THE DIVII PROJECT: SUPPORTING INFORMATION PACKAGE

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PROJECT CONTACTS

Sydney Wagner, MSc., RPF, BIT
Senior Ecosystems Biologist, BC Government
Email: sydney.wagner@gov.bc.ca
Office: 604-413-0100

Contact for:

- Analysis/methods and results
- Applying this methodology to your area/questions of interest
- Tagging protocol & template requests
- R Data frame & code requests

Steve Andersen, *Wildlife Biologist*
Gwich'in Renewable Resources Board
Email: sandersen@grrb.nt.ca

Contact for:

- Camera array design/co-development with traditional & local knowledge holders
- Data sharing inquiries
- Questions about local management applications (Gwich'in Settlement Area)
- Questions about the divii traditional knowledge study

KEY PROJECT TAKEAWAYS

1. Cameras **add a tool to the monitoring toolbox** and can supplement data between years of aerial survey. In our case, they do not replace aerial surveying in full.
2. For sampling demography specifically, the aim was to get as many samples as possible. Therefor, design focused on sites with **high known use** by sheep, including both key seasonal neonatal areas & seasonal movement trails. **Different research questions will require different array designs.**
3. Local & traditional knowledge was paramount to successful camera placement. Site selection was informed by multiple knowledge sources & field verification:
    i. Community workshop: identified key sheep areas/known use areas/ known high-use trails
    ii. Biologist then looked at terrain features and historic survey data to narrow down camera site selection
    iii. Field reconnaissance / verification of these potential sites was done collaboratively with biologist & community members. Access for camera maintenance was a major consideration as well: cameras needed to be accessible to service in the winter via snowmobiles, and community members played a large role in this work.

iv. Cameras installed; first year was a "pilot" to make sure cameras were in a good location/position. Data collection started in earnest in 2019 after adjustments were made.

4. Tagging & data management is the most time-consuming element of the project.
    - Use of MegaDetector AI in the tagging process resulted in an average **efficiency gain of approximately 50-60%,** mainly by eliminating unnecessary review of empty photos.
    - When only tagging sheep demography and nothing for other species, I am tagging at a rate of approximately **4,500 photos/hour**. This rate is very site-dependant and can also fluctuate greatly depending on how many sheep detections you are getting.
    - Our array produces about **100,000 photos/year = 20 to 40 hours of tagging**

Benefits of monitoring with cameras	**Cautions**
- "Eyes on the land" approach to monitoring - More population information than single-day snapshot, like an aerial survey - Can compliment & supplement aerial surveying data, especially for populations that are infrequently surveyed - Gets community out on the land; great opportunity for collaboration	- Divii project design does not produce a population estimate - Time-intensive for data management/analysis (though AI is streamlining this significantly) - Depending on your monitoring goals, this method is not necessarily a replacement for an aerial survey program

IMPORTANT RESOURCES

Thesis (Goward, 2024): The best resource for the divii project (publication currently under review), including detailed methodology & results: Using remote camera traps to monitor population demographics and community ecology of Dall's sheep 2024

Tagging template: The Timelapse template can be made available upon request. Customization per your study questions will be important. Contact Sydney for more information.

Tagging protocol: Available upon request. Contains standardized step-by-step guidance on how to use the tagging template, and how to consistently apply sheep classification methods when tagging.