

Technical Memorandum

QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission: Caribou Protection Areas in the Qikiqtaaluk Region of Nunavut

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1. Overview of Caribou Submission Package

“Our ancestors used to say: ‘make sure you are careful that you don't make the caribou migrate a different way. Respect their ways of migrating even if you're hunting, otherwise they could take a different route.’ They would be careful when hunting with rifles to muffle the sound and not disturb the other caribou.” (QIA-QWB Workshop Notes, October 12 2022)²

The Qikiqtaaluk Wildlife Board (QWB) and the Qikiqtani Inuit Association (QIA) are pleased to provide the Nunavut Planning Commission with this submission package on caribou protection measures to be established in the Qikiqtaaluk region through the Nunavut Land Use Plan. The full submission package includes this technical memo (QWB-QIA-2023-A-TM), and four separate written submissions for the following designation types: calving and post-calving habitat (QWB-QIA-2023-A-01), winter habitat (QWB-QIA-2023-A-02), movement corridors (QWB-QIA-2023-A-03) and harvesting areas (QWB-QIA-2023-A-04). The submissions apply to

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² The writing team has made an effort to include Inuit voices in this submission package wherever possible. The quotes are generally from two sources: workshops held by QWB and QIA with Hunters and Trappers Organizations (HTOs) in October and December 2022, and regional workshops on the land use plan held by NPC. QWB and QIA did not transcribe the translated audio from workshops held in October and December of 2022; however, staff took detailed notes during discussions to support this submission. Where quotation marks are used around a statement pulled from the October and December 2022 workshops, the quote is near verbatim based on the translation into English. Where no quotes are used and the text is written in the third person, the notes should be considered approximate.

all caribou in the Qikiqtaaluk region, including tundra-dwelling barren-ground caribou on Baffin Island and the surrounding islands, mainland barren-ground caribou on the Melville Peninsula, Peary caribou in the high Arctic, and introduced reindeer in the Sanikiluaq area (Belcher Islands).

This overview document provides the technical rationale for the joint approach developed by QWB and QIA for caribou protection in the Qikiqtaaluk region. The approach relies on the best available information and knowledge on barren-ground and Peary caribou from both Inuit Qaujimajatuqangit and western science. As described in the methods section below, the analysis relied on a comprehensive combined database of both Inuit Qaujimajatuqangit and western science,³ and critical input from key knowledge holders from all eleven hunters and trappers organizations (HTOs) across the Qikiqtaaluk, to identify areas of important calving, post-calving, winter, and migratory habitat, as well as caribou harvesting areas, which must be fully or conditionally protected through the Nunavut Land Use Plan.

Both QWB and QIA previously provided NPC with separate submissions on caribou protection in the Qikiqtaaluk region. In 2018, specific to the 2016 Draft Nunavut Land Use Plan (DNLUP), QWB submitted 43 written submissions (QWB et al. 2018). Of these submissions, five were specific to caribou habitat including caribou wintering areas (WS-06), caribou and reindeer harvesting areas (WS-07), caribou calving and post-calving areas (WS-08), caribou sea ice crossings (WS-09) and caribou migration (WS-10). In addition, in WS-11, QWB identified a large multi-value area on west-central Baffin that includes critical caribou calving, post-calving, movement and winter habitat. Several other written submissions (e.g., WS-32, WS-33, WS-34, WS-36, WS-40) included caribou harvesting areas that are important for local communities for the practice of rights. Some of the areas identified by QWB in these submissions were brought into the 2021 version of the DNLUP. Notably, however, caribou harvesting areas and multi-value areas were not included in the 2021 DNLUP, and some designations were not protected as strongly as QWB had requested.

In 2022, QIA reviewed the 2021 DNLUP protection measures for caribou in the Qikiqtaaluk region against available Inuit Qaujimajatuqangit (IQ) and western science, and identified several gaps in the caribou protection measures in the Qikiqtaaluk region.⁴ Based on this review, QIA entered into a formal agreement with QWB to develop a joint submission for the NPC to consider, regarding the protection of habitat for caribou in the Qikiqtaaluk region.

³ Note that the western science portion of the database was only available to QIA's technical consultants based on the conditions of the data sharing agreement with the Government of Nunavut, and was not shared with QWB.

⁴ For example, in the Qikiqtani region, the 2021 DNLUP only protected 49,046 km² or 4.9% of the land mass as caribou calving habitat; however, based on the available IQ, at least 21.9% of the land mass had previously been identified as critical calving habitat (see Table 2.4-2 in Appendix C of QIA 2022). QIA also identified insufficient calving habitat protected in north and northeastern Baffin, insufficient winter habitat protected across all of Baffin and the high Arctic, and insufficient movement corridors (including ice crossings) protected throughout the Qikiqtaaluk. QIA also identified a key gap with respect to NPC's failure to protect caribou harvesting areas submitted by QWB, and noted that these areas should be prioritized for protection as they are both important habitat and critical areas for the practice of rights. This issue is further addressed under the appended caribou submission QWB-QIA 2023-A-04.

This joint submission is a result of that collaboration. Together, QWB and QIA are requesting the following designations for caribou in the Qikiqtaaluk region:

- To protect caribou and their habitat during their most vulnerable seasons based on Inuit Qaujimajatuqangit:
 - Limited use designations for calving, post-calving, and winter habitat;
- To ensure connectivity of habitat:
 - Limited use designations within 10 km radius of freshwater and terrestrial movement corridors;
 - Conditional use designations for sea ice crossings;
 - Conditional use designations for open water crossings.
- To protect Inuit rights to harvest caribou in preferred harvesting areas as identified by each HTO:
 - Limited use designations for caribou harvesting areas as Community Areas of Interest - Harvesting.⁵
- To ensure continued revisions to the plan based on Inuit Qaujimajatuqangit and western science:
 - support for a monitoring program guided by HTOs to guide revisions to these designations;
 - support for a formal process to review designations with HTOs in keeping with the 10-year revision cycle for the NLUP.

