



WILDLIFE RESEARCH IN THE KIVALLIQ REGION OF NUNAVUT WITH
IMPLICATIONS TO THE NEEDS OF NUNAVUMMIUT

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Wildlife Research in The Kivalliq Region of Nunavut With Implications to The Needs of Nunavummiut

1) Review of Wildlife and Habitat Management Programs for Terrestrial Species in Nunavut.

1.1) Kivalliq Region:

Kivalliq Research Initiatives: 1.1.1 - Qamanirjuaq Caribou Monitoring Program, Qamanirjuaq Caribou Classification Studies, Qamanirjuaq Condition and Disease Monitoring, 1.1.2 - Beverly Caribou Population Monitoring Studies, 1.1.3 - Northeast Mainland Caribou Collaring and Delineation Studies, 1.1.4 - Southampton Island Caribou Condition Studies, Southampton Island Population Monitoring Studies, 1.1.5 - Nunavut Wide Ungulate Genetic Studies, 1.1.6 - Central Kivalliq and Northeast Kitikmeot Muskox Studies, 1.1.7 - Kivalliq Wide Ecological Land Classification Studies, 1.1.8 - Conservation Education Production of Kivalliq Research Results on CD Titled "Journey of The Caribou".

1.1.1 Qamanirjuaq Caribou Monitoring Program, Qamanirjuaq Caribou Classification Studies, and Qamanirjuaq Condition and Disease Monitoring

The above programs studying the Qamanirjuaq Caribou Population (Figure 1) have been partnered with the Kivalliq Wildlife Board (KWB), the Nunavut Wildlife Management Board (NWMB), the Beverly and Qamanirjuaq Caribou Management Board (BQCMB), the Local HTO's (Hunter and Trapper Organizations) of Arviat, Whale Cove, Rankin Inlet and Baker Lake, and the Jurisdictions of the North West Territories (NWT) and Manitoba (Campbell 2006 interim report) (Interim and final reports on these studies are listed in Appendix 1).

The Qamanirjuaq Caribou Herd is the largest herd in Nunavut occupying a massive (300,000km²) yet poorly understood range. Kivalliq Inuit utilize an estimated 15,000 Qamanirjuaq caribou per year worth an estimated 12 million dollars (\$800/caribou). The logistics involved in determining how these caribou use their range are for the most part labor intensive and cost restrictive. An ongoing satellite telemetry program launched in 1993 has provided the information to build a comprehensive location and activity database. Alone this database has been providing biologists, HTOs, the KWB Kivalliq Wildlife Board), and inter-jurisdictional and jurisdictional management boards with the only source of information connecting the Qamanirjuaq caribou to their seasonal range. This kind of information is crucial to the development of management

plans and the steering of land use activities in an informed, conservation minded direction. As land use activities heighten to meet the needs of a rapidly growing natural resource based economy, the maintenance of viable wildlife populations with high sustainable yields will require an escalation in our attempts to quantify wildlife habitat (Donihee and Grey, 1983; Scotter, 1980; Thompson et al, 1980). Knowing where the caribou are is the key to avoiding conflicts between natural resource industries and caribou (Tennenhouse, 1986). Understanding population trends is essential for herd management.

The objectives of the project are to maintain 20 GPS/satellite collars on Qamanirjuaq caribou cows to: 1) establish an important habitats information base for the Qamanirjuaq caribou herd by integrating the location and activity database, using spatial analysis software, with vegetation, hydrological, topographical, exploration and land use databases, 2) provide resource users, regional Wildlife Organizations, Jurisdictional and inter-jurisdictional management boards access to an information base with which to make management decisions and steer land use activities, in an informed and conservation minded direction, 3) locate caribou concentrations during spring to determine herd composition as well as determine spring recruitment values for the purposes of estimating herd trend, and monitor the health of the population in light of a recently detected decline in spring recruitment values.

Presently a Management Plan has been developed by the Beverly and Qamanirjuaq Caribou Management Board with involvement from the Jurisdictions of Saskatchewan, Manitoba the NWT and Nunavut. The present plan utilizes the results of the Qamanirjuaq Caribou Monitoring Program to make management recommendations to all jurisdictions occupied by Qamanirjuaq caribou range. Results of these studies have been used to review harvest rates, coordinate exploration aerial and ground operations, enforce KIA (Kivalliq Inuit Association) and INAC caribou protection measures, and for environmental Impact assessments.

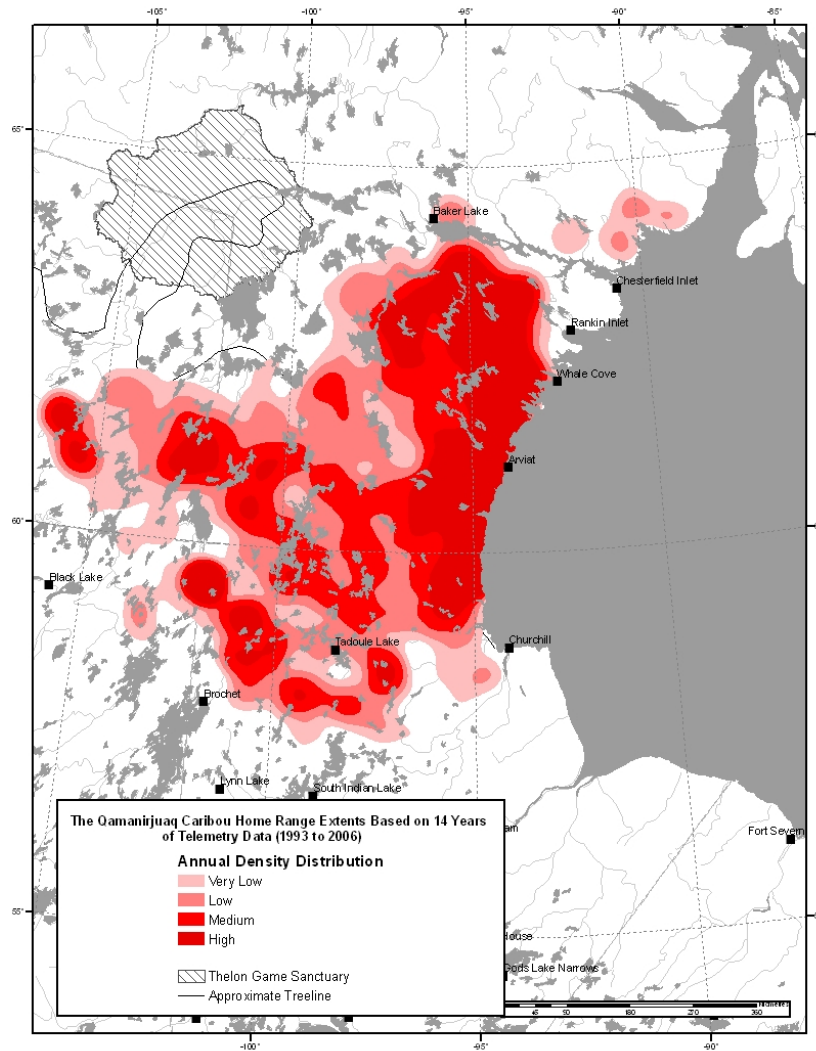


Figure 1 The Qamanirjuaq Home Range based on 14 years of telemetry data from 68 collared Qamanirjuaq cows (1993 to 2006).

Literature Cited:

- Campbell, M. 2006. The Monitoring of Qamanirjuaq caribou (*Rangifer tarandus groenlandicus*) using satellite Telemetry. Nunavut Government. Department of Environment. Interim Report. 15pp.
- Donihee, J. and P.A. Gray. 1982. Critical habitat in the Northwest Territories. Can. Comm. Ecol. Land. Classif. Newsletter, No. 12:13-15.
- Scotter, G.W. 1980. Management of wild ungulate habitat in the Western United States and Canada: A Review. Journal of Range Management. 33(1):16-24.

Tennenhouse, E. 1986. Caribou Protection Measures for the Beverly and Kaminuriak Caribou herds. Series ED: E. Hall. Publication of the N.W.T. Dept. of Renewable Resources. 17pp.

Thompson, D. C. G.H. Klassen, and J. Cihlar. 1980. Caribou Habitat Mapping in the Southern District of Keewatin, N.W.T.: An application of digital Landsat data. *Journal of Applied Ecology*. 17:125-138.

1.1.2 Beverly Caribou Population Monitoring Studies

The Beverly Caribou Population Monitoring Study is being partnered with the KWB, NWMB, the BQCMB, and the Baker Lake HTO. Other jurisdictions including the North West Territories (NWT), Saskatchewan the federal Government are also partnering in this project. (Interim and final reports on these studies are listed in Appendix 1).

The intent of the study is to obtain a current estimate of the number of breeding females in the Beverly herd of barren ground caribou (Figure 2). The last survey of the Beverly herd was conducted in 1994. Recent surveys of the Bathurst, Bluenose East and West and Cape Bathurst barren ground caribou herds show significant declines in all these herds and provide strong evidence to support a similar decline for the Beverly herd. The survey method consists of a 1) systematic reconnaissance survey that outlines the distribution of calving caribou and patterns of caribou numbers, 2) photographic survey that uses a specialized plane to photograph caribou on the annual calving area and 3) classification survey that determines the number of breeding and non-breeding females on the annual calving ground.

At present little is known of the status, health and seasonal range use of Beverly caribou. Information collected during the above studies on population status will be used to assess the sustainable harvest of the Beverly herd and determine whether enhanced management activities are required. Current information on the location of the annual Beverly calving ground will help reduce the effects of industrial and commercial activities.

Current information on the annual calving ground of the Beverly herd is required for the management of land use activities to reduce possible effects of human activities. Caribou Protection Measures were implemented by DIAND to protect breeding cows during the calving and post-calving periods, but there has been no funding for the caribou monitoring component of the measures since 1991, and Caribou Protection Areas (CPAs) are based on past calving and post-calving information. Since the CPAs were established, Beverly caribou have regularly calved outside of the CPAs including at least 4 years in which less than 5% of calving occurred within the CPA (Gunn and Sutherland 1997). Data from satellite-radio collared cows from the Qamanirjuaq herd have also demonstrated that cows have regularly calved outside of the CPAs.

