Nunavik Inuit Knowledge of Migratory Caribou

Makivvik

Available in print and electronic format in English, Inuktitut and French

COVER PHOTO (FRONT AND BACK): RACHEL GUINDON

About Makivvik

Makivvik, which in Inuktitut means *to rise up*, is a fitting name for an organization mandated to protect the rights, interests and financial compensation provided by the 1975 James Bay and Northern Quebec Agreement, the first comprehensive Inuit land claim in Canada, and the more recent offshore Nunavik Inuit Land Claim Agreement that came into effect in 2008. Makivvik is the birthright organization representing Nunavik Inuit and has been a leader in building and developing Nunavik as a distinct and vibrant regional homeland of Nunavimmiut since 1978. Throughout its history, Makivvik has spoken on behalf of the Inuit of Nunavik to uphold the constitutionally-protected rights of all Nunavik Inuit.

The Corporation's distinct mandates range from owning and operating large profitable business enterprises and generating jobs; to social economic development, improved housing conditions, to protection of the Inuit language and culture and the natural environment.

THE OBJECTIVES OF MAKIVVIK ARE:

- To receive, administer, distribute and invest the compensation money payable to Nunavik Inuit, as provided for in the James Bay and Northern Quebec Agreement;
- To relieve poverty, to promote the welfare, advancement, and education of the Inuit;
- To foster, promote, protect and assist in preserving the Inuit way of life, values and traditions;
- To exercise the functions vested in it by other Acts or the Agreement; and
- To develop and improve the Inuit communities and to improve their means of actions.

Makivvik also works with fellow Inuit from across Inuit Nunangat – the Inuit homeland – as part of the national Inuit political process, formally represented by Inuit Tapiriit Kanatami. At the circumpolar level, Makivvik is a member of the Inuit Circumpolar Council.

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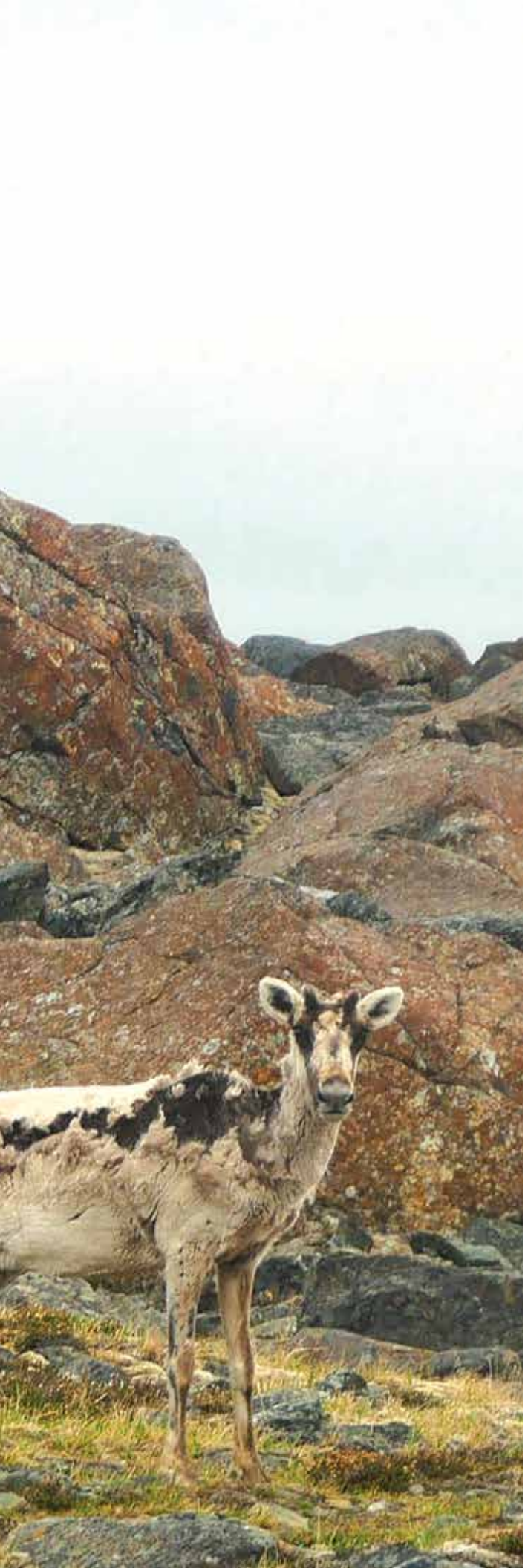
Makivvik



Dedication

This report is dedicated to the memory of individuals who contributed to this work with their immense wisdom, experience and dedication to promoting Inuit knowledge, and who have since passed. Their presence is deeply missed, and their legacy continues to inspire.

Kalingo Angutigirk
Silas Berthe
David (Tivi) Etok
Jobie Kutchaka
Lucassie Naulituk
Mark O'Connor
Jobie Ohaituk
Simeonie Ohaituk
Putulik Papigatuk
Epervik Parr
Sammy Unatweenuk

Acknowledgements

This report is based on the knowledge, experiences and perspectives of 75 Nunavimmiut from the communities of Kangiqsualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq. Names of those participants who agreed to be acknowledged are listed below, while three participants from Kangiqsualujjuaq and two from Umiujaq chose not to list their name. Makivvik and the Anguvigaq sincerely thank all participants for their contributions and generosity with their time.

KANGIQSUALUJJUAQ

Kenny Angnatuk
Jaiku Arnatuk
Bobby T. Annanack
David Annanack
Kenny Assevak
Elijah Emudluk
David (Tivi) Etok
Willie Etok
Lucassie Etok
Leevan Etok
Jimmy Jararuse
Norman Snowball
Sammy Unatweenuk
Tommy Unatweenuk

TASIUJAQ

Charlie Angnatuk
Willie Angnatuk
Tommy Annahatak
Silas Berthe
Billy Cain
Mary Cain
Willie Cain Jr.
Tommy Cain Sr.
Maggie Grey Cain
Billy Dan May
Moses Munick
Putulik Puttayuk

SALLUIT

Kalingo Angutigirk
Michael D. Cameron
Charlie Ikey
Moses Ilisituk
Adamie Kaitak
Daniel Kaitak
Natanailie Kilabuk
Pierre Lebreux
Kakkiniq Nakuiyuk
Lucassie Naulituk
Paulusie Okituk
Mosusie Padlayat Sr.
Putulik Papigatuk
Epervik Parr
Eli T. Quananack
Adamie Saviakjuk
Paulusie Tayara
Adamie Tayara
Irsutuk (Thomasie) Usuituayuk

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Daniel Aculiak
Charlie Elijassiapik
Shaomik Inukpuk
Daniel Kritik
Jobie Kutchaka
Sandy Niviaxie
Charlie Nowkawalk
Simeonie Ohaituk
Jobie Ohaituk
Anna Ohaituk
Billy Palliser
Noah POV
Lazarusie Tukai
Saroillie Weetaluktuk
Michael Williams
Jackie Williams

UMIUJAQ

Lucassie Cookie
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Charlie Kumarluk
Jeremiah (Eddie) Kumarluk
Willie Kumarluk
Davidee Niviaxie
Peter Tookalook
Timothy Tooktoo
Qalingu Napartuk

We would also like to thank Johnny Naktialuk (Umiujaq and Inukjuak), Paul Okituk (Salluit), Billy and Willie Cain (Tasiujaq) and Tommy Unatweenuk (Kangiqsualujjuaq) for their skillful interpretation, and to Julia St-Aubin, Elena Berthe, Barbara Papigatuk, Jeremiah (Eddie) Kumarluk and Jobie Oweetaluktuk for research assistance. We are also grateful for the local support provided by the Northern Village offices and Anguvigait. We also thank Billy Dan May, Michael D. Cameron and Jobie Epoo for their careful and expert reviews of this report. We gratefully acknowledge the support of Environment and Climate Change Canada, World Wildlife Fund (WWF) Canada and Société du Plan Nord.

WE WOULD ALSO LIKE TO ACKNOWLEDGE THE PROJECT TEAM:

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Suggested citation: Makivvik. 2025. Nunavik Inuit Knowledge of Migratory Caribou. Kuujjuaq, QC.

Preface

For countless generations, Nunavik Inuit have lived with migratory caribou, observing their movements, understanding their needs, and relying on them for subsistence, culture and identity. Our Elders and hunters have long been the guardians of this knowledge, witnessing firsthand the effects of climate change, shifting migrations and growing disturbances on the land. Today, as migratory caribou populations face unprecedented pressures, this knowledge is more important than ever.

This work represents our collective effort to document, honour, and mobilize Nunavik Inuit knowledge and values for the stewardship of migratory caribou. This report is the voice of our communities, a record of knowledge on caribou that has been passed down from generations through stories, practices and lived experience. These voices remind us of the values that have sustained Nunavik Inuit for generations: sharing what we harvest, respecting the land and caring for the animals.

Our land is changing, and so are the caribou. Inuit have been raising concerns for decades, calling attention to declining herds and advocating for decisions rooted in Inuit knowledge and experience. The well-being of caribou is directly connected to the well-being of our communities, and protecting them means protecting our culture, food security and future generations.

Recognizing Inuit governance, knowledge and traditions is essential to ensure that decisions are culturally grounded and effective. As Nunavik Inuit advance along the path of self-determination, Inuit-led wildlife management must be central. This work lays the foundation for an Inuit-led management initiative currently in development: the Nunavik Caribou Protection Plan.

It is our hope that this report guides meaningful actions so that future generations may continue to know, hunt and honour the caribou as Nunavik Inuit have always done.

Adamie Delisle Alaku
Executive Vice President
Department of Environment, Wildlife and Research
Makivvik

PHOTO: SOPHIANE BÉLAND

PHOTO: RACHEL GUINDON

Contents

Introduction

While there is caribou, while we have some Elders, it's like emergency now to pass on the knowledge to the younger generation. There's also methods of sharing, which needs to be properly learned by the younger generation, and it's true that this work is needed. While there is caribou, that we have a chance to pass knowledge, the proper knowledge of harvesting and taking care of caribou, to the younger generation. It's like an emergency now.

–JOBIE OHAITUK, INUKJUAK

In January 2019, Nunavik Inuit gathered in Salluit to discuss the state of migratory caribou in the region and to propose concrete actions to mitigate against the declines that Inuit have witnessed. There was consensus that the George River herd is at a critical low and that it must be allowed to recover. Participants were also concerned about the ongoing decline of the Leaf River herd and agreed that Nunavik Inuit must lead efforts to address it. Participants committed to the development of an Inuit-led management regime that addresses habitat and predator management, harvest management, harvest monitoring and hunter education, among others. The lack of documented Nunavik Inuit knowledge of migratory caribou was a concern for developing a Nunavik Caribou Protection Plan that would be accepted as credible outside of the region.

Further, to ensure the sustainability of the subsistence hunt in the context of population declines, Inuit hunters have begun adapting their harvesting practices. Sharing of best practices for a sustainable subsistence hunt based in Nunavik Inuit knowledge can support these efforts.

To address these needs, Makivvik decided to gather Nunavik Inuit knowledge of migratory caribou, focusing on the Leaf River and George River herds. The goals of the project were to:

1. Document Nunavik Inuit knowledge and values related to stewardship of caribou and their cultural importance, historical population trends, biology and behaviour, critical habitat, harvesting practices and changes over time; and
2. Develop a caribou harvesting best-practices guide based on Nunavik Inuit knowledge.

This work is the foundation for the regionally-led Nunavik Caribou Protection Plan.

Approach

To assist with gathering Inuit knowledge of migratory caribou, Makivvik contracted Polynya Consulting Group to support the Department of Environment, Wildlife and Research (DEWR) in collaboratively designing and carrying out a study.

A qualitative research design with a case study approach was used (Creswell 2007). While caribou are important to all Nunavik communities, project limitations required five communities be selected for inclusion in the project. The Anguvigaq and DEWR staff selected communities in consideration of having representation throughout the annual caribou cycle and movements (e.g. knowledge of calving grounds, wintering grounds, etc.) and historical distribution of caribou for different herds. Support and interest from the local Anguvigaq for the community to be included in the study was confirmed before proceeding. Based on those factors, the communities of Kangiqsualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq were selected for inclusion in the study.

Semi-directed interviews and small focus groups were conducted. In total, 58 participants shared their knowledge and experiences over the course of 10 focus groups and nine interviews in 2020 and 2021. Most took place from January to February 2020. Four additional interviews with younger participants were conducted remotely with local support in Kangiqsualujjuaq in February 2021, as the first set of interviews in the community involved no younger participants. Participants ranged in age from 22 to 92, with the average age being 57 (see Table 1). Fifty-six of the participants were men and two were women. Some participant observation was also conducted during a caribou hide preparation workshop in Kangiqsualujjuaq, where all participants were women. Participants in the focus groups and interviews were primarily recruited by the local Anguvigaq in each community, although in Kangiqsualujjuaq and Salluit, interpreters and a local research assistant also assisted with recruitment.

Table 1. Original data gathering participants by community and age group

COMMUNITY	ELDER (61+ YEARS)[1]	MIDDLE-AGED (41-60)[1]	YOUNGER (18-40)[1]	TOTAL
Kangiqsualujjuaq	7	2	3	12
Tasiujaq	5	2	5	12
Salluit	6	7	2	15
Inukjuak	4	3	1	8
Umiujaq	2	7	2	11
Total	***24***	***21***	***13***	***58***

1 Age at the time of first participation, estimated based on birth year

All sessions conducted in January and February 2020 included participatory mapping, and sequential Inuktitut-English interpretation was provided for participants when needed. The additional interviews in Kangiqsualujjuaq in February 2021 did not include participatory mapping, as they were conducted remotely. Regional (all of Nunavik) and local basemaps (see Figure 1) used in focus groups and interviews were prepared by Nunavik Geomatics. Cargo delays meant that prepared basemaps could not be used in Inukjuak and Umiujaq; instead, available maps in the community were used.

Sessions were audio recorded with participants' informed consent. Informed consent for photos was also sought. Audio recordings were transcribed by Transcript Heroes and thematically coded in the qualitative analysis software QSR NVivo 12. A hierarchical thematic coding structure was developed based on the workshop/interview guide and adjusted based on topics raised by participants. Within the coding structure, transcript data was cross-coded to nodes based on time period, season, and herd.

Map data was analyzed in ArcGIS; photos of completed maps were digitized and attribute data was extracted from the explanatory notes on the maps. During qualitative analysis, additional attribute data relevant to the digital maps was noted and added to the ArcGIS map database.

Due to Covid-19 pandemic-related restrictions on travel and gathering, validation was delayed and adapted. First, the Anguvigaq identified three Nunavik expert reviewers to review a full draft of the project report. The project report was revised based on reviewer feedback, and their feedback also informed questions posed during validation with participants, which took place from February to October 2021. Validation was primarily conducted remotely with local support, while members of the research team conducted validation in-person in Inukjuak and Salluit in June 2021 and in Umiujaq in October 2021. Sessions were conducted individually and in focus groups and included sharing and gaining feedback on findings in general, seeking additional information or clarification on specific topics and questions, and confirming the accuracy and use of quotes. In some communities, it was possible to receive assistance with delivering validation documents to participants that were unavailable for the validation session, and one person was reached by phone. In total, 94% of the original 54 participants attended validation sessions, were provided with documents or were reached remotely. As noted above, four new younger individuals from Kangiqsualujjuaq also participated at this time. The feedback, clarifications, edits as well as additional information was analyzed and used to update the report. However, validation of map data and spatial descriptions that rely on maps was not feasible at this time due to not being able to have technical support in-person in communities.

Once COVID-19 travel restrictions were lifted, in-person mapping validation was planned and conducted in March 2023 in all five participating communities. Thematic synthesis maps were created for each of the population low, increase, peak and post-peak periods, each showing features by four seasons. Because of the gap in time, a number of original participants were unavailable for map validation, because they were too elderly or ill, had moved, or had passed away. There were a number of other participants that were out of town or otherwise unavailable. With the guidance of local Anguvigaq members, additional knowledge holders—some of whom were

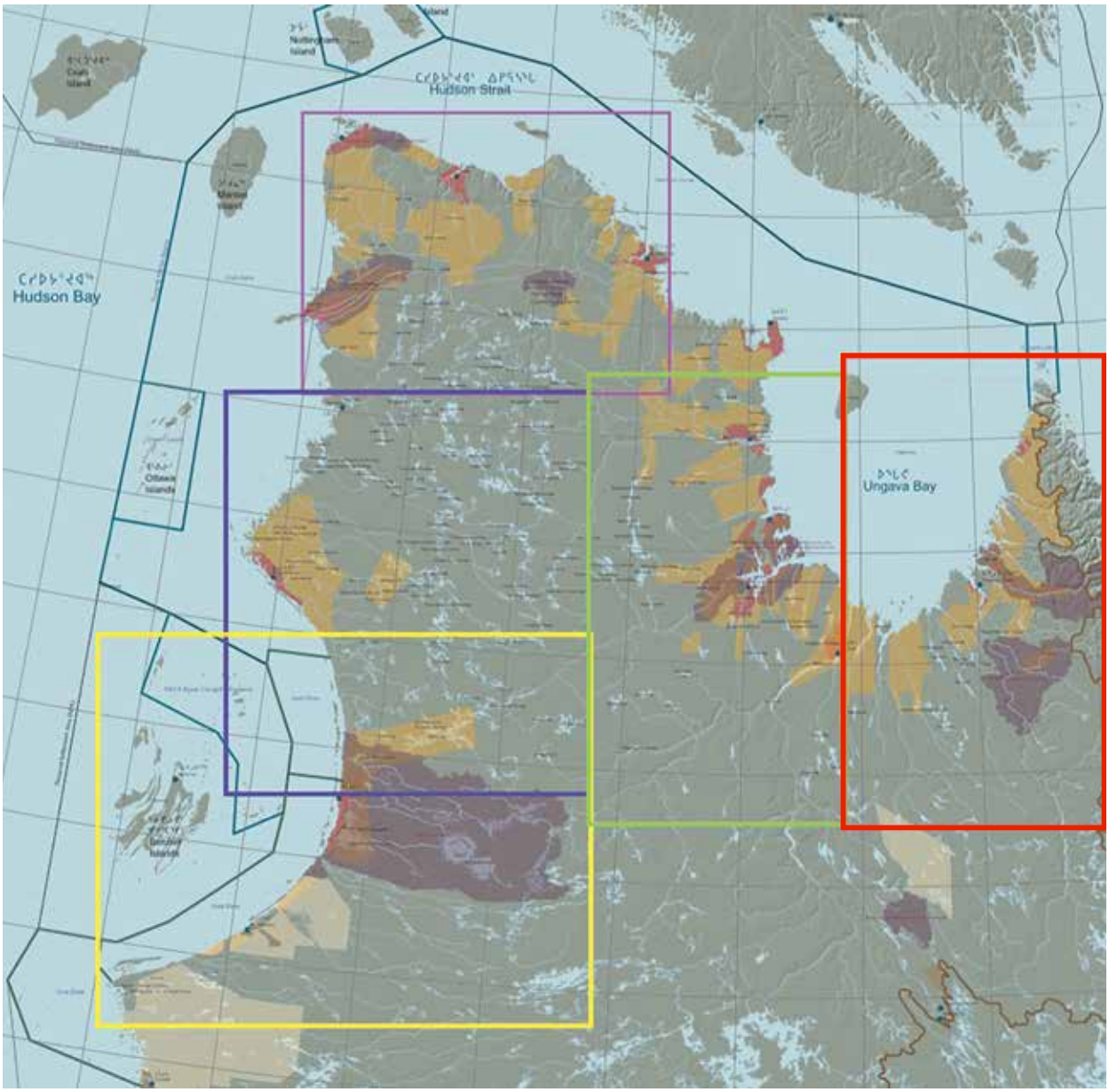


Figure 1. Approximate geographic extent of local basemaps prepared for use in each community

Anguvigaq members—were invited to join community validation sessions together with original participants. In total, 35 participants took part in map validation, and 17 of these participants were new (Table 2). Participants in map validation sessions added and deleted features, corrected the shape of features, corrected the attributes of features (e.g. the population cycle, season, or herd), and provided feedback on the maps in general. Based on this feedback, additional work was done to update the maps. Further quality checks were conducted in 2024 and 2025 on the map attribute data compared to the visualized maps, and work was done to improve map display and ease of understanding. Revised maps were shared with the Expert Roundtable for the development of the Nunavik Caribou Protection Plan in April 2025 to get additional feedback, which was then used for further map improvements.

Table 2. New/additional participants from map validation by community and age group

COMMUNITY	ELDER (61+ YEARS)[1]	MIDDLE-AGED (41-60)[1]	YOUNGER (18-40)[1]	TOTAL
Kangiqsualujjuaq	3	1	1	5
Tasiujaq	0	0	0	0
Salluit	2	1	1	4
Inukjuak	3	3	2	8
Umiujaq	0	0	0	0
Total	***8***	***5***	***4***	***17***

1 Age at the time of first participation, estimated based on birth year

In total, between 2020 and 2023, 75 Nunavimmiut participated in this study, based on the number of participants from data gathering and qualitative validation, as well as map validation (Table 3). The average age of the total participants remained 57.

Table 3. Total participants from data gathering and validation by community and age group

COMMUNITY	ELDER (61+ YEARS)[1]	MIDDLE-AGED (41-60)[1]	YOUNGER (18-40)[1]	TOTAL
Kangiqsualujjuaq	10	3	4	17
Tasiujaq	5	2	5	12
Salluit	8	8	3	19
Inukjuak	7	6	3	16
Umiujaq	2	7	2	11
Total	***32***	***26***	***17***	***75***

1 Age at the time of first participation, estimated based on birth year

For interpretation of the maps, it should be noted that the maps are composites of knowledge shared by participants. While they show caribou abundance, movements and harvesting over all of Nunavik, they only represent the knowledge shared and validated by participants from the five participating communities in this study. Further, there are limitations to what participants could record on maps, based on factors such as time and limitations of what can be represented with a point, line or polygon. Therefore, the maps below are not a full representation of Nunavik Inuit knowledge of caribou nor a full representation of the knowledge of participants in this study. The maps should be interpreted in conjunction with the qualitative text in this report.

PHOTO (FOLLOWING PAGE): MIKHAELA NEELIN

FINDINGS PART 1

Nunavik Inuit knowledge of caribou

1. Significance of caribou for Nunavik Inuit

[We] use it for everything, make clothing out of the hide, cook it, dried, raw. For everything it's being used. All the meat is edible, except the genital parts… All bones, feet, hoofs are edible, even the stomach.

–MOSES MUNICK, TASIUJAQ

The significance of caribou and caribou harvesting was reported by all communities and among all age groups. A few participants stated that harvesting and using caribou is a way of life and part of Inuit culture. To illustrate the significance of caribou, some participants described the continuity of caribou harvesting over their lifetimes and their ancestors' lifetimes:

> *Everywhere you go in Nunavik you see tracks and work that's been done by Inuit. It's everywhere…Like, we would see, way inland where a person harvests the caribou. They would erect one inuksuk where they had one, and if they had happened to catch three they put up three small inuksuit so you could see, way inland, where they had harvested them. They indicated where they were. It's just to tell people. Tell people, that will come after, I was here. I got three. –Simeonie Ohaituk, Inukjuak*

Some Elders in Umiujaq and Tasiujaq also described caribou as a gift from God or from heaven. However, the way in which most participants described the importance of caribou was by explaining how completely the whole caribou is used, emphasizing that they "take everything."

There were also a number of changes over time that were described by participants. While the continued importance of caribou was emphasized by participants, it was also noted that in the past, it was essential that the whole animal be used. In this way, there has also been a change in the importance of caribou over time.

> *When I was young, we used to go hunting for long, over a month at a time, used to bring every little part of the caribou. Now, when people don't bring back everything, I think about that. Because they never saw how important it was and how we did it before. –Silas Berthe, Tasiujaq*

More than any other use, participants reported on the importance of caribou as a food source. Other stated uses were clothing and shoes; tools; shelter and furnishings; medicine; material for

traditional games; and a means for economic opportunities, such as guiding. The significance of caribou for these uses and changes over time are discussed in detail below.

> *Historically the caribou has been very important to us. It's still important today but not as important as back then, because all parts were used for daily tools and things that we needed. Like, for the hide would be used for a mattress. So since we [had] not a lot then, back then, we were very happy that we would have more tools and things that we would have in the house. The back muscles [tendons], they were used as thread, and making thread was very important for the women to make warm clothes for the men to hunt. So caribou was all around used for everybody. –Simeonie Ohaituk, Inukjuak*

1.1 FOOD

Participants from all communities and age groups discussed the importance of caribou as a food source, emphasizing that all parts of caribou can be eaten:

> *Before, everything was eaten. In lean days, we even ate the hoof. Just the middle bone would be left. The hoof itself would be eaten. Shin bones were ground up with fat. Even when you would finish having boiled meat, we would save the bones and re-use them for a broth, even if there was no more meat – there would be fat in the water. –Silas Berthe, Tasiujaq*

> *The whole caribou is edible. –Adamie Saviakjuk, Salluit*

> *For me it's a big part of my diet. I want caribou for extended period of time, I need it for meat. –Jeremiah (Eddie) Kumarluk, Umiujaq*

Many participants described eating caribou for their whole life, but there were also some community level differences, as some Elders in Salluit also described how caribou were not present in their area when they were young. There are also recent changes in abundance that affect access to caribou meat. For example, an Elder in Kangiqsualujjuaq noted that in recent years caribou meat needed to be bought in from other communities because there were so few caribou in the area.

There were also some changes in eating caribou that were described by some participants. Some middle-aged and Elder participants described being concerned about younger people having less appreciation for the "real taste" of caribou and not eating parts like hoofs anymore, although it was also noted that people tend to bring parts that they do not like to eat to the community freezer to share.

> *For us…we all know what's good. But we get the ones – some of the younger ones, let's say 60% of them, they like thighs nowadays…Some of them don't eat some parts anymore. –Umiujaq participant*

Sharing caribou meat with family and others in the community was described by some participants across age groups as an important part of using caribou for food.

CARIBOU MEAT BEING PREPARED IN INUKJUAK. PHOTO: KAITLIN BRETON-HONEYMAN

PHOTO: MIKHAELA NEELIN

> *There is a lot of sharing. Whenever somebody goes harvesting and they have some at home, they call around to have people come and get what they need… Even young people bring food to houses. Even my nephew just yesterday he said that all his catch is shared. –Jobie Kutchaka, Inukjuak*

Some participants across age groups described how sharing is strong in their communities, and some middle-aged and Elder participants described concerns that sharing was not as strong as it could be. For example, a younger participant in Inukjuak described how there is more sharing within families, whereas in the past when people lived in smaller family groups, there would be more sharing across groups. One middle-aged participant in Kangiqsualujjuaq described how selling caribou meat was reducing sharing. Lastly, an Elder from Umiujaq described how younger people need to learn to share better with Elders, with closer care and attention to caribou delicacies.

Some participants described techniques for butchering and storing caribou meat, and also discussed changes over time. Seasonal differences in caribou harvesting and thus eating caribou were described. For example, some Elders in Umiujaq described how the warmth of the summer means that caribou meat will rot quickly, so fewer caribou are taken as harvesters have to be able to bring all of meat home quickly for processing. Some Elders in Kangiqsualujjuaq, Tasiujaq, Umiujaq described how they used to cache caribou meat under rocks in the fall, which was a good time to hunt caribou for clothing, and would return to pick up the meat in the winter when it was frozen. No participants mentioned this as a practice that they commonly do today.

> *You kill the caribou and cover it with rocks, and pick it up in the wintertime. It's even more tastier than the new meat. So we used to do this, and still today, we still can do this. –Lucassie Etok, Kangiqsualujjuaq*

> *Back then – before there were freezers, we used to do the method covering [the meat] with rocks, and going back when it's frozen. Not many people do that anymore. Some, they put it under for a few – maybe a week or two. –Moses Munick, Tasiujaq*

Elders in Kangiqsualujjuaq and Tasiujaq also described how during dog team times they would put pieces of the caribou inside its body to make it into a contained bag for transportation, because it took up less space.

> *Today it's very different, we would just cut [the caribou] in pieces and put them in the boxes, but before…we would use the whole body as a bag and put all the legs and the head inside the stomach, take the guts out and put all the meat inside, so that would be in one good piece. –Norman Snowball, Kangiqsualujjuaq*

As space is not as constrained with snowmobiles, this is no longer a common practice. However, it was described as a better way to handle the meat, including by younger participants in Tasiujaq, who explained that the meat, "tasted better, because it's contained and not spread out and open."

Some Elders in Kangiqsualujjuaq, Tasiujaq, Inukjuak and Umiujaq noted that before snowmobiles, caribou and other meat was shared with dog teams. An Elder from Umiujaq explained that this ensured that no meat was wasted.

> *There's also a difference between having a dog team from back then because all food they harvest was shared between the dog team and the people; and now with the slaughter of dog team there's no more dog teams there's a lot of waste of food. And Inuit are blamed for it and the original result of the law coming down from south to slaughter the dogs have never been up here to help in any way. –Davidee Niviaxie, Umiujaq*

While snowmobiles are the most prevalent means of transportation today, there are still some Nunavimmiut that use dog teams. In Tasiujaq, two younger participants noted that they had dog teams.

Another change that was discussed was the emergence of selling of caribou meat for food, which is discussed in more detail in section 6 regarding perspectives on caribou management. Some participants from Kangiqsualujjuaq, Salluit, Inukjuak, and Umiujaq discussed the increasing popularity of selling caribou meat today compared to the past, particularly nikkuk (dried caribou meat, usually from the hindquarters) and selling of meat to Hunter Support. Overall, participants expressed concern about waste and overharvesting, and the influence of selling meat in furthering these trends, especially among younger hunters. During the Umiujaq validation, it was mentioned that this trend has been increasing in recent years. One Nunavik expert reviewer and one middle-aged participant in Kangiqsualujjuaq described how this was reducing sharing. Some middle-aged participants in Umiujaq described how some younger people are focused on harvesting caribou meat to make and sell nikkuk, which seems to be a part of changing taste preferences around caribou, from the "real" taste to something closer to beef jerky. Some participants raised the reality of reduced abundance of caribou in some communities, and how this is both leading to the need to buy caribou meat from other communities and also leading to some harvesters to travel to other communities, where there are caribou, to harvest and sell to those communities where demand for caribou meat outstrips supply. Some middle-aged participants described selling caribou meat as a complex situation, which is good for the harvester and those purchasing the meat, but with consequences that can be less positive.

> *Today we never see George River herds…We're only hunting Torngat herds but sometimes we have to order some caribou meat from the other village. This winter we had some caribou from Inukjuak and we had some caribou from Tasiujaq. It's the only way we get a lot of caribou meat for the village. –Kenny Angnatuk, Kangiqsualujjuaq*

Some Elders emphasized that these trends have to be understood in the context of colonialism, where starting in the 1960s, children were taken to schools that did not teach about how to care for animals and share meat, as is the Inuit custom.

Sarah Pasha Annanack, who led the Kangiqsualujjuaq caribou hide workshop in Jan.-Feb. 2020

PHOTO: AGATA DURKALEC

> *A lot of caribou are being sold a lot through the internet and some communities don't have caribou at all. They're coming to the ones with caribou, they're catching lots to sell to the other communities… I don't know, or if it's good in a way and it's also not good in a way. –Jeremiah (Eddie) Kumarluk, Umiujaq*

1.2 CLOTHING

> *Even the caribou feet, they have big feet, we would boil it and take the meat off and then we would make sunglasses. We'd make a very small hole and we would use it as sunglasses, like in the wintertime….We would make sunglasses out of the caribou feet, even the antler. So, that's how we used to use caribou in the way we could. –Lucassie Etok, Kangiqsualujjuaq*

Some participants from Kangiqsualujjuaq, Tasiujaq, Salluit and Inukjuak discussed the use of caribou skin and fur for clothing and shoes. Most contributions on this topic were from Elders, with a few references from middle-aged participants as well. Participants discussed the value and utility of using caribou skin for items such as kamiks (boots), mittens, parkas, pants, and sunglasses as well as making thread from sinew. An Inukjuak Elder noted that in the 1920s and 1930s her father would travel on foot inland to hunt caribou, make clothing from the skin that was highly valued and then trade with Sanikiluaq for ivory to make tools.

> *We can use for anything, everything, the caribou hide. Makes snow pants, parka, anything. Anything you need. –Silas Berthe, Tasiujaq*

> *[Caribou is] not only for food, but it's the only material that you can put together a garment with and be able to meet the challenge of the cold. –Kalingo Angutigirk, Salluit*

Most of the references to using caribou skin for clothing referred to uses in the past, but some participants also noted that some uses continue today. For example, two of the members of the research team for this project had the opportunity to sit in on part of a caribou hide tanning workshop being held in Kangiqsualujjuaq, where about 10 women, under the guidance of Elder Sarah Pasha Annanack, were undertaking the multi-day and labour intensive process of preparing hides. After scrapping the fur off, participants demonstrated and explained about the multiple iterations of soaking, softening, stretching, and drying the hide. Caribou brain would be used as part of the tanning process. When the skin is ready for smoking, holes are sewn up, and then a certain kind of spongy dead wood is used for the smoking process. Participants in Tasiujaq noted that methods of tanning caribou skin are very old, and the same in their community as those used in Kangiqsualujjuaq. A Tasiujaq Elder also noted that skin from a male caribou is tougher and harder to soften than skin from a female. Caribou hide workshop participants emphasized that mittens made out of caribou skin are exceptional and valuable, and when a person makes their first pair, they typically gift it to their sanaji[1] (godparent, the person that cut their umbilical cord).

1 On the Ungava coast, Sanaji is used by girls / women; boys / men call the person who cut their umbilical cord Arnaquti. On the Hudson coast, Sanijik is used by both boys / men and girls / women.

The beneficial qualities of caribou skin were also discussed by an Elder from Kangiqsualujjuaq, who explained that it makes the best mittens because when they are wet, squeezing them returns them to normal. Participants at the caribou hide workshop also shared their perspective that the traditional practice of caribou hide preparation in Nunavik is currently strongest in their community of Kangiqsualujjuaq.

The timing and techniques of harvesting caribou for the purposes of making clothing were also discussed. Generally, participants discussed how summer and fall are the best seasons for harvesting caribou skin for clothing, after molting. At these times of year, the fur is thinner and easier to scrape off. By mid-winter, the larvae that burrow into caribou skin (larvae of caribou warble fly or bot fly) are at a larger stage and can leave large holes in the hide. This problem is avoided by harvesting the skin in the fall. An Inukjuak Elder mentioned how summer is the preferred season for harvesting caribou hide for clothing, because the fur is darker. Elders in Kangiqsualujjuaq also mentioned that skin can be good earlier if there was a lot of rain in the summertime. One Elder from Kangiqsualujjuaq also noted that when plants are starting to grow in the spring, it is a good time for harvesting caribou skin for clothing. At the caribou hide workshop, participants described how fur on the legs is also used for kamiks (boots) and pualuk (mittens).

Elders from Kangiqsualujjuaq and Tasiujaq described how in the past, thread was so important that the removal of the sinew for drying came first, and children had to wait until that was done before they could go ahead and eat the rest of the meat.

> *Today when we see the meat, we're able to cut it and eat it, but before, our parents used to say, the meat is going to be used, so we just don't cut it and eat it. We had to wait …There's muscle in there. They have to take the meat off and then dry it for sewing…The rule was that the kids, we're not supposed to touch the back legs, the muscles, until the mother is finished [taking] all what she wants for thread. –Norman Snowball, Kangiqsualujjuaq*

1.3 TOOLS

> *Caribou to Inuit people is not just to eat. Caribou is a big tool for Inuk. They would use all the caribou, different kinds of tools…The bone would be snow house knife…It can be used all kind of way for Inuit people. It's very important for Inuit. –Kenny Angnatuk, Kangiqsualujjuaq*

The utility and historical importance of using caribou to make tools was discussed by some participants, although to a lesser extent than either food or clothing. Using caribou for making tools was discussed by some participants from Kangiqsualujjuaq, Tasiujaq, Salluit and Inukjuak, most of whom were Elders, though there were also a few mentions by middle-aged participants.

Participants described how the caribou antler or bone would be used to make a snow knife, which would be used for making an iglu and a bone from the feet would be used to make a needle, which would be used for making snow shoes. Bones would also be used for other types of tools, for example for softening kamiks if the leather becomes too dry. Participants in Salluit described that a historical two-bladed caribou bone knife had been found near Salluit, both indicating that

caribou used to be in the area historically and that their bones were utilized to make tools (see Map 2 for historical caribou bones and antler sites near Salluit). An Elder in Kangiqsualujjuaq described boiling caribou feet all day and using the hardened lard that would be released from the feet to make a candle. Some Elders from Tasiujaq and Inukjuak described how their fathers would make thread from caribou muscle to sew qajaqs (skin boats).

1.4 SHELTER AND FURNISHINGS

There were few references to using caribou for shelter or furnishings, primarily from Elders from the communities of Kangiqsualujjuaq, Tasiujaq, Salluit and Inukjuak. Participants described how the caribou hide would be used to make a mattress. Fall and winter were discussed as the best time for harvesting caribou hide for a mattress, with winter being preferred by most because the fur is at its longest then. One Elder described how caribou hides were even used for insulation:

> *My father – at the peak when there was many, many caribou around – he even built a cabin and insulated it with caribou hides. –Silas Berthe, Tasiujaq*

During the caribou hide workshop in Kangiqsualujjuaq, participants described how caribou hides are still used today as camp mattresses or cushions to sit while ice fishing.

