



SUBMISSION TO THE

NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

Information:

Decision: X

Issue: Southampton Island (SHI) Caribou Management

Background:

- The Southampton Island caribou herd was in decline beginning in June 2003, and by June 2011 had declined to levels unable to sustain the estimated subsistence harvest.
- The main cause of the decline was a reproductive disease termed Brucellosis. This disease causes severe reproductive declines within caribou populations, negatively impacting birth rates in females and sperm production in reproductive males through testicular tissue damage.
- Though the disease is thought to have caused the decline, intra-territorial sales of caribou meat from SHI to primarily Baffin Communities dramatically accelerated the decline in 2010 and 2011.
- The establishment of a TAH helped control this intra-territorial sale, helping to stabilize the population.
- Management actions have proven effective thus far but all parties are very concerned about finding a way to control the intra-territorial sale of caribou meat if we are to secure the herds future.

Current Status

- The SHI caribou population has increased from an estimated 7,287 caribou in May 2013 to 12,297 caribou in May 2015.
- Both the Department of Environment (DOE) and the Coral Harbour Hunters and Trappers Organization (HTO) believe this increase is at least in part related to an emigration event detected by Coral Harbour hunters in the winter of 2013/2014 from mainland Nunavut.
- DOE is currently comparing genetic profiles of recent caribou samples with pre-immigration samples in an attempt to confirm this immigration event.
- Additionally both Coral Harbour harvesters and DOE survey crews have detected an increase in calf observations between the 2012/13 harvesting season and the present suggesting an increase in productivity over the same period.

Consultation

- Through the examination of current and past information during a management meeting between the Coral Harbour HTO and DOE regional wildlife staff, a consensus was reached to increase the current TAH.
- The HTO supported a motion to increase the current TAH to 1,600 caribou: 1,500 to be dispersed amongst the community (6 per household) and an additional 100 to be put aside for special management purposes as required by the HTO.
- Though removing the TAH was considered, it was felt by both the HTO and DOE that the intra-territorial sale of caribou meat presented a continuing high risk to the SHI caribou population and that at present, the maintenance of a TAH on this population was the most effective way to control this high risk harvest.
- The HTO requested continued annual meetings to re-assessment the TAH and existing Non-Quota Limitation (NQL). Additionally the Coral Harbour HTO requested a re-assessment of the population in 2017.
- The HTO agreed to work with other stakeholders over this two year period prior to the 2017 population assessment to explore the development of effective bylaws and/or other means to control the intra-territorial sale of caribou meat.

Recommendation

- Increase the SHI TAH to 1,600 for the 2015/16 harvesting season to maximize new harvesting opportunities.
- This can be accomplished through amending the Interim TAH Order made by the Minister of Environment.



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Decision:

Issue: Aerial survey of southern Ellesmere Island for Peary caribou and muskoxen

Background:

Southern Ellesmere Island has been sporadically surveyed since 1961, but generally not over a consistent area or with consistent methodology. The 2015 survey covered the same area as previous 1989 and 2005 surveys, with a standard fixed-width strip transect survey design. In this type of survey, all caribou and muskoxen within 500 m either side of the aircraft (in this case, a Twin Otter) are recorded and used to calculate the population estimate.

Prior to the 2015 survey, the most recent survey was in May 2005. It estimated only 456 muskoxen (95% confidence interval = 312-670) over the study area, and there were many observations from the survey and from residents of Grise Fiord of muskoxen in poor condition or dead muskoxen found on the land. There had been freezing rain and ground-fast ice that fall which restricted access to forage.

In total, 1181 muskoxen were seen, including many of last year's calves (short yearlings), providing an estimate of $3200 \pm SE602$. This suggests good calf recruitment and population growth over the last ten years since the 2005 survey.

In 2005, the Peary caribou population was estimated at 219 (95% confidence interval = 109-442). Many of these observations were on Graham Island, on the north tip of Bjorne Peninsula, and north of the ice cap by Sor Fiord. We only observed 38 caribou on the 2015 survey, all in the same areas as in 2005 and consistent with where hunters in Grise Fiord harvest caribou.

The population estimate for Peary caribou, $183 \pm SE128$ has too much variation to reliably detect a population trend since 2005, but the population appears to be fairly stable. Previous surveys have also suggested low densities of caribou on southern Ellesmere Island, with less than 100 estimated in the 1989 survey covering the same area.

Current Status:

A survey report is being finalized from an aerial survey of southern Ellesmere Island completed in March 2015 for Peary caribou and muskoxen.

Recommendations:

No changes to management appear necessary at this time.



**DISTRIBUTION AND ABUNDANCE OF PEARY CARIBOU (*Rangifer tarandus pearyi*)
AND MUSKOXEN (*Ovibos moschatus*) ON SOUTHERN ELLESMERE ISLAND, MARCH 2015**

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And

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STATUS REPORT
NUNAVUT DEPARTMENT OF ENVIRONMENT
WILDLIFE RESEARCH SECTION
IGLOOLIK, NU

Anderson, M. and M. C. S. Kingsley. 2015. Distribution and abundance of Peary caribou (*Rangifer tarandus pearyi*) and muskoxen (*Ovibos moschatus*) on southern Ellesmere Island, March 2015. Nunavut Department of Environment, Wildlife Research Section, Status Report, Igloolik, NU. 46 pp.

