



\* While the contents, results, and conclusions of this report are finalized, some of the figures require aesthetic or minor changes which will not affect the report as a whole. Please use this version for information purposes only for the Nunavik Beluga Public Hearing in January 2020. Please delete after use. A finalized report will be available at [nmrwb.ca](http://nmrwb.ca) in the coming weeks.

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# 1 Executive Summary

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In 1986, Fisheries and Oceans Canada (DFO) closed an area of southern Ungava Bay to beluga harvesting including the Ungunniavik (Whale) and Marralik (Mucalic) River estuaries (“the Marralik-Ungunniavik closure”). The Marralik-Ungunniavik closure was established by DFO to conserve the Ungava Bay stock of beluga whales. The Ungava Bay stock is one of three beluga stocks that use Ungava Bay, but the only stock that historically summered in Ungava Bay. This stock was drastically reduced from its historical numbers by commercial whale harvesting from the mid 1800s to the early 1900s.

The signing of the Nunavik Inuit Land Claims Agreement (NILCA) in 2006 established the Nunavik Marine Region Wildlife Board (NMRWB) as the main instrument of wildlife management in the Nunavik Marine Region (NMR). As such, beluga management decisions, including those regarding the Marralik-Ungunniavik closure, are now under the authority of the NMRWB. The NMRWB is responsible for making wildlife management decisions with the goal of maintaining vital, healthy wildlife populations capable of sustaining harvesting needs. However, since the closure was put in place, very little information has been documented about beluga use of Marralik and Ungunniavik. This has made it difficult for the NMRWB to render informed beluga management decisions for the area, and has led to stagnation in its management.

As a result, the NMRWB developed and carried out a study to gather Inuit knowledge of beluga in southern Ungava Bay and explore Inuit perspectives on beluga management. Workshops and interviews with participatory mapping were carried out in Kuujjuaq, Kangiqsualujjuaq and Tasiujaq in April 2019. Participants were selected by the Local Nunavimmi Umajulirijiit Katujjigatigiinningit (LNUK or Anguvigaapik). Validation of report findings was carried out through follow-up workshops with participants in Kangiqsualujjuaq and Tasiujaq and individual sessions in Kuujjuaq in November 2019. Feedback from Kuujjuaq participants led to three additional interviews with Kuujjuaq Elders in November 2019. Overall, there were 10 participants from Kuujjuaq, 10 from Tasiujaq and 11 from Kangiqsualujjuaq. Interviews were transcribed and thematically coded. Detailed findings are presented in the full study report, and a summary of **key findings** are presented below:

## Importance of beluga harvesting

Nearly all participants described the significance of beluga harvesting for them personally and for their families for food, identity and culture. Participants described strong ties to Marralik and Ungunniavik before the closure. The seasonal abundance of beluga and short travel distance made this area important in the past for beluga harvesting, learning harvesting practices and passing down knowledge to the next generation.

## Regional distribution and migrations

Participants emphasized that migration timing and routes depends on the ice, which is affected by winds and current. When ice breaks up in the spring, beluga start migrating west to summering areas in Hudson Bay. They have been observed migrating west through Ungava starting in May until August.

In the fall, beluga have been observed migrating east towards overwintering areas off the Labrador Coast. Most observations of the fall migration were in September and October.

Participants explained that ice cover prevents beluga observations in the winter, but that does not mean that they are absent. A couple of observations of beluga in polynyas in the winter in the 1960s were shared. One participant observed a unique event from the air in February 1973, where approximately a thousand beluga were in open water surrounded by ice in central Ungava Bay.

## Seasonal use of rivers, estuaries and coast

Beluga use the coastal, estuary, and river areas of Ungava Bay seasonally, based on migration timing. Participants described and documented seasonal beluga use of all of southern Ungava Bay's estuaries and rivers, and emphasized that they are not limited to use of Marralik and Ungunniavik.

Many participants explained that beluga primarily access rivers to 1) moult and 2) feed on fish. Participants explained that beluga can have young at any time and place along their migration route, and that calving occurs in rivers by chance.

Nearly all participants described beluga use of rivers for moulting in July and August, explaining how beluga go to the falls or rapids to change, clean, or shed their skin. The shallow and muddy waters of Marralik were described by many as being a preferred area for beluga to moult before the closure. Post-closure observations were limited as most participants bypass the area since the closure was put in place.

July and August are also the peak months for beluga harvesting. Participants explained that in the summer months beluga generally use areas off the coast during low tide to feed on fish, and move into rivers during high tide. Many described their beluga hunting methods before the closure, and how they would typically time their beluga hunting in rivers with the new moon or full moon (when the difference between high tide and low tide is the greatest). Hunters described how they would watch for beluga moving into rivers with the rising tide and would follow them in to hunt them. Many participants shared accounts of this harvesting practice for the Ungunniavik and Marralik rivers before the closure. Marralik's muddy waters meant that it was important for hunters to harpoon before shooting to not lose their kill.

## Changes in habitat use over time

Participants reported that beluga are continuing to use Ungava Bay with some areas of higher abundance (e.g. around Tasiujaq), but that there are overall fewer migrating through Ungava since the 1980s.

Participants primarily from Kuujjuaq and Kangiqsualujjuaq reported observing decreasing beluga use of Marralik and Ungunniavik in the late 1970s and early 1980s. Most participants linked these changes to two main pressures: 1) increases in noise and disturbance from outboard motors and shipping, and 2) changes in harvesting pressure and practices (i.e. increased chasing of beluga in open water rather than harpooning in rivers), facilitated by the spread of outboard motor use. One participant explained that noise from outboard motors, ships, and planes travels differently when the water is shallower, and that beluga may be experiencing higher noise impacts in the Ungunniavik and Marralik estuaries as a result of the shallow water environment. Some participants noted that observed changes in environment (changes in ice, warming, river erosion) may also have an effect. Other changes noted around Marralik and Ungunniavik included increased observations in black bear and ugjuk (bearded seal) and decreased

sightings of in geese and natsiq (ringed seal). Observations of beluga in Marralik and Ungunniavik by participants post-closure were limited as most people now bypass the area.

## Population trends

Commercial whaling around Nunavik by Hudson Bay Company from the mid 1800's until early 1900's caused major beluga population decline, including in Ungava Bay. Some participants noted the locations of commercial whaling posts used for netting beluga on the Kuujuaq river. Still, participants described observing high numbers of beluga from 1940s to mid 1970s (e.g. pods of about 20 whales).

In the late 1970s and early 1980s, participants primarily from Kuujuaq and Kangiqsualujuaq described observing a major decrease in beluga numbers around Marralik and Ungunniavik. This population change was linked by participants to increases in noise and disturbance from outboard motors and shipping and changes in harvesting pressure and practices facilitated by the spread of outboard motor use, combined with the long-term impacts of commercial whaling on the beluga population. It is unknown if the group of a thousand beluga observed in the ice in Ungava Bay in February 1973 were trapped and perished or not; there is a possibility that this was a catastrophic event that also affected population numbers.

Between late 1980s to today, substantial numbers of beluga continue to use areas in Ungava Bay seasonally. When traveling or hunting, most participants have been bypassing the Marralik-Ungunniavik closure area since the 1980s, so have had few opportunities to observe beluga there. A few participants noted occasional observations of individual beluga or small pods (generally under five individuals) around Marralik and Ungunniavik in the post-closure period; most of these were observed from the air during other activities (e.g. commercial flying, surveying other species). The limited observations of beluga in the course of substantial flying time indicate sporadic use of the area by beluga since the closure.

## Appearance and stocks

Some participants noted differences among groups of beluga, while others did not describe differences. Some described how the beluga that migrate through Ungava toward Hudson Bay are distinct from the beluga that migrate through the Hudson Strait to Nunavut or that come from Greenland (which may be the same group or separate groups). Some participants noted that beluga that used Ungava Bay pre-closure were smaller, had straighter tail ends (flukes), were softer, and had less maqtaq while beluga that used the Hudson Strait and migrated to Nunavut had curvier tail ends (flukes) and more maqtaq. Further, participants explained that they are observing fewer numbers of these smaller beluga that use Ungava today than in the past, and greater numbers of the larger Hudson Strait beluga.

Some participants explained that pre-closure, some of the beluga used to stay behind in Ungava Bay after the spring migration and were summer residents of Ungava Bay. Some explained that they have not observed this occurring anymore post-closure, while others maintained that some beluga still stay behind. There were varied observations of differences in size before the closure between beluga that used the Marralik-Ungunniavik area and other beluga that migrated through Ungava Bay. One participant described how pre-closure, there was a distinct group of beluga that used the Marralik and Ungunniavik area, but based on current sporadic and limited use of the area by beluga, that this distinct group has been extirpated.

## Impacts of beluga harvesting closure

Most participants described the closure as not achieving its intended purpose as there has been no increase in beluga numbers observed in the Marralik and Ungunniavik area over the last 33 years, since the closure was put in place.

Nearly all participants described range of complex negative impacts of the closure on beluga harvesting, knowledge of beluga and relationship to beluga:

- Reduced harvesting benefits (i.e. direct impacts of loss of beluga access)
- Disruption to knowledge acquisition about beluga that use the Marralik and Ungunniavik area, due to area avoidance by harvesters
- Increased costs and risks from travelling further for harvests for Kuujjuaq and Kangiqsualujjuaq hunters
- Disruption to intergenerational knowledge transfer as increased travel distance and risks limits opportunities for young people to follow and learn
- Increased beluga harvesting pressure near Tasiujaq from Kangiqsualujjuaq and Kuujjuaq hunters
- Increased tensions between communities due to differential closure impacts
- Poaching by some Kuujjuamiut and Kangiqsualujjuamiut within the closure area, impacting sharing practices and increasing tensions within communities
- Increased use of harvesting practices that have larger impact on beluga (increased rushing and chasing, increased harvesting of only maqtaq due to difficulty transporting the whole carcass over far distances)

Participants described major impacts of the closure on their relationships to and use of Marralik and Ungunniavik estuary areas, as most participants no longer go to the area due to feeling unwelcome or having no reason to go.

Some participants discussed impacts from the closure on individual and collective Inuit autonomy and self-determination, due to the imposition of the closure on Inuit.

## Future management preferences

Nearly all participants preferred re-opening closure area. Most participants discussed conditions that should accompany any re-opening, with the most frequently described conditions being 1) more study and ongoing monitoring, and 2) local management and control of harvesting. While some did not specify conditions, others participants also expressed concern that a “free for all” would negatively impact beluga. Management options that some participants suggested included enhancing beluga harvest skills transfer to younger hunters, restricting noise (i.e. restricting outboard motor use, restricting permanent cabin construction), use of traditional beluga harvest approaches for the area (i.e. harpooning beluga in the rivers instead of chasing in open water) and applying quotas. Some participants discussed how local control and enforcement may curb poaching, and thus a limited legal harvest may not increase the number of beluga taken over the current illegal harvest. At the same time, a limited legal harvest would be more equitable and may mitigate some of the other described closure impacts.

# 2 Introduction

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## 2.1 RATIONALE

Beluga management in the Nunavik Marine Region (NMR) is based on maintaining vital, healthy wildlife populations capable of sustaining harvesting needs [Nunavik Inuit Land Claims Agreement (NILCA) 5.1.5(b)]. Currently, it is understood that four beluga stocks occupy the NMR, all named based their respective summering areas: Eastern Hudson Bay (EHB), Western Hudson Bay (WHB), James Bay (JB), and Ungava Bay (UB) beluga. Three of these stocks (WHB, EHB, UB) may be found in Ungava Bay. The WHB and EHB stocks move through Ungava Bay during seasonal migrations between their summering areas in Hudson Bay, and their wintering area in Davis Strait and the Labrador Sea (Bailleul, Lesage, Power, Doidge, & Hammill, 2012). JB beluga are considered to be non-migratory (Postma et al., 2012).

The UB stock historically occupied Ungava Bay during the summer, with the Marralik (Mucalic) estuary serving as an important moulting and calving area in the past. This stock was drastically reduced from its historic numbers by commercial harvesting. The commercial fishery was at its highest in the bay from 1867 to 1911, with a strong peak during the period 1877 to 1897 when it is estimated that 1,340 to 2,000 whales were taken (Doniol-Valcroze & Hammill, 2012). The Hudson Bay Company (HBC) expanded the number of posts along Nunavik's coast and its whaling operations in the 1900s, including opening a commercial whaling post at Ungunniavik in 1927 (Finley, Miller, Allard, Davis, & Evans, 1982).

The UB stock was designated as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 1998. COSEWIC also designated EHB Beluga as endangered in 2004 (COSEWIC, 2004). In 1986, Fisheries and Oceans Canada (DFO) created permanent beluga harvesting closures in southern Ungava Bay at the Ungunniavik (Whale), Marralik (Mucalic), Tuttutuq (Tuctuc) and Qurlutuq (Tunulic) Rivers to protect the UB stock of whales. The closures were designated under the *Marine Mammal Regulations* SOR/93-56, created pursuant to the *Fisheries Act*. Nonetheless, aerial surveys of Ungava Bay conducted in 1985, 1993, 2001, and 2008 did not find any beluga, which may indicate that the UB stock is extirpated. Despite the lack of sightings, the results of these surveys were used to model an estimated population of 32 UB beluga, with a 95% confidence interval from 0 to 94 individuals (Doniol-Valcroze & Hammill, 2012).

There were four years where Ungava Bay was entirely closed to beluga hunting (2002–2003, 2005–2006). Beluga hunting in Ungava Bay was again allowed starting in 2007, except for in the Marralik estuary and immediate surrounding area, including the Ungunniavik estuary. According to the *Marine Mammal Regulations*, the closure at Marralik estuary includes waters that are south of a straight line joining Point Tasker at Latitude 58°29'40" N., Longitude 67°44'00" W., and Cape Kernertut at Latitude 58°30'00" N., Longitude 66°56'00" W (Figure 1). The closure at the Marralik and Ungunniavik estuaries has been in place since 1986, meaning that Nunavik Inuit have not been allowed to harvest beluga in this area for the last 33 years.

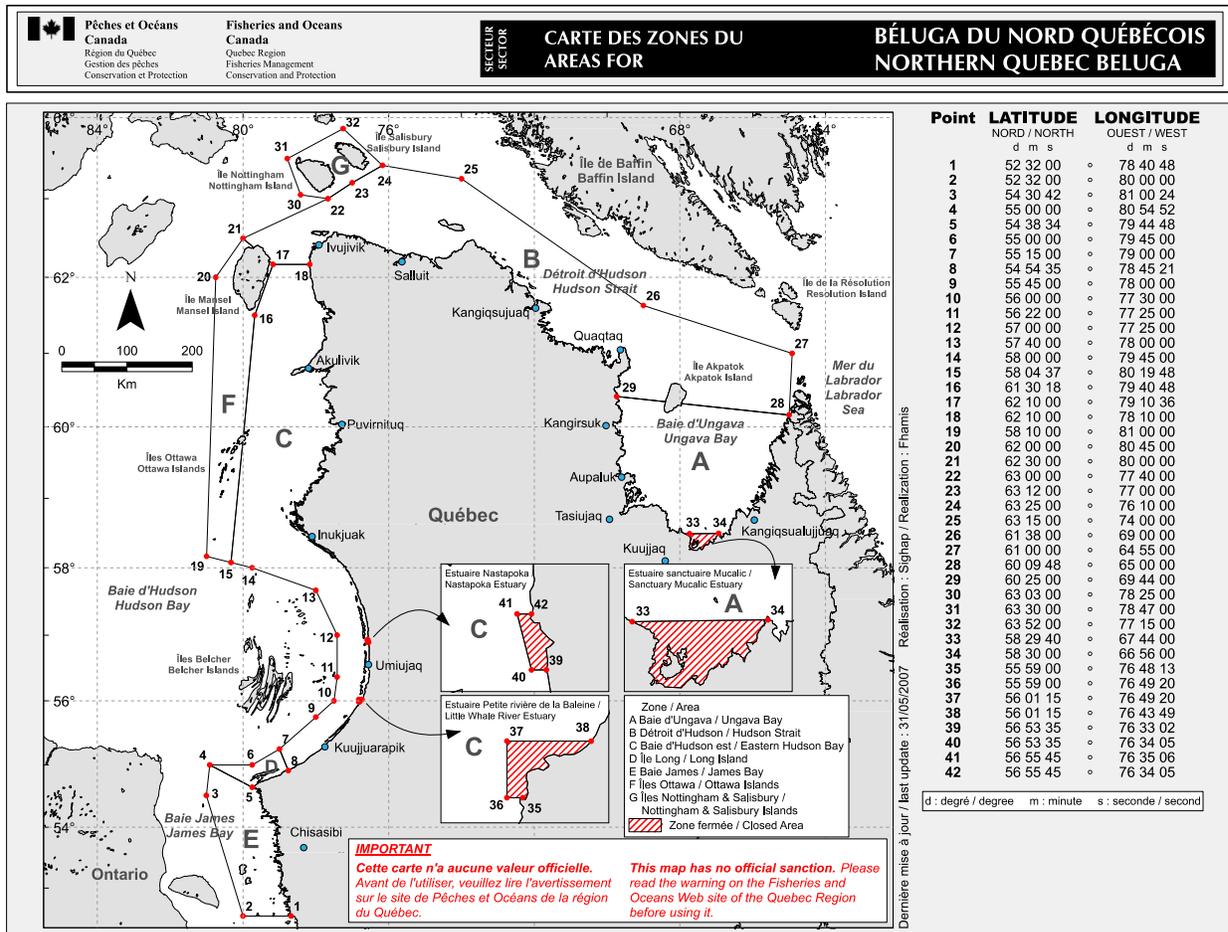


Figure 1. Murrilic (Mucallic) estuary beluga closure location and other permanent beluga fishery closures in the NMR (DFO, 2007)

With the establishment of the Nunavik Marine Region Wildlife Board (NMRWB) in 2007, the closure of the Murrilic estuary, and the other areas, are considered an NMRWB decision under section 5.2.22 of the NILCA. The NMRWB has the mandate to only restrict harvesting rights to the extent necessary to affect a conservation concern and as such if the UB stock has become extirpated or if the restriction is not effective, then the restrictions on hunting in the Murrilic estuary may not need to be maintained.