1.5 OTHER USES

Several other uses of caribou were mentioned. One Elder in Kangiqsualujjuaq described how in the past, the antler would be used for medicinal purposes:

> *The antlers of a caribou can be used as medicine, to help with people having a difficult time urinating; you boil the antlers (which are first shaped[2]) and then drink the water when it has cooled off. –Lucassie Etok, Kangiqsualujjuaq*

A staff person from the Anguvigaq of Tasiujaq described how caribou knuckles would be used to play traditional games, and this is still continuing today. Two middle-aged participants from Kangiqsualujjuaq and Umiujaq mentioned past work as guides related to caribou hunting.

2 Meaning carved into a point

PHOTO: SOPHIANE BÉLAND

PHOTO: SOPHIANE BÉLAND

2. Values and best practices for caribou harvesting

Participants from all communities and all age groups reported on caribou harvesting skills and values, with the most references from Elders. Participants discussed best practices and undesirable practices, as well as the values that should guide harvesters. Based on these contributions, seven overarching caribou harvesting values based in Nunavik Inuit knowledge were identified: 1) respect the life of the animal, 2) take only what you need, 3) take care of the herd, 4) be observant and thoughtful while harvesting, 5) do not waste, 6) make good use of and appreciate the animal, and 7) share the catch. These broad values are not necessarily limited to caribou harvesting, but were specifically shared by participants as important for caribou harvesting and especially as important to pass on to younger generations.

Many caribou harvesting skills and practices were also discussed by participants. These practices are linked to demonstrate ways to enact the seven overarching values. These are summarized in Figure 2, and discussed in detail below.

2.1 RESPECT THE LIFE OF THE ANIMAL

Respecting the life of the animal was a value discussed by participants in all communities. Most references on this topic were from Elders and middle-aged participants, with one reference from a younger participant. Some participants described the importance of respecting animals in general, and some also described practices that should be carried out or avoided to properly respect animals. An Elder from Tasiujaq shared a story to illustrate a teaching about the importance of respecting animals, as even a word of disrespect can cause them to leave:

> *At one point, the caribou were displaced from here. And it was partly because a man was travelling, and I guess caribou were in his way and he told the caribou to move from the area. And they did – but far. And when caribou start migrating they're very fast – faster than a bird…It's [about] not talking down of animals. Because you don't have to talk against the animal, it's listening to your mind. The caribou vanished, they disappeared, from the word of one man. Because the caribou was in his way – "get out of my way." And the caribou was gone for many years after what he said. So, do not disturb any kind of animal, and any kind of species. –Moses Munick, Tasiujaq*

An Elder in Kangiqsualujjuaq also described an old story, where the disrespectful actions of a hunter of refusing to take an animal that had offered itself to him caused all the animals to leave and people to starve (see Map 2 for the location of this caribou legend site north of Kangiqsualujjuaq):

Figure 2. Caribou Harvesting Values and Best Practices Based on Nunavik Inuit Knowledge

VALUES	PRACTICES
RESPECT THE LIFE OF THE ANIMAL	• Take an animal that offers itself to you • Do not disturb or speak against the animal • Do not kill for fun • Kill an animal that will not survive • Dispose of remains properly
TAKE ONLY WHAT YOU NEED	• Take only as many animals as is necessary • Do not kill more than you can butcher and transport
TAKE CARE OF THE HERD	• Leave enough animals for the future • Avoid taking animals needed for future health of the herd: Pregnant or nursing cows, young calves, biggest bulls, leaders • Avoid calving areas and times
BE OBSERVANT AND THOUGHTFUL WHILE HARVESTING	• Hunt seasonally based on your intended use • Observe the caribou first • Wait for the first group to pass • Position yourself so that the caribou does not sense you • Be selective about which individuals you take • Do not chase
DO NOT WASTE	• Take all parts of the caribou you harvest • Butcher carefully and do not rush • Contain and store the meat well
MAKE GOOD USE OF AND APPRECIATE THE ANIMAL	• Make best use of all of the parts • Store and prepare the food to honor and enhance the taste of the caribou • Enjoy the goodness of the food
SHARE THE CATCH	• Share your catch widely • Share especially with those in need and with Elders, with consideration for the delicacies that they enjoy

> *There's a legend about this place. In this point here [Alluviaq Fiord], there's a camp. A very old legend story about [how] there were so many caribou, so many caribou. This man couldn't sleep, as there were so many caribou, and there were many caribou paths, some small, some wide. So he would put walrus heads in the caribou trail, so caribou stopped passing by and he would sleep in peace…Then he woke up and he started kayaking to the small island. Suddenly there was a small walrus, a walrus without tusks that approached him to offer himself so that he can provide himself as food. And the Inuk man said, "you don't have a tusk, I don't want you." So he refused to catch the walrus, and that small walrus went back to the walrus pack and they all went underwater and they started going away, even the caribou and all the other animals. Everything was gone, completely gone, and everybody was so hungry, they starved to death, because he refused to hunt that small walrus… My parents used to tell me that animals are not a game, that animals can become scarce even if a small animal is taken for granted. This is the moral of the story: animals are not a game to be played with, we must not take animals for granted, even the smallest animal, and we must not act by belittling animals with our words and actions. That is why the animals left in this story, even the caribou.*
> *–David (Tivi) Etok, Kangiqsualujjuaq*

The value and importance of respect was also conveyed by a middle-aged participant in Kangiqsualujjuaq, who described how in 2000 during a guiding trip, he witnessed a helicopter disturb a herd of caribou with loud noises like fireworks, which caused them to change migration direction from north to south. The participant suggested that this act had been done by outfitters, to drive the caribou south for hunting, and that the numbers of George River caribou have plummeted in the last two decades as a result of this act of disturbance and disrespect. An Elder and a middle-aged participant in Salluit described the importance of not killing for fun or sport.

> *That's what the old people taught us. They said "When you hunt for fun, hunt for sport, the animal will leave you and it's going to take a long time for it to come back to you. But when you treat it with respect, it will always be there." –Charlie Ikey, Salluit*

Some Elders and middle-aged participants also mentioned instances where they killed caribou because they were not going to survive, as an act of kindness. For example, an Elder from Kangiqsualujjuaq described finding and feeling sorry for some calves without a mother, and needing to kill them as they would not survive. A middle-aged participant from Inukjuak described learning that if you see an animal that is sick, you kill it and leave it for the animals.

A couple of participants also described the importance of disposing the remains of caribou properly by leaving them on the land, where the animal is from:

> *When I was growing up our Elders used to tell us to treat the animals with respect, that if we want the animals to come back, when we harvest the animal, we have to keep the area clear, we have to respect what we leave on the land, how we leave it. For example, if we get an animal from the sea, we don't throw the carcass or whatnot on the ground, it goes back in the water. The same for land-based animals—you don't throw their guts into the water, you leave it on the ground. –Michael D. Cameron, Salluit*

2.2 TAKE ONLY WHAT YOU NEED

All communities reported on the harvesting value of taking only what you need. Most references were from Elders and middle-aged participants, with a few from younger participants. Many participants emphasized the importance taking only what is needed, describing this main value through a number of practices, including hunting only when necessary, when there was not enough food or tools; harvesting only the number of animals that they could take with them; stopping when they had what they needed; stopping when the qamutik is full; and not taking more than they were going to eat.

> *Even as kids, even when we were killing birds, our parents would tell us don't kill what you won't eat. Even with birds. So they have to be told. Basically, if we see them doing this, somebody has to tell them, like I do if I ever find anybody who is killing without a need. –Simeonie Ohaituk, Inukjuak*

Some participants in Inukjuak described how long ago, when guns were first introduced, where people overharvested caribou by just taking the skins for clothing and leaving the rest of the carcass. Numbers of caribou began diminishing, and participants explained that the mentality of only harvesting what is needed and not wasting emerged from, or was reinforced by, this experience.

Some participants described how only taking what is needed is a central value that they are trying to convey to younger generations, for example by Elders sharing their knowledge on the local radio, but there is still more effort needed to share this value with younger people who rush to catch as many as caribou as they can.

> *If you catch too many, we tend to get tired and we waste. That's how the wasting is done… We're not teaching our young ones not to shoot too many. Even the little kids, they go out in the land on their own without their fathers. That's a big wasting, done by that too. They like to shoot, so they shoot many and waste. –Tasiujaq participant*

2.3 TAKE CARE OF THE HERD

Participants from all communities and all age groups reported on a number of practices that were tied together with a common theme: ensuring that the population of caribou would multiply and be strong into the future. As one Elder from Inukjuak stated, Inuit need to, "properly take care of the herds that we hunt from." Some Elders and middle-aged participants from all communities described the importance of not overhunting, which is linked to both taking care of the herd and taking only what you need. Some participants described how Inuit have always harvested sustainably, because they understand that the animal population needs to be healthy so as to meet future harvesting needs.

> *The Inuit people, hunting people, they never hunt to over catch… Let's say we see maybe 100 caribou, we don't try kill all the caribou. Or let's say we see 30 whales, we don't try kill all those 30 whales because we need some for the next day or the next time. –Charlie Ikey, Salluit*

Some participants from Kangiqsualujjuaq, Tasiujaq, Salluit and Umiujaq described how certain individuals from the herd should not be harvested, with some explaining that it affects the future wellbeing of the herd. Most commonly reported on, and with contributions from all age groups, was leaving the biggest bulls to ensure that calves will be strong and numerous. Participant explained that as a result of the sports hunt, there was a loss of large bulls that serve as the studs for the whole group. This caused a decline in the number of calves and weakened genetics among those calves that were born, thus affecting the health of the caribou population as a whole. One Elder from Salluit explained that he heard a 100-year old woman from Igloolik, Nunavut stated if she had one piece of advice to give, it would be to refrain from killing big bulls, and that this advice made a big impact on him.

> *The outfitting camps, trophy hunters, had a big impact of the caribou because they're getting the best prime bull that produces caribou and these were being killed and there was a big impact on caribou…One boy can have over ten females. They don't only follow one and make one baby. It makes lots. So if you take that one male, big strong male, you're taking lots of baby caribou it would have made, over ten, like at a time. –Billy Cain, Tasiujaq*

> *[Sport hunting is] the biggest, in my mind they're the biggest hindrance to the growth of the caribou population. I would accuse them of being the number one reason for calves not being born. –Epervik Parr, Salluit*

A couple of participants from Kangiqsualujjuaq and Salluit stated that pregnant females or nursing mothers should not be harvested, noting that it is at times difficult to identify a pregnant female and that more education should be done about this. An Elder from Kangiqsualujjuaq states that when calves are being born, there should be no hunting in that area. A middle-aged participant from Kangiqsualujjuaq noted that calves should not be hunted when they are young:

> *[Hunters] should respect their caribou, cows and calves and let them grow a bit. They should stop killing calves while they are still young. –Bobby Annanack, Kangiqsualujjuaq*

Some participants from all communities and age groups discussed the importance of not taking the leaders. Leaders can be male or female. For a small group, the leaders may be one or two caribou, while for the migration this may be a large number, like 100 caribou. Migration leaders leave a scent trail to lead the rest of the herd on the migration route. Participants explained that harvesting the migration leaders, or butchering along the migratory route, can interfere with the migration, and cause the rest of the herd to become lost and turn back. Leaving the leaders, which means allowing the first one or two groups to pass without harvesting makes sure that the rest of the herd knows where to go to avoid hazards, and that they follow the trail with no fear. A younger Kangiqsualujjuaq participant explained that the leaders are older caribou teaching the way to younger ones. An Inukjuak Elder explained that Inuit have had this knowledge since forever. He also added that since the lead caribou arrived unexpectedly in the fall of 2020, they were left alone by hunters, which may explain the large number of caribou that came by the community without fear. In Umiujaq, Elders and others expressed concern that this practice is not well understood and followed by younger hunts. Leaving the leader of smaller and medium-sized groups was also discussed by some participants, as the group will similarly become lost if the leader is taken.

> *Well sometimes we anxiously wait for caribou in the winter and there's nothing. But once they start arriving, people scramble, you know. And…we don't wait for the first group to pass. That's one of the mistakes we make for the younger people. And then they can turn elsewhere. So I don't know how much we bother the caribou that way.–Jeremiah (Eddie) Kumarluk, Umiujaq*

> *We were taught not to harvest animals who look like leaders, you know. And today they harvest animals they see, without watching to see if they could be leaders or pregnant or anything. –Jobie Kutchaka, Inukjuak*

2.4 BE OBSERVANT AND THOUGHTFUL WHILE HARVESTING

Historically we would hunt at different times of year for different reasons.

–SIMEONIE OHAITUK, INUKJUAK

All communities and all age groups reported on the importance of being observant, thoughtful and intentional while harvesting, with the most references from Elders and middle-aged participants. Most references related to this value focused on practices of hunting seasonally and purposefully based on the intended use, which was discussed by only Elders from all communities.

There were many references from Elders that described their practices of hunting seasonally. For example, summer and fall were described as the best times for hunting caribou for their skin to make clothing, although one Elder noted that early spring was also a good time for harvesting caribou for fur for clothing. The fur was described as being the best in summer and late fall, but the longest in winter so at that time it would be most suitable for making mattresses. For food, in winter the focus is on females with fat, as males would have lost fat during their rutting season.

In spring, females with fat and older calves are harvested for food, taking care to not harvest pregnant females. In the summer, males with fat are harvested for food, and nursing mothers and just-born calves are avoided. In the fall, bulls are avoided as they smell due to it being rutting season, and as a result females and younger males are harvested for food. Overall, participants described harvesting when necessary for tools and food, but generally harvesting fewer caribou in the summer because the air temperature could spoil the meat, and instead focusing their caribou harvesting efforts on the winter season.

Some participants in all age groups described the importance of observing the caribou first before attempting to harvest them, which helps you be selective about which caribou you take. For example, observing would help you target fatter caribou and avoid caribou that it would be better to avoid, such as pregnant females. Some participants discussed the importance of identifying leaders, and avoiding taking them. Leaders can be the large groups that lead the migration, as well as the one or two individual caribou that lead small or medium-sized groups. This exception discussed by some participants in Tasiujaq and Salluit is when there is a very small group and a need to harvest all the animals in that group (e.g. for filling up fall caches). In this case, hunters could be selective about taking the leader first so that the rest of the small group could also be taken easily. This should only be done carefully and selectively to uphold other important harvesting values such as to respect the animal, only take what is needed, and no waste. There was also concern expressed from middle-aged and Elder participants about young people being insufficiently observant and selective when hunting. However, some younger participants also noted the importance of being observant and selective to avoid certain animals, such as big bulls, pregnant females, and leaders.

> *With the new rifles and with telescopes, rifles with telescopes it makes it a lot easier to shoot at them without having to go near them. But in the old days we had to go near them and watch what we were killing but today using the scope they can kill anything anywhere. –Davidee Niviaxie, Umiujaq*

> *For me, when I see them, I observe them. I observe which is female or which is male or female with a calf. I observe them instead of seeing them and going to them. But the younger people today, if it's a caribou, they think it's good, you know. Whether it's fat or male or female. I think the younger people, they don't know what they're going to be shooting, they're going to be like a cowboy. –Umiujaq participant*

> *If there was a bunch of caribou, like a herd, [my father] would just look at them, like read them first…he would look for the fat caribou, the ones that are behind. Not only one, but some Elders told me about not to hunt the leaders because they know the way and they lead the younger ones so that they keep their route. –Jaiku Arnatuk, Kangiqsualujjuaq*

Some participants also described positioning themselves so that the caribou would not sense them. Some Elders described the practice carried out by their parents and grandparents of hiding behind an inuksuk to camouflage themselves and make it easier to strike the caribou with a bow and arrow, noting that these inuksuit are still all over the land. Some participants in all age groups

Epervik Parr (left) and interpreter Paul Okituk in Salluit

PHOTO: AGATA DURKALEC

described still positioning themselves today in relation to the wind so that the caribou cannot smell them, and one participant also mentioned being under the sun so that the caribou will face the sun and not see you. Some mentioned that there is less attention placed on positioning oneself carefully today.

> *In the old days they had to be very, very careful because they had to go near the caribou. They even used to have special kind of feet bottoms when they walk to make less noise to go near them and to crouch down and not to be visible. But today they go chasing them whenever they see them. –Willie Kumarluk, Umiujaq*

Some Elders also discussed the importance of not chasing caribou, as it affects the quality of the meat, making it less tender and less tasty. Davidee Niviaxie added that the taste is also affected by wolves chasing caribou.

> *When they're running too much, being chased, it's different meat. When you surprise kill the caribou, it's better. –Willie Etok, Kangiqsualujjuaq*

> *I was taught to kill the animal before it starts running away, because once it starts running it begins to develop a bitter taste. –Epervik Parr, Salluit*

2.5 DO NOT WASTE

Many participants from all communities described the importance of not wasting, with most references from Elders and middle-aged participants and some references from younger participants. Participants emphasized the importance of taking everything with them, leaving nothing behind, and not wasting any part of the caribou. Elder especially emphasized that in the past, they needed to bring everything back to their family camp because it would all be used for their family needs.

> *[I was taught] to always ensure I take the whole kill home so that there's no wastage of any part of the caribou that's going to be used. –Epervik Parr, Salluit*

Some participants, especially Elders, described how today younger people do not bring everything back, with some explaining that some had not been taught this practice. Participants in Umiujaq noted that hunters have been asked by Elders and local and regional organizations (e.g. Anguvigaq of Umiujaq and the Landholding Corporation) to bring back all of the remains, except the guts, and the majority seem to be doing this now.

> *Traditionally it has always been the parents who hunt with their children and teach them their traditions. They learn by watching and doing later from what they were taught following their parents from a young age as soon as they are able. But today it's really different. It's not possible to take kids out hunting and when they do harvest they don't bring back all the parts. They leave the hide behind and take only what they want, so it's really different now. –Davidee Niviaxie, Umiujaq*

However, some younger participants described how they were taught to bring back all parts of the caribou and not waste, which remains an important traditional value to them.

The importance of butchering carefully along the joints, and not rushing so as not to waste, was discussed by some Elders and middle-aged participants. In Umiujaq, participants discussed how some do not seem to have respect for the animal anymore, as they are butchering much faster and with less care than they were taught. For example, one participant stated that it takes him an hour to butcher and cook, and now he observes people doing it in half of the time. This was especially discussed in the context of people getting caribou for the purposes of making and selling nikkuk from the hind quarters, where some do not spend the time to carefully butcher the rest of the animal.

> *When I butcher my calves, I can make 27 pieces not counting the head, shins and the hooves. Yeah, cutting up all the joints, the spine, the ribs. Cutting the ribs into whole pieces. But later on at home I cut it up more. Nowadays they don't do that. –Umiujaq participant*

> *And even older ones not being taught how to skin efficiently, they see other people getting many, so they think they can. But in reality, they can't skin enough. So, they get tired – they can't finish it. And it freezes. And they leave it. Like say they catch eight and it's almost dark and they can't finish. That happens a lot. –Billy Dan May, Tasiujaq*

Containing and storing the meat well was discussed by participants from all age groups. Some Elders described the practice of caching meat under rocks in the fall and winter, so that it could be picked up later. This method was used to ensure nothing was wasted, even if it could not be transported at the time of harvest. Some participants also discussed how when they used dog teams, they would pack parts of the caribou into itself for efficient transportation, thus making the caribou into a bag. Some participants described how the meat not being self-contained exposes it to air and negatively affects the taste. Packing the caribou up in a self-contained way also ensured that all parts of the caribou were brought back, so that nothing would be wasted. These practices for containing and transporting caribou are also discussed in section 1. Anguvigaq of Tasiujaq members mentioned that they are planning a caribou butchering workshop in the community to share knowledge around proper butchering and storing practices.

2.6 MAKE GOOD USE OF AND APPRECIATE THE ANIMAL

All communities and age groups reported on making good use of and appreciating the caribou, with the most references from Elders and middle-aged participants. Many participants reported on ways that they would make the best use of all the parts for food, clothing, tools and other uses, which are all discussed in detail in section 1. As discussed in section 1, participants emphasized how almost all of the caribou is edible and the whole caribou can be used. Some participants from all age groups also described the value of transporting, storing and preparing caribou meat in ways that enhances and honors the natural taste of the caribou, specifically caching the meat

and letting it age, and also packing the caribou all together by making a bag out of its body, so that it is not "freezer burnt" from being exposed to the air. Some participants raised concerns that a growing number of younger people were no longer eating all the parts of the caribou, and instead preferring the select parts like the thighs, and also losing other important skills, like sewing clothing. As one middle-aged participant explained, he hopes that younger people will learn to better value the food, meaning eating and appreciating the whole animal.

> *I am also hoping that younger people can learn that the goodness of it, the value of the food. How to prepare it the right way, how to catch them, how to butcher them, make a good use of it. Because they seem to be like in a rush. –Jeremiah (Eddie) Kumarluk, Umiujaq*

2.7 SHARE THE CATCH

Sharing caribou meat was described by some participants across age groups as an important value. As discussed in section 1, some participants across age groups described how sharing is strong in their communities, while some middle-aged and Elder participants described concerns that sharing is not as strong as it could be.

> *It's always good to share…Everybody should be like that. –Salluit participant*

Some participants discussed the increased popularity of selling caribou meat to Hunter Support or informally within and between communities, which is also discussed in sections 1 and 6. An Elder in Salluit explained that harvesters are doing both—selling to Hunter Support and sharing their catch, while one middle-aged participant described how selling caribou meat is causing a reduction in sharing:

> *When [people] hunt, they make dry meat and they only sell them, they don't want to share them anymore….It happens these days now. It's too bad for them, I cannot control them. It's up to them, if they want to eat caribou meat for the future they should know what respect means. –Bobby Annanack, Kangiqsualujjuaq*

One Elder described how, as he learned, proper butchering was important for sharing well with those in need. While another Elder described concern with how careless butchering means that people are not sharing with Elders all of the parts of caribou that they would most enjoy.

> *The way they share food now is like cutting up food for dogs. Like [younger hunters] don't think of the delicacy parts of the caribou that Elders would love. They don't do that anymore. As long as meat, they're sharing meat, not caring, properly caring to what is good for Elders. –Davidee Niviaxie, Umiujaq*

3. Skills transfer and learning

My father learned from my grandfather. And me, I learned from my father. So for sure, I know about caribou, the way to work on the caribou.

–LUCASSIE ETOK, KANGIQSUALUJJUAQ

All communities and age groups reported on learning related to harvesting values and practices. Intergenerational learning is closely tied with the caribou harvesting values and practices described in section 2.

Participants from all communities described how they learned to harvest, butcher and make use of caribou. The most common method of learning reported, among all age groups, was from watching while following family members on the land. The majority of younger participants also described how they learned to hunt this way. Some participants explained that little was said in terms of what to do and what not to do, with the focus being on observation.

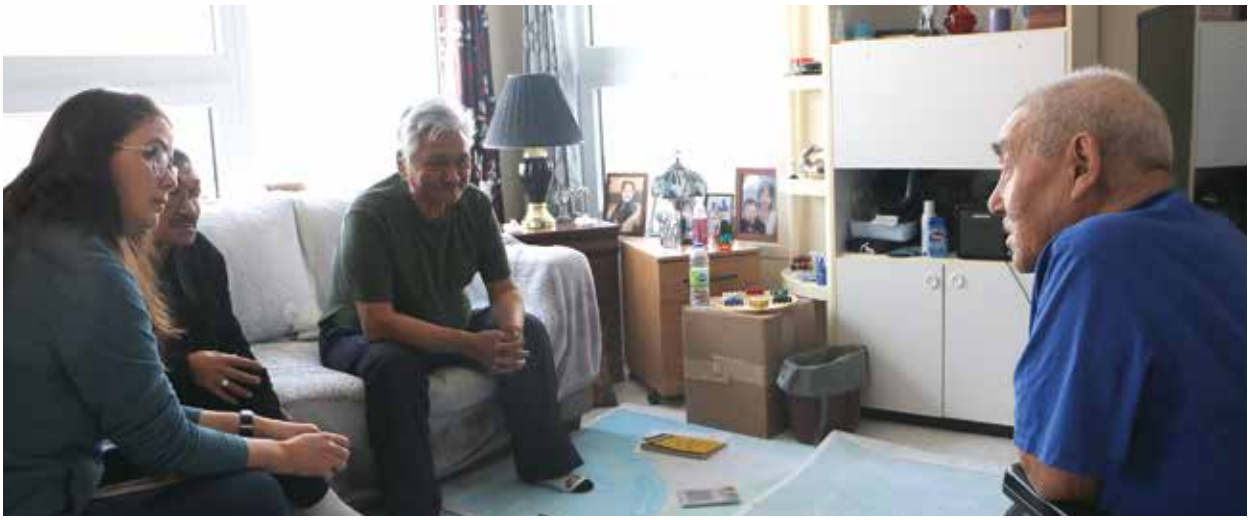
> *When we were still using dog teams we learned from our parents, I personally learned from two men in particular, following them everywhere they went and nothing was wasted then, everything was used. And like with [my adopted son] that was here earlier, he used to be with me out hunting like this, watching me butcher, watching me share the food and save the food and deal with the food. And he learned that way and how can do the same things the way I did it.*
> *–Willie Kumarluk, Umiujaq*

> *I think majority of our fathers, they never talked while they were trying to teach us. We watched and learned. –Umiujaq participant*

Some described how when their parents or other guides had decided that they were ready, they would be allowed to try so they could learn from experience. A couple of Elders described needing to be patient when they were young, because they were not allowed to do things like shoot caribou until it was decided that they were ready. Some participants from all age groups also described learning from stories or teachings that were passed down to them orally from their parents, grandparents or other older family members. Some also described learning from markings left on the land by people, like inuksuit, or by animals, like trails, often in combination with stories.

> *When my mother was young, there used to be a lot of caribou …I used to walk with my mother when I was a child, and my mother used to say this used to be a caribou trail, and I never used to believe it, but today, now I notice the same thing, [and say] the same story to my son.*
> *–Norman Snowball, Kangiqsualujjuaq*

In Salluit, an Elder noted that most of the harvesters had to learn from other communities, because caribou had been absent in the area for an extended time until recent decades.



Umiujaq Elders, Davidee Niviaxie (right) and Willie Kumarluk (center), sharing their knowledge of caribou
PHOTO: LAURIE BEAUPRÉ

Some participants, from all age groups, described concerns about gaps in knowledge among younger and even some middle-aged harvesters. Some of these gaps have been described in section 2 above, in relation to specific practices. There was one Elder from Umiujaq, however, who stated that younger people are trying their best to follow traditions.

> *There is a concern now with the younger generation. They are not taught to take care of food, how to harvest them and how to properly prepare the food. The school does not teach them these kind of things. So they are not learning their ways of making sure that food is shared and safe. –Davidee Niviaxie, Umiujaq*

There were a number of barriers to transmitting knowledge and skills to younger generations identified by participants. Several younger and middle-aged participants in Inukjuak explained that very few younger people are learning by following today. When they are younger and in school, they are occupied and cannot follow, and when they are older youths they either go out on their own, or they cannot go out because they have no equipment or family members to follow. Some Elders described how new technology both makes it very easy for younger people to go harvesting without additional guidance, and is also distracting so younger people are not asking to learn.

> *With the new rifles and transport it's very easy. They can go anytime without thinking to have an Elder to show them when they are out there what to do and where to go.*
> *–Willie Kumarluk, Umiujaq*

> *The high use of electronics, TV, and iPads and all electronics and things that they're using now, they're not looking to learn and when they hear of a lot of caribou nearby then they go harvest them without knowing what to do. –Davidee Niviaxie, Umiujaq*

A younger participant described how in early stages of learning to hunt, that people can be very excited and too 'trigger-happy,' as he also was, until he learned.

There were also a number of solutions that participants suggested or were already being implemented to help younger people learn traditional harvesting values and skills. Participants noted current initiatives, including the culture class at the school in Umiujaq, where students have been taught butchering and how to kill a caribou; the Unaaq Association in Inukjuak, which provides a community-based mentorship program to teach land-based skills; and the caribou hide preparation workshop in Kangiqsualujjuaq, which two of the research team members for this study were able to briefly sit in on. At the time of conducing workshops for this study, the Anguvigaq of Tasiujaq was planning a caribou butchering workshop focused on traditional techniques. Some Elders noted that for the future, younger people need to learn more from their Elders, and that current efforts, including in schools, are insufficient. Strengthening the sharing of knowledge between Elders and younger people through means such as the radio, culture classes, and school in Inuktitut, and direct mentorship were all mentioned, as was developing a local caribou management board that could help share knowledge. Younger participants specifically described that they would like to see Elders and seasoned hunters sharing their knowledge with younger generations more, by show them how to hunt, skin, butcher and share caribou meat and also explaining these practices to them. A couple of younger participants described how this could be done by having younger people follow seasoned hunters, and one younger participant suggested that videos showing caribou skinning and other skills posted to social media would be helpful.

4. Caribou herds

I never liked the differences being made between the two herds because historically they were never just in that area, they were all around Nunavik area. So I never like the part, they should have been called Nunavik herd; yeah because we Inuit see ourselves as one people in one area not to be separated by maps and rules and regulations.

–DAVIDEE NIVIAXIE, UMIUJAQ

The George River and Leaf River migratory herds were the primary focus of this study and thus most reported on by participants, but participants also made a few references to the non-migratory Torngat Mountains herd (also referred to by some as the Killiniq herd) and reindeer (see Map 1). Some participants explained that Inuit traditionally did not use the Leaf River and George River herd designations, and hunted whatever caribou were available.

In general, the main difference between the Leaf herd and the George River herd described by participants was spatial distribution and areas of migration, described in more detail in section 5.1 and shown in Map 3 to Map 6. For example, an Elder in Kangiqsualujjuaq described observing the Leaf River and George River caribou gathering, and then diverging in the spring in the 1940s and 1950s:

> *I had a camp here and here – two camps [inland between the Leaf River and Kuujjuaq River]– and we would see George River herds here, and Tasiujaq [Leaf River] herds, they gathered a little bit and then they split and Tasiujaq herd would go there [to Tasiujaq], and George River herd would go back to George River. –Willie Etok, Kangiqsualujjuaq*

Participants were asked if they observed any differences in physical characteristics between the Leaf River and George River herds, and some had while others had not. In Tasiujaq, participants discussed how the only difference that they have observed is in the antlers, where the George River herd has bigger antlers with pointier fingers (tines) than the Leaf River herd. In Kangiqsualujjuaq, an Elder noted that the antlers of the George River caribou were bigger than that of the Leaf River herd in the past, which attracted trophy hunters, and another Elder described how feeding in the mountains aided the George River herd to grow larger in size.

Further, an Elder in Inukjuak described how when he was hunting with his father as a young person, he noticed that the animals in the George River herd were larger in stature than those in the Leaf River herd. An Elder in Umiujaq, described that traditionally, the people of Umiujaq and Kuujjuaraapik did not see any animals from the George River herd, but that he had recently harvested one and thought that caribou in the George River herd have a less attractive face than those in the Leaf herd. Other participants said that they did not notice differences.

The Torngat herd was reported on by a few participants in Kangiqsualujjuaq and Tasiujaq. The Torngat herd was described as larger in stature, having shorter legs, having bigger antlers on bulls, and being smarter, fatter, and faster at climbing than the George River herd. This was explained as being due to living in the mountains and not migrating, whereas the George River herd had to expend more energy on migration and being chased more by wolves. Elders from Kangiqsualujjuaq described how the Torngat herd is also healthier than the Leaf River and George River herds, noting in particular that they have healthier livers. An Elder also noted differences in behaviour:

> *[The Torngat herd] were very smart [compared to] the [George River] caribou because they would not try to have tracks when they jump over the snow, they try not to show their tracks from the walk, and they would be much fatter than George River herds.*
> *– Lucassie Etok, Kangiqsualujjuaq*

An Elder from Kangiqsualujjuaq described how when he was young and living in Killiniq in the late 1950s to 1970s, numbers of the Torngat herd in that area were very low. As there were no caribou in the Killiniq area, Killiniqmiut used to hunt by dog team in the Kangiqsualujjuaq area. It was only in the 1980s that they started to see Torngat Mountains caribou in the Killiniq area. In the 1980s, during the peak of the George River caribou herd, the population was extending all the way up the coast and mixing with the Torngat herd. During map validation, participants in Kangiqsualujjuaq described how the Torngat herd caribou are non-migratory, but circle around within their habitat area of the Torngat Mountains National Park (see Map 1). Within their broader habitat area, there is an area in the middle of the mountains that participants described as their sanctuary.

Participants from all communities reported on reindeer (barren-ground sedentary caribou). Participants in Salluit described how reindeer are on Mansel Island and Digges Island, having crossed over from Coats Island and Southampton Island on floating ice pans (see Map 1). Hudson Bay participants also reported that reindeer are around Sanikiluaq.[3] An Inukjuak Elder, whose father was from Sanikiluaq, said he never knew him to hunt caribou because caribou had not arrived to the islands yet. During Inukjuak map validation, participants added that they started seeing reindeer when ice used to form between Sanikiluaq and the Nunavik coast, but that this is no longer happening because the current is always moving and making ice formation difficult. Very infrequent sightings were also reported by participants in Tasiujaq. Reindeer were described as having shorter legs and being smaller in size than Nunavik migratory caribou. They were also reported to be faster runners than migratory caribou. Participants reported that they stay on the islands, and that they do not have leaders. During map validation, participants in Kangiqsualujjuaq described how in the area of the Torngat Mountains National Park, Torngat caribou and reindeer are neighbours (Map 1), and that they started seeing reindeer in that area in the late 1970s, but now their numbers have grown.

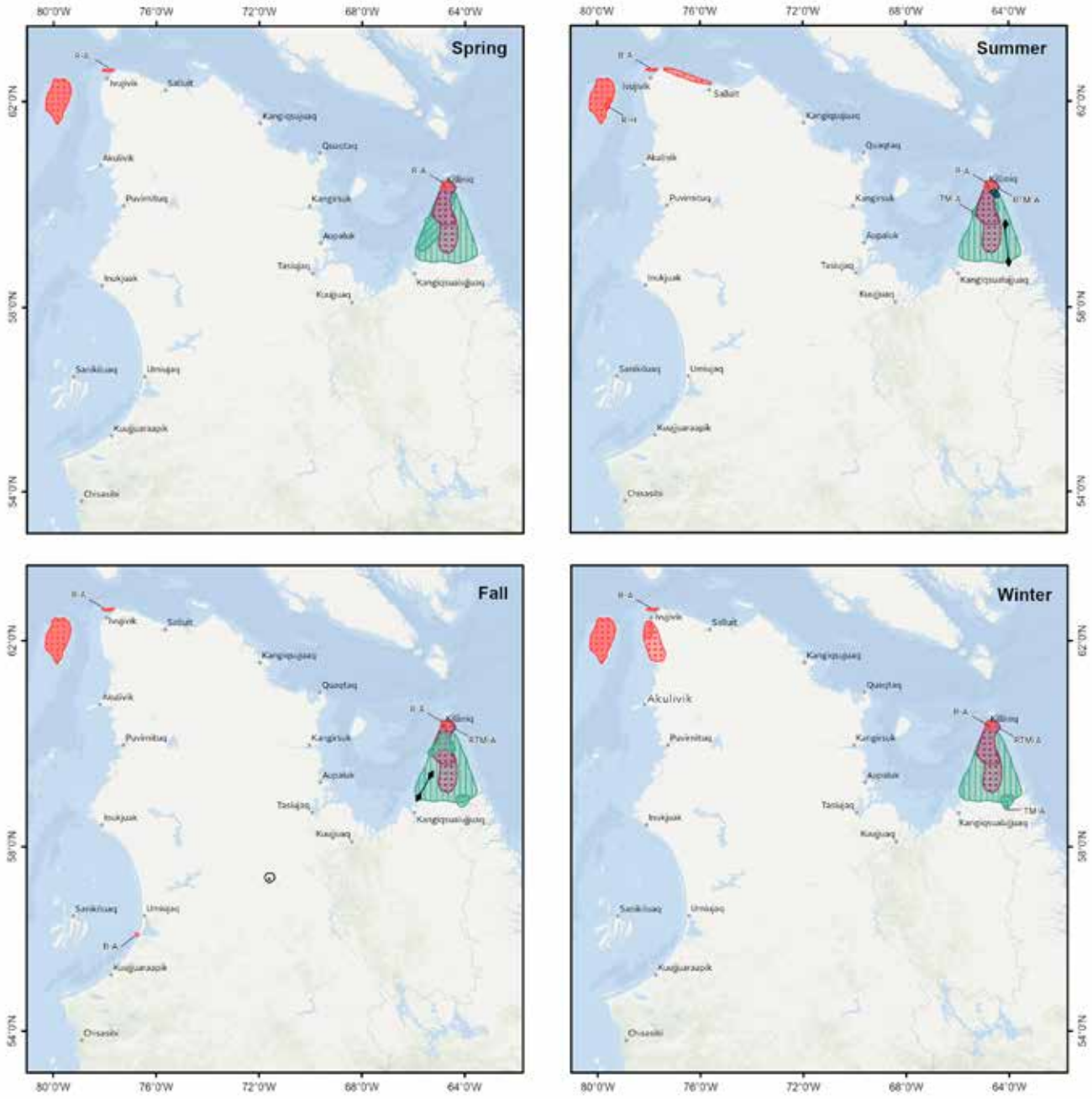
3 Sixty reindeer from the Reindeer Reserve near Tuktoyaktuk, Inuvialuit Settlement Region (then the Northwest Territories) were introduced to the Belcher Islands in 1978 (Ferguson 1985).