Figure 1 shows the areas QWB and QIA are requesting as Limited Use and Conditional Use for the final version of the Nunavut Land Use Plan, and Table 2 summarizes the submissions and their respective designations. In total, based on guidance from the HTOs, QWB and QIA are requesting 36.3% of the Qikiqtaaluk region to be designated as Limited Use and protected for caribou, including to two freshwater crossings, and 10 on-land movement corridors. QWB and QIA are also requesting two open ocean crossings and 41 sea ice crossings in addition to those already incorporated in the 2021 DNLUP.

This submission package clearly points to the need for much higher levels of protection for caribou in the Qikiqtaaluk region than previously contemplated in the 2016 and 2021 versions of the DNLUP. Members of all the HTOs have emphasized that the areas identified for protection in this submission are the **minimum requirements** to ensure that caribou habitat in the Qikiqtaaluk can continue to support long-term caribou population cycles that are critical for

⁵ The QWB-QIA joint submission on harvesting areas further lays out the rationale for designating harvesting areas as “Wildlife Harvesting Areas” under Chapter 2 or “Community Areas of Interest - Harvesting” under Chapter 4 of the final NLUP.

Inuit rights and food security.⁶ The areas identified for protection are based on the best available knowledge for ensuring that caribou in the Qikiqtaaluk region can continue to reach population levels observed during previous population highs, last seen on Baffin Island in the late 1990s (within the window of 1998-2002)⁷. On Baffin and the surrounding islands, protection measures included in this package are based on the ecology of Baffin Island tundra-dwelling barren-ground caribou, which exhibit important differences in movement patterns and calving / post-calving strategies compared to mainland taiga and tundra-dwelling barren-ground caribou. For Peary caribou in the high arctic, habitat protection and movement across sea ice are the primary drivers of protection measures included in this submission package.

Inuit engaged in the development of this submission package have emphasized that additional measures will be needed in areas outside of these designated Limited and Conditional Use areas to protect caribou and caribou habitat from disturbance during high levels of their population cycles, including area-based and linear limits on total disturbance and conditional or mobile protection measures. These recommendations fall outside of the NLUP and will be addressed separately through the regulatory process.

This overview memo is arranged as follows:

- Section 2 provides important background information for the QWB-QIA caribou submission package, including the respective roles of the QWB and QIA in managing caribou populations and habitat in the Qikiqtaaluk region and the Guiding Principles used to develop this submission, emerging policy and best practices that support identifying large areas of the Qikiqtaaluk to be protected from industrial development, and a summary of key aspects of the ecology of caribou in the Qikiqtaaluk region.
- Section 3 describes the methods used to develop the QWB-QIA caribou submission package, including the approach for working with the HTOs across the Qikiqtaaluk, and the datasets used to review all proposed protection areas (Table 1).
- Section 4 provides a high level summary of the results included in each of the four appended submissions, including the map of all submissions (Figure 1) and an accompanying table (Table 2) summarizing each habitat type delineated through this submission.

⁶ This emphasis on minimum protection requirements is particularly important to consider in light of the combined impacts of climate change and increasing pressure from industrial development and tourism on all aspects of the environment in the Qikiqtaaluk region. See Sections 2.2 and 2.3 for additional policy context.

⁷ By 2004, Inuit were recognizing signs of population decline, as described in the draft (unpublished) 2005 management plan for south Baffin caribou.

2. Background Information to Support the QWB-QIA Caribou Submission Package

2.1 Roles of QWB and QIA in Caribou Protection and Management in the Qikiqtaaluk Region

As a Designated Inuit Organization, QIA's mandate is to advance the rights and benefits of Qikiqtani Inuit through protection and promoting their social, political, economic and cultural interests, while safeguarding the land, waters and resources that sustain their communities. QWB is the Regional Wildlife Organization, which oversees the exercise of Inuit harvesting in the Qikiqtaaluk region, in collaboration with the related Hunters and Trappers Organizations. QWB has a direct interest in the planning of land uses in Nunavut, given that impacts on wildlife populations can potentially affect Inuit harvesters. Together, QWB and QIA have a shared interest in caribou protection in the Qikiqtaaluk, particularly to ensure that the caribou protection approach in the final NLUP is based fundamentally on Inuit Qaujimajatuqangit, using western science where appropriate and available, and with strong guidance from HTOs. QWB and QIA agree that the approach used to protect caribou habitat in the Qikiqtaaluk region within the NLUP will conform to Inuit systems of wildlife management and Inuit understanding of caribou ecology and long-term population cycles, based on guidance from Inuit experts.

The parties have been guided by two key principles in the development of this approach to caribou protection in the Qikiqtaaluk region:

1. **Primacy of Inuit systems of wildlife management:** In December 2020, QWB adopted the legal position to assert that the Nunavut Agreement, a constitutionally protected treaty between the Inuit of Nunavut and the Crown of Canada provides primacy to Inuit Systems of Wildlife Management with respect to decision-making processes and outcomes regarding wildlife and wildlife harvesting by Inuit. This primacy extends to Inuit Qaujimajatuqangit (IQ) because IQ is the basis for Inuit Systems of Wildlife Management.
2. **Full protection of caribou habitat from disturbance:** At the October 2015 Annual General Meeting, the QIA Board of Directors adopted a resolution endorsing full protection of caribou calving grounds in the Qikiqtani region. At that time, measures contemplated to protect post-calving habitat also included mobile protection. Both QWB and QIA now agree that core seasonal habitat for caribou must be off-limits to development. Since Inuit Qaujimajatuqangit is clear that during the low and initial increasing periods in the caribou population cycle on Baffin Island, caribou can very quickly learn to avoid areas of disturbance at apparently considerable distances from the disturbance, it is critical that large areas are protected from disturbance even when

caribou are not currently occupying these areas. Mobile protection measures⁸ will likely have a role in the protection of caribou in the Qikiqtani region outside of core areas that are off-limits to development.

2.2 Role of land use planning for caribou protection

The purpose of land use planning is to make informed decisions about future uses of all areas within the plan, including lands, waters, and other resources. The plan should be designed to achieve defined vision and goals for the planning area. Specific to the Nunavut Land Use Plan, the Nunavut Agreement lays out requirements for the plan in Article 11, and in particular Section 11.2 lays out the principles and goals of land use planning in Nunavut. These principles and goals are clear that the primary purpose of land use planning in the Nunavut Settlement Area centres on protecting and promoting the existing and future well-being of residents of Nunavut, with a special focus on the well-being of Inuit and Inuit Owned Lands.