Summary

We flew a survey of southern Ellesmere, Graham, and Buckingham islands by Twin Otter in 50 hours between March 19 and 26, 2015, to update the population estimate for caribou and muskoxen in the study area. Previous survey attempts in April and August 2014 were cancelled due to weather. Severe winter weather in the early 2000s, resulted in poor condition and low muskox numbers during the previous survey in 2005, although the area supported relatively high densities of muskoxen in the past. This survey found that muskoxen had recovered from the previous population crash and caribou continued to persist at low densities, as seen in previous surveys.

Muskoxen were abundant north of the Sydkap Ice Cap along Baumann Fiord, north of Goose Fiord, west and north of Muskox Fiord, and on the coastal plains and river valleys east of Vendom Fiord, although they were also seen on Bjorne Peninsula and the south coast from Harbor Fiord to Jakeman Glacier. Short yearlings (10-month old) made up 22% of the population in March 2015. We observed 1146 muskoxen, and calculated a population estimate of $3200 \pm \text{SE } 602$. Although this is the highest estimate recorded for surveys of the area, most previous surveys covered only part of the area, included other areas, or provided only minimum counts. However, the muskox population does appear to have recovered from the low of 312-670 (95% CI) recorded in 2005.

We only saw 38 Peary caribou during the March survey. They were concentrated on the north tip of Bjorne Peninsula and Graham Island, although not as many as had been seen there in 2005. We saw another group east of Vendom Fiord and a group between Bird Fiord and Sor Fiord. That area is also where we saw 2 groups totaling 8 caribou in the August 2014 survey attempt (neither of the 2014 survey attempts covered most of the areas where caribou were expected to be, and none were seen in April 2014). The low number of observations and large variance, making it difficult to tell whether the population has declined from 2005, when 109-442 caribou (95% CI) were estimated to inhabit the same study area. We estimated $183 \pm \text{SE } 128$ caribou, so the population is likely stable at low density on southern Ellesmere Island.

Introduction

Peary caribou (*Rangifer tarandus pearyi*) are a small, light-coloured subspecies of caribou/reindeer inhabiting the Canadian Arctic Archipelago in the Northwest Territories and Nunavut from the Boothia Peninsula in the south to Ellesmere Island in the north. They are sympatric with muskoxen (*Ovibos moschatus*) over much of their range although diet, habitat preferences, and potentially interspecific interactions separate the two species at a finer scale (Resolute Bay Hunters and Trappers Association [HTA] and Iviq HTA, pers. comm.). Arctic wolves (*Canis lupus*) occur at low densities throughout Peary caribou range, but the most significant cause of population-wide mortality appears to be irregular die-offs precipitated by severe winter weather and ground-fast ice that restricts access to forage (Miller et al 1975, Miller and Gunn 2003, Miller and Barry 2009).

Peary caribou have been surveyed infrequently and irregularly on Ellesmere Island since Tener's 1961 survey extrapolated 200 animals for the island (Tener 1963). Weather issues prevented a full systematic survey of the island however, and the reliability of this estimate is questionable. Riewe (1976) flew unsystematic surveys primarily north of the Sydkap Ice Cap, along Baumann and Vendom Fiords and on the Svendsen, Raanes, and Bjerne peninsulas in 1973, with minimum counts of 150 caribou. In 1989, surveys on southern Ellesmere estimated $89 \pm \text{SE } 31$ caribou, including the Svendsen Peninsula (Case and Ellsworth 1991). In 2005, the GN systematically surveyed southern Ellesmere and Graham islands, with an estimate of 219 caribou (95% CI=109-244). Central and northern Ellesmere Island were surveyed in 2006, with an estimate of 802 caribou (95%CI=531-1207). Residents of Grise Fiord have not noticed a marked increase or decline in caribou where they hunt, primarily on Graham Island, the Bjerne Peninsula, the head of Muskox Fiord, and Baumann Fiord from Okse Bay to Stenkul Fiord. They have noticed some changing distribution patterns, with caribou caught in 2014 and 2015 on northeast Devon Island (Iviq HTA and Wildlife Officer J. Neely, pers. comm.).