MAP 1

Non-Migratory Caribou

For non-migratory caribou from 1940s onwards, until the time of data collection.

DETAILED VIEW OF MAPS PROVIDED ON FOLLOWING PAGES

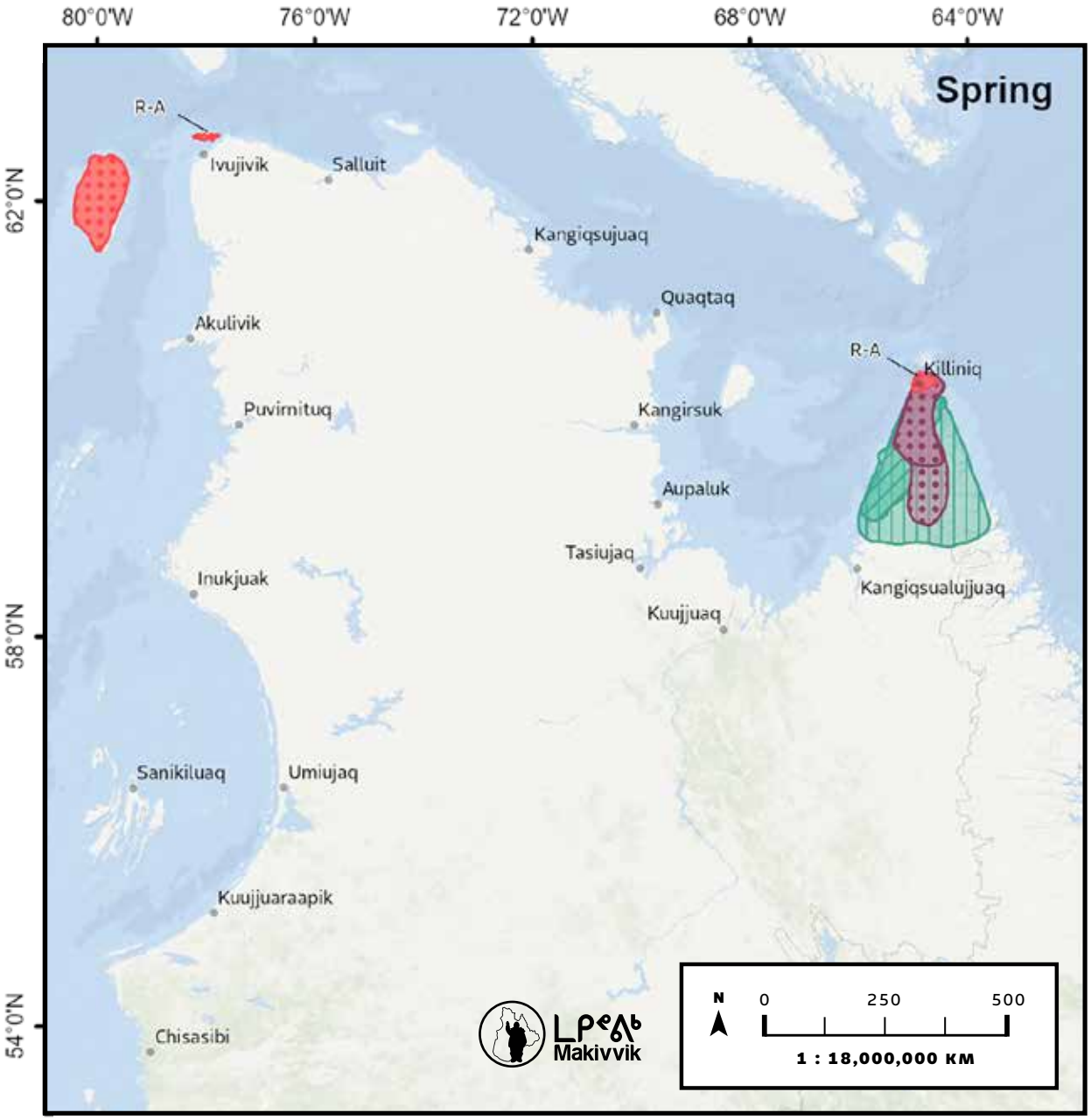


Information presented on these maps represents data gathered from participants in Kangiqsualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq in 2020 and validated in 2023 for the Nunavik Inuit Knowledge of Migratory Caribou project, and is not the full representation of all Nunavik Inuit knowledge of caribou for this area. These maps should be interpreted in conjunction with qualitative text in the project report. These maps are not to be reproduced without the prior authorization of the Department of Environment, Wildlife and Research at Makivvik and the Anguvigaq.

MAP 1

SPRING

Non-Migratory Caribou



Caribou herd - features

- Reindeer - Abundance
- Reindeer & Torngat Mountains (mixed) - Abundance
- Torngat Mountains - Abundance
- Torngat Mountains - Calving
- Torngat Mountains, - Sanctuary
- Undefined - Abundance

Caribou herd - harvesting features

- Reindeer - Hunting area
- Torngat Mountains - Caribou trail
- Torngat Mountains - Hunting route
- Community

R-A Reindeer - Abundance
R-H Reindeer - Hunting Area
RTM-A Reindeer & Torngat Mountains (mixed) - Abundance
TM-A Torngat Mountains - Abundance

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

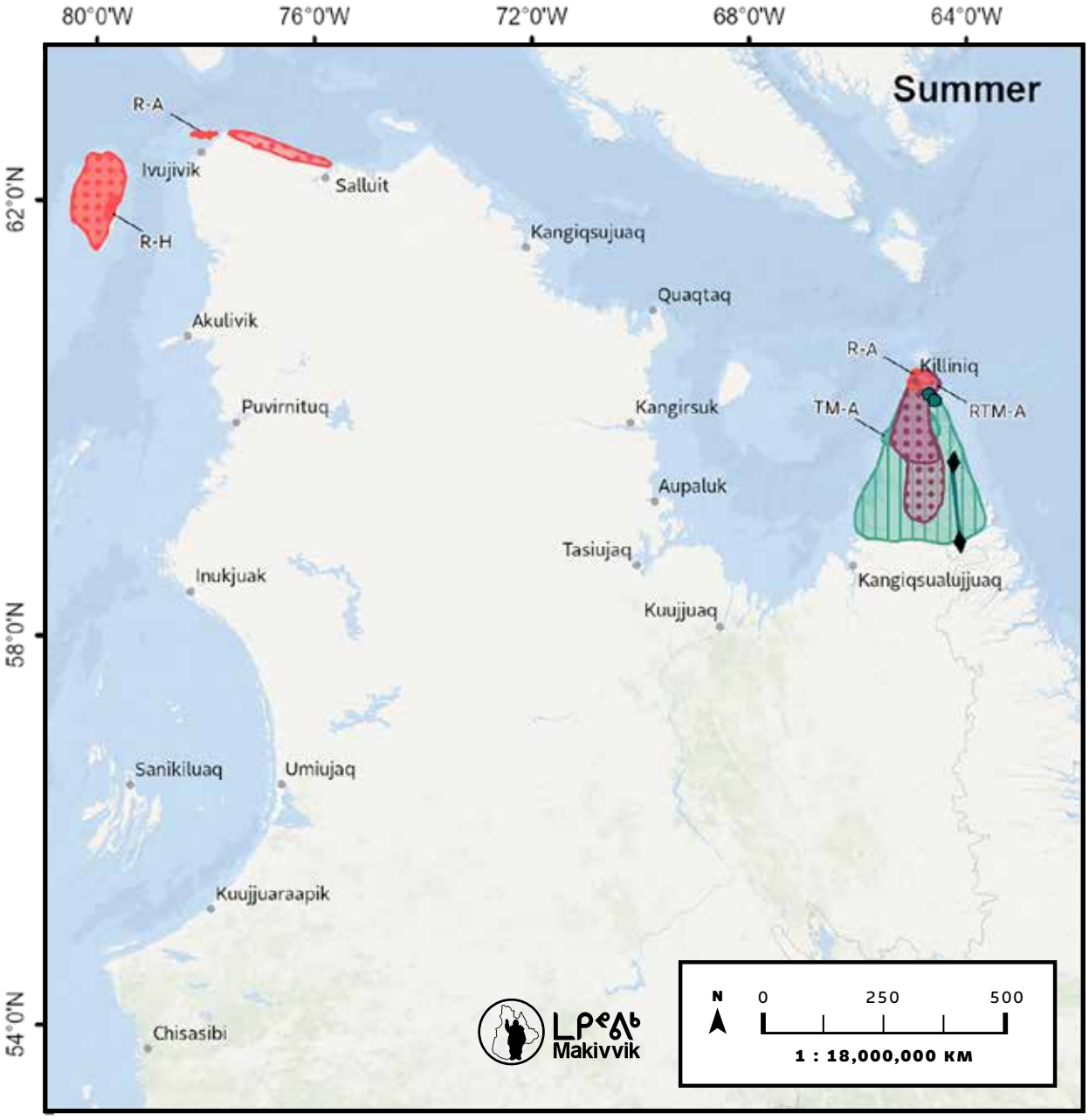
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 1

SUMMER

Non-Migratory Caribou



Caribou herd - features

- Reindeer - Abundance
- Reindeer & Torngat Mountains (mixed) - Abundance
- Torngat Mountains - Abundance
- Torngat Mountains - Calving
- Torngat Mountains, - Sanctuary
- Undefined - Abundance

Caribou herd - harvesting features

- Reindeer - Hunting area
- Torngat Mountains - Caribou trail
- Torngat Mountains - Hunting route
- Community

R-A Reindeer - Abundance
R-H Reindeer - Hunting Area
RTM-A Reindeer & Torngat Mountains (mixed) - Abundance
TM-A Torngat Mountains - Abundance

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

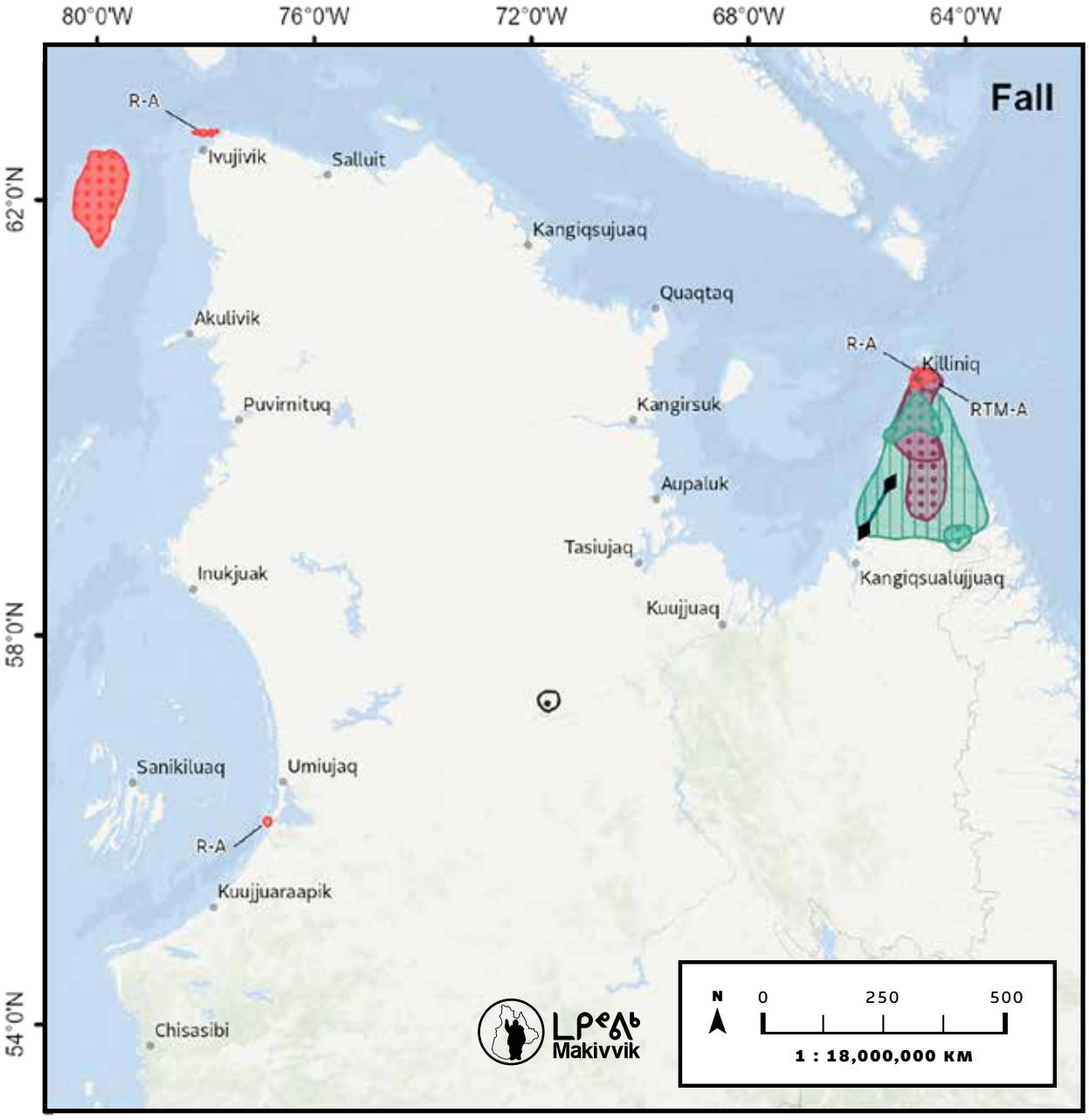
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 1

FALL

Non-Migratory Caribou



Caribou herd - features

- Reindeer - Abundance
- Reindeer & Torngat Mountains (mixed) - Abundance
- Torngat Mountains - Abundance
- Torngat Mountains - Calving
- Torngat Mountains, - Sanctuary
- Undefined - Abundance

Caribou herd - harvesting features

- Reindeer - Hunting area
- Torngat Mountains - Caribou trail
- Torngat Mountains - Hunting route
- Community

R-A Reindeer - Abundance
R-H Reindeer - Hunting Area
RTM-A Reindeer & Torngat Mountains (mixed) - Abundance
TM-A Torngat Mountains - Abundance

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

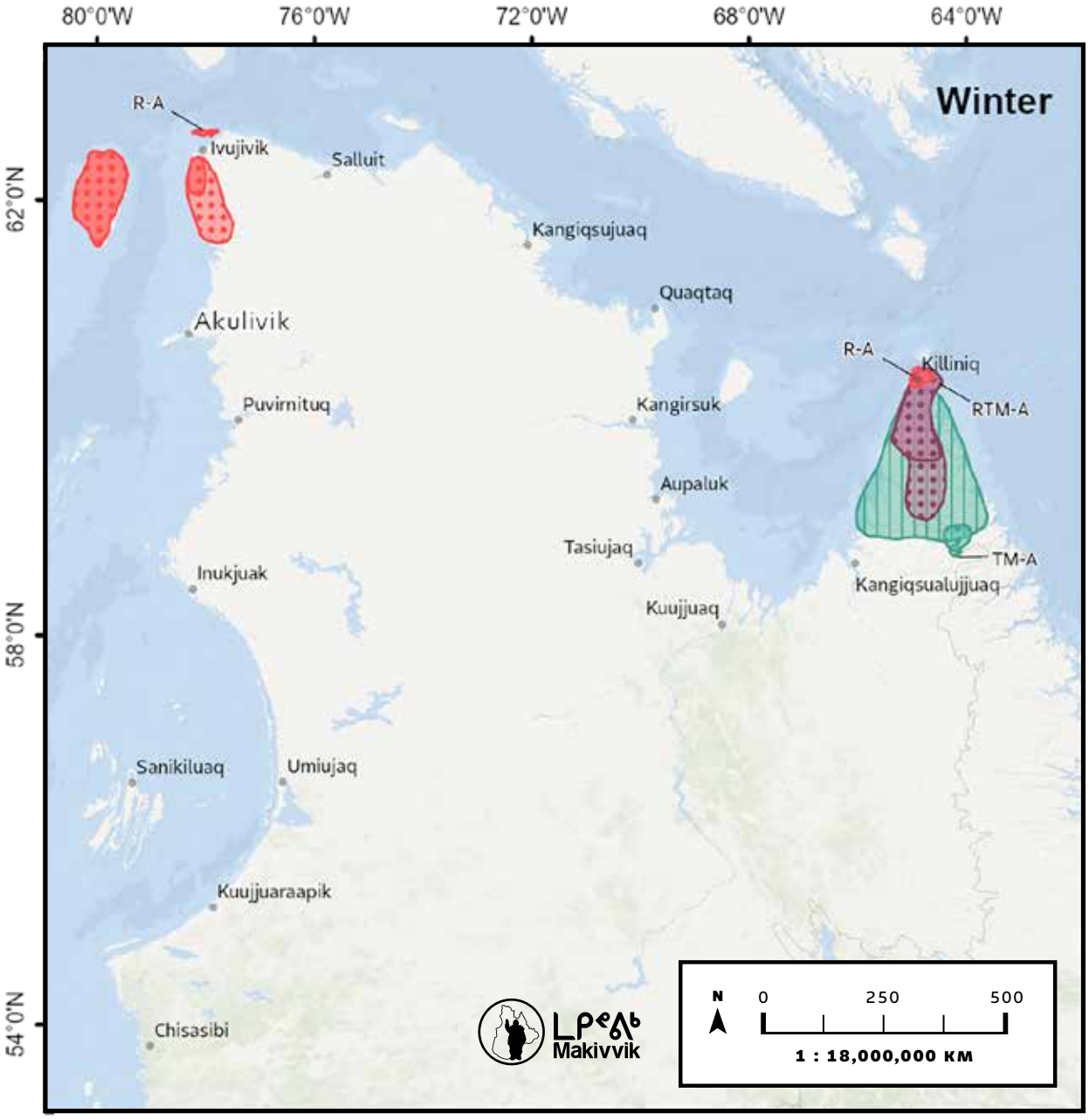
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 1

WINTER

Non-Migratory Caribou



Caribou herd - features

- Reindeer - Abundance
- Reindeer & Torngat Mountains (mixed) - Abundance
- Torngat Mountains - Abundance
- Torngat Mountains - Calving
- Torngat Mountains, - Sanctuary
- Undefined - Abundance

Caribou herd - harvesting features

- Reindeer - Hunting area
- Torngat Mountains - Caribou trail
- Torngat Mountains - Hunting route
- Community

R-A Reindeer - Abundance
R-H Reindeer - Hunting Area
RTM-A Reindeer & Torngat Mountains (mixed) - Abundance
TM-A Torngat Mountains - Abundance

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

In addition to these four caribou populations, another group of caribou was reported by some participants in Inukjuak. The participants described finding a group of caribou different than the George River or Leaf River herds far inland in the centre of Nunavik, in the past, with a smaller stature similar to that of barren-ground Nunavut caribou, glistening fur, and more fat:

> *We went very far inland and when we did, we found the caribou. The caribou we found were smaller in size. Even the fur was glittering like a polar bear skin. They were so fat and the taste was very good on the caribou that was in the inland, than the herd that we normally took in our time. And the time when we noticed the caribou [from herd we normally took], they just came in, they were bigger in size, darker in colour, their taste is the same [compared to the inland herd]. So they just came in, it's probably a different herd. We have Leaf River herd, George River herd, but this herd should have another name because they were a different sub-species. –Shaomik Inukpuk, Inukjuak*

These caribou were described as “really wild” with participants explaining that they run away and go very long distances at any sound or if they even saw dog tracks. They were described as walking all over the centre of Nunavik, and were observed walking south and towards Ungava Bay.

Further, during map validation in Kangiqsualujjuaq, an Elder described a group of caribou distinct from the George River or Leaf River herd that was inland in the 1970s and 1980s, and possibly the 1990s. He had heard about this other caribou group from an Elder in Kuujjuaraapik, and also saw it himself. He described it as looking similar the Torngat herd, as the hind legs were wider, thicker and shorter than the George River herd caribou. He identified them as being also different from reindeer, which have smaller feet and are overall smaller in stature than these other caribou.

5. Population cycles, habitats and harvesting over time

Based on the knowledge shared by participants, the approximate time periods of migratory caribou population cycles are summarized in Table 4. For each subtopic in this chapter, knowledge is organized and presented according to the population cycle (historical abundance, low, increase, peak and post-peak) to show changes over time and in accordance with caribou abundance.

Table 4. Summary of Nunavik migratory caribou population cycles and their approximate time period

	George River herd	Leaf River herd
HISTORICAL ABUNDANCE	Pre-1940s (previous peak late 1800s to early 1900s)	Pre-1940s (previous peak late 1800s to early 1900s)
LOW	1940s to early 1960s	1940s to late 1960s
INCREASE	Late 1960s to 1970s	1970s to early 1980s
PEAK	1980s to 1990s	Mid-1980s to early 2000s
POST-PEAK	2000s to 2023 (present)	Late 2000s to 2023 (present)

Similarly to how the sections in this chapter are organized, maps with participant knowledge of caribou abundance, movements and harvesting of caribou are organized by the population cycle (see Map 3 to Map 6). As the population cycle is offset for the George River and Leaf River herds, this means that the features displayed on Map 3 to Map 6 correspond to slightly different time periods, as shown in Table 4.

5.1 SEASONAL AREAS OF ABUNDANCE, MOVEMENTS AND POPULATION DYNAMICS

As observations of caribou locations and movements and population numbers occur simultaneously, these topics are presented in an integrated way. While participants shared numerous observations of caribou areas and numbers, many participants also explained that migratory caribou are always moving; their choices of migratory routes, grazing areas, calving areas, and other habitats are always changing; and their numbers are always fluctuating.

> *We used to hear from Elders that the numbers of animals always fluctuate. Some years there are more, some years are less, and some of the years you don't see any at all. It's just the way it is, it's just the way the numbers are of all species. –Jobie Kutchaka, Inukjuak*

> *We can't really say if they move, because of one reason. They have their own mind of themselves too. They want what is better for them. So, even if we try to say they went here because of this – nobody really knows. An animal goes where it pleases.*
> *–Silas Berthe, Tasiujaq*

This dynamic and ever-changing nature of migratory caribou is the context for all knowledge presented in this section, and should be considered when interpreting information about general population trends and patterns of caribou movements and land use.

While caribou are always moving, there are also seasonal indicators for different periods of their movement and behaviour. For example, during map validation, Kangiqsualujjuaq participants noted that when seeds of Arctic cotton plants would begin to fly in the early fall, it signals the start of the caribou fall migration. Salluit participants, meanwhile, explained that when geese are migrating, caribou are calving. There are also caribou areas of abundance or movements that are harder for participants to observe, given the vast distribution of caribou. During map validation, Kangiqsualujjuaq participants described how it is harder to mark inland areas with caribou in the summer, as harvesters are camping closer to the shore and moving by boat along waterways, while in winter they are travelling all over the land and ice and see caribou and their tracks. During Inukjuak map validation, participants made similar remarks about how it was challenging to mark calving areas because hunters are not going as far inland as they used to.

HISTORICAL ABUNDANCE

All communities reported on a time before living memory when caribou were abundant, with most references from participants in Kangiqsualujjuaq. While there were references from participants in all age groups, most were from Elders. Elders and middle-aged participants shared stories passed down to them from their parents and grandparents, which characterized a period of historical caribou abundance from the late 1800s to the early 1900s.

Some participants from Salluit, Umiujaq and Inukjuak emphasized the extreme high numbers of caribou during this historical peak.

> *My father used to tell the story to us that in my grandfather's time there used to be plenty of caribou and there were so many in the hill. And when they start walking it looks as if the mountain, the whole mountain starts moving. That's how plentiful they were. I assume that must have happened in 1800s that they were plenty. –Shaomik Inukpuk, Inukjuak*

> *I remember my mother talking about her father's time, my grandfather, their generation… they used to hear caribou walking from a great distance because they were, like shaking the land. I think it used to be two days before they arrive they started hearing caribou walking on the land. –Inukjuak participant*

Some Elders in Umiujaq and Inukjuak described how during the historical peak, back when there were family camps rather than the current communities of Inukjuak and Umiujaq, caribou had expanded all the way to the coast, similar to the range during the recent peak. In between these

Jobie Ohaituk (far right) discusses his knowledge of caribou with other Elders and hunters, including Jobie Kutchaka (left).

PHOTO: LAURIE BEAUPRÉ

periods, when there was a low, caribou would be found inland and not range to the coast. An Elder in Umiujaq, Davidee Niviaxie, described how at the end of the 1800s and early 1900s, when caribou were numerous, there was a strategy for hunting that relied upon herding caribou into a corral. Hunters would hide near rock formations and, using ropes to assist, scare caribou into a corral made of inuksuk-like rock formations called nalluit. At that time, some of the winter harvesting areas were around Chavigny Lake and Bacqueville Lakes. The Elders described the large number of caribou trails that they had observed all over inland areas in the past, before the current increase in caribou, indicating that this showed that caribou had once been abundant before.

During the historical peak, caribou ranged as far north as Salluit. For example, a Salluit Elder in his early eighties, Kalingo Angutigirk, recounted that his grandmother used to say that, "the caribou around the hills were so many, the hills were like they were moving." From this, it can be inferred that caribou would have been abundant in the Salluit area in approximately in the late 1800s to early 1900s. In addition, a Salluit participant described that in a valley across Sugluk Inlet, an old caribou antler had been found with lichen on it—an indicator that the antler was very old—and in a lake near Foucault River a two-bladed caribou bone knife and old caribou bones were found. The locations of these historic caribou bones and antlers are shown on Map 2. In a meeting with the NV and the Anguvigaq of Salluit, it was explained that the Inuktitut name for Deception River is Tuttuqaluutik, which was explained to mean "known to have abundant caribou."

There are several explanations that participants shared as reasons for the historical decline. Some explained that caribou populations always fluctuate in long cycles. Participants in Umiujaq explained that after the historical peak, caribou overgrazed their food source, and the land could not sustain them. During validation, Davidee Niviaxie added that lemming and fox also cycle similarly to caribou. In Salluit, an Elder described that he had heard from his Elders that one winter before firearms were used, when Inuit used a bow and arrows to hunt, it started raining and the ground froze, and that is why most of the caribou left. Participants in several communities explained that caribou left due disrespectful actions of harvesters. For example, an Elder in Tasiujaq described how a man travelling had asked the caribou to move out of his way, and after that they vanished for many years, illustrating that the actions of just one person speaking against an animal can have major consequences. In Umiujaq, participants described how too many caribou bones left on the ground after harvesting for clothing led caribou to leave.

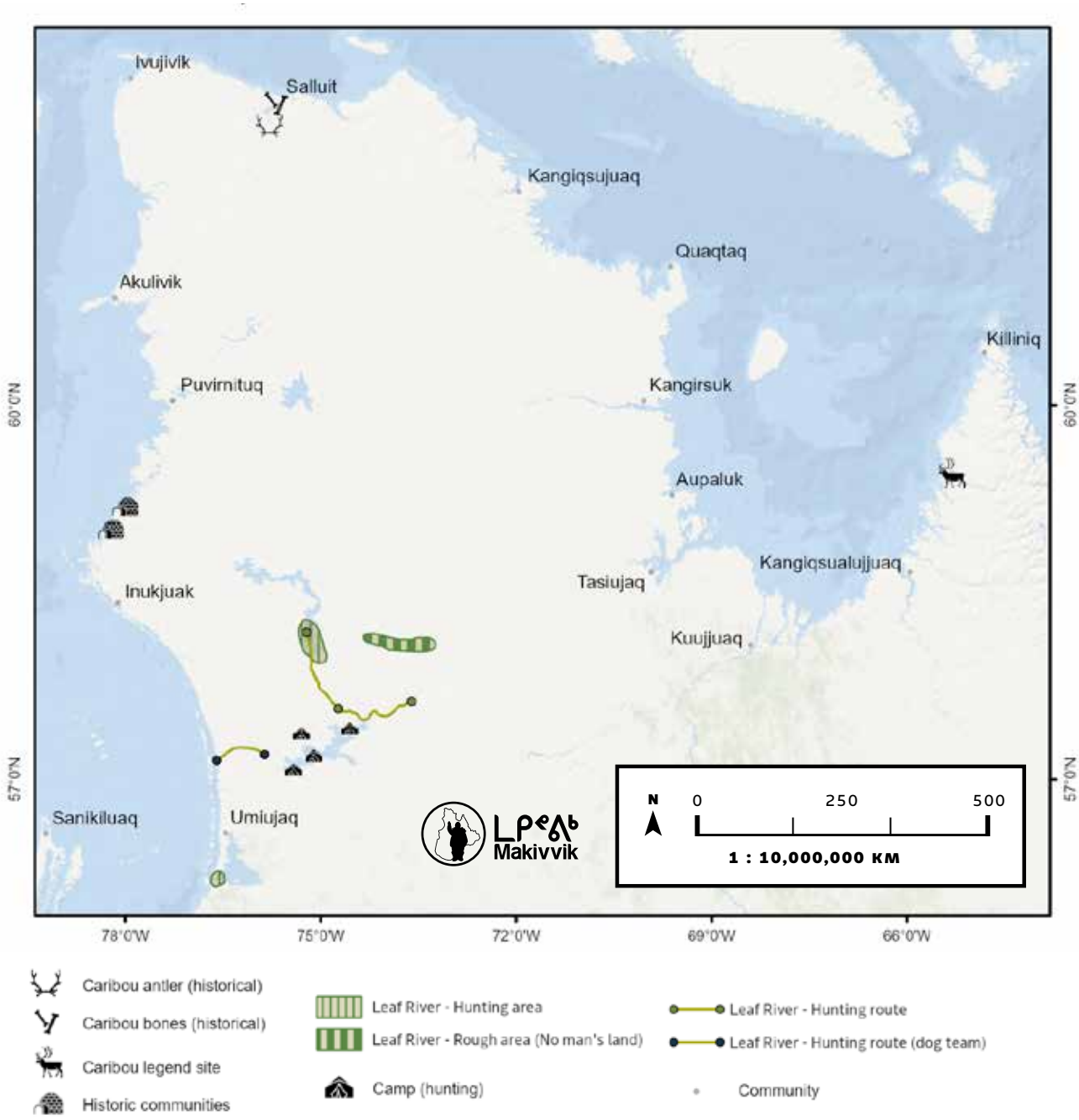
Based on the knowledge shared about high numbers of caribou in the late 1800s and early 1900s, the peak-to-peak caribou population cycle appears to be in the range of 70 to 90 years. Some participants described how their parents and grandparents had told them that though the caribou had left, that they would be back.

> *My mother one time told me that the caribou, at that time, went away. They went away. No more… She told me, she said that they would come back one day. So they've been back, as foretold. –Jobie Kutchaka, Inukjuak*

MAP 2

Historical Caribou Areas and Cultural Sites

The historical period for caribou was pre-1940s. Archeological sites and cultural sites are also represented on this map.



Information presented on this map represents data gathered from participants in Kangiqsualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq in 2020 and validated in 2023 for the Nunavik Inuit Knowledge of Migratory Caribou project, and is not the full representation of all Nunavik Inuit knowledge of caribou for this area. This map should be interpreted in conjunction with qualitative text in the project report. This map is not to be reproduced without the prior authorization of the Department of Environment, Wildlife and Research at Makivvik and the Anguvigaq.

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> *Our Elders used to see them just in the dreams, to us, now they're on our land, they're back. They're starting to come back. They used to be around. And in the late 70s we started noticing caribou tracks in the close area, before there was no caribou at all. And the Elders used to say they'll be coming back in the future. So they came back in the late 70s and they're still here.*
> *–Adamie Saviakjuk, Salluit*

POPULATION LOW

All communities reported on the period of population low, with the most references from Kangiqsualujjuaq participants. Most contributions on this topic were from Elders, though there were a few references from participants in other age groups. Some participants reported that the population low began in the first few decades of the 1900s.

> *And my father, along with my grandfather, they travelled from Ungava to Hudson in beginning of 1900s and that's when the caribou disappeared. And that's where they – there were so few that they only caught them in the inland. –Shaomik Inukpuk, Inukjuak*

Salluit participants described how a late Elder had said that even when he was a child, there were no caribou present in the Salluit area, but had heard from his father that there had been caribou there in the past. Several Elders from various communities who participated in the study were in their 80s, and one was in his 90s, and none reported observing the high numbers of caribou that would have been associated with the historical peak. This indicates that the population of caribou had declined and was low by the 1940s. In general, participants described how caribou were far inland at this time, scattered and hard to find, with hunters travelling great distances to harvest caribou. In general, participants reported these lower numbers and greater difficulty in getting caribou through the 1940s to the early 1960s. It was emotional for some Elders to recall this time, because of the hunger and hardship that the low numbers caused. An Elder from Tasiujaq recalled that it was very difficult in those years to hunt caribou, and some would die going inland trying to find them.

> *My family was originally from this area and at that time in the 60s or just before that we would hardly know of any caribou. Once in a long while they would arrive and we would harvest them. –Willie Kumarluk, Umiujaq*

Davidee Niviaxie, an Elder from Umiujaq, recounted how he had to go way inland in the 1950s to find caribou because their numbers were so low, and when in 1951 one person had harvested one a caribou on the shore, word spread quickly because it was so unusual for a caribou to be found there. Elders in Kangiqsualujjuaq described how there were small scattered groups of caribou of between two and ten animals at that time, rather than a large herd. Sometimes they would see some, and sometimes there would be none.

> *Long time ago, [the caribou] were not in the pack…We would see two or three or five caribou… They were not one big herd, they were scattered all over.*
> *–Norman Snowball, Kangiqsualujjuaq*

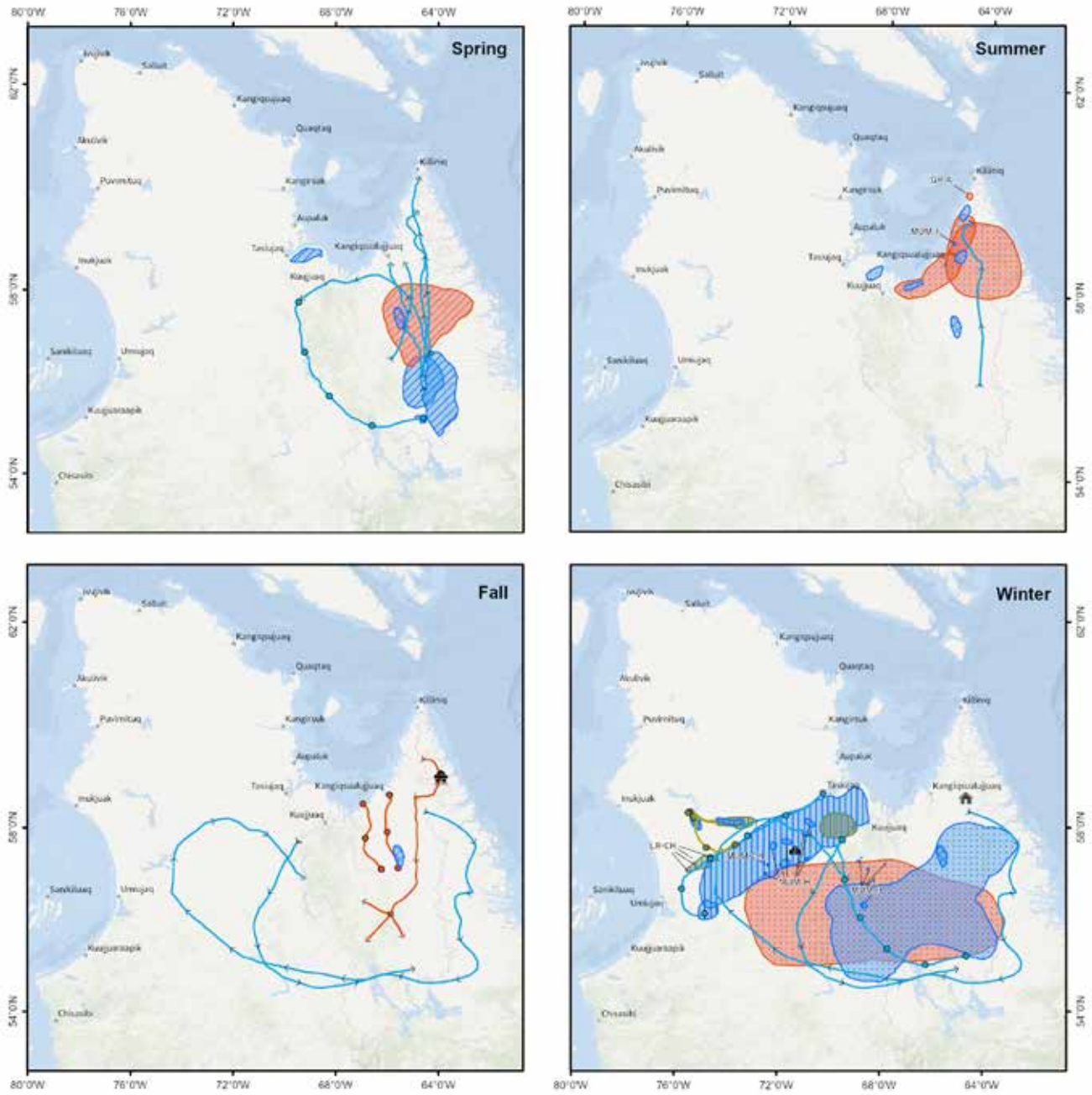
MAP 3

SEASONAL MIGRATORY CARIBOU ABUNDANCE, MOVEMENTS AND HARVESTING

Caribou Population Low[4]

The Nunavik migratory caribou population low and early increase period was from the 1940s to early 1960s for the George River herd and 1940s to late 1960s for the Leaf River herd.

