NORTH BAFFIN CARIBOU INUIT QAUJIMAJATUQANGIT STUDY

September 1, 2025

FINAL REPORT

Qikiqtani Inuit Association

North Baffin Caribou Inuit Quajimajatuqangit Study

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Disclaimer:

The information contained in this Report is based on research conducted by Qikiqtani Inuit Association, with support from Firelight Research Inc., as well as published works and archival research. It reflects the understandings of the lead authors and is not intended to be a complete depiction of the dynamic and living system of use and knowledge maintained by Inuit. It may be updated, refined, or changed as new information becomes available. Mapped information collected as part of this Study is based on a focus group and workshop with Mittimatalik HTO, Sanirajak HTA, Clyde River HTO, Igloolik HTO, Arctic Bay HTO, Kimmirut HTO, Kinngait HTO knowledge holders conducted within constraints of time, budget and scope. Where relevant, mapped information from previous Inuit Quajimajatuqangit studies and engagement with Inuit is also included within this Report. Base map data originate from the National Topographic System and Natural Resources Canada. The information contained herein should not be construed as to define, limit, or otherwise constrain the Nunavut Agreement rights of Inuit.

EXECUTIVE SUMMARY

The Qikiqtani Inuit Association (QIA) with support from Firelight Research Inc. (together, the Research Team) undertook a north Baffin Caribou Inuit Quajimajatuqangit (IQ) Study to document Inuit Quajimajatuqangit in relation to caribou in north Baffin, understand how caribou are impacted by the Mary River Project, and determine how best to mitigate and monitor these impacts. The Study involved working with Hunters and Trappers Organizations / Associations (HTOs/HTAs) and community members from communities affected by the Mary River Project to verify and map the sensitive areas for caribou and gather IQ related to caribou on north Baffin. This Report provides confidential IQ related to Inuit knowledge and stewardship of north Baffin caribou, impacts of the Mary River Project on north Baffin caribou, caribou habitat areas that Inuit knowledge holders identify are impacted by the Mary River Project, and perspectives on monitoring and mitigations specific to caribou.

This work builds from Phase 1 of the research, which compiled all available information on north Baffin caribou into a confidential literature view. To gather and interpret additional knowledge specific to this Study, the Research Team held a focus group (additional knowledge collection) and workshop (knowledge interpretation) with Mittimatalik HTO, Sanirajak HTA, Clyde River HTO, Igloolik HTO, Arctic Bay HTO, Kimmirut HTO, Kinngait HTO knowledge holders. Additional spatial data from past Inuit Quajimajatuqangit studies and engagement with Inuit were used to inform the discussions during the focus group and workshops and are reflected where relevant within the maps of this Report. Discussion topics during the focus group and workshop were limited to the north Baffin region, including the current locations of Project components and areas of future development.

The focus group included 14 representatives from 5 HTOs/HTAs: Mittimatalik HTO (3 participants), Sanirajak HTA (4 participants), Clyde River HTO (3 participants), Kimmirut HTO (1 participant), and Igloolik HTO (3 participants). During the focus group, the Research Team worked with participants to review and confirm Inuit Quajimajatuqangit compiled as part of the literature review, and gather additional Inuit Quajimajatuqangit to fill in the gaps identified in the literature review. Topics discussed as part of the focus group included:

- Seasonal resource and habitat needs for caribou on north Baffin;
- Cycles of caribou populations on north Baffin;
- Different caribou sub-populations on north Baffin;
- North Baffin caribou sensitivity to disturbance during different times of year and phases within their population cycle
- Important caribou habitat areas on north Baffin; and
- Suggestions for ways to monitor caribou on north Baffin.

Following this focus group, the Research Team held a workshop with 12 representatives from 7 HTOs/HTAs from Mittimatalik HTO (2 participants), Sanirajak HTA (1 participant),

Clyde River HTO (1 participant), Kimmirut HTO (1 participant), Igloolik HTO (1 participant), Arctic Bay HTA (1 participant), and Kinngait HTO (5 participants). The workshop involved verifying key messages from the focus group, gathering additional Inuit Quajimajatuqangit where gaps still remained, and interpreting the knowledge into management recommendations. Topics discussed as part of the workshop included:

- Impacts of industrial disturbances on caribou on north Baffin;
- Distance at which Inuit have observed that caribou behaviour suggests impacts from the Mary River Project;
- Areas that should be protected from disturbance for caribou in the vicinity of the mine site; and
- Other mitigations for impacts to caribou on north Baffin.

Through the engagements, participants conveyed the importance of IQ, including the holistic nature of IQ and its vital perspective in examining impacts across the land, water, air, humans and animals. Participants highlighted the importance of IQ in guiding monitoring, mitigation, and management activities associated with caribou on north Baffin.

Participants identified different populations of north Baffin caribou, and noted their use of distinct areas and migration routes, as well as differences in behaviours. For all caribou on north Baffin, participants agreed on the timing for seasonal activities, including spring migration (April to May), calving (June to July), post-calving (July to mid-August), fall migration (mid-August to October), rutting (September to October) and wintering (October to March), with caribou moving to higher elevations from December to March.

Participants shared their insights on population trends and cycles for north Baffin caribou, including caribou behaviour, habitat use, sensitivity, and fluctuations in health throughout the phases of the caribou population cycle. Cycles in the caribou population are largely driven by food abundance and timing can vary, with faster cycles of approximately 25 years during years with warmer temperatures.

Participants shared that other factors beyond human disturbance can impact caribou, including climate change and changes to weather, which can impact caribou's ability to access certain areas in the wintertime and the likelihood of winter survival. Warming fall temperatures also trigger the increase of rainfall instead of snow, causing problems for foraging caribou. Participants also mentioned that the presence of other species, specifically wolves and geese, have been linked to the reduced occurrence of caribou in the area.

While participants observed that caribou are sensitive to disturbance at all times, and during all periods of their population cycle, participants emphasized that this sensitivity is increased when they are in periods of natural stress (e.g. calving; low phase of their population cycle). Participants shared that Inuit hunters avoid harvesting caribou during spring migration and calving and instead hunt later in the year when caribou are fattened up, providing important IQ guidance about how to avoid impacts to caribou populations over the long term.

Participants shared IQ related to north Baffin caribou and the current Mary River Project, as well as the future southern railway route and Steensby port, including the importance of the area for caribou migration and movement, calving, and wintering. Participants noted important routes for caribou migration around the existing Mary River Project and future southern railway route and Steensby port. Participants shared the expectation that caribou using these migration routes near the future Steensby Port and southern railway corridor would be impacted. Regarding harvesting areas, participants noted that areas around the Steensby Inlet are traditional caribou harvesting grounds.

Participants reported recent observations of north Baffin caribou near the existing Mary River Project and the future southern railway route and Steensby port, with caribou being seen near the Mary River mine site at the end of April to early May of 2024, while large numbers of caribou were observed in the Steensby Inlet area as recently as May 2024. Despite these recent observations, participants also noted that the current project activities have caused a variety of impacts on caribou migration patterns, habitat use, and Inuit hunting practices. The Mary River area is an important habitat area for caribou and since operations commenced, participants have observed that the increase in operational activities such as traffic, helicopter overflights, and mining have prompted caribou to avoid the area in recent years. The mine site has also negatively impacted Inuit hunting routes and methods, as hunting grounds used previously no longer have caribou and hunters are now required to travel further. Participants linked the accumulated dust from mining activities to the disappearance of the caribou, and noted higher levels of glacier melt due to dustfall.

With respect to the potential impacts of the future southern railway corridor and Steensby Port on caribou, participants predicted similar consequences to those experienced with the existing Mary River Project. Concerns noted by participants included: disruption of migration routes, disruptions to caribou habitat use, and subsequent impacts to Inuit hunting areas caused by construction and ongoing operations. Specific to the southern railway corridor, participants raised concerns about specific impacts to caribou from the construction and operation of the railway, including the risk of caribou being struck by trains..

Based on a review of IQ from previous studies (2019 and 2020 interviews from the Qikiqtani Inuit Association’s Tusaqtavut studies) and IQ shared from participants during the engagements, Inuit have observed impacts on north Baffin caribou and their habitat in areas that overlap with the existing footprint of the Mary River Project and extend beyond the existing footprint. These impacts include, but are not limited to, general disturbance from project-related activities, including increased noise, blasting, and dust generation leading to fewer or no caribou being seen in harvesting areas, calving areas, and other areas where they were seen in the past, and perceived contamination of caribou hunting grounds via dustfall.

During discussions on ways to monitor north Baffin caribou, participants highlighted the importance for Baffinland to appropriately incorporate IQ into work plans and caribou monitoring programs at the Mary River Project. Participants also requested that more of the caribou range be monitored. Participants expressed their general distrust in the validity of the survey results Baffinland has reported in the past, and recommended that independent, third-party monitoring by an organization trusted by Inuit be involved in collecting monitoring data so that Inuit can trust the results.

Participants stressed the importance of collecting baseline information on caribou and monitoring them in the southern region of the Mary River Project, before construction starts. IQ is an important part of caribou monitoring that must be included. Participants shared different ideas for how IQ could be brought to the forefront of caribou monitoring, including: establishing a caribou committee to discuss annual caribou trends, setting up a call-in line where hunters and land users can report caribou sightings, and hiring community caribou monitors.

With respect to a more western science-based approach to collecting data about caribou on north Baffin in the vicinity of the mine, participants were supportive of the idea of using wildlife cameras to monitor caribou. Participants suggested that cameras could be placed along the southern railway corridor and other migration routes to monitor for changes in caribou activity and caribou crossings. As well, participants noted that it would be important to have wildlife cameras placed in the surrounding landscape, along migration routes and within important caribou habitat. Regarding the use of satellite collars, some participants were supportive of using collaring, while other participants expressed strong opposition to collaring caribou. Concerns expressed by participants related to collaring caribou included impacts to the health of caribou, the risk of placing too many collars on caribou, and the use of methods that do not follow appropriate stewardship protocols based on Inuit Quajimajatuqangit. Participants shared an interest in using other methods for monitoring caribou, including noise monitoring devices, use of drones, smaller tracking devices than collars, and taking photos when doing aerial surveys. Further details of recommendations from participants related to monitoring and mitigations are provided below.

Related to stewardship of caribou on north Baffin Island, participants provided guidance and recommendations across five primary themes:

- Inuit Qaujimajatuqangit must play a critical role in guiding the stewardship and adaptive management of caribou on north Baffin;
- Disruption to caribou during sensitive periods in their seasonal round and population cycle must be avoided;
- Sensitive areas around the Mary River Project must be protected;
- Actions must be taken to protect and support caribou movement through the Mary River Project area; and
- Management decisions must be guided by monitoring and adaptive management.

This Report lays a foundation for the integration of in the development of a revised zone of influence around that Mary River Project, and delineation of areas that should be prioritized for protection. Information shared on the distance from the existing Mary River Project at which caribou experience impacts, and the areas around the Project that should be prioritized for protection, provide important guidance for Baffinland to integrate into their mitigation efforts at this time. However, the knowledge shared should be considered draft and will be subject to refinement through ongoing monitoring efforts, particularly by IQ-holders

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ACRONYMS AND ABBREVIATIONS

HTA	Hunter's and Trapper's Association
HTO	Hunter's and Trapper's Organization
IAKK	Inuit Avatimut Kamattiarnirmut Katimajiit
ICA	Inuit Certainty Agreement
ISP	Inuit Stewardship Program
IQ	Inuit Qaujimajatuqangit
NIRB	Nunavut Impact Review Board
NLUP	Nunavut Land Use Plan
PIPR	Production Increase Proposal Renewal
QIA	Qikiqtani Inuit Association
QWB	Qikiqtaaluk Wildlife Board
TEWG	Terrestrial Environment Working Group

1. INTRODUCTION

1.1 OVERVIEW

Caribou are central to the lives of Qikiqtani Inuit communities. As required by the Nunavut Impact Review Board, Inuit Qaujimajatuqangit (IQ) must play an important role in the management and stewardship of resources and values in Nunavut (QIA and BIMC 2014; NIRB n.d.). For many years, IQ holders from the five northernmost communities on Baffin Island (the five affected communities), Mittimatalik, Sanirajak, Clyde River, Igloolik, and Arctic Bay, have been identifying concerns regarding impacts of the Mary River Project on caribou (e.g. QIA 2019a; QIA 2019b, QIA 2021). IQ holders have expressed concerns that caribou are avoiding the existing Mary River Project area, that they can no longer hunt caribou in the existing Mary River Project area like they did in the past, and that the future construction and operation of the southern railway corridor and Steensby Port will impact caribou in those areas as well.

The purpose of this Study is to document all available Inuit Quajimajatuqangit related to caribou on northern Baffin Island, using existing summaries and in collaboration with holders of Inuit Qaujimajatuqangit in this area, to understand how caribou are impacted by the Mary River Project and identify appropriate stewardship protocols for caribou around the Mary River Mine, including mitigation measures and monitoring based on Inuit Quajimajatuqangit. This Report documents the background, methods, and results of the Study. The approach used as part of this Study includes:

- Amass existing Inuit Quajimajatuqangit relating to caribou in the Mary River Project area and the range of north Baffin caribou[1] (the Study Area);
- Review this information with participating IQ holders from all five communities and fill gaps in that knowledge; and
- Work with the Inuit Avatimut Kamattiarnirmut Katimajiit (IAKK)[2] of the Inuit Stewardship Program (ISP) to identify appropriate stewardship protocols around the Mary River Project, including:
    - Areas that are important to caribou around the Mary River Mine that should be subject to enhanced caribou protection measures;
    - Seasons of sensitivity during which enhanced protection measures should be in place; and
    - Recommendations for monitoring programs, to ensure that IQ can continue to inform management of impacts to caribou around the mine going forward.

The Study was initiated after engagements between the QIA and Baffinland Iron Mines Corporation (Baffinland) on the Production Increase Proposal Renewal (PIPR) for the Mary River Mine, to help inform future efforts by Baffinland and the Terrestrial Environment Working Group (TEWG) to implement caribou protection zones and protection measures for the Mary River Mine. The Study has been made possible by funding provided by Baffinland to the Inuit Stewardship Program (ISP). Established by

[1] Section 1.2.2 describes caribou groupings on Baffin Island in more detail.

[2] The IAKK is the central committee of the ISP which guides decision making related to the program.

QIA and Baffinland to fund, design and conduct Inuit-led research on matters related to the Mary River Project, the ISP is intended to enhance Inuit participation in the stewardship of the Project by focusing on Inuit-identified priorities and ensuring that the measurement of Project effects meets Inuit goals.

This Study included participants from Mittimatalik HTO, Sanirajak HTA, Clyde River HTO, Igloolik HTO, Arctic Bay HTO, Kimmirut HTO, and Kinngait HTO and focused on caribou in north Baffin Island.[3] For the purposes of this Report, there are references to the existing Mary River Project infrastructure and activities (i.e. existing components like the Tote Road and Milne Port), operated by Baffinland, and future components of the Mary River Project (i.e. components that are planned to be built, including the southern railway route, and Steensby Port).

Knowledge shared with the Research Team[4] by participants and presented in this Report is based on current and available Inuit Quajimajatuqangit in relation to Inuit lands on north Baffin. The Report provides information on the ecology of north Baffin caribou, including seasonal habitat needs, behaviours, and locations, areas of Inuit harvesting of caribou on north Baffin, descriptions of population cycles, and sensitivities of caribou on north Baffin. Maps and descriptions of caribou seasonal habitats, Inuit caribou harvesting areas, impacts of the existing Mary River Project, recent sightings of caribou near Steensby Inlet, and recommended protection areas are included within the Report. IQ and Inuit perspectives of possible monitoring methods and mitigations that were shared with the Research Team are described along with recommendations for improving the stewardship and protections of caribou on north Baffin. As well, this Report includes additional data from QIA's Inuit Quajimajatuqangit database, including information shared as part of the following projects:

- Interviews from 2019 to 2021 that were completed as part of the Tusagtavut Studies;
- Workshops held from October to December 2022 under the joint QIA – Qikiqtaaluk Wildlife Board (QWB) submission for the Draft Nunavut Land Use Plan, including the QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission: Calving and Post-Calving Habitat;
- Interviews completed by ArctiConnexions between November 9 and 14, 2024;
- Arctic Corridors: Research for policy on shipping governance in Arctic Canada;
- Baffinland Traditional Knowledge Study dataset (2008-2009);
- Baffinland's Phase 2 Contemporary Land Use Workshops (2015, 2016);
- Government of Nunavut Coastal Resource Inventory (2008-2015);

[3] The five affected communities for the current MRP include Mittimatalik, Sanirajak, Clyde River, Igloolik, Arctic Bay. The IAKK includes membership from two additional southern communities, Kimmirut and Kinngait, who will also be affected by the Steensby expansion.

[4] Qikiqtani Inuit Association (QIA) with support from Firelight Research Inc.

- Inuit Land Use and Occupancy dataset (1974-1975);
- Qikiqtani Inuit Association's Inuit Owned Land Designation dataset (2014-2017);
- Qikiqtani Inuit Association's Strategic Environmental Assessment Consultations dataset (2017 - 2018);
- Qikiqtani Inuit Association's Inuit Qaujimajatuqangit Of Freshwater Study For Baffinland's Mary River Project Specific to the Community Of Mittimatalik (2025); and
- Qikiqtani Inuit Association's Tusagtavut for Phase 2 Application of the Baffinland Mary River Project (separate reports for Pond Inlet; Igoolik and Hall Beach; Arctic Bat and Clyde River).

The Research Team intends for this Report and the information it contains to support the protection of the rights of Inuit related to the use and protection of caribou on north Baffin, as established under the Nunavut Agreement, in Mary River Project-impacted areas. This Report includes confidential site-specific and qualitative information related to north Baffin caribou and the Mary River Project. Site-specific information in this Report includes knowledge and use values reported by participants that are specific, spatially distinct, and that can be mapped.

The Report contains 6 sections:

- Section 1 describes the scope of the Report, background information, and Study limitations;
- Section 2 presents an overview of the Study Area and describes the methods used for the Study;
- Section 3 describes Inuit Quajimajatuqangit and Inuit perspectives specific to north Baffin caribou, including the importance of Inuit Quajimajatuqangit as it relates to caribou on North Baffin, caribou seasonal activities, caribou population trends and cycles, impacts on caribou and caribou sensitivities, approaches for monitoring caribou, and approaches for mitigating impacts on caribou;
- Section 4 includes stewardship direction based on Inuit Quajimajatuqangit;
- Section 5 provides management direction based on Inuit Quajimajatuqangit, including specific mitigation measures; and
- Section 6 provides a summary of findings and a Report conclusion.

1.2 BACKGROUND INFORMATION

1.2.1 Importance of North Baffin Caribou to the Qikiqtani Inuit Association

Caribou are central to the lives of Qikiqtani Inuit communities. Terrestrial harvesting of caribou is integral to the cultural identity of many Qikiqtani Inuit people (QIA 2021). The ritual of harvesting involves time on the land with family, providing opportunity to transfer

skills and knowledge throughout generations (Gunn et al. 2011). Community members describe learning to hunt as joyful, a time to explore the land, and an opportunity to share meat with family (QIA 2021). Community members from Igloolik and Hall Beach describe that the experience of hunting includes many lifeways such as travelling, camping, heritage, and connection to place (QIA 2019b).

The importance of caribou goes well beyond dependence on meat, as they are inextricably integrated into the lives of community members (Environment and Climate Change Canada 2017), providing the basis of culture for people in the Arctic for the last thousand years (QIA 2022). Barren-ground caribou are considered a keystone species,[5] linking their existence to a wide network of species with which the Qikiqtani have strong, historical relationships (Environment and Climate Change Canada 2017).

In addition to the cultural experience of hunting, caribou have significant direct economic value for communities (Environment and Climate Change Canada 2017). Hides are used to create a wide variety of crafted goods, including clothing, hats, books, bedding, and sleds. The creation of these goods integrates caribou deeper into the traditions and roles of all Inuit people harvesting caribou, while providing necessary garments (QIA 2019b). Caribou also contribute economically through subsistence use, wildlife tourism, and recreational hunting (Environment and Climate Change Canada 2017). It is estimated that in these communities, four in ten households consume more than 50% locally sourced meat. This country food represents an important source of nutritious, high-value meat, central to the health of Inuit communities, that cannot be replaced by store-bought food (Kitching 2016).

