

Together for Wildlife - Interior Universities Research Coalition Student Research Grant Final Report

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Principal Investigator: Dr. Cole Burton

Project Title: Investigating competition between feral horses and native ungulates in the Chilcotin Plateau of BC

What has been achieved over the duration of this grant award period?

Fieldwork trips were completed in October 2022 and June 2023 to do maintenance of and collect data from the 30 remote sensing cameras (i.e., camera traps) deployed near Puntzi Lake, BC, in the range of the feral horse population in the Chilcotin. An additional 60 camera traps were serviced in nearby areas outside of feral horse range in June 2023, which will provide useful data on the overall use and habitat preferences of moose and mule deer in areas without feral horses. Planning has been completed for a final check of the Puntzi grid in October 2023, which will provide two full years of data on this ecologically important area of overlap between feral horses, moose, and mule deer. To date, we have collected just under 300,000 images from the Puntzi Lake camera trap grid, with 600-700 total detections of feral horses and 200 detections each of moose and mule deer expected for the full 2-year sampling period, extrapolated from the first year of sampling.

Along with Taz Gharajeh, a WildCo PhD student also working on the broader Itcha-Ilgachuz Camera Trapping Project, I have overseen data management, training of research technicians on image processing, and performed quality review checks of image classifications. Image processing and review has been completed for all images collected in the first two years of the project (Fall 2020 – Summer/Fall 2022). Processing of the Puntzi Lake grid for images captured from October 2021 to June 2023 has also been completed, with processing of the June 2022 to June 2023 data for the other two low elevation camera grids in progress.

Data simulation efforts to inform analysis were completed in Spring 2023. I simulated camera trap detections given the expected number of species detections, known effects of environmental variables

such as wetland area near camera sites, and simulated avoidance of feral horses at multiple spatial scales by moose. This process allowed me to solidify my analysis methods for answering the question of whether feral horses are competing with moose and mule deer. As a result of this process, I am focusing on the habitat preferences of feral horses, moose, and mule deer, particularly regarding wetlands, broad scale spatial avoidance and altered wetland use by moose and mule deer in areas with feral horses, and finer-scale avoidance of horses in space and time by moose and mule deer in the Puntzi Lake camera grid.

Preliminary results from the first year of sampling by Puntzi Lake found that horses and moose both have preferential use of wetland areas, indicating potential for competitive interactions. Moose may be broadly avoiding the Puntzi Lake grid compared to our other sampling areas, although this cannot be attributed solely to the presence of horses. At the finer scale, moose may be avoiding sites used by large groups of horses. However, a second year of data from the Puntzi lake grid is needed to increase the available sample size and confidence in these preliminary results.

How does this work contribute to the overall project objectives (i.e., to completion of your thesis)?

Fieldwork efforts during this period have allowed me to collect almost two years of camera trap data for the Puntzi Lake camera grid. The October 2022 check of the Puntzi Lake camera grid was primarily funded by the T4W research grant and was a particularly important contribution to the completion of my project. This additional trip allowed me to collect data from the busiest months of the year (July, August, and September) to work with in winter and spring as I finalized my modelling framework and conducted preliminary analysis. In addition to the data collected, fieldwork efforts have also allowed me to spend time on the ground in the study area, gaining a greater understanding of the resources available and how the focal species of my research may be navigating their environment. I have also been able to connect in person with project partners and community members during fieldwork. These conversations in a more informal context have been valuable in understanding the local and cultural context around feral horses in the Chilcotin and how my research fits in.

The data simulation and preliminary analysis I have completed over the past year have set up the analysis framework for my final analysis. Data simulation informed by the number of detections in the first year of sampling at Puntzi Lake allowed me to focus my proposed analyses on what is feasible given my data. Conducting the preliminary analysis with the first year of data allowed me to get feedback from my thesis committee and project partners on my methods and initial results. Further, I have now written the R code for analysis that I will be able to reuse once the full dataset has been processed, making the final analysis much more efficient.

How have you communicated about this project and work?

Within the academic community?

- With project partners including non-academic and community members?
- With government staff?

I had the opportunity to present my work on feral horse-native ungulate competition to the academic community at the joint conference of the BC and Canadian Section of The Wildlife Society in Victoria, BC in Spring 2023. I presented my research question, analysis methods, and preliminary results in a 5-minute rapid fire oral presentation at the conference. I was also able to include a brief overview of this project in a presentation highlighting the broader efforts of the Itcha-Ilgachuz Camera Trapping Project at the “Improving monitoring of protected area effectiveness for terrestrial mammals using camera traps” workshop session of the BC Protected Areas Research Forum in Nanaimo, BC in December 2022.