On January 24, 2018 the Immilik Committee of the Regional Nunavimmi Umajulivijiit Katujiqatigininga (RNUK) made a resolution stating the intention to have the Murrilic estuary opened for hunting to gather information on the beluga occupying the estuary through harvest and biopsy sampling. Subsequently, the NMRWB discussed the closure of the estuary and resolved that there was not enough information available to consider any changes, but that gathering the required information to make such a decision must become a high priority for all co-management partners.

Subsequent to the Immilik Committee and the Board resolutions, DFO proposed a project to begin gathering scientific information on the beluga occupying the Murrilic estuary. The objective of this project

are to determine the timing and duration of occupancy, the number of beluga, and the stock structure of the whales that are present.

## 2.2 PURPOSE OF THE STUDY

To support the NMRWB in giving equal consideration to scientific information and Inuit knowledge in its decision-making, this study gathered Inuit knowledge of beluga use of southern Ungava Bay, particularly the closure area, and Inuit beluga harvesting practices and knowledge.

The objectives of this study are:

- ▶ Document Inuit knowledge of beluga of southern Ungava Bay and the Marralik estuary, including:
  - Current and past use of Marralik estuary and surrounding areas by Inuit
  - Knowledge of beluga occupancy of Marralik estuary and surrounding areas
  - Beluga migration patterns (and any other indicators of how beluga use Ungava Bay, with special attention on seasonal timing and changes over the participants' lifetime)
  - Beluga calving
  - Changes regarding all of the above
- ▶ Explore Inuit perspectives on beluga management, including:
  - Impacts of the beluga closure
  - Future management preferences



Figure 2. Kangiqsualujuaq validation workshop in November, 2019. Clockwise left to right: David Annanack, Norman Snowball, Kenny Angnatuk, Sammy Unatweenuk, Tommy Unatweenuk, Agata Durkalec (photo by Mark Basterfield)

# 3 Methods

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To gather Inuit knowledge of beluga of southern Ungava Bay, a qualitative research design with a case study approach was used (Creswell, 2007). Based on feedback from the RNUK and the Local Nunavimmi Umajulirijiit Katujjiqatigiinningit (LNUK or Anguvigaapik), the communities of Kuujjuaq, Kangiqsualujjuaq, Tasiujaq, and Aupaluk were selected for inclusion in the study. While the Marralik-Ungunniavik area was a traditional harvesting area for Kangiqsualujjuamiut and Kuujjuamiut, some Tasiujarmiut have family roots in the Marralik-Ungunniavik area. Further, Tasiujaq harvesting areas are also impacted by the closure. While Aupaluk was initially included in the study under the same rationale as Tasiujaq, in further discussion with the Aupaluk LNUK they did not feel their participation in the study was necessary.

Workshops (focus groups) and interviews with individual participants were held in each community in April 2019 (Table 1). LNUK representatives selected participants that were knowledgeable about beluga and/or beluga harvesting in southern Ungava Bay, and participants with greater knowledge of the study area were prioritized. All sessions were semi-directed and included participatory mapping, and sequential Inuktitut-English interpretation was provided for participants when needed. Base-maps at two scales were provided during workshops and interviews; one that focused on southern Ungava Bay and included place names in Inuktitut (Figure 3, produced by Avataq Cultural Institute) and a supplementary map of all of Ungava Bay. Paper maps were overlaid with mylar and features were indicated by participants using markers, with explanatory notes on the mylar.

Sessions were audio recorded with participants' informed consent. Participants were also asked for consent regarding inclusion of their name in the report acknowledgements, attribution of their name to quotes, and taking their photograph for inclusion in the report. Audio recordings were transcribed by Transcript Heroes and thematically coded in the qualitative analysis software QSR NVivo 12. A hierarchical thematic coding structure was developed based on the workshop/interview guide, and adjusted based on topics raised by participants. Within the coding structure, transcript data was cross-coded to nodes based on location (if the information was related directly to the closure area) and time (before or after the closure). Map data were analyzed in ArcGIS; photos of completed maps were digitized and attribute data were extracted from the explanatory notes on the maps. During qualitative analysis, additional attribute data relevant to the digital maps were noted and added to the ArcGIS map database.

A follow-up trip was conducted in November 2019 to check the validity of findings with participants—that is, to ensure that participants had an opportunity to check that their knowledge had been represented accurately in summary maps and in the report, and to create an opportunity to refine the findings or add new data. Validation of report findings and summary maps was carried out through validation workshops with participants in Kangiqsualujjuaq and Tasiujaq and individual meetings in Kuujjuaq. Validation workshops in Kangiqsualujjuaq and Tasiujaq were organized in cooperation with the LNUKs; the majority of participants from April data collection attended and one new participant in each community also joined the workshop. Summary maps were presented and a high-level summary of the report was discussed. The draft report was also made available and shared with a number of participants. Validation workshops were recorded by notetaking, and audio recordings were used as a reference to complete written notes. Feedback from Kuujjuaq participants regarding the need for additional data from Kuujjuaq Elders led to three additional interviews being conducted in Kuujjuaq in November 2019.

Overall, there were 10 participants from Kuujuaq, 10 from Tasiujaq and 11 from Kangiqsualujuaq that participated in the study. Not including validation workshops, a total of seventeen hours of audio from workshops and interviews were transcribed and coded. In the report body, names are only included with quotes where consent has been provided. Map information is presented as pre-closure (1986 and earlier), or post-closure (1986 onward).

Table 1. Timing and number of participants in recorded workshop and interviews, excluding validation meetings

Date	Interviewer names	Format	Number of participants
<b>Kuujuaq</b>			
09-Apr-19	M. Basterfield, P. Kasudluak	Workshop	4
09-Apr-19	M. Basterfield, P. Kasudluak	Interview	1
16-Apr-19	M. Basterfield	Interview	1
16-Apr-19	M. Basterfield	Interview	1
05-Nov-19	M. Basterfield, A. Durkalec	Interview	1
07-Nov-19	M. Basterfield, A. Durkalec	Interview	1
07-Nov-19	M. Basterfield	Interview	1
<b>Kangiqsualujuaq</b>			
12-Apr-19	M. Basterfield, P. Kasudluak	Workshop	3
13-Apr-19	M. Basterfield, P. Kasudluak	Interview	1
14-Apr-19	M. Basterfield, P. Kasudluak	Workshop	4
15-Apr-19	M. Basterfield	Workshop	2
15-Apr-19	M. Basterfield	Interview	1
06-Nov-19	A. Durkalec, M. Basterfield	Validation workshop	9
<b>Tasiujaq</b>			
10-Apr-19	M. Basterfield, P. Kasudluak	Workshop	8
11-Apr-19	M. Basterfield, P. Kasudluak	Interview	1
07-Nov-19	A. Durkalec	Validation workshop	6

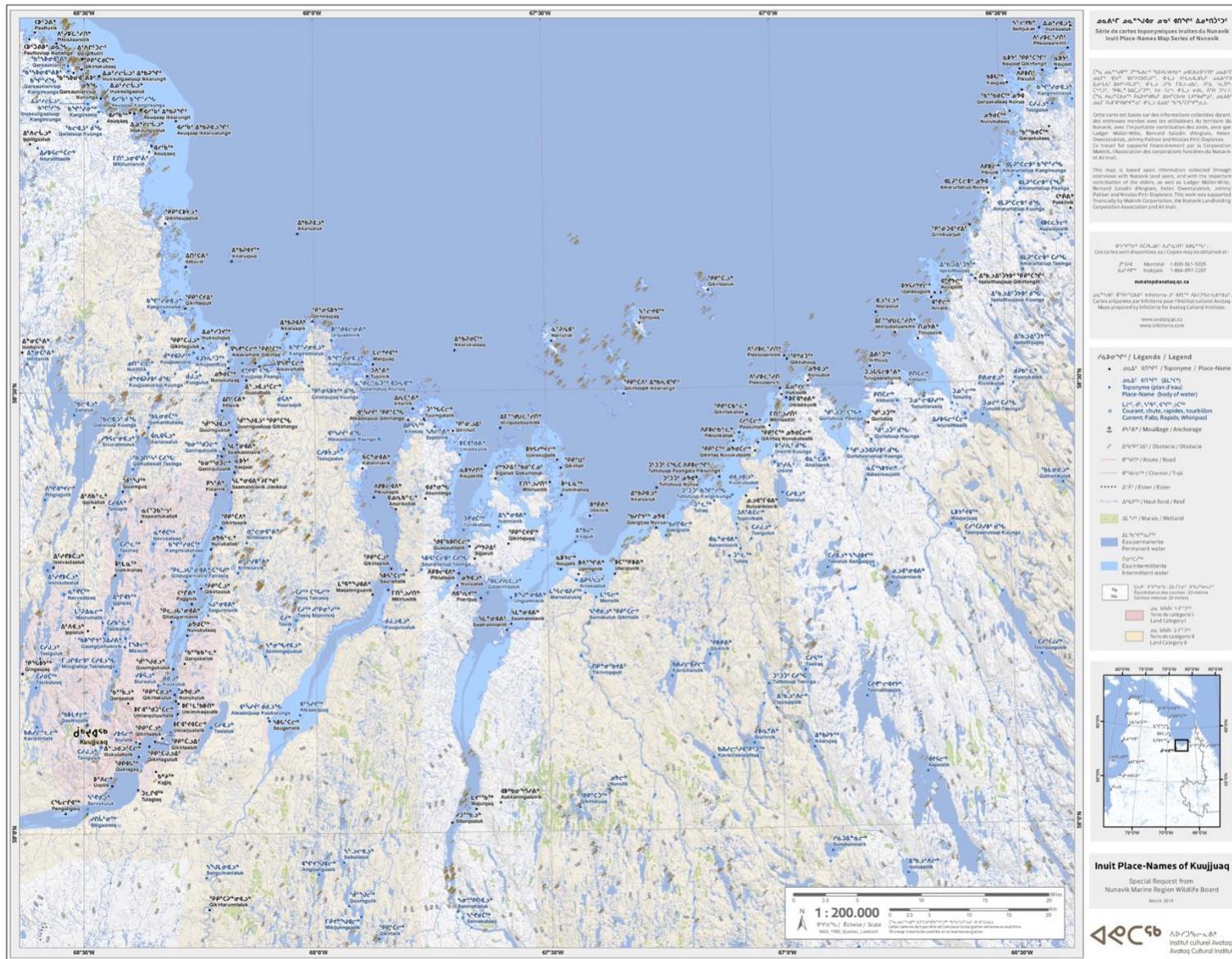


Figure 3. Primary base-map used for participant mapping

A number of different place names are used in documents and by participants for locations around southern Ungava Bay. Some names have been updated in federal and provincial records to accord with the Inuktitut spelling of the place name. For clarity, official names of locations and previous names are listed in Table 2.

Table 2. Names for select locations in the southern Ungava Bay area (Natural Resources Canada, 2019; Québec, 2019)

Official names	Previous names
George River (Rivière George); alternately Kangirsualujuap Kuunga River (Rivière Kangirsualujuap Kuunga)	
Koksoak River (Rivière Koksoak); alternately Kuujjuaq River (Rivière Kuujjuaq)	
Leaf River (Rivière aux Feuilles); alternately Kuugaaluk River (Rivière Kuugaaluk)	
Marralik River (Rivière Marralik)	Mucalic River (Rivière Mucalic)
Qikirtajuaq Island (Île Qikirtajuaq)	Big Island
Qurlutuq River (Rivière Qurlutuq)	Tunulic River (Rivière Tunulic)
Tunulliup Lake (Lac Tunulliup)	Tunulliq Lake (Lac Tunulliq)
Tuttutuq River (Rivière Tuttutuq)	Tuctuc River (Rivière Tuctuc)
Whale River (Rivière à la baleine); alternately Ungunniavik River (Rivière Ungunniavik)	



Figure 4. Interview with Johnny Gordon Sr. (middle), with Allen Gordon interpreting (left) (photo by Mark Basterfield)

# 4 Inuit knowledge of beluga in Ungava Bay

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Beluga harvesting practices are deeply integrated with Inuit knowledge of beluga; most knowledge shared by participants about beluga originated through their observations during or related to harvesting. As a result, knowledge of beluga harvesting is integrated into sections where knowledge about beluga is presented.

## 4.1 IMPORTANCE OF BELUGA HARVESTING TO NUNAVIK INUIT

Nearly all participants described the significance of beluga harvesting for them personally and for their families, communities and culture. Many participants described the importance of beluga harvesting for providing a source food to their families and communities. A few participants described how young people go with parents and other family members to learn harvesting and butchering practices, and that transferring harvesting knowledge and skills is a part of Inuit culture and tradition. As Jimmy Johannes explained:

*...beluga has always been an in important source of diet for us too living in the headwaters of Ungava Bay. Our river teamed with beluga ever since I can remember. That time, summertime was a busy time of the year, many hunters' families had owned these Peterheads and they would come here...every summer life continued, to find food – fish, salmon, beluga included.*

–Jimmy Johannes, Kuujjuaq

One participant described how his family's survival depended on harvesting a bunch of beluga for the winter. The beluga fat was critical food for sled dogs and the meat was dried. Changes in transportation away from sled dogs thus changed the critical nature of beluga harvesting for him, and now is more seasonal and occasional.

Lukas A. Etok explained that he learned from his ancestors that by harvesting and sharing food from a successful hunt, Inuit ensure that animals continue to come back to that place.

*...our grandparents or my parents used to say that there tend to be animals there when you harvest them for food – the animals tend to come again to migrate to feed the family...There's generations after generations that the food cycle usually is, like if you get this beluga harvested and give it to people and there's going to be another one coming because you are harvesting it and sharing it.*

–Lukas A. Etok, Kangiqsualujjuaq

The closure of Ungunniavik and Marralik rivers and estuaries and the surrounding ocean area to beluga hunting was described by one participant as bringing into focus and underscoring the strong relationship between Inuit and beluga:

*The issue of beluga has been magnified and has I think strengthened the Inuit to say, “that’s our food”. The idea of having to look forward to eat maqtaq and the goodness of the species, part of our diet, is starting to prove that it can help to avoid a whole lot of awful things that people die from...At the same time feeling, being pushed to the wall I think has strengthened the Inuit to have more awareness that yes they are in fact Inuit and they have always relied on beluga even before their time...going back in history.*

–Jimmy Johannes, Kuujjuaq

## 4.2 IMPORTANCE OF THE AREA AROUND MARRALIK AND UNGUNNIAVIK ESTUARIES TO NUNAVIK INUIT

Participants explained that Marralik and Ungunniavik estuaries were traditional areas for harvesting beluga before the closure, and nearly all participants described rich histories of land use for harvesting beluga and other activities in the areas of the Marralik and Ungunniavik estuaries in the past. Some participants grew up around the Marralik and Ungunniavik area or developed strong connections to this place through family members and ancestors. As one participant from a Kangiqsualujjuaq workshop stated about the Marralik area: “this is our land.” He explained that his family relied on it to survive.

