July 10th, 2023

Ms. Chloe Stuart
Assistant Deputy Minister
Ministry of Environment, Conservation and Parks
North Tower 5th Floor, 300 Water Street, PO Box 7000
Peterborough, Ontario
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Submitted via email: chloe.stuart@ontario.ca

Re: Boreal Caribou Monitoring Program Development Virtual Session

Dear Ms. Stuart,

Thank you for the opportunity to provide written feedback regarding the Boreal Caribou Monitoring Program Development Virtual Session. We commend Ontario's recent investment of over $29 million to support caribou management and recovery action under Canada-Ontario (S.11) Conservation Agreement for Boreal Caribou (the "Agreement"). Foundational to this Agreement will be the use of the best available information, including existing and emerging scientific and technical data, and Indigenous traditional and community knowledge, to support the implementation of conservation measures under the Agreement.

The OFIA represents 50 companies across Ontario, managing approximately 32 million hectares of Sustainable Forest License (SFL) area. Ontario's forest industry currently employs 142,000 people across all regions of the province and generates $20 billion in revenue annually. Since the 1990s, Ontario's forest management planning framework has incorporated measures to support caribou. Forest managers regenerate and renew caribou habitat in amounts and arrangements similar to what occurs naturally at a landscape, stand, and site scale. At a landscape level, this would include influencing the amount of early seral stage forests and available refugia and the renewal of old forested habitats. As an example of site-level tools to support caribou habitat, forestry practices can influence characteristics associated with greater amounts of vegetation that support nutrition (e.g. lichen). In partnership with the province and other scientific institutions, our membership is committed to advancing the understanding of boreal caribou as well as active adaptive management.

The OFIA and our member companies actively participating in caribou conservation research advice have been consistent since the release of the federal Recovery Strategy; a review of caribou range boundaries should be assigned the highest priority as these ranges form the cornerstone for virtually all population monitoring, protection and adaptive management investments. Further to this, establishing a monitoring program with an emphasis on science and methodologies that can continue to incorporate the latest knowledge and techniques is crucial to the implementation of the Agreement. As such, our letter is primarily centred around the importance of incorporating Fecal DNA analysis in the development of the caribou monitoring program. Doing so will utilize the latest scientific techniques and provide the best data

to inform policy decisions and improve outcomes for caribou and local communities across Ontario over the long term. As such, we strongly encourage the Ministry of Environment, Conservation, and Parks (MECP) to consider the following in the development of a caribou monitoring program:

1. Species at Risk

While GPS collaring can provide information to estimate survival rates, the invasiveness of temporarily capturing and handling caribou introduces a potential health risk to the animals. We are also aware that some Indigenous communities are averse to capturing wild animals. Fecal DNA sampling and hormone analysis offer an alternative method to estimate population trends, in addition to providing the ability to record individuals you may not see during aerial surveys and improving inferences into population sex ratios, age and other health-related indicators.

2. Engagement

Aerial surveys and fecal DNA sampling both provide an opportunity for Indigenous community members to participate as passengers on helicopter flights. Fecal DNA sampling provides additional opportunities for community representatives to participate as team members and guides in the development and execution of ground sampling surveys on their traditional territories, with additional opportunities to impart Indigenous knowledge about caribou ranges and habitat use on these lands.

There is also a capacity-building opportunity for Indigenous team members to work with innovative science organizations to participate in lab work analyzing DNA samples and reviewing results to understand caribou population dynamics and to gain community and individual capacity in lab work for these or related ecological studies in the future.

3. Appropriateness

Our understanding of the pros and cons of undertaking fecal DNA sampling is consistent with the analysis undertaken by the contractors hired by MECP (Biodiversity Pathways Ltd.). Strictly speaking to the reliability of methods proposed, fecal DNA sampling has significant pros related to the robustness and reliability of data (source: Appendix 1, pg. 11):

- "Robust, reliable abundance estimates with little statistical uncertainty with spatially explicit mark-recapture (SECR) compared to other methods."
- "Fecal DNA SECR methods give the most accurate and precise assessment of species abundance of the commonly used practices for ungulates."