DETAILED VIEW OF MAPS PROVIDED ON FOLLOWING PAGES



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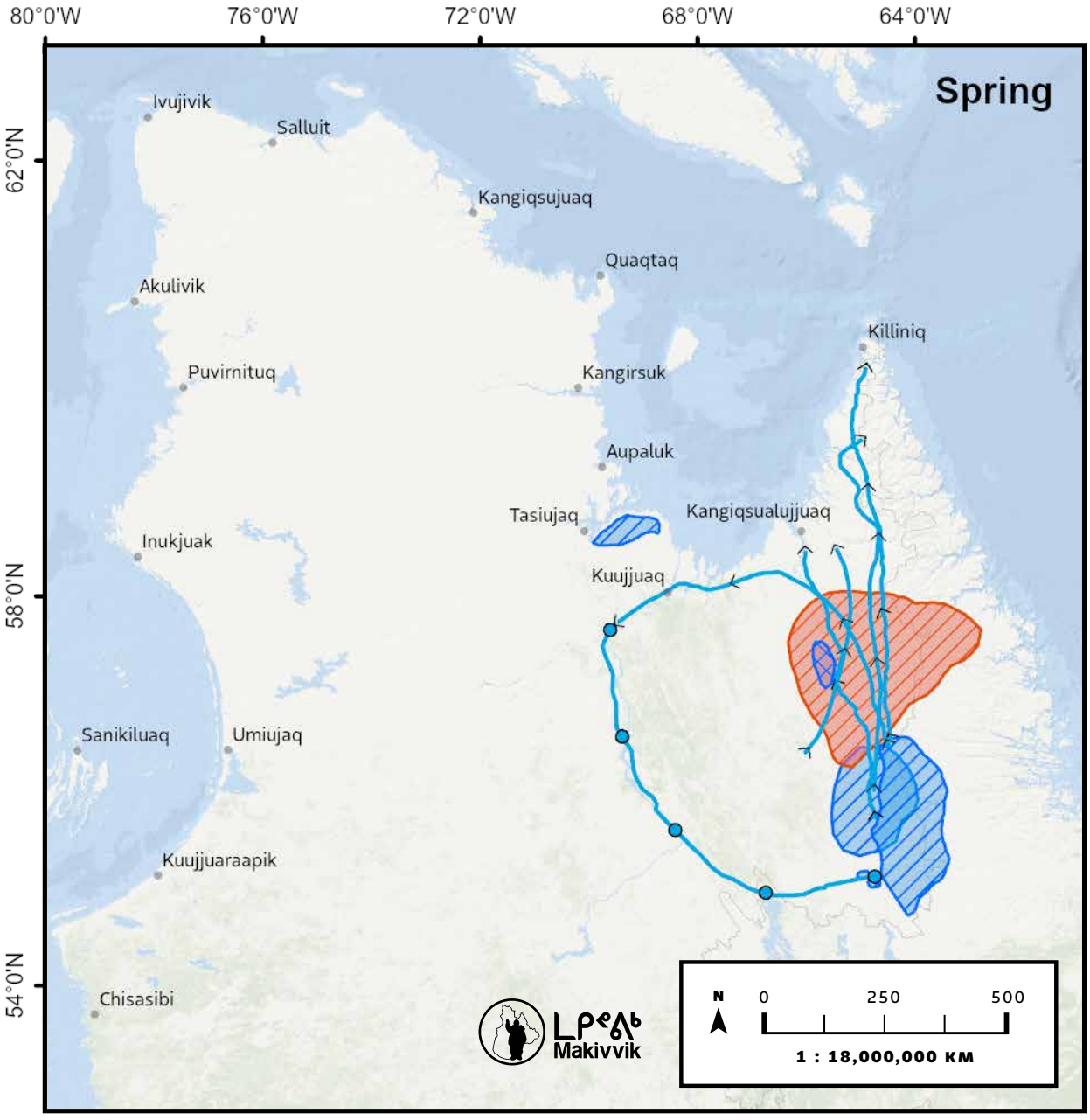
4 For some features on this map the time period was noted as 1960s and therefore may be related to the early increase of the herd cycles.

MAP 3

SPRING

Caribou Population Low



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Foraging
- George River - Migration
- Mixed or undefined migratory - Migration

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Camp (hunting)
- Mixed or undefined migratory - Hunting area
- George River - Hunting route
- Leaf River - Hunting route
- Mixed or undefined migratory - Hunting route

- Camp (hunting)
- Sod house (hunting)
- Wood house (hunting)
- Community

GR-A George River - Abundance
MUM-F Mixed or Undefined Migratory - Foraging
MUM-H Mixed or Undefined Migratory - Hunting Area
MUM-CH Mixed or Undefined Migratory - Camp (hunting)

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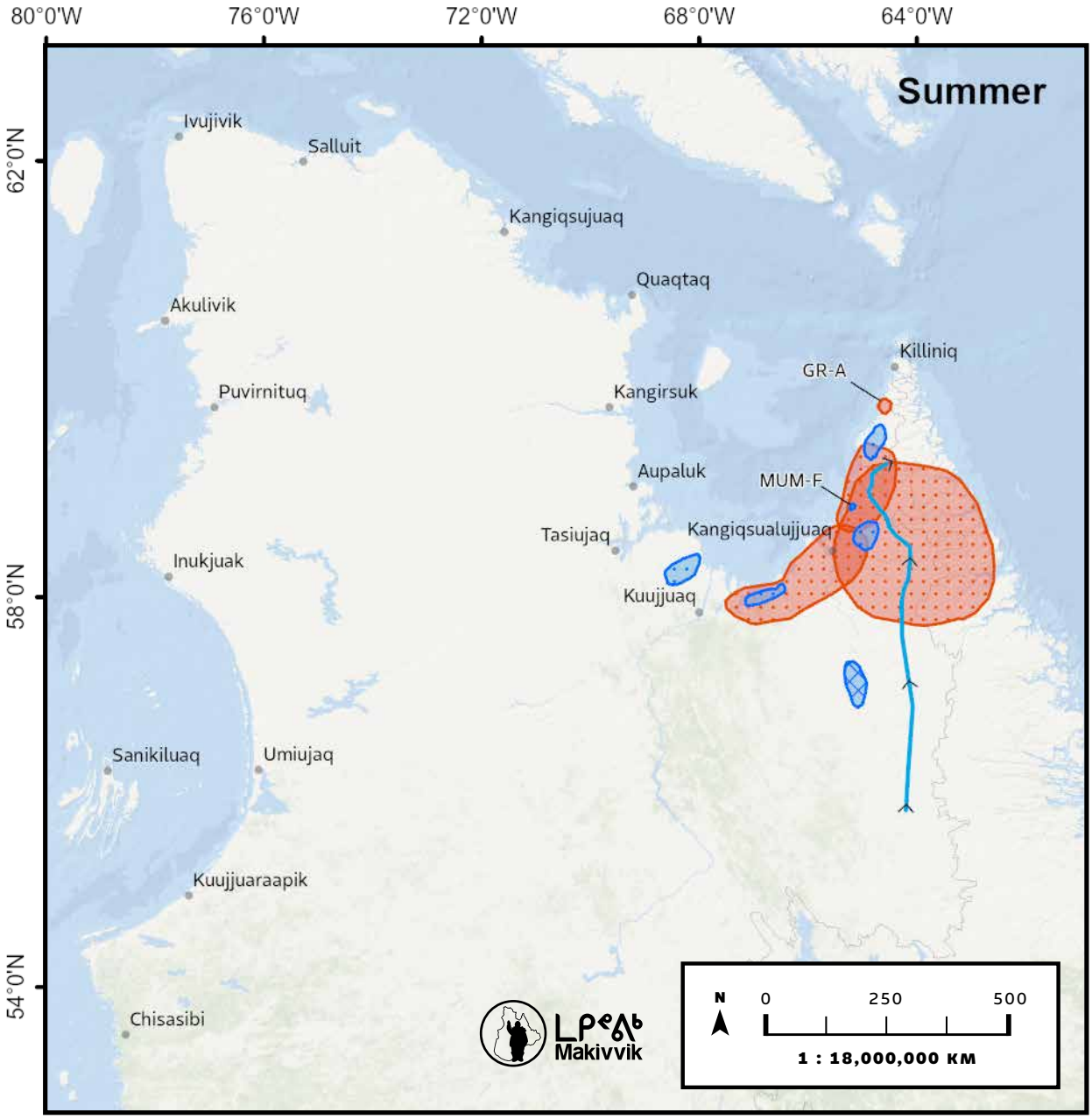
MAP 3

SUMMER

Caribou Population Low



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Foraging
- George River - Migration
- Mixed or undefined migratory - Migration

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Camp (hunting)
- Mixed or undefined migratory - Hunting area
- George River - Hunting route
- Leaf River - Hunting route
- Mixed or undefined migratory - Hunting route

- Camp (hunting)
- Sod house (hunting)
- Wood house (hunting)
- Community

GR-A George River - Abundance
MUM-F Mixed or Undefined Migratory - Foraging
MUM-H Mixed or Undefined Migratory - Hunting Area
MUM-CH Mixed or Undefined Migratory - Camp (hunting)

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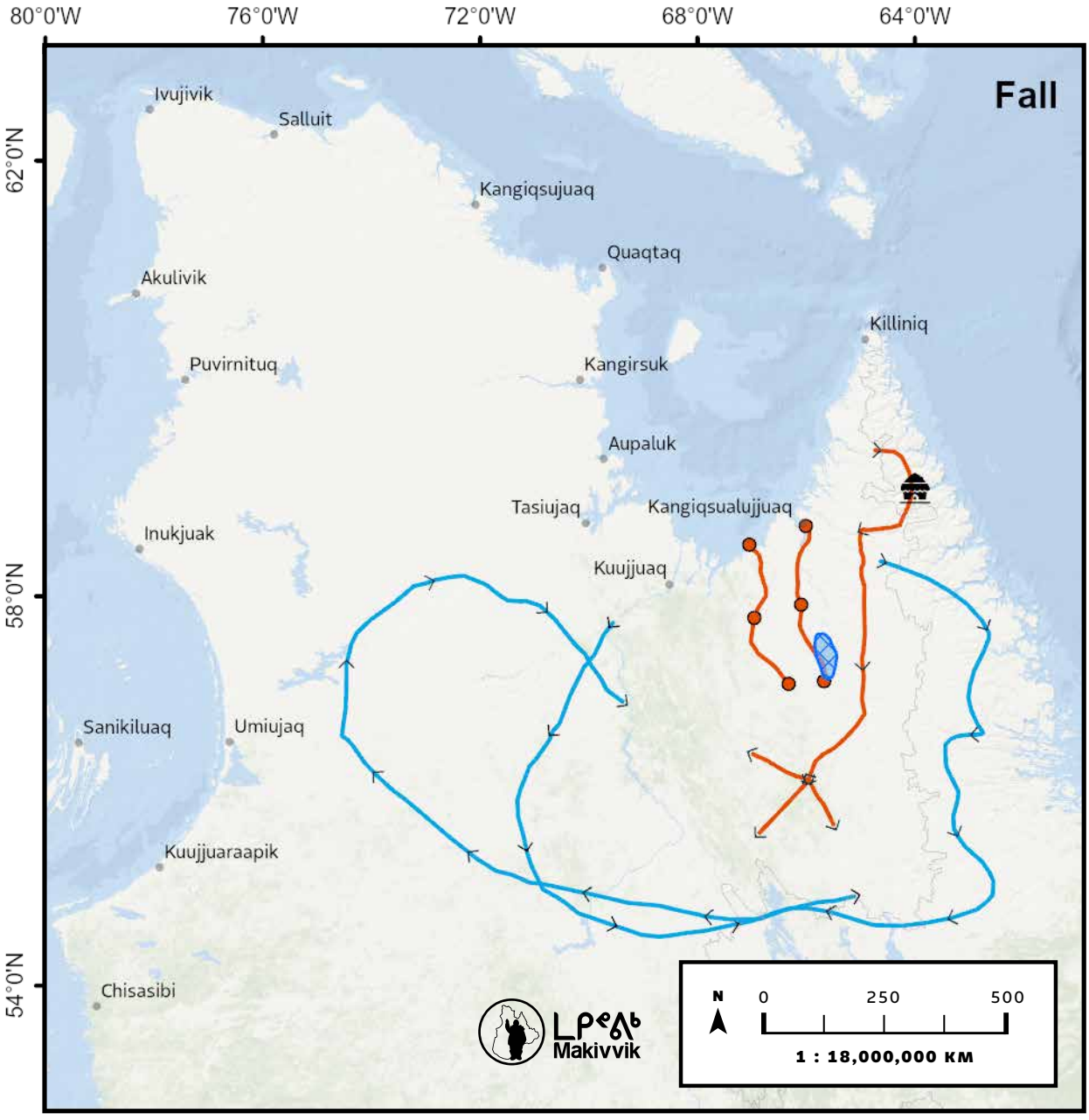
MAP 3

FALL

Caribou Population Low



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Foraging
- George River - Migration
- Mixed or undefined migratory - Migration

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Camp (hunting)
- Mixed or undefined migratory - Hunting area
- George River - Hunting route
- Leaf River - Hunting route
- Mixed or undefined migratory - Hunting route

- Camp (hunting)
- Sod house (hunting)
- Wood house (hunting)
- Community

GR-A George River - Abundance
MUM-F Mixed or Undefined Migratory - Foraging
MUM-H Mixed or Undefined Migratory - Hunting Area
MUM-CH Mixed or Undefined Migratory - Camp (hunting)

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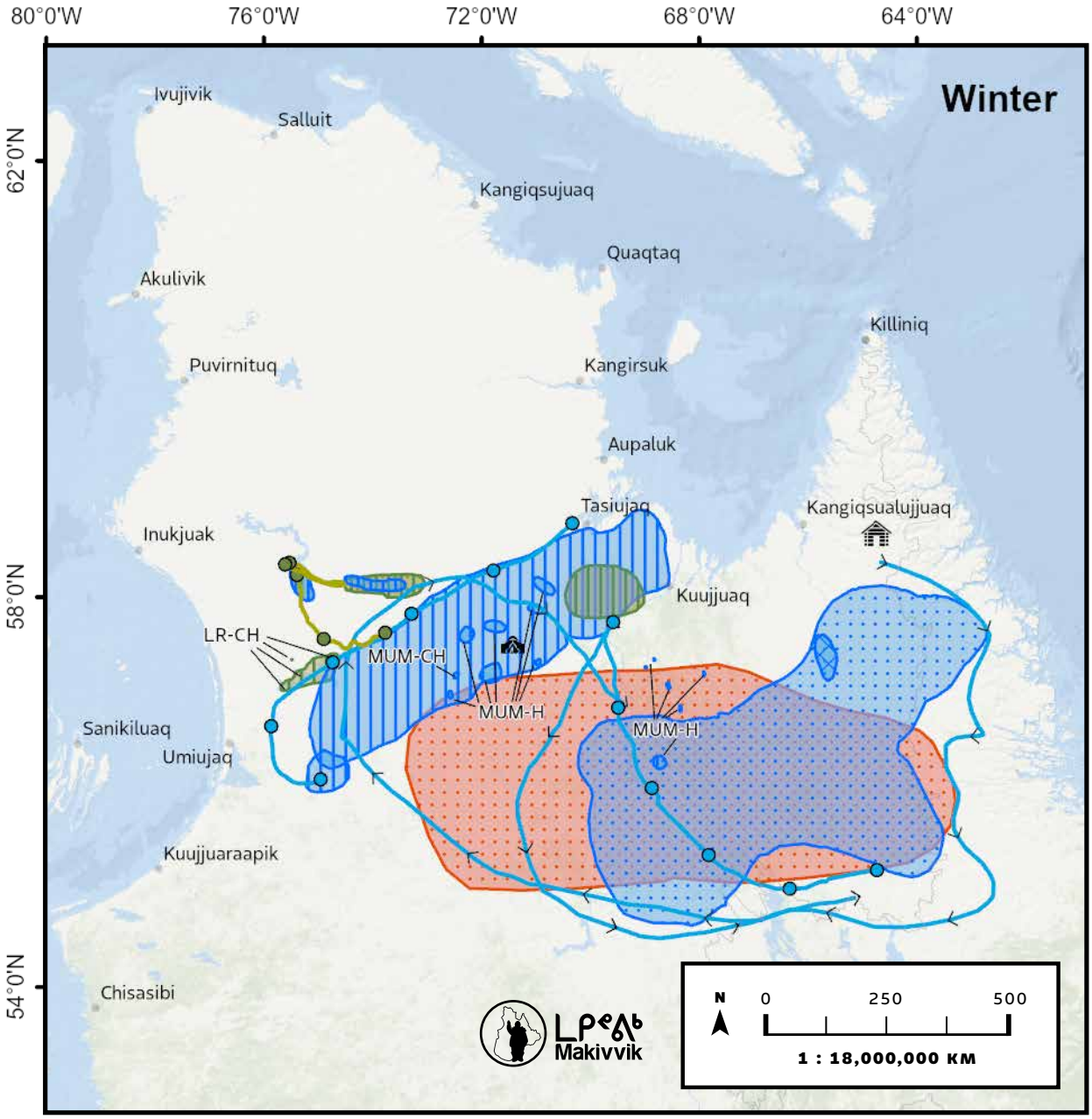
MAP 3

WINTER

Caribou Population Low



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Foraging
- George River - Migration
- Mixed or undefined migratory - Migration

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Camp (hunting)
- Mixed or undefined migratory - Hunting area
- George River - Hunting route
- Leaf River - Hunting route
- Mixed or undefined migratory - Hunting route

- Camp (hunting)
- Sod house (hunting)
- Wood house (hunting)
- Community

GR-A George River - Abundance
MUM-F Mixed or Undefined Migratory - Foraging
MUM-H Mixed or Undefined Migratory - Hunting Area
MUM-CH Mixed or Undefined Migratory - Camp (hunting)

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In Inukjuak, an Elder described how his grandmother, who was born right at the turn of the century, passed down stories of how she would have to go far inland to get caribou in the 1940s and 50s, and possibly earlier, to "no man's land" in the area east of Chavigny Lake, where the land is very flat and rough (see Map 2 for location). During validation in Inukjuak, Elders added that they used to have to travel to the middle of Nunavik to hunt for caribou in the 40s' and then later in the 50s to 60s they got permission from the Royal Canadian Mounted Police to hunt closer to shore. Another Elder added he didn't recall needing to get permission. One of the Elders added that her father would be gone for a month or longer during the winter to hunt caribou during the time when they were far inland. On the winter map of Map 3, the hunting routes and areas southeast of Inukjuak were places people where would travel by dog team to reach caribou in the winter during that period.

Some Elders in Kangiqsualujjuaq described how they and their families would focus their harvesting efforts on the few caribou that stayed around the coast year-round. These individuals were left behind after the rest of the caribou went inland in the winter. Even still, the Elders described how these few caribou were difficult to find and it would take a month to get their harvest. Other Kangiqsualujjuaq Elders also described the caribou being very far away at this time, and needing to travel up west of Tasiujaq to get any animals. It was noted that there were two hunters that came from Puvirnituq to the Kangiqsualujjuaq area around 1960 to get caribou, and it was their first time harvesting caribou as there had been none in Puvirnituq after the historical peak. During map validation, an Elder from Kangiqsualujjuaq recounted how people from Kangiqsualujjuaq, Kuujjuaq and Tasiujaq used to go caribou hunting by dog team along the Tasiujaq river. In the mid-1950s, a couple went further than the rest of the group to around the Clearwater Lake area east of Umiujaq (nearly 400 km straight-line from Tasiujaq). As they could not find caribou and were in a state of hunger, they had to eat their dogs and even their ropes for their dog team, and walked back along the Kuujjuaq River (see Map 3 for their hunting route).

Elders in Tasiujaq similarly described caribou hunting trips taking a month during this period, explaining that they had to go far south to find caribou. For example, Elders identified winter caribou harvesting areas around Nachicapau Lake, which is more than 250 km south-east of Tasiujaq.

An Elder in Tasiujaq described how during this period, the dog slaughter disrupted access to caribou for a time, in addition to other significant negative effects for hunters and their families.[5] This would also have disrupted to some extent the ability of some to observe caribou movements and abundance during this period.

> *I remember when access to caribou was lowest in my life, after the dog slaughter, when the men had no more transportation. The skidoos were not many yet, but they [snowmobiles] were prevalent, and we weren't used to them yet. It caused able-bodied men to start drinking… So, there was a shortage of meat, because of that. –Silas Berthe, Tasiujaq*

5 The RCMP and government officials carried out frequent mass killings of Inuit sleds dogs in Nunavik in the 1950s and 60s (**Croteau 2010**).

Map 3 shows caribou abundance, movements and harvesting for this part of the caribou population cycle. While the map shows large areas of caribou abundance or presence, this should be interpreted cautiously as caribou were very sparse and scattered at this time in their population cycle, and spread over a very large area, as described above. Participants described needing to travel huge distances, as shown on this map, to find caribou.

Some seasonal patterns of movements and abundance were described. Nearly all Elders from Kangiqsualujjuaq identified a number of calving areas during this period, inland around George River, north of Michikamau Lake, and on the coast of Ungava Bay west of Kangiqsualujjuaq, as well as migration routes from inland to the calving areas and the coast (see Map 3). Some summer abundance areas were identified by Kangiqsualujjuaq Elders related to this period, around Kuujjuaq, Kangiqsualujjuaq and up the coast, with some describing how caribou would range almost to Killiniq and Hebron, though in low numbers. Elders in Kangiqsualujjuaq explained that caribou would spend their time near the coastline to be near saltwater and avoid mosquitos, but that overall, caribou were more inland during this period as compared to later periods when the population was higher. As described in section 4 (Caribou herds), Elders in Kangiqsualujjuaq described observing the divergence of Leaf River and George River caribou during their spring/summer migration, with the former moving east toward Leaf River while the latter moved north, to George River and up the coast. During this same period in the population cycle, Elders from Umiujaq and Inukjuak also described how caribou ranged far inland, and they would have to travel far inland to harvest, usually by dog team in the wintertime as shows on Map 3.

For a number of the features shown on Map 3, it was not possible for participants to confirm if it was the George River or Leaf River herd for many reasons, including identifying the herd not being important or useful at that time, how long ago the observations where, and because the participants themselves who were sharing knowledge from this period in the population cycle were older Elders. These features are shown as mixed or undefined migratory herd, in this and other maps where the migratory herd could not be confirmed.

POPULATION INCREASE

All communities and participants reported on the period of population increase, with most references from Kangiqsualujjuaq, Salluit and Inukjuak. There were some differences in when communities started noticing an increase in caribou after the population low, likely related to the difference in population cycle timing between the George River herd and the Leaf River herd. One Elder from Kangiqsualujjuaq described noticing the increase in the 1960s.

> *In those days they used to be really far from the village and back in 1960s they start to come back. In fact the old people, the Elders in those days, they used to say there used to be a lot of caribou around and there was no more. But in that time when I was young, they start to come back and that's how I know about caribou. –Kenny Angnatuk, Kangiqsualujjuaq*

A middle-aged participant from Kangiqsualujjuaq described caribou numbers increasing in the area in the mid-1970s, which he first noticed by seeing an increasing number of caribou trails.

During map validation, an Elder who was a child in the 1960s remembered only starting to see caribou in the area in the 1970s. In Tasiujaq, participants also described noticing a higher abundance starting in the mid-1970s. For example, Moses Munick, an Elder in Tasiujaq, shared how he caught a caribou across the river in the early summer in the 1970s, and that is when he first noticed that the caribou were coming back. He recalled his father telling him during a time of hunger that the caribou would be back, and they would not be hungry forever, and that he realized during this period of increase that his father had been right. By contrast, an Elder in Kangiqsualujjuaq reported that in the 1970s, he noticed the caribou moving more inland and becoming less abundant. During map validation, Kangiqsualujjuaq participants described that in the 1970s, Inuit from Puvirnituq travelled to Kangiqsualujjuaq to hunt caribou. They explained that as this was at a time when flying was difficult, as Air Inuit did not exist yet, and when communities were divided politically over the JBNQA. For participants, this trip underscored how few caribou were available around Puvirnituq during that period.

Some Salluit participants described their parents travelling down to the tree line in the late 1960s to find caribou, in the range of 350 km south. One Elder described being a child then, and tasting caribou for the first time. An Elder from Salluit described starting to notice caribou at a very far distance from the community in the early 1970s, and that after that they started to come closer to the coast in numbers after that time. Map 4 shows these winter areas of caribou abundance far south of Salluit. During map validation, participants in Salluit described how in the mid-1960s, caribou were closer to Kuujjuaraapik in the winter, and by the 1970s they were closer to Puvirnituq.

Participants in Inukjuak reported that caribou started increasing in the 1970s and that in the 1980s caribou started to be observed along the coast and islands. An Inukjuak participant described how in the 1970s, when he went inland with his father to check traps, he saw the first two caribou that started to appear north, about 30 or 40 miles inland. This was the first sign he noticed of caribou numbers starting to increase in that area. An Elder from Umiujaq described the increase beginning in the late 1960s, the caribou migration changed and they started to show up after there being almost none up to the early 1960s:

> *In the later 60s, there was getting to be a bit more [caribou] because at the time, in 1968, I went up there [to Lake Minto] by dog team with others and that group with four dog teams harvested 54 at that time. So their numbers were increasing at that time. I mean since we were living here and in the summertime we would look for waterfowl and geese and we would start to see tracks of caribou. –Willie Kumarluk, Umiujaq*

Caribou movements and distribution across the seasons during this period in the population cycle were described by participants from all communities, and mapped areas are shown on Map 4. Participants from all communities described the spring migration as generally moving northward, whereas the fall migration would generally move southward and to inland areas. Some participants described how after spending a few months inland, caribou are drawn to the coast because they want salt water from the ocean, and to escape mosquitos, which were noted to have a large influence on caribou movement. Elders from Inukjuak described how during the period of the low, caribou were more inland and away from the shore, and during this period, when their

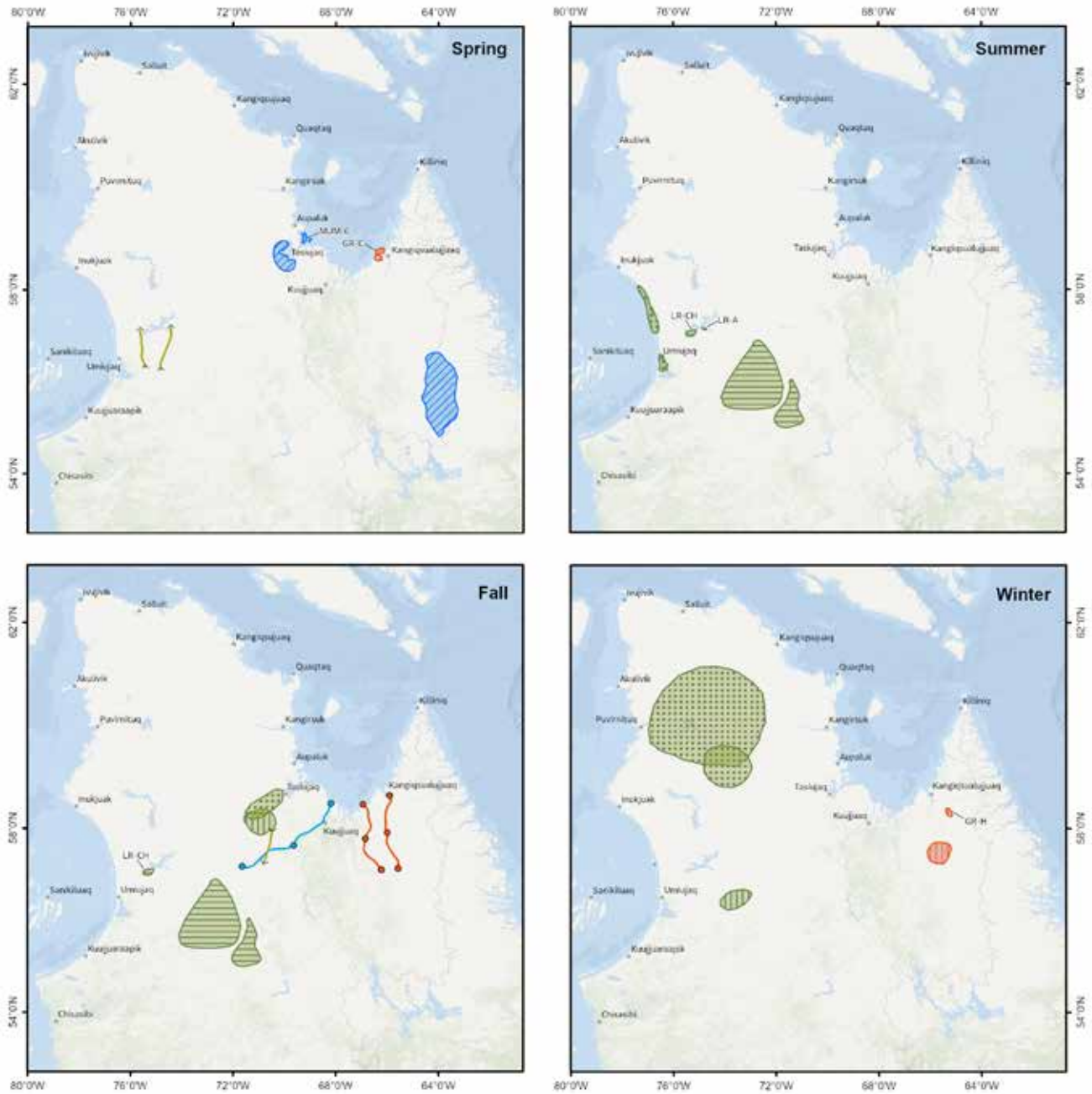
MAP 4

SEASONAL MIGRATORY CARIBOU ABUNDANCE, MOVEMENTS AND HARVESTING

Caribou Population Increase

The Nunavik migratory caribou population increase period was from the late 1960s to 1970s for the George River herd and 1970s to early 1980s for the Leaf River herd.

DETAILED VIEW OF MAPS PROVIDED ON FOLLOWING PAGES



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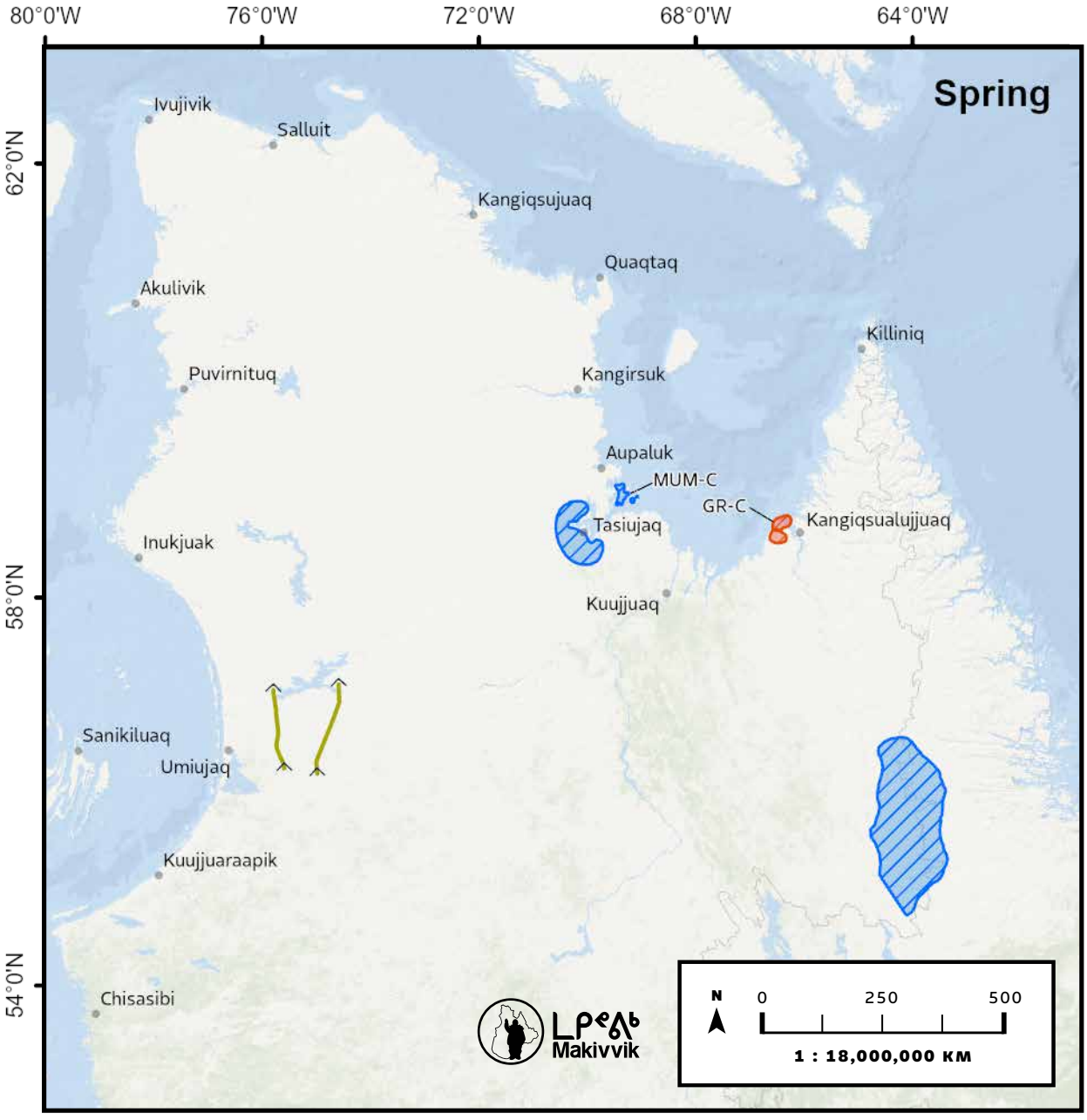
MAP 4

SPRING

Caribou Population Increase



Caribou herd - features

- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Calving
- Leaf River - Migration

GR-C	George River - Calving
GR-H	George River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
LR-A	Leaf River - Abundance
LR-CH	Leaf River - Camp (hunting)

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- George River - Hunting route
- Mixed or undefined migratory - Hunting route
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

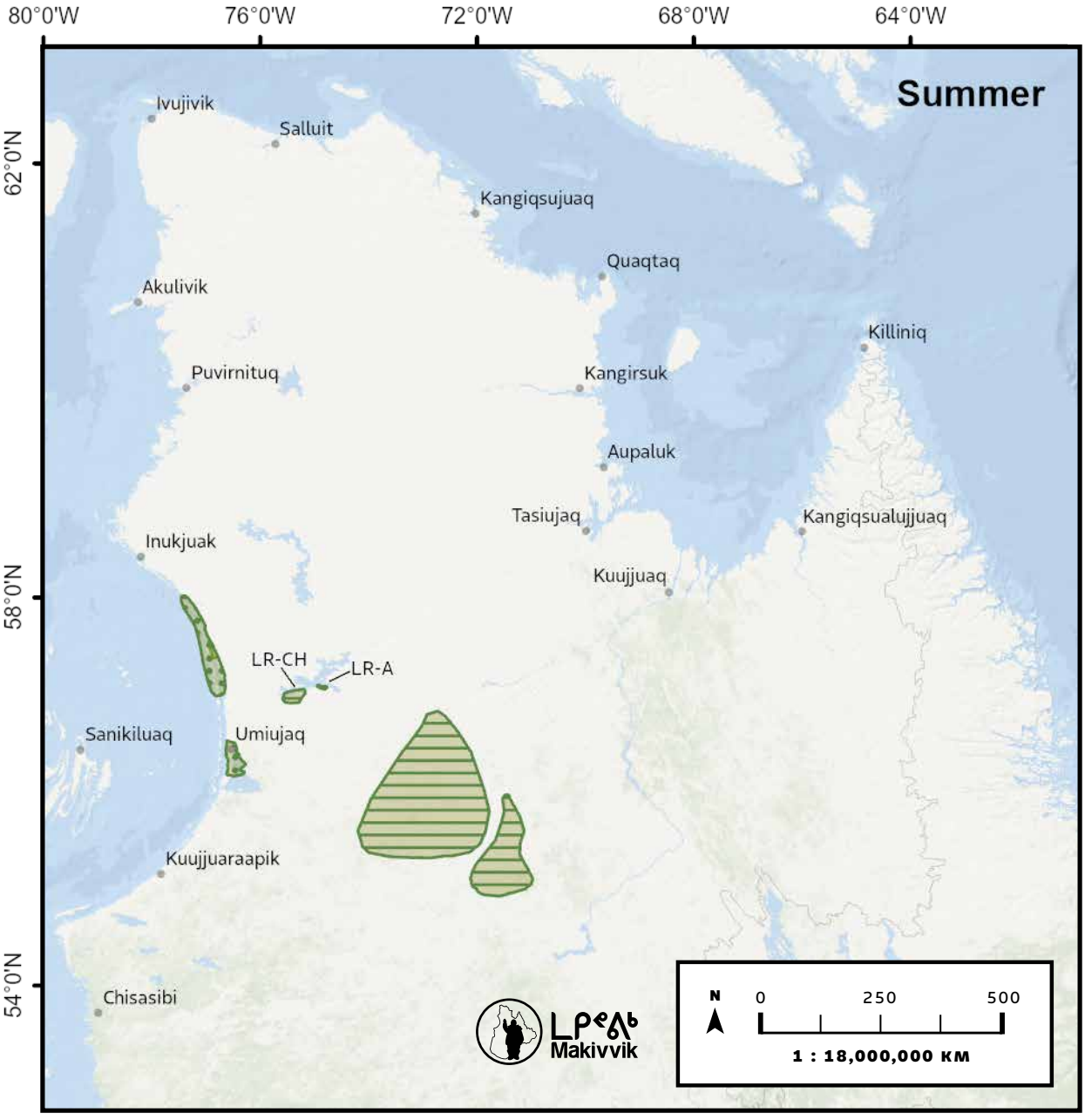
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 4