During workshops held by QWB and QIA for the development of this caribou submission package, Inuit of the Qikiqtani region repeatedly expressed that one of their key concerns related to land use planning is to ensure that caribou can return as they always have, following their population cycle (60-90 years). The section below notes some examples of quotes from QWB-QIA workshops held with HTOs referencing caribou numbers and concerns about supporting the population cycle:

“Our ancestors used to tell us to not worry about or try to control the animals, they will follow their patterns and come back. But things have changed, and we don’t know where to hunt.” (QIA / QWB Workshop Notes, October 12, 2022)

“IQ tells us that populations fluctuate, and movements change. Areas where there haven’t been many, now there are a lot. This has been the pattern for many years.” (QIA / QWB Workshop Notes, October 12, 2022)

“We have a goal, we want to protect the lands of the caribou...Which lands need the most protection? Let’s do this together, try to figure out exactly what areas need the most protection.” (QIA / QWB Workshop Notes, October 12 2022)

An HTO member shared how they heard from an Elder that caribou used to be abundant in Arctic bay when he was an adolescent, then as an adult there were none, and when he was an Elder, caribou came back. [Their] father used to say back then, when there were a lot of caribou, when we thought that there will always be caribou, he used to say that the caribou will move away, and that’s the cycle of life. (QIA / QWB

⁸ For an overview of mobile protection measures, see the GNWT’s Draft Implementation Framework for Mobile Caribou Conservation Measures on the Bathurst Caribou Range.

This repeated emphasis suggests that an important goal of this land use plan is to ensure that undisturbed caribou habitat continues to be available in the Qikiqtaaluk region for caribou to return as they always have. To achieve this goal, Inuit have emphasized the importance of protecting large areas of terrestrial habitat for caribou, as well as movement corridors, including those that cross land, freshwater, sea ice, and ocean channels.

Land use plans and strategies that protect large areas of terrestrial habitat are increasingly recognized as critical for the protection of all living things and the processes that connect and support them—values that ultimately support the rights and cultural practices that are of the utmost importance to Inuit and Inuit well-being. For example, ecosystem-based management approaches developed to protect critical ecological and cultural values in the Great Bear Rainforest identify a long-term goal of 70% protection, which is considered the minimum requirement for low risk management (e.g., see Price and Daust, 2007; Price et al. 2009). The Land Use Plan for Haida Gwaii protects about 50 per cent of the archipelago, including almost three-quarters of the shoreline, and requires that the remainder of the terrestrial landbase is stewarded to maintain cultural and ecological values through ecosystem-based management. The ultimate goal of this Land Use Plan is 70% protection.⁹ The 2021 Yahey Decision provides further impetus for the importance of protecting large, connected areas of the landscape in order to support the requirement for “peaceful enjoyment”—i.e., areas that are free of noise, dust and smells associated with industrial disturbance, which allow for the meaningful practice of rights (Yahey v. British Columbia 2021). A land use plan that proactively protects large, connected areas of caribou habitat in the Qikiqtaaluk region will prevent the otherwise continual erosion of these areas by industrial developments, which overtime could lead to cumulative impacts that degrade these areas in the “death by a thousand cuts” scenario that played out in Blueberry River First Nations’ territory, and continues to persist as part of the regulatory regime across much of Canada.¹⁰

2.3 Policy Context

Canada is a signatory to two related agreements through the United Nations: the UN Convention on Biological Diversity and the UN Framework Convention on Climate Change. Given the relationship between biodiversity loss and climate change, and the importance of maintaining large areas of the planet intact and free of industrial disturbance, there is increasing recognition of the important role of nature-based solutions for meeting targets that limit global warming and achieve biodiversity conservation objectives.

⁹ Haida Gwaii Strategic Land Use Agreement: <https://www.haidanation.ca/wp-content/uploads/2017/03/Haida-Gwaii-Strategic-Land-Use-Agreement.pdf>

¹⁰ [Yahey v. British Columbia, 2021 \(BCSC 1287\)](#)

Arising from recent commitments at the UN Committee of the Parties (COP) 15, thirty percent protection of lands and waters by 2030 is now a minimum goal for all signatories to the Convention on Biological Diversity. Areas like Nunavut, which are even more sensitive and vulnerable to climate change, need to see conservation of intact ecosystems as a primary outcome of land use planning. Inuit in the Qikiqtaaluk region have spoken strongly in favour of this perspective. Maintaining Inuit rights and food security in the face of climate change requires high levels of intact habitat to ensure caribou, which are the primary terrestrial food source, can increase as they always have.

Coupled with concerns about climate change and biodiversity, the connection between maintaining caribou cycles in the Baffin region and maintaining Inuit rights and food security strongly supports the application of the precautionary principle when making decisions about land use and caribou protection. In particular, alignment with the Universal Precautionary Principle, which integrates considerations of environmental, sociocultural, and economic resilience into the approach, should be an important tenet of land use decisions (Akins et al. 2019).

2.4 Ecology of Caribou in Qikiqtaaluk Region

Caribou are a keystone species for maintaining Inuit culture and well being, as well as for the northern ecosystem (QWB et al. 2018b). The section below identifies key characteristics of barren-ground caribou on Baffin island and Peary caribou that are fundamental to the approach for protection laid out in this submission package.

Baffin Island Barren-ground Caribou

Barren-ground caribou on Baffin are tundra-dwelling and exhibit long-term population cycles (60-90 years) that are linked to habitat quality (Ferguson et al. 1998; DOE 2019); currently population numbers are low but Inuit note that their populations are beginning to increase again. Inuit identify specific indicators based on Inuit Qaujimajatuqangit that elders and knowledge holders use to understand the current status of the long-term population cycle and the likely trajectory of the population, and this information is critical for informing management of the herds.

Baffin Island caribou migratory patterns shift with the population cycle. When caribou numbers are low, caribou are generally in smaller groups, more dispersed, and highly sensitive to disturbance. During this phase of their population cycle, caribou will learn to avoid areas very easily, particularly during the calving and post-calving phases. Also during the low phase of the caribou population cycle, Inuit Qaujimajatuqangit identifies that some inland areas in the Qikiqtaaluk region always have caribou even when there are no caribou anywhere else (Ferguson and Vivaventsova 2007; Ferguson et al. 2008; Ferguson et al.