Gunn, A. and M. Sutherland. 1997. Surveys of the Beverly caribou calving grounds, 1957-1994. Northwest Territories Department of Resources, Wildlife and Economic Development. File Report No. 120. 119 p.

1.1.3 Northeast Mainland Caribou Collaring and Delineation Studies

The study of Lorillard and Wager Populations of barren-ground caribou occupying the Northeastern mainland of Nunavut is being partnered with the KWB, the NWMB, and the Repulse Bay and Chesterfield Inlet HTOs (Campbell, 2006 Final report). Interim and final reports on these studies are listed in Appendix 1).

Repulse Bay, Baker Lake, Chesterfield Inlet, Pelly Bay and Igloolik have reported general declines in Northeastern mainland caribou health and numbers. With little information available on the number and size of caribou populations within the Northeastern mainland region, their range requirements and seasonal range use, managers had been unable to address community concerns. Surveys flown between 1976 and 1987 found three distinct densities and associated calving grounds occupying the Northeast mainland of the Kivalliq Region in June; the Melville, Lorillard (Figure 3) and Wager (Figure 4) Herds (Calef and Helmer, 1976; Calef and Heard, 1981; Heard *et al.*, 1981; Heard *et al.*, 1986; Donaldson, 1981). A VHF collaring program deployed within the Wager and Lorillard ranges during the 1980's found the presence of at least three additional aggregations of caribou in the area displaying calving ground fidelity (Heard *et al.*, 1986). Further research to confirm these aggregations in 1999 to 2005 suggest that these aggregations are no longer apparent.

The objectives of the project were to: 1) utilize satellite telemetry and calving ground delineation's to determine the range and number of distinct populations occupying the Northeast mainland. Collars were systematically deployed over the study area during early spring, a time of year, other than calving, when the expression of herd fidelity is at its strongest. 2) Utilize satellite telemetry to address the land use management issue of important winter, spring, summer and fall range. This base-line information is essential for determining where, when, and how natural resource industries can become established without jeopardizing the conservation of northeastern mainland caribou or their range.

The study of the Lorillard and Wager herds of barren-ground caribou concluded during the 2006/07 fiscal year. Much of the data has been analyzed and a report produced. Following the completion of the analysis talks towards the development of a management plan for the herds with the communities of Repulse Bay (Wager Herd) and Chesterfield Inlet (Lorillard Herd) can begin. Estimated completion of the final analysis is February/March 2008. Results from this research have and continue to be used to make management recommendations to communities and resource users on the ranges of both

herds, review harvest rates, coordinate exploration aerial and ground operations, enforce KIA as well as for environmental Impact assessments.

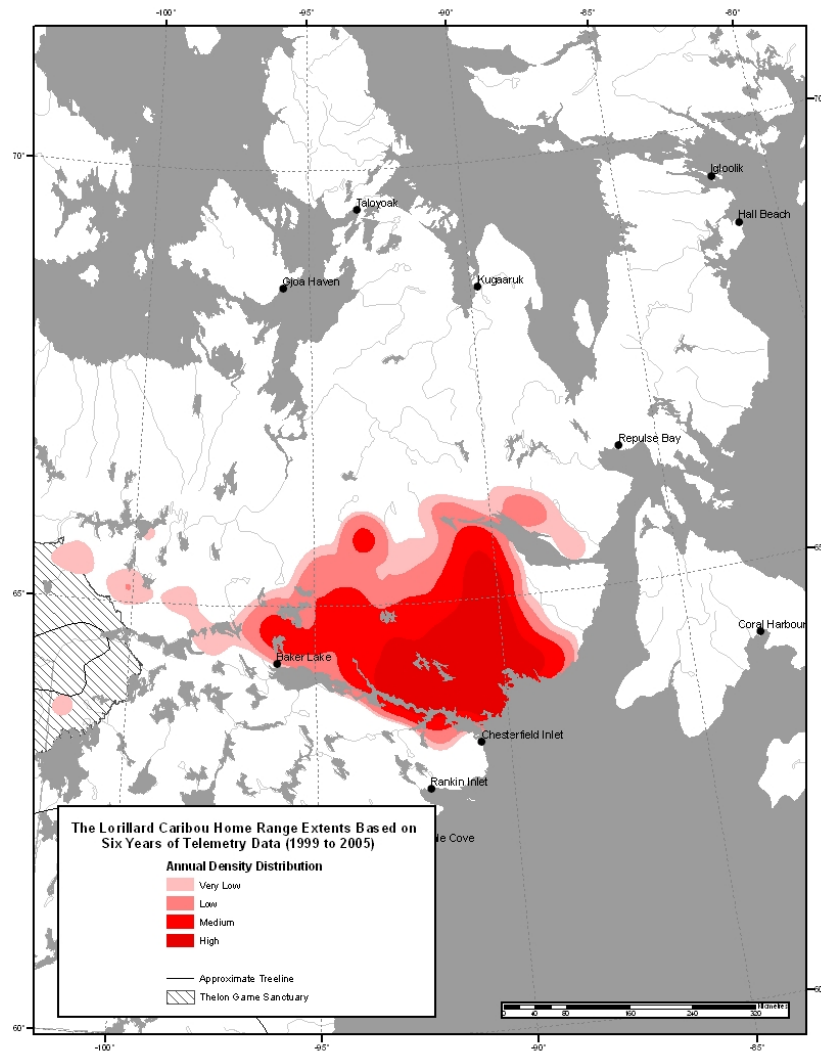


Figure 3 The home range of the Lorillard Caribou Herd based on telemetry data collected between 1999 and 2005 from 25 adult cows.

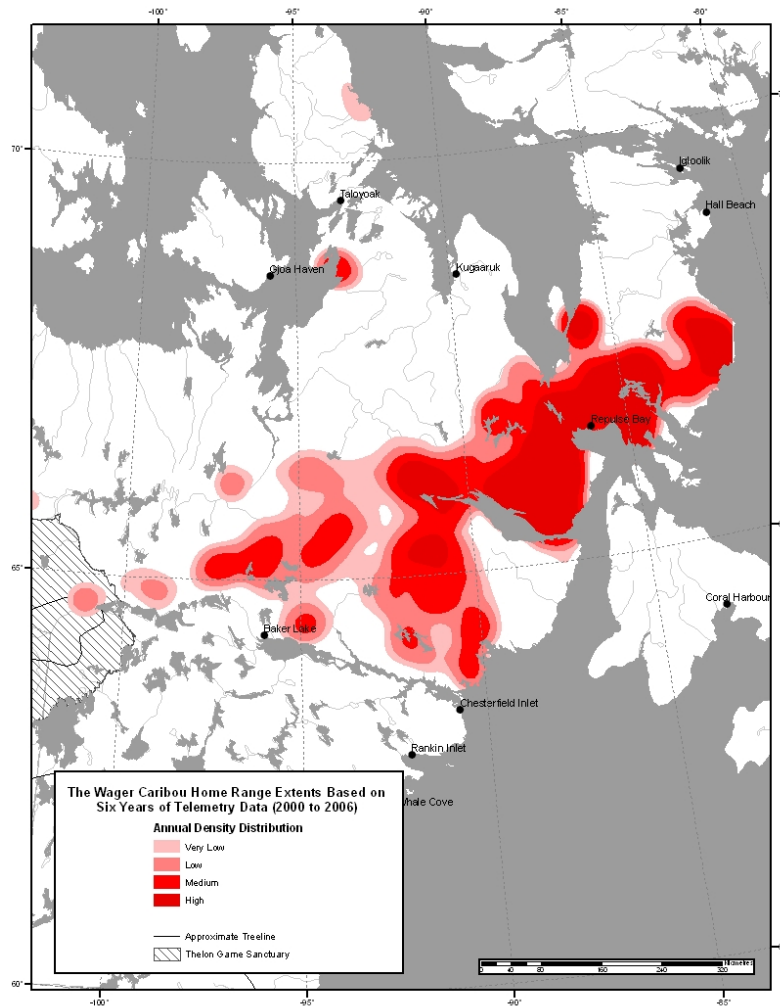


Figure 4 The home range of the Wager Caribou Herd based on telemetry data collected between 2000 and 2006 from 20 adult cows.

Literature Cited:

- Campbell, M. 2006. The seasonal distribution and herd delimitation of Northeastern Mainland caribou (*Rangifer tarandus groenlandicus*). Nunavut Government. Department of Environment Interim Report. 22pp.
- Calef, G.W. and Helmer, A. 1981. A population estimate for the Melville Peninsula caribou herd in 1976. 16 pp.
- Calef, G.W. and Heard, D.C. 1981. The status of three tundra wintering caribou herds in northeastern mainland, N.W.T. 25 pp.

Donaldson, J.L. 1981. Population and recruitment estimates for the Lorillard and Wager caribou herds in 1977. N.W.T. Wildlife Service. File Report No.13. 50pp.

Heard, D.C., Calef, C.W. and Cooper, S. 1981. Numbers, distribution and productivity of caribou in northeastern Keewatin District, N.W.T. 27 pp.

Heard, D.C., Williams, T.M. and Jingfors, K. 1986. Precalving distribution and abundance of barren-ground caribou on the northeastern mainland of the Northwest Territories. *Arctic*. 39(1): 24-28.

1.1.4 Southampton Island Caribou Condition Studies, Southampton Island Population Monitoring Studies

The above programs studying the Southampton Island Caribou Population (Figure 5) have been partnered with the KWB, the NWMB, the Coral Harbour HTO, and Agriculture Canada (Campbell, 2006 - interim report). Interim and final reports on these studies are listed in Appendix 1).