SUMMER

Caribou Population Increase



Caribou herd - features

- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Calving
- Leaf River - Migration

GR-C	George River - Calving
GR-H	George River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
LR-A	Leaf River - Abundance
LR-CH	Leaf River - Camp (hunting)

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- George River - Hunting route
- Mixed or undefined migratory - Hunting route
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

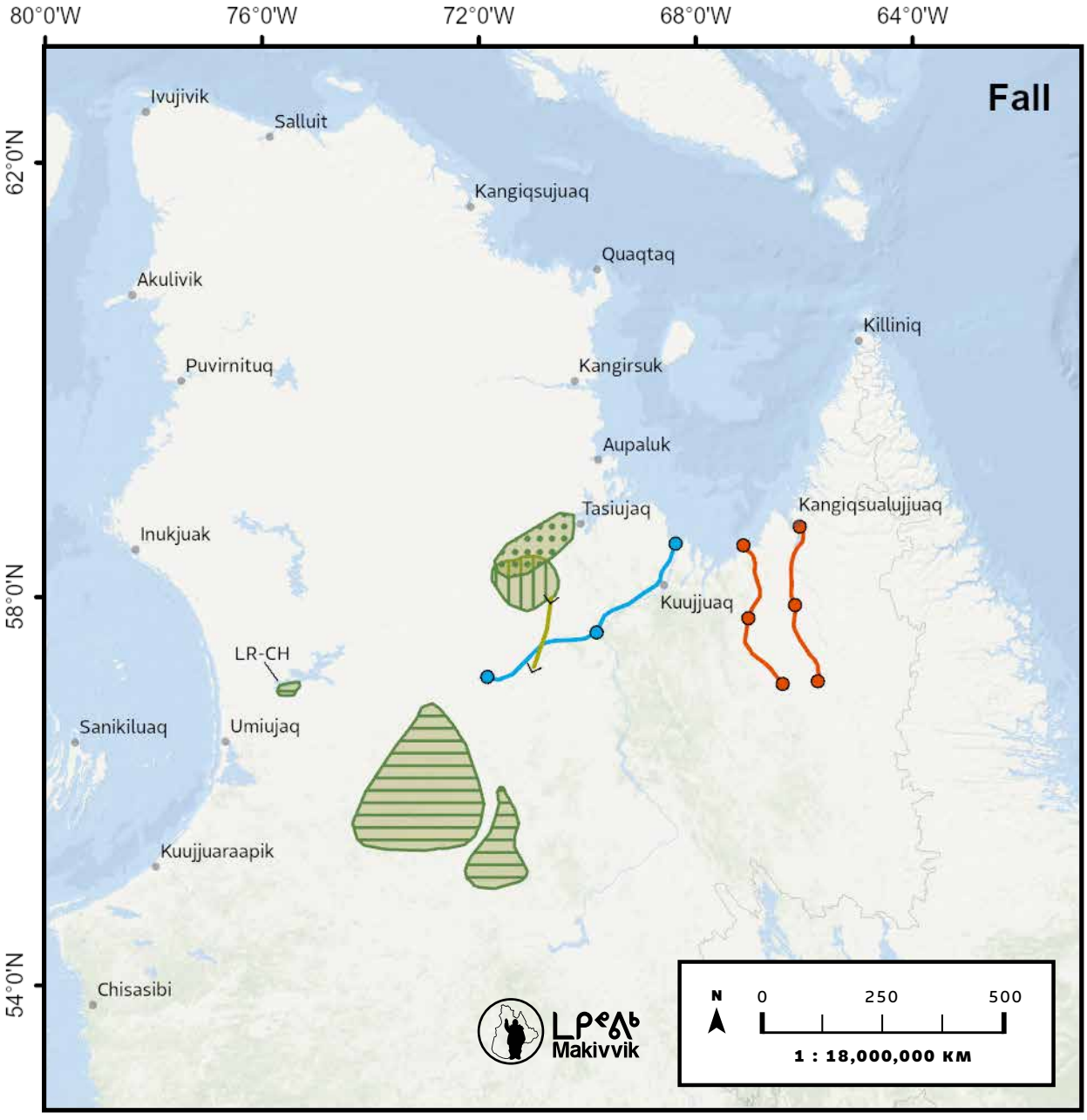
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 4

FALL

Caribou Population Increase



Caribou herd - features

- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Calving
- Leaf River - Migration

GR-C	George River - Calving
GR-H	George River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
LR-A	Leaf River - Abundance
LR-CH	Leaf River - Camp (hunting)

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- George River - Hunting route
- Mixed or undefined migratory - Hunting route
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

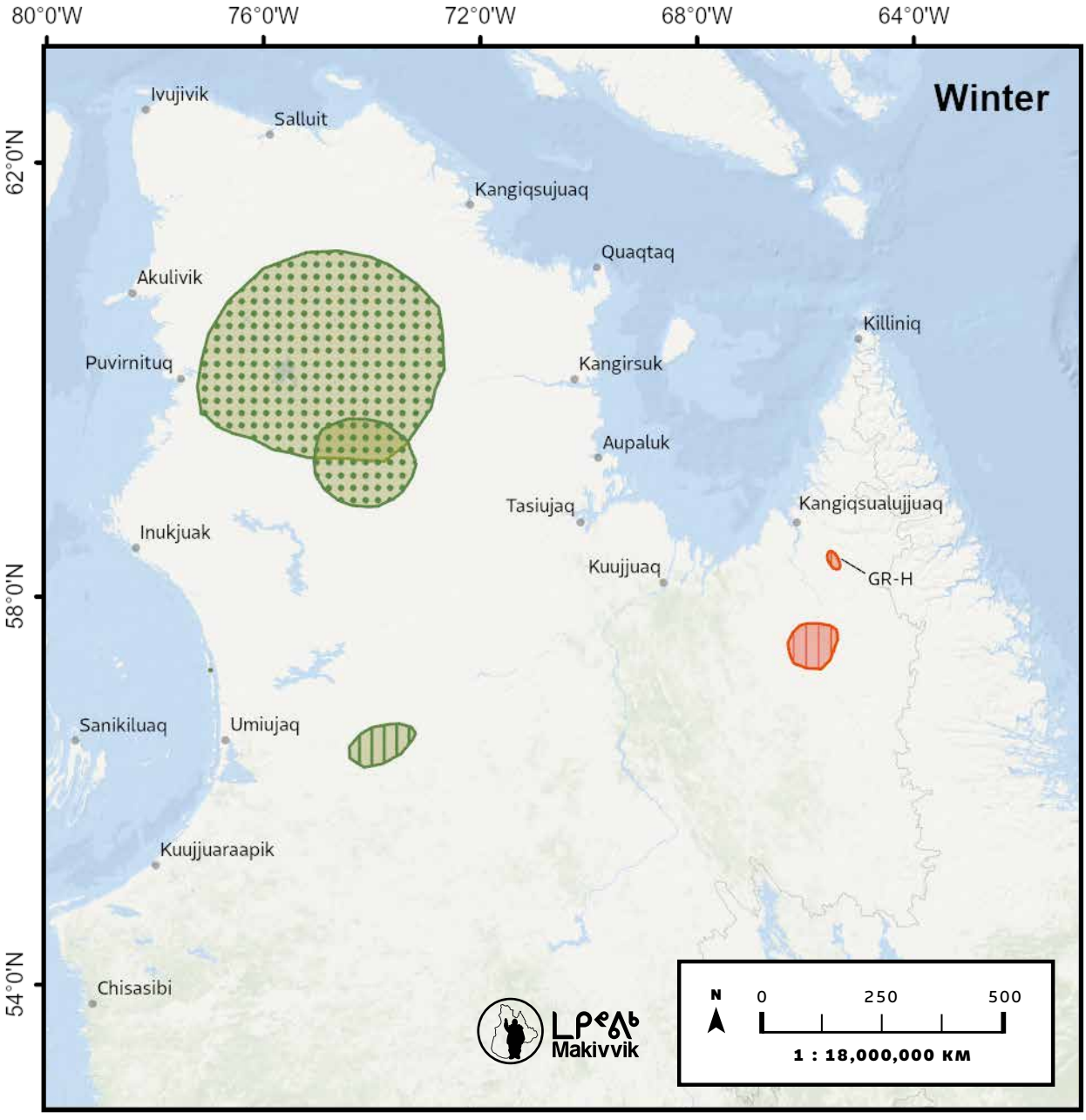
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 4

WINTER

Caribou Population Increase



Caribou herd - features

- George River - Calving
- Leaf River - Abundance
- Mixed or undefined migratory - Calving
- Leaf River - Migration

GR-C	George River - Calving
GR-H	George River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
LR-A	Leaf River - Abundance
LR-CH	Leaf River - Camp (hunting)

Caribou herd - harvesting features

- George River - Hunting area
- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- George River - Hunting route
- Mixed or undefined migratory - Hunting route
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

numbers were increasing, they would increasingly be found closer to the coast. These coastal areas of caribou abundance near Inukjuak during this period, where caribou started to expand to, are shown on Map 4. Though not shown on the map, Inukjuak participants noted that caribou would come in winter during this time.

During map validation, Kangiqsualujjuaq participants described a caribou hunting area far south on the George River where hunters from Kuujjuaq, Tasiujaq and Kangiqsualujjuaq would meet for caribou hunting in winter in the 1960s and 1970s, and Labrador Inuit would also meet there (see hunting area on Map 4). During map validation, Umiujaq participants added areas inland from the community to show where outfitting camps were located, noting that these camps began operating in the 1980s in the summer and fall.

POPULATION PEAK

All communities and age groups reported on the period of population peak, with some differences in timing based on community and related to the offset population cycles of the George River and Leaf River herds.

Most participants in Kangiqsualujjuaq described the period of most abundant caribou being in the 1980s, although one Elder explained that he observed the highest numbers in both the 1970s and 1980s:

> *Back in 1970 to 80s there were so many caribou. They even went to Kuujjuaq village…When we were driving skidoo in the trees it would be kind of risky, we would get hit by a caribou. – Kenny Angnatuk, Kangiqsualujjuaq*

In Tasiujaq, participants explained that it was the 1980s and 1990s when caribou were at their peak, with one younger participant stating that at "peak levels, there were too many around that time." A few Tasiujaq participants explained that the high numbers of caribou scratched up the land, and even the cloudberries couldn't grow anymore. Some participants in Tasiujaq described seeing both high numbers of caribou from the George River herd and the Leaf River herd at this time, and the George River herd would be seen going towards George River while the Leaf River herd would head in the direction of Leaf River during their spring/summer migration.

In Salluit, most participants discussed peak abundance of caribou in the area taking place in the 1990s and early 2000s, with some saying that the peak began in the late 1980s. Some participants described the huge numbers of caribou at this time making it look "like the land was moving."

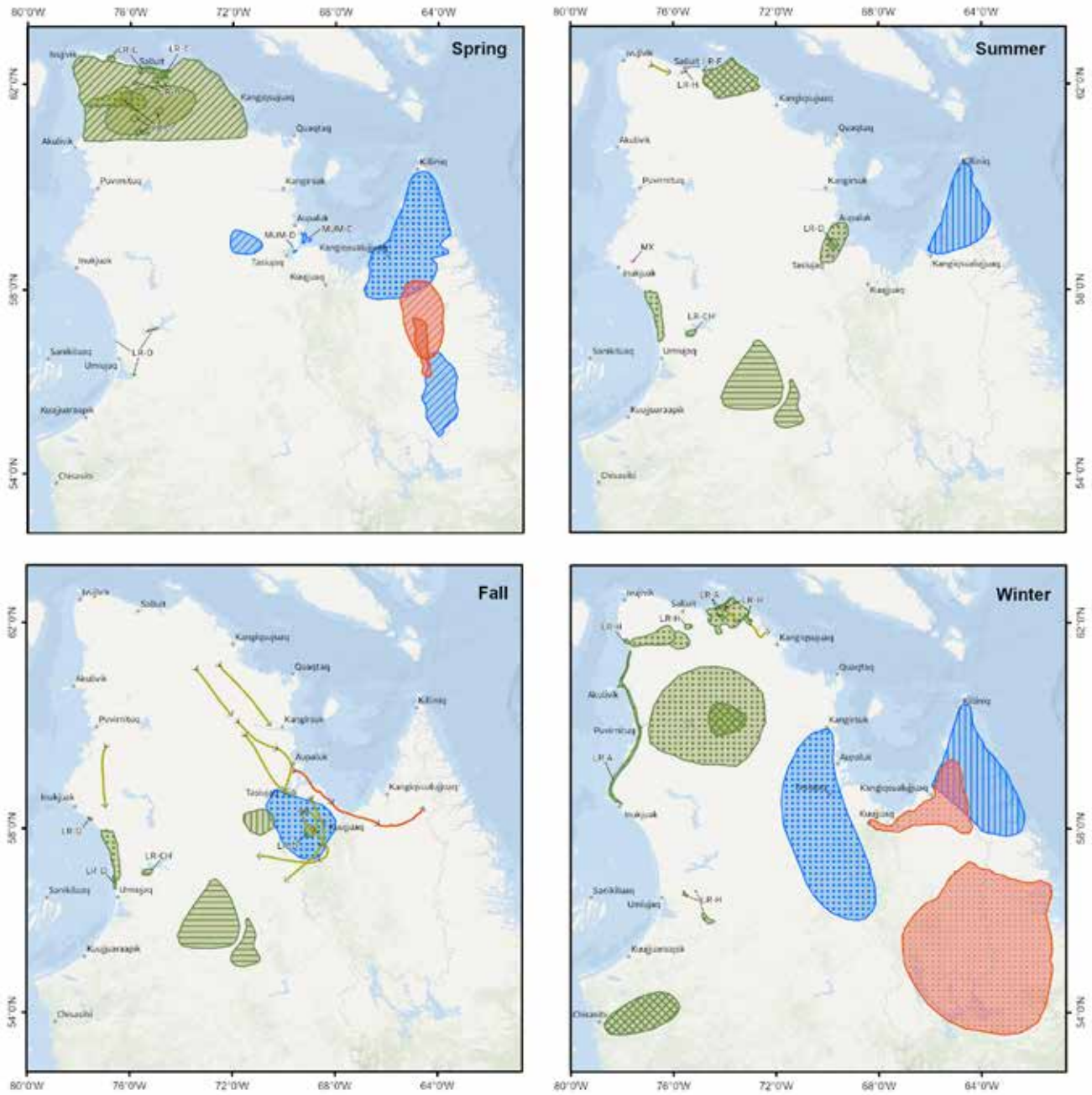
MAP 5

SEASONAL MIGRATORY CARIBOU ABUNDANCE, MOVEMENTS AND HARVESTING

Caribou Population Peak

The Nunavik migratory caribou population peak period was approximately from the 1980s to 1990s for the George River herd and the mid-1980s to early 2000s for the Leaf River herd.

DETAILED VIEW OF MAPS PROVIDED ON FOLLOWING PAGES

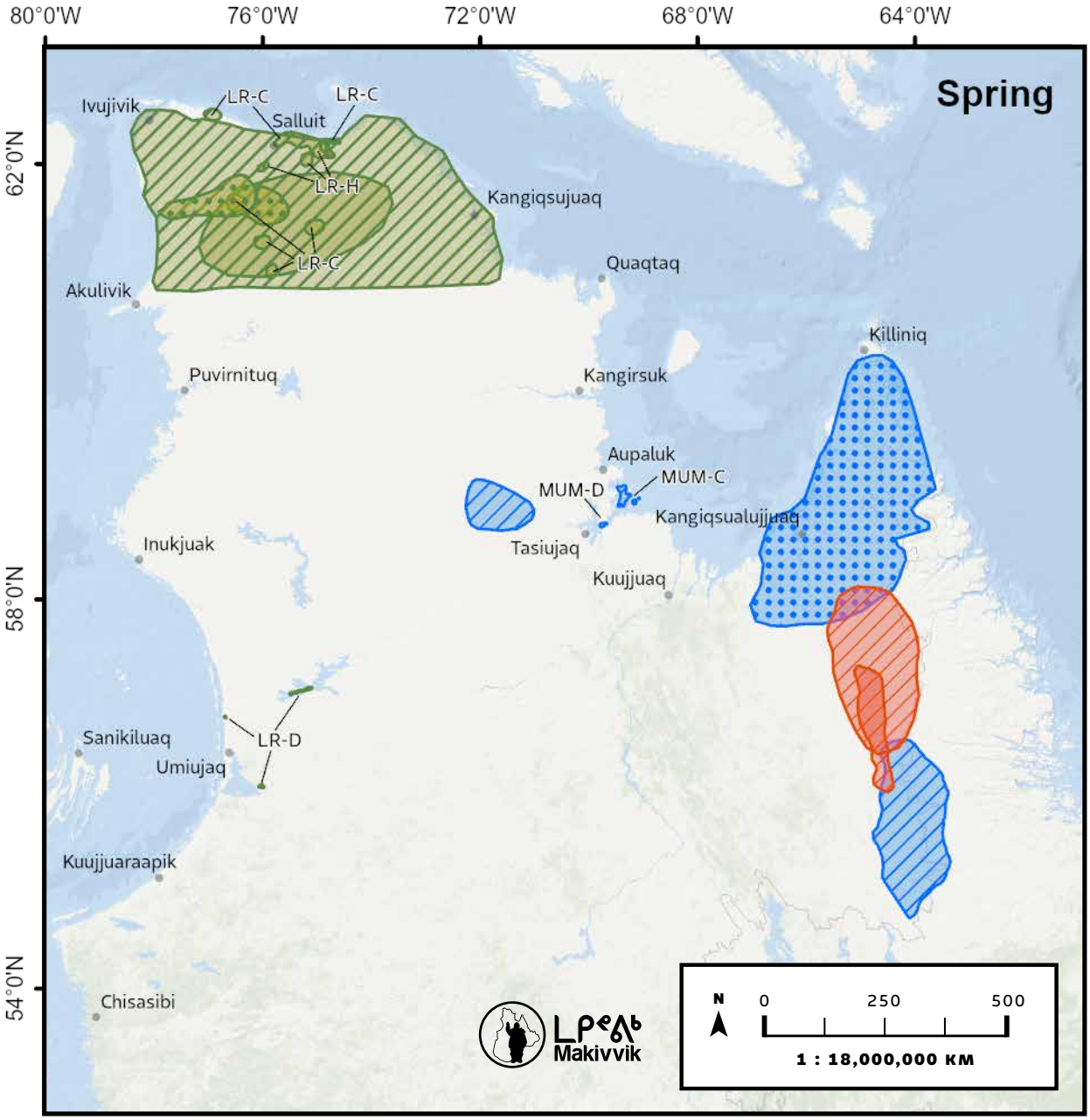


Information presented on these maps represents data gathered from participants in Kangiqsualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq in 2020 and validated in 2023 for the Nunavik Inuit Knowledge of Migratory Caribou project, and is not the full representation of all Nunavik Inuit knowledge of caribou for this area. These maps should be interpreted in conjunction with qualitative text in the project report. These maps are not to be reproduced without the prior authorization of the Department of Environment, Wildlife and Research at Makivvik and the Anguvigaq.

MAP 5

SPRING

Caribou Population Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Drowning site
- Leaf River - Foraging
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Drowning site

- George River - Migration
- Leaf River - Migration
- Muskoxen
- Community

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area

LR-A	Leaf River - Abundance
LR-C	Leaf River - Calving
LR-D	Leaf River - Drowning site
LR-F	Leaf River - Foraging
LR-CH	Leaf River - Camp (hunting)
LR-H	Leaf River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
MUM-D	Mixed or Undefined Migratory - Drowning
MX	Muskoxen

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

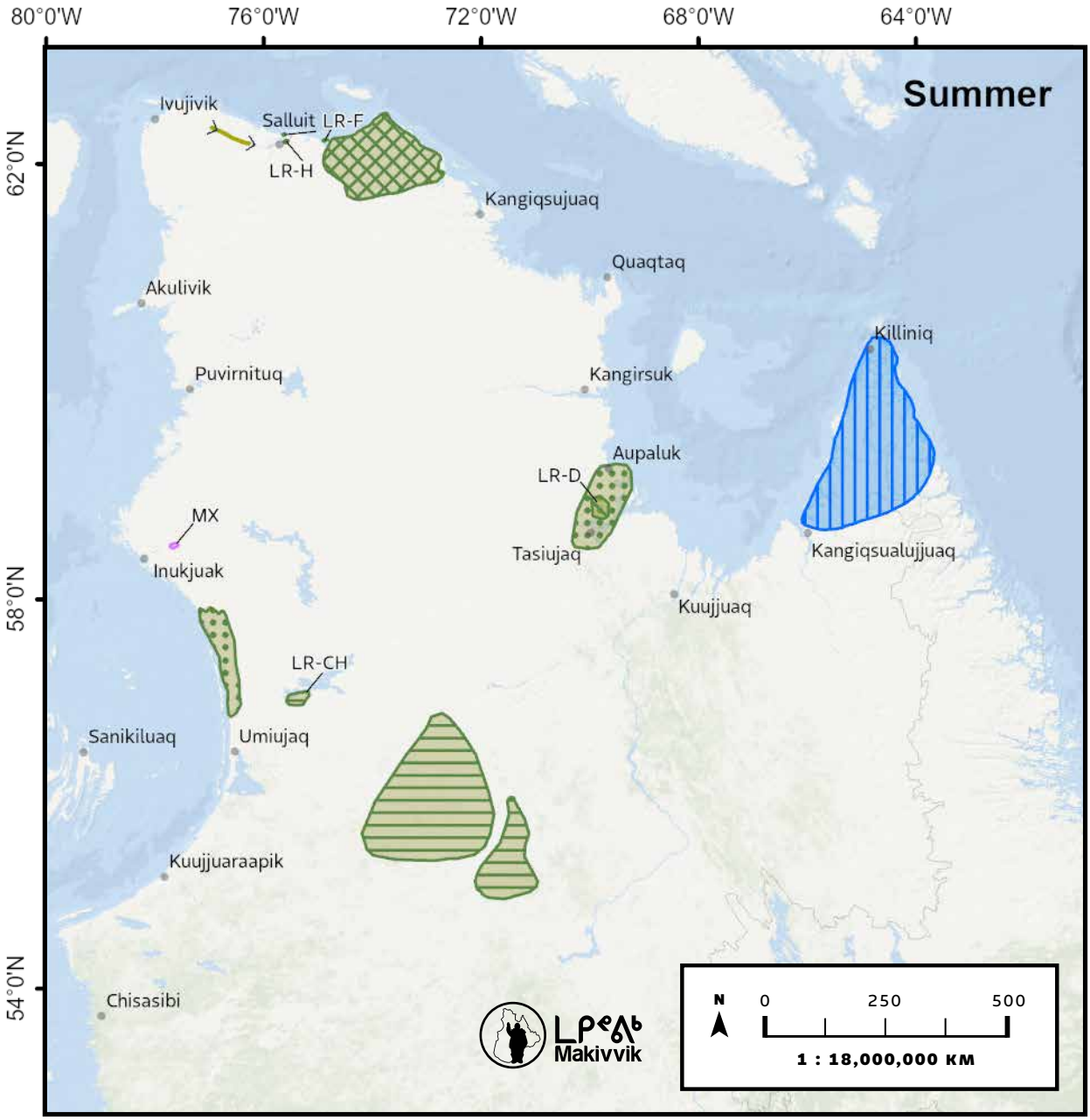
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 5

SUMMER

Caribou Population Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Drowning site
- Leaf River - Foraging
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Drowning site

- George River - Migration
- Leaf River - Migration
- Muskoxen
- Community

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area

LR-A	Leaf River - Abundance
LR-C	Leaf River - Calving
LR-D	Leaf River - Drowning site
LR-F	Leaf River - Foraging
LR-CH	Leaf River - Camp (hunting)
LR-H	Leaf River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
MUM-D	Mixed or Undefined Migratory - Drowning
MX	Muskoxen

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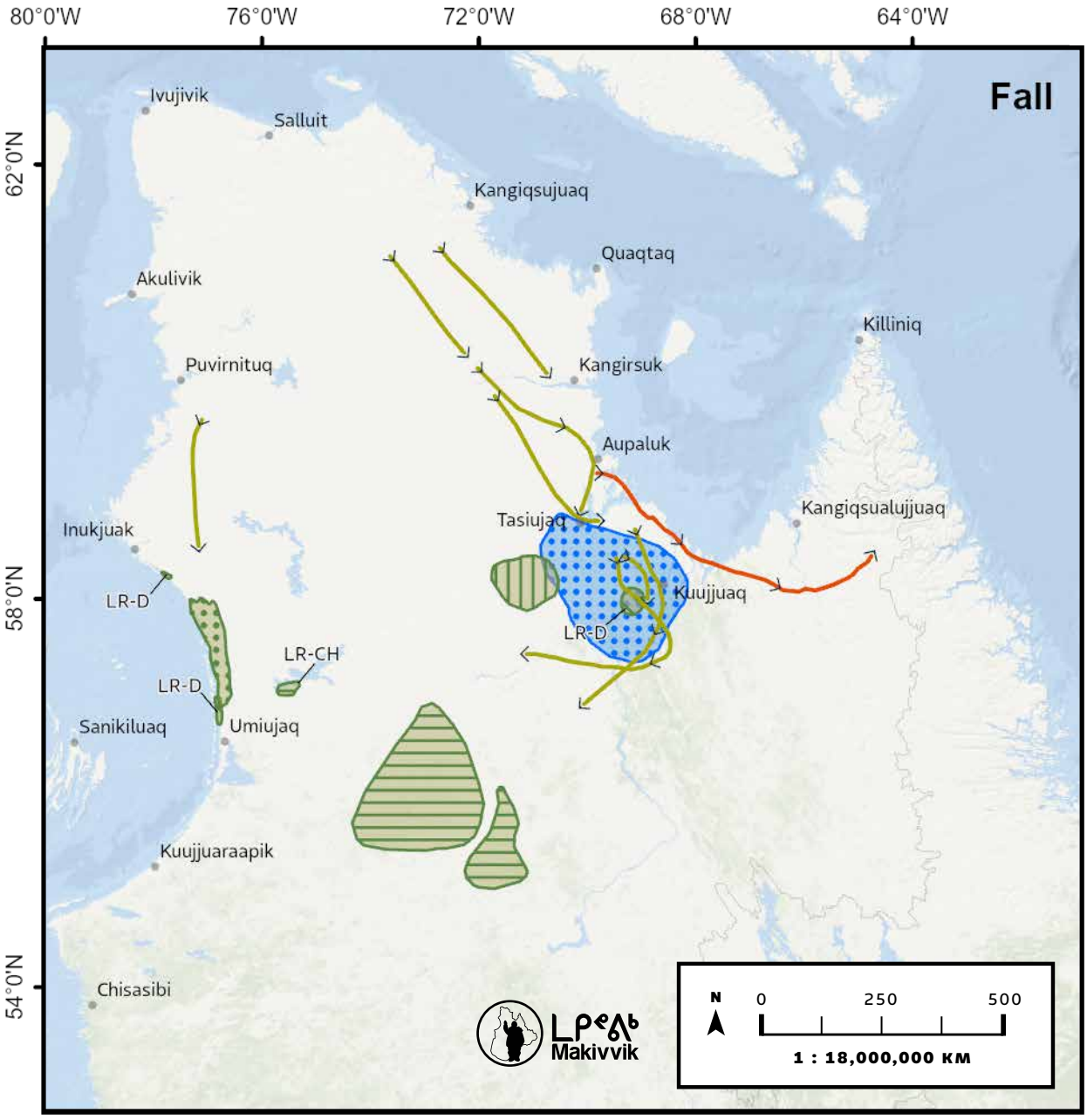
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 5

FALL

Caribou Population Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Drowning site
- Leaf River - Foraging
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Drowning site

- George River - Migration
- Leaf River - Migration
- Muskoxen
- Community

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area

LR-A	Leaf River - Abundance
LR-C	Leaf River - Calving
LR-D	Leaf River - Drowning site
LR-F	Leaf River - Foraging
LR-CH	Leaf River - Camp (hunting)
LR-H	Leaf River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
MUM-D	Mixed or Undefined Migratory - Drowning
MX	Muskoxen

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

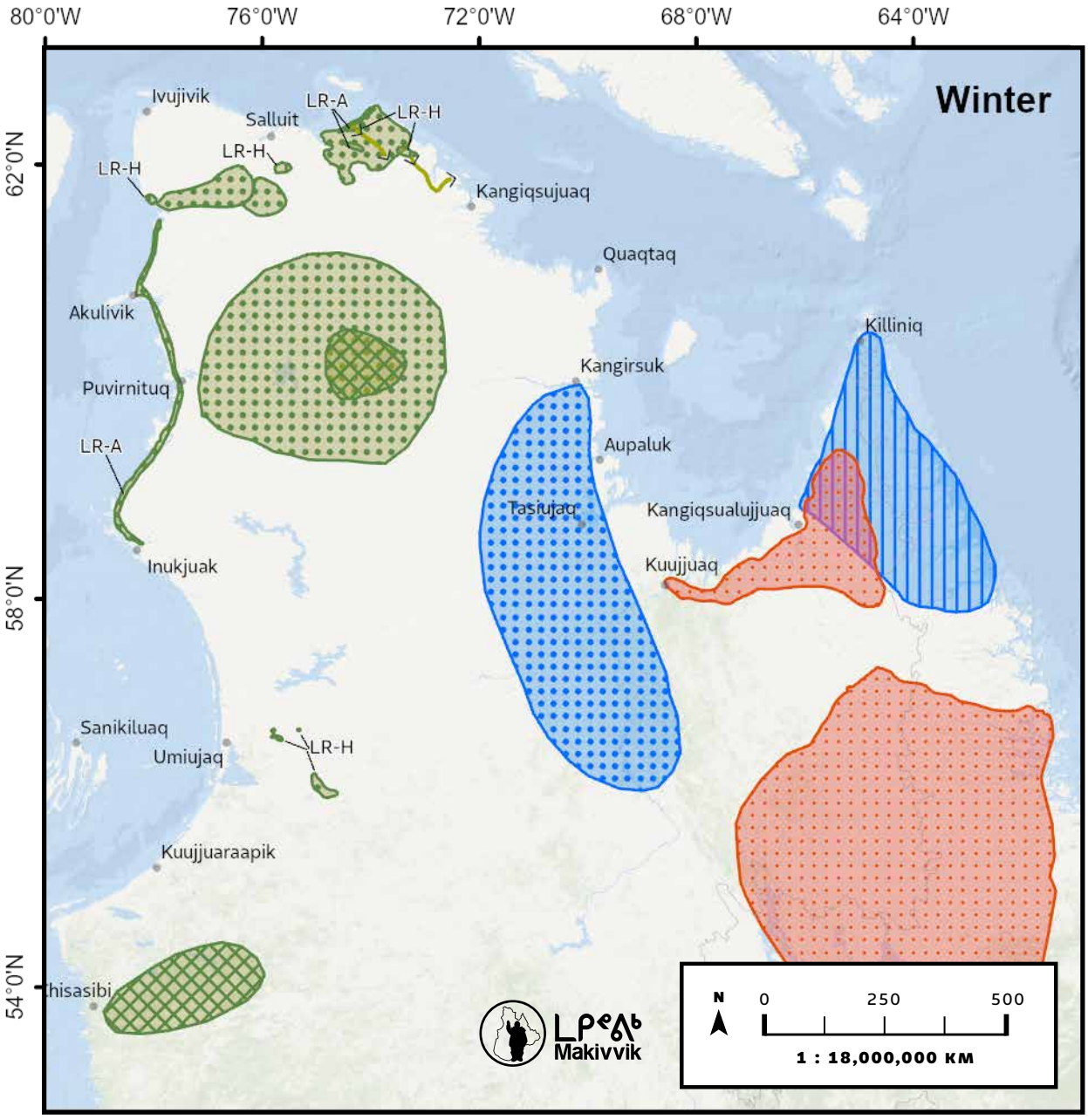
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 5

WINTER

Caribou Population Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Drowning site
- Leaf River - Foraging
- Mixed or undefined migratory - Abundance
- Mixed or undefined migratory - Calving
- Mixed or undefined migratory - Drowning site

- George River - Migration
- Leaf River - Migration
- Muskoxen
- Community

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area

LR-A	Leaf River - Abundance
LR-C	Leaf River - Calving
LR-D	Leaf River - Drowning site
LR-F	Leaf River - Foraging
LR-CH	Leaf River - Camp (hunting)
LR-H	Leaf River - Hunting area
MUM-C	Mixed or Undefined Migratory - Calving
MUM-D	Mixed or Undefined Migratory - Drowning
MX	Muskoxen

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

> *During those years that the caribou was very far away, the Elders used to tell other people they'll be like maggots when they finally arrive. There'll be so many they'll be like maggots on the hills. And we saw that in the 80s and 90s, caribou everywhere. –Salluit participant*

Another Salluit Elder described how there are caribou trails, characterized by collapsed earth in narrow lines, all over the land near Salluit, indicating that caribou had been there in high numbers.

> *If you were to go out on the land you'll see used caribou trails all over this land which indicates that they used to be here in very vast and great numbers. If you were to go out and walk you will still see the trails that were made by them. Because they tend to travel in a line and use that one trail, around these parts anyway. They came back every year. Collapsed earth because of the way the caribou travelling over it…To see that the caribou can have an impact on the earth, it's an amazing thing for me. –Epervik Parr, Salluit*

In Umiujaq, participants explained that in the 1980s and early 1990s there were lots of caribou in their area. Inukjuak participants described the peak in abundance in their area occurring in the 1980s and early 1990s, building on a growing population since the 1970s.

> *It was in the 1980s that we started seeing big numbers that were all around, even some were staying in certain areas and not moving – and those numbers started going more towards the shores…Even at times [before the 80s] when they were way inland it was very hard to find even tracks of caribou even way inland. They were so scarce. But in the 1980s, that's when we saw these were large numbers being around in the vicinity. –Simeonie Ohaituk, Inukjuak*

A middle-aged participant in Inukjuak pinpointed 1987 as the year with the highest abundance that he observed. During map validation, Inukjuak participants agreed that there was a large abundance from the late 1980s, through the 1990s, and until the early 2000s.

> *The peak population of the caribou, they used to be all over the place, they were even across the river, I remember in '87, 1987. That's when it was all over the place on the streets, sometimes in the town and all that. –Inukjuak participant*

Map 5 shows caribou movements and distribution across the seasons during this period in the population cycle. The high numbers of caribou during this period and mixing of the herds on the land meant that it was difficult in some cases for participants to identify the migratory herd.

Participants described a northward spring migration, and a southward fall migration, as in earlier periods in the population cycle. Kangiqsualujjuaq participants described how during the peak, George River caribou would migrate south around Aupaluk and Tasiujaq and then move east on the towards Labrador, while the Leaf River herd would move south of Tasiujaq and southwest toward inland Nunavik. Calving grounds were identified by participants from the northern tip of Nunavik to just north of Akulivik and south of Kangiqsujuaq, as well as over large areas around the Québec-Labrador border. Kangiqsualujjuaq participants described how during this period, George River caribou would be found on the Québec-Labrador Peninsula, ranging as far as Killiniq, and were mixing with caribou from the Torngat herd during this period.

Salluit participants explained that during this period caribou would arrive for calving in spring and after calving in summer to access areas of good vegetation. Salluit participants explained that overall, the highest seasonal abundance of caribou during this period near their community was in the summer. Islands were preferred areas for good feeding. Caribou would generally leave with the fall migration, though some stayed in the Salluit area all winter, as shown on Map 5.

Inukjuak participants explained that during the peak, caribou were ranging all the way to the coast, as shown on Map 5.

Participants identified large wintering areas in inland Nunavik, over the Québec-Labrador Peninsula, and extending south into areas of Labrador that are south of Nunavik, as well as a large winter foraging area east of Chisasibi.

POPULATION POST-PEAK

All communities and age groups reported on the post-peak period. There was agreement amongst participants in Kangiqsualujjuaq, Tasiujaq, Salluit and Umiujaq that caribou abundance has decreased since the peak. In Kangiqsualujjuaq, some Elders explained that the caribou have declined and are also moving inland, towards Nunatsiavut.

> *Today we notice George River herds being down a lot, and we notice Tasiujaq herds, they're going down. They're the second animals that they're going down since we noticed. Yeah, we noticed that the George River herds are way down, Tasiujaq herds are starting to go down. Even Torngat herd, they're completely going down, we notice. –Willie Etok, Kangiqsualujjuaq*

While caribou were generally reported to be in fewer numbers than at their peak, there were still some seasonal abundance reported by communities. Kangiqsualujjuaq participants reported the lowest migratory caribou abundance of all of the communities. As the George River and Leaf River herds are on offset population cycles, this relates to the earlier decline from the peak abundance of the George River herd, as compared to the Leaf River herd (see Table 4).

