

Together for Wildlife - Interior Universities Research Coalition Student Research Grant - Interim Reports

Informing the Management of Grizzly Bear Viewing in the Declared Title Area of the Tsilhqot'in Nation

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Question 1. What activities have been completed on this project to date?

Working with biologists from the BC Ministry of Forests from the Cariboo region and Tsilhqot'in National Government (TNG), 42 Reconyx Hyperfire 2 camera traps were deployed in August of 2021 across a 50 km² study area on the upper Chilko River in the Tsilhqot'in Title Lands. Approximately 114,000 images were collected in 2021 from the camera grid (August 10 – November 2). In early November 2021 and again in August 2022, cameras were serviced, including the replacement of SD cards and batteries and/or the camera itself if any damage or disfunction of the camera occurred. Cameras have been continuously active since August 2021 and funding is in place to continue data collection throughout 2023-2024.

Detection histories and activity profiles for wildlife (grizzly bears, moose, mule deer etc.) and humans from the 114,000 images collected from August 10 – November 2, 2021, have been completed. Grizzly bear detections were classified as either adult male, adult female, adult unclassified sex, sub adult unclassified sex, cub unclassified sex, and yearling unclassified sex. Additionally, the activity type of grizzly bears was recorded, including bedding, foraging, and transiting. A total of 9,600 of the 22,000 detections were of grizzly bears. Preliminary findings show that 90% of these detections were captured at cameras facing the Chilko River. From these detections, individual bursts were derived to determine the count of occurrences of grizzly bears which is the count of times they went through a cameras field of view. There were 1,140 occurrences of grizzly bears in all cameras. Temporally, grizzly bears were most active during the hours of dawn and dusk, and least active during afternoon hours. Conversely, the occurrences of boats were highest during daytime hours. In total, there were approximately 400 human occurrences, including 300 being boat-based (motorized and non-motorized) detections and 100 land-based detections.

We are currently developing mixed-effects models using an information-theoretic framework to test support for competing hypotheses on the influence of boat and bear viewing activity, salmon availability, habitat type, time of day, and season, on grizzly bear behaviour characterized using detections (binomial) and counts (Poisson). We will account for local conditions and pseudo-replication in the detection histories by including the camera ID as a random effect.



In addition to data collection, management, and analysis, an extensive literature review has been conducted on the current state of research on the relationship between grizzly bear and wildlife behaviour and wildlife viewing activities. The review will help inform development of models, including the inclusion on specific covariates, fieldwork planned for the 2023 field season, and will help contextualize results from the Chilko system.

Question 2. Is the project progressing as planned? If not, why not and what are you doing to mitigate or adjust?

The project is progressing as planned, with a few logistical challenges. Due to an early and very heavy snowfall in the fall of 2022, we were not able to return to the camera grid to retrieve the August – November 2022 camera data, which corresponds with the bear viewing season. There were also delays with obtaining the permit (now in-hand) to install additional cameras along Chilko Lake and the Homathko River; however, the early snowfall was more of a limiting factor. Over the winter, biologists with the BC Government have retrieved half of the camera data and we plan to retrieve the remaining data later March 2023. To streamline development of detection histories and activity profiles with new camera data, we will use an AI-based approach (MegaDetector), which will substantially reduce the processing time. We also plan to install the cameras on Chilko Lake and the Homathko in May-June 2023 once the snow and ice recede.

Question 3. How have you been working with your research partners, including Indigenous communities, to ensure meaningful collaboration and participation?

We are continuously coordinating with biologists from the Cariboo office who help with servicing and installing the Chilko River camera grid. Considering the number of cameras, which must be accessed by foot and boat, it would not be possible to keep the grid running without additional support.

Collaboration with TNG has primarily involved constant communication with Mitchell Warne, the lead wildlife biologist for TNG. We are currently developing plans to work with TNG Guardians and staff during the 2023 field season for servicing the existing cameras and installing new cameras on Chilko River and the Homathko.

Through the Upper Tsilhqox Working Group, results from this study to date were communicated to members of TNG, including their wildlife and land management (i.e., NEN planning) group (Mitchell Warne, John Lerner, Jessica Bratty), as well as BC Parks (Steven Hodgson, Kurt Williams), and provincial biologists (Shane White, Chris Swan, Garth Mowat, Lori Homstol, Christina Waddle). The Upper Tsilhqox Working Group has been tasked with helping to develop guidance on the implementation of regulations for bear-viewing in the Tsilhqot'in Title Lands and has been liaising with the operators on project results.

Additionally, my supervisor, Dr. Mathieu Bourbonnais, has organized the involvement of an undergraduate student who is part of the indigenous student research mentorship program at UBC (Okanagan), facilitated by the Indigenous Resource Centre, to participate in data analysis. In doing so, this promotes participation in this project and increases Indigenous engagement as this student receives hands on experience, learns new techniques in data analysis, and increases their network in this field.



Question 4. Tell us about one success, one challenge or difficulty and one thing you would do differently if you could go back?

A large success in this project was the presentation given to the Upper Tsilhqox Working Group as this was a point in the project where I was able to provide an update on the current findings. The meeting provided me with an opportunity to meet the members of the working group and fill them in on where the project is at so far. As a result of this meeting, I have a better understanding of the various organizations (TNG, BC Parks, BC Ministry of Forests, DFO) collaborating on the project and the how results from my work might fit in to the regulatory process being developed.

Further, by presenting current findings from the project, members of the working group can better understand the current situation of human-bear relationships in the upper Chilko River, resulting in increased investment and interest.

A challenge in this project has been field work logistics. Despite having a strong research partnership with the BC Ministry of Forests and TNG staff. The remote locations of the cameras require extensive travel by foot or boat and weather during fall 2023 limited our ability to service the camera grid.

If I could go back and do anything differently, I would likely have been in contact earlier with TNG staff, biologists from the BC Ministry of Forests, bear viewing operators and members of the Upper Tsilhqox Working Group to form a foundation of knowledge on human-bear relationships in the study area and the inherent challenges. Receiving varying perspectives and knowledge from different parties can help me better understand the complexities and history surrounding bear-viewing in the Title Lands and how this project can contribute understanding and clarity behind such an intrinsic relationship between grizzly bears and humans.