Wolves (*Canis lupus*) and barren-ground caribou (*Rangifer tarandus groenlandicus*) were a common component of Southampton Island ecology until the early 1900's. The decline of these animals became obvious by 1935 and was followed by the local extinction of wolves by 1937 (Parker, 1975). The extirpation of caribou from Southampton was complete by 1952, a result in part of over hunting. The absence of this resource was keenly felt by residents of Coral Harbor prompting both the local HTO and government to initiate the re-introduction of caribou onto the Island. In 1967, 14 years following their extirpation, 48 caribou from Coats Island were introduced onto Southampton Island. Caribou numbers have since increased rapidly which is in part due to exceptional range conditions resulting from the 14-year absence of caribou from the Island. The Southampton Island Caribou Herd is extensively utilized both commercially and domestically. Commercial harvests have seen a general increase from 564 in 1992, to 759 in 1993, 1,554 in 1994, 2,356 in 1995, 1,839 animals in 1996, 3,365 in 1997, 2,956 in 1998, 1,094 in 1999, 2,166 in 2000, 3,696 in 2001, 3,834 in 2002 to 5005 animals in 2003. of 4,000 animals were harvested at a sixty percent male ratio. The Department of Environment (DoE) over this same period recommended a harvest of 3,500 animals at a minimum 80 percent females with no mature females. The latest survey results suggest that the population is stable though a high incidence of *Brucella suis* is causing concern for both community members and biologists. Close monitoring of herd trend and health is strongly recommended to detect and possibly mitigate any demographic impacts.

The objectives of these research studies are to provide basic information on the Southampton Island Caribou Herd (Figure 5) with which to manage the population given the large commercial use as well as a significant subsistence

harvest. The objectives include: 1) The determination of Southampton Island caribou population trend as increasing, stable or decreasing in light of a high incidence of the disease *Brucella suis* as well as years of commercial and subsistence harvesting. 2) The monitoring of the condition of Southampton Island caribou and how any change in condition relates to range condition, availability and/or extent. 3) Monitoring the sex and age structure of the harvest to determine potential modifications in age/sex structure resulting from the commercial harvest is also required to predict short term trends. 4) Finally the study of feeding habits using rumen and stable Isotope analysis to determine range condition, quality and dietary shifts that may relate to changes in caribou health as observed during the condition analysis and again provide short term predictive power to the management of this herd..

These programs have been providing the Coral Harbour HTO with the information required to manage there caribou population for both commercial and subsistence utilization on a two year cycle. Without these programs the herd could be harvested to a point where the subsistence harvest is effected.

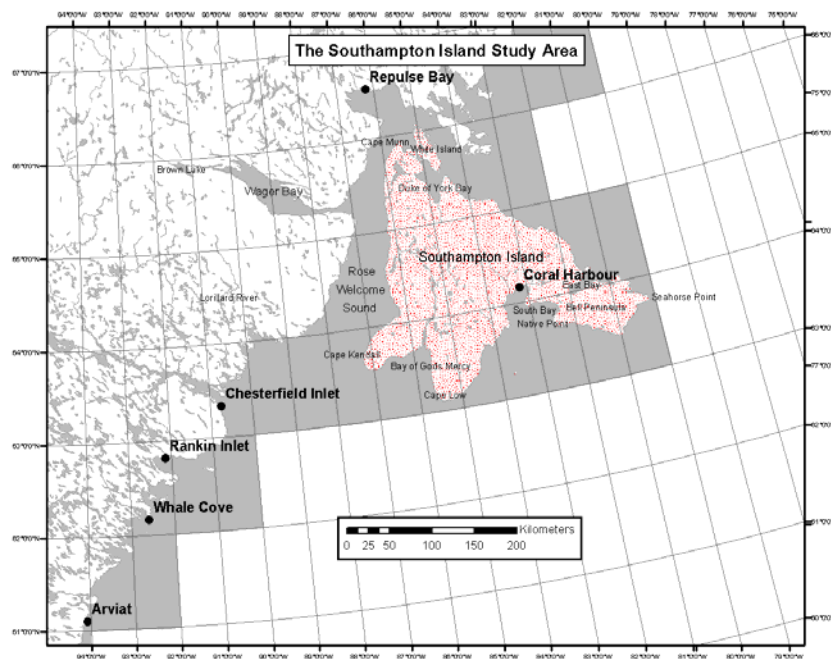


Figure 5 The Southampton Island Caribou Range.

Literature Cited:

Parker, G.R. 1975. An investigation of caribou range on Southampton Island, N.W.T. Can. Wildl. Serv. Rep. Ser. No. 33: 83 pp.

1.1.5 Nunavut Wide Ungulate Genetic Studies

The Nunavut wide genetic assessment of caribou and muskox populations is being partnered with the NWMB, and Nunavut HTO's. In addition Manitoba is providing assistance in the collection of genetic material from its northern caribou populations (Campbell 2006 – interim report). Interim and final reports on these studies are listed in Appendix 1).

The management of Nunavut caribou and muskox populations as distinct demographic units with associated harvesting recommendations requires research methodologies capable of delimiting these populations. Studies of caribou and muskox movement, population trends, and seasonal range will be used to direct the proposed study as well as compliment its results. Many methods have the potential of meeting these research goals however a genetic approach is proposed as a cost effective general first step towards defining demographic units to caribou and muskox populations across Nunavut.

Caribou (*Rangifer tarandus*) and Muskox (*Ovibos moschatus*) are valuable economic and cultural game species in Nunavut. Through traditional knowledge and scientific studies we know that these species, especially caribou, are not always a dependable resource due to the unpredictable nature of range shifts, population declines and resource availability. In the case of Peary caribou a changing environment has led to declines in many populations leading to their addition to the COSEWIC endangered species list. In addition to natural events many caribou and muskox populations have and will experience various levels of stress due to human impacts on their ranges. As caribou and muskox range conditions change with increased land use, the maintenance of existing genetic diversity could become more difficult (Zittlau, 2004). Genetic diversity is considered a necessity if a population is to avoid the risk of inbreeding effects and adapt to changing environmental conditions (Zittlau, 2004; Proctor, 2003; Proctor and Paetkau, 2004).

The objectives of these studies are to study the genetic relatedness of Nunavut caribou and muskox populations. Much debate has surfaced over the years concerning the relatedness of caribou populations and muskox distributions across northern North America. Specific to this report is the need to delimit these populations and or groupings for many reasons. The project is in the data collection phase until spring 2007. February 2008 should see the completion of the analysis and the associated report.

It is important to understand the genetic structure of caribou populations and to determine the current levels of diversity within these populations (Zittlau, 2004; Proctor, 2003; Proctor and Paetkau, 2004). The importance of this kind of study reaches into the very management regime and decision-making process where management decisions effecting one herd can have profound effects on related herds (Zittlau, 2004).

Literature Cited:

- Campbell, M. 2006. Delimiting Nunavut Caribou Populations Using Nuclear DNA. Nunavut Government. Department of Environment. Interim Report. 8pp.
- Proctor, M.F. 2003. Genetic Analysis of Movement and Population Fragmentation of Grizzly Bears in Southwestern Canada. Ph.D. Thesis. Department of Biological Sciences, University of Calgary. 147pp.
- Proctor, M.F., and D. Paetkau. ,2004. A Genetic-based Spatial Analysis of Grizzly Bears in Alberta. Alberta Fish and Wildlife Division. 27pp.
- Zittlau, A.K. 2004. Population Genetic Analyses of North American Caribou (*Rangifer tarandus*). Ph.D. Thesis. Department of Biological Sciences, University of Alberta. 187pp.

1.1.6 Central Kivalliq and Northeast Kitikmeot Muskox Studies

The Kivalliq and Northeast Mainland Muskox population study was partnered with the KWB, the NWMB, and all Kivalliq HTO's. The studies were completed in 2001 (Campbell and Settingington, 2001). Interim and final reports on these studies are listed in Appendix 1).

The distribution and abundance of muskox in the Central Kivalliq region of Nunavut (Figure 6), which includes muskox management zones MX/20 and MX/21 were estimated using fixed-width line transect surveys in July of 1999. The number and distribution of muskox in the northern Kivalliq and northeast Kitikmeot region (Figure 6), which includes MX/17 and MX/18, were estimated using fixed-width line transect surveys in July 2000 (Figure 6). Requests for this study came from all Kivalliq HTO's as well as the Kugaaruk, Taloyoak and Gjoa Haven HTO's. All groups reported seeing muskox expanding both their range and their number. Information provided by the Arviat, Whale Cove, Rankin Inlet and Baker Lake HTOs provided evidence of this range expansion within the central Kivalliq, while observations from the Northeast Kitikmeot were inconclusive. The population study was initiated in 1999 following through in 2000 in response to requests from Kivalliq and Northeast Kitikmeot hunters for increased quotas and closer harvesting opportunities. Both of these requests were granted in the Central and North central Kivalliq. In the northeast Kitikmeot a quota reduction was recommended due to the extremely low densities observed.

The objectives of the project were to utilize stratified random transect aerial surveys to determine the population status of Kivalliq and northeast Kitikmeot muskox populations. The study was also designed to complement proposed muskox surveys in the Kitikmeot Region and Thelon Game Sanctuary.

Results of this study have and continue to be used to set sustainable harvest quotas and foster the establishment of muskox into historic range. The success of this harvest management program is a direct result of the information collected during these studies and its continued success will rely of similar studies in the future.

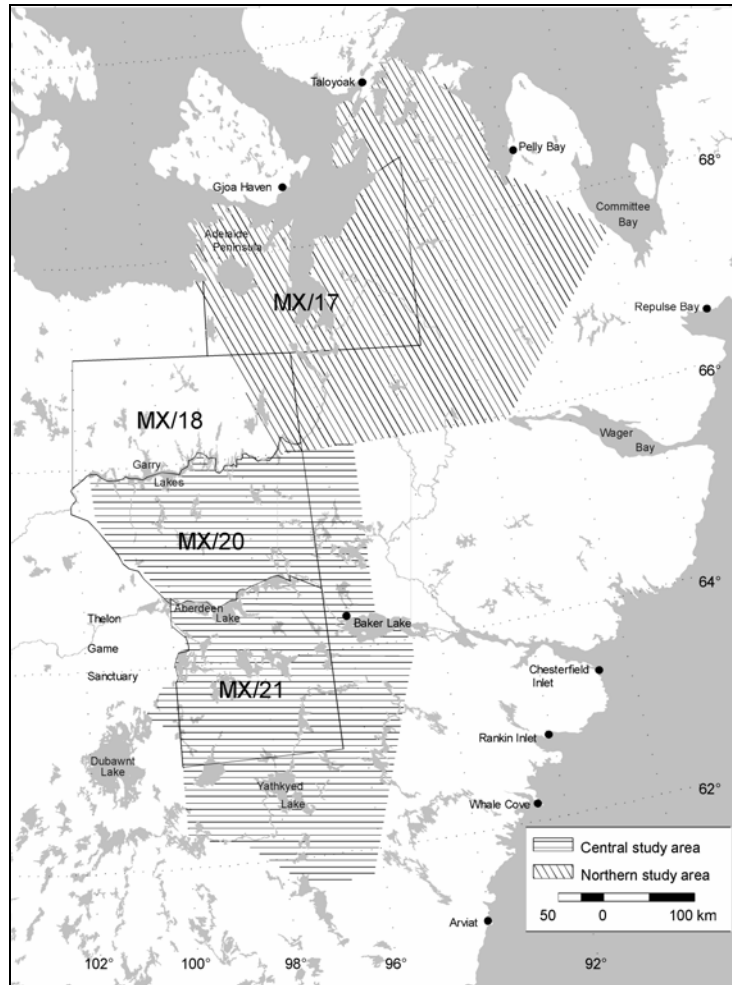


Figure 6. The northern and central Kivalliq muskox survey study areas and muskox management units, Nunavut.