> *It's a big difference from today from the past. Like today we only have Torngat herds around the area, George River. Today we never see George River herds. We're only hunting Torngat herds but sometimes we have to order some caribou meat from the other village. This winter we had some caribous from Inukjuak and we had some caribou from Tasiujaq. It's the only way we get a lot of caribou meat for the village. –Kenny Angnatuk, Kangiqsualujjuaq*

A middle-aged participant in Kangiqsualujjuaq recalled an incident in 2000 during a guiding trip he was leading inland between Nunavik and Labrador, where a helicopter scared a large group of caribou with loud fireworks. This caused them to change direction on their migration, from north to south. He stated that before this incident, there were still lots of caribou, but after, the caribou started to disappear from the area as a result of this major disturbance and disrespect.

Participants in Tasiujaq described observing a decline in caribou numbers in recent years and described a number of changes and pressures on caribou in the last 20 years that may be contributing factors, and which are discussed in detail in sections 5.4 and 5.5. Nonetheless, there

PHOTO: PUTULIK PAPIGATUK

are still caribou seasonally present—just not in the same numbers as occurred during their peak. For example, an Elder in Tasiujaq described how his son had taken a photo just days before the workshop, in January of 2020, and thousands of caribou were present between Tasiujaq and Kuujjuaq.

In Umiujaq, participants explained that there have been significant fluctuations in numbers in the last 20 years, but that generally there are fewer than at their peak in the 1990s.

> *It's been 10 to 15 years that the numbers are starting to diminish. –Willie Kumarluk, Umiujaq*

Salluit participants also shared observations of a decline in abundance since the peak, which had continued until the early 2000s. At a meeting with the NV and the Anguvigaq of Salluit, an Elder described how twenty years ago, around 2000, there were still lots of caribou, but after that he noticed the numbers starting to decrease. At their peak abundance, caribou can be found on Sugluk Island, but the last time he got a caribou on Sugluk Island was 20 years ago. During the same meeting, it was described how in 2015, a thousand caribou could be seen on both sides of Sugluk Fjord, but since that time they have not congregated in the same numbers. Some Salluit participants explained that the cyclical nature of caribou populations means that their numbers will go up again at some point in the future, and then go down again.

> *…like the old people used to say, even the people that's in Labrador they would say, you've got the big herd, OK, but eventually they will move away, unknown where or what they're doing, but they will rejoin and come back again, they're just repopulating…they will always return back again. That's what's going to happen with our caribou. But they will pass again. That's what the Elders say. That's our teaching. –Adamie Saviakjuk, Salluit*

In contrast to the general observations of declining numbers more recently compared to the peak described by participants in Kangiqsualujjuaq, Tasiujaq, Salluit and Umiujaq, some participants in Inukjuak described observing high numbers of caribou in recent years, especially compared to lower numbers in the winter about a decade ago. Some participants described how around 2010 there were hardly any caribou in their area in the wintertime, though there were still many in the spring and summer. By contrast, one Inukjuak Elder described how in the winter of 2020–2021, there were similar numbers around the community as there were during the peak. During validation, participants described a high abundance of caribou during the winter of 2020–2021, reporting that caribou were all around the community for five months. During map validation, Inukjuak participants added that caribou have recently been found on the offshore islands during the winter.

> *We see some very healthy population for the Leaf River herd in the last few years. And we see an increase in numbers. –Simeonie Ohaituk, Inukjuak*

Inukjuak participants also noted how the migration routes and what area the caribou come from varies year-to year depending on the presence of muskoxen and wolves, and food availability (i.e. if they have depleted grazing grounds in other places). Years ago, when they were travelling south, they would go further inland, but more recently caribou have been moving more towards the shore.

In the winter of 2019–2020, caribou were going south from the north, rather than the previous pattern of going north during the spring migration from wintering grounds around James Bay (see Map 6). A middle-aged participant explained that this indicates that caribou are staying in Nunavik for the winter and constraining their movements to a smaller area than they have in the past, when they would range to wintering grounds farther south. At the same time, a middle-aged participant shared observations of a new group of caribou that was much fatter coming from the south in the winter of 2019–2020, in addition to the group coming from the north. The recent migration routes that caribou have taken around Inukjuak may have coincidentally provided Inukjuammiut with a high local caribou abundance in the last several years.

Some changes in migrations and thus presence of caribou around Umiujaq in the post-peak period were also discussed by Umiujaq participants. Participants explained that in the 1990s and 2000s, caribou started going south to the La Grande and Kuujjuaraapik area for the wintertime.

Similar to Inukjuak, changes in migration routes have affected local caribou abundance around Umiujaq in recent years. Some Umiujaq participants explained that in the last five years, local caribou abundance increased as caribou were passing by the Umiujaq area during the fall migration, on their way south to the La Grande area for the winter, and again during the spring migration, on their way north for the summer. In the several years before this, fewer caribou were observed in the area, and the direction of the migration was different. Caribou had been coming from the south and going north during their fall migration. Recently, during the winter of 2019–2020, the route changed, with caribou coming from the north to go to wintering grounds in the La Grande area, and then going inland. These migration changes influence observations of local caribou abundance and access to caribou. Participants also explained that caribou overwintering in the area of La Grande and Kuujjuaraapik in large numbers is relatively new—in the 1990s and early 2000s, caribou were not observed there in the winter in the thousands, as they have been in more recent years.

Further, in 2021, some younger and middle-aged participants described how last year there were more George River caribou being observed, which gave hope of a potential rebound in population numbers. One of the participants also described how the Torngat herd had a lot of calves in the previous fall, so it had generally been a good year for caribou in that community.

> *For the George River [herd], seen some 65 km from here in December and January, there were small herds of 15 to 20. I think it was the first time in maybe 7 to 9 years, there was a few that actually came to town near the water station this summer. That was the first time we ever saw caribou, this summer (2020), in town. Everyone was really happy. People were saying, don't hunt them, let them come back, so it was fun even for the Elders, for them to see that they might be coming back. –Kangiqsualujjuaq participant*

Salluit participants also discussed how caribou can cross ice and water, even long distances, and that they follow their leader no matter where the leaders go. There is a time in the winter when wind from the north will push ice pans in the Hudson Strait together, and it was discussed how the caribou know how to cross across ice and water so they may be crossing in the winter as

Umiujaq hunters, Lucassie Cookie (left) and Charlie Kumarluk (right), mark important caribou locations on a map during an evening workshop

PHOTO: KAITLIN BRETON-HONEYMAN

well. For example, some Salluit participants noted seeing frozen caribou in the sea and tracks heading to the sea. Three to four years ago, a Salluit participant saw a large migration going up in the direction of Nunavut, and believes that they swam across. Participants discussed how in the last two years, Cape Dorset had an abundance of caribou, and discussed this as a possible reason. Observations of caribou believed to be from Nunavut, and with tags from Southampton and Baffin Island, are seen on occasion, as well as smaller caribou on the islands that may be arriving by ice pans.

Map 6 shows caribou movements and distribution across the seasons during this period in the population cycle. As in other periods, this map shows the general northward migration in spring and southward migration in the fall, as well as some northward and eastward migration in the fall and winter near Umiujaq in recent years as discussed above. During map validation, Tasiujaq participants explained the migration pattern shown on the map for this period, describing how the caribou that come to the Tasiujaq area are the same caribou that are found in eastern Hudson Bay. In recent years, during their spring migration they have been near Tasiujaq around June,

are near Quaqtaq by July, and return to the Tasiujaq area during their fall migration. This same seasonal movement was also described by Kangiqsualujjuaq participants during map validation.

Also as reported above, there are large wintering grounds near Inukjuak with high abundance of caribou in recent years. During map validation, Inukjuak participants added caribou areas along the coast and near the community throughout the seasons, noting that caribou go to the coast because they like the salt water (tariuq). Participants noted that the large hunting area around Inukjuak during the fall is where there are different groups of caribou mixing, with caribou migrating to the area from both the north and south. Participants also added that during more recent years caribou have been migrating further inland and are missing Umiujaq.

While the areas marked for the George River herd are similar in the peak and post-peak periods, the population levels are different with the steep decline in this herd after the peak. Thus, while areas of abundance are large for the George River herd in the post-peak period, the population of caribou within these areas of this herd is small and scattered as compared to the peak. Kangiqsualujjuaq participants reported that in the post-peak period, George River caribou were more south and east of the community, along the Labrador-Québec border and in Nunatsiavut, rather than also extending across the Québec-Labrador peninsula as they had during the peak.

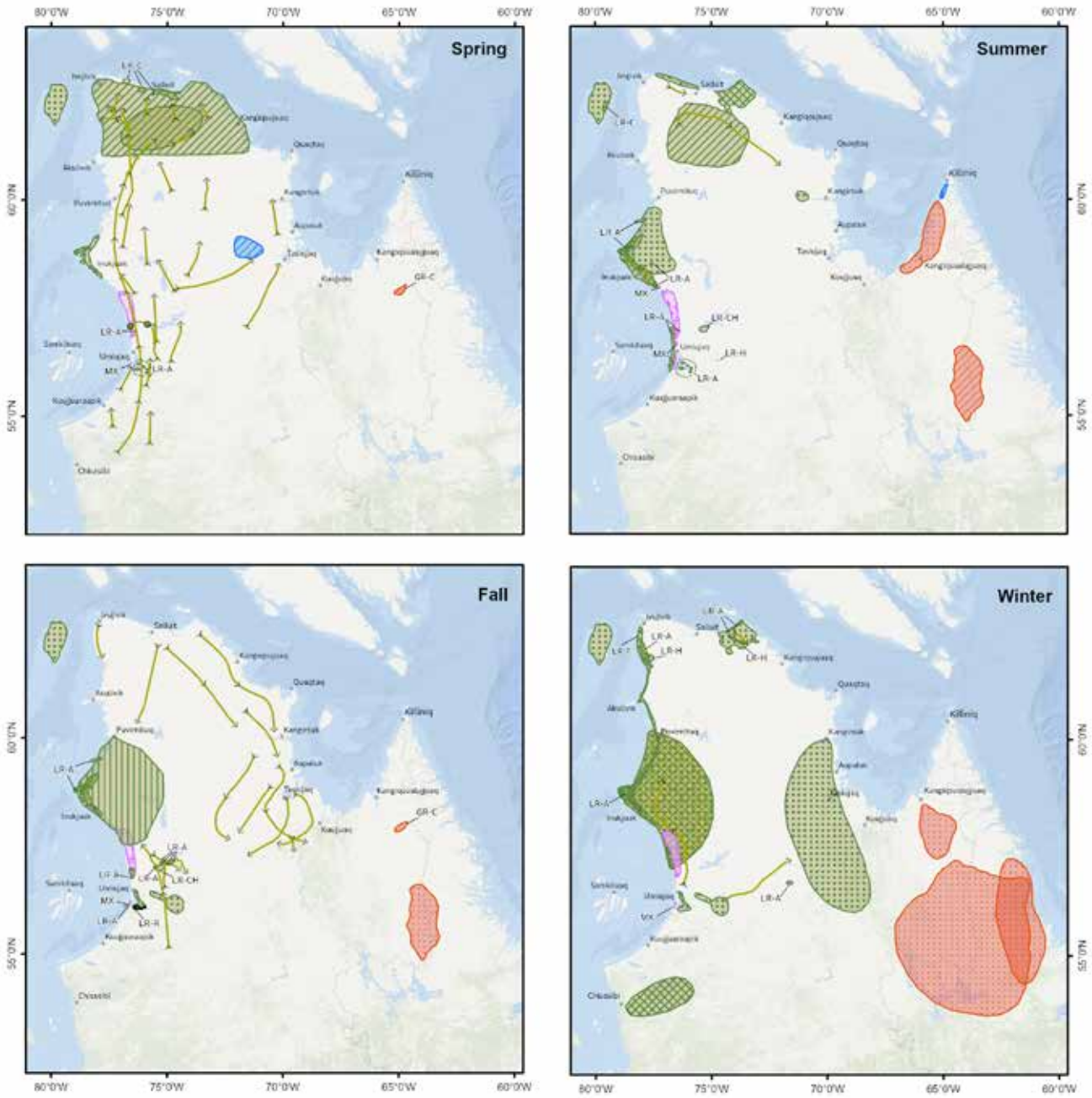
MAP 6

SEASONAL MIGRATORY CARIBOU ABUNDANCE, MOVEMENTS AND HARVESTING

Caribou Population Post-Peak

The Nunavik migratory caribou population post-peak period was for the 2000s onward for George River herd and the late 2000s for the Leaf River herd, until the time of data collection.

DETAILED VIEW OF MAPS PROVIDED ON FOLLOWING PAGES

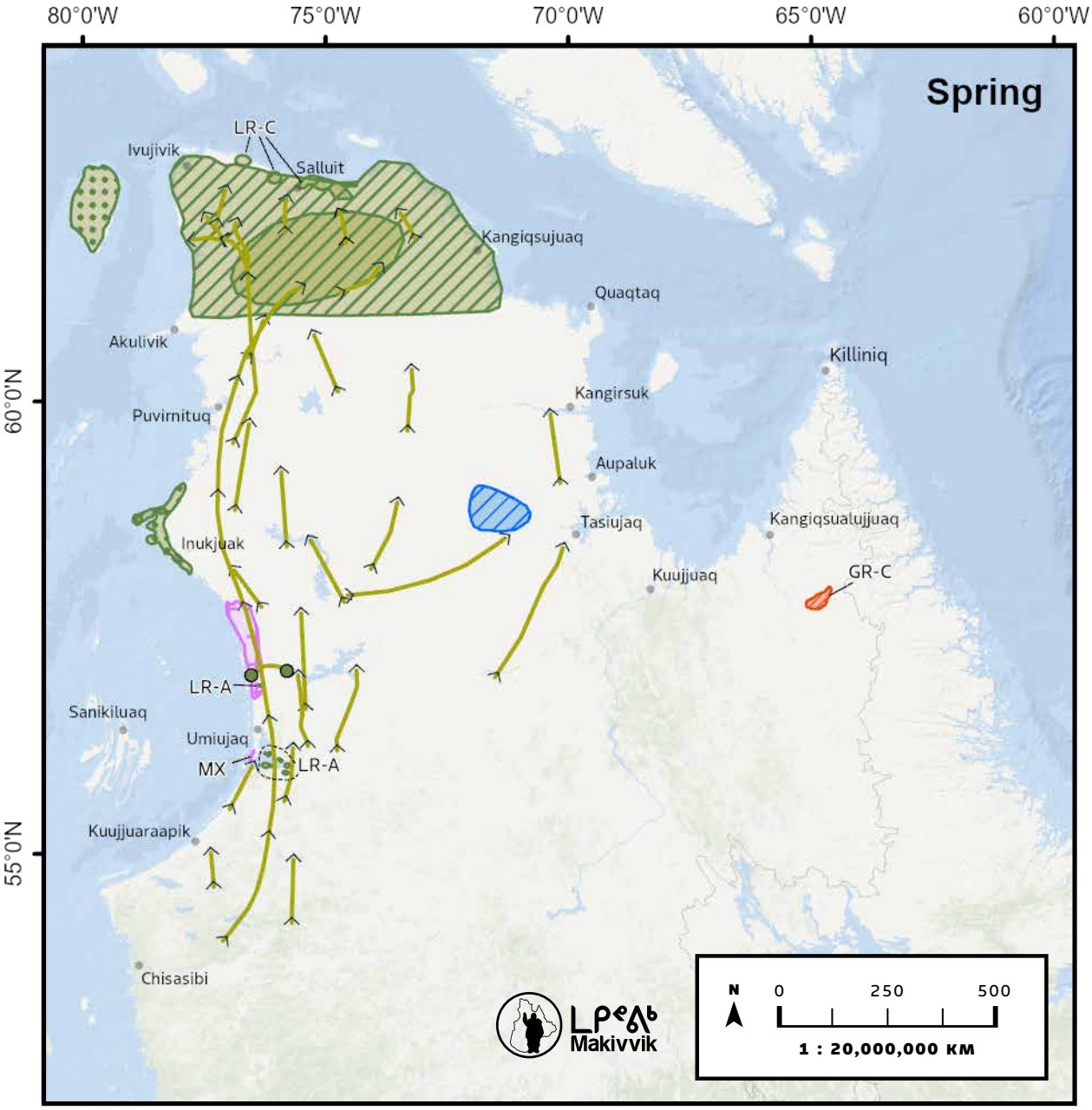


Information presented on these maps represents data gathered from participants in Kangiqsualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq in 2020 and validated in 2023 for the Nunavik Inuit Knowledge of Migratory Caribou project, and is not the full representation of all Nunavik Inuit knowledge of caribou for this area. These maps should be interpreted in conjunction with qualitative text in the project report. These maps are not to be reproduced without the prior authorization of the Department of Environment, Wildlife and Research at Makivvik and the Anguvigaq.

MAP 6

SPRING

Caribou Population Post-Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Foraging
- Leaf River - Rutting
- Mixed or undefined migratory - Calving
- Leaf River - Migration

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area
- Leaf River - Hunting route
- Muskoxen
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

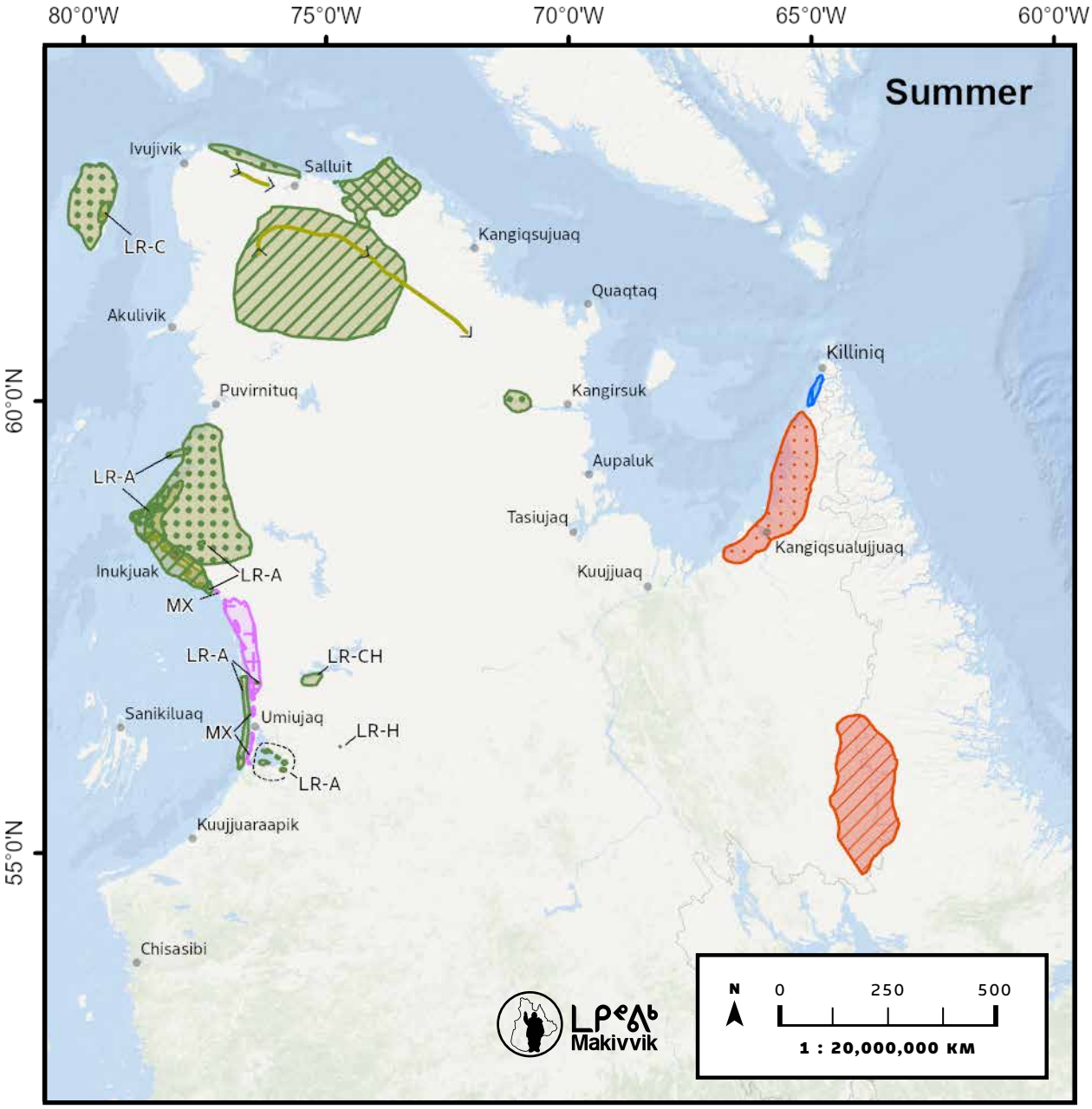
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 6

SUMMER

Caribou Population Post-Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Foraging
- Leaf River - Rutting
- Mixed or undefined migratory - Calving
- Leaf River - Migration

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area
- Leaf River - Hunting route
- Muskoxen
- Community

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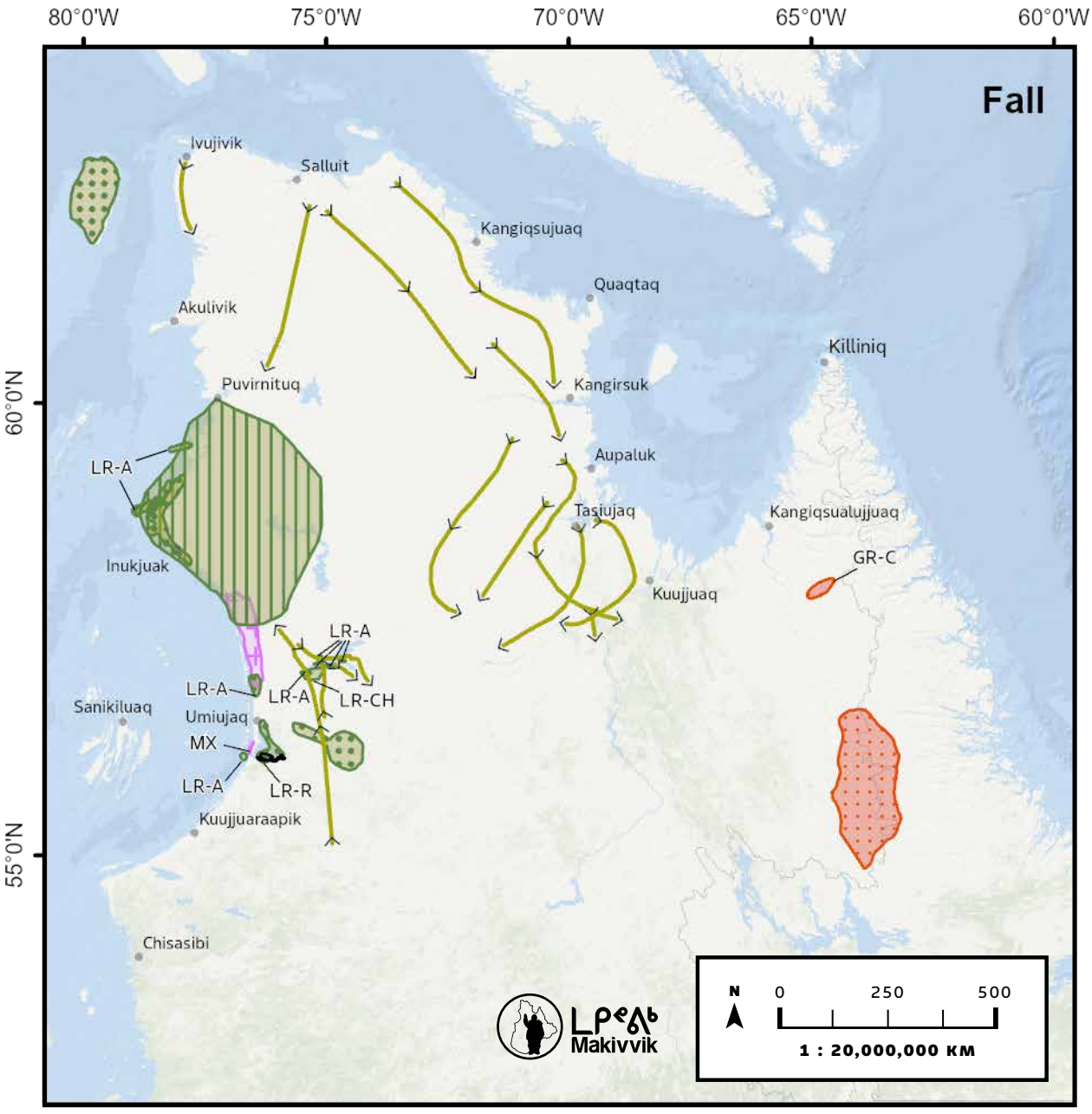
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 6

FALL

Caribou Population Post-Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Foraging
- Leaf River - Rutting
- Mixed or undefined migratory - Calving
- Leaf River - Migration

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area
- Leaf River - Hunting route
- Muskoxen
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

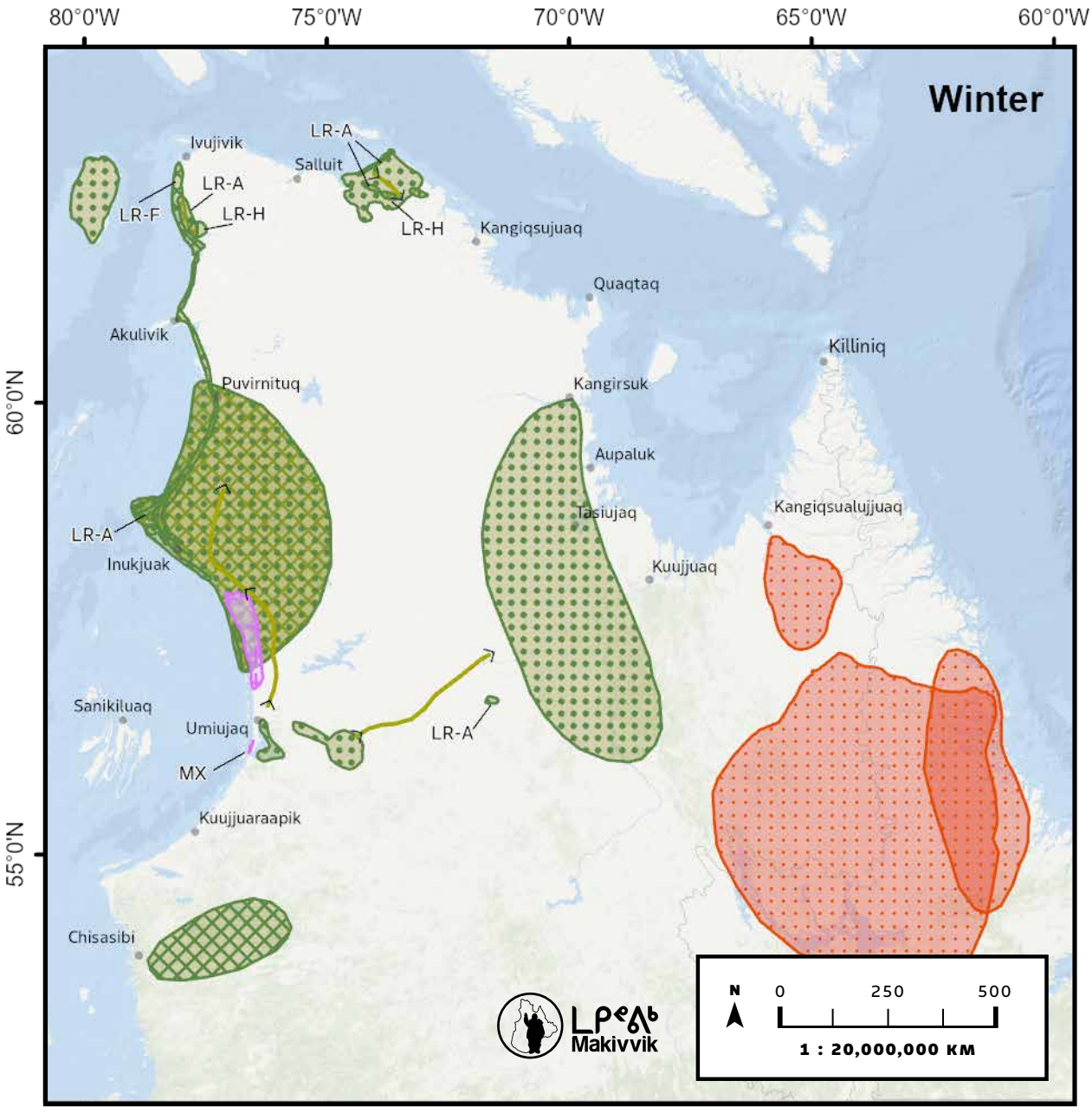
Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

MAP 6

WINTER

Caribou Population Post-Peak



Caribou herd - features

- George River - Abundance
- George River - Calving
- Leaf River - Abundance
- Leaf River - Calving
- Leaf River - Foraging
- Leaf River - Rutting
- Mixed or undefined migratory - Calving
- Leaf River - Migration

Caribou herd - harvesting features

- Leaf River - Camp (hunting)
- Leaf River - Hunting area
- Mixed or undefined migratory - Hunting area
- Leaf River - Hunting route
- Muskoxen
- Community

This map should not be used as a precise indicator of direction, distance or scale and may contain some errors.

Base data Source: ESRI World Ocean Base.

Map Information: Produced in ArcGIS Pro 3.2 using WGS 84 Web Mercator in April 2025 by Nunavik Geomatics.

5.2 REPRODUCTION

Participants from all age groups and communities reported on reproduction, with most references from Kangiqsualujjuaq, Tasiujaq and Salluit. There were some differences between communities reporting on calving based on the time period of the caribou population cycle. For example, during the periods of caribou population low and increase, there were no references made to calving by Salluit participants as caribou had not yet expanded to Salluit at that time.

Participants explained that calving occurs during springtime, and rutting occurs during the fall. During map validation, Salluit participants explained that when geese are migrating, caribou are having their calves. Although some calving areas were reported on as being reoccurring, some participants described calving areas as not occurring in one spot and having the potential to change year to year. Further, an Elder from Salluit recounted observing a caribou give birth while walking, and an Elder from Tasiujaq explained that caribou have their calves while on their migration and while they walk, so calving can happen anywhere.

> *The caribou are migrating all the time. They don't calf on the same spot. They are all over; they calf where they're migrating. They used to calf here a lot before. They calf where they migrate; even when they're walking they calf. –Silas Berthe, Tasiujaq*

Some participants described how females migrate first to get to calving areas, followed by males, and that they come back together during mating season:

> *The females are first, because they have to give birth in a safer place. And the males, they're just waiting for the female to be ready, so they're more slow. They're just waiting for mating season. Fall time, they'll come back together and mate. –Billy Dan May, Tasiujaq*

During map validation, Kangiqsualujjuaq participants described hearing from Elders about how when female caribou are pregnant, they are in a separate group from the males. A Kangiqsualujjuaq Elder recounted that during a hunting trip he saw a group of male caribou with no antlers, a group of pregnant females, and a group of non-pregnant females, all separate, which corresponded to what he had previously learned from Elders. During Inukjuak map validation, participants shared that the pregnant caribou are traveling further inland while the males are closer to the shore.

An Elder in Kangiqsualujjuaq described how in the fall, when rutting occurs, males track females by the scent of their urine, sensed through holes in their feet. Males gather females and there can be almost 20 females to one male. Knowledge of reproduction that is related to periods in the caribou population cycle is described below. In the fall during rutting, bulls become stinky, so harvesters avoid taking them after September, when the scent becomes too strong.

POPULATION LOW

A minority of references related to the period of population low, with most being from Kangiqsualujjuaq and related to calving areas. Elders from Kangiqsualujjuaq described calving areas in the spring and summer around the George River and along the coast west of the community during this time (see Map 3).

POPULATION INCREASE

Similar to the period of population low, a minority of references related to the period of population increase, with most being from Kangiqsualujjuaq and related to calving areas. Calving areas described by Kangiqsualujjuaq Elders focused on inland areas along the George River and along the Ungava coast west of the community (see Map 4). Some participants from Tasiujaq also described a calving area around Leaf Bay in the 1970s.

POPULATION PEAK

Most references to reproduction related to the period of population peak, with contributions from all communities except Umiujaq. Participants described calving areas, and there were also some concerns expressed about human disturbances to calving from industrial development (e.g. noise, light and dust due to the mines near Salluit) and wolf predation by participants from Salluit, Inukjuak and Tasiujaq. Calving areas identified by Kangiqsualujjuaq and Tasiujaq participants during this period included inland around George River and around the Québec-Labrador border, and near Tasiujaq on the Tiercel and Nipper Islands (see Map 5). One calving area was also identified by an Inukjuak participant on a big island that provides protection from wolves, but it was also noted that caribou can calve on any of the islands.

During the population peak, caribou expanded north and Salluit residents started observing calving and rutting. Salluit participants identified a number of calving areas, including inland near Allemand, Nuvilic and Chassé lakes, and along the Hudson Strait coast east and west of Salluit (see Map 5). An Elder from Salluit described how reindeer and caribou in that area coexisted with no issues, except during rutting season:

> *Both species get along with each other. The only time that they don't agree is when they're, when it's rutting season, vying for the females, that's when they're pissed off at each other, the males. Maybe the females are too few, fighting over a few females…It's possible that they inter-breed but I cannot say for sure. –Epervik Parr, Salluit*

During map validation, participants in Kangiqsualujjuaq described how in earlier periods, there was a certain area that caribou would use for calving, but during this period because of the high sports hunting pressure, this caused caribou calving to become scattered everywhere and that calving is still more scattered than it used to be. Participants explained that one outfitting camp could have 13 outpost camps at that time, and it disturbed the caribou calving grounds. Participants did record calving grounds for this period along the Québec-Labrador border, but noted that calving was not contained to these areas because of this disturbance.

POPULATION POST-PEAK

Most references to reproduction related to the period of population post-peak, and overlapped with knowledge shared from the period of population peak. More than for any other period in the population cycle, participants expressed concerns about disturbances to calving related to this period. Similar calving areas that were identified for the population peak were identified for

the period of post-peak, along with some additional areas (e.g. on islands near Inukjuak) (see Map 6). Some participants from Salluit discussed caribou calving occurring below the treeline, inland from the community. Tasiujaq participants echoed this, explaining that it was too hot near Tasiujaq for calving to occur there, and that caribou migrate to more northerly areas for calving, e.g. towards the area of the Raglan Mine, as there are fewer mosquitos and black bears to bother them. Tasiujaq participants noted that in the past year (2020), they had observed more pregnant females walking near the community compared to past few years, where most of the caribou walking by would be males. Participants in Umiujaq described how they see young calves, but not newborn caribou as calving occurs far from their community. An Umiujaq participant expressed that calving occurs inland from the community, but was not able to identify a specific location.

There was also some discussion regarding rutting. An Umiujaq participant identified Lake Minto as a common area for rutting. A few Tasiujaq participants, as well as Elder in Umiujaq, emphasized that the sport hunt affected the number of large bulls present, and thus reproduction, explaining that it has weakened the gene pool and reduced the number of strong young calves being born:

> *If you have two bulls, they're fighting. Back then, there was always extra bulls not fighting and they would mate. But now, because there's less bulls, they're only fighting and the younger bulls, they're with the female…The young male, it makes not a strong baby caribou. –Billy Dan May, Tasiujaq*

An Elder from Salluit expressed similar concerns, explaining that there has been a decline in the number of large bulls as a result of the sport hunt, and that this has affected reproductive success:

> *There's been a sharp decline in real bulls, you know, the ones that carry the thing in front of them, on their antler. The ones you know to be real big bulls, we don't see those anymore, there's been a decline of those. [It's been] over 10 years without seeing a real alpha bull... It does have an effect of calves not being born…It used to be all the cows had young to carry, like the yearling and the brand new. Never that anymore. Just a few females get their calves now. –Epervik Parr, Salluit*

Participants in Umiujaq and Inukjuak echoed these concerns about loss of big bulls leading to impacts on reproduction.

5.3 HEALTH AND BODY CONDITION

Participants shared a number of indicators of herd health over time, based on their observations of animals and on handling and tasting the meat from their harvests. Participants reported on various indicators of individual and herd health including fat and taste; parasites and diseases; and injuries. In addition to being an indicator of health, the taste of caribou meat changes seasonally based on their diet, as well as over time if their diet shifts (e.g. eating more grass recently instead of lichen on the Hudson coast). The taste of meat from males also changes and becomes stinky during rutting season. Females also tend to have more fat than males.

POPULATION LOW

Few observations of body condition or caribou health during the period of population low were shared. An Elder from Kangiqsualujjuaq explained how during the period of population low, the caribou were more skinny and their meat was less fatty and less tender than caribou today. Another Elder from Kangiqsualujjuaq explained that during this period, his cousin saw two caribou that were starving and hardly able to walk, because too much snow prevented them from being able to eat. The Elders explained that they noticed that when a caribou is skinny and the marrow is bloody, this indicates that the caribou has been walking a long time. Elders from Kangiqsualujjuaq also noted that during this period, when they were harvesting caribou fur for clothing, they noticed that when there is more rain in the summer, the fur would grow bigger and faster, just like a plant. It was also noted that caribou meat tasted different during this period because it was prepared differently—in those days, harvesters would cut the legs off, remove the guts and store the legs inside the caribou body, making the animal into a bag. Storing it this way for a while improved the flavour. Today, all the parts are left separate and exposed when the caribou is butchered, which affects the taste.

An Elder from Umiujaq explained caribou were always healthy in his observation during this period, except for one lame caribou. He also noted that during this period, caribou meat tasted very natural because the environment was pristine.

