

QWB-QIA Joint Caribou Submission to the Nunavut Planning Commission

Written Submission QWB-QIA 2023-A-03: Movement Corridors

Proposed designation(s): Varies by Movement Corridor Type as follows:

Terrestrial Movement:	Limited Use with 5 km buffer (see restrictions)
Freshwater Crossings:	Limited Use with 10 km buffer (see restrictions)
Sea Ice Crossings:	Conditional Use
Open Channel Crossings:	Conditional Use

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Introduction

This written submission summarizes the caribou movement corridors (terrestrial, freshwater, sea ice, and open channel) identified by the HTOs of the Qikiqtaaluk Region, which QWB and QIA are requesting that NPC designate as Limited Use (terrestrial, freshwater) and Conditional Use (sea ice, open channel). This written submission is part of a joint QWB-QIA caribou submission package that includes a Technical Memorandum and three other joint written submissions identifying caribou calving and post-calving habitat (written submission 2023-A-01), caribou winter habitat (written submission 2023-A-02), and caribou harvesting areas (written submissions 2023-A-04) in the Qikiqtaaluk region of Nunavut. The Technical Memorandum provides critical background information and a summary of methods used to develop this submission, and should be reviewed in tandem with the contents of this submission.¹

Importance of Caribou Movement Corridors

¹ Note: Many of the discussions with HTO members focused on barren-ground caribou on Baffin Island, Melville peninsula, and the surrounding islands. Unless otherwise noted, the importance of habitat types and harvesting areas should be considered to equally apply to Peary caribou in the high Arctic. The heightened sensitivity of Peary caribou to climate change, particularly in terms of impacts to sea ice crossings and winter habitat, has been highlighted wherever possible, and seasonal timing windows have been modified to the extent of available knowledge.

Tuktut (caribou) are critical to the strength, wellbeing, and sustainability of Inuit culture and heritage; the tundra-dwelling caribou populations of Baffin Island and the high arctic are a key species in the northern ecosystem. Caribou on Baffin Island exhibit long-term cycles in their populations (Ferguson et al., 1998), exacerbating their vulnerability to human disturbances during periods of low abundance, which can last for years or decades.

For the purpose of this submission, critical movement corridors for arctic tundra caribou are separated into four discrete categories:

1. Terrestrial movement;
2. Freshwater crossings;
3. Sea-ice crossings; and
4. Open-channel crossings

As stated by one workshop participant, 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). One workshop participant shared how their ancestor 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.”* (QIA / QWB Workshop notes, October 12, 2022).

Importance of Terrestrial Movement and Freshwater Crossings

Caribou movement corridors are known well to Inuit knowledge holders. In some places, terrestrial corridors used by caribou during snow-free months are obvious from trails well rutted into the land during migration. However, movement across certain terrain can leave little physical evidence (e.g., over bedrock), and whether the land is marked by these trails or not, Inuit are familiar with their locations. In areas of north Baffin, movement corridors are found within valley bottoms between steep terrain. Inuit Qaujimagatuqangit identifies that these corridors need protection, both for the sake of the animals, as well as for the long-term wellbeing of the Inuit communities who depend on these areas for harvesting.

In areas of south Baffin, community members have also observed and shared that the movement of caribou includes the crossing of lakes and large rivers, as they migrate from habitat to habitat (QIA / QWB Workshop Notes, October 12, 2022). Access to safe and reliable movement corridors is crucial to the reproductive and ecological success of caribou and by extension Arctic ecosystems. Landscape connectivity is a critical indicator of habitat quality for non-sedentary animals like caribou.

Delineation Methods

Please see the accompanying Technical Memo, section 3, which describes how these terrestrial and freshwater crossings were delineated, verified, and supported through additional data review.

Note: Because movement corridors often overlap with other polygon types, which take priority in the designation hierarchy defined in the accompanying Technical Memo, the submitted polygons for movement corridors may appear to be fragmented when viewed alone. When viewed on the map showing the full submission (see Figure 1 in QWB-QIA-2023-A-TM), it is apparent that these movement corridors continue through polygons designated primarily as other habitat types.

With respect to movement corridors on northwestern Baffin that were submitted previously by QWB in 2018 and accepted into the 2021 DNLUP as VECs, QWB and QIA have resubmitted portions of these movement corridors as Limited Use, interspersed with other polygon types.