2021). These special areas must be protected, as they continue to be used during the 10-30 years when caribou populations are at very low levels.

Inuit identify that protecting large areas of habitat from disturbance is essential even before caribou re-occupy these areas as populations increase. Inuit in the Qikiqtaaluk have expressed concerns about strategies such as mobile protection measures when caribou population numbers are low, because caribou would need to be detected at large distances from exploration / disturbance to ensure avoidance does not happen. For caribou on Baffin Island, the zone of influence around disturbances is unknown and likely varies with the population cycle and other factors (see Boulanger et al. 2021 for a discussion of yearly variation in zones of influence for mainland barren-ground caribou around northern mines). Research into variable zones of influence based on population cycles could be prioritized in the future through community-based monitoring; however Inuit report that caribou are currently avoiding the mining area around Mary River, implying large zones of influence around disturbance areas when caribou numbers are low.

Noted that there's a population in and around hills, near Mary River; migratory patterns rerouted once development began. (QIA / QWB Workshop Notes, October 11, 2022)

[onto Clyde River area] Identify a traditional route, and then an alternate route the caribou take because of the Mary River disturbance. (QIA / QWB Workshop Notes, October 13, 2022)

Inuit say that when caribou numbers increase, they are found everywhere on Baffin Island, including in Iqaluit and Pond Inlet. When caribou numbers are high, they must be able to shift to new areas: once an area has been depleted of lichen, caribou will shift their winter ranges to another winter range, sometimes abruptly and dramatically (Ferguson et al. 1998). The ability of Baffin Island caribou to move to small coastal islands across sea ice or sometimes open water, is also important.

"Around 1910, I believe that there was an abundance of caribou, from my older brother (I was born in 1942). (QIA / QWB Workshop Notes, October 11, 2022)

"In high population years [caribou] can be seen to cross everywhere." (QIA / QWB Workshop Notes, October 13, 2022)

"Numbers were higher in 1910-1940, numbers are lower now. Do they still use the same crossings? When there was more caribou, they began crossing more frequently in bigger numbers to find food [in Iqaluit area], and when the numbers go down we don't see them cross at all." (QIA / QWB Workshop Notes, October 12, 2022)

Baffin Island caribou migratory behaviour varies across different areas of the island. In some areas of Baffin (e.g., the northeast), caribou exhibit seasonal migration patterns across elevations, moving from high elevation areas for dispersed calving, to lower elevation areas for rutting and overwintering. Other areas of Baffin, such as the southwest, show migratory behaviour that is more similar to mainland barren-ground caribou herds, with more distinct calving and post-calving habitat. Caribou on north Baffin are relatively non-migratory, particularly at low population numbers. It is important to ensure that protection measures cover all areas of Baffin Island to ensure that these different caribou groupings are sufficiently protected.¹¹

Based on Inuit Qaujimagatuqangit, Baffin Island caribou are particularly vulnerable to disturbance during calving and post-calving periods, and disturbance during these periods can jeopardize calf survival and recruitment (QWB et al. 2018b). Calving habitat is generally dispersed in the Qikiqtaaluk region, with the peak of calving occurring in mid-June, later than is typical for caribou on the mainland (QWB et al. 2018b), and over a longer time span. An analysis of a fairly limited set of telemetry data¹² suggests that calving occurs from May 30 to June 25 on Baffin Island (Campbell et al. 2015). Based on Inuit Qaujimagatuqangit, this submission package identifies the calving period from June 12 - July 1, and the post-calving period from July 2 - August 31.

Inuit identify that winter ranges are critical to the survival of Arctic tundra caribou, and strongly recommend protection of winter habitat (QWB et al. 2018a). IQ identifies that caribou movement across sea ice occurs between areas of Baffin Island and adjacent islands and the mainland. Maintaining these sea ice crossings is of high importance to maintain connectivity between Baffin Island, surrounding islands, and various peninsulas. For barren ground caribou, maintaining freshwater crossings and on-land migration routes has been identified as important. On south Baffin Island, freshwater crossings are a critical area where caribou should not be disturbed. Because these crossings provide important connectivity between different areas of habitat, they are considered of high importance for protection. Seasonal habitat for calving, post-calving, wintering; special areas for caribou; sea ice crossings; freshwater crossings; and on-land migration routes are all of high importance for protecting caribou and caribou habitat in the Qikiqtaaluk Region, as is avoiding disturbance to caribou and their habitat when their population numbers are low.

¹¹ QIA's 2022 submission to the NPC on caribou suggested ensuring protection across the different caribou "groupings" as described in Campbell et al. 2015. Given the importance of connectivity between the different areas of Baffin Island and the lack of clarity on these caribou groupings at this time, QWB and QIA have chosen to avoid discussions of caribou groupings until they can be better understood. Instead, this submission relies on input from all of the HTOs about important areas for protection in their local geographical vicinity, ensuring that all areas of the Qikiqtaaluk have sufficient levels of protection for caribou.

¹² Telemetry data are limited to the following: North Baffin: 31 GPS collars from 2008-2011; 2 satellite collars from 1988-1990; central Baffin: 17 satellite collars from 1990-1994; south Baffin: 55 satellite collars from 1987-1994; 1 from 1991-1992.

Inuit identify harvesting areas for caribou as important community areas of interest. HTO members who participated in workshops in October and December explained that preferred caribou harvesting areas often have better habitat and produce higher quality meat and hides. As these areas represent an important confluence of both high quality habitat and preferred harvesting areas, they are of high importance for protection from industrial disturbance.

Additional Considerations for Peary Caribou

In addition to the above considerations, Peary caribou require particular focus in terms of maintaining connectivity across their habitat and ensuring large areas of winter habitat are available to support foraging in increasingly difficult climatic conditions. As Peary caribou live in a highly stochastic environment, they are much more opportunistic, relying on moving from island to island to find suitable habitat in the face of extreme environmental conditions. Peary caribou require an approach to protection that prevents habitat fragmentation at a large scale and ensures movement between islands can be sustained, particularly as climate change further manifests throughout the high Arctic (ECCC 2022).

