Session 14: Mammals and Movement

Session Moderator: Melanie Percy

Location: TBC

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

- [Cheng Chen](#) – Global camera trap synthesis highlights the importance of protected areas in maintaining mammal diversity
- [Jason Fisher](#) – Wolverines: A synthesis of global conservation ecology research with a focus on the role of protected areas
- [Ryan Gill](#) – Movement ecology of southern mountain caribou in response to COVID-19 lockdowns
- [Laura Eliuk](#) – Protected areas best explain the occurrences of mammalian predator species in Canada's Rocky Mountains

Cheng Chen

University of British Columbia, Department of Forest, Resources Management, Wildlife Coexistence Lab

Global camera trap synthesis highlights the importance of protected areas in maintaining mammal diversity

Abstract:

The establishment of protected areas (PAs) is a central strategy for global biodiversity conservation. While the role of PAs in protecting habitat has been highlighted, their effectiveness at protecting mammal communities remains unclear. We analyzed a global dataset from over 8671 camera traps in 23 countries on four continents that detected 321 medium- to large-bodied mammal species. We found a strong positive correlation between mammal taxonomic diversity and the proportion of a surveyed area covered by PAs at a global scale ($\beta = 0.39$, 95% confidence interval [CI] = 0.19–0.60) and in Indomalaya ($\beta = 0.69$, 95% CI = 0.19–1.2), as well as between functional diversity and PA coverage in the Nearctic ($\beta = 0.47$, 95% CI = 0.09–0.85), after controlling for human disturbances and environmental variation. Functional diversity was only weakly (and insignificantly) correlated with PA coverage at the global scale ($\beta = 0.22$, 95% CI = -0.02–0.46), pointing to a need to better understand the functional response of mammal communities to protection. Our study provides important evidence of the global effectiveness of PAs in conserving terrestrial mammals and emphasizes the critical role of area-based conservation in a post-2020 biodiversity framework.

Contributors:

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Acknowledgements:

Jason Fisher

University of Victoria

Wolverines: A synthesis of global conservation ecology research with a focus on the role of protected areas

Abstract:

Wolverines are vulnerable to multiple, widespread, increasing forms of human activity so have become an indicator of conservation success or failure for northern ecosystems. The last two decades have seen marked changes in technology yielding new insights. We reviewed and synthesized 156 research papers published over the last two decades and asked: what are the known drivers of wolverine populations and distribution, and how can this knowledge inform wolverine conservation? The role of protected areas was a special focus, in the context of climate and landscape change. In Scandinavia, coordinated long-term monitoring programs have yielded substantial information; hunting and persecution are the major stressors. In contrast the Nearctic has largely relied on stand-alone research until recently. Trapping, landscape change, and climate change are major stressors, and protected areas have a future role to play in mitigating all three. Globally, protected areas are important for wolverine conservation, but effective landscape and population management in those protected areas – and in the adjacent working land base – will be vital to wolverine persistence.

Acknowledgements:

Ryan Gill

University of British Columbia Okanagan

Movement ecology of southern mountain caribou in response to COVID-19 lockdowns

Abstract:

Southern mountain caribou are a species at risk occupying mountainous regions of the southern and central interior of BC. During late winter they become resident in high elevation, deep snow environments where they largely subsist on arboreal lichens. These habitats overlap temporally, and spatially with backcountry heli-skiing activities. We examined the movement ecology of collared individuals within the North Columbia, Central Selkirks and Hart Ranges herds in response to the COVID-19 mediated travel restrictions, which resulted in an almost complete cessation of heli-skiing in 2021. We compared home-range use, movement rates and habitat selection in the COVID-19 lockdown year to the two years prior to the travel restrictions (2019, 2020), and the year post travel restrictions, when heli-skiing resumed (2022). Our results indicate that caribou home-range size and daily diffusion rates increased significantly during the COVID-19 induced cessation of heli-skiing, as compared to years of normal heli-ski operations. Although caribou ranged over much larger areas when heli-skiing was paused, we found no evidence that they changed their patterns of resource selection. These results suggest potential fitness implications in areas where heli-skiing overlaps late-winter home range and can be used to inform the management of winter recreation within caribou late-winter habitat.

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- Dr. Michael Noonan, UBC Okanagan
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Laura Eliuk

University of Victoria

Protected areas best explain the occurrences of mammalian predator species in Canada's Rocky Mountains

Abstract:

Human developments have substantially restructured natural landscapes with cascading impacts on biodiversity, illustrated in the decline and range contraction of many North American large mammal species (ex. Grizzly bears, wolves, black bears). While the Canadian Rocky Mountains provide a protected area (PA) complex that aims to conserve such species, many are still threatened by current and historical human activities inside PA boundaries. To assess the effectiveness of PAs in maintaining mammal populations, we assessed the distributions of five species across various protected and unprotected areas in the Canadian Rocky Mountains. Synthesizing multiple wildlife camera datasets, we used generalized linear models to test whether PAs outweigh natural or anthropogenic landscape features in explaining species occurrence. We predicted that PAs would be most important for species sensitive to human activities, such as wolves and grizzly bears, but that natural or anthropogenic landscape features would be most important for species tolerant to human activities, such as deer, coyotes, and black bears. We found that PAs best explained the occurrence of wolves, grizzlies and coyotes, with wolves and grizzlies being positively associated with PAs and coyotes having a negative association with PAs. The occurrence of black bears and white-tailed deer was best supported by anthropogenic features. These results indicate that at broad scales, PAs provide important habitat to at-risk predators, but not all species rely on these areas; additionally, human-caused landscape alteration and landscape management are stronger determinants of species occurrence than natural habitat features, and have implications for broader landscape management and protection.

Contributors:

- Dr. Jason Fisher, University of Victoria

Acknowledgements: