

# Literature Review of Human Effects on Barren-Ground Caribou:

## Caribou Protection Measures

Prepared for the Nunavut Wildlife Management Board

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# Outline

## Nunavut's existing Caribou Protection Measures

- Origins
- Rationale
- Assessment

## Summary of guidelines in other jurisdictions

- Protected Areas
- Calving Grounds
- Migration Routes and Water Crossings
- Other Habitat Considerations
- Vehicles and Aircraft

# Existing Caribou Protection Measures in Nunavut

## **Keewatin Regional Land Use Plan** <sup>20</sup>

- Contains the original Caribou Protection Measures
- Protection for Beverly and Qamanirjuaq herds

## **North Baffin Regional Land Use Plan** <sup>21</sup>

- Contains the Caribou Protection Measures as an example
- Modifications for north Baffin never adopted

## **West Kitikmeot Regional Land Use Plan (Draft)** <sup>14</sup>

- Contains modified Caribou Protection Measures
- Plan was never signed off

# Origins of Existing Caribou Protection Measures in Nunavut

- In **1978** a German company was interested in mining uranium near Baker Lake <sup>20</sup>
- Caribou populations were **declining** <sup>20</sup>
- Consultants looked in to the effects of the project on wildlife <sup>15</sup>
- Report recommended that development activities be separated from caribou <sup>15</sup>

# Origins of Existing Caribou Protection Measures in Nunavut

## Conflict:

- AANDC: caribou decline was due to harvesting and wolf predation <sup>15</sup>
- Baker Lake: industrial activity posed a threat to caribou <sup>15</sup>

## Ruling:

- Finding in the report to serve as the basis for caribou protection <sup>15</sup>
- AANDC produced the Caribou Protection Measures <sup>15</sup>

# Origins of Existing Caribou Protection Measures in Nunavut

## 1979 - 1990

- AANDC studied land use opportunities in Lancaster Sound <sup>21</sup>
- Lancaster Sound Regional Planning Commission formed <sup>21</sup>
- Land use plans for Keewatin and Lancaster Sound developed <sup>15, 21</sup>
- Monitoring stopped in 1990 due to a lack of funds <sup>15</sup>

## 1993 – 1996

- Change in land use management with signing of the NLCA <sup>20, 21</sup>
- Existing land use plans were updated <sup>20, 21</sup>

# Rationale of Existing Caribou Protection Measures in Nunavut

## Intended to provide protection:

- During calving season <sup>8</sup>
- At water crossings <sup>8</sup>



Photo credit: Rebecca Jeppesen

## Caribou Protected Areas:

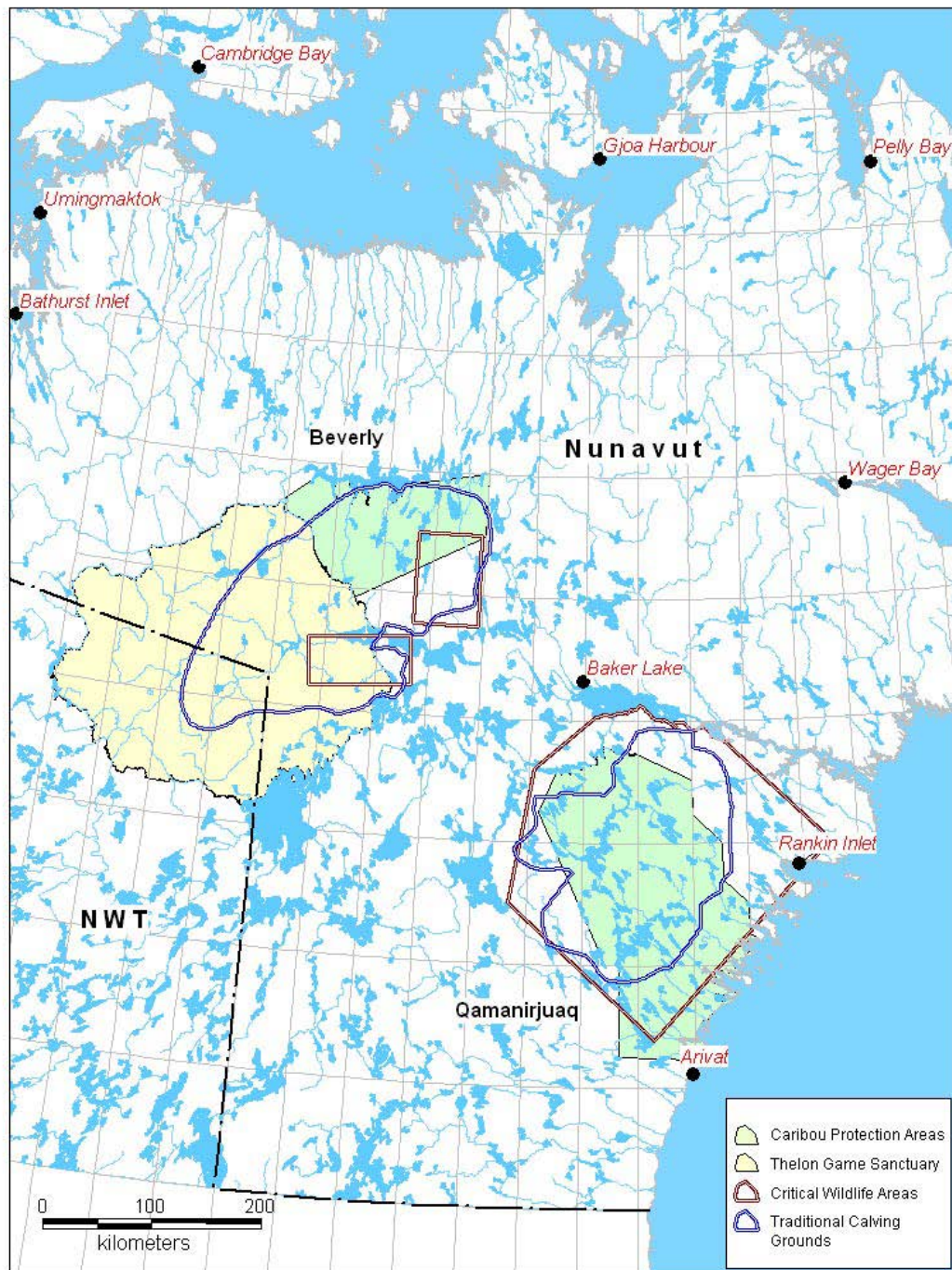
- Based on traditional calving grounds <sup>15</sup>
- Actual calving locations monitored until 1990 <sup>15</sup>
- Boundaries were modified accordingly <sup>15</sup>

# Rationale of Existing Caribou Protection Measures in Nunavut

During 2000 revision of Keewatin Regional Land Use Plan, it was determined that additional protection was warranted. <sup>20</sup>

- Thelon Game Sanctuary
- Fall Caribou Crossing (National Historic Site)
- Sentry Island (National Historic Site)





**Location of the Beverly and Qamanirjuaq Caribou Protection Areas, Critical Wildlife Areas, and Traditional Calving Grounds, Kivilliq Region, Nunavut.**

**Figure and caption from Gunn et al, 2007. Page 2.**



# Rationale of Existing Caribou Protection Measures in Nunavut

## Inside Caribou Protected Areas: <sup>20</sup>

- No activity May 15 to July 15
- Original monitoring program allowed flexibility
- Land use inspectors could lift restrictions



Photo from [www.trailmarksys.com](http://www.trailmarksys.com)

## Outside Caribou Protected Areas: <sup>20</sup>

- Activity continues unless caribou are present

# Assessment of Existing Caribou Protection Measures in Nunavut

## 2000 Assessment: <sup>15</sup>

- Consultants hired by AANDC
- Interviewed land users and wildlife managers
- Impossible to assess effectiveness or compliance
- Unknown amount of protection offered
- Caribou are protected but not the habitat

## 2000 Nunavut Planning Commission:

*“...the existing regulatory structure provides sufficient protection for these areas at this time”*

Keewatin Regional Land Use Plan, Nunavut Planning Commission 2000

# Assessment of Existing Caribou Protection Measures in Nunavut

## 2007 Assessment: <sup>15</sup>

- Compared Caribou Protected Areas with actual calving locations using monitoring and telemetry data
- Data from 1978 to 2005 was used
- An average of 68% of annual calving grounds were in the Caribou Protected Areas
- The timing of calving varies from year to year
  - Tends to be earlier one year and later the next
  - Overall shift to later in the season

# Assessment of Existing Caribou Protection Measures in Nunavut

## 2007 Assessment: <sup>15</sup>

- Caribou would have been exposed to 83 projects if there were no Caribou Protection Measures
- Caribou would have been protected from 65 projects in the caribou Protection Areas without monitoring
- Between 1993 and 2005 there were 14 projects that may have been suspended if monitoring had continued
- No independent data on compliance is available

# Additional Protection Offered through Existing Land Use Plans

## **Conformity Requirement 2.6** <sup>20</sup>

Prohibits development activities on both Inuit Owned and public lands and waters in caribou calving areas during calving season, and in caribou water crossings

## **Conformity Requirement 2.8** <sup>20</sup>

Identifies sites located within caribou calving areas as a priority for clean-up of industrial waste

# Additional Protection Offered through Existing Land Use Plans

## **Code of Good Conduct for Land Users #3** <sup>20</sup>

Recommends against low altitude flights whenever possible in areas where they will disturb wildlife

## **Code of Good Conduct for Land Users #4** <sup>20</sup>

Land use activities should be conducted in a way that conserves renewable resources in a given area

## **Code of Good Conduct for Land Users #6** <sup>20</sup>

Land use activities should be restricted during calving, post-calving and migration



# Mary River:

## Project Specific Caribou Protection Measures

January 2014 joint statement from Qikiqtani Inuit Association and Baffinland : <sup>24</sup>

- Mitigation measures during calving season
- Designated water crossings
- Monitoring will trigger mitigation strategies
- Caribou presence and herd size will be considered

*“...prospecting permits, quarry permits or leases, mineral claims and surface land leases are also potential sources of human activity on calving and post-calving ranges (that currently do not require land-use permits) ..... as of September 2006, (AANDC) had issued 37 prospecting permits, 417 mineral claims and 10 mineral leases for the BQ calving grounds . At this stage, it is unknown how those translate into activities on the ground. The only protection for caribou is if any of the activity reaches the stage of application for a Land Use Permit.”*

(Gunn et al., 2007: page 32)



Photo from ACCWM, 2014  
included therein courtesy of Kristen Callaghan





Questions?

Discussion?

# Caribou Protection Measures in Other Jurisdictions

## Northwest Territories:

- Protection plans, mitigation strategies, and monitoring programs developed by land users <sup>13</sup>
- Specific to the scope and nature of the project <sup>13</sup>
- Community conservation plans required by a number of Inuvialuit communities <sup>8</sup>

# Caribou Protection Measures in Other Jurisdictions

## Yukon:

- Interim measures implemented in 2009 for Porcupine herd <sup>9</sup>
- Working on developing guidelines <sup>9</sup>

## Nunavik:

- Caribou identified as a priority species <sup>16</sup>

# Caribou Protection Measures in Other Jurisdictions

## Labrador: <sup>17</sup>

- Evaluation of land use change is a priority
- Identified need to develop guidelines and regulations

## Alberta: <sup>12</sup>

- Caribou specific protection plans must be submitted
- Conditions attached to land use permits

## Manitoba: <sup>19</sup>

- Project-specific mitigation measures
- Attached as conditions to land use permits

# Caribou Protection Measures in Other Jurisdictions

## British Columbia: <sup>5</sup>

- Mitigation plans must indicate no impact or a net gain
- Within 10 years of project approval

## Alaska: <sup>8</sup>

- Recommendations included as stipulations to development permits

# Caribou Protection Measures in Other Jurisdictions: Designated Protected Areas

- The need for **designated protected areas** is well recognized <sup>6, 7, 14, 17, 19, 20, 21, 23</sup>
- Can be a **complex** and often lengthy process



Photo from Protected Areas Secretariat, 2014



# Caribou Protection Measures in Other Jurisdictions: Designated Protected Areas

## **Thelon Game Sanctuary (2000):** <sup>20</sup>

- Established with modification of Keewatin Regional Land use Plan

## **Edézhíé Candidate National Wildlife Area (2015):** <sup>23</sup>

- Surface and subsurface rights withdrawn
- 14,000 square kilometers

## **Broadback River Watershed (proposed):** <sup>7</sup>

- Two levels of protection

# Recommendations from the Literature: Designated Protected Areas

- Highest quality habitat should be **protected** <sup>10</sup>
- **Expand** existing areas <sup>18</sup>
- Different herds may have **different needs** <sup>21</sup>
- Account for **variation** between years <sup>15, 27</sup>



Photo from [www.nwmb.com](http://www.nwmb.com)

# Caribou Protection Measures in Other Jurisdictions: Calving Grounds

## Alberta: <sup>12</sup>

- No industrial activity mid-February to mid-July

## Alaska: <sup>8</sup>

- Minimal traffic during calving season

## Quebec: <sup>27</sup>

- Designated calving grounds for Leaf River and George River Herds as Wildlife Habitat

# Recommendations from the Literature: Calving Grounds

Gunn et al. (2007) in Northwest Territories:

- Variation in location and timing of calving
- Weather patterns can influence migration

Taillon et al (2012) in Quebec:

- Significant variation in calving ground locations
- Protected areas may not provide long term habitat protection

