

**Harvest Data and Sample Collection Metadata from the 2022 Beluga
(*Delphinapterus leucas*) Subsistence Harvest Monitoring Program in
the Inuvialuit Settlement Region**

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**Canada-Inuvialuit
Fisheries Joint Management Committee
Technical Report Series**

**HARVEST DATA AND SAMPLE COLLECTION METADATA FROM
THE 2022 BELUGA (*DELPHINAPTERUS LEUCAS*) SUBSISTENCE
HARVEST MONITORING PROGRAM IN THE INUVIALUIT
SETTLEMENT REGION**

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ABSTRACT

Every spring the Eastern Beaufort Sea (EBS) beluga (*Delphinapterus leucas*) stock migrates along the open ice leads from the Bering Sea to their summering grounds in Canada's Western Arctic. During the summer months, beluga from this stock are harvested for subsistence by local hunters from all Inuvialuit Settlement Region (ISR) communities (Tuktoyaktuk, Inuvik, Paulatuk, Aklavik, Ulukhaktok, and Sachs Harbour). As part of the established long-term ISR Beluga Subsistence Harvest Monitoring Program initiated in 1973, Beluga Monitors (hired by local Hunters and Trappers Committees) travel to traditional whaling camps during the summer to record data and information (including observational) about the harvest, as well as to collect beluga tissue samples for scientific analyses. This report summarizes harvest and biological data collected in 2022 from the ISR Beluga Subsistence Harvest Monitoring Program. Data includes harvest metrics (e.g., hunt timing and location), observations on color and condition of individual belugas, observations on environmental conditions, and morphometric measurements. In 2022, a total of 88 belugas were reported harvested in the ISR and 75 of those were sampled by Beluga Monitors. Of the harvested belugas, 67 were male, 4 were female, and the sex of the remaining 17 belugas was unidentified. Beluga from all hunt locations varied in colour from white, yellow, and dark grey. The standard length of all sampled belugas ranged from 342.9 to 455.9 cm for males and 365.8 to 426.7 cm for females.

The DFO Beluga Health Research and Monitoring expansion of the program, which began in 2000 supports sampling for contaminants and other areas of concern throughout the ISR, and includes an intensive health sampling program based out of Hendrickson Island. In 2022 the DFO Science team was able to return to their usual health sampling at Hendrickson Island, following easing restrictions from the COVID-19 pandemic. The local Research Monitor position that was initiated in 2020 due to the COVID-19 pandemic travel restrictions, was maintained in 2022, as part of the sampling team and to collect a reduced suite of samples from harvested whales after the DFO Science team returned to Winnipeg, MB.

The present report is the third of a series of annual reports, starting in 2020, that provide a summary and record of beluga harvest monitoring activities and data collected in the ISR each year. The publication of the annual report ensures a long-term standardized record of harvest and basic morphometric data, accessible for use by the co-management partners working under the Inuvialuit Final Agreement (i.e., FJMC, IGC, ISR HTC, and DFO) for monitoring, research, and future decision-making.

INTRODUCTION

Beluga whales (*Delphinapterus leucas*) are an important component of Inuvialuit diet, tradition, and culture (McGhee 1988; Day 2002; Usher 2002; Hoover *et al.* 2016). Each spring, beluga from the Eastern Beaufort Sea (EBS) stock migrate along open ice leads to their summering grounds in the marine waters of the Inuvialuit Settlement Region (ISR) (Fraker and Fraker 1979; Storrie *et al.* 2022; Figure 1). Belugas that enter the Mackenzie River Estuary are traditionally harvested for subsistence by hunters from the communities of Inuvik, Aklavik, and Tuktoyaktuk (Figure 2). Beluga are also widely distributed throughout the offshore Canadian Beaufort Sea and Amundsen Gulf, and are harvested by the communities of Paulatuk, Ulukhaktok and Sachs Harbour for subsistence (Harwood *et al.* 2020; Figures 1 and 3).

