Peary caribou, muskox, and wolves on the Bathurst Island Complex Final project report

1. NWRT Project Number: 2-19-07

2. Project Title: Peary caribou, muskox, and wolves on the Bathurst Island Complex

3. Project Leader:

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4. Summary:

Project not completed. March 2020 Bathurst Island aerial survey Cancelled due to COVID-19

Peary caribou were listed under the Species at Risk Act in 2011, and the main threats to the species come from climate change. To assess potential effects of climate change it is necessary to collect information on changes to distribution and abundance, and with this project we proposed to update distribution and abundance estimates for Peary caribou and muskox across the Bathurst Island Complex in Nunavut. We also sought to improve our understanding of predation in High Arctic systems by investigating wolf predation rates on Peary caribou and muskox. To explore predation, we planned to deploy GPS collars on 6 wolves in April 2019 to identify kill and den sites. However, we were only able to deploy 1 collar due to weather delays and challenges in finding and capturing wolves. In July 2019 a field crew visited the GPS cluster sites to categorize wolf activity that occurred between April and July.

Outreach and local involvement are important aspects of our project. In the early development phase of the project, we met with the Resolute Bay Hunters and Trappers Associations and sought their involvement. We have continued to provide them with regular updates as the project unfolds. Local observers have been and will continue to be integral to the fieldwork and interpretation of results.

5. Project Objectives:

Our primary questions are:

a) what is the status of Peary caribou and muskox populations on the Bathurst Island Complex?, and
b) what level of wolf predation exists for Peary caribou and muskox in this system?

The research objectives are:

1. Estimate abundance (population estimate from fixed-width transect survey) and distribution of Peary caribou and muskoxen on the Bathurst Island Complex.
2. Estimate predation rates on Peary caribou and muskoxen by wolves
3. Compare predation between two High Arctic wolf populations (Bathurst Island and Ellesmere Island) with very different prey populations (there were no Peary caribou in the area of the Ellesmere Island wolf study during its four-year duration).
4. Estimate adult: calf ratio for Peary caribou and muskoxen on the Bathurst Island Complex as an indication of short-term population trend.

The primary research question a) and research objective 1) noted above will be completed following our March 2020 survey. Our work on wolf predation in 2019 has begun collecting data to answer question b), and objectives 2) and 3). During our work in April 2019, we collected composition data to address objective 4), however the limited number of caribou observations makes inferences difficult.

6. Material and Methods:
   Project not completed. March 2020 Bathurst Island aerial survey Cancelled due to COVID-1

All design and methods used so far for the predation and caribou composition parts of this project have been the same as described in our original proposal. The one change for this project from our original NWRT application is that the survey area for the abundance and distribution survey has expanded in response to community requests to cover more of the adjacent areas (see Figure 1 for the revised survey area).

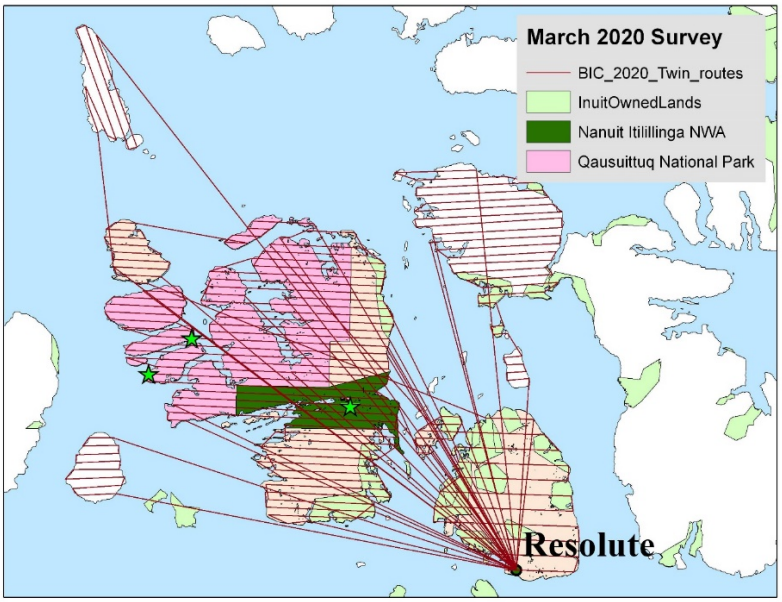

Figure 1 *Study area of 2020 Bathurst Island complex distribution and abundance survey. Red lines show the planned transects.*

7. Final results/discussion:
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Based on the conditions of our permits, we did not do composition work in Qausuittuq National Park.