The Mary River area has long been and continues to be a hunting ground for harvesting caribou meat and hides. Community members from Pond Inlet have travelled to the Mary River area for generations to hunt caribou. The continuity of use in the area is highlighted as being of the utmost importance to Pont Inlet community members (QIA 2019a).

1.2.2 Caribou on North Baffin

Caribou occur throughout most of Baffin Island. From a regional perspective, both IQ and western science provide evidence of different “groupings” of caribou in distinct locations across the Island.[6] Both IQ and science describe these groupings differently, with western science seeing the groupings as more distinct (Campbell et al. 2015), and IQ seeing the groupings as more strongly interconnected.

Limited western science-based research has been collected on the groupings of Baffin Island caribou, but telemetry studies and findings from IQ studies point to potentially three groupings on the island (Campbell et al. 2015; Ferguson 1993). These groupings are characterized regionally as south, north and central or northeast Baffin Island herds. Their delineation is based on some support within IQ studies, literature and telemetry

[5] Barren-ground caribou are considered both an ecological and a cultural keystone species; for further discussion and definitions, see Garabaldi and Turner 2004.

[6] It remains unclear whether these different “groupings” should be considered distinct caribou subpopulations or herds. The 2016 COSEWIC status report for the barren-ground caribou population considers caribou on Baffin Island as one subpopulation (COSEWIC 2016). For further discussion of conservation units, see Weckworth et al. 2018.

information, but more work is needed to fully understand the complexity of delineating different groupings and subpopulations of caribou on Baffin Island (Campbell et al. 2015).

Throughout Baffin Island, caribou are known to have cyclic patterns of abundance. Community members of Pond Inlet have commented that at times of high southern caribou abundance (e.g., 1980's and 1990's), they would migrate all the way north. A sign of this migration was the worn hooves, indicating the long distances travelled by the caribou (Jenkins and Goorts 2013). During these periods of high caribou abundance, some wintering grounds will be used by caribou cows exhibiting two distinct migratory patterns, with migratory caribou occupying low elevations, while resident caribou remain in the mountains (Ferguson et al. 1998). The northern grouping of Baffin Island caribou are relatively non-migratory, especially when their abundance is low (QWB et al. 2023f).

1.3 SCOPE OF WORK

To complete the Inuit Quajimajatuqangit study on north Baffin caribou, the Research Team, which consisted of QIA staff and consultants from Firelight Research Inc., undertook the following tasks:

- Preparing a comprehensive literature review to identify existing knowledge and knowledge gaps relating to caribou on north Baffin;
- Developing and tailoring focus group methodologies for the Study based on the findings of the literature review;
- Working with QIA staff to conduct a focus group in Iqaluit with representatives of the HTOs/HTAs with knowledge of caribou on north Baffin;
- Collating and analyzing results from the focus group;
- Developing and tailoring workshop methodologies for the Study based on the findings of the focus group;
- Working with QIA staff to conduct a workshop in Kinngait with the IAKK of the ISP to support interpretation of the knowledge shared on north Baffin caribou and the Mary River Project;
- Collating and analyzing results from the workshop;
- Verifying the summary report through a virtual meeting with the IAKK members acting as representatives of the HTOs/HTAs; and
- Final reporting based on IAKK, HTOs/HTAs, and QIA feedback.

1.4 LIMITATIONS

While this Report provides a comprehensive understanding of north Baffin caribou based on available Inuit Quajimajatuqangit, the Research Team acknowledges the following limitations of this Study:

- Efforts were made to include key knowledge holders from the HTOs/HTAs and knowledge holders with important knowledge of north Baffin caribou. However, not all knowledge holders were able to participate in this Study due to time, budget restrictions, or other factors. Similarly, not all Elders, recognized by focus group and workshop participants as the true holders of IQ[7], were able to participate due to the aforementioned factors and the fact that many Elders have passed on.

- Data collected for each participant are limited by what the participant was able and willing to report at the time of the focus group and workshop.

- Arctic Bay HTO representatives were unable to attend the June 2024 focus group but representatives of IAKK attended the workshop in January 2025; therefore, values and uses from Arctic Bay HTO may not be fully represented within this Report.

- The focus group and workshop were conducted in English and Inuktitut using simultaneous translation. Due to constraints of available resources, detailed notes were taken during the focus group and verified where needed by reviewing the recorded audio. Quote citations indicate detailed notes from either participants speaking in English or from the translator at the time of the focus group.

- The area demarcated by mapped site-specific use values should be understood to be a small portion of the actual area required for the meaningful practice of Inuit way of life. Site-specific mapped values (e.g., kill-sites) reflect particular instances of use that represent wider practices of culture, livelihood, and other Inuit rights within a particular landscape. For example, a single kill site may be mapped with a precise point, but that point does not capture the entire spectrum of related practices and values.

- This Report includes Inuit recommendations for stewardship and protection of north Baffin caribou as it relates to the Mary River Project.[8] It does not include a comprehensive list of additional QIA, HTO/HTA, and Inuit party recommendations for caribou monitoring and mitigations. Further engagement is recommended between QIA, impacted Inuit communities, HTOs/HTAs, the Terrestrial Environment Working Group and Baffinland on this subject.

- Candidate protection areas for caribou on north Baffin presented in this Report should be interpreted only as preliminary findings. Further locations may be added, and these locations may be subject to revision by the HTOs/HTAs.

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[7] IQ54 June 17, 2024; P14 June 19, 2024

[8] The proposed protection areas for caribou noted in Figure 12 are specific areas of high importance to protect caribou on north Baffin identified by Inuit Qaujimajatuqangit holders who participated in workshops held by QIA and QWB from October to December 2022 to inform the Nunavut Land Use Plan. These specific locations were verified during spring 2025 verification sessions with HTO members.

- This Report is based on the understandings and analyses of the authors and is not intended as a complete depiction of the dynamic way of life and living system of use and knowledge maintained by the HTOs/HTAs.

- This Report should not be taken as a replacement for other studies that may be required.

It is important to note that the Study does not reflect all knowledge and land use of the HTOs/HTAs members and community members in those areas, and an absence of data does not signify an absence of use or value. This Report is confidential and is intended for consideration by QIA and HTO/HTA representatives. All data included in this Report is the property of QIA and may not be used or reproduced without the written consent of QIA or their delegate.

Nothing in this Report should be construed as to waive, reduce, or otherwise constrain Inuit rights within, or outside of, a regulatory process. This Report should not be relied upon to inform other projects or initiatives without the written consent of the QIA.

2. METHODS

This section provides details on the Mary River Project, the Study Area, the literature review and gap analysis, and the focus group and workshop process and analyses conducted, including for both spatially mapped data and qualitative data.

2.1 MARY RIVER PROJECT

The existing Mary River Project is located on northern Baffin Island, between Milne Inlet to the north and Steensby Inlet to the south. Current mining activities include the extraction of ore, which is excavated, crushed, and graded into coarse and fine grades at the mine site and transported along the Tote Road to Milne Port via truck. The Tote Road largely follows Phillips Creek from the mine site to Milne Port. At Milne Port, the ore is loaded onto ships, which leave Milne Inlet and travel past Bruce Head and northeast around Ragged Island into Eclipse Sound. These ships then travel east between the south shore of Bylot Island and the community of Mittimatalik, into Guys Bight, and subsequently Baffin Bay on the way to ports where the ore is delivered.

The Mary River property was discovered in 1962 and the current operations phase began in 2014 when approval from the NIRB to operate the mine was provided. Ore first started being shipped from Milne Port to Europe in the summer of 2015 (Baffinland Iron Mines Corporation 2019). Future components of the Mary River Mine Project have already been approved and permitted but have not yet been built. These future components include the Steensby Port in Steensby Inlet and the southern railway corridor which would connect the mine site to Steensby Port. Once both the southern railway corridor and Steensby Port are built, ore would be shipped from Steensby Port through Foxe Basin, Foxe Channel, and Hudson Strait.

This Report includes information related to the existing and permitted Mary River Project infrastructure and activities, and those that have been approved as part of the regulatory process and planned to be built in the future (i.e. southern railway corridor and Steensby Port). Where relevant, the Research Team has made a clear distinction between these two components. All maps with Project components include both existing components (northern shipping route, Milne Port, Tote Road and mine site) and future components (southern shipping route, Steensby Port, and southern railway corridor). Baffinland's future plans to build the southern railway corridor and Steensby Port were underway when the focus group and workshop were conducted for this Study.

2.2 STUDY AREA

The Study Area consists of the northern Baffin Island region, which includes the extent of the north Baffin caribou herd range (GN DOE 2019d), and the existing and future footprints of the Mary River Project. North Baffin caribou use terrestrial and aquatic environments (both freshwater and marine) for various activities (e.g. calving, ice crossings, drinking water sources) and are the main areas of focus for this Study.

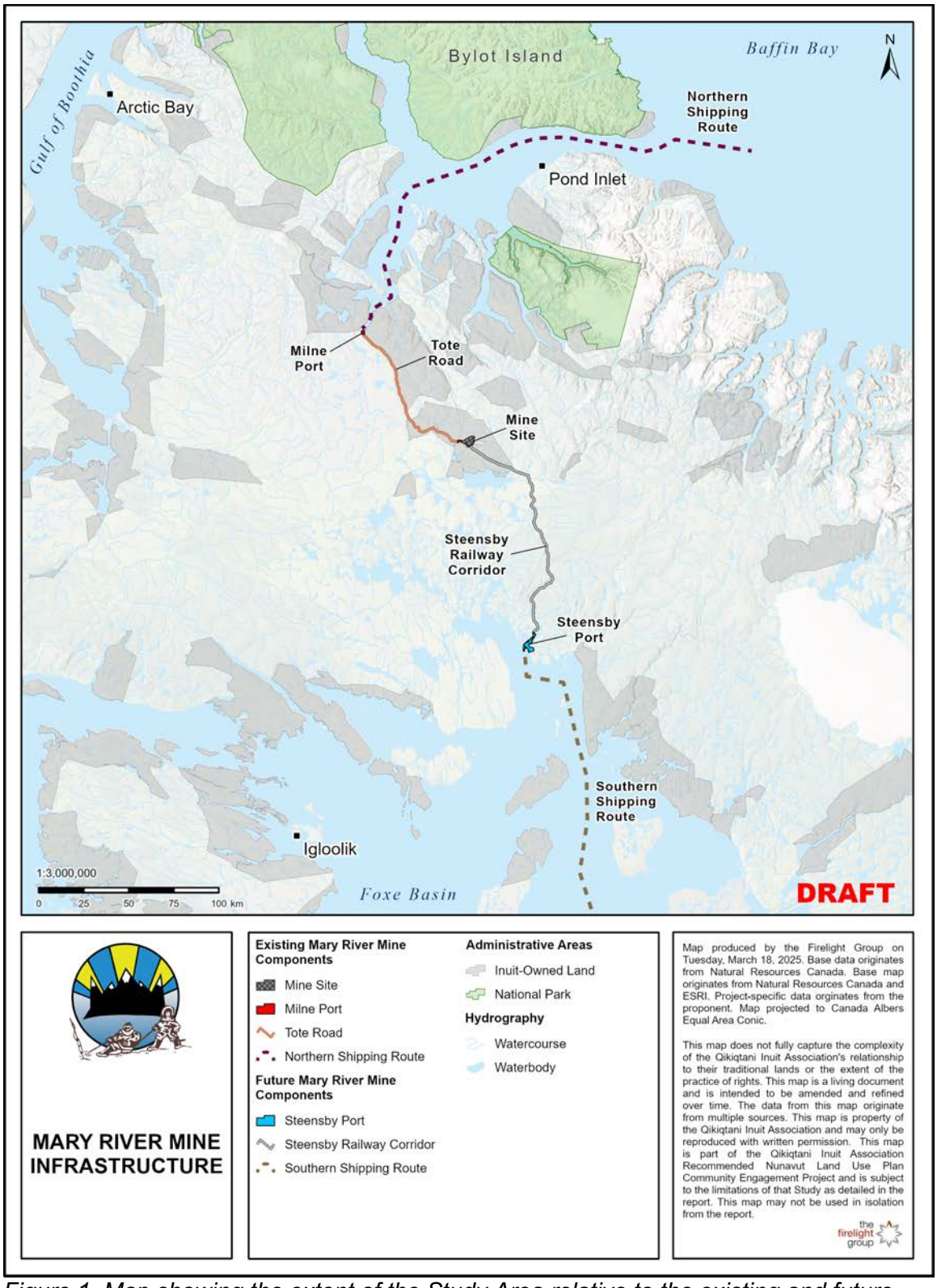

Figure 1. Map showing the extent of the Study Area relative to the existing and future components of the Mary River Project.

2.3 LITERATURE REVIEW AND GAP ANALYSIS

To summarize the current knowledge base related to caribou on northern Baffin, the Research Team conducted a comprehensive literature review and gap analysis comprised of gathering, reviewing, and synthesizing existing IQ and western science data sources, including:

- Caribou survey data (see table 1);
- Caribou harvesting tag data (see table 1);
- IQ workshop proceedings (see table 2);
- IQ studies / reports (see table 2);
- Documents related to the Mary River Project and other similar industrial projects in the Arctic;
- Documents related to the Nunavut Land Use Plan (NLUP); and
- Peer reviewed journal articles.

Table 1. Caribou survey data sources and harvesting data sources included in the literature review.

Study Name	Date
2023 Late-Winter Aerial Caribou Survey [Preliminary] Summary Report	2023
Baffin Island Caribou 2019 Spring Composition Survey	2019
Baffin Island Caribou Composition Summary Report 2015-2018	2018
South Baffin Caribou Fall Composition/Demographic Surveys	2017
North Baffin Caribou Fall Demographic Composition Survey, September 2016	2016
Aerial Abundance Estimates, Seasonal Range Use, and Spatial Affiliations of the Barren-Ground Caribou (Rangifer Tarandus Groenlandicus) on Baffin Island – March 2014	2015
Estimating the Abundance of South Baffin Caribou: Summary Report	2012
Status of Caribou on Northern Melville Peninsula in June 1982	1992
A Calving Ground Survey of the Hall Peninsula Caribou Herd	1980
Calving Ground Survey: South Baffin Caribou Herd	1979

Table 2. IQ workshop proceedings and IQ studies / reports included in the literature review.

IQ Study Name	Date
QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission: Calving and Post-Calving Habitat	2023
QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission: Movement Corridors	2023
QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission: Winter Habitat	2023
QWB-QIA Joint Submission to the Nunavut Planning Commission: Community Areas of Interest: Caribou Harvesting	2023
Technical Memorandum: QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission: Caribou Protection Areas in the Qikiqtaaluk Region of Nunavut	2023
Qikiqtani Inuit Association - Review & Comments on the 2021 Draft Nunavut Land Use Plan	2022
Qikiqtaaluk: Inuit and Tuktuit on Baffin Island in Arctic Canada	2021
Qikiqtani Inuit Association's Tusaqtavut Study Specific to Baffinland's Proposed Phase 2 of the Mary River Project	2021
Baffin Island Caribou Consultations with Hunters and Trappers Organizations	2019
Consultations with Hunting and Trapping Organizations on the Baffin Island Caribou Composition Survey Results, Future Research Recommendations, and Draft Management Plan	2019
Qikiqtani Inuit Association's Tusagtavut For Phase 2 Application of the Baffinland Mary River Project	2019
Summary of Caribou Knowledge on Baffin Island	2019
Tuktu and Environmental Change: Inuit Caribou Harvesting on Southern Baffin Island	2016
Public and Inuit Interests, Baffin Island Caribou and Wildlife Management: Results of a Public Opinion Poll in Baffin Island Communities	2015
Community and Hunter and Trapper Organization Consultations on Baffin Island Caribou: December 2013- January 2014	2015
Preliminary Report on Elder and Hunter Knowledge of Baffin Island Caribou	2015
Baffin Island Caribou Post-Workshop Update (February 2014)	2014
Community and Hunter and Trapper Organization Consultations on Baffin Island Caribou	2014
Working Together for Baffin Island Caribou' Workshop Report (August 2013)	2013

IQ Study Name	Date
Effects of Development on Barren-Ground Caribou: Insight from Inuit Qaujimajatuqangit and an Ecological Model	2011
Inuit Knowledge of Long-Term Changes in a Population of Arctic Tundra Caribou	1998
Collection and Analysis of Traditional Ecological Knowledge about a Population of Arctic Tundra Caribou	1997
Working With Inuit To Study The Population Ecology Of Baffin Island Caribou	1993
The Economic Ecology of Hunting: A Case Study of the Canadian Inuit	1988
Historical Factors Affecting Food Consumption Patterns in Northern Canada: I The Inuita: I The Inuit	1979

The Research Team used the literature review to develop a current summary report covering the following topics of interest:

- Importance of north Baffin caribou to Qikitani Inuit;
- Ecology of north Baffin caribou;
- Historical population trends of north Baffin caribou;
- Current population trend of north Baffin caribou;
- Impacts of human disturbance on caribou;
- Caribou monitoring methods;
- Caribou protection measures; and
- Recommendations / gaps.

The information gathered from the literature review and gap analysis helped guide the development of a focus group and subsequent workshop, specifically by identifying gaps in currently documented IQ, and interpreting currently documented IQ data. Moreover, to further refine and identify seasonal areas for caribou, spatial data from previous IQ studies were re-examined by reviewing the notes and metadata for potential additional information (e.g. months the time of caribou use during specific seasons).

2.4 FOCUS GROUP AND WORKSHOP

The Research Team used the findings of the literature review and gap analysis to develop the materials for the focus group and subsequent workshop, specifically to confirm findings in the literature review related to IQ and fill in gaps where present. The focus group was held between June 17 and June 19, 2024 at the Frobisher Inn in Iqaluit, Nunavut, with HTO/HTA members from four of the five communities most directly impacted by the current Mary River Project (Sanirajak, Clyde River, Igloolik, and

Mittimatalik),[9] along with one community from further south (Kimmirut). Focus group participants were identified by HTOs/HTAs and contacted by the Research Team. A total of 14 representatives participated from four of the five affected communities, including Mittimatalik HTO (3 participants), Sanirajak HTA (4 participants), Clyde River HTO (3 participants), and Igloolik HTO (3 participants). One representative from Kimmirut HTO also provided general knowledge pertaining to the overall protection of caribou.

The Research Team used a variety of methods to document and interpret IQ shared by the focus group participants, including taking visible notes on flip charts and mapping spatial locations using a 'direct-to-digital' process (see below). As part of the focus group, the Research Team also used a dot-mocracy activity where participants were asked to rate caribou sensitivity during different times of year and different phases of their population cycle by placing stickers under the most sensitive times of year or population phase. The Research Team provided all participants with a number of stickers equal to the sensitive times of year or population phases, and were asked to use all of their stickers.

The Research Team synthesized all of the information from the focus group into a "what we heard" summary report, which was brought forward into the subsequent workshop to confirm the results and support interpretation to identify stewardship actions (i.e. mitigations, protection measures) and distance of impacts of the Mary River Project. The Research Team conducted the workshop with the IAKK of the ISP, which included HTO/HTA members from five of the five communities most directly impacted by the current Mary River Project: Mittimatalik HTO, Sanirajak HTA, Clyde River HTO, Igloolik HTO, and Arctic Bay HTA, along with two communities from further south: Kimmirut HTO and Kinngait HTO. The workshop was held between January 13 and 14, 2025 at the Dorset Suites in Kinngait. A total of 12 representatives from 7 HTOs/HTAs participated in the focus group, including from Mittimatalik HTO (2), Sanirajak HTA (1), Clyde River HTO (1), Kimmirut HTO (1), Igloolik HTO (1), Arctic Bay HTA (1), and Kinngait HTO (5).

During both the focus group and workshop, the Research Team assigned participants a unique identifier to track the knowledge they shared. The Research Team obtained informed consent from all participants prior to the start of the focus group and workshop. Study participants can access their IQ data that was shared during interviews by making a request to the QIA. Both the focus group and workshop followed a semi-structured format and mapping protocols used were based on standard techniques (Tobias 2009; DeRoy 2012).

During the focus group and workshop, participants had the option to participate in Inuktitut or English. An interpreter was present and available during the entire focus group. Audio was recorded digitally and detailed notes were taken during the focus group. Findings were verified during the focus group and workshop at the end of the session each day. Where needed, the Research Team verified the detailed notes by reviewing the recorded audio. Quote citations indicate detailed notes from either participants speaking in English or from the translator at the time of the focus group.