The abundance of beluga in the Marralik and Ungunniavik rivers, estuaries and surrounding bay was a significant draw for seasonal land use in the past. For some, it was not only a hunting location—it was a place of significance in their personal histories as beluga hunters as it was a location where they harvested their first beluga or learned how to hunt beluga. As a Kuujjuaq workshop participant explained, “this was the closest area for us to go harvest when I was growing up. That’s where I got my first one and [how] I learned how to handle beluga is really from there.”

A participant explained that the short distance to the Marralik area from Kuujjuaq meant that in the past he and his hunting companions could bring the whole beluga carcass home after a hunt, and that they wouldn’t have to go frequently—that they could have enough food for the summer from one hunt. Some participants also described how in the past, Inuit always loved each other and wanted to help each other through sharing food, and they had that feeling when they harvested in the Marralik area. In these ways, harvesting beluga in the Marralik area was both supported by Inuit knowledge and culture, and also reinforced Inuit knowledge and culture, including knowledge of how to navigate and camp on the land safely, beluga hunting and butchering skills, intergenerational knowledge transfer and sharing practices.

## 4.3 SPATIAL AND TEMPORAL ASPECTS OF BELUGA HABITAT USE AND HARVESTING

### 4.3.1 REGIONAL DISTRIBUTION AND MIGRATIONS

Participants described how in general, beluga distribution depends on the presence and distribution of sea ice. Participants explained that beluga overwinter in the deep waters off the coast of Labrador. Depending on when ice starts to move, break and melt, beluga begin the seasonal migration west. Reports of migration observations related both to the pre-closure and post-closure periods (Figure 5). Participants from a Kangiqsualujjuaq workshop reported observing beluga around the Killiniq area in mid-May. Some participants reported that the choice of migration route—either straight to Quaqtaq from Killiniq or along the Ungava coastline—depends heavily on ice cover. One participant from Kangiqsualujjuaq reported that for the spring migration, most beluga tend to move directly from Killiniq to Akpatok Island, and then from Akpatok to Quaqtaq, navigating around ice along the way. Participants in the Kangiqsualujjuaq validation workshop explained that when a northwest wind packs Ungava bay and the Hudson Strait full of ice, beluga have been noted to adjust their migration route to move north across the Strait and follow the Nunavut coast westward. It was also noted that the strong currents of Hudson Strait are a deterrent to killer whales, who then do not follow the beluga as they move from the Labrador coast northwest across the Strait to Nunavut.

Participants generally described the timing of the spring migration as occurring in May through August, with the timing and number of beluga arrival depending on ice conditions year-to-year. As Jimmy Johannes noted, “like other species, beluga, they come back in many numbers some summers and some summers not many at all, again at the command of climate, mother nature, ice conditions, a whole lot of factors here in Kuujjuaq.”

Participants in Kangiqsualujjuaq reported seeing beluga pass by on their spring migration around mid-June, and a participant from Tasiujaq also reported June as the time that beluga start being seen in that area. It was noted that in the 1940s, Inuit would be seen arriving in the Tasiujaq area in June with dried beluga meat on their backs. One participant reported observing a beluga near the mouth of Kangiqsualujjuaq Kuunga in early June from a helicopter, while travelling for ice fishing. A participant in Kuujjuaq reported that he would see the last whales moving westward for the spring migration in August. Participants also reported that proximity of the whales to the coast during the migration also depends on the ice; if there is ice near the shore, the beluga would tend to be more “out”—further off the coast.

In the fall, participants reported that beluga migrate east, returning from their summering areas in the Hudson Bay towards the Labrador Coast. Most participants reported the fall migration taking place from September and October, and a few reported observing the migration as late as November. Participants reported that they generally stop seeing beluga in November because ocean conditions prevent them from observing beluga; nonetheless, they know that they are still travelling and migrating.

Due to ice cover, there were only a few observations of beluga in winter, including two sightings of small numbers of beluga in polynyas on the eastern Ungava coast in the 1960s, and more recently a sighting near Quaqtaq in March. The most significant observation of beluga in winter was witnessed by pilot Johnny May, who reported seeing about a thousand beluga in a small area open water surrounded by ice in central Ungava Bay in February 1973, while flying a twin otter to Killiniq (Figure 6).

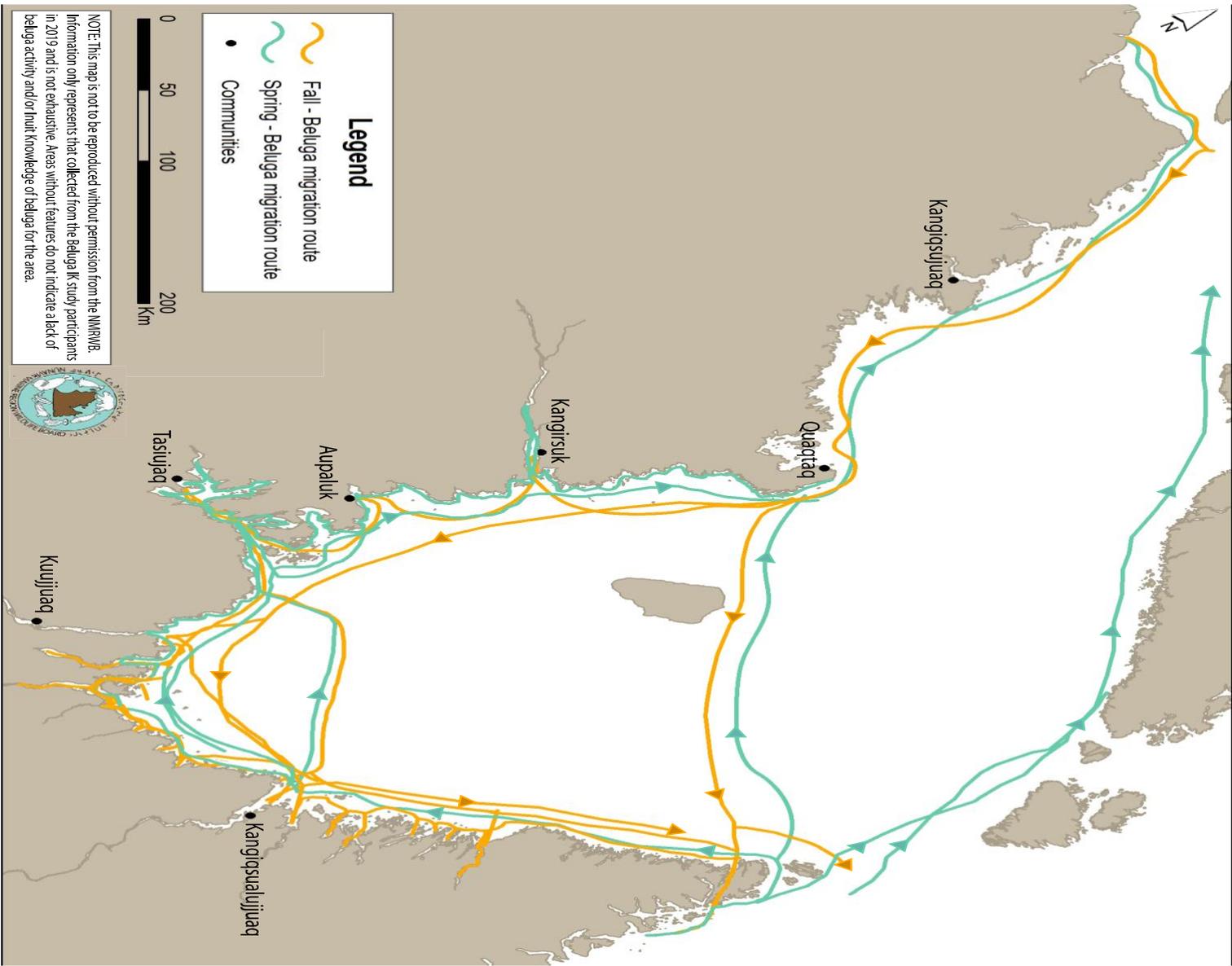


Figure 5. Spring and fall beluga migration routes (pre -and post-closure) recorded by participants

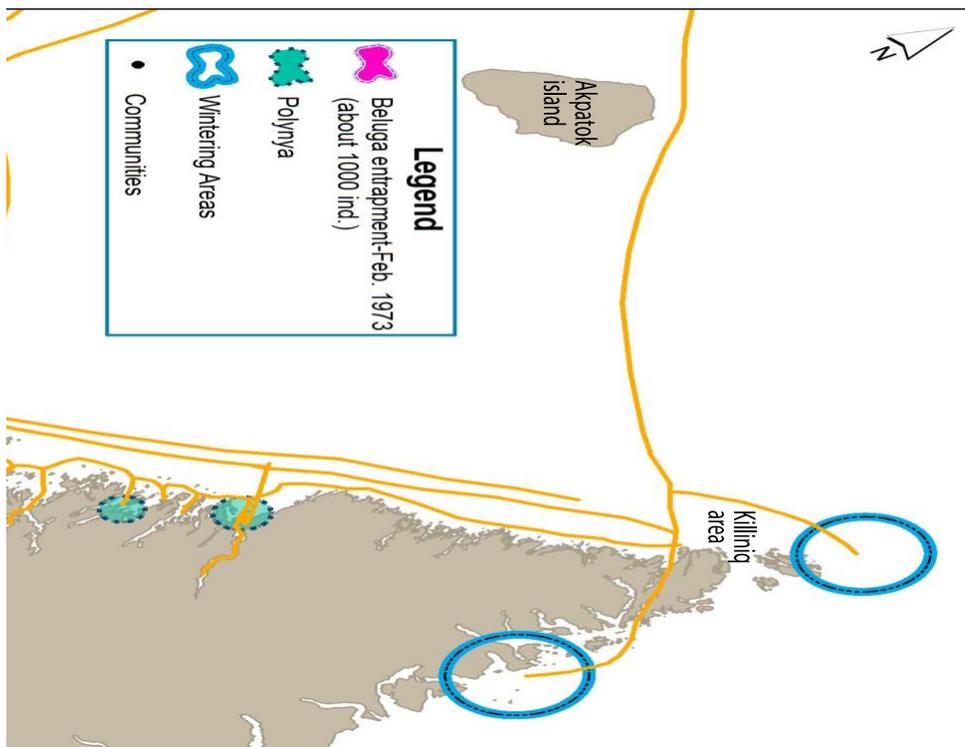


Figure 6. Location of beluga entrapment in winter 1973 and other winter observations of beluga recorded by participants

*In February way out here somewhere, the only open water that I could see, and there was probably a thousand beluga, in February, in that open water. Little open water, probably a quarter of a mile or less...I'm not sure if they were trapped, but there sure didn't look like any other place to get air.*

*-Johnny May, Kuujjuaq*

Few participants described the order or groupings of beluga during the migration; a Kuujjuaq participant described how solitary males usually lead, while slower females with calves follow. Kangiqsualujjuaq participants described the general order as females with calves leading and males following. A participant from Kangiqsualujjuaq reported seeing more beluga in that area during the fall migration than during the spring migration in recent years.

### 4.3.2 SEASONAL USE OF RIVERS, ESTUARIES AND COASTAL AREAS

*...when it was the time for the summer season to begin, thunder and lightning – that told hunters the beluga will be arriving very soon. The mosquitoes would come out in swarms and it was known that’s when the beluga are going to make a run in the high tide period, at the highest tide all around that area, in the river.*

*–Jimmy Johannes, Kuujjuaq*

Participants explained that the spring and fall migrations of beluga mean that beluga use the coastal, estuary and river areas of southern Ungava Bay seasonally. As Jimmy Johannes stated above, thunder and lightning have been used to mark the time of the year when beluga will begin to be seen around the southern Ungava coast. Participants described how the timing of beluga presence in rivers around their communities is “like a routine”—it is always in July and August. As a participant from Kuujjuaq explained: “beluga are hunted right in the mid-summer. The hottest days of summer. That's when we tend to see beluga in the river.” All workshops reported on seasonal use of rivers, estuaries and coastal areas in southern Ungava Bay, with the majority of accounts relating to the pre-closure period.

Participants described how beluga come in and out of the rivers—as a participant in Kangirsualujjuaq described, “they go out, and some come in. Some other ones come in. They go like that.” Participants explained that any given beluga does not stay in the area long (two to a few weeks at most) but that rivers are frequently occupied by beluga as individuals and pods migrate through the area. Participants emphasized that beluga do not just go to the Marralik and Ungunniavik rivers. As Edward Koneak explained: “They go in this river [Kuujjuaq] too, they go in every river.” Participants shared observations of beluga going up the Kangirsualujjuap Kuunga, Kuujjuaq, Kuugaaluk, Qurlutuq, Tuttutuq, Ungunniavik and Marralik rivers, amongst others. Observations of beluga utilizing most rivers spanned pre-closure and post-closure time periods. Participants explained that some years they see beluga in the Kuujjuaq every day during the summer months. Participants shared observations of beluga far upstream—for example, 30 miles up the Kuujjuaq River.

Movement into rivers was explained by many participants as being tied to the tides and moon phases. During the full and new moon, when the tide is up, beluga travel into rivers (Figure 7). A number of participants described timing the harvesting of beluga in rivers to the moon and movement of tides, focusing harvesting efforts around rivers during August when the tide is highest. Fall was described as a time for opportunistic beluga harvesting, but not the main timing.

Figure 8 shows beluga harvesting and watching areas (areas that are watched to see when beluga are coming in, to time harvesting), in addition to sightings, illustrating the concentration of beluga harvesting efforts in estuaries and rivers in southern Ungava Bay. It should be noted that areas around Tasiujaq fell outside of the area represented on the primary base-map used for data collection. As a result, Figure 8 represents only few beluga harvesting and sighting areas marked by Tasiujarmiut on a larger regional map, while Figure 9 is a close-up of Figure 8 that focuses on areas east of Marralik. Figure 10 shows some of the locations of other land-based activities that participants engaged in coincident with beluga harvesting (e.g. char fishing).

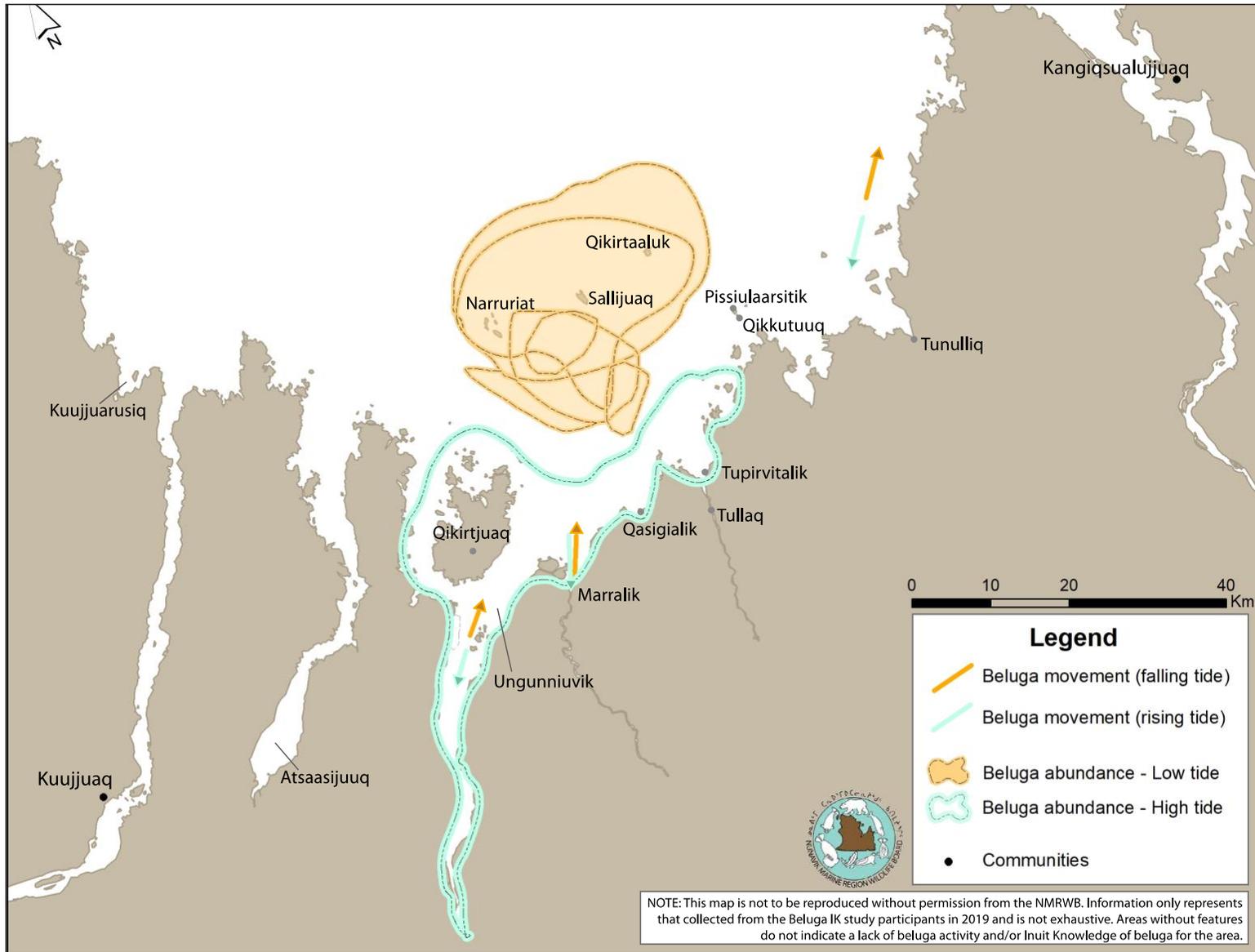


Figure 7. Beluga abundance and movement in relation to tides reported by participants