April: We collared one wolf, a 65-lb male that was part of a group with three other wolves. We flew over most of the island and saw the same wolf that we collared and his pack 3 times in different places. We only saw one other wolf on the southeastern shore of Bathurst Island, but we weren't able to capture it due to strong winds.

We saw 95 Peary caribou (31 in Qausuittuq National Park) and 425 muskoxen. Caribou were concentrated mostly to the west of Allison Inlet, with muskox found dispersed throughout the southern half of the island (Fig. 2). For groups where classification was possible (i.e., not in the National Park), we observed a calf:cow ratio of 0.76, which suggests good productivity and over-winter survival of calves.

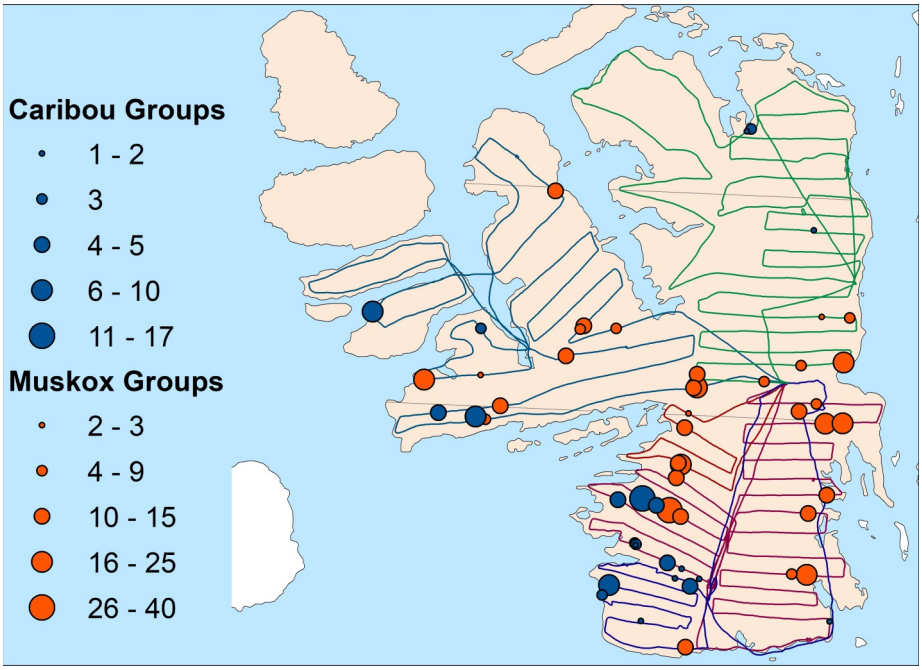

Figure 2 *Flight paths and caribou and muskoxen observations from spring 2019 field work.*

It is very important to note that these caribou observation were for composition (the proportions of bulls, females, and calves), and not a systematic survey to estimate the total number of caribou or muskoxen on the islands. Because of this, we cannot directly compare what we saw in April 2019 to the most recent survey of Bathurst Island in 2013. However, in areas that were surveyed in both 2013 and 2019, we saw far fewer caribou in 2019 compared to the 2013 survey. The

surveys did occur at different times of year and so we could expect caribou to be in different areas of the islands, but considering the amount of area we covered in April 2019, it does not seem likely that we missed large groups of caribou. Our preliminary findings here give further importance to our upcoming abundance survey for Bathurst Island in March 2020.