[9] Arctic Bay HTO participants were invited to the focus group, but were unable to attend that engagement. Arctic Bay HTO participants attended the workshop. Inuit Qaujimajatuqangit shared by knowledge holders from Arctic Bay was reviewed as part of the literature review and gap analysis.

2.5 SITE SPECIFIC DATA COLLECTION AND ANALYSIS

In this Study, site-specific data are values reported by participants that are specific, spatially distinct, and that may be mapped (however, exact locations may be treated as confidential). Shape files for the physical Mary River Project components were provided by the Baffinland.

The Research Team used a 'direct-to-digital' (D2D) process to map site specific data in the north Baffin Island region. The D2D process involved projecting Google Earth imagery onto a wall or screen. Points, lines, or polygons, were geo-referenced at a scale of 1:50,000 or finer, to mark areas of reported use and importance to north Baffin caribou and Inuit. Some lines, polygons and points were mapped at a coarser scale (i.e., greater than 1:50,000).

Information related to north Baffin caribou was also gathered from the other previous IQ studies as noted in Section 1.1. Maps of site-specific values presented in this Report were generated from data mapped during these sessions.

Mapped points were randomised within a 250 m radius and surrounded by a one-kilometre buffer. A one-kilometre buffer was also generated around each line and polygon. The purpose of the buffer is to account for a margin of error and to protect information confidentiality, as per good practice principles of direct-to-digital IQ mapping (DeRoy 2012).

Site-specific data are presented in maps according to thirteen activity codes. These activity codes are designed to capture the variety of important areas to caribou on north Baffin and the large breadth of the Inuit use and experiences with caribou on north Baffin. The 13 codes used during mapping as part of the Study are:

- Environmental feature corridor (migration trails, routes, and water crossings used by caribou);
- Caribou kill site (locations where caribou have been harvested by Inuit);
- Caribou calving areas (locations where caribou are known to be calving);
- Specific loss (locations where there has been a loss or reduction in use by Inuit);
- Visual sightings (locations where caribou have been observed by Inuit);
- Antlers or sheds (locations where caribou antler sheds have been observed by Inuit);
- Environmental features (including habitat and areas used by caribou);
- Food storage (locations used by Inuit for caching caribou);
- Permanent habitation (locations of permanent structure for habitation used by Inuit);
- Winter range (locations of wintering areas used by caribou);

- Habitat area (locations of habitat used by caribou);
- Degraded habitat area (locations of habitat used by caribou that has been degraded in some form); and
- Harvesting areas (locations of areas used by Inuit to harvest caribou).

This Study's temporal boundaries include past, current, and planned future knowledge and use. A 'past value' refers to an account of knowledge and use prior to living memory, passed down through history, a 'current value' refers to an account of knowledge and use within living memory, and a 'planned future value' refers to anticipated or intended knowledge or use.

2.6 QUALITATIVE DATA COLLECTION AND ANALYSIS

As part of the focus group and workshop, the Research Team collected qualitative data. Inuit Qaujimajatuqangit shared by participants encompassed the following topics:

- Ecology of north Baffin caribou (e.g., seasonal needs, behaviours, population cycles, and sensitive times of year);
- Recent sightings of caribou;
- Inuit use of caribou on north Baffin;
- Impacts of the existing Mary River Project;
- Potential impacts of the future components of Mary River Project;
- Mitigations for north Baffin caribou (including protection areas);
- Monitoring methods for north Baffin caribou;
- Moratorium on caribou harvesting and tag allocations on Baffin Island; and
- Commercialization of caribou harvesting.

The Research Team recorded detailed notes during the focus group and workshop, and, where needed, verified these notes by reviewing the recorded audio. Notes were then reviewed, coded thematically, and analysed. These data are summarized in Section 4.

All spellings of Inuktitut words used in this Report were either verified during the focus group or workshop, based on spellings encountered in relevant literature from the northern Qikiqtani, or based on the place names in use by the Inuit Heritage Trust ("Inuit Heritage Trust: Place Names Program" n.d.).

2.7 VERIFICATION

The Research Team completed verification of the results of this Study with participants during individual virtual verification sessions in spring 2025. Participants were provided

with a summary report of the Study, and the verification involved the Research Team reviewing the results of the Study with participants via a slide show presentation. Individual verification sessions were held between April 24 and May 23, 2025, and involved representatives from 6 of the 7 HTOs/HTAs that participated in the focus group and workshop, including from Mittimatalik HTO (1), Sanirajak HTA (1), Kimmirut HTO (1), Igloolik HTO (1), Arctic Bay HTA (1), and Kinngait HTO (1). Participants from Clyde River were invited on several occasions, but ultimately were unable to attend any of the individual verification sessions.

3. RESULTS

3.1 IMPORTANCE OF INUIT QUAJIMAJATUQANGIT

Participants emphasized the importance of proponents, like Baffinland, appropriately incorporating IQ into their work plans, and noted that previous attempts to include IQ by the Baffinland have been insufficient.[10]

> *"In terms of IQ, I want it to be acknowledged more. There needs to be focus on it… If you are going to mine or [undertake] commercial activity, IQ should always be at the forefront of all these activities, in foundation and principle. It is unfortunate how things have turned out."* (P15 June 18, 2024)

Participants referenced the holistic nature of Inuit Quajimajatuqangit, which seeks to understand impacts by examining all features of the land, water, and air, including humans and animals, rather than looking only at discrete components.[11] One participant shared that Inuit Quajimajatuqangit is more in tune with caribou populations and the conditions on the ground in comparison to western science, which means that decisions made by government based solely on western science can be slow to react.[12] One participant expressed frustration that proponents, like Baffinland, neglect to follow IQ-based recommendations, and stressed that Inuit lead best when they are believed and trusted.[13]

With regards to Baffinland's caribou monitoring, participants noted that there must be Inuit Quajimajatuqangit involvement in the monitoring program and that this requirement must be enforced.[14] One participant explained that because caribou herds occupy such large ranges, Baffinland cannot draw conclusions about the impacts to caribou if only a small portion of their range is monitored.[15]

These points highlight the importance of the ISP for ensuring that there is a mechanism for continued gathering and application of Inuit Quajimajatuqangit for monitoring, mitigating, and managing impacts of the Mary River Project on Inuit values.

3.2 GENERAL INFORMATION ABOUT CARIBOU ON NORTH BAFFIN

Participants in the focus group and workshop indicated that there are different types of caribou on north Baffin, which may interact with the Project area. Seasonal timings for caribou applied to all caribou on north Baffin Island. However, some specific behaviours

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[10] P15 June 18, 2024;

[11] I25 June 18, 2024; I25 June 19, 2024;

[12] IQ49 May 13, 2025

[13] P15 June 19, 2024

[14] P15 June 19, 2024

[15] P15 June 19, 2024

(e.g., migration patterns, herd sizes, calving strategies) may vary between different caribou types. Further information is required to better understand the different caribou that are present on north Baffin Island. This information should be collected within an adaptive management context—i.e., apply mitigation strategies as identified, while continuing to learn and adapt management practices to support caribou on north Baffin.

3.2.1 Different Caribou Populations

As noted in Section 1.2.2 and further described in the literature review, there are different groupings of caribou on Baffin Island. Furthermore, evidence suggests different caribou groupings with distinct behaviours exist on northern Baffin Island. Prno (2017) reported that 'mountain caribou', found on the northern Borden Peninsula, have slightly different physical characteristics from other north Baffin caribou such as larger body sizes, and longer eyelashes.

Participants in this Study also discussed the differences between caribou in different regions:[16]

> *"The caribou in Baffin is different. The fur is different and difficult to butcher. The skin is thinner and they seem to have more fat in this area [in north Baffin]. In this area I went twice in summer, the caribou in Melville and Iqaluit are different. Less taste and the parasites, some have parasites in their head. I have caught caribou like this before. I went there by ATV in the summer, we don't see the caribou that are in Melville. It is not the same."* (P14 June 17, 2024)

Participants shared that the different populations use different areas, have different migration routes and can have different behaviours, and that the number of caribou in their herds can also affect their behaviour.[17] As well, participants highlighted that the different caribou populations can interact with one another.[18] One participant highlighted that the behaviours of caribou on north Baffin differ from those on the mainland or south Baffin, which in part due to north Baffin having higher mountains.[19]

> *"From our discussions, because the herds here are different from your area the behavior becomes different from where they are from and where they have to go. It is like this everywhere. The population affects the behavior as well. The number in their herd affects their behavior."* (IQ49 June 17, 2024)

> *"Steensby area, [there is a] calving area around here. There are two calving areas near high ground. Near the mainland it is different and land is different from what you would see on the high ground. These are different populations. Some are in their areas year-round."* (I25 June 17, 2024)

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[16] I25 June 17, 2024; I25 June 18, 2024; P14 June 17, 2024; IQ49 June 17, 2024; IQ52 June 17, 2024

[17] IQ49 June 17, 2024; I25 June 17, 2024; IQ52 June 17, 2024

[18] IQ49 May 13, 2025

[19] K03 May 23, 2025

"Caribou will go to the Baffin Island on different years. It seems like they are not the same group. The caribou will move from Melville to Baffin Island and they will move to different areas to follow the food." (I25 June 18, 2024)

From the information shared, it seems that different caribou populations may interact with the Mary River Project, including both resident caribou populations and migratory caribou populations on north Baffin. This could have implications for management, mitigation, monitoring activities to ensure that they sufficiently capture the differences between these populations, which could impact the accuracy, effectiveness, and outcomes of those activities.

3.2.2 Timing of Seasonal Activities

Caribou on Baffin Island generally calve over a longer period than their mainland counterparts, with IQ identifying the calving period from June 12 - July 1 and the post-calving period from July 2 - August 31 (QWB et al. 2023b). Through a collaring data analysis for north Baffin caribou, Campbell et al. (2015) notes slightly earlier calving and post-calving periods of May 29 - June 25 and June 26 - August 12, respectively. On north Baffin, fall migration occurs from late August through to December, as individuals traverse larger distances looking for food and preparing for the winter months (Campbell et al. 2015).The core winter habitat use period extends roughly from mid-December to mid-spring (April; Campbell et al. 2015), with some telemetry data extending that period from September 1 - May 29 (QWB et al. 2023d). The period of spring migration for north Baffin caribou usually occurs between April and May as female caribou move from their winter habitats towards their calving grounds (Campbell et al. 2015).

As part of this Study, participants discussed and further refined the timing of these seasonal activities. Participants agreed on the below seasonal activities for north Baffin caribou and when those seasonal activities occur:[20]

- Spring migration occurs in April and May;
- Calving occurs in June into July;
- Post-calving occurs in July to the middle of August;
- Fall migration occurs from the middle of August into October;
- Rutting occurs from September to October; and
- Wintering occurs from October into December, with caribou generally known to move to higher elevations from December to March.

Figure 2 provides an overview of these different seasonal activities within the year.

[20] I25 June 17, 2024; IQ51 June 17, 2024; IQ50 June 17, 2024

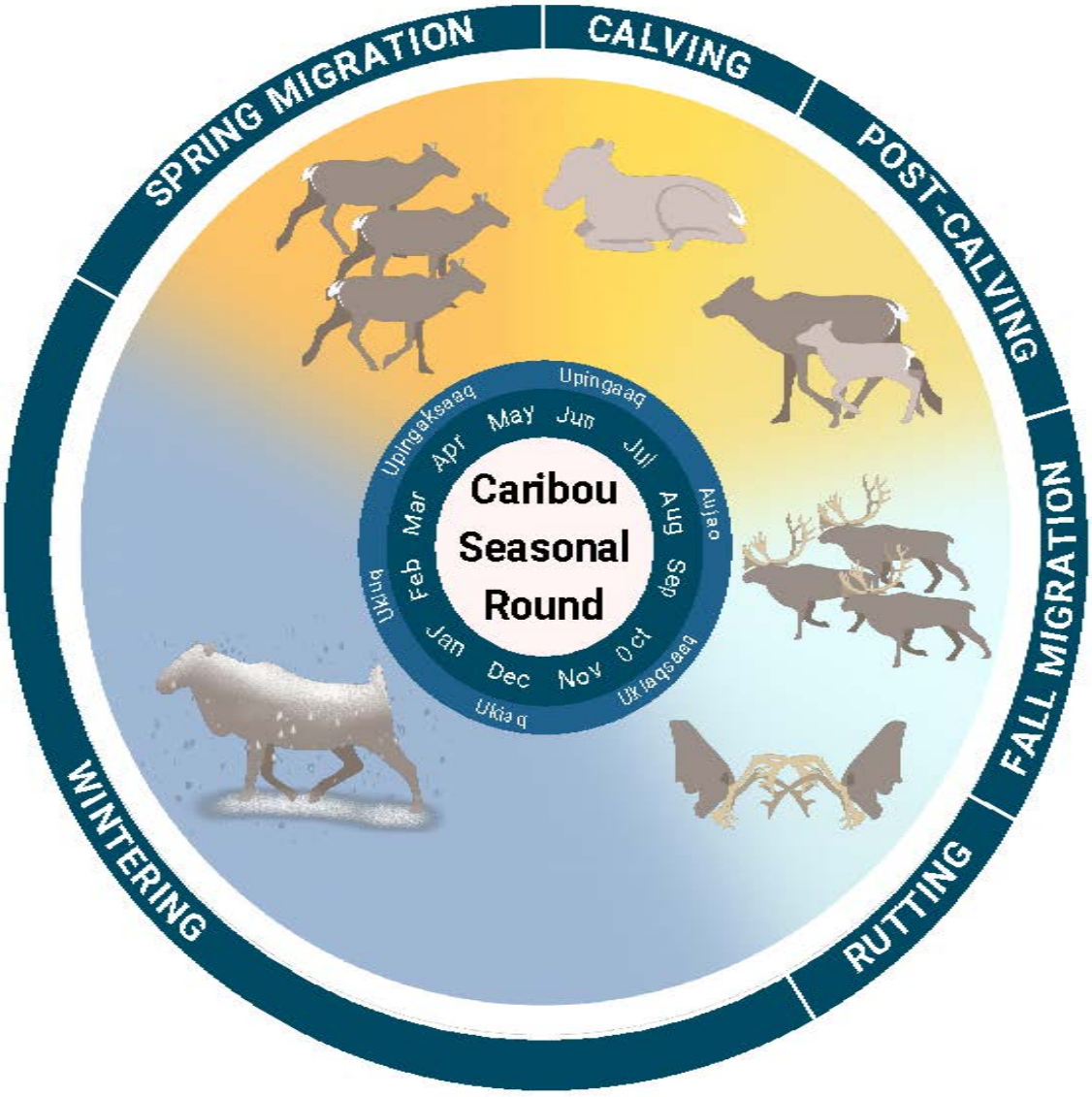

Figure 2. Seasonal round for caribou on north Baffin Island, showing the timing of different seasonal activities.

One participant explained how north Baffin caribou tend to begin their spring migration in April or May, moving to different areas within the lower part of Clyde River in search of better forage.[21] In June, the caribou arrive in their calving grounds and begin calving, which can sometimes last until July.[22] August was noted by participants as a time when their ancestors would harvest caribou for their fur to make clothing.[23] Come September, the caribou will begin to move again, gathering for winter migrations.[24] Participants stated that bull rutting often coincides with early snowfall, in September and October, adding that the males smell different when they start to eat the snow.[25] From the beginning of October through to December, the caribou will move to their wintering grounds.[26] In the colder months, sometimes beginning in December and often continuing into March, participants agreed that caribou begin to move to higher ground areas.[27] One participant communicated the general consensus of Inuit hunters within the Baffin Region to avoid lower coastal areas in the winter and access the higher areas instead to find and hunt caribou.[28]

Importantly, participants noted that caribou will not always be in the same area in different years and that this can be due to different factors.[29]

> *"Because they don't all stay in one area, we can't really say that they tend to be in that particular spot, because they don't all stay in one area together and when there has been too many wolves they tend to leave the whole area. Annually it is not the same, where they stay."* (I25 June 17, 2024)

3.2.3 Spring Migration

As part of their technical report on seasonal range use of Baffin Island caribou, Campbell et al. (2015) noted that spring and fall movements for north Baffin caribou are relatively minimal compared to other caribou groupings on Baffin Island, especially in the areas near Mary River and Steensby Inlet. Furthermore, IQ suggests that spring and fall migration routes are more predictable during high population phases (Prno 2017). During periods of low populations, north Baffin caribou tend to disperse individually more than migrate in herds (COSEWIC 2016). Regardless of relative differences in migration patterns between caribou in different areas of Baffin Island and differences in migratory behaviour during different periods of the population cycle for caribou on north Baffin, IQ-

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[21] IQ50 June 17, 2024

[22] H05 June 17, 2024; I25 June 17, 2024

[23] H05 June 17, 2024

[24] I25 June 17, 2024

[25] IQ51 June 17, 2024

[26] I25 June 17, 2024; IQ50 June 17, 2024

[27] I25 June 17, 2024; IQ50 June 17, 2024

[28] I25 June 17, 2024

[29] I25 June 17, 2024

holders are clear that movement corridors and crossings are important components of the habitat that require protection. As stated in QWB et al. (2023c, 2)

"…crossings and movement corridors are vital for the survival of caribou because they need to be able to follow the seasons to find food, and their migratory pathways can become disjointed or rerouted once development begins" (QIA / QWB Workshop Notes, October 11, October 12, 2022, as presented in QWB et al. 2023c).

With regards to impacts, participants in this Study noted that just before their calving season, caribou can be found near the Mary River area.[30] Sometimes when there are a lot of caribou on the land, wintering caribou in the north of Melville Peninsula will move to north Baffin, potentially in search of better forage, and eventually move towards the shorelines and their calving grounds.[31] One participant attributed the magnetic poles as a potential guide for caribou migration patterns.[32]

Figure 3 provides an overview of the IQ shared previously and IQ shared by participants as part of this Study related to areas used by north Baffin caribou during the spring and fall migration seasons

[30] I25 June 17, 2024

[31] I25 June 17, 2024

[32] I25 June 17, 2024

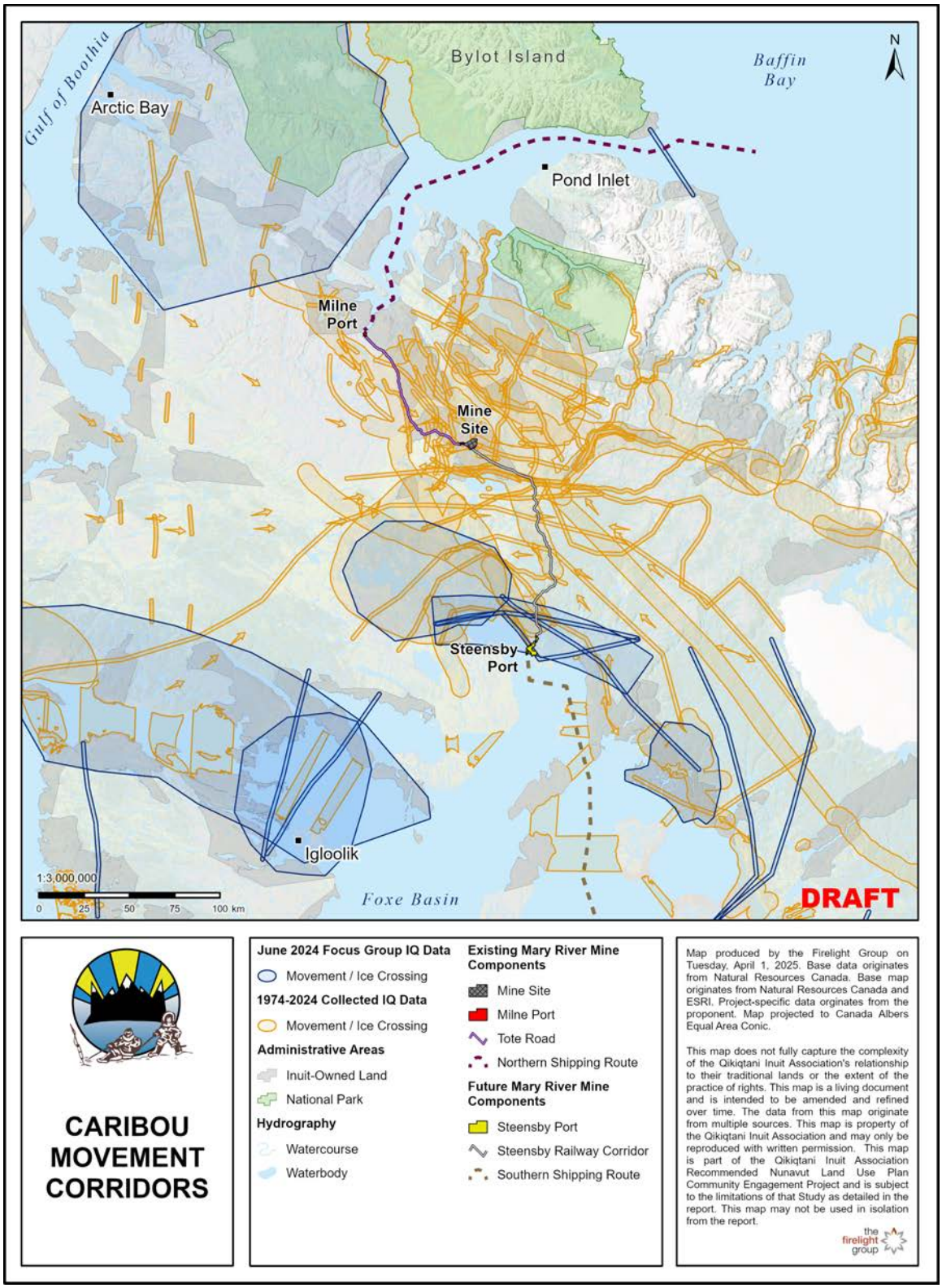

Figure 3. Map of caribou movement corridors, including IQ shared as part of previous IQ studies conducted between 1974 and 2023, and IQ shared during the engagements for this Study.