# Caribou Protection Measures in Other Jurisdictions: Migration Routes and Water Crossings

## Alaska: <sup>8</sup>

- Often prohibit permanent facilities in travel corridors
- Pipelines to be elevated or ramped



Photo credit: Rebecca Jeppesen

# Recommendations from the Literature: Migration Routes and Water Crossings

## Water Crossings:

- Nunavut Tunngavik Inc. (1994) noted that shipping traffic in areas of dense ice formation should be considered in land use planning

## Migration Routes:

- A study of habitat use in Yukon emphasized the importance of maintaining migration corridors <sup>10</sup>

# Caribou Protection Measures in Other Jurisdictions:

## Other Habitat Considerations

### Northwest Territories: <sup>8</sup>

- Measures must be in place to prevent or mitigate negative impacts to caribou

### British Columbia: <sup>5</sup>

- Impacts must be considered in all seasons
- Identify options to minimize impacts

### Alaska: <sup>8</sup>

- Specifies need for insect relief areas

# Recommendations from the Literature: Other Habitat Considerations

- Consider multiple **spatial scales** <sup>11, 17, 18</sup>
- Critical habitat may include **more** than calving areas <sup>10, 18</sup>
- Sites should be **remediated** <sup>4, 25</sup>



# Recommendations from the Literature:

## Mobile Protection measures

### Gunn and Poole (2009) Pilot study in Northwest Territories:

- If a collared cow came into a defined area around a mine, an aerial survey was triggered.
- Survey would indicate if shut down was likely
- Determined method was appropriate for late winter

### Appeal?

- Protection moves with the herd
- Allows for variation in migration and calving
- Minimizes impact to industry

*“Habitat – [we] need to look at [that]. Caribou manage their habitat – the caribou move to other areas and then move back to that area. We need to include more about habitat. (Tsiigehtchic)”*

(ACCWM, 2014: page 106)



# Caribou Protection Measures in Other Jurisdictions: Vehicles and Aircraft

## Alberta:

- Use temporary seasonal roadways <sup>3, 12</sup>

## Alaska:

- Maximum speed 15 mph when caribou are present <sup>8</sup>

## Northwest Territories and Yukon: <sup>8</sup>

- More stringent recommendations for pilots than those issued by Transport Canada

# Recommendations from the Literature: Vehicles and Aircraft

- Assess disturbance <sup>18</sup>
- Investigate consequences <sup>18</sup>
- Develop guidelines <sup>18</sup>



Photo from Rudolph et al 2012, credit to MRNF

# Recommendations from the Literature: Continued Research and Monitoring

## Population Parameters:

- Population size 10, 18, 26
- Population structure 5, 10, 18, 26
- Growth rate 5, 10, 26
- Health 5, 10, 26
- Distribution and habitat use 4, 18, 26

# Recommendations from the Literature: Continued Research and Monitoring

- Once measures are in place, determine whether they are **effective** <sup>2, 4, 6, 15, 18, 19</sup>
- Where possible, monitor the direct **responsiveness** of caribou to land use activities <sup>4, 10, 19</sup>



Taima

Nakurmiik



# End Notes

1. Advisory Committee for Cooperation on Wildlife Management. 2014. We have been Living with the Caribou all our Lives: a report on information recorded during community meetings for '*Taking Care of Caribou – the Cape Bathurst, Bluenose-West, and Bluenose-East Barren-ground Caribou Herds Management Plan*'. Yellowknife, NT.
2. Alaska Department of Fish and Game. 2014. Operational Plan for Intensive Management of the Fortymile Caribou Herd in Game Management Units 12, 20B, 20D, 20E, and 25C during Regulatory Years 2014-2019. Prepared by Division of Wildlife Conservation. 26pp.
3. Alberta Woodland Caribou Recovery Team. 2005. Alberta Woodland Caribou Recover Plan 2004/05 -2013/14. Alberta Sustainable Resource Development, Fish and Wildlife Division. Alberta Species at Risk Recovery Plan No. 4. 58pp.
4. Bathurst Caribou Management Planning Committee. 2004. A Management Plan for the Bathurst Caribou Herd. 51 pp.
5. British Columbia (B.C.) Ministry of Environment. 2013a. Implementation plan for the ongoing management of South Peace Northern Caribou (*Rangifer tarandus caribou* pop. 15) in British Columbia. Victoria, British Columbia.
6. Canadian Parks and Wilderness Society. 2013. Population Critical: How are Caribou Faring? First Annual Report on Government's Efforts to Conserve Canada's Declining Boreal Caribou Populations. Prepared by Canadian Parks and Wilderness Society and the David Suzuki Foundation. 32pp.
7. Cree Nation. 2012. Broadback Watershed Conservation Plan. 5pp.