July: We visited 80 GPS clusters between July 3 and 4. We found 14-16 kill sites containing carcasses of 8-10 Peary caribou and 6 muskoxen (Figure 3). Two of the Peary caribou sites appeared to have been locations where two caribou were killed, but we can't say for sure (it was mostly just fur remaining). Because we visited many of the sites weeks after the cluster event occurred, it can be very challenging to determine, for example, if more than one caribou carcass is present, or if the animal was scavenged rather than hunted. More cluster visits in the future will hopefully provide further insights into kill site classification.

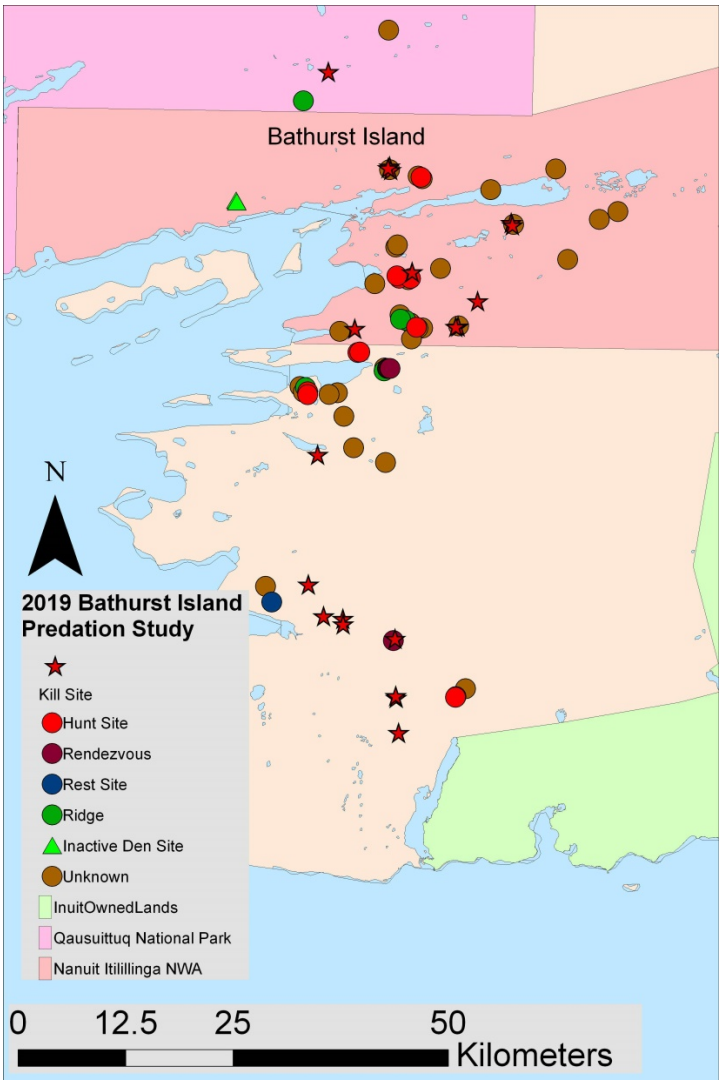

Figure 3 *Clusters with more than 3 locations that were visited on July 3rd and 4th, 2019. The legend indicates how we classified each cluster according to the activity of the wolf.*

Daily movement rates varied throughout the time line however it can be seen that the immediate days after a kill the average movement rate decreased (Figure 4). This decrease in movement rates is also more pronounced for muskox then it is for Peary caribou (Figure 5). There is still the possibility that not all these kill sites were actively killed by the wolf pack. At this point we have not been able to determine cause of death of the Peary caribou and muskox so scavenging could also have occurred.