3.2.4 Calving Season and Post-Calving Season

Calving and post-calving behaviours for caribou on north Baffin tend to be different from barren-ground caribou on the mainland and parts of southern Baffin Island, where they show high spatial fidelity towards calving grounds (Gunn et al. 2012). Although more is known about the calving and post-calving habitat on south Baffin Island, on north Baffin Island, cows seem to prefer higher elevation calving grounds (e.g. mountains and valleys), away from predators and mosquitoes (Prno 2017). Participants in QIA's Tusaqtavut Study for Sanirajak and Igloolik (2019b) further agreed that local mountains can be shelters for cows and calves during calving season.

Participants in this Study noted that during the calving and post-calving season, males and females are in separate herds.[33] The presence of mosquitoes during the spring and summer months can push caribou towards cooler locations, like higher areas near ice caps and glaciers, to get relief.[34]

> *"During mosquito season they tend to be near the ice caps where the snow is."* (IQ49 June 17, 2024)

> *"June to July we see lots of mosquitoes so the caribou move up where it is cooler. If there are lots of mosquitoes they have to move out of the area to get away from them. Only in June and July, in August it starts to cool by then."* (IQ52 June 17, 2024)

During the calving season, participants noted that female caribou will spread out by themselves to calve and then return to the other members of the herd later in the season.[35] One participant shared that specific calving areas may differ between years.[36]

> *"Caribou when they have calves they don't stay in one spot together so much. Before they start calving they are together, when they have calves what I have noticed is they tend to be with their calves by themselves more so. And then they join the other caribou afterwards."* (H05 June 17, 2024)

> *"We tend to hunt around the Steensby Inlet, they have a variety of caribou in the area. On the other side of Steensby, on the east side there are more males, on the west side it is a combo of males and females, and they come down during the [calving season]..."* (I25 June 17, 2024)

Participants stated that there are good quality calving areas around Mary River that extend to Arctic Bay and that there are calving grounds around the Steensby area.[37]

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[33] I25 June 17, 2024;

[34] IQ49 June 17, 2024; IQ52 June 17, 2024; I25 June 17, 2024

[35] H05 June 17, 2024;

[36] I25 June 17, 2024;

[37] I25 June 17, 2024

[In response to what makes Mary River to Arctic Bay a good calving area]: "The low plain area from Nuluujak to Tulukkat. In Igaqjua it is mostly males in this area. The males are also important to us too. The growth period is longer in this area." (I25 June 17, 2024)

"*Steensby area, [there is a] calving area around here. There are two calving areas near high ground. Near the mainland it is different and [the] land is different from what you would see on the high ground."* (I25 June 17, 2024)

"They try to stay in specific areas while calving, so the caribou while in herds, [they] tend to calve just anywhere. The other ones are in a higher place to stay away from predators in the area" (IQ53 June 17, 2024)

During the post-calving period / summer months, one participant noted that caribou will stay near where they have calved and also head down to the coastal areas to feed on vegetation.[38]

"From my knowledge after calving they tend to be close to where they just calved. I don't think they go very far from the calving grounds from what I've seen and heard." (I25 June 17, 2024).

"...in the summer cycle …caribou head to the coast to eat vegetation and plants near the sea. They head to the coast to feed off coastal plants before they start to get too salty. This is in the summer during post calving season, when there is enough salt but not too much salt." (I25 June 17, 2024)

Figure 4 and Figure 5 provide overviews of the IQ shared previously and IQ shared by participants as part of this Study related to areas used by north Baffin caribou during calving and post-calving seasons.

[38] I25 June 17, 2024

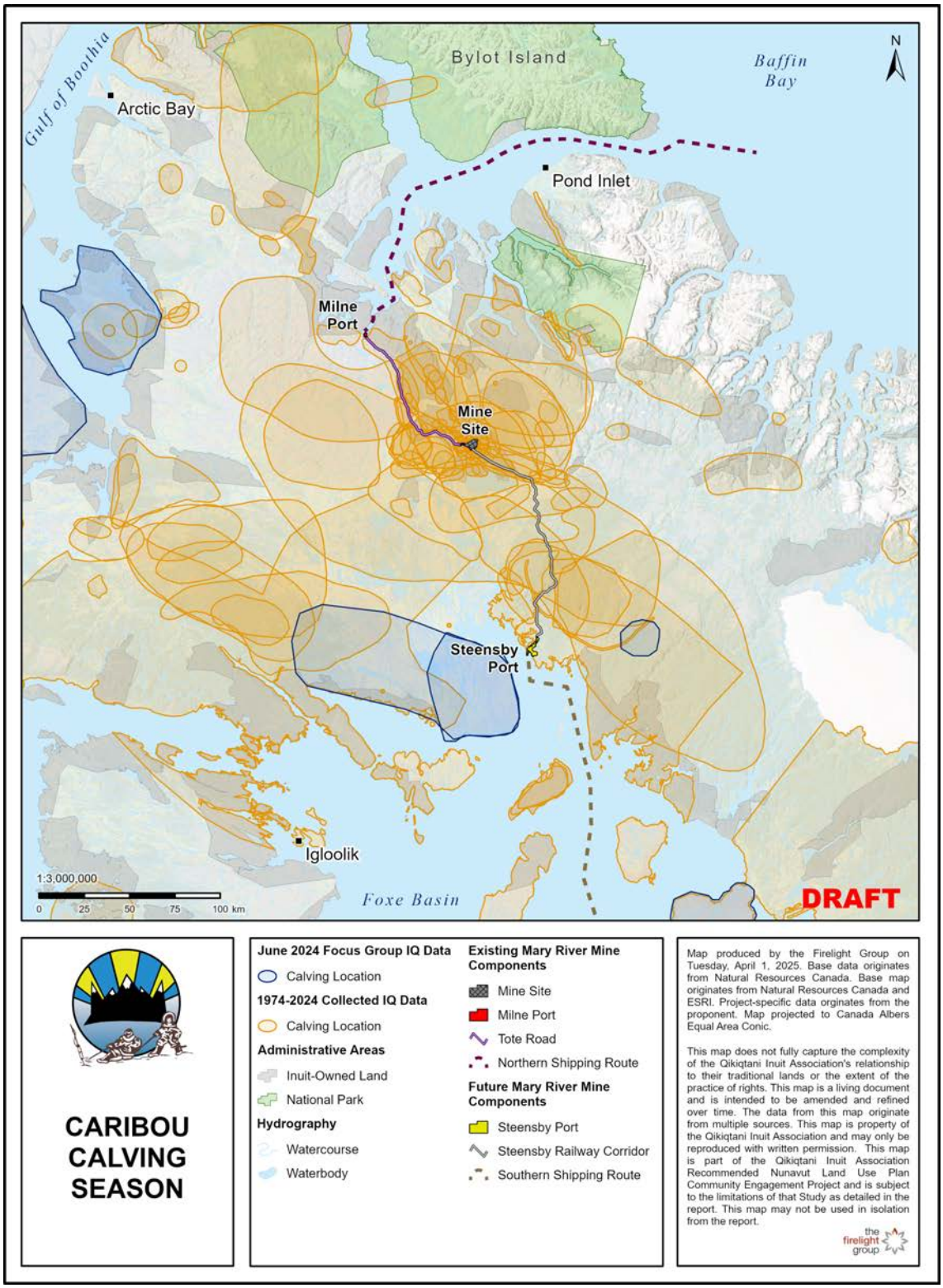

Figure 4. Map of calving areas for north Baffin caribou, including IQ shared as part of previous IQ studies between 1974 and 2023, and IQ shared during the engagements for this Study. Note that for the 1974-2023 collected IQ, the analysis assumes some areas to be calving and post-calving locations based on overlap in the timing or months in the associated notes and meta-data.

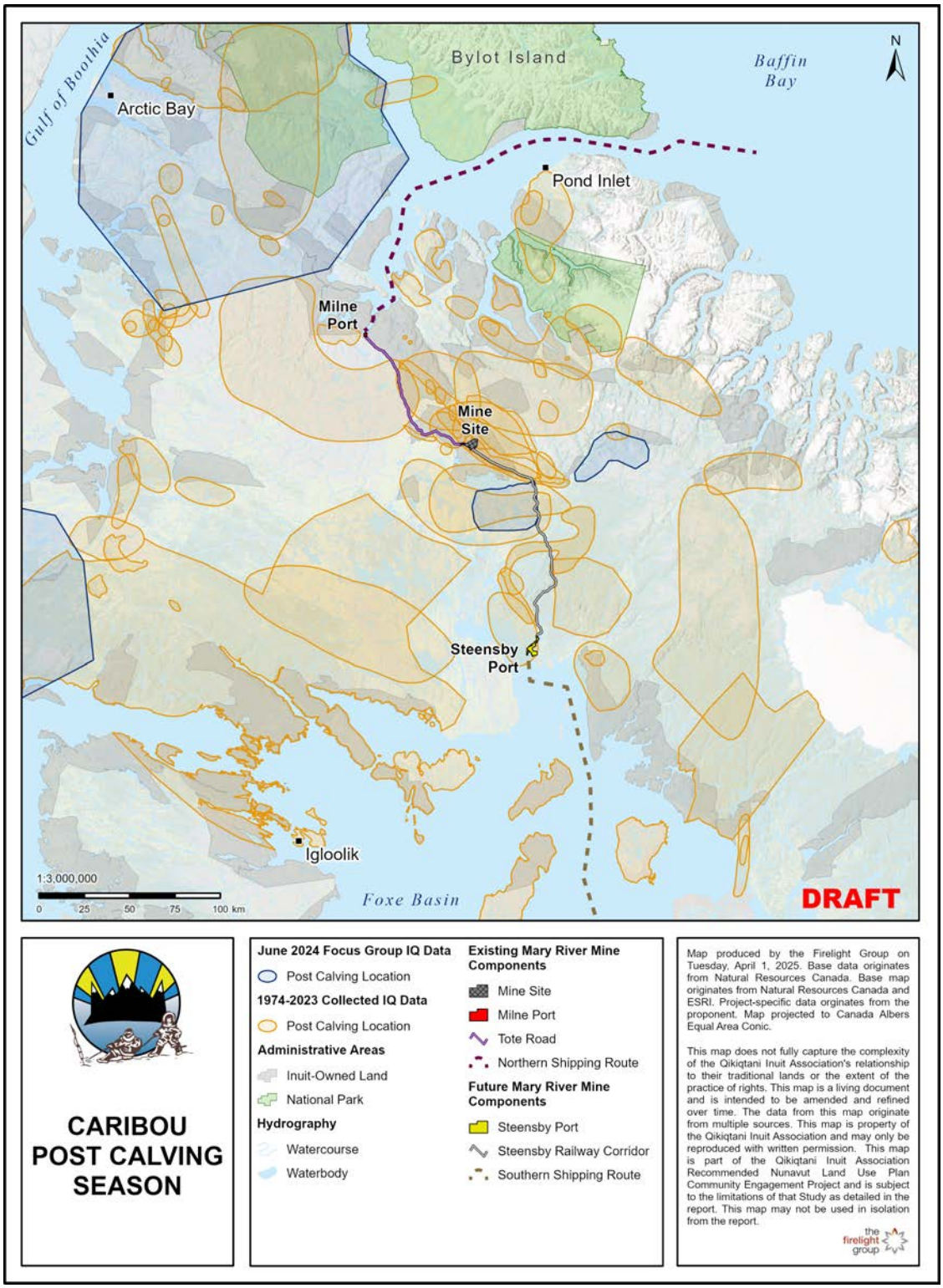

Figure 5. Map of post-calving areas for north Baffin caribou, including IQ shared as part of previous IQ studies between 1974 and 2023, and IQ shared during the engagements for this Study. Note that for the 1974-2023 collected IQ, the analysis assumes some areas to be calving and post-calving locations based on overlap in the timing or months in the associated notes and meta-data.

3.2.5 Fall Migration and Rutting Season

During the fall months, the fur on caribou calves change and caribou will gather into herds to migrate to their wintering areas as part of their yearly cycle.[39]

> *"I know from the end of August to the beginning of September, large birds get together for migration [it's] the same time for caribou getting together. It is beautiful to watch. The ancestors have seen this as have we. End of August and September is when they get together to start migration. They move to their feeding ground at Baffin Island, heading to their wintering grounds."* (IQ53 June 17, 2024)

> *"Our ancestors have said the little white snow bunting birds, when they're red is the same period as the caribou, they see the bird as the indication for the caribou. When the fur changes on the caribou calves and the birds change colour it is usually the same."* (H05 June 17, 2024)

> *"From what our ancestors have done, when the wind comes in September the herds come together."* (H05 June 17, 2024)

> *"In the fall in the high arctic when they are in higher areas it is true, August and September we start to get snowfall so the higher areas have snow by that time. From this time the caribou tend to move to the coast."* (IQ52 June 17, 2024)

Regarding specific caribou migration routes, participants shared that these routes are found across the whole Baffin region.[40] Around Mary River, one participant noted that during the fall, some caribou will go to different areas and some will stay in the area during the winter.[41]

> *"Arctic Bay for example when we went there in the beginning it seemed like there weren't any more caribou trails because there wasn't caribou in the area. We realized the entire Baffin region is populated by caribou. They can be fat and skinny, as far as trails and migration routes we know it's … the whole Baffin region."* (I25 June 17, 2024)

Regarding specific areas for rutting, participants said that caribou do not look for a specific area, but rather male caribou are following the females.[42]

Participants expressed concerns that rain during the fall months is particularly dangerous for caribou as it can impact their ability to feed and can subsequently impact the abundance of caribou.[43] One participant noted that the occurrence of rain during the

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[39] IQ53 June 17, 2024; H05 June 17, 2024; P14 June 17, 2024; IQ53 June 17, 2024

[40] I25 June 17, 2024

[41] I25 June 17, 2024

[42] I25 June 17, 2024; IQ49 June 17, 2024; IQ51 June 17, 2024

[43] IQ50 June 17, 2024; P14 June 17, 2024

fall months is increasing under climate change.[44] To avoid areas impacted by rain and also to avoid soft deep snow, participants noted that caribou will move to higher elevation areas with less snow.[45]

> *"In the fall time when the first few snowfalls and once it starts to cool and weather gets bad, it would rain after the snow had fallen, it thawed a bit. Once that occurred then it cooled down again and the snow freezes over and the caribou could no longer have access to their food because it was solid. We have a name for it when it rains in the winter. We don't like when this happens, it doesn't occur on a regular basis. In the past there was rain and snowfall so that caribou started moving to higher grounds to access food."* (IQ50 June 17, 2024)

> *"Before we were born, my father told me once it was raining a lot and there was no caribou around after that. Recently we noticed a rain event and we noticed there wasn't a lot of caribou near the Mary River area. I heard that it is very dangerous when it rains … because it prevents the caribou from getting to their food."* (P14 June 17, 2024)

Figure 2 and Figure 6 provide overviews of the IQ shared previously and IQ shared by participants as part of this Study related to areas used by north Baffin caribou during the fall and spring migration seasons, and the rutting season.

[44] IQ49 May 13, 2025

[45] IQ49 June 17, 2024; IQ52 June 17, 2024; K03 May 23, 2025

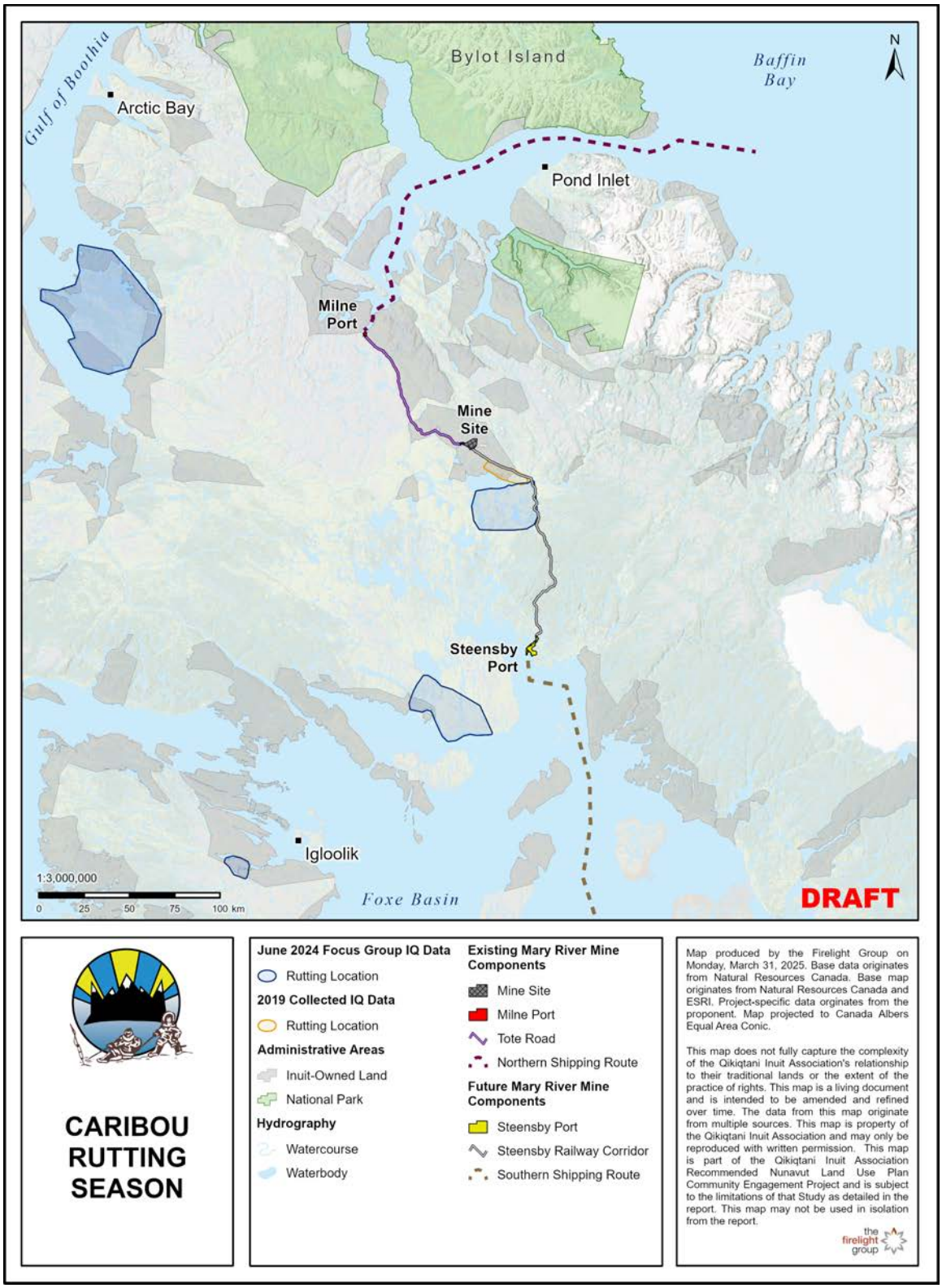

Figure 6. Rutting areas for north Baffin caribou, including IQ shared as part of previous IQ studies in 2019, and IQ shared during the engagements for this Study.