3. Methods for Developing Caribou Submission Package

This section provides a high level summary of the methods used to develop the written submissions included in this package. More detailed methods are available upon request.

3.1 Confirming Habitat Types and Protection Approach

Through initial meetings QWB and QIA agreed to focus caribou protection measures in the Nunavut Land Use Plan on the following four designation types:

- Caribou calving and post-calving habitat
- Important harvesting areas for caribou
- Caribou winter habitat
- Caribou movement corridors

This order generally defines the priorities identified by HTOs for protection in the Qikiqtaaluk region. In other words, the highest priority areas for protection in the Qikiqtaaluk region are calving and post-calving areas, as well as harvesting areas, followed by winter habitat and movement corridors. This prioritization is used to address overlapping polygons (i.e., where a calving and post-calving polygon overlaps with an important harvesting area, the polygon is designated as calving and post-calving). This process is described in more detail below. The prioritization is not intended to imply that less protection is needed for caribou winter habitat and movement corridors, and should not be interpreted as such.

3.2 Delineation of Protection Areas

To delineate additional areas for protection, QWB and QIA held two works with knowledge holders and undertook a final verification session with all HTO Boards. These three delineation and verification processes are described below:

Workshop 1: October 11-13 2022 – Developing a Joint Submission for Caribou

- A three day workshop was held in Iqaluit with HTO members and key knowledge holders representing all areas of the Qikiqtaaluk region. The goal of the workshop was to develop a joint submission to the NPC for caribou protection in the Qikiqtaaluk region. Eleven knowledge holders with a deep understanding of each region of the Qikiqtaaluk were presented at the meeting, along with representatives from QWB, QIA, and Nunavut Tunngavik Inc. (NTI). The workshop was simultaneously translated between English and Inuktitut.
- The workshop was organized around working sessions on calving and post-calving areas, winter habitat and harvesting areas, movement corridors, and sea ice crossings. HTOs members from similar regions of the Qikiqtaaluk worked together to review areas already included in the 2021 DNLUP, confirm or revise those areas if needed, and identify other areas that had not been previously included in the QWB submissions. Knowledge holders worked with workshop facilitators to identify these areas on 1:500,000 aeronautical maps, using fine tipped markers and guided by topographic features on the maps.
- Because calving and post-calving areas tend to overlap in some parts of the Qikiqtaaluk region (e.g., particularly on north Baffin), knowledge holders were asked to map new calving and post-calving areas together. Subsequent work has been undertaken to split these areas based on available telemetry data and IQ where possible; this process is described in more detail below.
- Knowledge holders generally addressed four different categories of polygons for each designation type:
 - Areas that were submitted by QWB in 2018 for protection, accepted into the 2021 DNLUP, and do not require any revisions. These areas are NOT being resubmitted as part of this joint submission, but should be retained in the final NLUP.
 - Areas that were submitted by QWB in 2018 for protection and not accepted into the 2021 DNLUP. These areas ARE being resubmitted as part of this joint submission, in some cases with some minor revisions to boundaries.
 - Areas that were submitted by QWB in 2018 for protection, accepted into the 2021 DNLUP, but require some minor revisions to their areas. These areas are being resubmitted as revised / expanded areas in each of the appended joint submission documents.
 - New areas delineated during these workshops.

- Knowledge holders discussed at length one of the key gaps in the 2021 DNLUP: the absence of harvesting areas that were identified in QWB's 2018 submission. Where possible, knowledge holders identified when these areas also contained critically important seasonal habitat. Many of the areas identified in QWB's 2018 submission are also important winter habitat, for example. Some contain calving and post-calving habitat. In subsequent sessions, workshop participants emphasized that harvesting areas should be elevated in importance in the joint submission, so the decision was made to focus on these areas as harvesting locations, while noting the underlying habitat values. This process is described in more detail below.
- HTO members were asked to be selective about the areas they requested to be off limits to development based on their knowledge. This approach reflects the QWB's principle on the primacy of Inuit systems of wildlife management and requirements in the Nunavut Agreement. This question of selectivity and ensuring that the minimum area for protection was identified was revisited several times with knowledge holders to verify that no revisions to the areas identified for protection were needed.
- The resulting paper maps were scanned and digitized using ArcGIS Pro. Additional notes on adjustments to the polygons and lines identified by community knowledge holders are provided below.

Workshop 2: December 9-10 2022 – Verification of the Joint Submission

- QWB and QIA held a two-day workshop in Iqaluit with the Chairs from all HTOs across the Qikiqtaaluk Region to verify the modifications to existing polygons and new areas identified in the October 2022 workshop.
- This workshop involved working sessions on Day 1 to review all of the proposed submissions (calving and post-calving areas; movement corridors, including sea-ice crossings, freshwater crossings, terrestrial movement corridors, and open channel crossings; winter areas; and community areas of interest for harvesting). On Day 2, HTOs members were asked to systematically confirm that each set of submissions was approved to be submitted to the NPC.
- Resulting revisions and changes to the proposed submissions were digitized into ArcGIS Pro and a final version of each set of submissions was developed.
- Several HTOs asked to bring the final maps back to the full HTO Boards for their regions to verify the submissions.

HTO verification: January 2023

- Regional map packages for each submission type were prepared for each HTO to review with their Boards in early January 2023.
- All HTOs confirmed the areas with their full Boards for final approval to be submitted to the NPC.

3.3 Revisions to Delineated Areas

During the digitization process, the following revisions were made to areas delineated on paper maps by workshop attendees:

- In the case of the movement corridors, many were delineated by workshop attendees as linear features. These lines were buffered by 5 kilometers.
- Freshwater crossings were buffered by 10km on either side.
- Where the delineated polygons included areas close to the shore, the boundaries were adjusted to reflect the shoreline from the NRCan CanVec and Land Cover 2020. This adjustment involved both extending the boundaries of the delineated polygons in some places, and cropping the boundaries in other places. The only exception to this approach occurred in cases where knowledge holders had explicitly instructed the mapping team not to extend the polygon to the shore.¹³
- Post-workshops, QWB and QIA made the decision to separate calving and post-calving areas based on the available telemetry data. Based on the calving and post-calving windows identified by knowledge holders, areas with concentrations of telemetry data collected between June 1 and July 1 (across years) were identified as calving areas. Areas with concentrations of telemetry data collected between July 2 and August 31 (across years) were identified as post-calving areas. Where telemetry data was insufficient to designate the areas as either calving or post-calving, we designated the areas as combined calving and post-calving habitat.