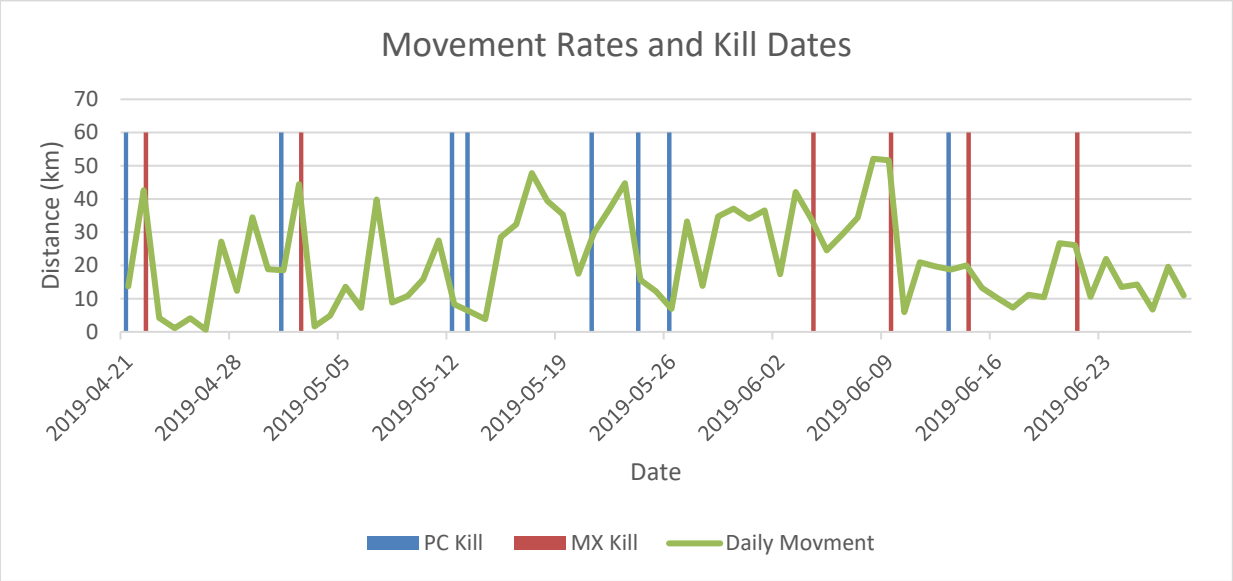

Figure 4 Daily movement rates with kills based on first date of a cluster identified as a kill for both prey species of Peary caribou (blue) and muskoxen (orange)

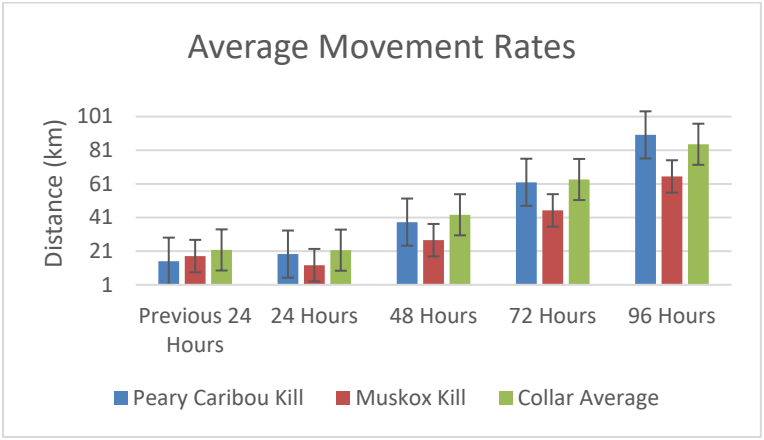

Figure 5 Comparing average movement rates where from any point looking either the previous 24 hours or forward 24, 48, 72, and 96 hours to the averages from the first location in a cluster determined to be a kill site for with Peary caribou (blue) or muskoxen (orange).

8. Reporting to communities/resource users:

We met with the Resolute Bay HTA in November 2018, January 2019, March 2019, July 2019, October 2019, and January 2020. We discussed planning for the project at the November, January, and March meetings and preliminary results at the July and October meetings.

We involved three community members in our research during the April and July work. Peter Eckalook came out with us in April and July, and Mark Amarualik and Valerie Amarualik assisted with work in July. As well in November Peter and his brother checked on some GPS clusters by snowmobile that were created near Resolute Bay.

Discussion/Management Implications:

Project not completed. March 2020 Bathurst Island aerial survey Cancelled due to COVID-19. With the limited data collected from the predation survey there are no management implications that are required. The Distribution and Abundance survey of Peary caribou and muskoxen on Bathurst Island and surrounding islands is now scheduled to be completed in March 2021.