3.2.6 Winter Season

Barren-ground caribou typically seek winter habitat characterized by relatively shallow snow cover, where food is easier to find (COSEWIC 2016). For Baffin Island caribou specifically, winter ranges include areas where lichen and food are available despite snow and permafrost conditions (QWB et al. 2023d). North Baffin caribou frequent valley bottoms during the winter, specifically at Tay Sound, Paquet Bay, and Milne Inlet (Ferguson 1989). These flatter environments increase visibility of predators for caribou (Prno 2017). Historically, caribou have been found on Bylot Island in the winter, but not since the 1950s (Banfield 1961). Winter habitat for north Baffin caribou reportedly overlaps significantly with their calving and post-calving habitat (Banfield 1961).

Participants in this Study spoke of caribou staying in lower wintering areas during October and December, and then moving to higher elevation areas for January, February and March.[46] Participants shared that north Baffin caribou behave differently than caribou on the mainland in winter.[47]

> "*In winter we don't hunt caribou in coastal areas because there are none. They go to the higher area, I believe it is like this in the entire Baffin Region."* (I25 June 17, 2024)
>
> *"Maybe at the beginning of October to December is when they seem to be around their wintering ground then, especially during colder months, January [and] February they tend to go to higher areas. This is my opinion, it gets cold in January, they move to another area, and slowly go up to the higher feeding grounds."* (I25 June 17, 2024)
>
> *"... in January, February, [and] March, they tend to be in higher areas at this time. In the colder winter months they tend to stay a little higher…. But January [to] March these months are when caribou are in higher areas"* (IQ50 June 17, 2024)
>
> *"When it is soft deep snow they stay in higher areas, so you have to go up to high areas to look for caribou."* (IQ49 June 17, 2024)
>
> *"In Canada [the mainland] the caribou gather quickly, when it snows they will gather but it is different in this area here [north Baffin Island]."* (I25 June 17, 2024)

Figure 7 provides an overview of the IQ shared previously and IQ shared by participants as part of this Study related to areas used by north Baffin caribou during the winter season.

[46] I25 June 17, 2024; IQ50 June 17, 2024; IQ49 June 17, 2024

[47] I25 June 17, 2024

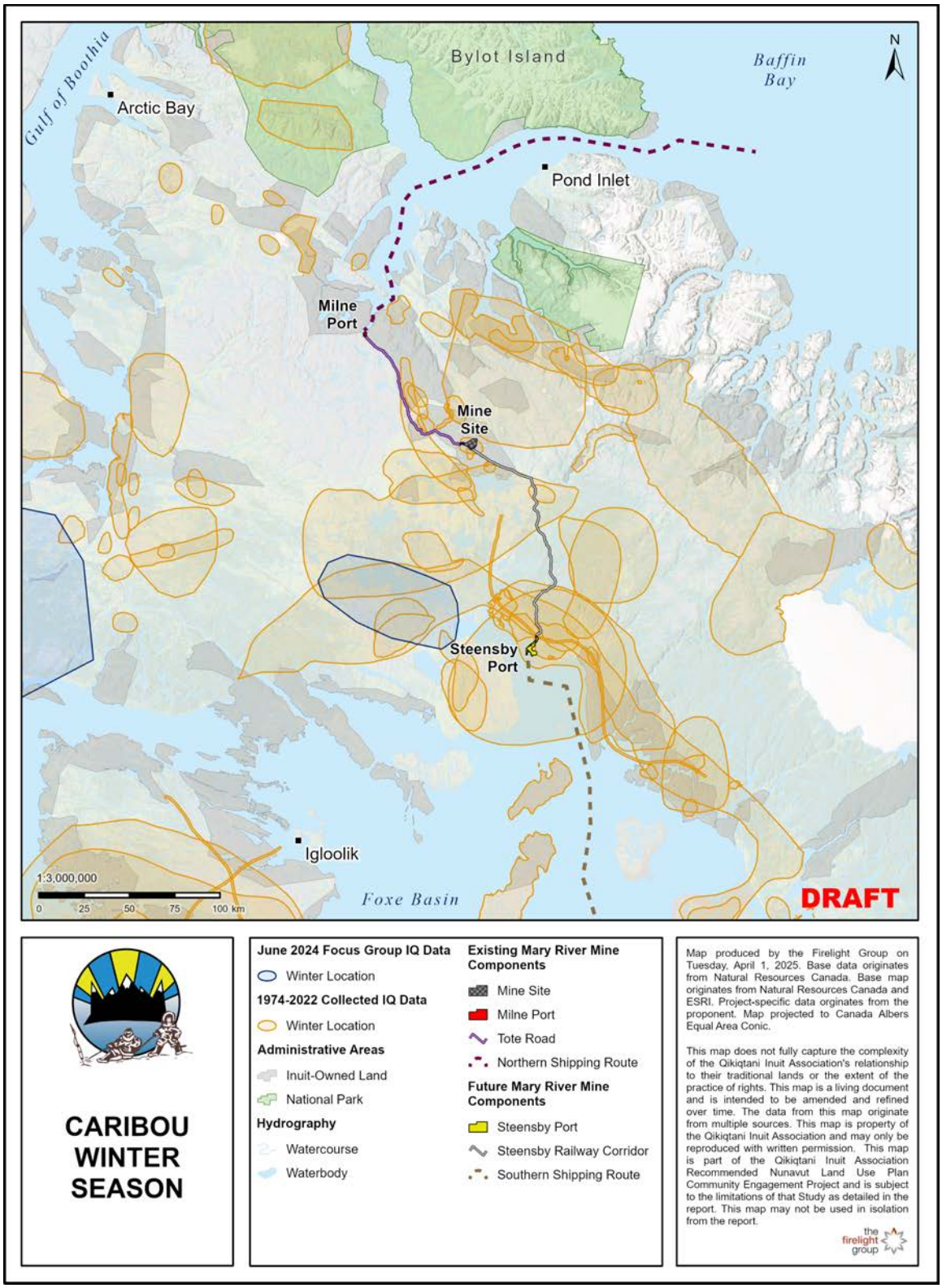

Figure 7. Wintering areas for north Baffin caribou, including IQ shared as part of previous IQ studies between 1974 and 2022, and IQ shared during the engagements for this Study.

3.2.7 Caribou Movements

Participants highlighted the importance of movement of caribou between Baffin Island and the mainland. Specifically, caribou will cross from north Baffin to the northern Melville peninsula and Igloolik, and from the Melville peninsula north to northern Baffin Island. Furthermore, participants noted the Fury and Hecla Strait is a common migration route.[48] Food availability was noted by participants as a reason why caribou will travel from northern Melville peninsula to north Baffin.[49]

On north Baffin, one participant shared that they had seen caribou northwest of the Steensby Inlet in an area extending from Tasirjuaq Lake east towards Sikusuittulik Lake and the northern end of Steensby Inlet, and that those caribou had traveled north from southern Baffin Island.[50] The general area from Isuqtuup Tasia Lake westwards to the north west end of Steensby Inlet was noted by a participant as an important area for spring migration; Elders would use this route going to and from southern areas of Baffin Island.[51] One participant shared that they expected the caribou that use this migration route would be affected by the future industrial development around Steensby Inlet.[52]

3.3 CARIBOU POPULATION CYCLES

Both IQ and western science show that barren-ground caribou populations on Baffin Island fluctuate in a cyclical manner, over the span of approximately 50–90 years (Ferguson et al. 1998; IQ as described in Gunn et al. 2011; IQ as described in Government of Nunavut Department of Environment (GN DOE) 2014a; GN DOE 2014b; GN DOE 2019b; GN DOE 2019c; MSES 2021), or once during the lifetime of an Elder (IQ as cited in Ferguson 1999). These population dynamics are driven primarily by density-dependent grazing impacts on forage availability (Ferguson 1997), but also in part by harvesting pressures, climatic conditions, and pathogens (Gunn et al. 2011; GN DOE 2019a). Generally, barren-ground caribou populations will grow and expand their range until they surpass the carrying capacity of the environment (GN DOE 2019d). When food sources (e.g., lichens, leafy vegetation) are depleted, caribou may shift their seasonal range to areas with greater forage availability (Ferguson et al. 1998; GN DOE 2014a; GN DOE 2014b; QWB 2023f) and eventually populations begin to decrease, often rapidly (Ferguson 1997; Ferguson and Messier 2000; Ferguson et al. 2001; GN DOE 2015; GN DOE 2019d). Once lichens have regrown over the course of decades, caribou immigrate and increase in abundance once again (IQ as described in Ferguson et al. 2021). Generally, this population cycle can be described in four distinct phases (GN DOE 2019d):

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[48] IQ53 June 17, 2024; IQ53 June 18, 2024; I25 June 18, 2024; IQ55 June 18, 2024

[49] I25 June 18, 2024

[50] IQ53 June 18, 2024

[51] IQ53, June 18, 2024

[52] IQ53 June 18, 2024

- Peak phase: caribou abundance is high;
- Declining phase: adult survival and calf production is reduced;
- Low phase: caribou abundance is less than 10% of its peak (Campbell et al. 2015; Ferguson et al. 1998; Stenton 1991); and
- Increasing phase: caribou population begins to recover, and its range expands.

IQ provides further insight that relates the long-term population dynamics of caribou on Baffin Island to four distinct caribou range changes (Ferguson et al., 1998; Ferguson 1999; Ferguson et al. 2001):

- Range expansion: the caribou population increases and caribou move further from the center of the range used in the previous year (increasing phase);
- Range drift: the population expands and contracts, while staying roughly the same size and overlapping with the previous year's range (increasing or stable phase)
- Range shift: many years of large numbers of caribou foraging in the same area reduce the quality and availability of forage, and the population shifts (but still overlaps with the previous year's range); and
- Range abandonment: occurs when the environment cannot support the caribou population, which leads to some caribou mortality and mass emigration to a new range, with no overlap with the previous year's range.

Historical (i.e., pre-2014) population estimates for Baffin Island caribou are limited due to reduced survey effort compared to mainland populations (Ferguson 1989) and in part due to survey difficulties because of poor weather conditions, rugged terrain, limited resources, and lack of funding (Hall 1980; Miller 1982; Jenkins 2007; Jenkins 2011). Approximate times of peaks of abundance of caribou on Baffin Island are 1845, 1910, and mid-1980s, while lows of are 1875, 1945, and 2014 (Campbell et al. 2015; Ferguson et al. 1998; Hantzsch 1913 in Soper 1928; Kelsall, 1949; Tener and Solman 1960, Ferguson et al. 1998; Chowns 1979).

Participants in this Study shared that caribou behaviour, habitat use, sensitivity, and health can change during the different phases of the population cycle for caribou. Participants noted that the cycles in the caribou population are largely driven by food abundance. Regarding the length of caribou population cycles, participants shared that it once took 75 years for caribou food sources to replenish,[53] but with warmer temperatures it takes less time, closer to 25 years.[54]

> *"Canadian [mainland] caribou come to the Baffin region area and so many years later they move back to particular areas, it is a cycle, not annually but I believe every so many years is how their cycle runs. Since I was a child I heard the [caribou in the] north Baffin region tends to move away from here, the reason being food. After so many years they go back, it is a cycle and they follow their food patterns."* (I25 June 17, 2024)

[53] I25 June 17, 2024; IQ49 June 17, 2024

[54] I25 June 17, 2024

"…when my grandmother was alive it was much colder in those days. Because it warms up faster now … it is warmer now than it used to be. It used to be colder and it took longer to start melting." (I25 June 17, 2024)

3.3.1 Increasing Population Phase

Participants shared that they have recently seen increases in the caribou population and that caribou are coming back to areas where they were seen in the past.[55] Participants noted that with increases in the caribou population, allowable harvests should increase as well.[56]

"Our life span is longer than our ancestors. I am expecting the caribou population to increase two-fold because we faced no caribou for many years and we are starting to see more caribou. Our ancestors indicated that once in their lifetimes they saw [a] large amount of caribou at one time, so for us that will probably happen down the road." (I25 June 17, 2024)

Participants noted that they have seen caribou numbers increasing around the northern end of Melville Peninsula.[57]

[Regarding community members harvesting a caribou southwest of Igloolik near Naluqqajarviup Tasia Lake / Lailor Lake in 2022]: "It's a good sign [for the caribou population] because caribou have not been seen here since the 90s." (IQ53 June 18, 2024)

Recent observations around the Mary River Project (Section 3.5) further supports the suggestion that caribou on north Baffin are in the increasing phase of their population cycle.

3.3.2 High Population Phase

During the high population phase, participants noted that caribou are more relaxed.[58] Participants shared that during the high population phase, caribou bulls have less fat because there is less food to eat, that caribou diets can shift, and that if there are too many caribou in an area they can starve and die off.[59] Participants stated that the rate of sickness increases amongst caribou during the high population phase.[60]

"In Baffin Island, what I was also aware of, they eat what they normally don't eat, like mushrooms. They will start to eat mushrooms when there isn't enough vegetation for

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[55] IQ49 June 17, 2024; I25 June 17, 2024

[56] IQ49 June 17, 2024; I25 June 17, 2024

[57] IQ53 June 18, 2024

[58] IQ49 June 17, 2024; I25 June 17, 2024

[59] I25 June 17, 2024; IQ49 June 17, 2024

[60] I25 June 17, 2024

them to eat. You can tell when there isn't a lot of vegetation for them." (I25 June 17, 2024)

"When there is increased population we tend to see increased sickness amongst the caribou, especially towards the end of high peak population before decline." (I25 June 17, 2024)

3.3.3 Declining Population Phase

In addition to declining food abundance, participants noted that other factors like predation from wolves and overgrazing by geese can lead to declines in the caribou population.[61]

"...there are still wolves that impact and … there are areas where geese destroy land, uprooting plants … Geese started being more of an impact around the 90s when the geese population went higher and higher all the time. Even in areas where there were no geese there are geese in today's age." (I25 June 17, 2024)

"*There was a lack of caribou because of low vegetation. But if you went there now you can tell from what they eat that there was more vegetation. Sometimes they scatter, they follow what food is available to them."* (IQ53 June 17, 2024)

3.3.4 Low Population Phase

During the low population phase participants said that caribou were more skittish and would flee further distances.[62]

"When there are less caribou they are on alert and they scare more easily. ... The reason why I say this is because I grew up when our area had caribou and we would try not to disturb them, try not to make any noise, we had to be very careful when there was less caribou they tended to flee easier." (IQ49 June 17, 2024)

Caribou change their habitat use during the low population phase compared to other phases, as observed by participants.[63]

"Yes [fall and spring migration] changes, they seem to stay in one spot more than others when there is less caribou. When they are in an area where they won't be disturbed they tend to stay in an area longer." (I25 June 17, 2024)

"...when there is less caribou in population, they tend to stay in one area more, because they are not disturbed as much… they tend to go to the calving grounds when there is more caribou." (I25 June 17, 2024)

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[61] I25 June 17, 2024

[62] I25 June 17, 2024; IQ49 June 17, 2024

[63] I25 June 17, 2024

3.4 HARVESTING PRACTICES AND PROTOCOLS

Participants shared that Inuit hunters would typically avoid harvesting caribou during their spring migration and calving period, and hunt later in the year, sometimes in August when some believe the fur is of highest quality.[64] One participant referenced knowledge from their ancestors that suggested the caribou hunt began in September when the herds came together, and continued until the end of October when caribou had fattened up.[65]

> *"From what our ancestors have done, when the wind comes in September the herds come together. Up to the end of October I am hunting during this period because they are more fat. This is the best period for meat… maybe [hunting] into the winter briefly but the meat is best in September to October. I have been doing this since I was a young man."* (H05 June 17, 2024)

Participants shared that there are preferred harvest times by Inuit for different animals, and that caribou meat is preferred to be harvested when rain comes and their fur and fat begins to thicken in the fall.[66]

> *"In July the meat is not the same, that is why we don't really hunt then. When it is raining that is when the fur starts to thicken, so we harvest caribou before the fall"* (P14 June 17, 2014)

Participants shared that the areas around the Steensby Inlet are harvesting grounds, and also identified Nuluujat, Arctic Bay, Pond Inlet, and Clyde River as good areas for harvesting caribou.[67]

Participants discussed the conditions necessary for caribou to yield good meat year after year. When caribou are stressed and forced to run away often, their meat will not taste as good; relaxed, undisturbed animals will provide the highest quality of meat.[68] Hunters must also be cautious about how many caribou they are removing from the population to ensure there are enough caribou for the following year.[69]

> *"The animals that tend to run away too much, their meat tastes a bit off. The caribou that hasn't run away so much and has been more relaxed the meat will taste better."* (I25 June 17, 2024)

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[64] I25 June 17, 2024

[65] H05 June 17, 2024

[66] I25 June 17, 2024; P14 June 17, 2024; IQ49 May 13, 2025; K03 May 23, 2025

[67] I25 June 17, 2024

[68] I25 June 17, 2024

[69] C03 June 17, 2024

Figure 8 provides an overview of the IQ shared previously and IQ shared by participants as part of this Study related to areas used by Inuit as part of harvesting activities for north Baffin caribou.

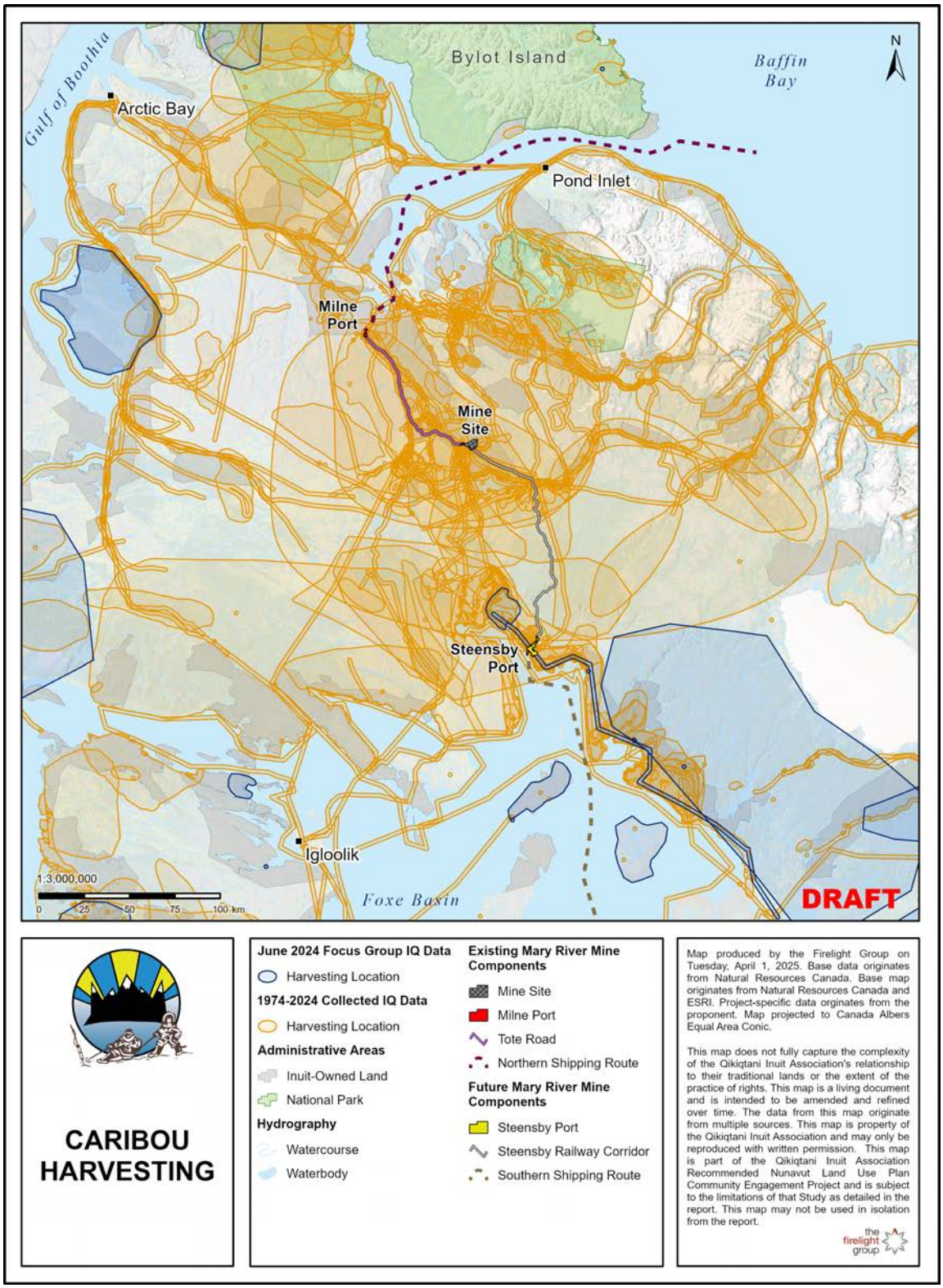

Figure 8. Areas used by Inuit for caribou harvesting activities on north Baffin, based on IQ shared as part of previous IQ studies between 1974 and 2022, and IQ shared during the engagements for this Study.

