley Park.

Mirjam Barrueto

University of Calgary

Protection status, human disturbance, snow cover and trapping drive density of a declining wolverine population in the Canadian Rocky Mountains

Abstract:

Protected areas are important in species conservation, but high rates of human-caused mortality outside their borders and increasing popularity for recreation can negatively affect wildlife populations. We quantified wolverine (*Gulo gulo*) population trends from 2011 to 2020 in >14 000 km² protected and non-protected habitat in southwestern Canada. We conducted wolverine and multi-species surveys using non-invasive DNA and remote camera-based methods. We developed Bayesian integrated models combining spatial capture-recapture data of marked and unmarked individuals with occupancy data. Wolverine density and occupancy declined by 39 percent, with an annual population growth rate of 0.925. Density within protected areas was 3 times higher than outside and declined between 2011 (3.6 wolverines/1000 km²) and 2020 (2.1 wolverines/1000 km²). Wolverine density and detection probability increased with snow cover and decreased near development. Detection probability also decreased with human recreational activity. The annual harvest rate of $\geq 13\%$ was above the maximum sustainable rate. We conclude that humans negatively affected the population through direct mortality, sub-lethal effects, and habitat impacts. Our study exemplifies the need to monitor population trends for species at risk – within and between protected areas - as steep declines can occur unnoticed if key conservation concerns are not identified and addressed.

Contributors:

- Anne Forshner, Parks Canada (LLYK)

- Jesse Whittington, Parks Canada (BFU)
- Tony Clevenger, Western Transportation Institute, Montana State University, MT
- Marco Musiani, Università di Bologna, Italy

Acknowledgements:

Land: Our research took place on provincial lands in south-eastern British Columbia and in Yoho and Kootenay National Parks, and in Alberta in Banff National Park. The provincial lands and the lands and waters of Yoho and Kootenay National Parks fall within the traditional territories of the Ktunaxa and Secwepemc Nations. Ktunaxa and Secwepemc Peoples have used and occupied the lands now encompassed by Yoho and Kootenay national parks for thousands of years. We acknowledge that Banff National Park is within the present-day territories of the Treaty 6, 7, and 8, Nations as well as the Métis Homeland. The lands and waters of Banff have been used for millennia by Indigenous Peoples for sustenance, ceremony, trade and travel.

People: For the field work, we thank Ben Dorsey, Barb Bertch, Reg Bunyan, Nikki Heim, Andrea Kortello, Jim Zettel, Don Gorrie, Bill Hunt, Glenn Kubian, Blair Fyten, Trevor Kinley, Alan Dibb, Steve Bertollo, Michele Huber, Leo Levesque, Barb Johnston, Jón Stuart-Smith, Sarah Fassina, Andrew Bullock, Michael Vanderveen, Seth Cherry, Dwight Bourdin, Jonathan Effa and many other staff, technicians, and volunteers. David Paetkau and Mike Sawaya supervised genetic analyses. Andrea Kortello, Doris Hausleitner, Garth Mowat, Luke Vander Vennen, Brett Boukall and Maria Didkowski provided harvest-related data. Trevor Thompson helped process images, and Magda Kosior helped with IT questions.

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Jenny Heron

British Columbia Ministry of Land, Water and Natural Resource Stewardship

Native Bees of BC's Parks and Protected Areas

Abstract:

British Columbia has the highest bee diversity in Canada, with more than 450 bee species described and potentially 600+ species based on genetic barcoding. At least one third of these bee species are potentially at risk at both the provincial and national scale. In 2010, building on the work of others, we started a project to inventory bees and potential threats to their populations in provincial hotspots. Much of our work has focused on the southern grasslands of the dry interior, where there are at least 100 species of bees that occur nowhere else in Canada. Other areas of the province with high bee diversity include the dry Coastal Douglas-fir and sparsely vegetated ecosystems of the south coast, and the dry interior grasslands that stretch through the southern Kootenays to the Alberta border. This presentation is an overview of the BC parks and protected areas that hold some of the most interesting bee diversity in the province, along with some highlights on other pollinators we've noted. We also present new findings, data gaps and plans for continued surveys in the next ten years.

Contributors:

- Dawn Marks, British Columbia Ministry of Land, Water and Natural Resource Stewardship
- Cory Sheffield, Royal Saskatchewan Museum, Regina, SK

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[Laura Stewart](#)

PRESENTATION CANCELLED

University of British Columbia

Wildlife Monitoring in Indigenous Protected Areas in the Northwest Territories

Abstract:

Ecological monitoring in protected areas is essential for baseline information, to understand species distributions, and to track changes over time. Protected areas in the Northwest Territories are under-monitored by conventional research protocols due to

their vast and remote nature. These challenges make working together a necessity. The Northwest Territories Biodiversity Monitoring Program is a partnership between Indigenous nations, government agencies, and academic institutions that has deployed arrays of hundreds of camera traps and autonomous recording units in 4 Indigenous protected areas across the NWT, with plans to expand coverage and facilitate long-term monitoring of songbirds and mammals. There are several research goals emerging from the program as a whole, including 1) improving long-term surveying methodologies to adequately assess multiple species at the regional scale; 2) integrating camera trap data with autonomous recording unit data to learn more about the holistic vertebrate community; and 3) understanding how well vertebrate communities are represented by existing protected areas. This presentation will summarize the program's progress to-date and highlight future research priorities and opportunities.

Contributors:

- Claudia Haas, Government of Northwest Territories / Wilfrid Laurier University
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- Cole Burton, University of British Columbia
- Danielle Thompson, Parks Canada / Government of the Northwest Territories
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- Frances Stewart, Wilfrid Laurier University
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- Edézhíe Management Board
- Wek'èezhii Renewable Resources Board

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We acknowledge that our projects have taken place on Treaty 8 and Treaty 11 territories, specifically in the homeland of the Łtsel K'é Dene, North Slave Métis Alliance, K'áhshó Got'ıne, Tłıchǝ, Yellowknives Dene, and Dehcho people. Our research has been funded by the Government of the Northwest Territories, the Natural Sciences and Engineering Research Council of Canada, Environment Canada, the Northern Research Scientific Training program, and the Canada Nature Fund.

[Siobhan Schenk](#)

University of British Columbia

Long-term monitoring of algal biodiversity in Stanley Park.

Abstract:

Macroalgae are marine foundation species in intertidal ecosystems, but data regarding their historical abundance, diversity, and phenology remains lacking in many regions, including British Columbia. This absence of historical baselines may hinder assessments of how macroalgae are affected by anthropogenic stressors, such as extreme weather events (e.g., 2021 heat dome) or invasive species. Obtaining baseline data may be especially important for urban intertidal zones, where the impact of increasing anthropogenic stressors is underappreciated. To fill this data gap, we started a collaborative long-term survey to document year-round macroalgal biodiversity in a highly biodiverse urban intertidal zone. From September 2021 onwards, we have conducted monthly surveys recording species composition and abundance along fixed transects in Stanley Park. After one year of data, we have captured the early growth period of kelps (brown algae) and monitored the shift in dominant algae at the site from kelp-dominated to *Ulva* (green algae) dominated through the summer months. We hope to highlight the often-underappreciated biodiversity of urban ecosystems and document ongoing long-term changes to macroalgal diversity, abundance, and phenology. We plan to make these data freely available, and coordinate monitoring efforts with other researchers to increase the utility of the dataset.

Contributors:

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This work is conducted on the unceded traditional and ancestral homelands of the xwməθkwəyəm (Musqueam), S'ólh Téméxw (Sto:lo) and Sə'lílwətat/Selilwitulh (Tsleil-Waututh) Nations.