Literature Cited:

Campbell M, and M Settington. 2001. The re-evaluation of Kivalliq and Northeast Kitikmeot Muskox (*Ovibos moschatus*) populations, management zones, and quotas. Draft File report #001. Department of Environment. Nunavut Government. 105pp.

1.1.7 Kivalliq Wide Ecological Land Classification Studies

This program studies the vegetative communities of the Kivalliq Region and has been/is partnered with the KWB, the NWMB, Parks Canada, the BQCMB, Cumberland Resources Inc., the Local HTOs of Arviat, Whale Cove, Rankin Inlet, Baker Lake, Chesterfield Inlet, Coral Harbour and Repulse Bay, and the Jurisdictions of the North West Territories, Saskatchewan, and Manitoba (Campbell, 2006 – Interim Report). (Interim and final reports on these studies are listed in Appendix 1).

The Kivalliq Habitat Mapping project began as a pilot study in July/August 2000. The pilot study was successful initiating the projects expansion to cover the entire Kivalliq Region (Campbell 2006 Interim Report). From August 8-14th 2000, approximately 200 plant communities in the Banks Lake study area were visited and plant type and percent cover recorded. During August 2001 160 sites were visited and plants and their percent cover values recorded in the Tehak Lake area. During August 2002 240 plant communities were examined in the Beverly lake area and 65 sites in the Lyon Inlet area, again in August 2003 240 sites in the Lyon Inlet area were sampled, in 2004 600 sites were sampled in the Baker Lake, Rankin Inlet and Snowbank River areas, while in 2005 450 plant communities were sampled in the Princess Mary Lake and Brown Lake areas. In August 2006 550 sites were sampled in the Henik, Edehon, Nulitin, Maguse and Hicks Lake areas south to the Manitoba border. (Figure 7).

The objectives of the project are to utilize digital Landsat 5 and 7 imagery to stratify and map terrestrial habitats of the Kivalliq Region into approximately 20-30 classes (15-20 vegetation classes and 5-10 abiotic (non-living) classes such as boulder fields, water etc.). The digital database (vegetation map) resulting from the proposed analysis will be used in association with GIS (Geographical Information System) software to determine wildlife habitat quality, quantity and availability, factors which largely govern the distribution and abundance of many ecologically and economically important species of wildlife. It is increasingly clear that migratory caribou populations as well as muskox populations are regulated by the abundance of high quality forage on their range. An understanding of the locations and size of distinct vegetation classes containing high quality forage and how these classes relate to wildlife will be critical to a manager's assessment and prediction of a population's status.

Additionally the identification of vegetation classes important to wildlife coupled with a map displaying the size and location of these vegetation classes will assist wildlife managers in their assessment of the potential impacts of land use on wildlife through the modification of their habitat. Strip mines, water development projects, urban expansion, pipelines, road constriction, chemical contamination, noise pollution etc. are on the increase across Nunavut a trend that will only intensify with time. This project will provide managers with more sophisticated ecological tools to deal with the increased pressures placed on wildlife habitat if wildlife and their habitats are to be conserved for future generations to enjoy.

Finally, concern regarding climate change and its potential effects on northern ungulates including caribou and muskox, is increasing. The mapping of plant communities with associated cover values and photographs will allow managers to assess future change through a comparison of sites between years. This index of change will allow managers to assess the potential impacts of the observed change to the productivity of wildlife populations.

Presently we have used this information to assess important habitat requirements to caribou and muskox as well as to determine the amount of these important habitats within any given range. The data from these studies has already been used as a resource selection function for proposed mine sites within the kivalliq to acknowledge and therefore reduce the mines impacts on wildlife.

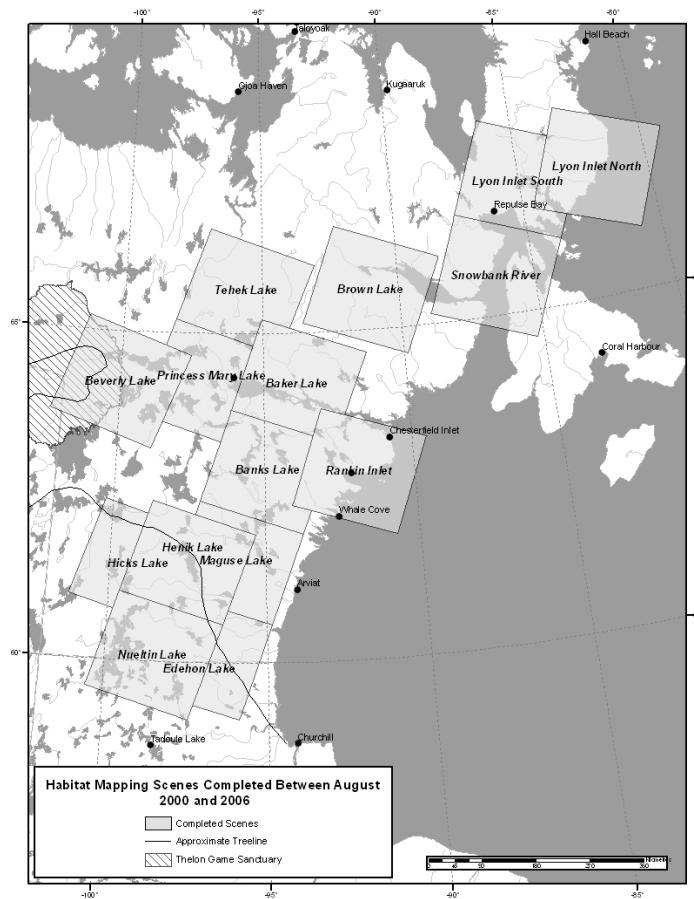


Figure 7 Landsat 7 and Landsat TM scenes sampled as of August 2006.

Literature Cited:

Campbell, M. 2006. Vegetation Mapping in The Kivalliq Using Digital Landsat TM 5/7 data. Nunavut Government. Department of Environment. Interim Report. 21pp.

1.1.8 Conservation Education Production of Kivalliq Research Results on CD Titled "Journey of The Caribou".

The above conservation/education material has been partnered with the KWB, the NWMB, the BQCMB, the Local HTOs of Arviat, Whale Cove, Rankin Inlet Baker Lake, Repulse Bay and Chesterfield Inlet (Campbell and Pameolik, 2006) (Interim and final reports on these studies are listed in Appendix 1).

The "Journey of the Caribou" CD represents a review of the Kivalliq Caribou Monitoring program initiated in 1993 and ongoing (Figure 8+9). The data generated over the monitoring programs history is still in the analysis phase and expected to reveal a new understanding of caribou distribution and movements for the herds occupying the Kivalliq Region of Nunavut. This first edition CD was specifically designed to bring the information in a visual format to Nunavummiut at the community level as well as provide an impact assessment tool that pulls together our best knowledge of caribou distributions and movements in the Kivalliq Region. The CD has been distributed to all Kivalliq HTOs and Wildlife officers, all Nunavut Wildlife Biologists and Managers, the KWB, the NWMB, Nunavut Arctic Collage, NTI, KIA and Many Kivalliq Schools. The CD is also available for general distribution.

This CD represents the beginning of an on-going process whose main goals are founded in conservation education. Each year the CD will be updated and new information added including ecological land classification data and any other research data pertinent to caribou and musk ox. We also hope in the coming years to expand this CD Nunavut wide and develop a companion text for meeting and classroom use.