3.5 RECENT OBSERVATIONS NEAR THE MARY RIVER PROJECT

Caribou have been observed recently near Baffinland sites, including the Mary River mine site and Steensby Inlet. One participant highlighted a recent caribou sighting near the Mary River mine site that occurred at the end of April or early May of 2024.[70]

> *"In May there was a person traveling and within a half hour he came across a caribou and he indicated there was caribou around the Mary River Project, just so you are aware ... It was approximately at the end of April or early May when this individual told us so it had to be around then. This year [2024]. He didn't indicate an exact number but just mentioned he observed caribou in the area."* (IQ51 June 17, 2024)

Participants shared that caribou have been seen and harvested in the Steensby Inlet area recently and that large numbers were seen in the area in the summer of 2023.[71] The area on the western side of Steensby Inlet was noted to be a calving area with thousands of caribou there in the 1990s and 2000s.[72] Caribou have been seen in that calving area again in 2024, and participants described this is a sign that caribou are coming back to the area.[73] One participant shared that the shoreline extending from the west side of Steensby Inlet eastwards to near Salliq Island / Bray Island hosted many caribou in the 1980's, after which their number fell, but recently the number of caribou in this area has increased to almost the same levels as the 1980's.[74] Another calving area is found west of Isuqtuup Tasia Lake and east of the Steensby Port and many caribou were seen there in May 2024 by one participant.[75] Every year since 2016 one participant reported seeing caribou in the area around the future Steensby Port.[76]

Figure 9 provides an overview of the IQ shared by participants as part of this Study related to areas where north Baffin caribou have been observed recently near the future southern railway corridor and Steensby Port.

[70] IQ51 June 17, 2024

[71] I25 June 18, 2024; IQ53 June 18, 2024

[72] IQ53 June 18, 2024

[73] IQ53 June 18, 2024

[74] IQ53 June 18, 2024

[75] IQ53 June 18, 2024

[76] IQ53 June 18, 2024

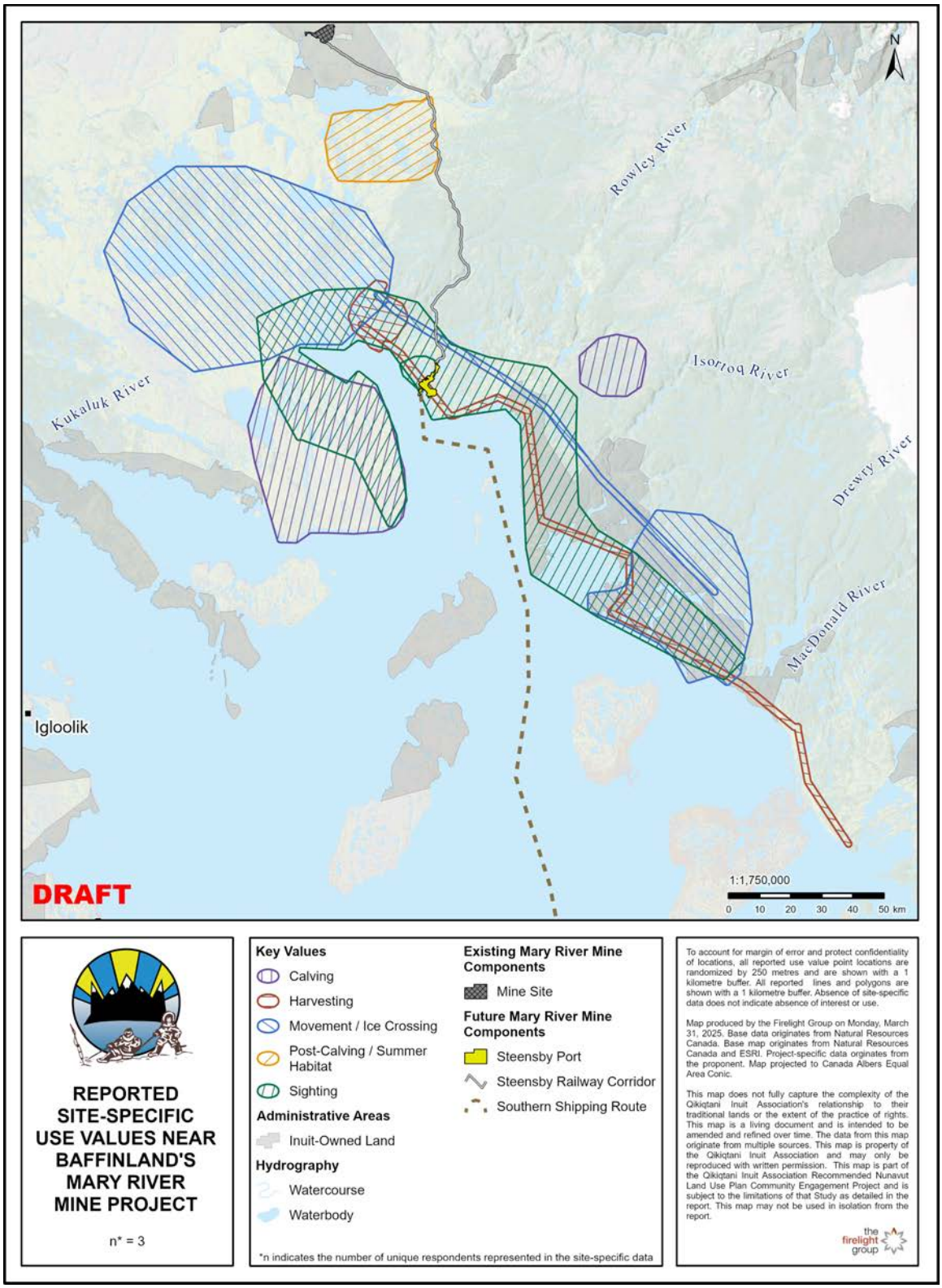

Figure 9. Recent observations of caribou around the future southern railway corridor and Steensby Port, shared during engagements for this Study.

3.6 IMPACTS ON CARIBOU

This section summarizes Inuit observations of impacts to caribou from the existing Mary River Project and predicted impacts from the future southern railway corridor and Steensby Port.

3.6.1 Impacts of the Current Mary River Project

Based on IQ summarized from previous studies, it appears that caribou on north Baffin are altering their behaviours and avoiding the Mary River Project site (QIA 2021; MSES 2021). Inuit hunters have reported noticeable changes in caribou movements, particularly that caribou are distributed further south (south Baffin and the mainland; QIA 2021). Another IQ holder expressed concerns that caribou are not occupying their traditional calving areas, which exist within the Mary River Study Area, and suggested that the sensory disturbances associated with the mine (e.g., blasting) are to blame (QIA 2021). These observations are in line with statements from Pond Inlet hunters expressed during a 2019 workshop; these hunters noted that caribou are leaving important calving grounds in the hills and mountains around the Mary River and they worried for the long term impacts of this change (QIA 2019a).

Several areas near the Mary River Project site have been identified by IQ holders as important caribou locations, including locations along the Mary River, Qinngua and Tugaat Lake areas (QIA 2019a). Since the establishment of the Project, caribou are no longer found in these traditional areas and members link their disappearance to negative Project impacts (QIA 2019a). The Mary River has disrupted caribou movements and migrations, and one member from Pond Inlet reported that caribou are moving further north in an effort to avoid mine disturbances (QIA 2019a).

Participants in this Study reflected on the Mary River Project and the related activities that have caused a variety of impacts on caribou migration patterns and Inuit hunting practices. Participants noticed a change in the seasonal migration patterns of Baffin Island caribou following the construction and operation of the Mary River mine site.[77] Historically, the Mary River area served as a migration corridor for caribou. Since operations commenced in the Mary River area, participants have observed that increased traffic, mining, helicopter overflights and related activities have prompted caribou to avoid the area in recent years.[78]

> *"North Baffin is very different today so we can't really talk about caribou having to go in to a particular area in this season. I believe the Mary River is a main migration route for the caribou. Perhaps, since it is always occupied by the workers because of the mine, their cycle has changed."* (P14 June 17, 2024)

Conversely, participants noted that some caribou are becoming less impacted by skiddoo travel.[79] One participant has observed that caribou are more accustomed to the

[77] P14 June 17, 2024

[78] P14 June 17, 2024; IQ49 January 13, 2025

[79] IQ52 January 14, 2025; K04 January 14, 2025

sound and movement of snowmobiles since they have become more common in the Arctic.[80]

In line with the reported changes in caribou movement patterns, participants also emphasized the impacts the mine site has imposed on Inuit hunting routes and methods. Before the mine was established, Inuit hunters used to access the inlets near Pond Inlet to harvest caribou. However, today local hunters have adapted their hunting strategies, often choosing to hunt during the summertime when they can use boats to access different areas beyond the inlets around Pond Inlet, further from the Mary River Project.[81] One participant communicated that they are beginning to see fewer caribou even in some of the more recent hunting grounds that are further away from the mine site, and linked the disappearance of the animals to the dust created by the mine site and other related activities.[82] The dust from the Mary River Project was noted by one participant to impact the nearby glaciers by causing greater levels of melting.[83]

> *"Before the Mary River Project was developed we were able to hunt caribou all over across the different inlets in my area [Pond Inlet]. When the mine was developed the caribou had moved. Now we will do summer hunts, we get a ride and we are taken to an area to hunt caribou and because of the impacts on caribou it has become evident that we are truly impacted."* (P14 June 17, 2024)

> *"Yesterday I was speaking about areas we used to harvest caribou by boat. We can no longer harvest here. They are no longer going to this area, perhaps because of the dust created… Why caribou aren't going here any more, is it due to the dust? Before the mine was established we would come to this area, and we just want to know why caribou don't come here. Is it noise or dust?"* (P14 June 18, 2024)

3.6.2 Predicted Impacts of the Future Southern Railway Corridor and Steensby Port

As part of the review of Baffinland's Phase 2 Development Proposal, Inuit raised concerns regarding the approved development of the Steensby Port and establishing a southern railway from Milne Port to Steensby (QIA 2021; MSES 2021). Inuit identified important caribou habitat and migration routes that overlap with the proposed Phase 2 construction. Specifically, there is overlap with the caribou movement corridor used to transit from the mainland (Igloolik area) to Baffin Island; if this corridor is impacted it could jeopardize the ability of Inuit to harvest caribou near their home communities (QIA 2021).

Based on the impacts recognized from the Mary River mine site, participants in this Study predicted similar consequences for the construction planned for Steensby Port and the southern railway route, aimed at connecting the Mary River mine site to the

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[80] IQ52 January 14, 2025; K04 January 14, 2025

[81] P14 June 17, 2024; K07 January 13, 2025; P14 January 13, 2025

[82] P14 June 18, 2024

[83] P14 June 17, 2024

future Steensby Port.[84] One participant reported increased observations of caribou along the future southern railway route, and expressed concerns that the construction will likely have lasting impacts on the herd's migration patterns.[85] Another participant predicted that the railway will have an even greater impact on caribou compared to the Tote Road, considering the proposed railway route passes through a known caribou migration corridor.[86] Multiple participants expressed concerns regarding the risk of caribou being struck by a fast-moving train, and the likelihood that the construction and operation of the railway will scare off the caribou, forcing Inuit hunters to hunt on the mainland instead.[87]

> *"Towards the spring they start to move towards the calving grounds. The rail route proposal will impact those caribou… The caribous move back and forth near the rail route so their migration patterns might change. As of late we have been seeing more [caribou] in this area."* (IQ53 June 17, 2024)

Though beyond the scope of this Study, it is worth noting that participants also raised concerns for marine life if the proposed shipping increases occur in and out of the Steensby Port.[88]

> *"We have discussed quite a bit of items this week. How can we deal with the communities? The people of Pond Inlet, 6 million tons. Will affect animals and hunting. Steensby will be much larger, and shipping, 242 ships, 32 metric tons. This will have a great impact. We won't be able to hunt in our areas. The marine life is abundant there. Their hunting ways, with shipping all year round, the marine life, animals, and the hunters will all be taken from us…."* (IQ53 June 17, 2024)

Participants expressed serious concerns about the proposed marine shipping from Steensby initiating discussions surrounding Baffinland's ability to respond to concerns from the impacted communities.[89] One participant expressed concern regarding impacts of future marine shipping on the land fast ice found north of Rowley Island.[90] Multiple participants expressed their frustrations for the lack of attentiveness they often feel from Baffinland after communicating their concerns.[91] Participants emphasized the importance of incorporating IQ and the need for this knowledge to be at the forefront of

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[84] IQ53 June 17, 2024; IQ52 January 14, 2025

[85] IQ53 June 17, 2024; IQ49 January 14, 2025

[86] K06 January 14, 2025

[87] IQ52 June 19, 2024; I25 June 18, 2024; IQ52 January 14, 2025

[88] IQ53 June 19, 2024

[89] IQ53 June 19, 2024; P14 June 17, 2024

[90] IQ49 May 13, 2025

[91] IQ53 June 19, 2024; P14 June 17, 2024; P15 June 18, 2024

decisions concerning the mine sites, ports, and related activities, especially if construction at Steensby Port and the southern railway route occurs as planned.[92]

> *"Our caribou hunting areas, if there aren't any areas where will we go to hunt? It gets hard for us, especially with Baffinland. The 75% of what we talk about is because Baffinland. We try to represent our hunters and communities... After a long time, we don't know what to say to Baffinland, our voices aren't heard, they don't feel for us."* (IQ53 June 17, 2024)

> *"…This railroad, should it go ahead, it will become even more impossible [to find caribou in areas where they used to be abundant]. If we are going to hear more about IQ we will work together and can build something that will be agreed to. Today we are not even catching up. They want public consultations, so it is tough to catch up with the IQ. When we try to put it in the forefront it just keeps going backwards. We should be listened to and what we say – we know it [IQ] like the back of our hands. This is what they are trying today. They will not tell you anything that is incorrect. The Inuit traditions, the culture – these should be used. Our ancestors strived to survive. I want you to know that and I will be defending them."* (P15 June 18, 2024)

Overall, one participant explained the challenge of predicting how caribou will respond to future disturbances and project activities: caribou move around constantly so it is difficult to predict how they will be impacted unless IQ holders have the opportunity to see the caribou for themselves.[93] With this in mind, a precautionary approach to project-related disturbances is essential.

Finally, some participants expressed concerns regarding the health of Inuit who eat country foods, including caribou.[94] Participants worried that caribou meat may have contaminants and expressed an interest in having opportunities for testing for contaminants in country foods and Inuit.[95]

The impacts on north Baffin caribou from the Mary River Project are summarized in Figure 10.

[92] P15 June 18, 2024

[93] K04 January 14, 2025

[94] IQ54 January 14, 2025; K05 January 14, 2025

[95] IQ54 January 14, 2025; K05 January 14, 2025

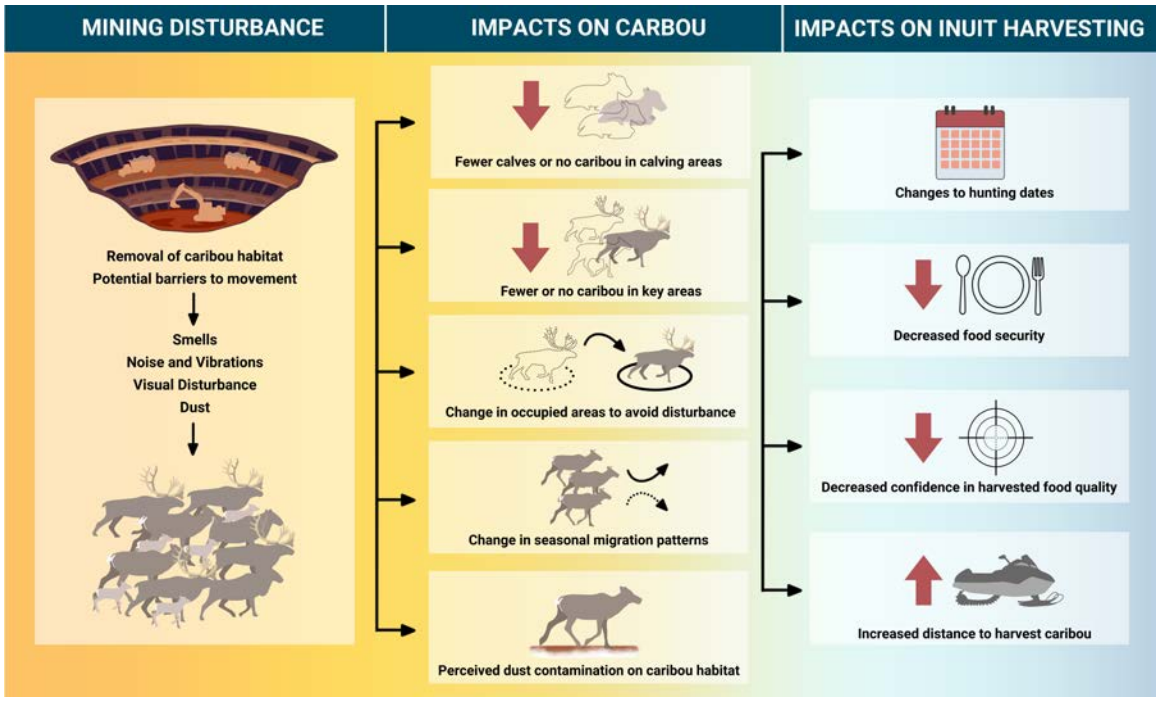

Figure 10. Graphical representations of the different impacts of the Mary River Project on north Baffin caribou and their habitat, and the subsequent impacts on Inuit harvesting.