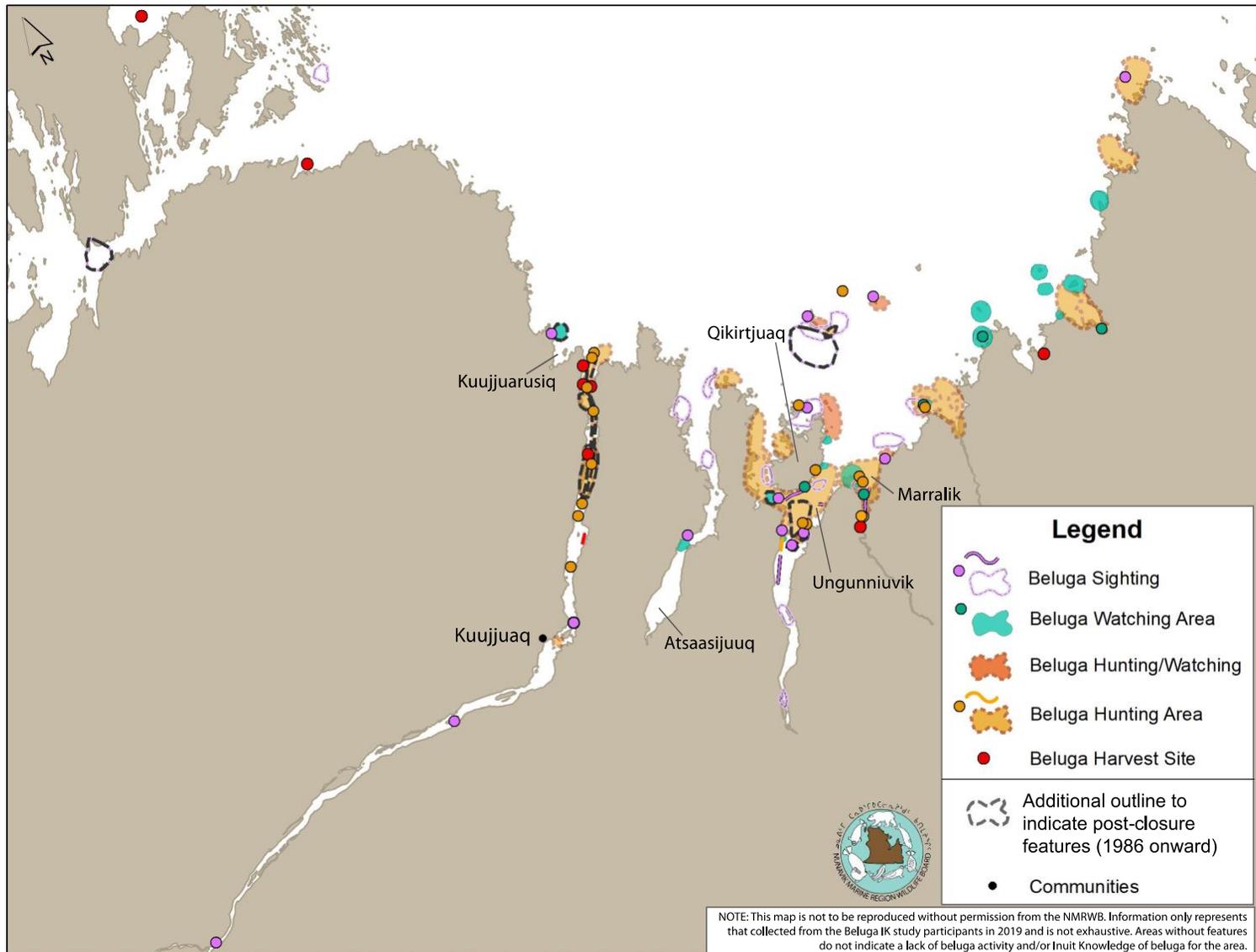


Figure 8. Beluga hunting areas, watching areas, and sightings in southern Ungava Bay reported by participants; features are all pre-closure (1986 and earlier) unless specifically indicated as post-closure

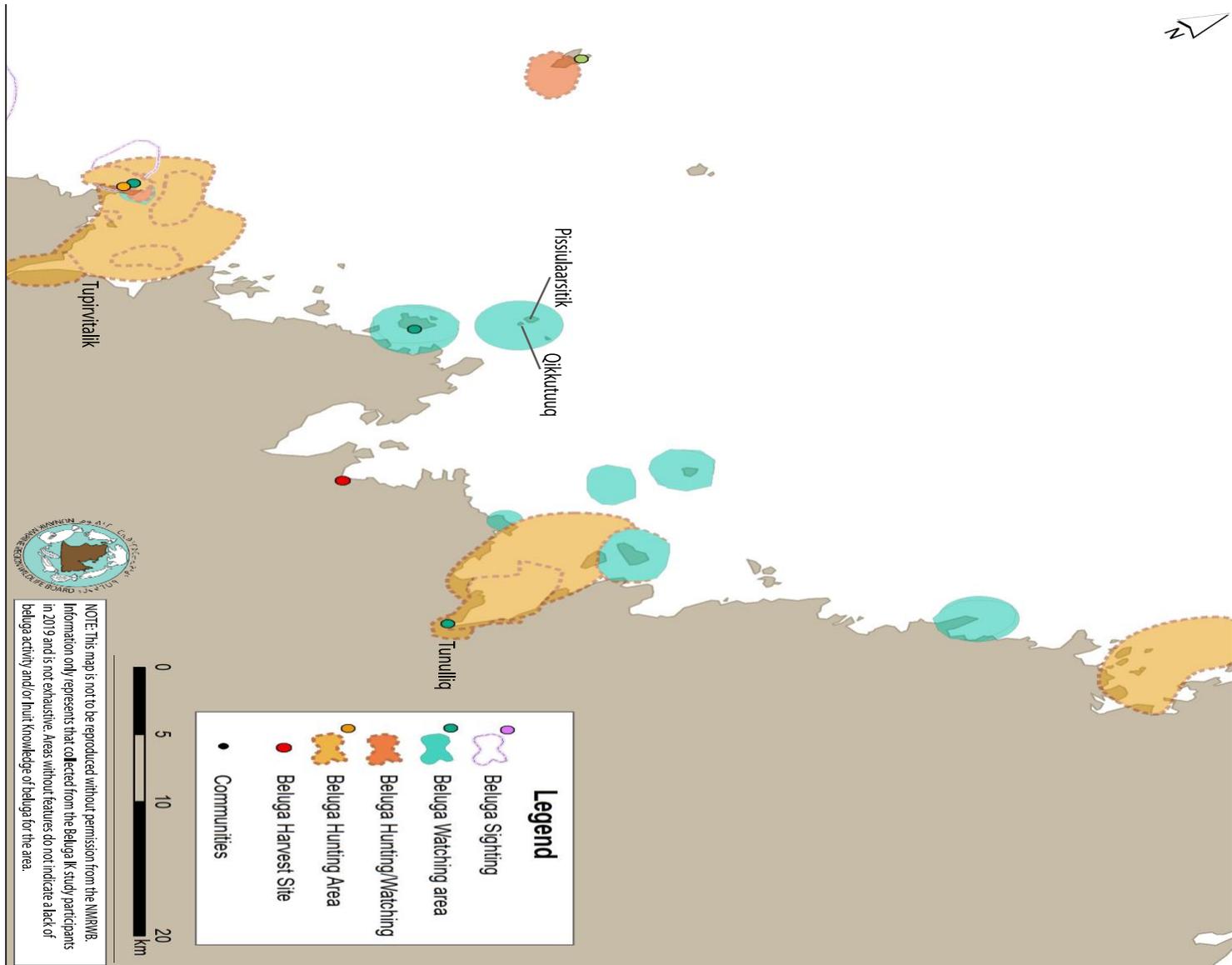


Figure 9. Close up of Figure 8, focused on areas east of the Marralik estuary

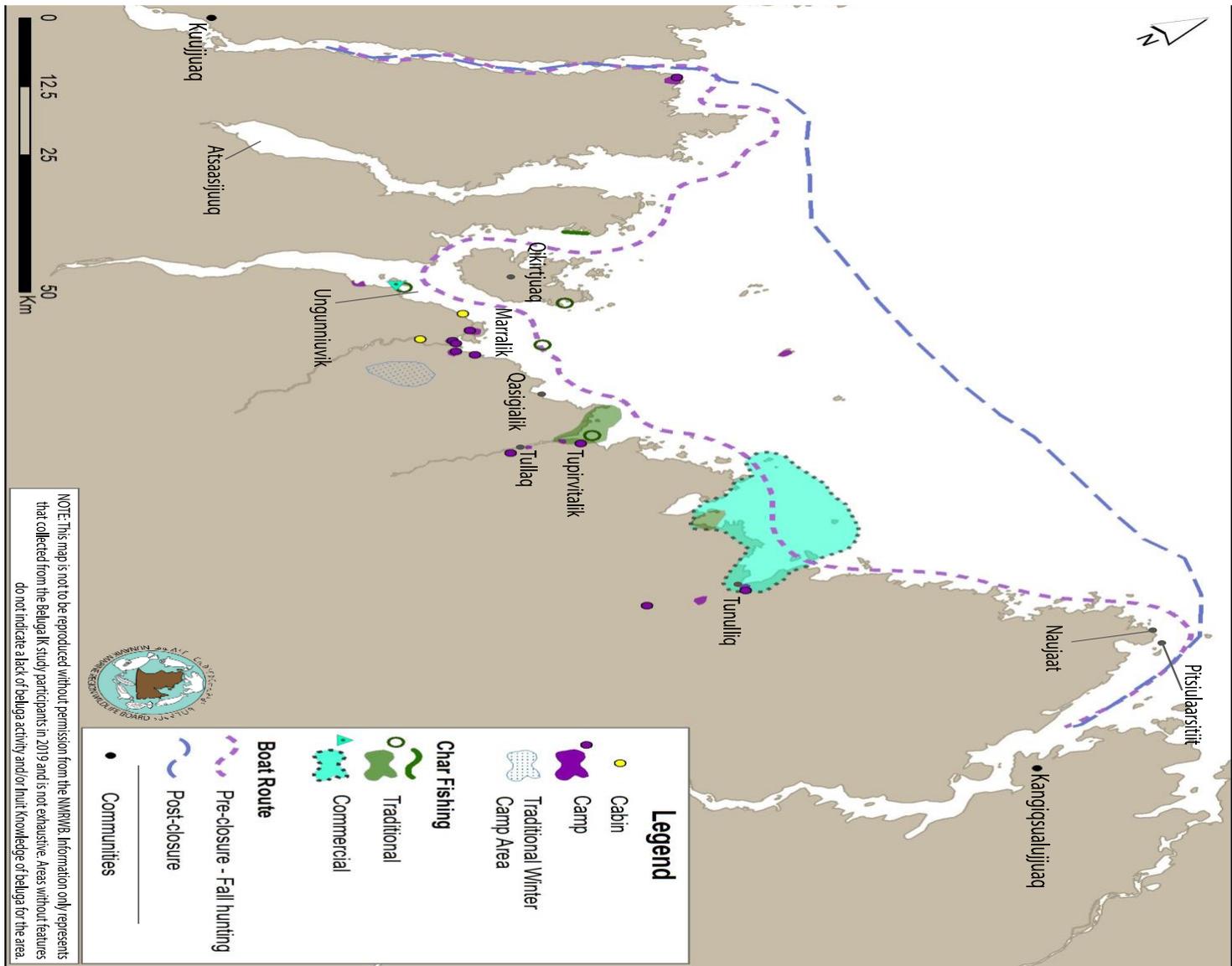


Figure 10. Locations of other land-based activities coincident with beluga harvesting or observations that were reported by participants

Many participants explained that there are two primary reasons that beluga access rivers: to moult and to feed on fish. Participants explained that beluga primarily travel upriver to clean their skin, as described in detail in section 4.3.3. Participants also explained that beluga tend to go where fish are located, which draws them into river environments. A participant suggested that different rivers have different fish and different tastes, and beluga may be trying to access a diversity of fish by moving from river to river. Some participants explained that beluga can also have young in the rivers, and that this knowledge was passed down to them, but some participants emphasized that the motivation for going upriver is not to calve but to moult and feed. Participants explained that beluga can and do have young at any time, suggesting that calving within rivers is incidental. Tivi Etok, Willie Etok and Elijah Emudluk discussed this topic during a Kangiqsualujjuaq workshop:

*...beluga calves follow their mothers everywhere. That's how they told us that beluga go Whale River and Marralik to go get calves, but that's not true. Actually – they go upriver to clean their skin, to go up. They go upriver to clean their skin instead of getting calves. Up to Ungunniavik and Marralik.*

*...Beluga go upriver to clean – mainly to clean their skin. Not to go calf.*

*–Participants from Kangiqsualujjuaq*

Some participants suggested that beluga may also go upriver to die, as they have generally observed more whales going into rivers than exiting them.

### ***Relationship to Marralik and Ungunniavik estuaries***

The movement of beluga in the summer into rivers during high tide was described by many participants in relation to the Ungunniavik and Marralik (Figure 7), with nearly all observations of beluga use of these rivers relating to the pre-closure period. Most observations related to the summer months, when beluga are in rivers moulting and feeding on fish. One participant from Kuujjuaq explained that large swells in Ungava Bay in October mean that few Inuit would travel to this area late in the fall, thus limiting fall observations in this area. Figure 11 shows details of both beluga and Inuit use of the Marralik and Ungunniavik estuaries.

Participants explained that during low tide, Marralik, Ungunniavik and a wide swath of the bay around their estuaries are extremely shallow, and nearly dry in places. As a result, participants explained that beluga tended to occupy areas around the islands of Narruriat, Sallijuaq and Qikirtaapit Ikkariangit during low tide, where they hunt for fish. Participants described how as the tide would rise, beluga would follow it and move into the Marralik and Ungunniavik rivers. Participants recounted waiting on islands like Qikirtajuaq or on the shore of these rivers for beluga during their hunts. As a Kuujjuaq workshop participant explained: “We used to wait in that island [Upirngivik] and make no noise at all, and wait till the beluga coming from the ocean comes slowly up the tide and once they pass, we go hunt.”

