NWT CIMP Caribou Monitoring and Research Blueprint

NWT CIMP focuses on three valued components: caribou, water and fish. Please see the other Blueprints if your project has the potential to overlap. For more information, visit our Action Plan and Funding Guides at www.nwtcimp.ca.

Background

What is the Caribou Monitoring and Research Blueprint and how is it to be used?

The Caribou Blueprint informs NWT CIMP funding applicants of key caribou-related cumulative impact monitoring and research priorities of key decision-makers and subject-matter experts. It describes information that is necessary to better understand cumulative impacts to caribou and the relationships between people and caribou.

For science projects to be considered for NWT CIMP funding, project submissions *must* demonstrate that they meet Blueprint priorities. The Blueprint guides the NWT CIMP Steering Committee and staff on the allocation of funds. See the NWT CIMP Science Project Funding Guide for more information on the funding process.

Who informs the Blueprint?

NWT CIMP engaged subject-matter experts with direct involvement in caribou monitoring, research and management to update specific and high monitoring and research priorities. These are NWT CIMP's funding priorities for the duration of the current Action Plan (2021-2025). Experts engaged included co-management boards, government scientists and regulators, and the NWT CIMP Steering Committee.

NWT CIMP's Key Principles

NWT CIMP's principles guide us in meeting our mandate and inform project funding allocation. Funding applicants should be aware of these principles, and, where possible, align their proposals with them. Important principles for applicants to consider are:

- Monitoring cumulative impacts that are **relevant to land and water use decisions** is a strong focus.
- Traditional knowledge and scientific knowledge are equally important sources of monitoring information and data.
- Community-based monitoring and capacity-building are supported in monitoring cumulative impacts.
- Effects- and stressor-based approaches are encouraged.
- Use of common and standardized data collection and analysis protocols are encouraged.

The Caribou Monitoring and Research Blueprint

This section details the locations, methods and topics of focus that are high priorities for NWT CIMP for both barren-ground and boreal caribou.

Where: Geographic locations of study

NWT CIMP prioritizes monitoring and research in areas impacted by disturbances, or vulnerable to disturbances. These include:

- Areas of past, current or future development interest;
- Areas impacted by climate change related disturbances;
- Areas vulnerable to impacts by climate change;
- Areas that support resilience to climate change (e.g., refugia); and
- Temporal (e.g., seasonal and annual variability, long term trends) and spatial (range, regional) scales.

How: Approach(es)

NWT CIMP supports several monitoring and research approaches including:

- Comparative studies across barren-ground herds
- Synthesis and analysis of existing monitoring or research data;
- Collection and analysis of new data, using standardized methods where possible;
- Model development and/or implementation (e.g. empirical or physically-based models); and
- Community-led collection and synthesis of Traditional Knowledge, including people-caribou relationships.

Priorities for Barren-ground Caribou

NWT CIMP's priorities are summarized in the table below and include disturbances from human activities (e.g., roads, oil and gas, forestry, mining, municipal infrastructure) and climate change (e.g., vegetation changes; fire dynamics; permafrost thaw).

NWT CIMP places a high priority on the use of Traditional Knowledge in environmental monitoring and research. Traditional Knowledge is an important source of knowledge to better understand each of the following priority questions. Identifying cultural indictors and methods, changing people-caribou relationships and traditional use mapping are monitoring and research approaches that could be considered. For additional information, refer to *Traditional Knowledge Monitoring Ideas*.

To be considered for funding, the project proposal *must* **clearly** address one or more priority questions

1. **What drives barren-ground caribou herd numbers up and down? (population, abundance and trend metrics)**
    a. What are the predator-prey relationships, implications to caribou recovery and variation with herd size?
        i. how wolves affect caribou calf and adult survival rates;
        ii. ecology of tundra wolves and caribou; and
        iii. how grizzly bears affect early caribou calf mortality
        iv. how climate change may alter predator-prey relationships (e.g., changes in overlap of predator and prey ranges, and/or prey switching).
    b. What are the drivers of mortality/survival, pregnancy rates and calf survival/recruitment rates?
    c. Why are the patterns and trends so different among barren-ground herds?
    d. modeling that integrates demographic data, predation, harvest, environmental data, and assesses cumulative impacts on population trends
    e. other factors that affect caribou demographics and health

2. **Why does the extent and severity of population cycles differ among herds?**
    a. Comparative studies of migratory herds considering habitat/vegetation diversity, variation in demographics, and predator/prey relationships.

3. **What are the climate change implications to caribou demographics and migrations?**
    Traditional Knowledge and understanding is central to answering these questions.
    a. What are the key migratory routes, water body crossings, and climate refugia, and how do we prioritize them to maintain connectivity and free migratory passage among them?
    b. Considering dynamic range use, where are the key areas and how will these change with climate change?
    c. What are the changes in vegetation and impacts of those changes to caribou demographics, comparing across migratory herds?
    d. What are the key climatic drivers of herd demographics?
    e. How can climate change and caribou demographics be used to predict future trends?

Priorities for Boreal Caribou

NWT CIMP places a high priority on the use of Traditional Knowledge in environmental monitoring and research. Traditional Knowledge is an important source of knowledge to better understanding each of the following priority areas. Identifying cultural indictors and methods, changing people-caribou relationships and traditional use mapping are monitoring and research approaches that could to be considered. For additional information, refer to *Traditional Knowledge Monitoring Ideas*.

NWT CIMP's priorities are summarized in table 1 below and include disturbances from human activities and climate change. To be considered for funding, the project proposal ***must*** **clearly** address one or more priority areas.

Table 1: Boreal caribou priority areas related to disturbances, factors of interest, and scales of study

<table>
<tr><td colspan="3">Many of NWT CIMP priorities can be grouped according to the statement:

"The impact(s) of [disturbance(s)] on [caribou-related factor(s)], at the scale of [scale(s) of study]."</td></tr>
<tr><td>Disturbances
(identify one or more)</td><td>Related factors
(identify one or more)</td><td>Scales of study
(identify one or more)</td></tr>
<tr><td>• Human activities (e.g. roads, oil and gas, forestry, mining, municipal infrastructure)

• Climate change-related and/or natural disturbances (e.g. vegetation changes; fire dynamics; permafrost thaw; refugia)</td><td>Population abundance and health:
• modeling that integrates demographic data and assesses cumulative impacts on population trends
• drivers of mortality/survival, pregnancy rates and calf survival/recruitment rates
• predator-prey dynamics (influence on caribou mortality/survival rates)

Caribou distribution and behaviour:
• habitat selection, foraging and movement
• diets, feeding rates, activity budgets, energetics
• key indicators of change
• Zone of Influence

Range condition:
• habitat/forage quality (vegetation distribution, productivity and phenology)
• habitat supply/availability (fragmentation/connectivity, rates of habitat regeneration, etc.)
• changes in important/preferred habitat

People-caribou relationships:
• identification of cultural indicators and methods that can be shared widely
• traditional use mapping
• understanding how relationships with caribou are changing</td><td>Temporal scale:
• seasonal and annual variability
• long-term trends

Spatial:
• local-scale
• seasonal range scale
• range-scale
• regional</td></tr>
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