I have presented objectives, methods, data summaries, and preliminary results for this project in the annual project report for the wider Itcha-Ilgachuz project. This report was circulated to the Itcha-Ilgachuz project advisory committee, which has a high degree of overlap with the T4W project team for my project and includes government staff from the BC Ministry of Water, Land, and Resource Stewardship, BC Ministry of Forests, Environment and Climate Change Canada, BC Parks, and representatives of the Tsilhqot'in National Government, Ulkatcho First Nation, and Southern Dakelh Nation Alliance. I presented these updates in an online meeting with the advisory committee, with the opportunity for discussion. I also had a masters thesis committee meeting in May 2023 to discuss the updated methods and preliminary results for this project in greater detail and get feedback to implement for the final analysis.

To share some of the amazing camera trap images we have captured in this project and express our appreciation for their contributions to the project, I produced a 2023 calendar highlighting the best images from the past year of sampling and distributed them to project partners, research assistants, and volunteers.

How have you fulfilled the commitments of your knowledge management plan?

I have shared insights on this project through presentations and discussions with the project advisory team as planned, but these have not occurred quarterly as initially proposed. The rate of progress on this project given my other academic commitments and the time-consuming nature of processing camera trap data have not produced updates for the project that would warrant such frequent meetings of the project advisory team. Further, arranging meeting times across such a large advisory group has proved challenging for annual and biannual meetings. Instead, I have communicated directly with specific project partners and committee members over email, in one-on-one meetings, or in smaller groups to share relevant updates or solicit specific feedback. I had hoped to be involved in organizing in-person community meetings with member nations of TNG, SDNA, and/or Ulkatcho First Nation to discuss this feral horse project and the broader Itcha-Ilgachuz project in Summer 2023, but unfortunately our efforts to organize these meetings were not successful for this year. I am hopeful that I will have the opportunity to share and discuss the question of feral horse competition with moose and deer and my findings directly with Indigenous communities whose territories we are working in in the future. I was able to engage directly with two Indigenous youth interns this past summer during June fieldwork. Both interns were from communities nearby the study area and are interested in pursuing careers in wildlife conservation, so I was able to share the details of our project and the research questions we are pursuing, as well as learn from them about their experiences in the area with wildlife, including their interactions with the feral horses.

I have begun to share my research with the academic community at conferences as described above and intend to publish my results in an open access, peer reviewed journal such as the Journal of Wildlife Management upon completion of the research project. I also had a brief graduate student feature in the Winter 2023 issue of the Wild Sheep Society of BC's magazine, which has a more non-academic audience. To communicate the final results of the project with a broader public audience, I plan to write an article for UBC Branchlines or a similar publication, as well as sharing key results and camera trap photos through the WildCo Lab's social media platforms.

Where will the data and/or information collected from this project be stored?

Camera trap image data for this project will be stored on the UBC Forestry data server, two external storage drives, and in the cloud based WildCo Lab data management and image processing program. These multiple back-ups will ensure that image data cannot be lost, and allows for review or verification of image data including species identification. This system will also preserve the dataset for use in answering additional secondary research questions in the study system.

Species detection data is recorded from the camera trap images by trained observers, reviewed by project leads to ensure accuracy, and summarized into "independent" detection events. This cleaned dataset is similarly backed up in multiple locations and shared with project partners. Upon publication

this dataset will be shared in a public repository (e.g. dryad, borealis), given agreement by all project partners, and that there are no concerns with ongoing research projects using the same dataset.

Please provide links to any publicly available information on or from your project:

- Wild sheep society student research feature (p19):
https://issuu.com/wildsheepsocietybc/docs/wild_sheep_society_bc_-_winter_2023
- BCTWS conference presentation abstract (p84):
https://www.bctws.ca/uploads/1/2/1/6/121665989/final_program_pdf_march_25_2023.pdf

Budget Reporting

Budget Item	Details	Proposed Amount	Actual Amount	Comments
Student stipend	Stipend for Katie Tjaden-McClement Sept 2022-August 2023	\$20,000	\$20,270.76	
Fieldwork expenses	Lab vehicle milage, ATV and trailer rental, accommodations, food, gas	\$4000	\$3880.05	Primarily the Fall 2021 camera checks of the Puntzi Lake Grid
Partner engagement and knowledge dissemination	Calendars featuring camera trap images from the project for partners, registration costs for the BC Protected Areas Research Forum Conference, and travel costs for TWS conference	\$1000	\$849.19	The original plan for these funds was for an in-person meeting to share results with project partners and community, which we attempted to organize in summer 2023, but was not possible