As per the discussion paper, aerial surveys are noted to have "low[er] detectability [rates], [which] could lead to unreliable estimates and unrepeatable results" (source: Appendix 1, pg. 11) - particularly for single-stage surveys to inform baseline population trends as currently practiced in Ontario. We acknowledge the limitations that fecal DNA cannot provide 100% certainty in the estimates but, when complemented with aerial surveys, could provide a more credible and reliable source of information than aerial surveys can provide alone. Moreover, when considering the limitations of Fecal DNA surveys, they are comparable to traditional aerial surveys (e.g. weather dependent).

In regards to methods to collect information on habitat trends, it was not clear within the discussion document how caribou range disturbance monitoring will be carried out or verified on the ground. Recent studies have demonstrated that understory vegetation and environmental conditions contribute to habitat suitability for caribou, which are currently not well-identifiable or captured by LiDAR or FRI data.[1] We recommend that the focus on landscape-level disturbance conditions be complemented with research and inventories focused on better understanding site-level conditions that provide suitable habitats for caribou. Science-based projects, such as the NCASI Caribou Research Program, should be leveraged to improve our ability to estimate and map understory forage resources that can be used to predict caribou habitat use and inform decision-making and better outcomes for caribou recovery. **As a next step, we encourage MECP to conduct a review of this research to inform the design of the habitat monitoring program and provide the opportunity for interested parties to be able to comment or provide input.**

4. Feasibility / Cost

Given the importance and profile of caribou in Ontario and the implication to resource users and northern communities of conservation policies based on monitoring results, **we recommend the development of a program using the most robust dataset yet practical dataset on caribou possible.**

We acknowledge that Fecal DNA surveys have additional costs to undertake lab analysis of samples and do require multiple visits through 'mark-recapture' methods, but inventories of each range could be carried out in five-year increments to help address budget concerns. Furthermore, Fecal DNA surveys can be complemented by targeted aerial surveys (e.g. post forest fire) to better understand caribou habitat use, as an example. In addition to a long-term planning schedule, several industry members have worked with Lakehead University to undertake Fecal DNA sampling for the Bridghtsands and Churchill ranges. As such, **we encourage MECP to consider incorporating this work into the caribou monitoring program to help address cost concerns.**

The discussion paper provided a comprehensive overview of the different methodologies for each measurement; however, it did not consider how the data could be conducive to other conservation measures and projects that are taking place in parallel to this work (e.g. range boundary identification). Assessment and verification of existing range boundaries based on ecological knowledge acquired over the last several decades should be viewed as a prerequisite to all other conservation measures. Since caribou management units were originally defined as administrative areas and not based on biological or genetic measurements, more information is required to better understand the value of current caribou 'range' boundaries. The collection of Fecal DNA sampling can directly inform this work by estimating genetic diversity and gene flow between herds to inform range delineation[2], while other collection methods will likely require more time and effort to re-analyze the data if caribou boundaries were to change. Further to this, Fecal DNA can provide insight into several lines of evidence identified in the discussion document (and potentially more in the future). **Our sector strongly encourages the Province to use fecal DNA sampling collection when evaluating and monitoring caribou populations in Ontario. It is the most appropriate methodology for providing large amounts of reliable baseline data and can contribute to the evaluation of long-term caribou population and health trends.**

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[1] NCASI Caribou Research Program (2021). Source: https://www.ncasi.org/resource/ncasi-caribou-research-program/

[2] Hettinga (2019). Use of Fecal DNA to Estimate Population Demographics of the Boreal and Southern Mountain Ecotypes of Woodland Caribou. Source: https://www.umanitoba.ca/institutes/natural_resources/pdf/theses/Masters%20Thesis%20Hettinga%202010.pdf

If you have any follow-up questions on the information provided in this submission, we would be happy to discuss this further with you and your team. I can be reached at 519-933-1231 or stodgham@ofia.com.

We look forward to working with you to support the development of a caribou monitoring program that is informed by the best available scientific methods and will advise policy decisions on caribou management in the future.

Thank you,

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CC Josh Manangan, Senior Policy Advisor, Ministry of Environment, Conservation, and Parks