Results

Table 1 summarizes all of the areas included as movement corridors (terrestrial and freshwater) in this submission, and includes a further rationale for each area based on a review of available IQ and western science overlapping with each polygon. Sources of IQ and western science are detailed in Section 3.5, Table 1 of the accompanying Technical Memo. The table below also notes where each identified polygon originally overlapped with another habitat or use type (e.g., calving / post-calving habitat, harvesting areas, or winter habitat). Polygons (or clusters of polygons in close proximity) are numbered in the table and accompanying map for ease of review. The submission includes two different categories of polygons:

1. Areas identified as movement corridors in QWB's 2018 submission to the NPC, which were not accepted into the 2021 DNLUP and subsequently reconfirmed or updated during the HTO workshops in 2022. QWB and QIA are requesting that these areas be reflected in the final version of the Nunavut Land Use Plan.
2. New areas identified as movement corridors in the HTO workshops in 2022. In some cases, these areas overlap with polygons identified in QWB's 2018 submission as multi-value areas — areas of important caribou habitat that were not brought into the 2021 DNLUP. All overlaps with other designations (either from 2018 or from the 2022 workshops) are noted in Table 1.

Table 1. List of polygons submitted to the NPC as final Caribou Terrestrial Movement and Freshwater Crossings for the Nunavut Land Use Plan. Rationales are provided for: (1) Previously accepted 2018 terrestrial movement submissions that have been submitted or expanded, (2) New terrestrial movement submission areas, and (3) New freshwater crossings submission areas.

Polygon No.	Rationale for Submission
Expansions to the QWB 2018 Caribou Terrestrial Movement Submissions to NPC	
108	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (1987-1994 and 2008-2011). • Overlaps with observed caribou from caribou composition surveys (2015-2022). • Overlaps with documented caribou movement IQ. • Overlaps with Core North Baffin Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with the spring migration kernel density estimates (Campbell et al., 2015) • Overlaps with the late summer and fall migration kernel density estimates (Campbell et al., 2015)
109	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (1987-1994 and 2008-2011). • Overlaps with observed caribou from caribou composition surveys (2015-2022). • Overlaps with documented caribou movement IQ. • Overlaps with Core North Baffin Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with the spring migration kernel density estimates (Campbell et al., 2015). • Overlaps with the late summer and fall migration kernel density estimates (Campbell et al., 2015).
110	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (2008-2011). • Overlaps with documented caribou movement IQ. • Overlaps with Core North Baffin Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with Female Caribou Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with the spring migration kernel density estimates (Campbell et al., 2015). • Overlaps with the late summer and fall migration kernel density estimates (Campbell et al., 2015).
New Caribou Terrestrial Movement Submissions	
111	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.

Polygon No.	Rationale for Submission
	<ul style="list-style-type: none"> • Overlaps with telemetry data (1987-1994 and 2008-2011). • Overlaps with documented caribou movement IQ. • Overlaps with observed caribou from caribou composition surveys (2015-2022). • Overlaps with observed caribou from the Baffin Island Caribou Population Survey (2014). • Overlaps with Core North Baffin Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with the spring migration kernel density estimates (Campbell et al., 2015). • Overlaps with the late summer and fall migration kernel density estimates (Campbell et al., 2015).
112	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with observed caribou from the Baffin Island Caribou Population Survey (2014). • Overlaps with documented caribou movement IQ. • Overlaps with Core North Baffin Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with Male Caribou Area identified in the Baffin Island Caribou Consultations (2012).
113	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (2008-2011). • Overlaps with documented caribou movement IQ. • Overlaps with Female Caribou Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with the spring migration kernel density estimates (Campbell et al., 2015). • Overlaps with the late summer and fall migration kernel density estimates (Campbell et al., 2015).
114	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with Caribou Area identified in the Baffin Island Caribou Consultations (2012).
115	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with calving areas from Elliot, 1974. • Overlaps with Caribou Area identified in the Baffin Island Caribou Consultations (2012).
116	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with documented caribou movement IQ. • Overlaps with Caribou Area identified in the Baffin Island Caribou Consultations (2012).
117	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with documented caribou movement IQ.

Polygon No.	Rationale for Submission
	<ul style="list-style-type: none"> • Overlaps with Core North Baffin Area identified in the Baffin Island Caribou Consultations (2012). • Overlaps with Male Caribou Area identified in the Baffin Island Caribou Consultations (2012).
New Caribou Freshwater Crossing Submissions	
118	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (2008-2011). • Overlaps with observed caribou from caribou composition surveys (2015-2022). • Overlaps with post-calving areas from Elliot, 1974. • Overlaps with calving areas from Redhead, 1976. • Overlaps with caribou river crossings from Kraft, 1984.
119	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (2008-2011). • Overlaps with observed caribou from caribou composition surveys (2015-2022). • Overlaps with survey area from Chowns, 1978 - exact caribou locations unspecified.

Importance of Sea-ice Crossings

Sea-ice crossings are important movement corridors for caribou in the winter months. The topography of Baffin Island is diverse and rugged, and sea ice can provide an alternative to the more difficult terrain of mountains, glaciers and cliffs. Ice crossings were noted in workshops by participants as being important for caribou to access their wintering habitat in areas north of Clyde River, and across to Prince Charles Island (QIA / QWB Workshop Notes, October 12, 2022).