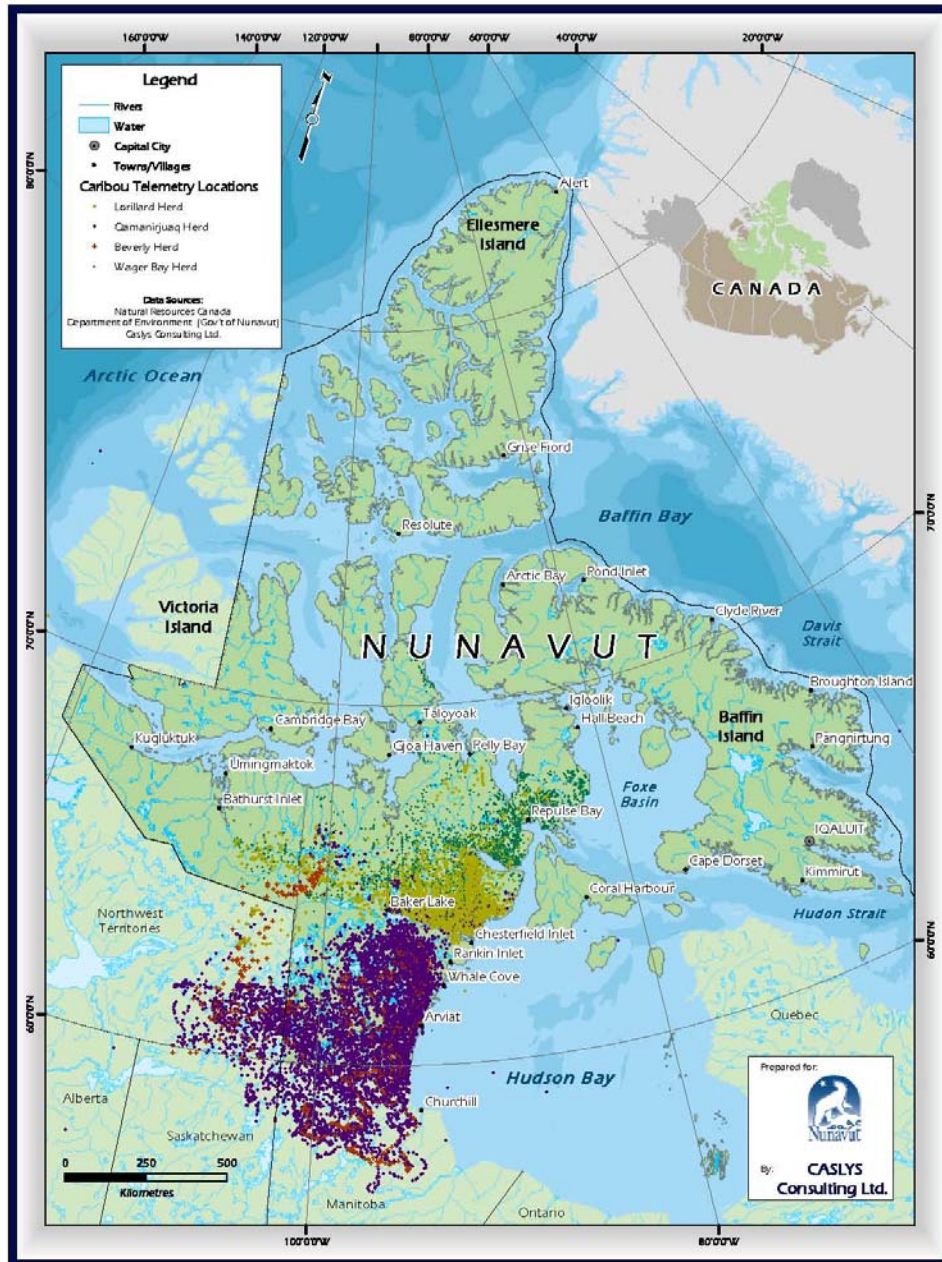
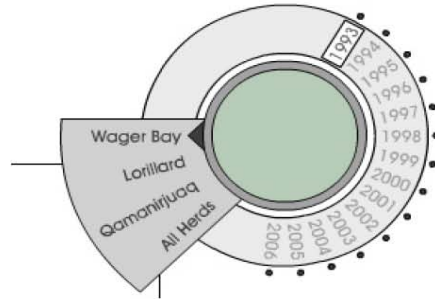


Figure 8 Project location figure from “Journey of The Caribou” CD.

Navigating the User Interface

The 'Telemetry Animations' page allows users to select the herd and/or year of interest through an easy to use interface. Navigation is controlled by a dial (displayed below). To select an animation just click on the herd name and then the year. A map or animation based on the user's selection is then displayed in the window to the left of the dial.



Navigation Dial

Each animation displays the locations of all the caribou that have been collared for the selected time period, and at any one time, shows the locations for a 15 day window. The large symbols represent the locations for the current day and the previous 14 days. After this 15 day time period, the symbol size decreases. This allows the viewer to see the movement trend for the herd over the selected time period at a glance. The locations are also colour coded to correspond with the season. The seasons are based on the following date ranges:

- | | |
|--------------------|---|
| - Late Winter | January 1 st to March 31 st |
| - Spring Migration | April 1 st to May 25 th |
| - Calving | May 26 th to June 25 th |
| - Post Calving | June 26 th to July 31 st |
| - Late Summer | August 1 st to September 15 th |
| - Fall | September 16 th to October 31 st |
| - Rut | October 15 th to October 31 st (Rut occurs in the fall season) |
| - Early Winter | November 1 st to December 31 st |

Figure 9 An example of some of the features within the CD animation page.

Literature Cited:

3) Trends and forecast of use of wildlife resources in Nunavut.

3.1) Kivalliq Region:

3.1.1) Ungulates (by population)

The communities of the Kivalliq region include Arviat, Whale Cove, Rankin Inlet, Baker Lake, Chesterfield Inlet, Repulse Bay and Coral Harbour. In all communities caribou represent the dominant food type represented by 6 main herds; the Qamanirjuaq, Beverly, Lorillard, Ahiak, Wager and Southampton herds. For the purposes of estimating the demand on each of these herds, proportions have been developed using both reports, and oral information. For the purposes of the Kivalliq Region the following table attempts to attribute harvesting proportions. These proportions will be used to calculate herd demand in table 2. Projected herd status “at a glance” is listed in Table 3.

| <i>Caribou Herd</i> | <i>Community</i> | <i>Harvest Proportions (%)</i> |
|----------------------------|-------------------------|---------------------------------------|
| Qamanirjuaq Herd | Arviat | 100 |
| | Baker Lake | 30 |
| | Chesterfield Inlet | 30 |
| | Rankin Inlet | 100 |
| | Whale Cove | 100 |
| Beverly Herd | Baker Lake | 20 |
| Lorillard Herd | Baker Lake | 20 |
| | Chesterfield Inlet | 60 |
| Wager Herd | Baker Lake | 10 |
| | Chesterfield Inlet | 10 |
| | Repulse Bay | 100 |
| Ahiak Herd | Baker Lake | 10 |
| Southampton Island Herd | Coral Harbour | 100 |

Qamanirjuaq Caribou Herd

Within the Kivalliq Region Qamanirjuaq caribou are utilized primarily for subsistence but also for clothing, sport hunting and commercial meat sales. Qamanirjuaq caribou are harvested by the communities of Arviat, Rankin Inlet, Baker Lake, Whale Cove and Chesterfield Inlet. The future demand on Qamanirjuaq caribou (Table 1) is listed alongside estimates of the resources capacity to fill that demand by 2011 (Table 2). All values are examined using estimates of current use as well as five year projections based on the 2001 community population figures and growth rates adjusted for 2006 and projected to 2011. Table 3 summarizes projected capacity issues at a glance.

The dramatic decline in Qamanirjuaq numbers, identified in the early 1950's, sparked a flood of scientific studies all attempting to understand the underlying mechanisms responsible for the decline (Heard and Calef 1986; Parker, 1972). Research efforts were at their peak between the late 1970's and early 1980's. A population survey in 1982 showed that the trend was dramatically, and despite research efforts, mysteriously, reversed (Gates, 1989). This mysterious increase was not surprising to local hunters as the local knowledge of the time disagreed strongly with scientific findings.

Population surveys conducted on the Qamanirjuaq population of barren-ground caribou have shown an increase from 44,000 animals in 1977 to 260,000 +/- 60,000 animals in 1987 to 496,000 +/- 105,400 animals in 1994 (Heard, 1981; Gates, 1983; Russell, 1990). Cow/calf ratios have shown a decline from 48:100 in 1994 to 47:100 in 1995 to 42:100 in 1996, to 30:100 in 1999 to 26:100 in 2003 and most recently to 16:100 in 2006 (Figure 10). This downward trend is worrisome and must be validated annually to track the trend. Spring composition values as low as 16:100 or lower, when compared to the current declines being observed in western herds, suggests that the Qamanirjuaq Caribou Herd could be at the beginning of a decline (Campbell, 2006 (interim report)). If this decline follows those of the western populations this could mean that within the next five years the demand (when factoring in other Jurisdictional harvesting) will likely exceed capacity and management action to control harvesting will have to be taken.

Capacity Estimates:

Given an estimated sustainable harvest of 10% for a stable population and 8% for a declining population, a projected capacity can be calculated based on the 1994 survey estimates though managers must be cautioned not to use these estimates to set future harvest quotas without first verifying herd status. As early information indicates a declining trend in productivity a sustainable estimate using 8% of the lower confidence levels is used (390,600) projecting an estimated sustainable harvest of 31,200 animals by 210,000 given that the population has remained stable since 1994 and given that productivity does not decline further (Table 2). Again a population estimate must be considered a necessary first step prior to setting future quotas.

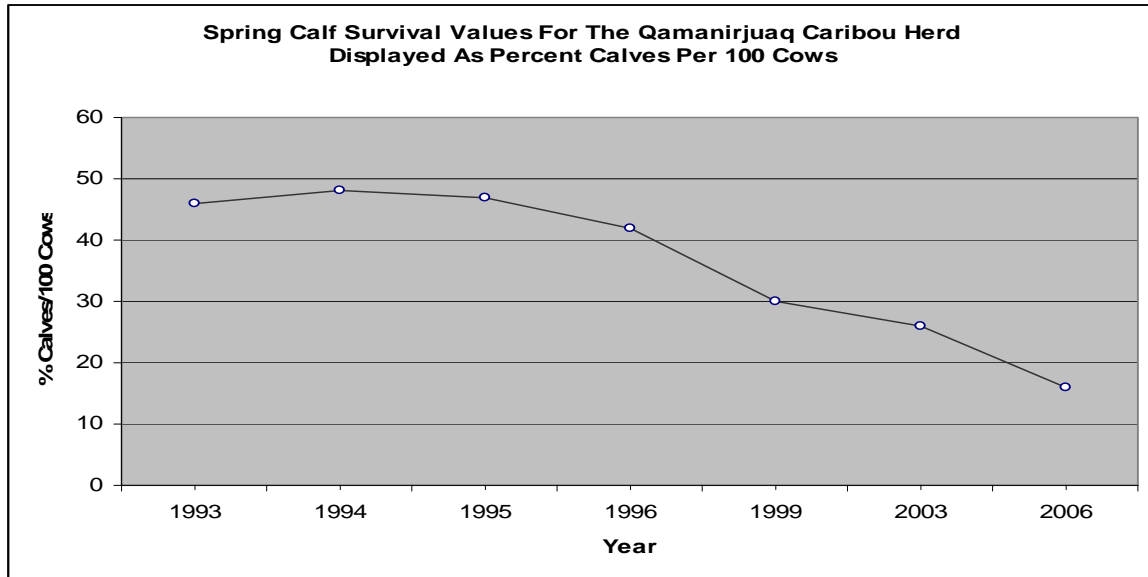


Figure 10 Spring recruitment measured as calves per 100 cows. Information based on periodic spring classification between 1993 and 2006.