# End Notes

8. EBA Engineering Consultants Ltd. 2011. Anthropogenic disturbance on ungulates, guidelines and mitigation of impacts, GN , Department of NU.
9. Environment Yukon. 2009. Rationale for Implementing Conservation Measures to Protect the Porcupine Caribou Herd. Yukon Government. 43pp.
10. Francis, S., and J. Nishi. 2015. Range Assessment as a Cumulative Effects Management Tool: Assessment of the Carcross Caribou Herd Range in Yukon. Prepared for Environment Yukon, Fish and Wildlife Branch Regional Programs. 84pp.
11. Francis, S., T. Antoniuk, J. Nishi, and S. Kennett. 2013. Range Assessment as a Cumulative Effects Management Tool: A Recommended Approach for Environment Yukon. MRC-13-01. Prepared for Environment Yukon, Fish and Wildlife Branch Regional Programs. 84pp.
12. Government of Alberta. 2012. Caribou Protection Plan Guidelines and Caribou Calving Information. Environment and Sustainable Development. Caribou Protection Plan – Integrated Resource Management Division. 3pp.
13. GNWT. 2014. Wildlife and Wildlife Habitat Protection Plan and Wildlife Effects Monitoring Program Guidelines. Department of Natural Resources. Wildlife Division. Draft Report. 54pp.
14. Gunn, A. and K. Poole. 2009. A Pilot Project to test the use of Aerial Monitoring to Supplement Satellite Collared Caribou for CPMs. Prepared for Deline Renewable Resources Council. 16pp.
15. Gunn, A., K. Poole, J. Wierzchowski, and M. Campbell. 2007. Assessment of CPMs. Submitted in fulfillment of NCR #830359 Indian and Northern Affairs Canada, Gatineau, Quebec. 45pp.

# End Notes

16. Kativik Regional Government and Makivik Corporation. 2011. Plan Nunavik. Published by Avataq Cultural Institute. Westmount, Quebec. 469 pp.
17. Labrador Woodland Caribou Recovery Team. 2004. Recovery Strategy for Three Woodland Caribou Herds (*Rangifer tarandus caribou*; Boreal population) in Labrador. Prepared by Isabelle Schmelzer on behalf of the Labrador Woodland Caribou Recovery Team for the Inland Fish and Wildlife Division, Department of Environment and Conservation, Government of Newfoundland and Labrador. 60pp.
18. Manitoba Conservation. 2005. Manitoba's Conservation and Recovery Strategy for Boreal Woodland Caribou (*Rangifer tarandus caribou*). Government of Manitoba. 22pp.
19. Manitoba Conservation. 2011. Action Plan for Boreal Woodland Caribou Ranges in Manitoba (*Rangifer tarandus caribou*). Draft Report. Government of Manitoba. 61pp.
20. NPC. 2000a. Keewatin Regional LUP. 110pp.
21. NPC. 2000b. North Baffin Regional LUP. 130pp.
22. NTI. 1994. Revised Report on Resource Management Planning in West Kitikmeot. Prepared by the West Kitikmeot Resource Management Planning Working Group. 71pp.
23. Protected Areas Secretariat. 2014. NWT Protected Areas Strategy. Edehzhie Candidate National Wildlife Areas. Public Information Pamphlet. 2pp.
24. QIA. 2014. Joint Statement of QIA and Baffinland to the NPC and the NU Impact Review Board regarding Appendix I of the North Baffin Regional LUP. 5pp.

# End Notes

25. Rudolf, T., P. Drapeau, M.H. St-Laurent, and L. Imbeau. 2012. Status of Woodland Caribou (*Rangifer tarandus caribou*) in the James Bay Region of Northern Quebec. Presented to the Ministère des Ressources naturelles et de la Faune du Québec and the Grand Council of the Crees (Eeyou Istchee). Prepared by the Woodland Caribou Recovery Task Force Science Advisory Group Nord-du-Québec. 85pp.
26. Saskatchewan Ministry of Environment. 2013. Conservation Strategy For Boreal Woodland Caribou (*Rangifer tarandus caribou*) in Saskatchewan. Saskatchewan Ministry of Environment. Fish and Wildlife Technical Report 2014.
27. Taillon, J., Festa-Bianchet, M., and Côté, S.D. 2012. Shifting targets in the tundra: protection of migratory caribou calving grounds must account for spatial changes over time. Biol. Conserv. In