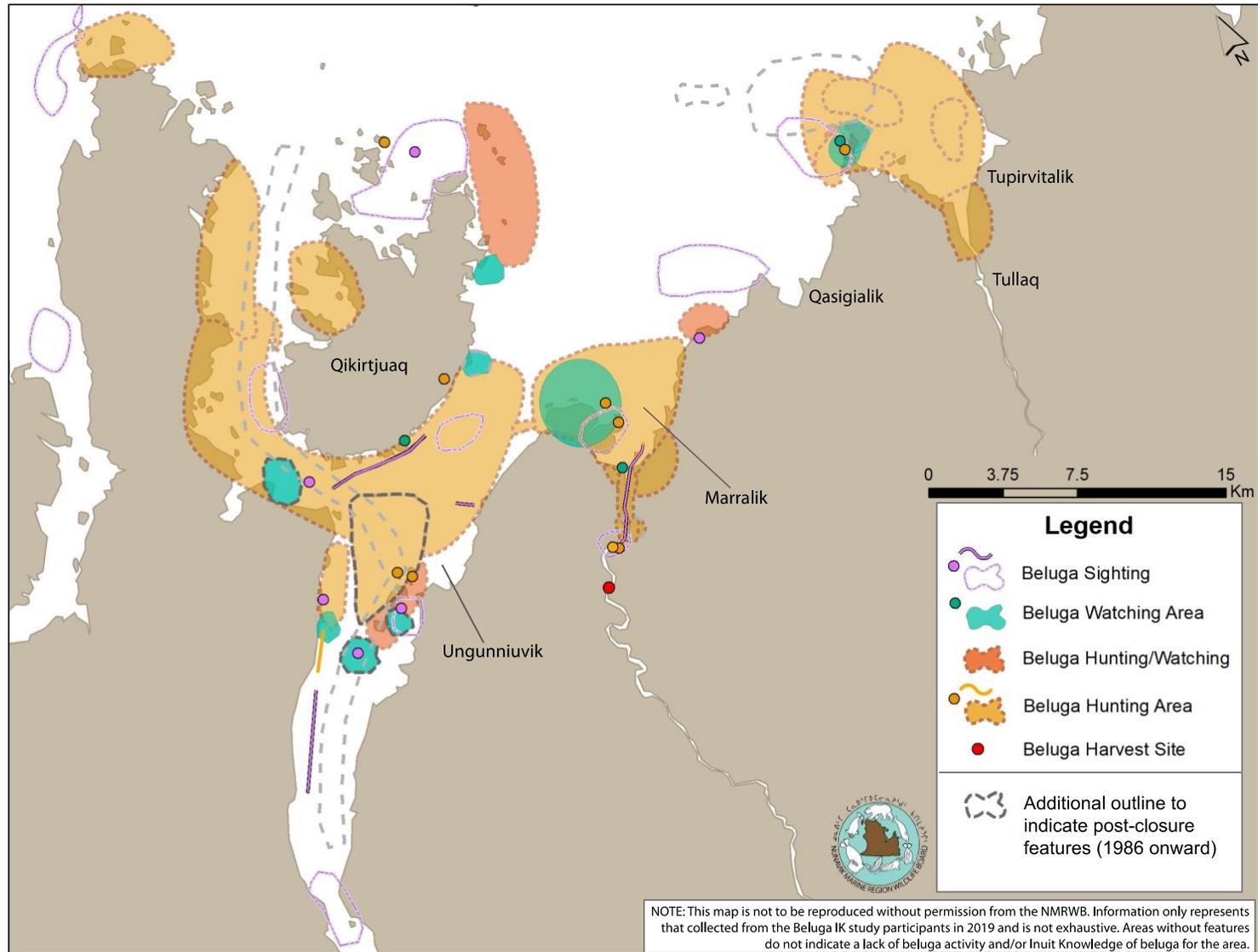


Figure 11. Close up of Figure 8, focused on the Marralik and Ungunniuvik estuaries; features are all pre-closure (1986 and earlier) specifically indicated as post-closure

Participants described how the Marralik is a shallow and especially murky river. Beluga were described as hiding in the muddy waters when they are frightened, making harvesting before the closure difficult and requiring patient harvesting practices tailored to this turbid river environment:

*When I went there for hunting with someone else, we saw beluga at the mouth of the Marralik, where the falls are. We could see them. But when we were in the space around this [area], that's how big it was [indicates depth with hands]—the river, it was so shallow. It was shallow area with smoke, mud under the water. We knew there were lots of beluga in the area but the beluga were making the dust going around in the water. We could even hear them hitting the boat. And that was happening for quite a long time and we were just sitting there, couldn't even see the beluga, because the water wasn't clear.*

—Participant from Kangiqsualujjuaq

*We used to hunt here, and this part is pretty shallow and murky. You cannot see the beluga...[but] you can know that it's there because of the bubbles that it's making. You cannot see the fins or anything that's moving except for the bubbles and you know it's going there. Once in a while they usually go up for air and before they do you can know that beluga is there, it's going to go up to surface cause it's blowing out air and you can see it when it's really calm.*

—Lukas A. Etok, Kangiqsualujjuaq

Some participants emphasized how it was important that they harpooned beluga in the Marralik before shooting it, as the water is so muddy that retrieval of the carcass would have been impossible otherwise. Some participants also described the narrow window of time that the Marralik and Ungunniavik estuaries are easily navigable by boat, explaining that high tide only lasts a few hours, and after this that low water levels make boat travel difficult.

Some participants described declining use of the Marralik River by beluga in the late 1970s, with one participant describing how beluga started skipping over Marralik and travelling to other rivers, like Ungunniavik, instead. Some participants reported seeing individual beluga or small pods in these rivers or in their estuaries since the closure while boating through or flying over the areas in the summer or early fall.

### 4.3.3 MOULTING AREAS AND TIMING

As mentioned in section 4.3.2, moulting was described by participants as a primary motivation for beluga use of river environments. Nearly all participants described the use of rivers for moulting in July and August, describing how beluga go to the falls or rapids to change or clean their skin. Marralik was described as a frequently used moulting area in the past, before the closure, but use of rapids or waterfalls for moulting in other southern Ungava rivers before and after the closure was also described by participants. For example, participants at a workshop in Tasiujaq described how beluga come to Tasiujaq in the summer months now and in the past because of the abundant fish in the Kuugaaluk River and to shed their skin in the rapids.

One participant described how he could tell that beluga have been moulting through changes in qualities of their skin:

*When it comes to beluga, the beluga who are more at sea tend to have a taste of salt, but when they go up river to clean their skin and they start coming out they're less saltier, more watery, and that's how he knows when they're going up river to clean their skin. And the skin tends to be harder when they just cleaned their skin up river.*

*–Participant from Kangiqsualujjuaq*

### ***Relationship to Marralik and Ungunniavik estuaries***

Marralik and Ungunniavik rivers were described by participants as important places for beluga to shed their skin in the past, before the closure. Some participants shared direct observations of beluga cleaning their skin in these rivers, particularly Marralik. Some also shared knowledge that was passed down to them from older generations, including their stories of observing beluga coming out of the waters of Marralik with mud on their backs. Tikinniqajuit, which means 'where you end your trip,' is where rapids are located on the Marralik river and a place that beluga would go to shed their skin. Qualities of these rivers that contribute to their utility for moulting were described:

*Those who were older than us knew these were the migrating beluga but some stayed. Some stayed to shed their skins where is the ideal place, and Marralik is one of the places for that purpose, and spots in the river here where there are pebbles 20 miles up, nice round pebbles down below and fish to be had for food.*

*–Jimmy Johannes, Kuujjuaq*



Figure 12. Marralik River in September 2019 (courtesy Allen Gordon)

In addition to pebbles, the mud and freshwater of Marralik were described as functioning like a “mud bath” for beluga, helping them shed their skin:

*Edward: [Beluga] needs the mud and the fresh water from the river, because that's what they use – fresh water to change their coat. And the mud it's easy rubbing, you know, probably, it's easier.*

*Norman: Soap.*

*Edward: Soap, like soap, yeah, they wash.*

*–Edward Koneak and Norman Cooper, Kuujjuaq*

Ungunniavik River was described as becoming very “fresh” with the low tide, also making it a good place for beluga to change their skin.

As described in section 4.3.2, participants explained that before the closure, they would time their harvesting of beluga in the area to the whale's seasonal use of Marralik and Ungunniavik rivers for moulting. Participants did not share any observations of beluga cleaning their skin in Marralik or Ungunniavik post-closure.

#### 4.3.4 CALVING AREAS AND TIMING

Some participants described beluga calving behaviour, places and timing. Most observations related to the period before the closure, but some related to the post-closure period. As described in section 4.3.2, participants described how beluga may have calves at any time and in any place. During a Tasiujaq workshop, participants discussed how beluga can give birth anytime, including while migrating: “[We] seen them, newborns here still on their mother, on top. We see them everywhere... Newborns like that, not just in Marralik...They don't go to certain area to make baby...They make babies migrating also.” At the same time, Kangiqsualujjuaq validation workshop participants noted that July and August are more frequent times for calving. Explaining that beluga can give birth to calves anywhere along their migration, a participant from a Kangiqsualujjuaq workshop described: “[I] used to see them in this ocean, that they were getting their calf...That's how I know. I've seen them myself.” Still, some participants described how areas along the coast (not in rivers) are preferred and thus important areas for calving.

Some participants described singular incidents in the past, before the closure and not necessarily in the closure area, where a mother or her young calf were mistakenly killed. For example, a participant recalled a time when a mother was mistakenly killed in a hunt because harvesters did not see the accompanying newborn calf, as well as an incident where a newborn still on its mother's back was mistakenly harpooned. Participants described these rare incidents as a “bad accident” and causing harvesters to feel “really bad,” underscoring that these incidents were uncommon and that harvesters try their best to avoid harming mothers and nursing calves.

#### ***Relationship to Marralik and Ungunniavik estuaries***

Some participants shared observations of beluga with young calves in the Marralik and Ungunniavik areas. For example, Lukas A. Etok described observing a mother and her calf in the shallow estuary area around Marralik and Ungunniavik for a period in the summer of 1980. He suggested: “They usually, probably hang around there due to their calf plus they're shedding their skin, cleaning them, on that area. They probably don't migrate to the deep area when they have calf.” Participants in a Kuujjuaq workshop described how

they had not seen beluga give birth in the Ungunniavik and Marralik areas, but they had observed some mothers with calves, including “some very fresh ones.” As one participant explained: “I don’t know if they were born there or not, but they’re very young when they’re there.”

One participant from Kuujjuaq described an account from the late George Koneak where he shared his observations of witnessed a birth at Mitirlusitik in the 1970s, before the closure:

*He said one morning...early, early morning, he was looking after the canoes, and he noticed a whale right by the shore, and it was very quiet...But he said it wasn't travelling...he started observing and he got his rifle ready, he was going to shoot it, but he observed it to be doing stationary kind of – not just travelling and he just looked at it more, and then he said a little one popped up. And he figured that was a birth, and he said he decided not to shoot it at all. And they travelled after. But he said he was sure it was born right there. Right in that - right near the point here, Mitirlusitik...he said it was just by itself at first. And after it made some unusual circle – or turns or – I don't know, I guess bopping around here and suddenly he saw this little black, grey little one by its side.*

–Participant from Kuujjuaq

Johnny May also described the importance of Mitirlusitik for young, describing the island being a place where he has seen a female with a calf more often than anywhere else.

#### 4.3.5 CHANGES IN HABITAT USE OVER TIME

Changes in beluga habitat use over time were discussed by participants in nearly all Kuujjuaq and Kangiqsualujjuaq workshops, but were not a major topic in the Tasiujaq workshops. In a Kuujjuaq workshop, participants explained that beluga have reasons for avoiding places where they have gone in the past: “they will always go as they please, there’s reasons not to go to where they usually go also.”

A number of participants in Kuujjuaq and Kangiqsualujjuaq workshops explained that changes in human activities in the Ungava area—boat travel by outboard motor and increased shipping—have elevated noise, which beluga are sensitive to, as well as increased harvesting pressure. Some participants described their perspective that these changes are a major reason that beluga have been migrating through Ungava and using habitat in southern Ungava less since the 1980s as compared to the past—although participants noted that some are still present. Figure 13 shows changes before and after the closure in observations of beluga, or areas often used by beluga. A participant in a Kangiqsualujjuaq workshop stated: “The noise has made a lot of effect, there have been less beluga since there were outboards.” Daniel Annanack explained: “since there’s so much traffic from Kuujjuaq and George River, I think they migrate here less as there’s too much noise that we make.” The outboard motor was described as driving changes in beluga use of southern Ungava areas both through increased noise, and also through changes in beluga harvesting practices—such as increasing “chasing” of beluga during a hunt. Some participants also described how beluga avoid areas where they can remember being hunted or pursued in the past, and suggested that beluga may be avoiding certain areas based on learning from previous hunts.

Noise from other human activities was also described as affecting beluga in Ungava Bay. Participants in a Kuujjuaq workshop described increased noise from shipping today compared to in the past being a potential contributing factor to changes in beluga habitat use. Participants in that workshop described

how when the ship comes in, beluga tend to swim inward towards the coast to run from the high volume of noise.

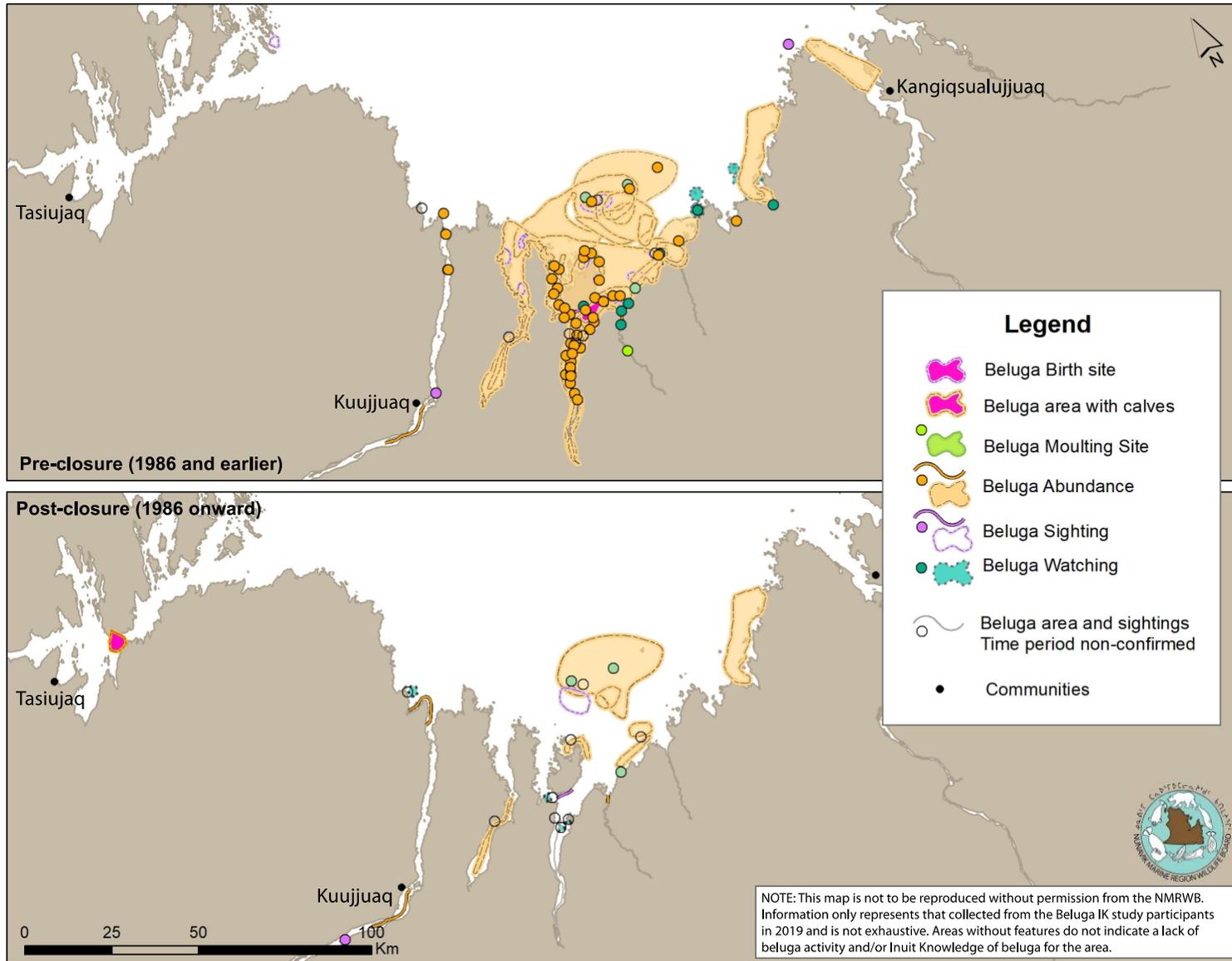


Figure 13. Changes before and after the closure (1986) in observations of beluga abundance and uses of the area

The sensitivity of beluga to sound interacts with these changes in human activities. For example, a participant from Kuujjuaq recounted camping near the mouth of Marralik in the late 1970s and observing beluga turn around and leave the area in response to noise from an outboard motor 15 to 20 km away in Ungava Bay.