Literature Cited:

- Campbell, M. 2006. The Monitoring of Qamanirjuaq caribou (*Rangifer tarandus groenlandicus*) using satellite Telemetry. Nunavut Government. Department of Environment. Interim Report. 15pp.
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Beverly Caribou Herd

Within the Kivalliq Region Beverly caribou are utilized primarily for subsistence but also for clothing, sport hunting and commercial meat sales. Beverly caribou are harvested by the community Baker Lake and on occasion Arviat. The future demand on Beverly caribou (Table 1) is listed alongside estimates of the resources capacity to fill that demand by 2011 (Table 2). All values are examined using estimates of current use as well as five year projections based on the 2001 community population figures and growth rates adjusted for 2006 and projected to 2011. Table 3 summarizes projected capacity issues at a glance.

The Beverly herd was last surveyed in 1994 when herd size was estimated at $276,000 \pm 106,600$ (SE) (Williams 1995). Estimates of herd size are based on aerial photography of the calving ground where the numbers of breeding cows are counted. The herd was likely stable between 1984 and 1994; however, recent observation and studies suggest that the herd may have declined. Since the fall of 2001, hunters from northern Saskatchewan have expressed concern about reduced numbers of Beverly caribou. A reconnaissance survey of the Beverly calving ground in 2002 found that the size of the calving ground was reduced and had a lower density of animals relative to past surveys (Johnson and Mulders, in prep). Results from a photographic calving ground survey of the Bathurst herd in 2003 and 2006 (Gunn et al. 2005, GNWT 2006) indicated that the Bathurst herd has been declining at about 5% a year for the past decade. Post-calving photographic surveys of the Cape Bathurst and Bluenose East and West herds in July 2005 and 2006 (Nagy and Johnson 2006a, 2006b) showed significant and continued declines in these three herds from 2000. There appears to be synchronicity between the barren ground herds in response to large-scale weather patterns, and therefore, a decline in these NWT barren ground herds provides strong evidence to support a similar decline for the Beverly herd.

Capacity Estimates:

Given an estimated sustainable harvest of 10% for a stable population and 8% for a declining population, a projected capacity can be calculated based on the 1994 survey estimates though managers must be cautioned not to use these estimates to set future harvest quotas without first verifying herd status. It appears clear from the available evidence that the Beverly herd, either through emigration to the Ahiak Herd, or through a sustained reduction in productivity, has suffered the same pattern of decline as that observed for the western herds. A calculated annual rate of decline of 5% has been applied to the western herds and there for will also be applied to their neighboring Beverly population. The first evidence of a decline (or range shift) was discovered during a Beverly Range reconnaissance survey flown in 2004. There for by 2010, and using the lower confidence limit of the 1994 population estimate the herd could have

declined to 124,524 animals. Taking 8% of this figure would then project an estimated sustainable harvest of 9,962 animals per year.

Literature Cited:

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Lorillard and Wager Caribou Herds (Northeast Mainland)

Within the Kivalliq Region the Lorillard and Wager populations of caribou are utilized primarily for subsistence but also for clothing, sport hunting and commercial meat sales. Wager and Lorillard caribou are harvested primarily by the communities of Repulse Bay and Chesterfield Inlet. Wager and Lorillard caribou demand (Table 1) and the resources capacity to meet that demand (Table 2) is listed. All values are examined using estimates of current use as well as five year projections based on 2001 community population figures and growth rates adjusted for 2006 and 2011.

A June survey estimate of the Lorillard herd of caribou using the June 1999 reconnaissance survey data found 13,918 +/- 5,377 adult caribou (95% confidence limits) (Figure 11). Identical surveys (using the same transects flown in 1999) flown in June 2001 and 2003 found 34,520 +/- 17,977 (95% confidence limits) and 12,156 +/- 3,697 (95% confidence limits) adult caribou respectively. Though the coefficient of variations for the 1999 and 2001 surveys were very high (1999 = .39, 2001 = .52) the data was tested to determine the significance of

the change using equation 5.3 of Thompson et al. (1998). There was a significant increase in the number of adult Lorillard caribou on the calving grounds between June 1999 ($Y = 13918$) and June 2001 ($Y = 34520$) ($z = 2.34$, $P = 0.02$).

A population estimate of the Wager Herd using the June 2000 reconnaissance survey data found 13,095 \pm 3,532 adult caribou (95% confidence limits) on the calving ground (Figure 11). An identical survey (using the same transects flown in 2000) flown in June 2002 found 20931 \pm 5296 adult caribou within the same study area. Though the coefficient of variation for both surveys was high (2000 = .27, 2002 = .25) the data was tested to determine the significance of the change using equation 5.3 of Thompson et al. (1998). There was a significant increase in the number of adult caribou on the calving grounds between June 2000 ($Y = 13095$) and June 2002 ($Y = 20931$) ($z = 2.62$, $P = 0.01$) and no significant difference detected between the 2002 and 2004 estimates. There was a significant increase in the number of adult caribou on the Lorillard calving grounds between June 1999 ($Y = 13918$) and June 2001 ($Y = 34520$) ($z = 2.34$, $P = 0.02$).

The underlying reasons for this increase over such a short period of time may be related, in part, to the movement of Lorillard animals out of the June 1999 calving ground survey area prior to the survey and/or the movement of Wager caribou south of Wager Bay and into the Lorillard River area in 2000. This movement was documented using the location data of ST-14 satellite collars, which indicated seven of the ten satellite collared Wager cows made this journey of which only 6 returned north of Wager Bay by June 2001. There was no significant difference between the 1999 and 2003 results and a significant difference between the 2001 and 2003 results. These findings are consistent with the initial hypothesis that Wager animals moved into the Lorillard study area over the 2001 survey period and moved back to the Wager study area prior to the 2003 survey. Following the 2001 survey Wager collars once again moved out of the Lorillard study area and the correlated drop in caribou numbers seemed to be the result.

An aerial estimate of Northeast Mainland caribou flown in 1983 found 119,800 \pm 13,900 caribou (Heard *et al.*, 1986). A population estimate of Northeastern mainland caribou was made in May 1995. The survey results suggested that caribou numbers had dropped significantly from 119,800 \pm 13,900 animals in 1983 to 73,994 \pm 11,670 caribou in 1995. In view of the most recent findings when compared to the 1995 observed declines it appears that the Northeast mainland caribou numbers have changed little or decreased from the 1995 estimates suggesting a stable or slightly decreasing trend. A population estimate of both the Wager and Lorillard populations of Northeast mainland caribou is required to verify these hypothesized trends.

Capacity Estimates:

Using reconnaissance based data as an index only to caribou numbers on both the Wager and Lorillard ranges, and given an estimated sustainable harvest of 10% of a stable population and 8% for a declining population, a projected capacity can be calculated though managers must be cautioned not to use these estimates to set future harvest quotas without first verifying herd status. As both the Wager and Lorillard populations appear to be stable with no present indication of decline for the near future, 10% of the total population is used to determine the sustainable harvest. Therefore the estimated sustainable harvest of the Lorillard population would be approximately 845 to 1585 animals/year while the Wager population could sustain a harvest of between 2,216 and 3,409 animals/year.

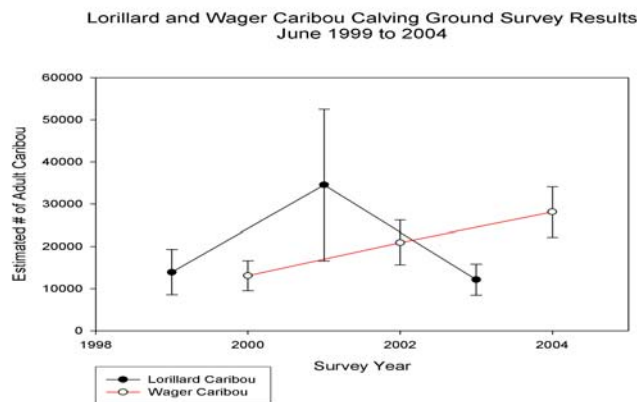


Figure 11 Population estimates based on calving ground delineation flights in June 1999, 2000, 2001, 2002, 2003 and 2004 over both the Lorillard and Wager spring range.

Literature Cited:

- Campbell, M. 2006. The seasonal distribution and herd delimitation of Northeastern Mainland caribou (*Rangifer tarandus groenlandicus*). Nunavut Government. Department of Environment Interim Report. 22pp.
- Heard, D.C., Williams, T.M. and Jingfors, K. 1986. Precalving distribution and abundance of barren-ground caribou on the northeastern mainland of the Northwest Territories. *Arctic*. 39(1): 24-28.
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Southampton Island Caribou Herd

Within the Kivalliq Region Southampton Island caribou are utilized primarily for subsistence but also for clothing, sport hunting and commercial meat sales. The commercial harvest of caribou on Southampton Island is the largest in the territory and has been in operation since 1996 harvesting as many as 5000 in one season. Southampton Island caribou are harvested primarily by the community of Coral Harbour. The demand on Southampton Island caribou (Table 1) and the resources capacity to meet that demand (Table 2) are listed. All values are examined using estimates of current use as well as five year projections based on 2001 community population figures and growth rates adjusted for 2006 and 2011.

Wolves (*Canis lupus*) and barren-ground caribou (*Rangifer tarandus groenlandicus*) were a common component of Southampton Island ecology until the early 1900's. The decline of these animals became obvious by 1935 and was followed by the local extinction of wolves by 1937 (Parker, 1975). The extirpation of caribou from Southampton was complete by 1952, a result in part of over hunting. The absence of this resource was keenly felt by residents of Coral Harbor prompting both the local HTO and government to initiate the re-introduction of caribou onto the Island. In 1967, 14 years following their extirpation, 48 caribou from Coats Island were introduced onto Southampton Island. Caribou numbers have since increased rapidly which is in part due to exceptional range conditions resulting from the 14-year absence of caribou from the Island. The lack of predation and low initial harvest rates also played a role in the overwhelming success of the introduction which was first realized following a population survey in 1978, estimating 1,200 +/- 340 caribou (Heard and Ouellet, 1994). Since the 1978 survey the Southampton caribou population continued to grow rapidly to 5,400 +/- 1,130 in 1987, 9,000 +/- 3,200 in 1990, 13,700 +/- 1,600 in 1991, 18,275 +/- 1,390 in 1995 (Heard and Ouellet, 1994), 30,381 +/- 3,982 in 1997, 17,981 +/- 2,127 in June 2003 (Campbell, 2006 (draft report)) and finally 20,582 +/- 3,065 in June 2005 (Campbell, 2006 (draft report)) (Figure 12).