3.6.3 Other Impacts to Caribou

The group of participants discussed additional impacts to caribou beyond those observed from the Mary River mine site and those that could occur at Steensby Port and the southern railway route. While not explicitly stated by participants during this Study, it seems likely that these impacts will add to cumulative effects in the region and further put pressure on caribou populations on north Baffin Island. Participants flagged climate change and changes to weather patterns as concerns for caribou, impacting the ability for caribou to access certain areas in the wintertime and the likelihood of winter survival.[96] One participant observed dead caribou calves around a lake in the Mary River area and linked these deaths to warming winter temperatures that caused early ice melt across Baffin Island lakes.[97] One participant shared that die-offs of caribou are happening more frequently due to climate change, which can further impact caribou populations.[98]

> *"When the snow melts earlier in the year, the lakes become dangerous. When we were around the Mary River area we found calves that were dead around the lake. We believe it was the weather that caused this. Because the weather changes and global warming they will likely face more hardship in the future."* (P14 June 17, 2024)

Warming fall temperatures also trigger the increase of rainfall instead of snow, which can cause problems for foraging caribou.[99] Participants explained that freezing rain creates a sheet of ice over the ground, making caribou forage difficult to access. In response to the freezing rain conditions, caribou will sometimes move to higher altitude areas where there is less freezing rain.[100]

Participants also spoke about the impacts of mosquitoes and wolves on north Baffin Island caribou. Caribou are sensitive to mosquitoes and are often smothered when there are too many.[101] Wolves are primary predators of caribou on Baffin Island and when wolves are present, caribou often flee the area.[102]

> *"When there are too many mosquitoes, they get smothered by mosquitoes and we have to be mindful of that."* (I25 June 17, 2024)

> *"...Wolves get many caribou in numbers as well. They flee from the wolves."* (IQ49 June 17, 2024)

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[96] P14 June 17, 2024; IQ49 June 17, 2024

[97] P14 June 17, 2024

[98] IQ49 May 13, 2025

[99] IQ52 June 17, 2024

[100] IQ52 June 17, 2024; IQ49 June 17, 2024

[101] S02 June 17, 2024

[102] IQ49 June 17, 2024

Finally, participants explained a pattern recognized between caribou and geese: when geese are present in an area during the summertime, the caribou will not be.[103] Historically, there were more Canada geese present on Baffin Island, but in recent years more snow geese have moved in, some of which interbreed with Canada geese.[104]

> *"In the summer when we look for caribou, if there are geese there won't be caribou. That is what we see. They don't get along."* (IQ49 June 17, 2024)

> *"In the past when there was less caribou they used geese as indication for whether caribou would be around. There used to be a lot of Canada geese and now snow geese have taken over. There is interbreeding now too. Canadian geese have declined, I don't see as many. But there is an increase in [the] snow geese population."* (I25 June 17, 2024)

3.7 AREAS OF SENSITIVITY FOR CARIBOU ON NORTH BAFFIN AROUND THE MARY RIVER PROJECT

3.7.1 Currently Observed Distance of Impacts of the Existing Mary River Project

During the workshop, the Research Team asked participants to identify how far away caribou are affected by different disturbances associated with the Mary River Project (e.g. blasting, traffic, helicopter overflights). Participants were reluctant to discuss specific distances, but did discuss general impacts to caribou from these disturbances. One participant identified that the disturbance from the Project led to the caribou leaving specific hunting grounds. Based on a review of Inuit Qaujimajatuqangit from this Study and previous studies, impacts on north Baffin caribou and their habitat have been observed in areas that overlap with the existing footprint of the Mary River Project and extend beyond the existing footprint (Figure 10). Impacts from the Mary River Project noted in these areas included:

- General disturbance and road dust leading to caribou no longer being found in places they were found in the past;[105]
- General disturbance leading to caribou no longer being found in places they were found in the past;[106]
- General disturbance leading to less caribou being found in hunting grounds or leaving those areas;[107]

[103] IQ51 June 17, 2024; I25 June 17, 2024

[104] I25 June 17, 2024

[105] P09 February 5, 2019

[106] C07 October 20, 2020; C19 October 22, 2020; C25 October 23, 2020

[107] P15 February 7, 2019; A14 November 5, 2020; A13 November 4, 2020, P14 January 14, 2025

- Perceived contamination of caribou hunting grounds through dustfall;[108]
- Noise and blasting leading to there being less caribou being found in hunting grounds or caribou leaving hunting grounds;[109]
- General disturbance leading to their being less calves in calving areas;[110] and
- General disturbance leading to caribou not being found in calving areas.[111]

While these polygons of avoidance do not represent complete avoidance, they do suggest that the mine is influencing caribou behaviour and use of habitat at considerable distances from the Mary River Project. Figure 11 provides an overview of the location where the impacts of the existing Mary River Project on caribou in north Baffin have been observed.

[108] C01 October 19, 2020

[109] P24 April 26, 2019

[110] P15 April 30, 2019

[111] P15 February 7, 2019; P32 April 28, 2019; P04 February 4, 2019; A04 November 3, 2020

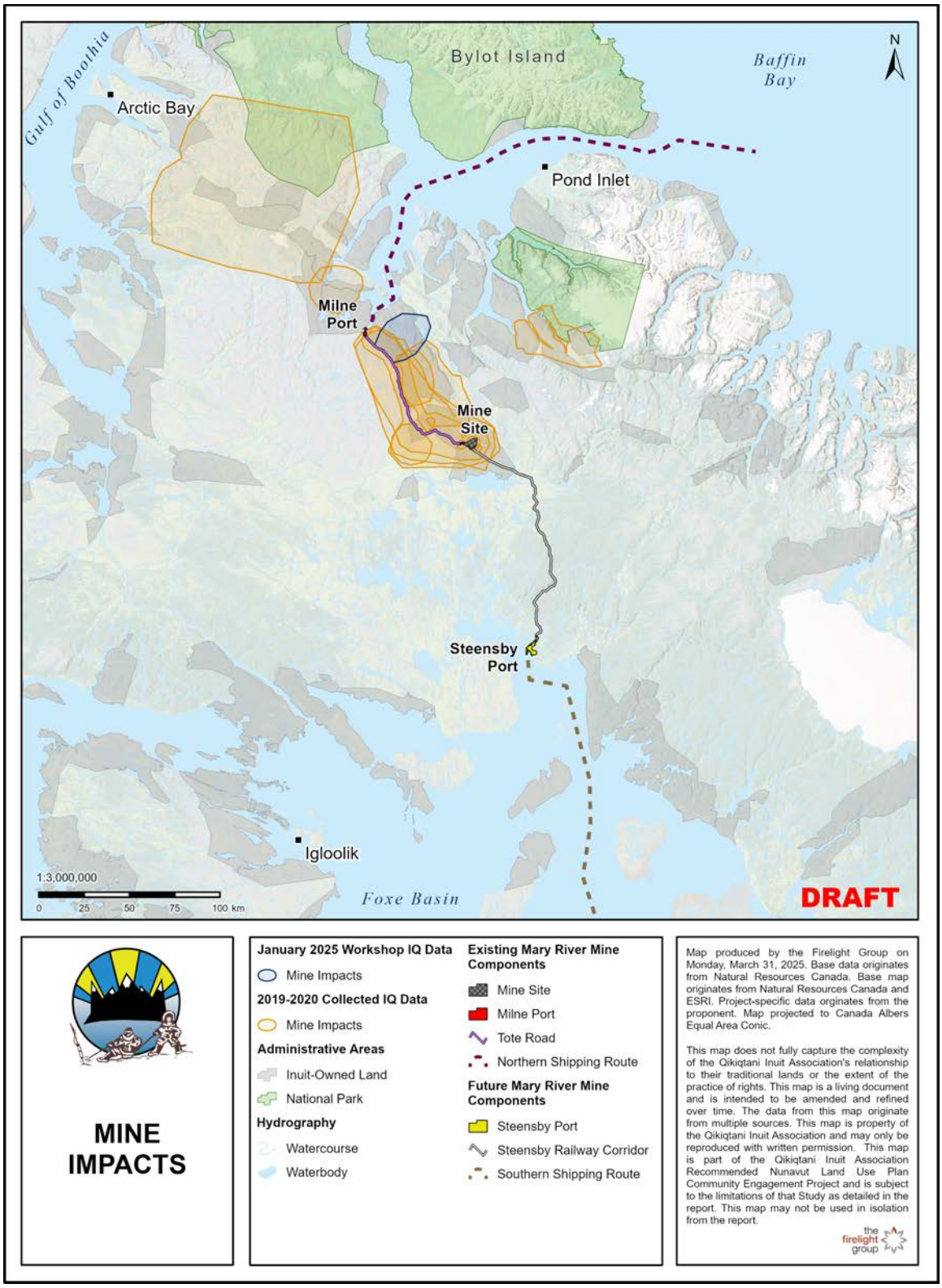

Figure 11. Areas where Inuit knowledge holders have observed impacts on caribou and caribou habitat from the Mary River Project, drawn from previous IQ studies (2019-2020), and IQ shared during the engagements for this Study.

3.7.2 Areas of Heightened Sensitivity for Caribou Around the Mary River Project

During the workshop, participants were asked to identify areas that should be protected around the Mary River Project, but they were reluctant to discuss specific locations and suggested having further discussions with specific Inuit Qaujimajatuqangit holders and examining previous studies on Inuit Qaujimajatuqangit to better inform this question.[112] Particularly, participants expressed their interest in determining where caribou hotspots exist according to previous studies and through consulting with IQ holders who are known to have specific and in depth knowledge of this area.[113] Participants conveyed that locations where caribou are always found should be priority locations for protection and that further engagement should happen with these IQ holders to delineate these areas.[114] One participant highlighted that in addition to protecting hotspots and areas where caribou are always found, protection areas need to be adaptive to where caribou are found on the land as well.[115]

During workshops held by QIA and QWB from October to December 2022 to inform the Nunavut Land Use Plan, IQ holders identified specific areas of high importance to protect caribou on north Baffin. The IQ holders engaged in 2022 were unable to attend workshops during the current Study; however, these individuals among the individuals identified by Study participants as key IQ holders to speak to about caribou protection areas around the Mary River Project. The Research Team received permission from the key IQ holders engaged in 2022 to use the information they shared to inform protection areas for caribou on north Baffin Island. Figure 12 below displays the locations of proposed protection areas for caribou in the vicinity of the Mary River Project, as informed by key IQ holders engaged during QIA-QWB workshops in 2022.

[112] IQ49, January 14, 2025; IQ54 January 14, 2025

[113] IQ49, January 14, 2025; IQ54 January 14, 2025

[114] IQ49 January 14, 2025; IQ54 January 14, 2025

[115] IQ49 May 13, 2025

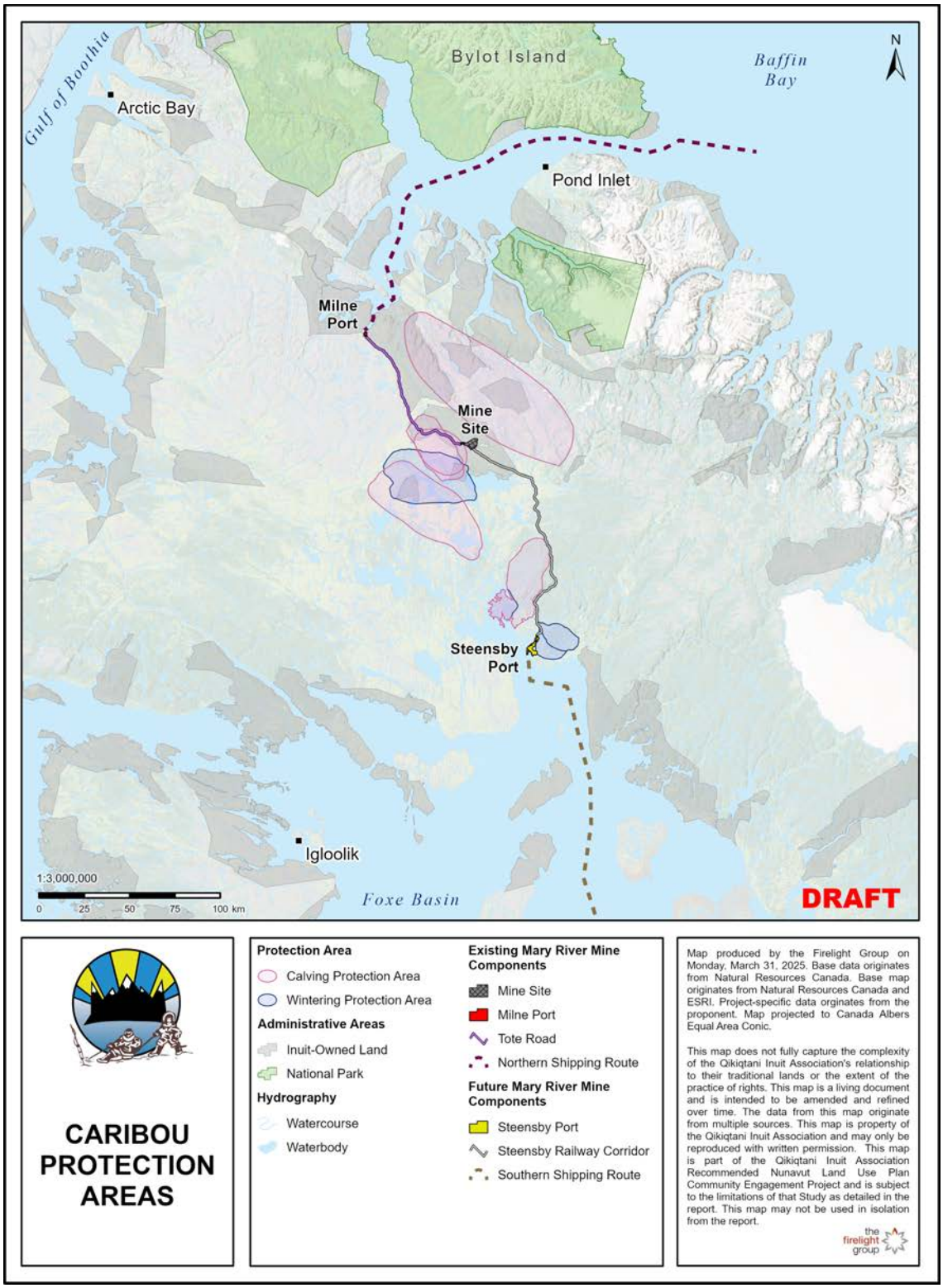

Figure 12. DRAFT Proposed Protection Zones for caribou around the Mary River Project based on IQ shared during QIA-QWB workshops for the Nunavut Land Use Plan, held from October to December 2022. The information used to inform the proposed caribou protection zones for the current Report was used with explicit permission from key IQ holders engaged during the QIA-QWB workshops in 2022.

3.8 TIMING OF SENSITIVITY FOR CARIBOU ON NORTH BAFFIN

The Research Team used a dotmocracy approach as an initial method of gauging both seasonal sensitivities and periods of the population cycle in which caribou are most sensitive. Participants were asked to rate caribou sensitivity during different times of year and different phases of their population cycle by placing stickers under the most sensitive times of year/population phase. All participants were given a number of stickers equal to the different population phases/times of year, and were asked to use all of their stickers. Follow up questions and conversations provided additional details about seasonal sensitivities for caribou on north Baffin.

Through the initial dotmocracy approach, participants emphasized that calving, post-calving, winter and fall migration are the most sensitive seasonal windows for caribou, with follow up discussions resulting in the inclusion of spring migration as another sensitive seasonal window.[116]

> *"Before rutting too [in addition to during their migration to the calving grounds] it would also be best that they [the caribou] are not disturbed during those times. So we make sure we don't disturb them then."* (I25 June 17, 2024)

> *"April, May, [and] June we need to prevent people from disturbing them because of the important events that happen at this time [movement towards their calving grounds]."* (I25 June 17, 2024)

> *"In the spring, there is other caribou migration. If the migration changes no one is responsible but humans."* (IQ53 June 17, 2024)

Participants shared that in some instances, they have observed that caribou behaviour and avoidance of snowmobile tracks has changed.[117]

> *"When I was growing up in Pond Inet they wouldn't even go near our snowmobile tracks. They have changed since then. They used to flee from snowmobile tracks and even the smell of them. Now they will cross skidoo tracks."* (IQ52 June 17, 2024)

However, it remains unclear whether these observations are enough to suggest the potential for caribou to habituate to some types of disturbance during some seasons and/or periods of population change, or whether they represent a potential for habituation to other industrial disturbances, such as those associated with the Tote road, the mine site, and helicopter overflights.

With respect to the population cycle, participants identified that caribou are sensitive animals during all phases of their population cycle. In addition to this general sensitivity, participants further distinguished that caribou are more sensitive during low periods of

[116] I25 June 17, 2024; IQ53 June 17, 2024

[117] IQ52 June 17, 2024; I25 June 17, 2024

their population cycle[118] and less sensitive during high phases of their population cycle.[119]

3.9 SUGGESTED NEXT STEPS

During discussions surrounding future workshops, participants stressed the importance of speaking with the older generation of Inuit to document and preserve their unique knowledge.[120] Ensuring the participation of Elders, recognized as the true holders of IQ, at similar workshops in addition to HTO and HTA members in the future was flagged as important.[121] One participant also expressed interest in participating in similar workshops targeted towards more specific impacts, like marine shipping.[122]

> *"...the older generation there are few of them left, it would be wise to interview them before they pass so we don't lose their knowledge."* (IQ52 June 17, 2024)

> *"I know IQ, and caribou, because we don't have many Elders anymore who our true IQ holders are."* (P14 June 19, 2024)

> *"We know that they are planning to do more shipping, so it would be great to do a similar workshop focused on shipping."* (IQ49 June 19, 2024)

Regarding data sharing, participants expressed interest in learning the number of caribou that were harvested in recent years, including the ones harvested without tags.[123] One participant was also interested in accessing the results of any collaring studies that had been conducted with Baffin Island caribou.[124] For future caribou counts, one participant stressed they would benefit from consultations and collaboration with HTO members.[125]

> *"In our community… …I want to know this is how many caribou that were harvested, the ones without tags, if we could get these statistics it would be great. You can't find the data anywhere."* (IQ49 June 17, 2024)

> *"If there has been a study on caribou that have been collared, I am wondering if you could provide a report or study that has taken place or is it the HTOs that would request that info. It would be good to see that report, if there have been*

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[118] I25 June 17, 2024; IQ49 June 17, 2024

[119] IQ54 January 14, 2025; IQ49 January 13, 2025

[120] IQ52 June 17, 2024

[121] I25 June 19, 2024; IQ55 June 17, 2024; P14 June 19, 2024

[122] IQ49 June 19, 2024

[123] IQ49 June 17, 2024

[124] IQ54 June 19, 2024

[125] IQ56 June 19, 2024

improvements or changes to the caribou. Could you pass along this kind of information to the communities." (IQ54 June 19, 2024)

"...when they go to count caribou maybe it would be appropriate if they ask HTOs some questions, I don't think they do a complete study and count. I want HTOs to be approached for help…" (IQ56 June 19, 2024)

Participants emphasized the need for HTOs/HTAs to have more authority and recognition, especially with regards to providing input on the Mary River Project, and authority in decision making processes.[126]

"We need more influence on making decisions. Problems arise because of misunderstandings. HTOs need to be recognized and given more authority especially for the communities most impacted and especially when we are dealing with Baffinland. We need to be a more recognized organization." (P15 June 19, 2024)

4. Stewardship of Caribou on North Baffin

The following section summarizes Inuit perspectives on stewardship of caribou on north Baffin, including mitigation and adaptive management measures to reduce impacts from the Mary River Project, and monitoring methods.

4.1 General Approaches for Mitigating Impacts on Caribou

Overall, to most effectively mitigate Mary River Project-related impacts to caribou, a participant stated that Baffinland must be proactive about their activities and the measures they are undertaking to protect caribou.[127] One participant shared that mitigations measures need to account for the smaller group sizes for caribou on north Baffin, and that mitigations that work for specific group sizes on the mainland would not be suitable for caribou on north Baffin.[128]

Participants were also concerned about how impacts to caribou will be mitigated near railway tunnels.[129] It was recommended Baffinland have mitigations in place to ensure caribou are not entering tunnels along the railway and being hit by passing trains.[130]

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[126] P15 June 19, 2024; I25 June 19, 2024; IQ49 June 19, 2024

[127] IQ49 January 14, 2025

[128] IQ49 May 13, 2025

[129] IQ52, January 13, 2025

[130] IQ52 January 13, 2025

When discussing the railway construction, one participant stressed the importance of proper construction and keen attention to detail to mitigate impacts to caribou, including avoiding steep banks in caribou crossing areas so the animals may cross easily.[131]

4.2 MITIGATIONS BASED ON TIMING

One participant noted that Baffinland should adapt their railway construction window to align with when caribou populations are in their high population phase.[132] Participants explained that caribou are less vulnerable when they are in their high population phase and therefore, less impacted by disturbances.[133] If Baffinland chooses to begin construction during the increasing population phase, the railway may be detrimental to population growth and occupancy of the area.[134]

Participants explained that sound travels faster during the winter months when the temperature is lower and the ground is snow covered; therefore, Baffinland should avoid blasting during the winter months, especially on clear days when the air temperature is below -40°C.[135] On participant also shared that while sounds are louder and travel further in the winter, vibrations in the land travel further in the summer, suggesting a need to be mindful of too much blasting occurring in the summer season as well.[136] It is also essential that project-related activities be restricted during caribou calving seasons to avoid disturbing vulnerable calves and females,[137] which includes avoiding blasting during the calving season.[138]

4.3 MITIGATIONS BASED ON AREAS OF SENSITIVITY

Participants shared that caribou hotspots (e.g., areas where caribou are always found) should be protected. Identifying these hotspots should be based on previous studies and further engagement with IQ holders, particularly in areas where caribou are always found.[139] As mentioned in Section 3.7.2, the proposed areas for protection were identified by key knowledge holders during workshops held by QIA and the Qikiqtaaluk Wildlife Board (QWB) from October to December 2022 to identify caribou protections for the Nunavut Land Use Plan (Figure 12). During the current Study, participants identified those individuals engaged during the workshops in 2022 as some of the key IQ holders who should support the identification of caribou protections around the Mary River

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[131] K07 January 14, 2025

[132] IQ54 January 14, 2025

[133] IQ54 January 14, 2025; IQ54 January 14, 2025; IQ49 January 13, 2025

[134] IQ54 January 14, 2025

[135] IQ52 January 14, 2025; IQ49 May 13, 2025

[136] K03 May 23, 2025

[137] K06 January 14, 2025

[138] K09 April 25, 2025

[139] IQ49, January 14, 2025; IQ54 January 14, 2025

Project. In response, the Research Team sought and received permission from the IQ holders engaged in 2022 to use their information to inform proposed caribou protection zones around the Mary River Project.