Peter May recounted beluga sensitivity to the sound of helicopters during aerial surveys:

*These ones here, we were flying – I don't know how high we were, probably 1,500 feet at least. We could just barely see them, and we were flying up and you could see this one whale. He was in shallow water and he wouldn't come to the surface. He was going around in circles, going around in circles, and I'm sure he knew the helicopter was above him, eh? He could hear it or hear something, and he was just only maybe eight feet down but he wouldn't come up to the surface.*

*-Peter May, Kuujjuaq*

In addition to changes in human activities and accompanying increases in noise, some participants described how environmental changes may also be affecting beluga habitat use. Some participants described how today, the Kuujjuaq River is dammed, resulting in there being “hardly any water left coming down on those hot days in the high tide, low tide period” with unknown implications for beluga. Environmental changes due to climate change were also described, including decreases in ice cover, increased vegetation growth, increased heat in the summer causing increased sunburn risk for animals, new species (e.g. pike, suckers, insects) as well as changes in species (e.g. increased black bear, decreased ringed seals, decreased Arctic terns). Some participants shared observations of erosion in rivers. For example, one participant described three places on the Kuujjuaq River where the banks have slipped down, suggesting that permafrost may not be holding anymore. Lukas A. Etok described seeing signs of erosion in areas around Kangiqsualujjuaq: “Back then it used to be just pure mud, only the biggest rocks used to up here. But nowadays you can see rocks everywhere because the mud is, has reduced.”

Changes in ice conditions have also interacted with changes in harvesting practices to increase access to beluga harvesting in different places. One participant recounted that climate change has increased access to places like Imilik, near Quaqtq, in the last two decades. Ungava Bay used to be “choked” with ice in the past, and now more ice-free areas coupled with fast motorboats allows harvesters to travel far distances for beluga over a longer season.

As mentioned, changes in beluga habitat use was not a major topic for Tasiujaq residents. Some Kuujjuaq participants shared observations of high numbers of beluga in the Tasiujaq area in 2018.

### ***Relationship to Marralik and Ungunniavik estuaries***

Similar themes discussed by participants related to beluga habitat use changes in southern Ungava in general were also described in relation to the Marralik and Ungunniavik estuary areas. Some participants described the effects of harvesting by outboard motor and associated noise impacts on beluga in the Marralik and Ungunniavik estuary areas in the late 1970s and early 80s. Some participants also described how they observed beluga passing over Marralik starting in the late 1970s, preferring to go to other rivers instead.

*[The reduction in beluga] is probably because of the noise, the loud noise... We could see beluga here from time to time but we never saw them going up the river anymore.*

*Because there was too much noise. It's probably the reason why they moved to another area. It wasn't like, when I was a young boy, when I could see lots of beluga there. But when I moved [to Kangiqsualujjuaq] in '78 I couldn't see beluga going upriver anymore in the Marralik area.*

*–Norman Snowball, Kangiqsualujjuaq*

*Back then there, before the canoes, people from Kuujjuaq never used to go the Marralik area. But when they started getting canoes with outboard people from Kuujjuaq started coming in to that area and may have affected the beluga going there.*

*–Participant from Kangiqsualujjuaq*

*I think honestly, that really changed with the outboard motor. Outboard motor changed everything...The noise level, the speed that you can go back and forth to this place, and the way you can chase the beluga. Before it was qajaqs and small umiaqs. So the beluga always had a chance to really run away quickly. The versatile outboard motor with the canoe that is so easy to haul up, push down and tie it in the mud. So I think at the end of the '60s, '70s, the amount of pressure for the beluga to have its own pod here, I think it became very difficult to remain a population that was growing at all here.*

*–Participant from Kuujjuaq*

A participant explained that noise from outboard motors, ships, and planes travels differently when the water is shallower, and that beluga may be experiencing higher noise impacts in the Ungunniavik and Marralik estuaries as a result of the shallow nature of the area:

*For example, when you're swimming and dive under the water and there's a big noise and you can hear it very loud under the water. Like for the airplanes and helicopters, if they're not thousand and something feet, the beluga tend to hear it too. And also the ships and I know that's mainly the effect that causes reduced beluga in that area... low tide tends to go very low and when there's too much noise since it's very shallow there tends to be more noise in that area. I know for sure that affected the beluga as well.*

*–Lukas A. Etok, Kangiqsualujjuaq*

As use of the Marralik and Ungunniavik areas since the closure has been sparse for most participants, there were few observations of habitat changes or habitat use changes by beluga in these areas since the closure. Bobby Snowball, who had a cabin on the Marralik River for almost four decades, noted that brush growth has changed significantly over the years and gotten very thick, while the river and ponds are drying up. Some participants suggested that similar to areas around Kuujjuaq and Kangiqsualujjuaq, the Marralik and Ungunniavik areas may be experiencing ice, permafrost and erosion changes. Only one participant from Kuujjuaq noted the possible influence of the closure on beluga use of the area, explaining that closure may have reduced boat traffic and thus noise pollution impacts on beluga, but also noted that some traffic and noise has remained. As that participant had bypassed the area since the closure, he had not observed if boat traffic changes influenced beluga use of the Marralik and Ungunniavik estuaries since the closure.

## 4.4 BELUGA POPULATION TRENDS AND PRESSURES

### 4.4.1 BELUGA ABUNDANCE PRE-CLOSURE

Most observations of beluga abundance in the pre-closure period shared by participants related to the Marralik and Ungunniavik estuary areas, in response to questions posed in workshops, but some participants also shared observations of beluga abundance in the past in other areas in Ungava Bay. As Jimmy Johannes explained:

*Lots of beluga that time too, very much. You were basically guaranteed every summer for beluga around Ungunniavik area and sometimes in Kuujjuaq, and a lot even around most of Tasiujaq... There is reversing falls there as well at high tide and low tide and lots of beluga would be around there...But the most amount of beluga that I can recall – this whole area [Kuujjuaq River] used to be full of beluga right here. If we're going around here, the smell of maqtaq in the air – you can smell it from quite a ways out.*

*–Jimmy Johannes, Kuujjuaq*

Some participant reported observing pods of beluga numbering between 4 to 10 individuals between the late 1970s and early 1980s in rivers or coastal areas in southern Ungava, such as the estuary of False River, mouth of Kangirsualujjuap Kuunga River, mouth of Kuujjuaq River and near Qikirtaajuit Island (west of Kuujjuaq River). These sightings took place between August and November.

#### ***Relationship to Marralik and Ungunniavik estuaries***

Many participants described seeing abundant beluga in the Marralik and Ungunniavik rivers and estuaries as they were growing up, before the closure.

*When I was a little boy [1940s/1950s], there used to be lots of beluga around this area. When I was young, they used to come here. There used to come lots. Plenty. We used to go down the Marralik. All the way down to that little area.*

*–Participant from Kangirsualujjuaq*

A participant in the Tasiujaq workshop explained how his father had a Peterhead boat, and in the 1960s he would join him and travel to Marralik; he observed “tons” of beluga in Marralik at that time. In the early 1970s, a participant in the Kuujjuaq workshop stated that he used to observe hundreds of beluga in Marralik. Johnny May described his observations flying over the area in the 1960s and early 1970s:

*When I used to fly for an airline, a couple of airlines back then, I'd do a lot of trips to George River and Killiniq, and certain times of the year Marralik area. I remember one day counting 300 beluga together, so there was a lot of beluga and they used to go right up in the river when the tide was up, up to the fresh water. And inside the river it would be just white from beluga. And you know, I haven't seen that for years and years, anything like that.*

*–Johnny May, Kuujjuaq*

Johnny Gordon Sr. described seeing average pods of 20 beluga go into Marralik between the 1950s until the 1980s, with the largest pod he saw there consisting of 40 beluga. He also heard a large pod enter the Marralik River at night in the fall in the late 1970s.

*I'm remembering the ones going into Marralik area, they would probably be average of a pod of 20. I would observe many with binoculars, but not all would join in to go in with the tide.*

*—Johnny Gordon Sr, Kuujjuaq*

A participant in a Kuujjuaq workshop described camping at the point near the mouth of Marralik in the late 1970s, and for three days observed about 20 beluga coming into the mouth of the river each day. He observed that by comparison, numbers of beluga in the area were reduced starting in the early 1980s: “In the '80s we would check, seal hunt, a lot of seal hunting and we would always kind of check in the area. And we weren't seeing that many.” Participants at a Kangiqsualujjuaq workshop also stated that they began noticing a decline in numbers in the area in the 1980s. A participant from Kangiqsualujjuaq described how by 1978 he was not observing beluga go up the Marralik River with the high numbers that he had seen in the past.

While beluga numbers were reported by participants to be much lower in the 1980s than they had been in previous decades, participants still noted some observations. For example, a participant observed a pod of whales at the mouth of Ungunniavik in the early 1980s, and a pod of 10 to 15 whales around Mitirlusitik in the mid-1980s, and a pod of 5 whales at the mouth of Ungunniavik in the mid-1980s. One participant from Kuujjuaq noted that the 1980s was when she observed the most beluga in the Marralik and Ungunniavik areas.

#### 4.4.2 BELUGA ABUNDANCE POST-CLOSURE

Participants explained that beluga have been present across locations in southern Ungava Bay over the last three decades, and provided various examples of observations. In the mid to late 1980s, a participant observed 30 to 40 beluga while flying over the Tasiujaq area, with pods at Tasiujaaluk and the Kuugaaluk River estuary and another pod exiting the bay. A participant observed two whales at the mouth of False River in the late 1980s. In the late 1990s, a participant observed eight whales in the Kuujjuaq River, two of which were harvested by hunting groups, and seven beluga around Qikirtaajuit, near Dry Bay. In the early 2000s, a participant observed two beluga around Qirnituarjuit,

Observations from the last decade indicate that there continue to be substantial numbers of beluga in Ungava seasonally. A Tasiujaq workshop participant explained: “[in] Tasiujaq we see quite a bit. Even last year that was a lot, more than other years, like in the range of more than 50. And all summer there’s been beluga here, last summer.” A Kuujjuaq participant noted that in recent times, a pod of over 50 beluga came in front of the Kuujjuaq River. Participants at a Kuujjuaq workshop explained how “there is a lot, if you’re there at the right time you’ll see lots”:

*There are huge, huge, huge amounts...Every day sometimes the whole, almost the whole summer in Kuujjuaq. Just this morning!... They go all the way up the falls; the rapids. And there’s more and more every year coming through Kuujjuaq.*

*—Participant from Kuujjuaq*

Johnny May noted observations of beluga numbers over the last forty years and up to today around Qirnitajuit: “When I am at Black Point for the month of July I have my little plane and I usually come in once a week. And almost every flight in July I see three or four pods or beluga, of [5] to 15.”

Some participants also shared specific sightings in the last decade. For example, a Kuujjuaq participant shared recent observations of beluga in the Kuujjuaq River: one beluga in 2013 and two in 2016 north of Kuujjuaq in September, and two whales in 2016 and one whale in 2016 south of Kuujjuaq in October.

### ***Relationship to Marralik and Ungunniavik estuaries***

Observations of beluga abundance in the Marralik and Ungunniavik estuaries since the closure was limited, as most participants bypass the area. Most observations came from two participants, who saw beluga during various aerial surveys.

One participant spent three weeks in July at an observation post on the Marralik River around 1986 or 1987 with two DFO researchers, for the purpose of assessing beluga abundance. During that time, he observed only one beluga in the Marralik River. Associated with that field work, he observed five beluga exiting the Ungunniavik. This field work, more than 30 years ago, represents the most recent time that beluga abundance was systematically surveyed from a land-based observation post in the Marralik and Ungunniavik areas (see COSEWIC, 2004). The same team conducted an aerial survey of the area before setting up the observation post, around early July, and did not observe any beluga during that flight.

Peter May, a participant from Kuujjuaq, conducted annual aerial surveys of geese in the area with the Canadian Wildlife Service from 1986 to 1992, and again from 1997 to 2012. He explained that in one goose banding season, he would spend 30 hours in a helicopter, and summarized his observations of beluga in the area of Marralik and Ungunniavik estuaries:

*I never saw a lot when I was flying. We would fly the shoreline a lot. We don't go out – the surveys that we did were further out but when we were banding geese it was more like close to shore. And we never saw a lot but I'm not sure. I don't think it's changed much. I mean last fall we saw I think five or something? Yeah, we saw here and there. We saw big groups in the '80s here [in Ungunniavik]. [Since then] I saw just a few individuals here and there, like a few small groups, no big groups.*

*–Peter May, Kuujjuaq*

Peter described seeing individual beluga and pods with up to six individuals over this time period. For example, he described observing multiple sightings of groups of beluga in the Ungunniavik estuary and in the shallow area between Ungunniavik and Marralik over the years; a group of three whales near the bottom of the Ungunniavik estuary and one whale in the rapids of Ungunniavik River in 2009. He also observed a group of three beluga north of Mitirlusitik Island in 2016, and group of four beluga northwest of Qikirtajuaq Island, near Umiakkuvik, in 2016. In October 2018, he observed three whales near Qikirtajuaq and a couple nearby.

During a helicopter flight in 2018, another participant observed seven adult beluga just south of the mouth of Ungunniavik, and a separate group with a mother and a calf, also just south of the mouth of Ungunniavik.

Johnny May noted that in his flights over the last three decades over the area, he continues to note similar concentrations of beluga outside of Marralik in the ocean, but that “the big concentrations are gone.” In the Marralik River, he noticed the absence of beluga starting around the 1990s. He participated in an aerial survey of beluga in the area in the early 1980s, but noted some methodological issues, including the survey being done a bit late in the season, not concentrating sufficiently over shallow areas, and the general issue of accuracy as beluga are disturbed by and tend to swim away from airplane noise far before they can be observed.

Some participants that travelled through the area shared additional observations. One participant from Tasiujaq noted that he passed through the area in September 2012, and did not observe any beluga. A participant from a Kuujjuaq workshop explained that he used to see beluga in the 1980s and 90s in the Marralik and Qikirtajuaq areas, and that while he does not go there because beluga harvesting is not permitted in the area, he conveyed that he knows from others that in July and August there are some beluga there still.

#### 4.4.3 POPULATION PRESSURES OVER TIME

As population pressures in Ungava Bay in general and in the Marralik and Ungunniavik estuaries are connected to each other, they are reported on together.

A number of participants described how pressures on the beluga population in the area began with commercial whaling in the 1800s by the HBC, and some indications of commercial activity (e.g. remnants of posts used for netting beluga in rivers) were recorded by participants on maps (Figure 14). A participant from Kangiqsualujjuaq stated that Europeans used to take thousands of beluga from around Nunavik. A participant from Kuujjuaq explained that her parents used to talk about how in the past, the beluga were in great numbers, before impact of commercial whaling. The HBC established a post at Kuujjuaq (Fort Chimo) in 1830, abandoned between 1842 and 1866, and reopened in 1867 when a commercial whale fishery was initiated (Finley et al., 1982). The HBC expanded the number of posts along Nunavik’s coast and its whaling operations in the 1900s, including opening a commercial whaling post at Ungunniavik in 1927 (Finley et al., 1982).

*There used to be a Hudson Bay post here [Ungunniavik]...That's when the European used to come to go to this area. And we know for sure that they overharvested beluga for their oil. And that's when the beluga [became] less.*

*–Lukas A. Etok, Kangiqsualujjuaq*

*...the numbers used to be really high – I know in the whole Hudson Bay records, like the Koksoak and – on the river here there's big rings on the bedrock where they used to have the big nets for beluga, and they used to kill hundreds here and ship the oil and stuff, like the Hudson's Bay Company. And that's was in 1800s I guess, but there was a lot of whales here a long, long time ago.*

*–Peter May, Kuujjuaq*

Another participant explained that whalers would drive the beluga into the small bays, use metal posts and rings affixed to the bedrock to string the net across the bay, and wait for the tide to go out to contain and kill beluga in the Kuujjuaq River.