3.4 Overlapping Designations

Through the approach used to map out new areas for protection, several different scenarios resulted in overlapping polygons. For example, in the first workshop, two separate groups of knowledge holders identified areas in the central area of northern Baffin. In some cases, knowledge holders mapped areas again that were identified in QWB's 2018 submissions or mapped a number of different designations that overlapped with these areas. This overlap is logical, as many caribou habitat areas are used throughout multiple seasons and for multiple purposes. In order to avoid confusion in the final submissions, QWB and QIA decided to remove overlapping polygons and merge areas into one final version for submission to NPC. Where overlapping polygons occurred, the mapping team used the following rules to guide decisions about merging polygons:

1. Where newly delineated polygons overlap with the QWB 2018 submissions of the same designation type and are centred on the same area, the polygons were merged together to highlight adjustments to the previously submitted boundaries.

¹³ Note that in some cases, knowledge holders were not directly asked whether polygons should extend to the shore, while in other cases, the question was explicitly asked and clarified. Subsequent work may be needed in future mapping efforts to refine mapped areas adjacent to shorelines. Where the assumption has been made to extend coastal polygons to encompass the entire shoreline, it seems a logical extension as these small areas would be stranded and inaccessible for other uses.

2. Where new submissions overlap with the previous submissions but are not centred on the same general area (i.e., the area of overlap is very small), the submissions have been kept separate and the overlap has been removed.
3. When newly delineated polygons of the same designation type were delineated within overlapping areas, they were merged together to create one large polygon.
4. Where areas of the same designation type overlap, the larger polygon was used.
5. Where polygons of different designation types were delineated over the same or overlapping areas, the mapping team deferred to the highest need for protection based on HTO input, and clipped the overlapping boundaries. This approach applies to previous submissions as well as newly designated areas. The ranking of the need for protection is as follows:
 - a. Freshwater crossings
 - b. Calving
 - c. Post-calving
 - d. Harvesting
 - e. Winter
 - f. Other movement features such as movement corridors and sea ice crossings.

Note that this ranking scheme should not be used as a rationale to remove areas from protection, as HTO Boards have confirmed that all of the delineated areas should be protected.

3.5 Supporting Data Review

Concerns have been raised by some parties regarding the available evidence to support areas requested as limited or conditional use for caribou in QWB's 2018 submission. To be clear, QWB and QIA are both strongly supportive of these areas as delineated, given that Inuit knowledge holders are the experts in the identification of areas that need to be protected to maintain caribou population cycles into the future. However, to counter this concern, the mapping team reviewed a comprehensive database consisting of both Inuit Qaujimagatuqangit and western scientific information, to show additional lines of evidence for each of the areas designated in these submissions. Each polygon has been reviewed against the data sources available to the analysis team, and tables with supporting evidence for each polygon are included in the separate submissions. Tables 1a and 1b below list the Inuit Qaujimagatuqangit and western science data sources used in this review.

The review also serves as a reminder that despite NPC's previously raised concerns about the lack of telemetry data in the Qikiqtaaluk to support the identification of habitat areas for caribou, there is in fact a comprehensive IQ and western science-based dataset on caribou, particularly for some parts of Baffin Island, that can further support informed decision-making for the identification of these areas. It would be useful to examine areas of data deficiency in the Qikiqtaaluk region and prioritize these areas for data collection using methods that are approved by HTOs and based on Inuit systems of wildlife management.

Table 1a: Data Sources Used for Supporting Data Review: Inuit Qaujimajatuqangit

Inuit Qaujimajatuqangit Studies from QIA	Date	Coverage (spatial area)
Inuit Land Use and Occupancy Project	1976	Qikiqtani Region
Lancaster Sound Regional Coastal Atlas	1990	Lancaster Sound
Makivik Land Use Study	1979	Hudson Strait
Nunavut Atlas	1992	Qikiqtani Region
Resolute Polar Gas Socio-Economic Study	unknown	West Lancaster Sound
Arctic Corridors and Northern Voices Research Project	2017-18	Lancaster Sound, Hudson Strait
Baffinland Caribou Workshops 2015-16	2015-16	North Baffin
Baffinland Consultations: 2008-2009	2008-09	North Baffin
Baffinland Phase 2 Community Workshops	2017	North Baffin
Baffinland Consultations: 2010	2010	South Baffin
GN Nunavut Coastal Resource Inventory	2018	Qikiqtani Region
IOL Designation Project 2016 – 17	2016-17	Qikiqtani (minus Sanikiluaq)
Iqaluit Seismic Workshop 2015	2015	Baffin Island
QIA Community Consultations 2015	2015	Lancaster Sound, Baffin Bay, Hudson Strait
QIA Strategic Environmental Assessment 2017	2017	North Baffin
Strategic Environmental Assessment 2018 development session	2018	East Baffin
TINMCA IMP	2018	Lancaster Sound
Qikiqtani Inuit Association Knowledge And Use Study For Baffinland's Mary River Iron Mine Project Phase 2	2017-2019	North Baffin
Workshops and HTO verification for caribou study (see Section 3.2)	October 2022; December 2022; January 2023	Qikiqtani
Other Inuit Qaujimajatuqangit Studies	Date	Coverage (spatial area)
QWB workshops with HTOs	2017-18	Qikiqtani
Baffin Island Caribou Consultations	2012	North Baffin
Community and Hunter and Trapper Organization Consultations on Baffin Island Caribou	2013-14	Baffin Island

Table 1b: Data Sources Used for Supporting Data Review: Western Science Studies

Study Name	Date	Coverage
2014 Baffin Island Caribou Population Survey	Feb - March 2014	Three strata across Baffin Island and upper Melville Peninsula
2015 - 2022 Spring and Fall Composition Surveys	Various periods	Varies but entirety of Baffin is covered