4.4 MONITORING AND ADAPTIVE MANAGEMENT APPROACHES FOR NORTH BAFFIN CARIBOU

Monitoring and adaptive management are recognized as important components of reducing impacts to caribou on north Baffin Island. Monitoring activities must be guided and informed by IQ, a critical consideration for the future construction of the southern railway route and Steensby Port: the results of this monitoring activity must be reliable and trusted by Inuit. Participants stressed the importance of collecting baseline information on caribou and monitoring them in the southern region of the Mary River Project.[140]

> *"We need some form of baseline information related to this. We have provided samples of their fur and meat. Other studies must be thought of that need to include caribou monitoring."* (I25 June 19, 2024).

Participants expressed their general distrust in the validity of the survey results Baffinland has reported out in the past.[141] Another participant worried that the high cost of the Mary River Project will deter Baffinland from reporting out any severe caribou impacts or restricting project activities when necessary.[142] Participants recommended hiring an independent third party consultant, specifically someone who is recognized and trusted by the Inuit, to conduct the baseline studies for the Steensby Port and southern railway for the Mary River Project.[143]

4.4.1 Camera Trapping

Regarding the potential for a wildlife camera program to be developed for the southern area of the Mary River Project, participants provided advice on how it could take place if a program were to move forward. Participants noted that wildlife cameras could be placed along the southern railway corridor to monitor for caribou activity and determine whether they cross the railway line[144], further suggesting that if Baffinland needs to put poles around crossings, these could serve a dual purpose for mounting the wildlife cameras.[145] As well, participants noted that wildlife cameras should be placed in caribou habitat, including along migration routes in the southern region of the Mary River Project,

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[140] I25 June 19, 2024; IQ49 June 19, 2024

[141] IQ54 January 14, 2025; K04 January 14, 2025

[142] IQ49 January 14, 2025

[143] IQ54 January 14, 2025

[144] IQ49 June 19, 2024; IQ52 June 19, 2024; P14 June 19, 2024; IQ49 January 13 2025; IQ52 January 13, 2025

[145] IQ52 June 19, 2024;

from inland areas with glaciers down to the coast.[146] One participant noted that wildlife cameras could be placed at regular intervals to monitor important areas for caribou.[147] Participants shared that IQ holders should be in charge of selecting sites for wildlife cameras along the proposed railway route to ensure the best chance of spotting caribou and subsequently, selecting the most optimal locations for the wildlife crossings.[148]

> *"It was also mentioned that the crossings for wildlife if they can be monitored once the railway has been set up. The caribou hunting grounds were affected when [the Mary River] project started. So, it would be preferable to set things up right away. Allow us to suggest where the cameras are located because the board members know the land."* (P14 June 19, 2024)

The importance of getting a wildlife camera program started in the near future was highlighted by participants so that data can be collected before construction begins, and then compared to data collected after construction is completed.[149] It is important wildlife cameras are installed along caribou migration routes prior to the railway construction and set up at varying distances depending on how far railway noise is expected to travel.[150] Participants noted that a potential wildlife camera program should be a long term program so that changes can be documented over time.[151] Although camera trap monitoring is important, participants emphasized this should not be the only method used to monitor impacts of the Mary River Project on caribou.[152]

One participant requested that Baffinland share their anticipated blasting and helicopter flight schedule so any caribou responses captured on the cameras can be compared to their behaviours during quieter periods.[153]

Regarding the specifics of setting up and maintaining the cameras, some participants noted that wildlife cameras could be accessed by sleds in the spring and winter,[154] while other participants noted a preference for using helicopters.[155] One participant noted that poles would need to be used to mount the wildlife cameras,[156] and other participants

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[146] IQ49 June 19, 2024; P14 June 19, 2024; general consensus from the focus group

[147] IQ49 June 19, 2024; IQ52 January 13, 2025

[148] P14 June 19, 2024

[149] IQ49 June 19, 2024; IQ54 June 19, 2024; P14 June 19, 2024; IQ49 June 19, 2024

[150] IQ49 January 13, 2025

[151] IQ49 June 19, 2024

[152] IQ49 June 19, 2024

[153] IQ54 January 13, 2024

[154] I25 June 19, 2024

[155] P14 June 19, 2024; IQ54 June 19, 2024

[156] I25 June 19, 2024

stated that it would be important to not have any exposed wires present that could be chewed on by wildlife such as arctic foxes.[157] Participants highlighted the importance of using wildlife camera technologies that allow for remote access to data so that data can be assessed in real time.[158] A participant also stressed the importance of having IQ holders guide where cameras are placed as they know the land.[159] In addition to the camera traps, some participants noted that audio recording devices could be used as well to monitor noise impacts.[160]

4.4.2 Collaring

During the discussion on caribou collaring as a monitoring method, some participants stated they were supportive of collecting western science data using this method because of the potential impacts of the southern railway corridor,[161] while other participants expressed strong opposition to collaring caribou.[162] One participant in favour of collaring caribou explained this method could also provide more employment opportunities for Inuit.[163] However, other participants against collaring suggested that different, smaller devices should be used.[164]

> *"I believe collared caribou become disabled and sometimes starve. For example if they are going to build a railway we want to be able to know the reaction of the caribou. If there are too many caribou collared it wouldn't look good in both North and South Baffin. I think it is better to use collaring at this time because the caribou we can hunt is limited due to the quota."* (I25 June 19, 2024)

> *"I believe it can be useful with caribou collaring. They did this in a study near Baker Lake and disclosed results of the collared caribou.... It can be useful for us too…. And if cameras were set up as well it can be useful. The results we saw from caribou that were collared it was useful for the Baker Lake project."* (IQ54 June 19, 2024)

> *"We don't really like it, but we wanted to support it because it is part of western science. They will have the right data along with Inuit Qaujimajatuqangit. What they were thinking of is collaring 35 caribou, although we are against it, it was better to trust them at the time to see where they [caribou] migrate to, at what times, when they go to their calving grounds, so that we have baseline information although we are not really happy with caribou collaring."* (IQ53 June 19, 2024)

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[157] IQ49 June 19, 2024; P14 June 19, 2024; IQ49 January 13, 2025

[158] IQ53 June 19, 2024; IQ49 June 19, 2024

[159] P14 June 19, 2024

[160] I25 June 19, 2024

[161] IQ54 June 17, 2024; I25 June 19, 2024; P14 June 19, 2024; IQ54 January 14, 2025; K03 May 23, 2025

[162] P15 June 18, 2024; IQ53 June 19, 2024

[163] IQ54 January 14, 2025

[164] K04 January 14, 2025; IQ50 June 19, 2024

"Before the railway is built I am fine with it [collaring caribou]. To track them. Once the railway is built I wonder how they would react. I would want to know the patterns and trends of the caribou because some of them become skinny, lose weight." (P14 June 19, 2024)

"We wouldn't normally support it, the western science. But they are rushing the Mary River Project, so we want to support. They are against the IQ but we wanted to support and we want to have baseline information. We want to be able to tell results of studies once the railway is built so we can pass on the knowledge to next generations. HTOs didn't really support this in the past but the rail has changed that, so we want to have the right information through this [collaring]." (IQ53 June 19, 2024)

"I don't want caribou collars. I don't want them affected... If you are going to put on collars you must follow IQ, if we don't want collars put on. For example a caribou went from A to B but following IQ we would recognize this. I want the government to stop collaring. Please listen to IQ values." (P15 June 18, 2024)

Another disadvantage of collars was noted by one participant, who said that harvesters could use the locations from the collars to go to those areas to hunt the caribou.[165]

If collaring were to take place, participants shared that the collars should not be too tight on the necks of the caribou,[166] that the collars should be spread out among the different caribou populations (i.e. avoid attaching 35 collars in just north Baffin Island),[167] and that less than 35 collars should be used.[168] One participant stressed that if collars were used, other monitoring methods should be used as well.[169]

" …if you are going to be doing it [collaring] put them on different subpopulations, not 35 altogether. If there was 35 collars in a single population it won't look good….." (H05 June 19, 2024)

4.4.3 Other Monitoring Options

Participants emphasized the importance of monitoring the natural environment in a holistic way, including impacts on caribou food resources and diet.[170] For example, participants highlighted that IQ should be a focus of caribou monitoring[171] Participants

[165] P14 June 19, 2024

[166] H05 June 19, 2024

[167] H05 June 19, 2024; IQ52 June 19, 2024; IQ49 June 19, 2024; IQ50 June 19, 2024

[168] IQ54 June 19, 2024

[169] IQ54 June 19, 2024; IQ50 June 19, 2024

[170] I25 June 19, 2024; IQ54 January 14, 2025

[171] IQ49 June 19, 2024; I25 June 19, 2024; P15 June 19, 2024

shared different ideas for how IQ could be brought to the forefront of caribou monitoring, including creating a group that HTOs/HTAs can engage with.

> *"Create a group that we can approach and [share] where we hunted and after each year, they can review this. So, we have more close monitoring of the caribou."* (IQ49 June 19, 2024)

> *"...have a phone number to observe what they see, or a program to report… A program in place throughout Nunavut. A local hunter can call and mention I caught a caribou, location, season, part of the year. This would be more up to date data on the movement of caribou. The data would be more relevant and in tune with the time. It would be live documentation in real time, instead of a survey every few years…"* (IQ49 June 19, 2024)

> *"There are polar bear monitors, these monitors could make observations… It would be good if the researchers that are out there report observations as well. Communities used to have monitors; they no longer do. The Inuit would like to see these programs come back to monitor the caribou. There are no programs like this anymore so we should bring back these programs."* (I25 June 19, 2024)

Participants emphasized the importance of having Inuit monitors on the land in areas impacted by the Mary River Project, ensuring ongoing, long-term monitoring.[172] They also highlighted the need for future railway tunnels to be monitored by on the land monitors, and stressed that all caribou trails and movement corridors should be carefully tracked to assess any project-related impacts.[173] A participant highlighted an opportunity to have Inuit hunters opportunistically collect data while they are out on the land, including taking caribou blood samples.[174]

Participants also discussed the use of drones compared to aerial plane surveys and collaring.[175] Participants noted that drones are smaller than planes and therefore pose less disturbance to caribou.[176] One participant noted it would be beneficial to take photos while doing aerial surveys of caribou to collect additional information.[177] Additionally, since it is especially challenging to collar male caribou due to the growth of their necks prior to the mating season, drones would provide the non-invasive opportunity to monitor both males and females effectively.[178]

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[172] K04 January 14, 2025; IQ49 January 14, 2025

[173] IQ49 January 14, 2025

[174] IQ54 January 14, 2025

[175] IQ52 January 14, 2025; K04 January 14, 2025; IQ57 January 14, 2025

[176]K04 January 14, 2025

[177] IQ52 January 14, 2025

[178] IQ57 January 14, 2025

5. MANAGEMENT RECOMMENDATIONS

The following recommendations reflect what was heard from participants during the engagements, based on Inuit Qaujimajatuqangit provided by participants during the focus group and workshop and Inuit Qaujimajatuqangit shared during past studies. These recommendations can be considered a starting point to build better protections and monitoring for caribou on north Baffin, and should be bolstered with further knowledge gathering under an adaptive management approach. The development of these management recommendations did not involve a review of the existing environmental management systems that Baffinland currently has in place; rather, these management recommendations are reflective of the IQ and guidance provided from participants. These management recommendations should be integrated into existing environmental management systems and mitigations by Baffinland, and where needed Baffinland should consider creating new systems to action the recommendations.

5.1 RECOMMENDED MITIGATIONS

Inuit Qaujimajatuqangit Must Guide the Stewardship and Adaptive Management of Caribou on North Baffin: Inuit Qaujimajatuqangit must play a critical role in all decisions related to stewardship of caribou around the Mary River Project, including baseline data collection, research, monitoring, mitigation, and adaptive management. To ensure Inuit Qaujimajatuqangit fulfills this role, there must be ongoing engagement with Inuit—and particularly engagement with the older generation of Inuit, to document and preserve their unique Inuit Qaujimajatuqangit related to north Baffin caribou.

Avoid Disruptions to Caribou During Sensitive Periods in their Seasonal Round: Specific mitigations should reflect information shared on sensitive timing periods for caribou on north Baffin. In particular, the Mary River Project activities should be proactively restricted during the caribou calving season to avoid impacts on female caribou and calves, which are sensitive at that time of year. Blasting should be proactively avoided during the winter season.

Protect Sensitive Areas Around the Mary River Project: Areas of importance to caribou on north Baffin during the calving and wintering periods must be subject to proactive reductions in disruptive activities to allow caribou to continue using these areas during these seasons. This guidance should be implemented within Protection Zones identified in draft form in Figure 12. Adaptive measures also need to be in place to ensure that caribou are protected where they are present on the land.

Protect and Support Caribou Movement Through the Mary River Project Area: Mitigations should be developed to avoid potential impacts on caribou movement through the existing Mary River Project area, and future southern railway corridor and Steensby Port. This should include but not be limited to: mitigations to avoid potential mortalities of caribou when they attempt to cross the southern railway corridor, restricting traffic on the Tote Road and southern railway corridor to allow for safe and unimpeded movement of caribou through these areas, and ensuring railway embankments for the southern railway are sloped so that caribou can cross easily.

5.2 MONITORING AND ADAPTIVE MANAGEMENT RECOMMENDATIONS

Guide Management Decisions with Monitoring and Adaptive Management: Management decisions must be guided by Inuit Qaujimajatuqangit that is both current and from the most knowledgeable Elders and land users. As one participant explained, it is challenging to predict how caribou will respond to future disturbances and project activities, and therefore critical that Inuit knowledge holders have the opportunity to observe these impacts and interpret them from their own body of knowledge and understanding. These observations would then inform additional mitigations that are managed adaptively based on the results of monitoring. Monitoring and adaptive management related to north Baffin caribou around the Mary River Project should include:

- Inuit monitors should be on the land around the Mary River Project to collect information on Mary River Project impacts, and to collect information on caribou on the wider landscape year-round;
- Western science-based monitoring should be undertaken by an independent third party that is trusted by Inuit;
- A tissue sampling program undertaken by a trusted third party should be established that allows for Inuit hunters to provide caribou samples (e.g. blood, organs) that can be analyzed for impacts related to the Mary River Project;
- A caribou diet monitoring program undertaken by a trusted third party should be established that monitors the quality and quantity of the foods, and for potential contaminants from the Mary River Project;
- Wildlife cameras should be used as part of the baseline surveys on caribou and other wildlife around the southern railway corridor and Steensby Port and this monitoring should continue after construction to assess the Mary River Project impacts; and
- Other technologies like noise monitoring devices, the use of drones, and taking photos when doing aerial surveys to monitor caribou and Mary River Project impacts on caribou should be explored for use in the Mary River Project context.

5.3 ADDITIONAL RECOMMENDATIONS

The summary below provides additional recommendations for stewardship of caribou on north Baffin and overall management of the Mary River Project:

Role of the HTOs/HTAs with the Mary River Project - HTOs/HTAs should have more authority and recognition, especially with regards to providing input on the Mary River Project, and authority in the decision making processes.

Caribou Call-in Line - A call-in line should be established so hunters can call and mention where they harvested their caribou, the location, and the time of year, along with any additional observations of caribou.

More Engagements with Inuit on Caribou - Having further engagements to speak with the older generation of Inuit to document and preserve their unique knowledge related to caribou on north Baffin.

More Engagements with Inuit on Other Environmental Concerns - Having further engagements to speak with the older generation of Inuit to document and preserve their unique knowledge related to other aspects of the environment that are impacted by the Mary River Project and could be impacted by the southern railway corridor and Steensby Port.

Further Engagement with HTOs/HTAs on Future Caribou Monitoring - There should be more consultation and engagement with HTOs/HTAs on future caribou counts and other monitoring initiatives, and this should include opportunities for collaborating with the HTO/HTA when undertaking those activities.

6. CONCLUSION

This Report provides an overview of the Inuit Qaujimajatuqangit on north Baffin caribou from the HTOs/HTAs of the five communities directly affected by Baffinland's Mary River Project, along with IQ from HTOs representing two southern communities. As noted by participants during the focus group and workshop, Inuit Qaujimajatuqangit is extremely important in understanding impacts on the land, water, air, humans, and animals, including caribou. Inuit Qaujimajatuqangit must be the foundation and guide efforts to re-estimate the zone of influence for the Mary River Project, collect baseline data, and develop more robust protection measures for north Baffin caribou impacted by the Mary River Project.

As highlighted by participants, Inuit Qaujimajatuqangit is holistic in nature; having a more robust understanding of the ecology of north Baffin caribou can help support decisions made around the stewardship and protection of caribou to ensure they are well informed. This Report outlines Inuit Qaujimajatuqangit shared by participants on north Baffin caribou related to:

- Seasonal needs, their timing, and how these relate to caribou's sensitivity to disturbance;
- Inuit harvesting practices;
- Phases of their populational cycles and how these relate to caribou's sensitivity to disturbance; and
- Additional factors that could impact caribou like freezing rain, predators, mosquitoes, and other competitors like geese.

With the near-term future development of the southern railway corridor and Steensby Port, it is more important than ever to have an understanding of caribou presence and use around the existing Mary River Project and these future developments. Participants shared their Inuit Qaujimajatuqangit on caribou habitats around the existing and future Mary River Project components, and provided details of recent sightings of caribou and

harvesting activities in these areas as well, which provide evidence of an increasing population phase.

Participants stressed their significant concerns with the impacts of the Mary River Project on caribou migration patterns, habitat use, habitat quality, and the effects they have observed on caribou and the cascading effects these have on their use of the land and ability to harvest caribou. Concerns about the potential future impacts of the construction and operation of the southern railway corridor and Steensby Port were also voiced by participants and included: caribou being struck by trains, disruption of migration routes, and changes in the abundance of caribou Inuit hunting areas. Importantly, participants predicted that the southern railway corridor may have an even greater impact than what has been experienced by caribou on north Baffin with the construction and operation of the Tote Road.

In addition to the Inuit Qaujimajatuqangit collected as part of this Study, the Research Team reviewed Inuit Qaujimajatuqangit from previous studies (see Section 2.3) to identify areas of impacts on north Baffin caribou and their habitat. Through this review, the Research Team identified that impacts have been seen in areas that overlap with the existing footprint of the Mary River Project and up to 155.9 km from the nearest portion of the existing footprint. The significant distance at which impacts form the Mary River Project on caribou can be observed by Inuit underscores the need for robust re-assessment of the zone of influence of the Mary River Project, especially with the prospect of Steensby Port and the southern railway corridor being constructed in the near future.

Monitoring activities of north Baffin caribou must be guided and based in Inuit Qaujimajatuqangit to ensure that they are appropriately scoped, and that the methods resonate with both IQ and western science knowledge systems. Participants shared their concerns regarding their general distrust in the validity of the survey results Baffinland has reported in the past, which highlights the need for trusted independent third parties being involved in collecting monitoring data. Having increased involvement of independent third parties should increase levels of trust among Inuit that the monitoring results are accurate and reflective of on-the-ground conditions observed by Inuit. Baffinland could consider undertaking a new approach to communicating monitoring results that integrates the finding of these trusted independent third parties and potentially provide opportunities for Inuit to voice concerns when Baffinland's monitoring findings do not align with Inuit lived experiences. Other options could include: giving Inuit more control over conducting studies; phasing studies and periodically reviewing results with Inuit to ensure that methods / approaches are appropriate; and identifying a review body to provide recommendations when the results of studies do not align with Inuit observations. In terms of immediate actions to take, participants were resolute in conveying the importance of collecting baseline information on caribou around the Steensby Port and southern railway corridor areas, before construction starts.

This Report provides a set of robust mitigation measures, monitoring, and recommendations for stewardship of north Baffin caribou around the Mary River Project, based on Inuit Qaujimajatuqangit, underpinned by the importance of continuing to learn and adapt by actively being and observing on the land. Additional studies will supplement the current understanding; however, the mitigation measures and recommendations shared in this report should be implemented as soon as possible, with the intention of adapting them through ongoing monitoring, in collaboration with Inuit.

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