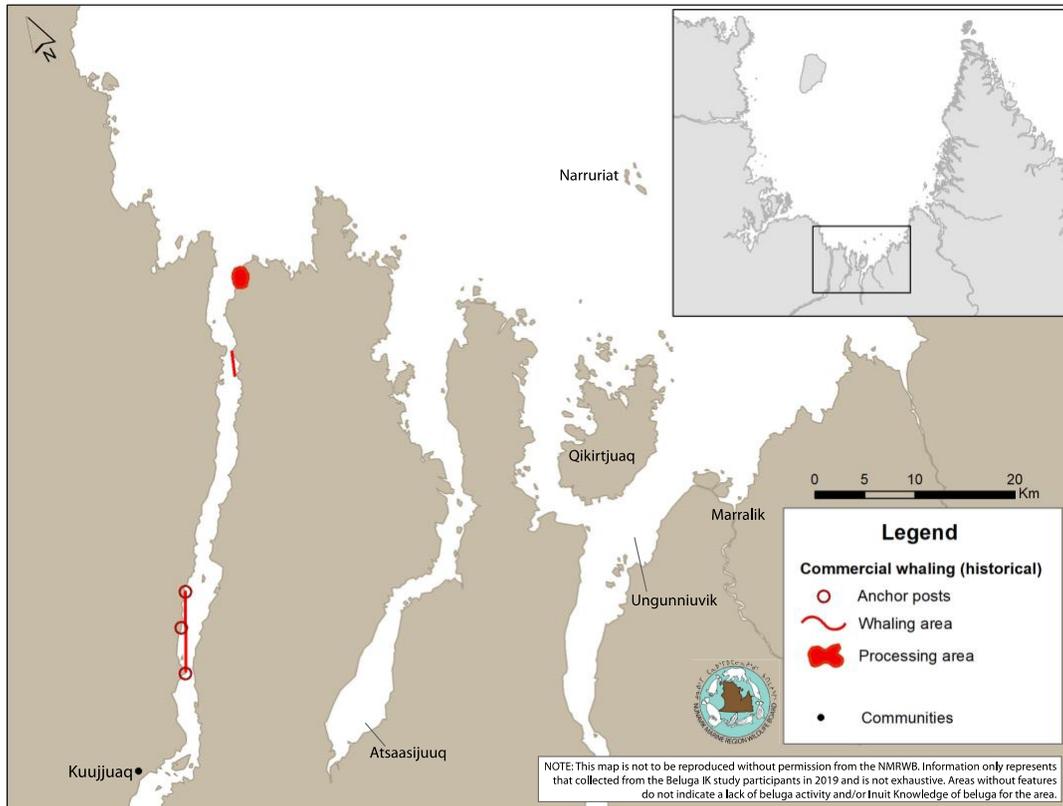


Figure 14. Remnants of historical commercial whaling activities reported by participants

As described in section 4.3.5, some participants described how the introduction of the outboard motor, through both noise and by increasing harvesting pressure, affected the beluga population in general and in the Marralik and Ungunniuvik estuary areas.

A participant described how changes to hunter support in the mid to late 1970s increased harvesting pressure on beluga:

*When the hunter support opened, 1976, everybody was going haywire on beluga hunting; two beluga was able to buy 22 foot canoe and a 40 horse outboard motor, one shot. There was about at least 10 to 20 people getting skidoos, all this, outboard motors, canoes, with the program, then all of a sudden somebody came: 'You guys are over harvesting your beluga.' ...That was the time the warning calls start to come... I think it was 1978 to '79, it was, Ungava Bay became a war zone, by DFO and hunters. And it became a very unsecure place. If you had to translate you almost had to wear a helmet. So it was very ugly, ugly zone.*

–David Annanack, Kangiqsualujjuaq

There was not a consensus on the role of harvesting in the declining presence of beluga around the Marralik estuary. One participant described how harvest levels had not been higher before the decline in beluga presence or use of southern Ungava, around the Marralik area:

*And I can't say it was overharvesting, because nobody ever really overharvested, but they did disappear. And I mean where they went, I don't know, it's not because of our overhunting, because nobody brought back extra more than what they used to.*

*–Edward Koneak, Kuujjuaq*

One participant also described how the beluga population in the Marralik and Ungunniavik estuary areas may be lower than in the past because the harvesting relationship between Inuit and beluga has been severed in that area; that according to Inuit knowledge, animals continue to come to a place if you harvest and share them.

*Since the closure I have had a feeling that there are less beluga now than before but you still can see them in that area. And maybe that is why there's less beluga; if it was still open and people were still going there or to hunt, maybe there would be more beluga in that area.*

*–Lukas A. Etok, Kangiqsualujjuaq*

It is unknown if the group of a thousand beluga observed in the ice in Ungava Bay in February 1973 were trapped and perished or not; there is a possibility that this was a catastrophic event that also affected population numbers. This ice entrapment is somewhat coincidental with the timing of observed decreases in beluga abundance around Marralik and Ungunniavik in the 1970s and 80s, although causation cannot be assumed given the current evidence.

## 4.5 BELUGA APPEARANCE AND STOCKS

### 4.5.1 PHYSICAL CHARACTERISTICS, HEALTH AND CHANGES OVER TIME

Participants were asked if they observed any differences in physical appearance of beluga among groups or over time, and some participants reported observations of differences in physical appearance, mostly relating to the pre-closure period. Most differences in physical appearance were reported to be related to age.

A participant from Kangiqsualujjuaq explained that bigger beluga come up more slowly and dive more slowly than smaller beluga, which is how he knows their size. A participant from Kuujjuaq described how in the past he observed lots of grey beluga in the spring. The spring migration would have a big migration with a few scouts in front, and not long after the main pod, “the big guys would follow at the end, the lone big males.” A participant from Kuujjuaq described how during the migrations, including in recent times, some big beluga seem to be the leaders of the packs.

In the fall, a participant from Kuujjuaq described how in the past he would observe huge males, 20 to 22-foot long, come through the river and continue eastward.

Some participants described how older beluga would be large with more yellowish skin. Smart, older, yellow skin beluga were described as “old timers.” Some participants described seeing certain lone old timers repeatedly over the years in places like the Kuujjuaq River, and how these smart older beluga would consistently evade being hunted.

Some participants described how beluga skin is also more yellow before they moult. As described in section 4.3.3, a participant from Kangiqsualujjuaq described how after moulting, there are changes in the quality of beluga skin—it becomes harder and less salty—while another participant noted that moulting does not change the taste of maqtaq.

Only one participant reported an observation of a sick beluga. He observed it in October 2017 in the Kuujjuaq River, and explained that the whale was starving, “all marked up” and not scared of people if they came close. The participant did not hear of anyone harvesting the whale.

### ***Relationship to Marralik and Ungunniavik estuaries***

Some participants shared observations of the physical appearance of beluga that would use the Marralik or Ungunniavik estuaries in the past, before the closure. Tooma Gordon explained: “We used to find them a lot bigger for some reason. I don’t know if it’s a different species or – but they seem bigger. Even my fellow hunters they would say they’re bigger too.” A participant in a Kangiqsualujjuaq workshop also described how the beluga in this area “used to be big,” and participants in another Kangiqsualujjuaq workshop discussed how the beluga that used to be in this area were substantially bigger than other beluga.

Some participants also explained that because of the closure, they do not know if there have been any changes in the appearance of beluga in Marralik and Ungunniavik estuaries or if there are still some of these bigger beluga using the estuaries:

*Because I cannot answer that because of the closure, and we were not able to hunt them. And we couldn’t see the kind of skin or what – beluga, what’s affected, how...*

*Back then they used to hunt them a lot in different areas. And I don’t know anymore because we don’t hunt them anymore. So, I don’t know. That’s how I am. I cannot say or tell how different they are from back then.*

*–Participants in Kangiqsualujjuaq workshop*

## **4.5.2 BELUGA GROUPS AND STOCKS**

Some participants described differences in beluga groups or stocks based on physical appearance and/or location, while others did not describe differences. Some described how beluga that migrate through Ungava to Hudson Bay (described by participants as “Ungava beluga” or “our beluga”) are distinct from beluga that tend to migrate directly through the Hudson Strait to Nunavut (“Nunavut beluga”) in spring or beluga that come from Greenland (“Greenland beluga”). In the Kangiqsualujjuaq validation workshop, participants described how in the spring, Greenland beluga travel east while Hudson Bay beluga travel west, and that in the fall the migration directions are the opposite. Based on this description, Nunavut beluga and Greenland beluga may be distinct groups, but this was not confirmed. Kangiqsualujjuaq validation workshop participants described how in the past, Ungava beluga (i.e. beluga that tended to migrate through Ungava, not necessarily specific to beluga that used the Marralik/Ungunniavik estuaries) were smaller, had straighter tail ends (flukes), were softer in taste, and had less maqtaq while beluga that tended to use the Hudson Strait and migrated to Nunavut (Nunavut beluga) had a curvier tail ends (flukes) and more maqtaq. Further, participants explained that they are observing fewer numbers of these smaller beluga that use Ungava today than in the past, and greater numbers of the larger Nunavut beluga.

*I've been going hunting beluga to Kangiqsujuaq and I've been hunting beluga up here in Ungava, [and] when I'm in the Hudson Strait area there's two kinds of beluga there. They're the same beluga from close to Greenland, and beluga [that] goes to Labrador and then go back to Hudson Strait. Those two kinds of beluga that I know is different. But up here it looks like we only have one kind of beluga. Like, they migrate to Labrador and go back and some time. The [second group that goes to Labrador and the Hudson Strait] could be the same, but they migrate around Ungava when they're going back.*

*The ones from the Greenland [are] way much bigger than the one that goes there [in Hudson Strait]...like when they're ... when they came together they're fighting.*

*–Participants in Kangiqsualujjuaq workshop*

*These big guys were known to come from around Greenland area like the salmon that come to the Koksoak. Our elders there know this stuff. I don't know how they got but they knew that these big huge white ones usually came from around Greenland area, the big ones.*

*–Jimmy Johannes, Kuujjuaq*

Varied observations of similarities and differences between beluga stocks were shared. Some participants described how in the past, before the closure, some of the beluga used to stay in Ungava Bay after the migration, but that this does not occur anymore.

*I feel they were not a transient group, that they were a resident of this area. They didn't move. Once they came in they stayed here for the summer...August was the prime month that they really were in this area. It would coincide with the nesting also.*

*–Johnny Gordon Sr., Kuujjuaq*

*Some of the beluga used to be left behind in certain areas, when they were migrating, but nowadays they don't do that anymore, because there's too many outboard motors, like 24/7, too much noise. So due to that they're not staying in one spot.*

*When they migrated back then some used to be left behind, but today, with all the noise, they're not. They're not going there anymore...Not with all the noise. [The beluga are] just passing through.*

*–Participants in Kangiqsualujjuaq workshop*

Participants at a workshop in Kuujjuaq described how there are still some beluga that stay in southern Ungava after they arrive with the spring migration today, describing them as generally bigger than ones that are found further up in Hudson Strait. At the same time, a participant from Kangiqsualujjuaq described how today beluga that migrate through Ungava seem to be smaller than their counterparts that can be found in Hudson Strait.

Some participants also described observing much larger pods of beluga travelling through Hudson Strait than Ungava Bay in the post-closure period, suggesting that this may be because of lower abundance of beluga in general.

### ***Relationship to Marralik and Ungunniavik estuaries***

As noted in section 4.5.1, some participants described differences between beluga that they used to see in the past in southern Ungava in the Marralik and Ungunniavik areas, before the closure, describing these beluga as bigger than others.

Limited use of the Marralik and Ungunniavik estuary areas in the last three decades made it difficult for participants to speak to the current status of the population there. One participant from Kuujjuaq explained that based on his observations, the Marralik population is now extirpated:

*...I really think there was such a thing as a Marralik stock, of Whale River especially. But like I said, once the outboard motor took over, fast travel, fast hunting, it really took a toll on the population.*

*–Participant from Kuujjuaq*

## **4.6 ECOSYSTEM INTERACTIONS**

### **4.6.1 PREY**

Some participants described ecosystem interactions related to beluga, mostly related to beluga feeding on prey.

*Daniel: Summer season, July, August [we hunt beluga]. That's when the fish are plenty on the ocean side and when the salmon are getting going up to the streams, the rivers.*

*Lukas: Beluga tend to go where the fish is going like salmon, arctic char and lake trout. So they'll be able to locate them where there's fish.*

*–Daniel Annanack and Lukas A. Etok, Kangiqsualujjuaq*

Some participants described locations around southern Ungava where there is an abundance of fish for beluga to feed on, including Tuttutuuq and Kuugaaluk Rivers. Participants named trout, salmon and char as being common, abundant species. One participant from Kuujjuaq described multiple instances where he witnessed beluga chasing fish across the Kuujjuaq River. Participants also described adapting hunting areas and timing to locations where beluga are going to feed, as described in section 4.3.2.

### ***Relationship to Marralik and Ungunniavik estuaries***

A participant from Kuujjuaq described how there is salmon in almost every river in Ungava, including Marralik and Ungunniavik, and an abundance of char. Some participants described fishing in this area before the closure because there was an abundance of fish; for example, one participant from Kuujjuaq used to camp on Mitirlusitik and fish for char by netting.

As described in section 4.3.2, some participants described the movement of beluga into shallower coastal, estuary and riverine areas of the Marralik and Ungunniavik during high tide, and then their movement 30 to 40 km north to the islands of Narruriat, Sallijuaq, Qikirtaapit Ikkariangit and Qikirtaaluk during low tide, when the whales would feed on arctic char at sea. Some participants also described fishing around these outer islands during low tide.

## 4.6.2 PREDATORS

Predation by other animals was not asked about in workshops and interviews and as a result was not discussed directly by any participants. However, some participants noted a couple of observations of killer whales, including a group of three killer whales near the mouth of Kangirsualujjuap Kuunga River in the mid-1970s and some killer whales in Tasiujaq's bay in 2018. At the Kangiqsualujjuaq validation workshop, participants noted that "polar bears and killer whales are all over the place today."

## 4.6.3 COMPETITORS

Other animals that feed on fish occupy some of the same areas that beluga use. A participant from Kuujjuaq noted that the area around Ungunniavik and Marralik is ugjuk (bearded seal) territory. Some noted that there is very good seal hunting all around the southern Ungava area, including the estuaries of Ungunniavik and Marralik.

### ***Relationship to Marralik and Ungunniavik estuaries***

Some participants described changes the abundance or distribution of competitor or other species in relation to the areas around the Marralik and Ungunniavik estuaries. A participant from Kuujjuaq noted that the black bear population has risen in the area. He stated that there used to be many geese in that area, particularly Qikirtajuaq. He observed there are fewer there now—that they seem to have moved more out west—and that their nesting grounds on Qikirtajuaq have been decimated by black bear. Participants from a Kuujjuaq workshop noted that the ugjuk population in that area has grown, while the natsiq (ringed seal) population is low.

# 5 Perspectives on beluga management

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## 5.1 IMPACTS OF THE BELUGA HARVESTING CLOSURE

### 5.1.1 IMPACTS ON SEASONAL BELUGA OCCUPANCY OF MARRALIK AND UNGUNNIAVIK ESTUARIES

Some participants expressed that at the time of the closure, they understood the rationale for it and hoped that it would ensure a return to seasonal beluga abundance in Marralik and Ungunniavik. However, no participants reported observing such a change. This corresponds to the post-closure beluga population numbers summarized in section 4.4.2. Participants described sporadic observations of individual beluga or small pods over the last 30 years in these rivers, but not substantial or sustained seasonal use by beluga. As a participant explained:

*It was very sad that it was closed. When it was closed for beluga, he thought there was going to be lots of beluga. But there were less and less. He thought that this closure was the right thing to do. But he's mad that they have still no beluga over there. Nothing to catch. And closed for 30 years.*

*–Participant from Kangiqsualujjuaq*

A participant from Kuujjuaq described how the closure “has not had a positive impact in terms of the beluga.” Another participant from Kuujjuaq stated that the closure is probably a good idea if the Ungava Bay beluga are still a distinct stock and not extirpated, but if the beluga that use Ungava and Hudson Strait are a mixed stock, then it is not beneficial. Another participant explained that without confirmation of why beluga numbers decreased in the first place, and lack of monitoring during the closure period, it was difficult to assess if there were any benefits for beluga. One participant noted mixed feelings about the closure, including that the closure may have reduced boat traffic and thus noise pollution impacts on beluga, but also noted that some traffic and noise has remained.

As described in section 4.1, Lukas A. Etok explained how the closure has disrupted the cyclical harvesting relationship between Inuit and animals, where harvesting and sharing animals ensures that they come back to an area. He explained that when government said the area was closed, they used a “strong word,” and Elders used to say that strong words are listened to. He explained that according to Inuit knowledge, by creating a rule that beluga cannot be harvested in this area, that this may be contributing to the continued absence of beluga here.

## 5.1.2 IMPACTS ON BELUGA HARVESTING, KNOWLEDGE OF BELUGA AND RELATIONSHIP TO BELUGA

Nearly all participants described a range of complex negative impacts of the closure on beluga harvesting, knowledge of beluga, and relationship to beluga, where in some cases impacts have also resulted in secondary and tertiary consequences.

### ***Reduced harvesting benefits***

Some participants described the direct impact of loss of access to beluga within their nearby hunting areas. Participants described how they were “really affected,” that it was “heartbreaking,” and it was “really, really hard.” Some participants described the reduction of a primary source of food, while some described how because they could not harvest, going in the area around Marralik and Ungunniavik was no longer a source enjoyment as it had once been. Some participants described changes in their relationship with beluga in the area. For example, one participant from Kangiqsualujjuaq stated: “When I see beluga, I look in a different direction.”