2008 - 2011: 31 GPS collars on north Baffin during period of low abundance	2008-2011	North Baffin only
1987 - 1994: 71 satellite collars on south Baffin (2 collars on cows within north Baffin population) – during period of high caribou abundance	1987-1994	South Baffin primarily (2 North Baffin caribou included)
Elliott, R.C. and C.E. Elliott. 1974. Baffin Island Caribou Surveys Progress Report 10 June/17-July/74 Summary. Unnumbered report. 5 pp.	1974	Unclear
Elliott, R.C. and C.E. Elliott. 1974. Observations of the Distribution and Migration of Caribou on Southern Baffin Island July 4 – Aug. 8, 1974. Un-numbered report. Game Management Service. Government of the NWT. 10 pp	1974	South Baffin
Redhead 1976: Calving ground survey, South Baffin caribou herd	1976	South Baffin - Dewar Lakes area
Kraft 1984: Tagging report from Koukdjuak River	1974-1982	Koukdjuak River / South Baffin
Chowns and Popko 1980: A calving ground survey of the Hall Peninsula Caribou Herd	June 8, 10, and 14 1979	Hall Peninsula

4. Results

4.1 Summary of Measures for Caribou in the Nunavut Land Use Plan

Table 2, below, provides a summary of each submission type included in the appended written submissions for caribou calving and post-calving habitat, caribou winter habitat, caribou movement corridors, and caribou harvesting areas. Figure 1 shows these areas on a map of the Qikiqtaaluk region. More detailed information, including rationales for each of the polygons included under each submission type is provided in written submissions 2023-01, 2023-02, 2023-03 and 2023-04.

Table 2: Summary of Submissions and Designations for Caribou Protection in the Qikiqtaaluk to be included in the Final Nunavut Land Use Plan¹⁴

Barren-ground caribou on Baffin Island, Melville Peninsula, and surrounding islands				
Submission Type	Designation	Limited Use Designated Area in 2021 DNLUP	Proposed Area for Final	Percent of Total Land Area (592312 km ²)

¹⁴ Note: the seasonal timing windows listed in this table may be inserted into the Table of Caribou Seasonal Restrictions for barren-ground caribou on Baffin Island and the Melville Peninsula, as well as Peary caribou in the high Arctic. Additional research is needed to confirm the Peary caribou timing windows proposed herein.

			NLUP¹⁵	
Calving habitat	Limited Use Horizontal and vertical setbacks for overflights from June 12 - August 31 ¹⁶	43193 km ²	89067 km ²	15.0%
Calving and post-calving habitat	Horizontal and vertical setbacks for overflights from June 12 - August 31	None	80416 km ²	13.6%
Post-calving habitat	Limited Use Horizontal and vertical setbacks for overflights from June 12 - August 31 (note that post-calving is July 2 - August 31 but restrictions should apply across entire calving and post-calving period)	41 km ²	16625 km ²	2.8%
Community Area of Interest - Caribou Harvesting areas	Limited Use Horizontal and vertical setbacks for overflights unless written permission provided by local HTO	None	77665 km ²	13.1%
Winter habitat	Limited Use Horizontal and vertical setbacks for overflights from December 1 to April 30	166 km ²	45095 km ²	7.6%
Terrestrial movement	Limited Use 5 km on either side of designated movement corridor Horizontal and vertical setbacks for overflights when caribou are present.	None	16984 km ²	2.9%
Freshwater crossings	Limited Use 10 km on either side of designated movement corridor	None	7987 km ²	1.3%

¹⁵ Includes new areas proposed in this submission package, areas proposed by QWB in 2018, which were not included in the 2021 DNLUP and are being resubmitted jointly in this submission package, and all areas already approved for the 2021 DNLUP, including proposed revisions of those areas.

¹⁶ Horizontal and vertical overflight setbacks were taken from Yukon Environment 2010.

	Horizontal and vertical setbacks for overflights unless written permission provided by local HTO			
Sea ice crossings	Conditional Use; no ice-breaking during Ukiuq, Ukiuq, Upingaksaaq and Upingaaq (December 1 to July 31)	1240 km ²	7599 km ²	N/A
Open channel crossings	Conditional Use; no vessel traffic without written permission of local HTO	None	55 km ²	N/A
Peary caribou in high Arctic				
Habitat Type	Designation	Previous area in 2021 DNLUP	Proposed area for final NLUP	Percent of Total Land Area (408763 km²)
Calving	Limited Use Horizontal and vertical setbacks for overflights from May 25 - August 31	5853 km ²	7492 km ²	1.8%
Calving and post-calving	Limited Use Horizontal and vertical setbacks for overflights from May 25 - August 31	None	849 km ²	0.2%
Peary caribou area	Limited Use Horizontal and vertical setbacks for overflights from December 1 - August 31	5134 km ²	5134 km ²	1.3%
Community Area of Interest - Caribou Harvesting areas	Limited Use Horizontal and vertical setbacks for overflights unless written permission provided by local HTO	None	11109 km ²	2.7%
Winter habitat	Limited Use Horizontal and vertical setbacks for overflights from December 1 to May 24	None	4944 km ²	1.2%

Sea ice crossings	Conditional Use; no ice-breaking during Ukiaq, Ukiuq, Upingaksaag and Upingaaq (December 1 to July 31)	16309 km ²	32955 km ²	N/A
Reindeer				
Habitat Type	Designation	Previous area in 2021 DNLUP	Area of new additions	Percent of Total Land Area (3375 km ²)
Community Area of Interest - Caribou Harvesting areas	Limited Use Horizontal and vertical setbacks for overflights unless written permission provided by local HTO	None	1736 km ²	51.4%