Climate change is posing a real threat to the persistence of seasonal and multi-year sea-ice and thus jeopardizing the safety and reliability of these crossings for caribou. Community members have vocalized concerns stating that climate change will make the ice too thin, or too sparse, for caribou to cross (QIA / QWB Workshop Notes, October 12, 2022). These concerns are echoed by western science and the Intergovernmental Panel on Climate Change, who state that “arctic surface air temperature has likely increased by more than double the global average over the last two decades, with feedbacks from loss of sea ice and snow cover contributing to the amplified warming” (IPCC, 2019 p. 51).

"Apparently, [caribou] have been crossing island to island in the winter, and they have crossed as far as Somerset Island and beyond. We have just recently found out the ice they travel on is becoming [un]stable,² and that worries us. Climate change has created havoc on the ice." — Pond Inlet Public Hearing, (October, 2022)

Delineation Methods

Please see the accompanying Technical Memo, section 3, which describes how these sea ice crossings were delineated, verified, and supported through additional data review.

Results

Table 1 summarizes all of the areas included as sea ice crossings in this submission, and includes a further rationale for each area based on a review of available IQ and western science where data are available. Sources of IQ and western science are detailed in Section 3.5, Table 1 of the accompanying Technical Memo. Crossings are numbered in the table and accompanying map for ease of review. The submission includes two different categories of crossings:

1. Areas identified as sea ice crossings in QWB's 2018 submission, some of which have been expanded in this resubmission. QWB and QIA are requesting that these areas be reflected in the final version of the Nunavut Land Use Plan.
2. New sea ice crossings identified in the HTO workshops in 2022.

² Note that the original transcript erroneously states “stable” here; the edit has been made to reflect that the ice is becoming unstable. See p.73 from the Pond Inlet Public Hearing Transcript.

Table 2. List of polygons submitted to the NPC as final Caribou Sea Ice Crossings for the Nunavut Land Use Plan. Rationales are provided for: (1) Previously accepted 2018 submissions that are being resubmitted / expanded and (2) New submission areas.

Polygon No.	Rationale for Submission
Expansions to the QWB 2018 Sea Ice Crossing Submissions to NPC	
120	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. • Overlaps with telemetry data (1987-1994 and 2008-2011). • Overlaps with observed caribou from caribou composition surveys (2015-2022). • Overlaps with documented caribou movement IQ.
New Sea Ice Crossings Submissions	
121	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
122	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
123	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
124	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
125	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
126	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
127	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
128	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
129	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
130	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
131	<ul style="list-style-type: none"> • Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.

Polygon No.	Rationale for Submission
132	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
133	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
134	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
135	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
136	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
137	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. Overlaps with documented caribou movement IQ. Overlaps with Water / Ice Crossing identified in the Baffin Island Caribou Consultations (2012).
138	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. Overlaps with Water / Ice Crossing identified in the Baffin Island Caribou Consultations (2012).
139	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
140	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
141	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
142	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. Overlaps with documented caribou movement IQ.
143	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
144	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. Overlaps with telemetry data (1987-1994).
145	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
146	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
147	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.

Polygon No.	Rationale for Submission
148	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. Overlaps with telemetry data (1987-1994).
149	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
150	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
151	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
152	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
153	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
154	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process. Overlaps with Water / Ice Crossing identified in the Baffin Island Caribou Consultations (2012).
155	<ul style="list-style-type: none"> Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.
156	<ul style="list-style-type: none"> Area was previously submitted by QWB to the NPC in 2018. Area was reiterated by knowledge holders during the 2022 joint QIA-QWB review process.
157	<ul style="list-style-type: none"> Area was previously submitted by QWB to the NPC in 2018. Area was reiterated by knowledge holders during the 2022 joint QIA-QWB review process.
158	<ul style="list-style-type: none"> Area was previously submitted by QWB to the NPC in 2018. Area was reiterated by knowledge holders during the 2022 joint QIA-QWB review process.
159	<ul style="list-style-type: none"> Area was previously submitted by QWB to the NPC in 2018. Area was reiterated by knowledge holders during the 2022 joint QIA-QWB review process.
160	<ul style="list-style-type: none"> Area was previously submitted by QWB to the NPC in 2018. Area was reiterated by knowledge holders during the 2022 joint QIA-QWB review process.

Open-channel Crossings

Caribou will also cross water during the ice-off seasons. One participant shared knowledge highlighting how caribou are adept swimmers and are able to cross to Prince Charles Island where they can survive for a time (QIA / QWB Workshop Notes, October 12, 2022). These types of crossings are important during the spring and summer months as caribou seek suitable calving and post-calving habitat.