Some participants also described how their growing community wants and needs to be able to rely on traditional foods but is not able to, because many cannot go far (e.g. Quaqtaq, Imilik, Kangiqsujuaq) to hunt beluga. A participant from Kuujuaq explained that this disruption to traditional food access is “hurting a lot of folks.”

While a number of participants described going to other, further places like Quaqtaq to get beluga, some explained that it is not always possible to go because of cost and environmental conditions, such as too much ice in Ungava Bay.

### ***Disruption to knowledge acquisition***

Most participants described bypassing the closure area when they go harvesting, or simply going to other areas. As a result, participants described how they no longer know the status of beluga that use the closure area. Participants in a Kangiqsualujjuaq workshop discussed this issue:

*We would know how they are. We would know how they're affected, but since it was closed, we don't really know anymore because we're not allowed to hunt them.*

*...But then it was closed. I wouldn't really study them anymore because of the closure because we were told not to hunt them anymore. That's how it was.*

*...when they told us that it was closed now, didn't really go hunting anymore. I stopped hunting. I wouldn't hunt beluga anymore because of the closure...That's why we cannot really say. We don't really have the knowledge of the beluga – what kind they are, and how scarce they are anymore. Because of the closure of the beluga, we weren't to hunt them anymore.*

*–Participants in Kangiqsualujjuaq*

### ***Increased costs and risks from travelling further for harvests***

Because harvesters are not permitted to hunt beluga nearby in the closed area, many travel to further areas (e.g. Quaqtaq, Imilik) to harvest beluga. Participants described how travelling to far distances for beluga is expensive, physically risky, or both.

*...since it was closed our lives changed, just like that. We couldn't hunt there no more. We had to go all the way up to Quaqtaq and Kangiqsujuaq to hunt, which cost a lot of money by plane. And now we go by boat and we're in very dangerous situations. Ice conditions, and we're somewhere stuck in the sea...It became very dangerous for hunters to go far.*

*–Participant in Kangiqsualujjuaq*

*It has totally affected in my part, yes, because if I want a good share of maqtaq I have to go all the way up to Imilik...or even Wakeham Bay. I mean, before we used to take 15 gallons of gas, I have 445 gallon of gas to go where I can get it now, and I still have to get some more to get back. It's very expensive now.*

*The other thing is, to have to be able to travel all the way over here to risk our hunting equipment, even ourselves. We've had many close calls with ice; a lot of ice, because the whole Ungava Bay is full of currents... sometimes you feel you're getting too old to do that sometimes, but you have no choice, there is no other alternative, but to go far.*

*–Participants in Kuujjuaq*

Participants in a Tasiujaq workshop discussed how harvesters from Kuujjuaq and Kangiqsualujjuaq are coming all the way to their area for beluga harvesting, and underscored the danger of coming that far. One participant described seeing overloaded boats travelling through dangerous areas (e.g. areas with strong currents and tides), while there is still ice in the bay, and being worried about the safety of harvesters coming from elsewhere. Kangiqsualujjuaq validation workshop participants described the high landing costs of getting beluga from Quaqtaq, totalling approximately \$17,000 for one beluga and \$102,000 for six beluga. It was estimated that \$2 million has been spent on landing beluga in Quaqtaq since the closure, which has been very financially burdensome for the community. Tasiujaq validation workshop participants also noted that many Nunavimmiut are buying maqtaq from Nunavut at premium prices, which means a high expense for families to get this food source.

### ***Disruption to intergenerational knowledge transfer***

Disruption to the transfer of knowledge to younger generations as a result of the closure was a major theme raised by participants. Participants explained that when they were learning, they used to follow their parents and learn by watching. Because harvesters cannot hunt beluga nearby in the closed area, they have no option but to travel to further areas (e.g. Quaqtaq, Imilik) to harvest beluga, limiting opportunities for transferring knowledge to younger generations:

*Because it's closed a lot of families and young people, they miss out on learning how because not everybody can go Imilik all at the same time...it created a lack of knowledge transfer where there are only a handful of young people were able to go north.*

*Because it's too far to go Imilik with all the younger generation, like younger family. So they bring now only one because the boat is not big enough. If it was open I think there would be more hunters, young hunters hunting in that area.*

*They were never taught how to efficiently hunt beluga because they never had the chance.*

*–Participants in Tasiujaq*

One participant described how he was personally affected by the closure as it disrupted the transfer of beluga harvesting knowledge from his father:

*Growing up my father wanted to show me how to hunt and where to hunt, and what to do with the butchering and everything. But ever since the closure he said he cannot – himself he respects the closure and he would not want to go hunting there because he doesn't want to break any law. And it kind of affected myself because he wanted to show me how to hunt within that area, and it kind of restricted him to do that, to show me how to do it.*

*–Tooma Gordon, Tasiujaq*

A participant from Kangiqsualujjuaq described observing young people in other communities that do not have a closure nearby, like Quaqtaq and Kangiqsujuaq, following experienced hunters and “learning a lot” about beluga hunting and butchering, but that the situation is very different in his community, where young people do not have the opportunity to learn in the same way.

Participants described the consequences of disruptions and declines in intergenerational knowledge transfer, including younger people in their communities having gaps in knowledge related to how to make and use harpoons, how to shoot, proper and safe meat preparation and fermentation, and knowledge of water and currents in different places for safe navigation. Participants described how lack of knowledge is dangerous. For example, some explained how decades ago, some people in Kuujjuaq died from botulism from nikkuk that was not properly prepared. One participant recalled an incident that occurred decades ago where two knowledgeable harvesters from Kangiqsualujjuaq scouting for beluga migration drowned during a storm, underscoring that environmental conditions can be dangerous even for experienced and knowledgeable harvesters. It is in this context that lack of knowledge can significantly elevate risk.

### ***Increased use of harvesting practices that have larger impacts on beluga***

Participants described how the closure has led to the adoption of some harvesting practices that participants considered less than ideal, but are a consequence of harvesters making choices under less than ideal conditions.

Some participants described how when they used to harvest in the Marralik and Ungunniavik areas before the closure, they were able to take back and use the whole beluga carcass, but when they harvest beluga far from home today they can no longer bring back and use the whole animal.

*And when we harvest within this area, we used to be able to take everything, everything from the beluga back to the community, but if we go all the way over up there, we can't bring everything, because of the space...*

*Of course, this closure has affected our ways of life, because of that and everything that we just mentioned. The utilisation of the whole carcass has been affected today.*

*–Participants in Kuujjuaq*

Participants in Tasiujaq discussed how they are displeased about the volume of harvesters that are coming from Kuujjuaq and Kangiqsualujjuaq, including because they are “wasting a lot of meat and just taking the maqtaq.”

Some participants in Kangiqsualujjuaq described how now when a beluga is spotted, there is increased “rushing” and chasing compared to the past.

*When there’s beluga seen, it’s like 20 or 15 boats going to the same place, and it never used to be like this, so it’s like rushing. Like in the past they were like taking time and observing the beluga, what they’re doing... we were not trying to lose wounded [ones] in the past.*

*–Daniel Annanack, Kangiqsualujjuaq*

A participant described how increased rushing is dangerous as it increases risk of harvester accidents and injuries.

### ***Poaching and impacts on sharing practices***

Some participants described how the vast majority of harvesters in their communities respect the closure and do not harvest beluga within it, but that they know that illegal harvests in the area have occurred since the time the closure was put in place. A participant in a Kangiqsualujjuaq workshop described seeing nets on the Marralik River in the post-closure period, and participants in the workshop described how as far as they know, one or two beluga are taken in the closed area in the summer or fall every year or two. Participants described figuring out that people harvested beluga illegally when they have or share maqtaq but do not say where they got it.

Some participants described the most significant impact of poaching as undermining sharing practices, and thus Inuit values and way of life:

*People tend to hide their catch and they’ll do it behind the authorities’ backs. And it’s not a very good practice and it does go on, and it’s better to have open hunting. Because people are going to hunt whether there’s a closure or not... And it’s affecting the way Inuit share their catch. It used to be just giving away to the community. Knowing that they’re going to be prosecuted if they came in with an illegal catch, they tend to hide it and it creates greed, and that’s the way – the biggest impact I think towards Inuit having closures, is they tend to hide their catch.*

*–Tooma Gordon, Tasiujaq*

*...these closures have created a different way of life...a death of a way of life; greed, no more sharing, that’s not Inuit way of life...You have to share, it’s a catch; it’s a catch that gives life for everybody, nobody should be hungry... today it’s different. All because you don’t want to get arrested or you don’t want to be talked about, some just don’t say anything. Sad, sad, sad, sad.*

*–Participant from Kuujjuaq*

### ***Increased tension between communities***

Some participants described how the closure has introduced sources of tension between communities, through differential impacts of and reactions to the closure by residents. Some participants noted that when they come to other communities, such as Quaqtaq, residents of those communities have complained about their harvesting practices (e.g. being noisy). Participants in a Tasiujaq workshop described dissatisfaction with increased traffic in their area from Kuujjuaq and Kangiqsualujjuaq:

*Right at the time when it was closed we didn't feel it affected us, but nowadays it's really affecting us now because a lot of boats from Kuujjuaq are coming to hunt here...Long time ago, Inuit always loved each other, like wanted to help each other. We used to have that feeling in the past when the Marralik was open, but nowadays we don't have that feeling anymore. We're not welcoming the hunters from other towns because they're wasting a lot of meat and just taking the maqtaq and there's way too many traffic now, too many boats. So we don't have that welcoming feeling any more, like helping each other.*

*–Participant from Tasiujaq*

A participant noted that after the closure was put in place, some Kuujjuaq residents continued to harvest illegally, which was a source of frustration for those in other communities that were respecting the closure.

### **5.1.3 IMPACTS ON INUIT RELATIONSHIPS TO AND USE OF MARRALIK AND UNGUNNIAVIK ESTUARY AREAS**

As described in section 4.2, many participants developed strong relationships to the Marralik and Ungunniavik areas, including by growing up there, learning to hunt beluga there, and engaging in harvesting activities there over the years. While some participants explained that they still go to the Marralik and Ungunniavik areas for harvesting other species (e.g. seal, eider down and eggs, char), most participants described no longer going to this area after the closure was put in place. As one participant from Kangiqsualujjuaq stated: “Ever since it was closed we never go to that area. And we even kind of forgetting about what it looks like.”

Some of the reasons that participants provided for avoiding the area were practical. Some participants described how they bypass the area in favour of places where they are allowed to harvest beluga. Participants in a Kangiqsualujjuaq workshop explained that they only go so far to fish, so they have no draw to go to that area anymore. Reasons that had an emotional quality were also shared. Participants in a Kuujjuaq workshop explained that they do not feel welcome or comfortable in that area anymore, while a Kangiqsualujjuaq participant described going to the area for harvesting other species but it feeling “scary.” One participant described how sometimes when people discuss going to this area, they use an Inuktitut term that means “breaking in.”

*...it had a big effect on our youth since that two places were closed for hunting. Their knowledge that they would have learned is like lost. Lost. Now some boys, some guys don't even know the land, the routes no more and where to try and harvest beluga.*

–Daniel Annanack, Kangiqsualujjuaq

*There's dangerous areas, there's really shallow areas and so on. That knowledge has possibly impacted – the knowledge of this, I would say this area really, because now people pass more this area.*

–Participant from Kuujjuaq



Figure 15. Marralik estuary in 2019 (courtesy Allen Gordon)

#### 5.1.4 IMPACTS ON INUIT AUTONOMY AND SELF-DETERMINATION

Some participants discussed impacts from the closure that extended beyond beluga harvesting or relationships to the closure area, and related to larger themes of autonomy and self-determination. As a participant from Kuujjuaq explained, in the old days they used to harvest anytime they wanted, and now it is not like that. Jimmy Johannes explained that the current approach of government is:

*Leaving hunters worrying more than looking forward to going for a good beluga hunt; and also feeling alienated that there seems to be so many fingers pointing at you, you feel intimidated by this government, and that effect is not known very much by scientists.*

–Jimmy Johannes, Kuujjuaq

A participant described how: “now DFO acts as if they own the beluga, they control the people and it really affected their lives.” Some participants discussed how their harvesting rights are supported by the James Bay and Northern Quebec Agreement, but non-Inuit in institutions outside of Nunavik are trying to scare

or exercise power over Inuit as has occurred in the past. Some participants discussed scare tactics and threats used by DFO wardens, and explained that after the closure, with the “powerful words” that government officials were using caused Inuit hunters to be “very low.” A participant in Kangiqsualujjuaq described clashes between harvesters and DFO in the past, and the lasting impacts of government exercising authority over Inuit lives.

*So we had argument every fall, every winter, about beluga harvesting, and the DFO people would say: ‘If you can get yourself government you can make your own rules, but we’re going to make the rules, since you don’t have self-government.’ Hey, that’s it. That’s really hard to swallow, and it still hurts.*

–Participant in Kangiqsualujjuaq

A participant in Kuujjuaq described that the magnification of the issue of beluga has also had a positive effect, by causing Inuit to defend and elevate the longstanding dependence on this species for food.

## 5.2 FUTURE MANAGEMENT PREFERENCES

Nearly all participants expressed a desire for the closed beluga harvesting area around the Marralik and Ungunniavik estuaries to be cautiously reopened. Participants cited mitigation of the wide-ranging negative impacts of the beluga harvesting closure described in section 5.1 and/or the lack of evidence of positive benefits of the closure for beluga as the rationale for reopening the area to harvesting. For example, some participants discussed how gaps in beluga harvesting knowledge and other knowledge about land use in the Marralik and Ungunniavik areas among young people in southern Ungava communities can be addressed, but only if there is the potential for beluga harvesting.

Most participants discussed conditions under which they would prefer to see the area opened for harvesting, with a number of participant emphasizing concern that a “free for all” would negatively impact beluga. The most frequently discussed conditions being 1) more study and ongoing monitoring, and 2) local management and control of harvesting in the area.

Participants discussed the need for a baseline study to better understand the current status of beluga in the area. Some participants stated that there should be a baseline study done first, so that an informed decision can be made about whether to keep the area closed or open it for a limited amount of time. Other participants stated that the area should be open first, because for “for research purposes, there needs to be a harvest.” Participants discussed how a harvest would allow collection and analysis of beluga samples, which may help answer current questions (e.g. about genetics and stocks). Some participants discussed how beluga abundance changes over the course of the seasons and year-to-year, emphasizing the need for a multi-year study. Some participants discussed the inadequacy of aerial surveys, because waters in Marralik are murky and beluga are hard to see. Some participants suggested observation posts on the ground and underwater cameras.

Many participants also discussed how local institutions are in place that can manage beluga harvesting, like the Anguvigaapik (LNUK), Northern Village Councils and Landholding, and that strict rules should be put in place under local management to control the harvest. One participant suggested developing a management agreement between all communities in Ungava Bay (e.g. with restrictions on the timing of harvesting), rather than focusing on the Marralik and Ungunniavik area only. Some participants discussed how local control and enforcement may curb poaching, and thus a limited legal harvest may not increase

the number of beluga taken over the current illegal harvest. At the same time, a limited legal harvest would be more equitable and may mitigate some of the other described closure impacts. One participant explained that how new regulations should support transfer of knowledge to ensure safe, appropriate harvesting practices by younger people.

*There was about 500 people in the population, up here, but now it's over a thousand and if they start hunting now, using the new generation ways of hunting, it's going to affect lots of things, in a bad way. But the older generation and the younger generation will have to learn how to hunt together and use the new regulations and teach the new regulations to the younger generation. And I know that it's scary, nowadays, to hunt with younger generation because they tend to, like exaggerate, going hunting really fast...And using the Anguvigaapiks in the community or the other communities, we'll have to make regulations, rules to follow them, for the safety sake, because our younger generation don't know how to hunt beluga and don't know the way of hunting with the beluga nowadays.*

*—Participant in Kangiqsualujjuaq*

Participants also discussed restricting noise, specifically restricting outboard motor use and permanent cabin construction, which can increase boat traffic, and one Kuujjuaq participant (Johnny Gordon Sr.) also documented a proposed area of noise restriction due to beluga sensitivity to noise. Ensuring use of traditional harvesting approaches was emphasized by some, including participants at the Kangiqsualujjuaq validation workshop that argued strongly for this to be prioritized. Enhancing beluga harvest skills transfer and implementing harvest quotas was also discussed, to a lesser extent. For quotas, suggestions ranged from two to ten beluga.

Additionally, a participant suggested that in addition to a management plan, there should be a communications plan to communicate better with harvesters in nearby communities.

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