4.2 Other Considerations: Mitigation Measures, Monitoring, and Adaptive Management

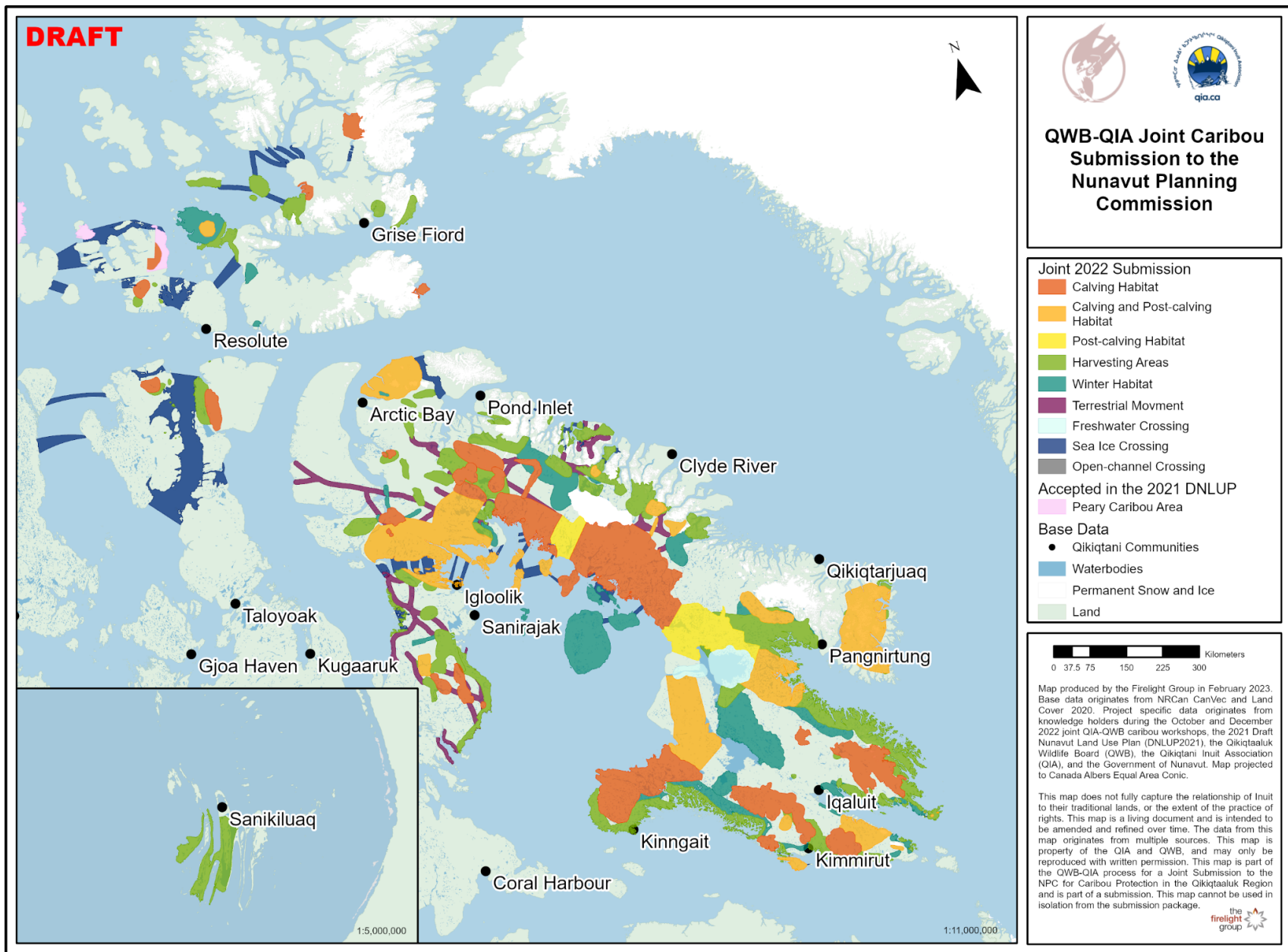
Areas of the Qikiqtaaluk region that are not identified as off limits to development still need to be managed to be useable by caribou when population numbers are high; there may be a role for other tools (such as mobile protection measures, other mitigation measures, and limits to total disturbance) in those areas to ensure that all of Baffin Island can be used by caribou when numbers are high. These recommendations fall outside of the NLUP and will be addressed separately through the regulatory process.

As noted above, the information contained in this submission package is based on the best available Inuit Qaujimajatuqangit and western science. Ongoing monitoring is required to further verify that the placement of areas identified as Limited Use and Conditional Use best capture critical, core habitat for caribou in the Qikiqtaaluk region. Harvesting areas may need to be adjusted if climate change or other factors change how caribou are using the landscape. The areas may also need to be adjusted as caribou populations increase, based on Inuit Qaujimajatuqangit and western science indicators of habitat condition and caribou health.

The potential requirement for adjustments in the future points to the need for ongoing monitoring of caribou, with a focus on population numbers, health, habitat condition, and the efficacy of mitigation measures. To meet this requirement, QWB and QIA are recommending funding for community-based monitoring of caribou both within the designated areas identified in the NLUP and outside of these areas, to further develop mitigation measures that ensure caribou can continue to use the entirety of their ranges on Baffin Island. QWB and QIA recommend that community-based monitoring be designed in collaboration with local HTOs, who should be intimately involved in interpreting results and making management decisions. Assuming they are approved by HTOs, periodic aerial surveys of caribou on Baffin Island and elsewhere in the

Qikiqtaaluk should be equally balanced by periodic Inuit Qaujimajatuqangit studies with all HTOs. Further work should be undertaken to identify the zones of influence around active exploration areas during different points in the caribou population cycle, to determine whether mobile protection measures could be used to allow exploration in some areas of caribou habitat without unduly disturbing caribou. Additional data on seasonal timing windows for barren-ground and Peary caribou should be collected and incorporated into the conditional restrictions listed in Table 2, and the proposed overflight setbacks should be researched to determine if they are adequate. Finally, QWB and QIA recommend that caribou protection measures in the Qikiqtaaluk be revisited at the seven year mark with HTOs, and any revisions to limited and conditional use designations be integrated into a revised Nunavut Land Use Plan as part of the Periodic Review process. These monitoring and adaptive management measures are necessary to ensure that the Nunavut Land Use Plan successfully achieves its goal of maintaining long-term caribou population cycles in the Qikiqtaaluk region.

Figure 1 (next page): This map shows all of the QWB-QIA submissions for caribou protection in the Qikiqtaaluk region, including areas that were previously submitted and accepted into the 2021 DNLUP, and new areas identified through collaboration with all Qikiqtaaluk region HTOs.



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