Muskoxen are generally surveyed at the same time as caribou. Ellesmere Island was estimated by Tener (1963) to have more muskoxen, about 4000, than the rest of the Queen Elizabeth Islands combined. Southern Ellesmere Island, being largely comprised of ice fields, mountains and fiords, has historically had a much smaller muskox population than the Fosheim Peninsula and Lake Hazen areas further north (Tener 1963, Jenkins et al. 2011). The coastal lowlands along Baumann Fiord support some of the highest densities of muskoxen south of the Svendsen Peninsula (Iviq HTA pers. comm., Case and Ellsworth 1991, Inuit Qaujimajatuqangit [IQ] in Taylor 2005). In ground surveys of the Jones Sound region in 1966-67, Freeman (1971) counted 470 muskoxen on southern Ellesmere Island. In July 1973, Riewe (1973) estimated 1060 muskoxen north of the Sydkap Ice Cap, and on the Bjerne Peninsula, Raanes Peninsula, Svendsen Peninsula, Graham Island, and Buckingham Island. Of these, 260 muskoxen were estimated on Bjerne Peninsula alone (Riewe 1973). Case and Ellsworth (1991) estimated $2020 \pm \text{SE } 285$ muskoxen (including calves) on southern Ellesmere Island, including the Svendsen Peninsula, in July 1989. In May 2005, the population was estimated at only 456 (95%CI 312-670) 1+ year-old muskoxen south of Baumann and Vendom Fiords, including Graham and Buckingham islands, and many muskoxen seen on the survey were in poor condition (Campbell and Hope 2006, Jenkins et al. 2011). Residents of Grise Fiord recall freezing rain and ground-fast ice in fall/winter 2005, causing many muskox to starve (Iviq HTA, pers. comm.).

The Peary caribou and muskoxen of northern Devon Island, southern Ellesmere Island, and Graham Island are vitally important to the community of Grise Fiord. Muskoxen have been hunted

in the area since the government ban on muskox hunting was lifted in 1969, and tags are currently set aside for domestic/commercial use and sport hunts. Caribou have been regularly hunted in the region since Grise Fiord was established in 1953, with most harvest since 1964 focusing on the Bjorne Peninsula, south shore of Baumann Fiord, and Graham Island (Riewe 1973, IQ in Taylor 2005, Iviq HTA pers. comm.). Petroleum exploration in the 1970s is believed to have caused caribou to shift their ranges and movements, and there is concern that future industrial activity could be detrimental to the herds as well (Iviq HTA, pers. comm.) This survey was conducted to update the population estimates, demographic characteristics, and distribution of Peary caribou and muskoxen on southern Ellesmere Island and Graham Island.

Management Recommendations

Peary caribou and muskoxen on southern Ellesmere and Graham islands are an important source of country food and cultural persistence for the Inuit of Grise Fiord. Consistent with the Nunavut Land Claim Agreement, and the Management Plan for High Arctic Muskoxen of the Qikiqtaaluk Region, 2012-2017 (DOE 2014), these management recommendations emphasize the importance of maintaining healthy populations of caribou and muskox that support sustainable harvest. The current abundance and good calf recruitment suggests that the muskox population is healthy, and although relatively few caribou were seen, this appears to be fairly normal for the area.

Under the Management Plan (DOE 2014), Ellesmere Island is considered a single management unit, MX-01, with no quota. It is highly recommended that a harvest reporting system be maintained even without a quota in place. This allows biologists, community members, and decision makers to track harvest patterns and changes in wildlife populations over time and to determine whether changes to management zones or harvest restrictions have the desired effect.

Harvest trends for muskoxen over the last decade suggest that Grise Fiord harvests fewer muskoxen than in the 1990s, averaging fewer than 10 tags per year from 2005-2014 (Government of Nunavut Harvest Database, unpubl. data). An unusually high harvest in 2012-13 due to several problem muskoxen in town resulted in the use of 13 tags in what is now MX-01 - less than 0.5% harvest if the population was similar in 2013 to the current 2015 population and if only southern Ellesmere Island and Graham Island are considered (which does not take into account the high muskox populations elsewhere in MX-01, notably the Fosheim Peninsula and Lake Hazen). Hunters can also access the Svendsen and Raanes peninsulas, north of the study area, which are also included in MX-01, and were not surveyed in 2015. As local knowledge and previous surveys have demonstrated, population changes can be rapid and unexpected if severe weather causes localized or widespread starvation or movement, so continuous monitoring and adaptive management is necessary.

Although we saw only 38 caribou during the survey, the results of previous surveys over the same areas suggest that caribou have persisted at relatively low densities on southern Ellesmere Island for at least as long as they have been regularly hunted from Grise Fiord. There may or may not have been a decline from the 2005 survey, the variation around the estimates is too wide to tell. It is unlikely that harvest restrictions on Peary caribou will result in any marked increase in the population, as harvest is restricted to a small human population with limited access to the caribou range. Increased monitoring of sightings and reporting caribou harvest would provide a more complete picture of where caribou are on the landscape, and could inform population metrics like calf recruitment.

This survey also contributes additional data to the pattern observed by community members, of the inverse relationship between muskox and caribou densities. Although there is general consensus that when some muskox populations are high, sympatric caribou populations are low, the mechanism remains a subject of some debate – the strong smell of the muskoxen is repulsive to caribou, or the muskoxen trample foraging areas and compact the snow, or wolves that hunt the muskoxen have a disproportionate effect on the caribou, or some other factors. Additional research by biologists and IQ holders into this mechanism would be beneficial for informing caribou and muskox management in the High Arctic.