The survey results suggest a population growth rate of approximately 27 %/year up until 1997 followed by a 40% decline between June 1997 and June 2003 and an increase of 9% between 2003 and 2005. Commercial harvests have seen a general increase from 564 in 1992, to 759 in 1993, 1,554 in 1994, 2,356 in 1995, 1,839 animals in 1996, 3,365 in 1997, 2,956 in 1998, 1,094 in 1999, 2,166 in 2000, 3,696 in 2001, 3,834 in 2002 to 5005 animals in 2003, 3,200 animals in 2004, 4,038 in 2005 and 3803 in 2006.

Between 2003 and 2005 the population showed no significant change though the estimate was 9% higher then the 2003 estimate. This suggests that the harvest over the two year period was at or slightly below the maximum sustained yield of

the population. The number of animals harvested over that period was 8,000 commercially and an estimated 3,000 for subsistence, suggesting that an annual harvest of 5,500 animals will likely cause the population to stabilize or slightly increase between 2005 and 2007 given that mortality rates remain the same and that the harvest, over all is not sexually skewed.

Caribou condition between 2004 and 2005 declined while over the same period caribou diets shifted from primarily graminoides and lichens to mosses. In addition the disease *Brucella suis* was reaching unprecedented serum prevalence levels (50% from a random sample of 400 animals). Plans to study these aspects of herd health have been made for the February 2007 harvest. Following this work the data will be analyzed to see if this trend continues.

Capacity Estimates:

With few predators and adequate range conditions the Southampton Island caribou population has been growing at an unprecedented rate. Recently however disease and declining range conditions have retarded productivity as low as 50% in 2005. Though the 2006 productivity figures suggest a rebound we should approach the estimation of the sustainable capacity of this population with caution. Unique to Southampton Island is the near absence of wolves lowering mortality rates both on adults and calves. These circumstances do not occur on the mainland and for these reasons that harvest rates in excess of 20% have been sustainable. The Southampton Island population of caribou is still considered a growing population so projecting estimates of sustained yield in the absence of population data would be dangerous. Using the 2003 and 2004 survey estimates combined with estimates of use a harvest of between 3,503 and 4,729 animals should be sustainable over the short term (Table 2). Periodic surveys must be continued to insure the sustainability of this figure.

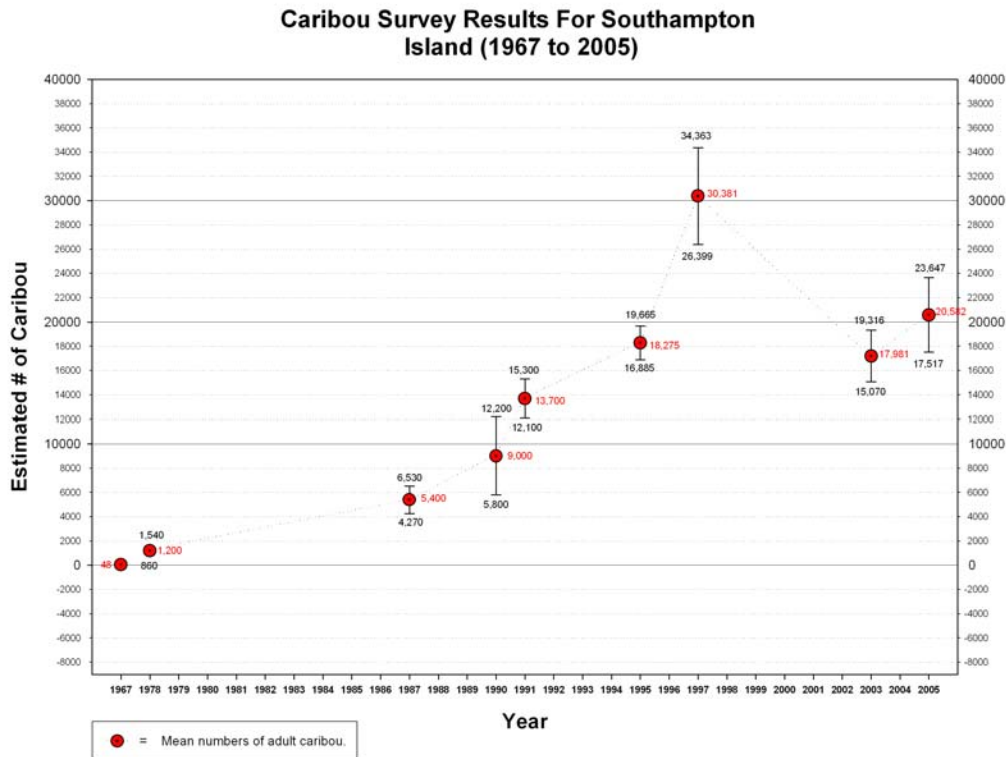


Figure 12 A history of survey results of the Southampton Island caribou population. The first value has been arbitrarily set at zero.

Literature Cited:

- Campbell, M. 2006. Monitoring Condition, Feeding Habits and Demographic Parameters of Island Bound Barren-Ground Caribou (*Rangifer tarandus groenlandicus*) Southampton Island, Nunavut. Government of Nunavut, Department of Environment. Interim Report. 18pp.
- Heard, C.D. and Ouellet, J.P. 1994. Dynamics of an introduced caribou population. *Arctic*. 47(1): 88-95.
- Parker, G.R. 1975. An investigation of caribou range on Southampton Island, N.W.T. *Can. Wildl. Serv. Rep. Ser. No. 33*: 83 pp.

Coats Island Caribou Herd

The origin of this herd is not know but evidence suggests that the herd has been established on the Island since the early part of the century (Ouellet et al 1996). Over a period spanning 3 decades the demographics of this population is best

characterized by rapid population increases followed by occasional substantial winter die-offs. These die-offs were occurred at least twice between 1961 and 1991 (Ouellet et al 1996). Survey results such as those flown in 1978 estimating 4,200 animals and that of 1980 estimating 1,700 animals show how quickly adverse weather can decimate these small Island populations. Additional surveys flown since the 1980 survey estimated. The 1980 survey result is the only accessible published figure on the status of the Coats Island Population.

Capacity Estimates:

No Capacity estimates can be made at this time for this population due to the populations known and often severe fluctuations as well as the lack of recent survey information.

Literature Cited:

Ouellet J. P., D.C. Heard, and R Mulders. 1996. Population Ecology of Caribou Populations Without Predators: Southampton and Coats Island Herds. The sixth North American Caribou Workshop. Prince George. B.C. Rangifer, Special Issue No.9, 17-26.

Central Kivalliq and Northeast Kitikmeot Muskox Populations

Within the Kivalliq Region Muskox are utilized primarily for subsistence but also as Komatik robes and sleeping mats, for carving (horns) and sport hunting. Muskox are harvested primarily by the communities of Baker Lake, Arviat, Rankin Inlet and Whale Cove. Muskox demand and the resources capacity to meet that demand are listed in Tables 1+2. All values are examined using estimates of current use as well as five year projections based on 2001 community population figures and growth rates adjusted for 2006 and 2011.

The distribution and abundance of muskox in the Central Kivalliq region of Nunavut, which includes muskox management zones MX/20 and MX/21 were estimated using fixed-width line transect surveys in July of 1999 (Figure 6). There were between 4022 to 5854 adults in the entire central Kivalliq study area. In MX/20 there were between 843 and 2201 muskox scattered sparsely throughout the management zone. In MX/21 there were between 1747 and 2539 muskox. In the area south of MX/21 there were between 257 (minimum count) and 1266 adults (upper 95% confidence limit). The distribution of muskox was sparse throughout the strata. There appears to have been an increase in the number of muskox in MX/21 from 1991 to 1999, but the survey areas were somewhat different in each year, so the comparison is treated with caution (Table 1). Muskox appear to be continuing to colonize areas south of MX/21 (south of Yathkyed Lake). The 1999 estimate suggested that there was an increase of

1325 to 2041 muskox (lower and upper 95% confidence limits) in MX/21 from the number estimated in 1991. As the 1991 survey found muskox in a much smaller area than the 1999 survey, yet at similar densities, these differences could indicate both population and range expansion.

The number and distribution of muskox in the northern Kivalliq and northeast Kitikmeot region, which includes MX/17 and MX/18, were estimated using fixed-width line transect surveys in July 2000. There were between 1840 and 3402 adult muskox (95% confidence limits) in the northern study area. There were between 595 and 1317 adult muskox in the MX/17 portion of the northern study area. There were very few muskox observations north and east of the MX/17 boundaries.

Distribution of muskox in the northern Kivalliq appear to have changed little from those observed on the Adelaide Peninsula and vicinity in 1992 (Gunn et al. 1996), or from the northeast mainland caribou survey in 1995 (Buckland et al. 2000) (Campbell in prep). A distributional shift to the east from areas known to be occupied by muskox was not evident. Comparisons between the July 2000 observational data and available local knowledge suggest that animals have abandoned historic range within the northern tip of the survey area between Taloyoak and Kugaaruk. Adult and calf distribution was limited almost entirely to the western portion of the survey area south from the northern coast of the Adelaide Peninsula, as was found in the previous studies noted above.

Calves represented approximately 16.8% of the animals observed during the northern muskox survey. This value was considerably higher than the 6.6% calves observed by Gunn et al. (1996) during a survey of the Adelaide Peninsula in 1992. In 1986 however proportions of calves were similar (17.1%) suggesting variability in the annual productivity of Adelaide Peninsula muskox. The northern muskox survey calf proportions were also consistent to those observed within the central Kivalliq where 16.9% calves were observed on transect suggesting a consistent muskox calf ratio across the central and northern Kivalliq and northeastern Kitikmeot.

Capacity Estimates:

Harvest quotas for all management zones are based on 3% of the estimated adult muskox population (lower 95% confidence limit). A quota of 18 is suggested for MX/17, 25 in MX/20, 52 in MX/21, and an additional seven (7) may be harvested from the portion of the population that is now south of the southern boundary of MX/21 south of Yathkyed Lake. Current harvest quotas in MX/17 (55 tags), MX/18 (30 tags), MX/20 (3 tags) and MX/21 (25 tags) are at levels set following the 1991 population survey (Fournier and Gunn 1997).