“The migration of herds seems to have changed a lot, perhaps due to climate change. We have heard from the presenters that they are running out of caribou herds.” — Iqaluit Public Hearing, (November, 2022)

Table 2. List of polygons submitted to the NPC as final Caribou Open Channel Crossings for the Nunavut Land Use Plan. Rationales are provided for new submission areas.

Polygon No.	Rationale for Submission
New Open Channel Crossing Submissions	
162	<ul style="list-style-type: none">• Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process
163	<ul style="list-style-type: none">• Area was delineated by knowledge holders during the 2022 joint QIA-QWB review process.

Source of Information: These areas have been delineated by HTOs who are most familiar with the different subregions of the Qikiqtaaluk, and are primarily based on Inuit Qaujimajatuqangit. As noted in Table 1 of the accompanying Technical Memo, each polygon or cluster of polygons is cross referenced to underlying Inuit Qaujimajatuqangit from other studies, and western scientific information from a variety of different sources. Note that due to the limited spatial (i.e., not all areas of Baffin Island were covered) and temporal (i.e., western science data do not cover all time periods in the population cycle) extents of other data sources in the Qikiqtaaluk region, an absence of overlapping data from other sources should not be used to negate or downgrade the importance of areas identified by HTOs in the 2022 workshops.

Proposed designations vary by corridor type as follows:

Terrestrial Movement Corridors:

Proposed Designation: Limited Use within 10 km wide zones

Proposed Restrictions: The following uses are prohibited:

- Hydro-electrical and related infrastructure
- Linear infrastructure; and
- Related research except non-exploitative scientific research.

Conditional Restrictions: In addition to the prohibited uses noted above, the following conditional restrictions are requested for all areas identified as terrestrial movement corridors:

- During Aujaq and Ukiaksaaq, closed to any activities related to:
 - Mineral exploration and production;
 - Oil and gas exploration and production; and
 - Quarries
- Long-term projects and activities related to any of the above land uses must shut down during Aujaq and Ukiaksaaq.
- During Aujaq and Ukiaksaaq, helicopters and airplanes must maintain a vertical distance of at least 300 meters / 1000 feet above ground level (magl) or a horizontal distance of at least 600 meters / 2000 ft from terrestrial movement corridors.
- Wind turbines for electrical generation must be at least 5 km from caribou terrestrial movement corridors, and must be positioned so they are not visible from caribou terrestrial movement corridors.

Freshwater Crossings:

Proposed Designation: Limited Use within 10 km radius buffers

Proposed Restrictions: The following uses are prohibited:

- Oil and gas exploration and production;
- Mineral exploration and production;
- Quarries;
- Hydro-electrical and related infrastructure;
- Wind turbines for electrical generation and related infrastructure;
- Linear infrastructure; and
- Related research except non-exploitative scientific research.

Conditional Restrictions: In addition to the prohibited uses noted above, the following conditional restrictions are requested for all areas identified as freshwater crossings:

- Helicopters and airplanes must maintain a vertical distance of at least 300 meters / 1000 feet above ground level (magl) or a horizontal distance of at least 600 meters / 2000 ft from caribou freshwater crossings. These overflight restrictions should apply at all times in caribou freshwater crossings; however, if a proponent would like to vary these restrictions, they may seek free, prior and informed written consent from the nearest HTO.
- Wind turbines for electrical generation must be at least 5 km from caribou freshwater crossings, and must be positioned so they are not visible from caribou freshwater crossings.

Sea Ice Crossings:

Proposed Designation: Conditional Use Areas within which, except as required for safe navigation, no person is to conduct ice breaking activities during the indicated seasons:

- Ukiaq, Ukiuq, Upingaksaag, and Upingaaq (December 31 to July 31)
- Note: this restriction does not apply to vessels engaged in community resupply or emergency response.

Open Channel Crossings:

Proposed Designation: Conditional Use Areas within which, except as required for safe navigation, no vessels should travel during the ice-free period without free, prior, informed written consent from the nearest HTO.

Proposed Boundaries of Movement Corridors Limited Use and Conditional Use Designations

See the attached map and the associated shapefiles. The attached map shows both previously submitted terrestrial movement corridors (outlined in black), as well as newly submitted terrestrial movement corridors (no black outline); note the fragmented appearance due to overlaps of these movement corridors with polygons identified under other designation types. The map also shows newly delineated freshwater crossings (which were previously part of a large multi-value area submitted by QWB in 2018), previously submitted and newly submitted sea ice crossings, and newly delineated open channel crossings. The shapefile package includes new and resubmitted terrestrial movement corridors; new freshwater crossings; new and previously submitted sea ice crossings; and new open channel crossings.

References:

See accompanying Technical Memo QWB-QIA-2023-A-TM for full reference list.