POPULATION INCREASE

There were no specific observations of health or body condition that related to the period of population increase, although some observations from the period of population low may also be applicable.

POPULATION PEAK

Observations of health and body condition during the peak seemed to vary by herd. Participants generally described caribou in the Leaf River herd having less fat and higher frequency of disease during the peak compared to more recent times. For the George River herd, there were observed as being skinnier and with a higher prevalence of parasites and disease after the peak, although there were some observations of disease starting in the late 1980s.

Some participants from Tasiujaq, Salluit and Inukjuak reported that during the population peak, caribou were skinnier. An Elder in Tasiujaq explained that they were not fat because of the high abundance of animals. A middle-aged participant from Inukjuak explained that in the late 1980s, there were lots of caribou all over the place in town, but it was not great because they were skinny and not tasty, as a result of outgrowing the amount of food available. An Inukjuak Elder explained that there had been a high number of caribou passing by in the winter of 2000, and they were lean. He explained that when they are in a big herd, they constantly move and they don't have enough to eat because there are so many of them.

> *We have learned that the population of caribou comes from food source. If there are too many caribou around there might not be food to share around, but that's why we have explained that we have noticed the caribou have no fat, they're not healthy when there are too many, they are not healthy…So in order to have a caribou herd, it's important to keep on harvesting the caribou. –Shaomik Inukpuk, Inukjuak*

> *Well, when there was a lot – like high abundance, they weren't very fat, even the females. Only the males, in the late summer. There were too many. –Silas Berthe, Tasiujaq*

In Salluit, participants explained that the caribou used to be leaner prior the 2000s compared to more recent times. Some Salluit participants also reported encountering a number of health issues during the peak period: yellow pus in the joints of knees and elbows, swollen testicles, rough skin that felt like sand (besnoitiosis), and infected lungs. Some of these issues also extended into the post-peak period.

By contrast, some Kangiqsualujjuaq participants noted that George River herd caribou were noticeably fatter during the peak abundance period than in the post-peak period, when they appeared much leaner. Also, in Kangiqsualujjuaq, an Elder described starting to notice parasites and disease (e.g. white spots on the liver and brain) in the late 1980s. This observation was echoed by the interpreter, who also remembered seeing some white spots on the liver in the late 1980s. Overall, the levels of disease were reported as lower during the peak for the George River herd, compared to the post-peak period.

> *I used to notice those George River herds just before they got away. I noticed that the liver, they have a white spot inside the liver. That would be some kind of sickness and even the brain, they had some kind of spots too. Maybe that's the reason why there were so many caribou dying from that sickness. Sometimes I'm blaming those kind of sickness would kill so many animals. People were starting to notice that they had sicknesses in the liver. That was maybe late 80s up to today. –Kenny Angnatuk, Kangiqsualujjuaq*

At a meeting with the NV and the Anguvigaq of Salluit, participants shared observations of caribou injuries linked to mining operations and operations, including caribou getting stuck on wire fences; getting hit by trucks on the Deception Bay road to the mine; and falling into the Canadian Royalties' Mine tailings sludge, which is more liquid compared to the semi-solid tailings of the Raglan Mine. Participants noted that the mortality numbers from these incidents are not high, but should be considered.

There were a few mentions of other causes of injuries as well. Some participants in Salluit and Kangiqsualujjuaq raised concerns about heavy radio collars injuring caribou:

> *When they are having a collar on their neck, the collar is heavy and in the fall the fur changes, it becomes really short fur, then the collar can be rough on their neck, sometimes almost cutting the meat up to the neck, up to the throat. –Lucassie Etok, Kangiqsualujjuaq*

A middle-aged participant in Inukjuak also raised the issue of caribou and muskoxen clashing, resulting in caribou becoming injured.

POPULATION POST-PEAK

As with the peak period, observations of health and body condition during the post-peak period seemed to vary by herd.

For the George River herd, some Kangiqsualujjuaq participants described observing less fat on the caribou in the post-peak period, and almost all Kangiqsualujjuaq participants reported observing an increase in parasites and disease during the post-peak period. Some noted that the diseases observed were not common before. Conditions reported on were rough or sandy meat (besnoitiosis); a pebble texture of the meat; small white spots on the brain, liver, and meat; white and rotten liver; and puss in the legs and meat. One participant described how in the fall, caribou grow their antlers, but he observed the top antlers falling off, which is abnormal. He thought it may have been caused by the caribou being sick. An Elder described seeing a caribou that was very skinny and seemed to be suffering, so he killed it. Another Elder fed some of the sick caribou to his son's dogs, and it made the dogs sick and unable to get fat. A younger participant explained his observations increasing frequency of disease and lower body fat was occurring at the same time as population numbers of the George River caribou herd were declining. Some Kangiqsualujjuaq participants said that they thought parasites and disease were some of the factors that caused the population to decline.

> *Back then, when I was young I used to follow people who used to go caribou harvesting, and I find that the meat were fatter, they were more healthier caribou. In years when the caribou were starting to diminish, when we would have to look for them further outside the area of the town, we started seeing pebbles on skin and meat and the pelt. We didn't know what it was… It was not often, but when we started seeing less caribou, would see it more often in caribou nearby. There would be some caribou that had that stuff on their meat. We would ask Elders if they knew anything about that, and some of them were surprised of the sandpaper texture on meat and pelt, along with the pebbles. –Jaiku Arnatuk, Kangiqsualujjuaq*

Regarding the Leaf River herd, participants generally reported seeing more fat on the caribou in recent years compared to when population numbers were highest, while reports of disease varied. An Elder from Tasiujaq explained that compared to the skinnier caribou he observed during peak abundance, caribou seem fatter these days, which was echoed by a younger participant who reported observing young males and females with fat around the community. Salluit participants also reported that in the last decade, the caribou seem to be getting fatter than during the peak. Participants in Umiujaq described year-to-year fluctuations in fat. For example, participants explained that in the previous year, changes in weather meant that caribou were not very fat in the fall, though in previous years they had a healthy amount of fat.

With regard to parasites and diseases, Tasiujaq participants explained that in the last two decades, they started noticing caribou starting to get rough or sandy meat (besnoitiosis), and that this was not common before. During a focus group in Tasiujaq, a participant, Billy Cain, brought a chunk of frozen caribou meat that contained small, white spots that looks like thin grains of rice that he had seen for the first time that fall/winter (see following picture). No one in the focus group had

Willie Angnatuk, Billy Cain and Billy Dan May looking at diseased caribou meat during a focus group in Tasiujaq.

PHOTO: AGATA DURKALEC

observed this kind of parasite or disease before in caribou meat. Billy Cain sent it to the Nunavik Research Centre (NRC) for analysis, and the NRC and the University of Saskatchewan identified it as *Sarcocystis rangiferi*. This was the first time that this parasite had been identified in North America in caribou.[6] During map validation, three years later in 2023, a different Tasiujaq participant reported seeing more and more sarcocystis, with at least one out of every two caribou having it.

An Umiujaq participant described encountering caribou with a smelly, greenish-yellow liquid in the joints in recent years, describing this as a new disease that Elders do not talk about existing in the past. Participants in Umiujaq postulated that this was caused by caribou eating salt from the highway, and conveyed that they have heard from Kuujjuaraapik residents that caribou are being negatively affected by eating highway salt. However, during validation an Umiujaq Elder did not think this was related to road salt. Another participant mentioned an instance where the caribou's lungs were not healthy, but the meat appeared to be fine. Another Elder mentioned that caribou will avoid a diseased animal.

In Salluit, participants described observing parasites and diseases such as tape worm cysts, besnoitiosis, lumps, and green pimples, but it was not clear if the level of disease is higher, lower, or the same as during the peak. In Inukjuak, participants described how in recent years, there seems to be less disease than there was during the peak. Nonetheless, there were still some observations of diseases. There were two caribou that were caught by a middle-aged participant in Inukjuak in recent years that were sick: one that was fat but had infected lungs with yellow and green pus, and another that was limping very hard.

An Inukjuak Elder noted that parasites and other organisms were far less common in the past when conditions were colder, but their prevalence in caribou and wildlife has increased as the climate has warmed. He expressed concerned about how this can affect Inuit health as consumers of wildlife.

There were several topics that were raised related to the peak population period, that are also relevant to the post-peak period, including caribou becoming injured from mining operations; injuries from radio collars and clashes with muskoxen, and increasing incidence of parasites and diseases being observed by Kangiqsualujjuaq participants.

Some participants also reported observations related to reproductive success. An Elder from Salluit explained that females are having fewer calves because of the absence of large alpha males—identifiable because of their brow palm on the front of the antlers— due to the sport hunt, noting that he had not seen a large male in the last decade. Similar concerns about the loss of large males on calving were also raised by participants in Tasiujaq, Umiujaq and Inukjuak (also see section 5.2).

6 See an article in Tarralik (Taqralik) Magazine for more details (Cain et al. 2021)

5.4 ECOSYSTEM INTERACTIONS

All communities reported on ecosystem interactions, with most reporting related to food, muskoxen and wolves. While all communities mentioned muskoxen, most of the references were from participants in Inukjuak and Umiujaq, and all mentions of muskoxen related to the periods of peak and post-peak caribou abundance. Other competitors noted by participants were reindeer, and other predators noted were black bears and eagles. Table 5 shows the number of references by participants to different ecosystem interactions, which shows the extent to which different ecosystem interactions (both positive and negative) were discussed by participants.

Table 5. Number of references by participants to ecosystem interactions

ECOSYSTEM FACTOR	POPULATION LOW	POPULATION INCREASE	POPULATION PEAK	POPULATION POST-PEAK
Food	●	●	●●●	●●●
Predators				
Wolves	●	●	●●	●●●●
Black bears	●	●	●	●●
Eagles		●	●	●
Competitors				
Muskoxen			●●	●●●●
Reindeer			●	●

LEGEND: ● : 1-10 references ●● : 11–20 references ●●● : 21–30 references ●●●● : 31–40 references

POPULATION LOW

In reference to the period of population low, some participants discussed food and predators, especially wolves. Some Elders in Kangiqsualujjuaq and Inukjuak discussed how there was less food for caribou to eat after the historical peak and through the period of the low. When asked why the caribou numbers had gotten so low in their parents' and grandparents' time, Elders in Inukjuak and Umiujaq explained that it was the lack of food:

> *In that time the temperature used to be colder, meaning that the plants grow slower. The food source was growing slow and the increasing of caribou was high so they had no more food and they had to go somewhere else. –Shaomik Inukpuk, Inukjuak*

> *I only think that it could what they ate that could be the cause of the low numbers because I know of different kinds of flora that caribou eat and today there's hardly any, so it might have something to do with the amount of and kinds that they have to eat. Even at that time even the berries that they would normally be picking, the crowberry, the cloudberry and the redberry, there was hardly any at that time, so at the same time there was hardly any geese and others that eat berries. There was hardly even birds at that time, they were even affected because of the low amount of food to eat on the land. –Davidee Niviaxie, Umiujaq*

This aligns with the observation by an Elder from Kangiqsualujjuaq that during the period of low abundance, caribou had less fat on them and their meat was tougher and leaner than today. Another Kangiqsualujjuaq Elder relayed an observation from his cousin of two caribou starving during this period of time because they could not access food through the thick snow. In Salluit, a participant recalled hearing Elders describe caribou leaving the area after the historical abundance after a winter where freezing rain left the ground frozen. By contrast, another Elder from Umiujaq explained that caribou were able to forage from a pristine environment and were generally healthy during this period.

Some Elders in Tasiujaq, Inukjuak, and Umiujaq explained that they did not see many wolves during this period.

> *Predators like wolves are more, there's a lot more of them. In the older days, I don't remember seeing any wolves at the time. –Davidee Niviaxie, Umiujaq*

> *If someone said a word of a wolf they would get scared back then because they didn't mention wolves too much. There wasn't too many. –Silas Berthe, Tasiujaq*

> *Back then even if we were far inland, we wouldn't find any wolves. It's only when [the caribou] started coming in big numbers, that's when we started to see wolves. We just knew about them, we never even saw their tracks. –Simeonie Ohaituk, Inukjuak*

One Elder from Umiujaq recounted that though he rarely saw any wolves, he remembers seeing one and the tail was much longer than wolves today, to the extent that the tail was dragging on the ground. He suggested that they may be mixed up with other kinds of dogs now, as they are different than in the past. He also noted that black bear numbers were low at that time.

POPULATION INCREASE

There were few mentions of ecosystem interactions that related to the period of caribou population increase. In relation to food, an Elder in Kangiqsualujjuaq noted that during the late 1970s, caribou moved more inland in the Kangiqsualujjuaq area because they had used up the food. Several participants explained that caribou can deplete the food in an area, leave for several years and then come back when it has regrown.

Some participants described how as the caribou population rose, so did the wolf population. However, only one participant, an Elder, reported specifically on the wolf population during the

period of caribou population increase, explaining that wolf population was abundant during the periods of caribou population increase and peak.

> *Between the '70s and '80s there were so many wolves and there was a guy watching over the land for the wolves. And his name was Bobby May, and he said there was too many wolves…That's when we had more wolves before than today. When we were travelling to Nain by skidoo we have seen dead caribou that had been caught by wolves…[Between Kangiqsualujjuaq and Nain] we noticed that there were a lot of wolves.*
> *–Lucassie Etok, Kangiqsualujjuaq*

One Elder from Kangiqsualujjuaq also mentioned observing caribou being disturbed by black bears and eagles, in addition to wolves.

POPULATION PEAK

Predation by wolves, competition from muskoxen, and other changes that affect vegetation were the primary ecosystem interaction topics discussed by participants in relation to the period of caribou population peak. Some participants across all communities discussed wolf numbers being high during the caribou population peak, which corresponded to the increase of caribou as they are a food source for wolves. An Elder from Kangiqsualujjuaq described how radio collars, which tend to be a visible colour, increase the likelihood that a caribou will be caught by a wolf. A few participants from Kangiqsualujjuaq, Salluit and Tasiujaq also noted that black bears and eagles hunt young caribou. For example, a younger participant in Tasiujaq observed a black bear hiding near a waterfall to get a caribou. An Elder in Kangiqsualujjuaq noted that black bear numbers have been increasing in that area, and participants in Salluit also described increasing black bear numbers, which is new since the climate began warming.

In the late 1960s, muskoxen were brought to Kuujjuaq from Nunavut for an experimental farm, and when their numbers increased they were released and started to travel through Nunavik, including to the Hudson coast.[7] Participants in Umiujaq and Inukjuak agreed that muskoxen began increasing in number in their areas in the 1980s. Participants described how the muskoxen are territorial, and that caribou dislike or are scared of muskoxen and avoid going to areas where the muskoxen are, or even have been. For example, participants in Umiujaq identified areas once used by caribou during the peak abundance period that are now occupied by muskoxen and no longer frequented by caribou. (see areas along the coast between Umiujaq and Inukjuak on Map 5 and Map 6). Inukjuak participants mapped a muskox area slightly inland from the community, noting that it was the first-time seeing muskoxen in the 1980s. A couple of participants suggested that the smell of muskoxen may play a role in caribou avoiding the area. Participants from Umiujaq, Inukjuak and Tasiujaq described how muskoxen also eat the food that caribou eat, reducing the available food for caribou. It was also noted that at times caribou and muskoxen can fight, and

7 In 1967, 15 muskoxen were captured on Ellesmere Island and brought to an experimental farm near Kuujjuaq, which closed in 1983 **(Nault et al. 1993)**. Between 1973 and 1983 55 muskoxen were released **(Nault et al. 1993)**.

caribou can become injured. In Inukjuak, a younger and middle-aged participant described how muskoxen are affecting the migration route of caribou. They are now taking a more inland route, instead of a route along the shore. One Elder in Tasiujaq also noted that he observed an interaction where a muskox and caribou touched noses; no other positive interactions were mentioned by any other participants.

> *The muskox that seems to be more of a problem because the caribou doesn't like being with them and they would eat – they surely were not from here. So they are also fighting over food. And whenever they come – the wolves and the muskox come near the shore, the caribou also leaves. –Inukjuak participant*

> *There was a muskox on the mountain and the herd of caribou was coming to the muskox. They see the muskox, [and] the caribou ran away, back. –Tasiujaq participant*

In Umiujaq, participants described how muskoxen do not migrate the way that caribou do. They stay in the Umiujaq area and south of Umiujaq year-round and breed as young muskoxen have been observed. As noted in section 5.2 regarding reproduction, an Elder in Salluit described how reindeer and caribou coexist with no issues, except during rutting season, indicating that competition with reindeer is not a major factor for caribou.

Some participants discussed changes to the vegetation that sustain caribou. Participants from Umiujaq, Inukjuak and Tasiujaq described muskoxen grazing on vegetation that caribou eat, and thus reducing food availability for caribou. Participants in Umiujaq described significant growth of plants and bushes, which is discussed more in the reference to the post-peak period. In Kangiqsualujjuaq, an Elder noted observing more caribou moss starting in the 1980s compared to before, while a few participants from Inukjuak and Tasiujaq reported that caribou were leaner during their peak because they overgrazed their food source. In Tasiujaq, a younger participant noted that summers have been becoming drier, and that this is having an effect on the food that caribou rely on. In Kangiqsualujjuaq, an Elder described how in the last several decades, there has been more rain in the fall that turns to ice. This makes it hard for the caribou to graze, and is also hard on their hooves. Some participants in Salluit also described freezing rain in early winter becoming more frequent since the 1980s and 1990s, so being observed more frequently during the population peak and post-peak periods compared to the past. Others said that it has always been a problem or that they were not sure about it.

POPULATION POST-PEAK

Similar themes that were discussed by participants in relation to the caribou peak were also discussed for the post-peak period. Changes in vegetation linked to a warming climate were described as causing complex and sometimes contradictory effects on caribou food and land use in recent years. As noted in the period of caribou peak population, there were some observations of increasing plant growth due to a longer growing season in Kangiqsualujjuaq and Inukjuak, but the most significant changes were described by participants in Umiujaq:

> *It used to be just like a tundra, [but] now its bushes. Even if they're just tall [now], there was nothing before. But if they're already there like that, now they are 20 feet…there's bushes taller than muskox… We're right in the middle of these chaotic plants. So bushes growing, so it's still hard to – we haven't even had time to really evaluate what's really happening. We are right in the middle. –Jeremiah (Eddie) Kumarluk, Umiujaq*

The tall new growth of willows and other shrubs was described as affecting caribou movement over the land, but the changes are also so rapid that participants described not yet being able to assess the scope of the impacts on caribou or their own land use. In Inukjuak, an Elder described how lichens are growing faster, and a Tasiujaq Elder described 2019 as a long and productive berry growing season, due to a lot of snow and rain, benefiting caribou. She noticed that Tasiujaq residents were able to order more caribou meat from Hunter Support as a result, as compared to previous years where some caribou meat was ordered from Hudson Bay communities. While climate change has lengthened the growing season, an increase in dry summers was noted in Tasiujaq and increasing incidence of rain in the fall that ices over was noted in Kangiqsualujjuaq. Participants in Umiujaq also discussed the difficulty of caribou grazing when the land has frozen hard after rain in the fall, but noted that in the last three to four years, the ground has not iced over in this way. In Inukjuak, an Elder described how the slow-growing vegetation is just starting to grow back after the depletion that occurred during the caribou population peak.

> *At that time there was nothing left when there were so many [caribou]. And right now, they're just starting to grow back, just now…Some people, even here today, might not know that [in the olden days] there was lichen all around nearby. –Simeonie Ohaituk, Inukjuak*

At the same time, an Elder in Salluit described not noticing vegetation being depleted by caribou to the point that they would have to leave the area. An Elder in Kangiqsualujjuaq noted the same observation, though mentioned hearing from others that caribou had left because they had depleted the land.

As described for the period of caribou population peak, the impacts of muskoxen on caribou were emphasized (see Map 6). In addition to the points noted above, in Umiujaq, a middle-aged participant stated that there have been more muskoxen in the last five years, which has again displaced caribou from areas that they had previously used.

Wolves continued to be described as a significant issue in Kangiqsualujjuaq, Tasiujaq and Umiujaq, and was also mentioned by a participant in Inukjuak.

> *We have too many wolves – like one wolf get maybe five cubs a year. When the hunters from George River, when they're going hunting, they always see a dead caribou killed by a wolf. That's how we know the wolves are hunting a lot of caribou. Just maybe two or three days ago, somebody went fishing to Koroc and they saw some tracks, caribou tracks, chased by a wolf. That's how wolves are hunting – more hunting than Inuit people.*
> *–Willie Etok, Kangiqsualujjuaq*

A younger participant in Inukjuak described how there is a high number of wolves in the treeline that kill a large number of calves when the main caribou population overwinters there. He explained that wolves and soft snow in the treeline causes a very high mortality rate for calves.

Some Salluit participants described a recent decrease in wolves, explaining that they used to see many in large packs 10 years ago following the caribou, now they only see one or two on occasion. One person noted that the numbers seem to be increasing again after being low, while a couple thought that numbers were the same. One person described how if the caribou arrive from the east (Ungava side), more wolves follow than when they arrive from the west (Hudson Bay side)—this may explain some of the variation in wolf numbers observed. As noted for the period of the caribou population peak, an increase in black bear numbers and predation on caribou was brought up by participants in Kangiqsualujjuaq, Salluit and Tasiujaq, and predation on calves by eagles was also mentioned. In Kangiqsualujjuaq, a younger participant described observing a recent increase in numbers of golden eagles, which predate on caribou calves.

5.5 POPULATION PRESSURES

Participants from all communities and age groups reported on population pressures, meaning factors or activities with negative or complex effects on the caribou population. Table 6 lists the different pressures on caribou identified by participants, including ones related to ecosystem interactions discussed in section 5.4 and detailed in Table 5. For clarity, Table 6 only illustrates the extent to which different negative or complex pressures were discussed, not the importance or severity of that pressure.

Table 6 shows that the issues most discussed by participants as affecting caribou populations negatively in recent years are competition by muskoxen (see section 5.4), predation by wolves and black bears (see section 5.4), and sports hunting impacts. The most discussed complex pressures on caribou populations, where there was a combination of positive and negative pressures or the dynamics were unknown, were food availability (see section 5.4), environmental change, and subsistence harvesting impacts. There was also a trend of increasing references to pressures over time, with the fewest mentions of pressures for the period of historical abundance, and the greatest number of mentions for the post-peak period.

HISTORICAL ABUNDANCE

A few participants from Inukjuak mentioned pressures on the caribou population during the period of historical abundance. Some participants described being hearing stories from grandparents of how caribou were overharvested during the historical peak, where some harvesters would take the skin to make clothing and leave the rest of the carcass. Participants explained that numbers began diminishing after this, an experience that was described as teaching or reinforcing the value of not wasting and only taking what is needed (also see section 2 regarding harvesting values).

Table 6. Number of references by participants to negative and complex pressures on the caribou population

PRESSURE	HISTORICAL ABUNDANCE	POPULATION LOW	POPULATION INCREASE	POPULATION PEAK	POPULATION POST-PEAK
Ecosystem interactions					
Muskox competition				⬇⬇	⬇⬇⬇⬇
Wolf predation		⬇	⬇	⬇⬇	⬇⬇⬇⬇
Black bear predation		⬇	⬇	⬇	⬇⬇
Eagle predation				⬇	⬇
Disease/parasites				⬇	⬇⬇
Food availability		⬇	⬇	⇕⇕	⇕⇕⇕
Environmental factors					
Drownings			⬇	⬇	⬇
Environmental change		⬇		⇕⇕	⇕⇕⇕
Other pressures					
Sports hunting			⬇	⬇	⬇⬇
Mining development				⬇	⬇
Aircraft				⬇	⬇
Research and monitoring				⬇	⬇
Roads				⬇	⬇
General increased human presence				⬇	⬇
Commercial harvesting				⬇	
Subsistence harvesting	⇕	⇕	⇕	⇕	⇕⇕⇕

LEGEND: ● : 1-10 references ●● : 11–20 references ●●● : 21–30 references ●●●● : 31–40 references
⬇ Generally negative pressure ⇕ Complex (positive and negative) pressure, or where dynamics are unknown

POPULATION LOW

Changes in environmental conditions and their impacts were described by some Elders in Umiujaq and Inukjuak. Elders in Umiujaq described how during the time of the caribou population low in the 1940s and 1950s, vegetation on the land became scarce, leading to low numbers of animals including caribou. An Elder in Inukjuak explained that temperatures used to be colder, causing plants to grow more slowly compared to today. This meant that after the historical abundance of caribou, vegetation like lichen rebounded slowly and caribou left because of insufficient food.

Some Elders in Tasiujaq, Inukjuak, and Umiujaq explained that very few wolves were seen during this period, and one Elder in Umiujaq noted that he did not see many black bears during this period either (see 3.4.4 on ecosystem interactions).

Some Elders described how fewer numbers of caribou were harvested during this period compared to more recent periods. This is related to a number of factors, including the low numbers of caribou

that were available, the way that Nunavik Inuit society was organized into small family groups that moved to follow seasonal harvesting cycles, the transportation and storage methods at that time that constrained the volume of harvests (e.g. limited room on qamutiks led by dog teams), and the strength of Inuit caribou harvesting values such as not wasting and only taking what was needed (see section 2 regarding harvesting values).

> *Back then and today there's a lot of difference. Back then there were small groups in one settlement, like small family, and today we have villages. Back then we didn't kill many caribou, as today. –Silas Berthe, Tasiujaq*

POPULATION INCREASE

Participants described the roles of wolf and black bear predation, food availability, drownings, and sports hunting as exerting pressure on caribou populations starting in the 1960s, during the population increase, although there were few mentions by participants for this period overall.

As described in section 5.4, some participants described observing how as the caribou population rose, so did the wolf population. Predation by black bears and eagles was also mentioned by one Elder from Kangiqsualujjuaq. Food availability is also discussed in section 5.4, where an Elder in Kangiqsualujjuaq described caribou moving inland because they had depleted food in the area.

The sport hunt for caribou in northern Québec opened in 1964, covering all of the area north of the 50th parallel (Dion 2003). The size of the sport hunt on the George River herd was lower during the population increase compared to the peak period (Couturier et al. 1990). As explained by participants, the effects of the sports hunt on the health and genetic strength of caribou has been cumulative over time. Sports hunting was explained by participants as causing a loss of large bulls that serve as the studs for the whole group, which has caused in the long-term a decline in the number of calves and weakened genetics among those calves that were born. As the effects are cumulative and related to the size of the sports hunt, this pressure is described in more detail in reference to the post-peak period.

In Tasiujaq, a couple of Elders described how in the early summer, when caribou were moving north, they would go to the islands and many would drown in Whale Bay, when the water level was high and many caribou were in the group moving at the same time. The Elders explained that starting when caribou numbers began to increase, there were small numbers of drownings each year, and at times, larger drowning events occurred.

As described in section 1, an Elder from Umiujaq explained that sharing extra caribou meat with dog teams helped ensure that no part of the caribou was wasted. After the sled dog slaughters of the 1950s and 1960s, snowmobiles became the dominant mode of transportation. The Umiujaq Elder explained that ultimately these slaughters and the transition to snowmobiles that they brought about have resulted in more waste, from dog teams not being present to consume caribou remains.

POPULATION PEAK

Participants from all communities described pressures on caribou during the period of population peak. The largest range of pressures was described for this period than compared to any other. The negative pressures discussed the most by participants were muskox competition and wolf predation, while the complex pressures discussed the most were food availability and environmental change. Other negative and complex pressures included black bear and eagle predation, drownings, sports hunting, mining development, aircraft and roads, physical impacts of research and monitoring, commercial harvesting, subsistence harvesting, and general increased human presence.

As described in section 5.4, muskoxen are an introduced species to Nunavik, and participants in Umiujaq and Inukjuak began noticing a rise in muskoxen numbers in their areas in the 1980s. Participants described how caribou avoid muskoxen and areas that they have used, and that muskoxen are territorial and can fight with and injure caribou, in addition to muskoxen directly competing with caribou for food. Additionally, section 5.4 describes participant observations of increasing wolf numbers during the population peak. Increasing black bear numbers were noted by some participants in Kangiqsualujjuaq and Salluit, and in Salluit participants associated this increase with warming temperatures.

Changes in the food availability were also discussed by participants, as detailed in section 5.4. Negative pressures on food availability were reported by a few participants from Inukjuak and Tasiujaq related to caribou overgrazing their food sources, and by participants from Umiujaq, Inukjuak and Tasiujaq related to muskoxen grazing on caribou food sources. During map validation, Kangiqsualujjuaq participants described how caribou would move south when lichens are depleted, as occurred during the peak. They explained that it is known from Elders that it would take many decades for lichens to start growing again on the deep migration tracks of the caribou, and when this has happened, the caribou will start to come back. Complex changes related to impacts of environmental change on food availability were discussed by participants in Umiujaq, Kangiqsualujjuaq, and Tasiujaq, including drier summers that reduce vegetation, increased rain in the fall that turns to ice and makes foraging more difficult, and increased conversion of tundra to bushes, as well as increased growth of plants such as caribou moss from warmer temperatures. Some participants in Salluit also described freezing rain in early winter becoming more frequent since 1980s and 1990s, and an Elder in Kangiqsualujjuaq described how in the last several decades, there has been more rain in the fall that turns to ice, making it harder for caribou to graze. Participants in Salluit described several early winter freezing rain events where many reindeer on Coats Island and Mansel Island starved unless they could get to the mainland, where there were more foraging options.

Changes in environmental conditions were also described by some participants as affecting caribou movement on the land and ice, and at times causing injury or death. An Elder in Kangiqsualujjuaq described how the fall migration route of caribou had changed in southern Ungava Bay from a route along the coast using the ice to in the 1970s and 1980s, when there was more snow and ice in fall, to a more inland route since then. Another Elder in Kangiqsualujjuaq described

how ice is melting from underneath, rather than the air, and that is affecting ice thickness. He described seeing a caribou falling through the ice in the fall and not being able to get back on top, and suggested that more animals are dying like this. Mass drowning events during the population peak were brought up by participants in Kangiqsualujjuaq, Umiujaq and Tasiujaq. Some participants noted a mass drowning event in 1984, where 10,000 caribou drowned in the Kuujjuaq River. Three to five thousand caribou drowned near Tasiujaq in the late 1990s or early 2000s, and a mass drowning of thousands of caribou during the 1990s was also noted in Umiujaq, in addition to drownings with smaller numbers of caribou in that area. During map validation, Inukjuak participants added additional drowning locations from the 1990s in the fall along the coast between Inukjuak and Umiujaq.

> *Going back to research about ice thickness, one time in the 90's, there were thousands that drowned at Minto Lake and we had to go and clean up at Minto Lake. Maybe it would be good for [government] to at least monitor them more, to see if there's drowned caribou in strong flowing rivers, in the spring…We were cleaning the carcasses, [but] we were a little bit late. Most of them were like skeletons on the shore. Most of the ones that were underwater still had some meat. –Umiujaq participant*

Sports hunting was raised as a pressure during the population peak by some participants from Tasiujaq, Salluit, Inukjuak and Umiujaq. During map validation, Umiujaq participants mapped large areas southeast of the community where outfitting camps were active in the summer and fall from the 1980s to 2015, noting that those camps are now being demolished along with camps around Tasiujaq and Kuujjuaq. Anguvigait members shared that based on records left at a camp near Clearwater Lakes, there were 26 bulls removed in a single day during the population peak. Details of the impacts of sports hunting are described in more detail in relation to the post-peak period. During the peak period, there were some regional caribou commercialization initiatives that participants discussed. Makivvik launched an Inter-Community Trade initiative in 1990 and four caribou processing plants were built in four communities that were then closed in 1996 due to lack of profitability (Lanari et al. 2001). Nunavut Arctic Foods also undertook a pilot project to harvest caribou commercially at Mollet Lake, northeast of Kuujjuaraapik from 1999 to 2000. An Elder in Kangiqsualujjuaq explained that 40,000 caribou were harvested for commercial processing as part of the Inter-Community Trade initiative. To be accepted for processing at the factory, the caribou had to be shot in the head and had to be a female or young male. He explained that wrong actions (i.e., actions that are in contrast to the Inuit harvesting values described in section 2) associated with this initiative contributed to the eventual decline of the herd:

> *We had a factory, Makivvik had a factory down there for caribou. I noticed small caribou with no mother because the mother had been killed. They would still have been breast-feeding. I felt sorry for those small caribou with no mother and I had to shoot one small one, the smallest one. When I shot a small one, they all went down, because they have no mother. That time the Makivvik project was so wrong. They made a very big mistake to have a caribou factory in George River. That would be a reason why we have less animals today. –Lucassie Etok, Kangiqsualujjuaq*

Participants in Umiujaq also recalled commercial caribou harvesting, describing how it was good for the factory workers and harvesters. However, a middle-aged participant in Umiujaq that worked as a guide for the commercialization pilot project in Lake Mollet also described how the application of external rules for food safety rather than Inuit knowledge led to unnecessary waste. He described how over a four-week camp, 120 of his caribou were discarded because the butchers deemed the caribou unfit based on looking at the heart. He explained that deciding on the safety of the meat just by looking at the heart is not a typical Inuit practice.

Mining impacts were also noted by some participants in Salluit, while others described impacts as being minimal. At a meeting with some officials from the NV of Salluit, meeting participants described a low number of caribou injury and mortality as a result of mining developments, including: injury from caribou becoming stuck on wire fences; mortality from caribou getting hit by trucks on the Deception Bay road to the mine; and caribou falling into the tailings sludge at the Canadian Royalties' Nunavik Nickel Mine, which were described as more liquid compared to the semi-solid tailings at Glencore's Raglan Mine. Meeting participants also described air and water pollution impacts from mines discharging treated water containing some heavy metals into the Deception River, and from dust. Meeting participants described how there are still stockpiles of crushed asbestos at the abandoned Asbestos Hill Mine,[8] and the old road to the Asbestos Hill Mine, now used to access the Raglan Mine, still legacy chemical residue. Meeting participants described how contaminated dust from the stockpiled asbestos and from road is blown by winds and settles on the vegetation that caribou eat. Disturbance to caribou from noise from blasting and lights was also noted by meeting participants, especially in relation to calving. At the same time, participants in the meeting and Salluit focus group noted that caribou often graze very close to mine sites, explaining that they seem less fearful of mining developments because they know they will not be hunted there.

> *For the Inuit, because we're hunters and we're hunting there, you know, if we come close [the caribou] will run away. But if you're not a hunter, if you're the mine employee and you come around it doesn't matter to them because they're not going to shoot them, right? It seems to be like that every time. –Putulik Papigatuk, Salluit*

The road to the mine was also described by some Salluit focus group participants as helping them access caribou, because they will travel along it to access inland areas. Some participants from Umiujaq and Tasiujaq also described how roads, aircraft and general development and noise in communities also disturbs caribou and adds to cumulative impacts.

Impacts from caribou surveillance and monitoring of relevance to this period was also described by some participants in Tasiujaq, Salluit, and Umiujaq. A participant in the meeting with the NV of Salluit described how mining companies have been doing their own population counts for most of the last two decades, and for most of that time they would fly very close to the herd, causing caribou to avoid returning to places where they were disturbed in this way. Other impacts

8 The Asbestos Hill mine operated from 1972 to 1984 **(Carney 2016)**.

on caribou from research and monitoring noted by participants included stress from chasing, drugging and tagging, and wounds as a result of wearing tracking collars.

Lastly, changes over time in subsistence harvesting practices that have resulted in more pressure on caribou were noted by participants. As explained by a participant in the meeting with the Salluit NV, in the 1940s, 50s and 60s, hunters used to be limited by what they could carry, which was generally one to two caribou. In more recent decades, hunting equipment has changed—powerful guns and snowmobiles mean that harvesters can get and transport 10 to 20 caribou at once. At the same time, many participants described Inuit harvesting values and practices that support sustainable management and use of the herd, demonstrating their continued strength (see Figure 2). Caribou harvesting values and practices, and changes to harvesting practices and skills transfer, are discussed in detail in sections 2 and 3.

POPULATION POST-PEAK

Overall, the caribou post-population peak period had the highest number of references to pressures compared to other periods. Most pressures were the same as for the peak period, although some negative pressures (i.e. muskox competition, wolf predation, sports hunting) and some complex pressures (i.e. subsistence harvesting, environmental change) were described as having intensified impacts. The only pressure that was not a factor in the post-peak period, but was discussed in reference to the population peak, was commercial caribou harvesting. This is because commercial harvesting initiatives ended after the population peak.

As discussed in section 5.4 and above in reference to the peak period, some participants in Umiujaq, Inukjuak and Tasiujaq discussed how over the last several decades, muskoxen have been displacing caribou and competing with caribou for food. In Umiujaq, a middle-aged participant stated that muskox numbers and thus caribou displacement had increased over the last five years. The increase of muskoxen was further emphasized during map validation with the Umiujaq Anguvigaq members and other participants reporting that muskoxen are doubling every two years. Members also noted that the presence of muskoxen around Umiujaq is causing caribou to reroute. Wolf predation on caribou was described as a major issue by participants in Kangiqsualujjuaq, Tasiujaq, Inukjuak and Umiujaq. During map validation in Umiujaq, it was noted that there are lots of wolves in Richmond Gulf. Inukjuak implemented a predator control program in recent years where hunters are paid for each wolf pelt that is received until the funding runs out with the intention of decreasing predation pressure on caribou. At the same time, the number of wolves observed in the last decade by Salluit participants in their area has been fluctuating and generally lower than before, with more wolves following the caribou if they migrate from the Ungava area and fewer if they migrate from the Hudson area. Increased predation by black bears, the numbers of which have been increasing, was brought up by participants in Kangiqsualujjuaq, Salluit and Tasiujaq. Occasional predation on calves by eagles was also mentioned.