Table 1 A summary of results of muskox surveys in the central Kivalliq Region of Nunavut (surveys limited to MX/21 and vicinity from 1985-1999).

| Year | Total Stratum Area (km ²) | Population Estimate | Standard Error | CV | Lower 95% CI | Upper 95% CI | % Calves | Authors |
|-------------|---------------------------------------|---------------------|----------------|------|--------------|--------------|----------|--------------------------|
| 1985 (Nov) | 19,706 | 1,262 | 563 | 0.45 | 159 | 2,365 | 17.9 | Case & Graf (1986) |
| 1986 (July) | 8,261 | 838 | 176 | 0.21 | 476 | 1,200 | 11.5 | Case et al. (1986) |
| 1991 (July) | 12,555 | 1,203 | 145 | 0.13 | 919 | 1,487 | 15.9 | Mulders & Bradley (1991) |
| 1999 (July) | 19,475 | 2,143 | 199 | 0.09 | 1,747 | 2,539 | 15.0 | This Study |

Literature Cited

- Fournier, B. and Gunn, A. 1997. Status of muskox populations in the Northwest Territories. DRWED Yellowknife NWT. Draft Manuscript Report 13pp.
- Case, R.L. and R. Graf. 1986. Abundance and distribution of muskoxen in central Keewatin, NWT. DRWED, Yellowknife, NWT. GNWT File Report No. 63. 19pp.
- Mulders, R. and M. Bradley. 1991. Distribution and abundance of muskoxen in Central Keewatin, NWT. DRWED. Arviat NWT. Government of the Northwest Territories file report 32pp.
- Gunn, A. K. Lambert, and R. Morrison 1996. Distribution and abundance of muskoxen on Adelaide Peninsula, NWT 1986 and 1992. Northwest Territories Renewable Resources File Report No. 117. 20 pp.
- Buckland, L., J. Dragon, A. Gunn, J. Nishi and D. Abernethy. 2000. Distribution and abundance of caribou on the northeast mainland, NWT in May 1995. DRWED, Yellowknife, NWT. GNWT Manuscript Report No. 125. 24pp.

Table 1 Estimated demand for wildlife based on proportions calculated from the NWMB harvest study (2004), Edible weights of meats for specific wildlife genera (Usher 2000), projected population growth within Kivalliq communities (Statistics Canada, 2001) and estimated weights of daily meat ration of 400 g/person/day (reference, 19XX).

| Estimated Demand For Wildlife - Kivalliq Region | | | | | | | | | | | | | | | | | | | | |
|--|------------------------|-----------------|------------------------|--|-------------------------------|-------------------------------|---|--------------------|---|--------------------|--|--------------------|---|--------------------|--|--------------------|--|--------------------|-----------|--------------------|
| Community | Population (2006 est.) | Growth Rate (%) | Population (2011 est.) | Annual Meat Req. (based on 0.4kg/person/day) | Other Meat (Store Bought)-*** | Other Meat (Country Food) *** | Caribou est. edible weight of meat 35kg/caribou | | Seals est. edible weight of meat 13kg/seal) | | Fish est. edible weight of meat 1.32kg/Fish) | | Birds est. edible weight of meat 1.57kg/Bird) | | Whale est. edible weight of meat 50kg/Whale)** | | Muskox est. edible weight of meat 58kg/Muskox) | | | |
| | | | | | % of Diet | % of Diet | % of Diet | Total # of Animals | % of Diet | Total # of Animals | % of Diet | Total # of Animals | % of Diet | Total # of Animals | % of Diet | Total # of Animals | % of Diet | Total # of Animals | % of Diet | Total # of Animals |
| Arviat | 2313 | 21.8 | 2817 | 411313.0 | 38 | 2 | 47.6 | 5593.9 | 2.4 | 756.2 | 4.1 | 12682.1 | 1.6 | 4244.1 | 4.2 | 232.5 | 0.1 | 5.0 | | |
| Whale Cove | 309 | 1.3 | 313 | 45695.3 | 38 | 2 | 47.6 | 621.1 | 1.8 | 64.7 | 4.7 | 1630.5 | 0.6 | 165.9 | 5.2 | 31.5 | 0.2 | 1.2 | | |
| Rankin Inlet | 2303 | 5.8 | 2437 | 355780.9 | 38 | 2 | 45.5 | 4622.1 | 3.4 | 925.0 | 5.5 | 14824.2 | 0.4 | 929.1 | 4.9 | 230.5 | 0.2 | 9.2 | | |
| Chesterfield Inlet | 353 | 2.4 | 362 | 52816.8 | 38 | 2 | 47.2 | 712.0 | 2.8 | 114.2 | 7.5 | 2984.9 | 0.7 | 228.8 | 1.8 | 12.3 | 0.1 | 1.1 | | |
| Baker Lake | 1640 | 8.8 | 1784 | 260449.7 | 38 | 2 | 54.8 | 4080.9 | 0.0 | 6.0 | 4.7 | 9313.1 | 0.3 | 447.9 | 0.0 | 0.0 | 0.2 | 6.7 | | |
| Repulse Bay | 670 | 9.5 | 734 | 107135.3 | 38 | 2 | 37.8 | 1158.0 | 8.2 | 673.3 | 8.9 | 7215.4 | 0.1 | 68.2 | 4.9 | 70.4 | 0.1 | 1.5 | | |
| Coral Harbour | 758 | 6.4 | 806 | 117683.6 | 30 | 5 | 38.8 | 1303.9 | 8.1 | 730.5 | 6.7 | 6000.1 | 8.0 | 6011.6 | 3.4 | 53.2 | 0.0 | 0.0 | | |
| Totals | 8346 | | 9253 | 1350875 | | | | 18092 | | 3270 | | 54650 | | 12096 | | 631 | | 25 | | 0 |

* Proportions calculated using mean annual wildlife harvesting estimates/Community listed within the Nunavut Wildlife Harvest Study. Additional calculations were made using the total number of animals recorded multiplied by their estimated edible weight of meat (Usher, 2000) taken as a percentage of the total harvested meat equivalent (kg) harvested by the community for the species listed.

** Whale meat estimated as finished Muktaaq with fat trimmed.

*** Other meat includes meats such as chicken, pork and beef as well as remaining wild meats generally making up less than 2%/species of the diet.

Table 2. The projected (estimated) average annual demand and sustainable removal capacity for the next 5 years for Nunavut terrestrial wildlife populations are listed. Strictly quantitative methods for projecting demand and capacity are not available for some populations. The values presented represent expert opinion of professional biologists, and consider published information, interim research results, and Inuit knowledge (both written and oral). Also note that many of the populations indicated are interjurisdictional. Harvest requirements from other jurisdictions are not included in this table..

| Wildlife Population | Qikiqtaaluk | | Kivalliq | | Kitikmeot | | Total | |
|---------------------------|-------------|----------|----------|---------------|-----------|----------|--------|----------|
| | demand | capacity | demand | capacity | demand | capacity | demand | capacity |
| Ahiak Herd | | | 408 | ? | | | | |
| Qamanirjuaq Herd | | | 12,275 | 31,200 | | | | |
| Beverly Herd | | | 816 | 9,962 | | | | |
| Lorillard Herd | | | 1,243 | 845 – 1,585 | | | | |
| Wager Herd | | | 1,637 | 2,216 – 3,409 | | | | |
| Coats Island Herd | | | ? | ? | | | | |
| Southampton Herd | | | 5,303 | 3,503 - 4,729 | | | | |
| Barrenland caribou Total | | | 24,866* | | | | | |
| Peary caribou | | | N/A | N/A | | | | |
| D-U caribou | | | N/A | N/A | | | | |
| Island caribou | | | | | | | | |
| Mainland Musk Ox | | | 25 | 104 | | | | |
| Victoria Isle Musk Ox | | | N/A | N/A | | | | |
| Arctic Isle Musk Ox | | | N/A | N/A | | | | |
| Moose | | | | | | | | |
| Polar Bears | | | | | | | | |
| Grizzly Bears | | | | | | | | |
| Wolverine | | | | | | | | |
| Fox | | | | | | | | |
| Other Carnivores | | | | | | | | |
| Raptors | | | | | | | | |
| Other Terrestrial Species | Chris | Chris | Chris | Chris | Chris | Chris | Chris | Chris |

Table 3. The projected capacity of Nunavut terrestrial wildlife to meet user group demands over the next 5 years is summarized. Animals that are likely to produce more than the demand from communities in their range are designated (+). Adequate, but no surplus is designated as (0). Insufficient to meet the demand is designated (-). If the range of the animals does not extend to the Region identified, the designation is (NA).

| Wildlife Population | Qikiqtaaluk | Kivalliq | Kitikmeot | Nunavut |
|----------------------------|--------------------|-----------------|------------------|----------------|
| Qamanirjuaq Herd | | + ¹ | | |
| Beverly Herd | | 0 ¹ | | |
| Lorillard Herd | | 0 ¹ | | |
| Wager Herd | | + ¹ | | |
| Coats Island Herd | | ? | | |
| Southampton Herd | | + ¹ | | |
| Ahiak Herd | | + ¹ | | |
| Barrenland caribou | NA | | + | + ¹ |
| Peary caribou | - | NA | - | - |
| Dolphin Union caribou | NA | NA | - | - |
| Island caribou | - | - | NA | - |
| Mainland Musk Oxen | NA | + | + | + |
| Victoria Island Musk Oxen | NA | NA | + | + |
| Arctic Island Musk Oxen | + | NA | + | + |
| Moose | NA | + | + | + |
| Polar Bears | - | - | - | - ² |
| Grizzly Bears | NA | + | 0 | + |
| Wolverine | NA | 0 | 0 | 0 |
| Fox | + | + | + | + |
| Other Carnivores | + | + | + | + |
| Raptors | + | + | + | + |

¹ Mainland caribou herds are forecast to decline as part of their natural cycle. Currently herd levels are large enough that they are forecast to provide sufficient animals to meet the demand over the next 5 years, but the trend will be downward and Barrenland caribou may not be present in sufficient numbers to meet projected needs in the second 5 years.