Changes over time in subsistence harvesting practices that have resulted in more pressure on caribou were noted by participants, with the most discussion on this topic in reference to the post-peak period. Subsistence harvesting is a complex pressure. For example, the harvesting

animals that offer themselves is a form of respect, and by engaging in this relationship respectfully Inuit can ensure that animals do not leave. Harvesting can help maintain herd health by managing population numbers during periods of high abundance, preventing caribou from outgrowing their food supply and declining in body condition (see section 2 for more discussion). Many participants described employing sustainable harvesting practices that are aligned with Inuit caribou harvesting values, demonstrating their continued strength (see Figure 2). However, participants from all communities also described a rise in the number of undesirable practices today compared to in the past. Specifically, some participants described how some younger and middle-aged harvesters are rushing and chasing the herd, rather than observing the herd first and being selective about which individuals they take; taking as many animals as they can, rather than being careful to only take what is needed; wasting by not using the whole animal; wasting by rushing when they butcher; and not appreciating the full value and goodness of the whole animal (see section 2 for more details). Participants described how a major reason for this is that younger people have access to the equipment to go out and hunt on their own, but disruptions to knowledge transfer mean that many have not fully learned caribou harvesting practices and values from older generations (see section 3 for more details).

> *Back then and today there's a lot of difference…Once the caribou herd arrives everybody's going hunting and they can kill as much as they want. Young people at times they overharvest, especially when someone's not watching and sometimes if they get too many they don't butcher all of it. –Silas Berthe, Tasiujaq*

> *The big part of it is, the fact that no young people are – from a young age not following their fathers or Elders as they hunt. They're not watching them. They're not learning that way, the way we had learned historically. That's why they are – like in the summertime, they shoot at everything, anything that they see. Even if the caribou are sickly, even if they're not healthy, they shoot at them. They shoot at anything. And because they haven't learned and watched the Elders or the parents, how to prepare and harvest animals, they don't know how. –Inukjuak participant*

The pressure from there being a larger human population today compared to the past, and this itself resulting in higher harvesting pressure, was also raised by a couple of Elders in Tasiujaq.

> *So many people are hunting caribou now, nowadays, every community. A hunter can get many. That's why the population is going down. There are other factors too that we don't mention, the wolves, sickness, other stuff. –Moses Munick, Tasiujaq*

Some participants also expressed concern about how selling animals to the Hunter Support Program can motivate hunters to rush and take too many animals. Changes over time in how the program has functioned, with complex results, were also noted.

> *Each community was supposed to come up with a plan to apply the work of Hunter's Support Program. Here, when it first started, they hired two men to do the hunting for those in need, the widows, the Elders and those lacking equipment, so that was how it started. Two people*

> *were hired to go hunting for those people. And then, afterwards, it got all mixed up… now everybody's just using it… Even Elders, even if they harvest [caribou], they don't have time to sell them [to Hunter Support] because young people who don't really take care to properly use all the meat or use all of the caribou, are the ones going before those who can do it properly, and that is an abuse in some way –Simeonie Ohaituk, Inukjuak*

> *It's really different now. Ever since the Hunter Support Program started I know that a lot of caribou has been, some wasted to be sold and it's been like that since the Hunter Support Program started because a lot of them sell to those places.–Davidee Niviaxie, Umiujaq*

> *Sometimes I'm not happy when a lone hunter harvests 10 or 15 caribou to himself. I mean, hey, come on, maybe you have three or four people to get that money together, not just for the lone hunter, which is practice right now. Because if they get so many caribou and they sell it to Hunters Support, they'll get $10,000 instead of $1,000 for selling their catch. That's the way it works right now. –Putulik Papigatuk, Salluit*

Participants in Salluit also discussed how harvesters will share what they do not sell to Hunter Support—they do not keep all the caribou that they harvest for themselves. Some participants also described how the program helps hunters, by paying for their catch so that they can afford to keep hunting. Being able to make money from selling nikkuk, which is generally only made from the hind quarters, was also described as motivating harvesters to take too many animals and also to waste other parts of the animal that are not as valuable for selling on the informal market, within and between communities. Caribou harvesting values and practices, and changes to harvesting practices and skills transfer, are discussed in detail in sections 2 and 3.

Environmental changes that are discussed above for the population peak also apply to the post-peak period. As participants in Salluit explained, "the land is changing." Complex and at times opposing impacts of changing environmental conditions on food availability described by participants during the peak that apply to the post-peak period include: freezing rain in the fall that ices over the land and makes foraging more difficult; reduced foraging areas from increased conversion of tundra to bushes; reduced vegetation from drier summers; and increased growth of plants from warmer temperatures. Additionally, some participants in Umiujaq described how winter foraging for caribou in their area has been easier in the last three to four years from the land not freezing as hard, and an Elder in Umiujaq noted that changes in the land have also changed the taste of caribou. These changes are interacting with diminished vegetation caribou overgrazing and impacts of muskoxen:

> *For climate change, I know for sure that there was a change of their food that they eat in recent years because when there are higher numbers they eat away their food and there's scarce food for them to be healthy… It impacts with climate change, because right now we know that the muskox are more in the south of us, so there's less caribou in that vicinity because they don't want to be near the muskox, even in the summertime. –Simeonie Ohaituk, Inukjuak*

Reductions in ice thickness and extent that affected caribou migration routes and caribou mortality from falling through ice, which were noted in relation to the peak period, were also discussed

in relation to the post-peak period. Some participants noted that there are small numbers of drownings of caribou every year, but did not discuss any mass drownings during the post-peak period. A participant in Tasiujaq also described ponds drying up, and this being another cause of mortality for caribou:

> *There's a lot of mud too, where ponds dry, and they get stuck in dry spots too. That's another mortality cause. We found here by four-wheeler, we found a dry lake and there was maybe seven bull carcasses, all pointing the same way. Like they got stuck and they never moved again. –Billy Dan May, Tasiujaq*

Warming temperatures and their impacts were also described by some participants as affecting caribou movements and use of the land. Participants in Tasiujaq described how caribou move north now to the Salluit area for calving because temperatures are cooler there compared to the Tasiujaq area, and there are fewer black bears and mosquitos in that area as well. An Inukjuak Elder described how there were not as many parasites and other organisms affecting caribou and other wildlife the past when it was colder, but they are becoming more prevalent now that conditions are warmer. Some participants also noted changes in species, which are an indicator of changing environmental conditions. Participants in Salluit described observing new species of insects in recent years, and noted that two wolverines—that usually have a more southerly range—had been sighted in Akulivik in 2019. An Elder in Umiujaq, Davidee Niviaxie, explained that 143 different types of animals migrate through the area, many of which he has documented by name. He also noted that 32 species are no longer found there, while seven new species have appeared that were not historically present.

Some participants described the cumulative impacts of the sports hunt on the caribou population. As described in section 5.2 on reproduction, some participants from Tasiujaq, Salluit, Umiujaq and Inukjuak explained that since its start in the 1960s, the sport hunt has targeted the largest bulls, thus weakening the gene pool and reducing the number of strong young calves being born. During map validation in Kangiqsualujjuaq, the sports hunt was also identified as disturbing calving grounds, and causing calving to become scattered, even to today. It was also noted by some participants that sports hunting goes against Inuit values, explaining that if you hunt for fun or for sport, the animal will leave and it will take a long time for it to return. To relieve pressure on the declining populations, the sport hunt for the George River herd was closed by Québec in 2012, and the sport hunt for the Leaf River herd was closed in 2018, an action which Nunavimmiut had been requesting for years. A middle-aged participant in Salluit noted that he had recently seen his first large bull in many years, while other participants noted that they had still not seen large bulls return after the sports hunt closures, but were hopeful that they would rebound soon. During validation, participants in Umiujaq noted that caribou are getting stronger again now that the bulls are not being taken. One younger participant in Inukjuak noted that the impacts of the sport hunt have varied between the George River herd and the Leaf River herd, and suggested that the sport hunt was a major factor in the recent population decline of the George River herd. He explained that sport hunting of the George River herd has a long history of being based out of northerly outfitting camps, such as along the George and Kuujjuaq rivers, while sport hunting

of the Leaf River herd has generally been based out of more southerly outfitting camps. During map validation, Umiujaq participants added the large areas southeast of the community where sports hunting camps were active from 1980s until 2015 in the summer and fall, noting that these camps are now being demolished. They added that an outfitting camp by Minto Lake was still in use with planes going there from the 1980s until 2023 and people poaching after the closure of the sport hunt.

Some participants from Umiujaq and Kangiqsualujjuaq noted aircraft disturbing caribou purposefully, to divert them for the purpose of sports hunting. A middle-aged participant in Kangiqsualujjuaq described a specific incident in 2000 where he saw a helicopter deploy a loud sound, like fireworks, to scare caribou and cause them to change their migration route from northward to southward. The participant suggested that the intention was to drive the herd towards sports hunting outfitters in the Schefferville area. A middle-aged participant from Umiujaq noted more general observations of this practice. Some Elders from Kangiqsualujjuaq described how a sport hunting camp near Kuujjuaq was making the herds run towards the south, before the sport hunting ban. A younger participant in Tasiujaq noted a general increase in noise, including from airplanes, disturbing caribou.

Mining development impacts on caribou for the post-peak period were similar to those described for the peak. In addition to these impacts, noted above, an Elder in Kangiqsualujjuaq described how a mining road around the Labrador-Québec border (likely associated with Quest's Strange Lake mining exploration site) was built across a caribou trail. He explained that the caribou used this trail starting in the period of the population increase, but no longer use it because of the road, which now block access to their traditional calving grounds. An Elder described how the George River herd also no longer travels to the Voisey's Bay area, because of mining development there. In Umiujaq, impacts of a caribou eating salt from a highway were discussed. Participants described how they found sick caribou two years in a row recently, with bad smelling meat and greenish-yellow liquid in their joints, which is a new condition that they had not observed in the past. Participants described how they have been told by Cree that salt from the highway destroys the insides of caribou, and they thought that the sickness they are observing could be caused by caribou eating salt from the highway.

General disturbance from increased human presence and interactions was also noted by some participants in Tasiujaq, Salluit and Umiujaq.

> *When I was up inland and they were building a road, I was watching caribou coming. But when the dump truck dumped – when the gate slammed – the caribou turned around. So, it's like development in the communities, has an impact. –Willie Angnatuk, Tasiujaq*

At the same time, some participants in Salluit noted that caribou have adapted their behaviour to adjust to increased human presence. They described how caribou have a nose or sensor in between their toes, and that in past if they stepped on a skidoo or ATV trail, they would sense this and run far very quickly, but that today they do not run if they step on these machine-made trails.

Left to right: Moses Ilisituk, Kalingo Angutigirk, and interpreter Paul Okituk in Salluit

PHOTO: AGATA DURKALEC

Some participants from all communities described the physical impacts of research and population monitoring on caribou, specifically related to satellite tracking collars. Some participants in Kangiqsualujjuaq, Tasiujaq and Salluit described observing shorter fur and wounds from tracking collars rubbing the skin on caribou necks. A middle-aged participant in Umiujaq questioned whether having tracking collars could lead to caribou being rejected by other caribou. A younger participant in Kangiqsualujjuaq described how individuals with a tracking collar slow down, and end up being left behind by the main group, leading to the group scattering. A Kangiqsualujjuaq Elder found an empty collar on the land three to four years prior, likely because the caribou had been killed by a predator, and described how tracking collars make caribou more vulnerable to predation:

> *When a female got a collar, and she has a small caribou in the stomach, and she would be more caught by a wolf because she has a collar on her neck. And when the wolf caught a caribou with a caribou in the stomach, then he gets like three caribou in one kill. So I really didn't like to see caribou wearing a collar. –Lucassie Etok, Kangiqsualujjuaq*

Other impacts noted by some Salluit participants were stress from chasing, drugging and tagging, and causing caribou to avoid areas where aircraft would fly too close to them during population counts. A younger Kangiqsualujjuaq participant described how aerial surveys for the Torngat herd are done mid-March, when females are pregnant, and he has observed from aerial survey pictures that the caribou are running away very fast and thus stressed. Close flying was a practice done by mining companies over the last two decades when they were doing their own population counts, but it was noted that this practice was stopped a few years ago, in response to repeated requests from Salluit.

PHOTO (FOLLOWING PAGE): MIKHAELA NEELIN

FINDINGS PART 2

Nunavik Inuit perspectives on caribou management

6. Perspectives on past caribou management

Well, before the introduction of the southern ways, the way Inuit dealt with and managed caribou was the traditional way where we really had no issues. Never had issues with them, but with the introduction of schools and new things in the law, it's really difficult now.

–DAVIDEE NIVIAXIE, UMIUJAQ

Participants from all communities and age groups shared their perspectives on past caribou management. As described in Findings Part 1 and throughout this report, Inuit have always had a traditional management system based on Inuit values. Participants from all communities and across age groups discussed the imposition of external government policies and actions over the last several decades, since Inuit were coerced into settlements.

Participants discussed the slaughter of sled dogs by RCMP and government officials in the 1950s and 1960s, which had numerous negative effects including on caribou harvesting practices; provincially-regulated sports hunting of caribou starting in the 1960s, which has affected caribou herd health and abundance; and the release of muskoxen in Nunavik in the late 1970s and early 1980s, which participants describe as displacing caribou. Participants in Inukjuak explained that the Québec government offered to release the muskoxen, and some Ungava Bay communities agreed, but that Hudson Bay communities were never consulted and the land and caribou are being affected by muskoxen populations. Additionally, some described how external government control and management of wildlife populations generally misunderstands Inuit wildlife management based on harvesting values, and also undermines it.

> *The government does not need to tell the Inuit that they're not – that they're hunting unsustainably because Inuit have always hunted sustainably. There was never an unsustainable hunt going on. –Moses Munick, Tasiujaq*

> *All the old people, they used to talk to me about that, why are we always – we're going to be controlled, we're only allowed this many animals, that's not our way of living… But we are being controlled. All the time. And that's what's hurting all the 14 communities. –Charlie Ikey, Salluit*

Inuit have been regaining authority for wildlife management since the mid-1970s through wildlife management structures created as a result of signing the James Bay and Northern Québec Agreement (JBNQA) in 1975, subsequent agreements with the Québec government regarding

administration and governance in mainland Nunavik,[9] and the signing of the Nunavik Inuit Land Claims Agreement (NILCA) in 2006 regarding the offshore. However, there remains significant gaps in the existing systems. While the JBNQA established the Hunting, Fishing, and Trapping Coordinating Committee (HFTCC), a co-management body that is mandated under the JBNQA to review, manage, and supervise the Hunting, Fishing and Trapping Regime of the Territory and provides for Nunavik representation, it did not formally establish or provide a mechanism to fund the Anguvigait (the local Hunting, Fishing, and Trapping Associations). The fact that the Hunting, Fishing and Trapping Regime of the JBNQA remained silent on the Anguvigait also means that their roles and responsibilities on the Nunavik mainland are more challenging. Anguvigaq, formerly known as the Nunavik Hunting, Fishing and Trapping Association (NHFTA), has represented Inuit hunters, fishers, and trappers in the region since the 1980s with the support of Makivvik. It is represented at the HFTCC through an appointment by Makivvik, as part of the Inuit Party delegation. When the NILCA came into force, it recognized the offshore wildlife management mandate of the Anguvigaq and the Anguvigait. The NILCA also meant that operational funding had to be provided to the Anguvigaq and Anguvigait to enable them to fulfill their roles and functions as regional and local wildlife management actors in the marine region.[10]

As described previously, many participants reported employing sustainable harvesting practices that are aligned with Inuit caribou harvesting values, demonstrating their continued strength. However, for any younger and middle-aged harvesters that are straying from these values and at times using undesirable practices, the current wildlife system makes this difficult to manage at a local or regional level. Subsistence harvesting management issues related to lack of recognized authority of the Anguvigait to make enforceable bylaws for caribou harvesting on the mainland were raised by some participants.

> *[The Anguvigaq of Tasiujaq] made a small bylaw like, for outside hunters [from other communities] – five caribou per hunter. But it's not being obeyed. It's not enough. The springtime is when the rule is followed, but in wintertime, they go everywhere in the land. You don't see them. –Tasiujaq participant*

> *Actually the head office already – the Anguvigaq, the main head, they told us [the Anguvigaq of Umiujaq] to tell – well actually for our [Hunter Support] to stop accepting pregnant female caribou. Because a lot were being killed, because they're usually fatter too… But that happened for one season. Now it's like already forgotten. –Jeremiah (Eddie) Kumarluk, Umiujaq*

9 Specifically, the Sanarrutik Agreement (Partnership Agreement on Economic and Community Development in Nunavik) in 2002 and the Sivunirmut Agreement (Agreement Concerning Block Funding for the Kativik Regional Government) in 2004.

10 See Gombay (2019) for more information on the wildlife management regime in Nunavik.

> *A couple of years ago, when there was a concern raised about the number of caribou in the region going down, when people heard that in some communities like here, this society being a hunting society, encouraged their boys or their kids to at least catch one and several fledgling hunters caught – I don't know, it was not only here but Ivujivik and POV, as well – where a lot of caribou were caught, were caught after the flag you know? [Leaders said] the numbers are going down, slow down on your harvest. Instead of that happening, the harvest increased…That's why it should not be a free-for-all anymore. –Kalingo Angutigirk, Salluit*

During validation, Inukjuak participants added that they are have tried to regulate the hunting of pregnant caribou but that it is difficult to implement. One approach has been for Hunter Support to refuse purchasing caribou meat during March, April, May and June to discourage hunting of pregnant caribou. Lack of organizational capacity and resources for the Anguvigait was also raised, as there is no specific funding for functions related to the mainland.

> *It was a good approach to have Anguvigait to make sure that they're managing their species how they want. However, they are underfunded up to a point where they come up and set their own rules, they don't have the proper resources to do what they actually want to do, if it were to become a reality. –Shaomik Inukpuk, Inukjuak*

Some participants from Tasiujaq and Salluit described the enforcement of existing wildlife protection policies and laws as lacking, and a problem in their communities. An Elder in Salluit also described how lack of clear enforcement powers leads to tensions between families. The Uumajuit Wardens, housed under the Kativik Regional Government (KRG), monitor harvesting activities and regulations but have limited enforcement powers.[11]

11 Uumajuit Wardens can seize catches, but do not have power to seize equipment or arrest people (Gombay 2019). There is to be an Uumajuit Warden or Technician for each community, and the positions have recently been increased to full-time (combined with the Indigenous Guardians program).

Silas Berthe (left) and Moses Munick in Tasiujaq

PHOTO: AGATA DURKALEC

7. Vision for future caribou management

7.1 INUIT-LED MANAGEMENT STRUCTURES AND SYSTEMS

Some Elders from Inukjuak described how all that is needed is for Inuit to follow traditional Inuit harvesting values, which are still being taught by Elders:

> *The teaching of the Elders is ongoing…Not to leave anything behind, even if they will need to put it in the garbage when they get home, but not to leave anything behind except blood. If we are made to be able to manage ourselves, these are the kinds of things we would be doing instead of waiting for other people to come to do it for us. Whenever those in power get an idea to deal with walruses, beluga and, right now, caribou, without involving the communities and the Elders all of this will continue. So we have to be able to do our own message that we've learned historically. We wouldn't have to be doing all this if we were to manage our own way. –Simeonie Ohaituk, Inukjuak*

> *Historically, we've been independent and we've been managing our own lives and our own harvesting, and if we are able to be given some freedom then we could do what we know how to do. Because our harvesting methods are really different [from non-Inuit methods]. And we were taught not to harvest animals who look like leaders, you know.*
> *–Jobie Kutchaka, Inukjuak*

However, most participants across all communities and age groups agreed that they wanted to develop a local, community-based caribou management system, through which Nunavik Inuit could collectively make short and long-term decisions about wildlife management measures as well as promote transfer of Inuit harvesting values and skills, to ensure abundant caribou into the future.

> *It's kind of urgent to get a management board for the caribou, before they decline down too much, and for the youngsters, for sure, they would listen to the management board because they've got ears and they're not fools. –Willie Etok, Kangiqsualujjuaq*

> *I would not want outside influences in managing the caribou because Inuit can do it ourselves. I would want Inuit to work on the conservation plan instead of outside pressure. We would be able to manage it on our own, like making our own rules and if people are not following them then we would be able to deal with it as Inuit. –Moses Munick, Tasiujaq*

A younger participant from Inukjuak described how the majority of harvesters are using traditional best practices, but that there are always a few people who do not. He explained that

community-based management could ensure that the public is well-informed about best practices, and this would help make sure more people follow the traditional rules. In Inukjuak, participants thought it was important to have this documented to be able to show government that they have their own plan in place. A younger participant from Umiujaq described how knowledge is power, and when a community gets together and uses all if its knowledge, it is very strong. Some participants expressed a fear that if Inuit do not lead the development of caribou management, that it will be imposed by government.

Participants suggested the development of local community-based management organizations, a regional caribou management board, a regional Inuit-led caribou management plan, or a combination of these systems. The possibility of strengthening the resources, capacity and authority of existing structures (e.g. Anguvigait) was also described. One Elder from Umiujaq described how instead of having a management board specific to caribou, a broader organization is needed to gather knowledge about and manage all of Nunavik's animals:

> *We need to come up with some kind of animal caring organization that will deal with all different kinds of animals, to keep records and see how they're doing because we only know of three, there's caribou, polar bear, and walrus that are being watched over but nobody else is watching over all the other animals…. We need to have sort of wildlife management so that we all could know what is happening to them before something serious happens. –Davidee Niviaxie, Umiujaq*

Some participants described the creation or strengthening of these wildlife management systems as both being informed by and strengthening Inuit caribou harvesting values and practices, by deciding on rules collectively rather than leaving individual harvesters to manage themselves. A participant suggested that other Inuit regions with caribou management plans can be learned from. Some participants discussed the importance of gathering knowledge to inform caribou management, which is discussed in section 8 regarding perspectives on research.

7.2 LOCAL ENFORCEMENT CAPACITY AND AUTHORITY

Some participants in Kangiqsualujjuaq, Tasiujaq, Salluit, and Inukjuak described how they would like to see strengthened local capacity and authority for enforcement of wildlife protection measures, as well as more Uumajuit wardens.

> *The wildlife officers would need to have powers, rules and regulations that we would recognize that if somebody broke – like hunting a caribou that is pregnant, or newly born calf – if there were rules against [that], you're not allowed to hunt those. They would have to have laws that prohibit the hunters from hunting those, and the penalty that would have to apply that everybody, all the hunters. [We need] people to recognize that if you get such an animal that you're not allowed to, this is what the penalty is. –Putulik Papigatuk, Salluit*

> *The KRG have to start enforcing the law, with their Uumajuit wardens. And, they need to start practicing their power. They need to gain more power to have not the waste that's going on. They're not doing their job right now. –Tasiujaq participant*

An Elder from Inukjuak described how Anguvigait are currently systematically underfunded, so if they were to make caribou management rules, they would need more resources to implement and enforce those rules.

7.3 MANAGEMENT MEASURES

Participants from all communities and across age groups suggested specific management measures that could be considered under an Inuit-led caribou management regime. Measures to manage subsistence harvesting were the most discussed topic, followed by strengthening of knowledge transfer around Inuit harvesting skills and values, predator (wolf) control, competitor (muskoxen) control, exploring herding or penning of caribou, and sports hunt management.

Among measures to manage harvesting, the most discussed topic was preventing harvesting of pregnant females or young calves, by creating a seasonal restriction for harvesting during calving time or a temporary geographic restriction (i.e. a calving sanctuary). This was suggested by some Elders and middle-aged hunters from Kangiqsualujjuaq and Tasiujaq.

> *When they're making small caribou in the area, stop hunting. Block that area. That's what I'm thinking. Mostly hunters are thinking like that. –Kenny Angnatuk, Kangiqsualujjuaq*

Limiting the harvesting season to certain months of the year was suggested by some Elders and middle-aged hunters from Kangiqsualujjuaq, Salluit and Umiujaq.

> *With respect to measures being taken, perhaps hunts should be allowed during a particular part of the season, where the animal has gained weight and the fur, the skin is better to work with. Because it's not like that in the winter and spring, because it hasn't changed colour, I mean, it hasn't gotten refreshed. So we can think about having specific harvesting seasons. This is not to say it should be done but it is an option. –Kalingo Angutigirk, Salluit*

An Elder in Salluit suggested putting measures in place to limit waste by ensuring that harvesters take the whole animal, a younger participant in Tasiujaq suggested restricting the sale of meat. An Elder in Salluit also explained that there has been discussion about limiting the number of catches per hunter. Some participants in Kangiqsualujjuaq, Tasiujaq and Salluit and Inukjuak described not wanting to have a system of quotas or a Total Allowable Take (TAT), with some describing how this has not worked well with beluga harvesting, while an Elder in Tasiujaq described how if the population of caribou keeps decreasing, Inuit may need to set a TAT under an Inuit-led management plan, but that this should be a last resort.

Some participants from Kangiqsualujjuaq, Salluit, and Tasiujaq suggested that there could be penalties set for not following rules to provide a deterrent, such as fines or even temporary confiscation of harvesting equipment. It was also explained that such penalties have very serious and personal consequences for harvesters, so would need to be coupled with education and awareness-raising about the rules and the consequences for breaking them.

Strengthening the transfer of knowledge about good harvesting values and practices was discussed by participants in all communities and among all age groups, including younger participants. Participants emphasized that the knowledge of Elders should be shared with younger generations, and some suggested that a caribou management board could help share Elder knowledge. Strengthening involvement of Elders in schools to teach caribou harvesting skills and values was also emphasized as crucial.

> *It will have to be the youth today who will be left behind to manage all this, so we have to take the time to give them the knowledge. Because even before the communities came into Inukjuak, before they all came here in their clans, in their camps, in their homes, they were able to manage their own whales, their fish, their caribou, their fowl, everything. They follow their traditional ways. So it can be done, it can be done…And if we give [youth] proper tools, they will be able to do it. –Inukjuak participant*

> *I would like to see the youngsters being taught by the Elders, and the Elders would say not to overharvest the animals…If we have a management board, we talk to our young and teach them how and tell them not to overharvest. That's a big point we have to look on today. –Kenny Angnatuk, Kangiqsualujjuaq*

One younger Kangiqsualujjuaq participant stated that there should only be teaching and knowledge transfer, and not a punitive approach. A Nunavik expert that reviewed the report suggested that there should be investment in teaching and knowledge transfer for how to make caribou skin clothing, as this would reduce waste.

An Elder in Salluit also suggested that wildlife wardens should teach good practices for conservation, rather than only being focused on enforcement.

> *What I'd like to see on the whole region…[is to] have the game warden teach the populations of conserving the animals. Teach, not just patrolling. They've got to teach the communities as well, the population, and it would help…You know, we just see them walking around or driving around patrolling, but we don't get to see them teach or mention anything on the radio, nothing. Teach. We've got to learn. The population has to learn how to conserve what we're eating. –Salluit participant*

Predator control, specifically for wolves, was discussed by some participants in Kangiqsualujjuaq, Tasiujaq, Inukjuak and Umiujaq, spanning all age groups. Some participants suggested putting a higher price on wolf pelts to encourage hunting and one participant suggested developing a sport hunt for wolves. In Inukjuak, there has been an increase in the cost paid for each wolf pelt recently in order to reduce wolves and increase the caribou population. During the validation workshop, participants stated that this initiative is important and would like this program to be further supported. An Elder in Inukjuak explained that predator control is an effective management practice:

> *In my time, I grew up when there were so many eider ducks, so many ptarmigans, so many birds like fish. There were so many birds when there was fish growing up. That is because my father was harvesting so many foxes… So many pelts harvested, so many foxes harvested, and we were able to see fox furs hanging in front of our Hudson Bay Company post…And now we're not harvesting foxes as much as we could, so there are a lot less birds now. The bird population is declining now. So in order to properly manage whatever species, the best management practice is to take care of the predator control. Therefore, I would propose that some sort of incentive to capture a wolf would help a lot if we were to conserve or protect the caribou herd. –Shaomik Inukpuk, Inukjuak*

There was general agreement among participants in Inukjuak and Umiujaq, among all age groups, that muskoxen needed to be controlled or eliminated, as they are an introduced species that Nunavik Inuit did not ask for and that most do not eat. Participants in these communities suggested opening a sports hunt for muskoxen, or paying harvesters to kill them. A couple of participants from Salluit suggested that more research on the impact of muskoxen is needed to confirm their impact on caribou, so as to inform muskox control measures.

Some Elders in Kangiqsualujjuaq, Tasiujaq and Umiujaq and a Nunavik expert that reviewed the report suggested that caribou herding or pasturing in fenced areas could be explored, adapting the approaches of Sami reindeer herders. At the same time, an Elder from Tasiujaq stated that it would not be healthy for the caribou to be penned in fences.

Lastly, an Elder in Salluit suggested that killing caribou for sport should stop. Changes to manage the sports hunt was not discussed beyond this, as there are already sports hunting bans in place for both herds.

Elijah Emudluk (left) and interpreter Tommy Unatweenuk in Kangiqsualujjuaq

PHOTO: AGATA DURKALEC

8. Perspectives on research

8.1 PERSPECTIVES ON PAST RESEARCH

Participants from all communities and age groups discussed perspectives on past research on caribou. The main topics discussed were: issues with community engagement and control over research; treatment of Inuit knowledge; and issues with caribou research methods based in Western science.

Inadequate community engagement by researchers from outside Nunavik was raised by participants from all communities, including inadequate consultation, communication and approval-seeking before research takes place, and inadequate sharing of results. In general, participants were not aware of caribou research that is taking place, except for population surveys and satellite tracking using collars. Those that were aware of other caribou research projects were not aware of results, or how to find them. Some participants in Tasiujaq noted that they hear some results shared at the Anguvigaq Annual General Meeting, but more is needed, while others suggested that researchers have not been coming to their communities enough to share results.

> *A lot of the times there's no consultation concerning research programs. Only after-the-fact, after the research was done and report made they said we did this. And [the report is] three years old. –Salluit participant*

Some participants described how they used to have access to weekly data from the satellite tracking collars, but that this has changed. Participants expressed frustration that they and even the Uumajuit Coordinator in the community no longer have access to this data.

Participants in Tasiujaq and Inukjuak described significant past efforts to document Inuit knowledge, and how these sources of Inuit knowledge are "collecting dust" and have not been used enough. For example, participants described how after the JBNQA was signed, Makivvik carried out a multi-year initiative to document Inuit land use and more recently, the Nunavik Marine Region Planning Commission (NMRPC) carried out an extensive study to document Nunavik Inuit land use and occupancy.

Some participants discussed how Inuit knowledge has been ignored or has been secondary in research the past, and that this has been detrimental.

> *The southern people have never having been chatting to Elders to learn about their knowledge of caribou, and being one-sided has not really helped the region. The Inuit knowledge part has always been missing. –Davidee Niviaxie, Umiujaq*

Further, participants explained how authorities have given primacy to research using methods based in Western science, but lack of Inuit knowledge in these studies affects their validity and

thus community trust in the findings. Some participants in Tasiujaq, Salluit, Inukjuak and Umiujaq raised concerns about the accuracy and validity of caribou population surveys. Participants explained that the caribou are always moving around, and based on their observations of caribou numbers the surveys done only capture part of the population. Some also explained that external researchers are designing the geographic scope and timing of surveys without the guidance and input of Inuit, and as a result are missing large portions of the population in their counts. In Inukjuak, a participant gave an example of a caribou population survey approximately five years ago where researchers focused their counting efforts on the typical caribou wintering grounds around the tree line near La Grande, but that year the caribou were all wintering around the shoreline and islands between Inukjuak to Chisasibi. As a result, many caribou were missed in the population count. Some participants also gave examples of researchers observing fewer animals than they did, leading to further concerns of animal counts being under-estimated in surveys. Some participants also discussed how the collar tracking system does not necessarily give an accurate representation of where caribou are, because caribou travel in many small and large groups, while only the groups with the collared caribou are tracked.

> *All kinds of animals, whenever they count surveys we always tend not to believe them because they tend to count them at the wrong time and wrong places.*
> *–Simeonie Ohaituk, Inukjuak*

> *In the past, like 10, 20 years ago we used to try and follow the tracking system where the caribou might be. But they were always never really true or maybe it was just one caribou that had a collar, and we think there like hundreds where the collar is, but it wasn't.*
> *–Umiujaq participant*

Additionally, participants in all communities described concerns about impacts of research on the well-being of caribou, especially related to detrimental impacts of satellite tracking collars, as well as stress from close proximity during aerial surveys. These impacts are described in detail in section 5.5 regarding pressures on caribou during the post-population peak period. Lastly, some participants explained how research has led to negative impacts on Inuit in the past, and as a result there is fear about the potential negative impacts of research. For example, participants explained that in the past, when research on beluga showed a decrease in abundance, Inuit knowledge was put aside and quotas and closures were imposed.

8.2 FUTURE RESEARCH NEEDS

Participants from all communities discussed research needs and gaps that should be filled, and shared their visions for how research on caribou could be improved overall.

The need for improved community engagement by external researchers was discussed by participants from all communities and across age groups, especially better communication and engagement during the planning and design phase, and improved sharing of results. Some also discussed the need for greater control over external research, rather than just being more

Caribou hide drying during workshop in Kangiqsualujjuaq

PHOTO: AGATA DURKALEC

informed. Greater Inuit participation in research, as well as greater inclusion of Inuit knowledge was also suggested by participants. Some also noted a desire to move to more Inuit-led research, and the need for research to inform wildlife management.

> *There needs to be an organization that deal with different kind of mammals [where] the Inuit knowledge be treated as the same level as the scientist. That our knowledge be integrated and followed and make sure that the white man and the Inuit knowledge are both taken at same level. –Davidee Niviaxie, Umiujaq*

Some participants described this study of Nunavik Inuit Knowledge of Caribou as a step in the right direction, in terms of documenting Inuit knowledge so that it can become foundational to how caribou are managed in Nunavik.

> *The government has always been treating us like children, and we are tired of that. And this [study] is a good step to work towards them finally listening to us. And because even as there are few now, a lot will be gone from knowledge but we should do what we can. –Simeonie Ohaituk, Inukjuak*

> *Historically the numbers of the caribou has always been fluctuating. Years back there was – used to be huge numbers and then in the recent years there was a lot less, and recently there's been more and we have to hold certain places to harvest, so I feel that this [study] is the right kind of work that we need to do to properly take care of the herds that we hunt from. –Inukjuak participant*

Participants from Tasiujaq, Salluit, Inukjuak and Umiujaq and across age groups shared ways that research using western scientific methods could be improved. Participants suggested that researchers should use and build on documented Inuit knowledge; involve Elders throughout studies; and ensure accurate translation and interpretation so that Elders can participate and so that Elder knowledge is accurately represented. Additionally, specific to populations surveys, participants suggested that researchers consult with knowledge holders during the planning and design phase to ensure the best timing and geographic range for the survey; time the population count for June when the caribou have a white coat and the land is brown, to ensure caribou are not missed; expand the geographic scope of aerial surveys to include more areas on the Hudson coast; conduct aerial surveys at a higher altitude to avoid putting unnecessary stress on animals, especially pregnant females. Specific to studies using satellite tracking collars, some participants were not in agreement with the collars being used at all, some suggested that the collars should be redesigned to be lighter in weight and not rub or hurt the necks of caribou. Some participants discussed how collars should be removed from caribou after a year, instead of burdening caribou for year after year. Concerns raised about the bright colour of collars increasing predation indicate that a less visible colour may also be an improvement.

Participants from all communities and age groups suggested numerous topics that they would like researched. The extent of impacts of wolves on caribou was the most frequently discussed

research priority. A younger participant in Inukjuak suggested that Inuit could learn from Cree around James Bay to better understand wolf impacts on caribou.

> *The wolves are hunting and they're killing more than the hunters. And we need to study them, we need to find out exactly how many they are killing here. And we're talking about lots of wolves now, and lots of caribou chased by wolves. It's important, we cannot eat properly now, because of the wolves. We need to study that. –Sammy Unatweenuk, Kangiqsualujjuaq*

Though muskoxen impacts on caribou were a major topic of concern expressed by communities, minimal questions or research topics regarding muskoxen were shared. Nonetheless, based the concerns raised by participants, research regarding muskoxen impacts on caribou would align with community interests and concerns. Potential management options regarding wolves and muskoxen suggested by participants (e.g. increasing the price of wolf pelts, developing sport hunt for wolves and muskoxen) could be fruitful topics for research.

ALL SUGGESTIONS FOR RESEARCH MADE BY PARTICIPANTS ARE LISTED BELOW:

- Research on the extent of predator impacts on caribou abundance (wolf, black bear)
- Research on the effects of contaminants on caribou health, specifically road salt (near Umiujaq), and mining reagents and dust from mining (near Salluit)
- Research on the impacts of muskoxen on caribou
- Research the effect of the northward migration / range extension of moose on caribou
- More accurate information on caribou abundance
- Research on herd health, as well as why population numbers are going down (and in years when the numbers go up, why that is)
- Monitoring of parasites and diseases, especially new ones due to climate change
- Monitoring of caribou drowning events
- Research on changes in caribou reaction to people (less afraid today than in past), and any changes in their capacity to smell
- Research on differences between herds (migration routes, genetics)

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