The management of the population is based on the best available scientific and Indigenous Knowledge obtained through hunter observations, continued annual harvest-based monitoring of the stock, and the Beaufort Sea Beluga Management Plan (FJMC 2013). Additionally, within the ISR, two Marine Protected Areas (MPA) have been designated under Canada's *Oceans Act* for the protection and conservation of a number of components of the ecosystem, including beluga whales (Figure 1). Both the [Tarium Niryutait Marine Protected Area \(TNMPA\)](#) (2010) and the [Anguniaqvia niqiqyuam Marine Protected Area \(ANMPA\)](#) (2016) require regular monitoring and reporting to ensure conservation objectives are being met (DFO and FJMC, 2013 TNMPA Management Plan).

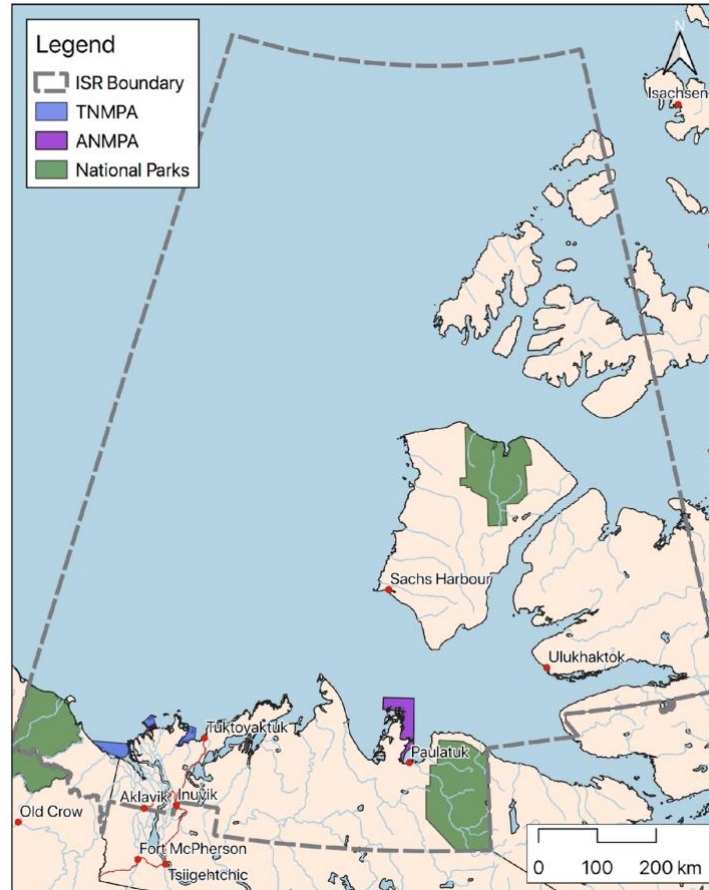


Figure 1. Map of the Inuvialuit Settlement Region (gray dashed line), as outlined in the Inuvialuit Final Agreement (1984), and communities of the western Canadian Arctic. The Tarnum Nirvutait Marine Protected Area (TNMPA) and the Anguniaqvia niqiqyuam Marine Protected Area (ANMPA) are shown in blue and purple, respectively.

A formal harvest monitoring program was started on the Mackenzie Estuary beluga harvest from 1973–1975 by the Fisheries and Marine Service of the Government of Canada (Hunt 1979). An oil and gas industry-sponsored program followed this from 1977 through 1982 (Fraker 1977, 1978, Fraker and Fraker 1979, 1981, Norton Fraker 1983). DFO assumed the role of coordinating from 1981 through 1986 and implemented standardized data collection protocols (Strong 1990, Weaver 1991). Finally, with the implementation of the Inuvialuit Final Agreement (IFA) in 1984, the FJMC assumed responsibility for the program in 1987 and has continued in that role to present (Harwood *et al.* 2002).

The program is conducted jointly with the HTC of the six Inuvialuit communities as part of the Fish and Marine Mammal Community Monitoring Program (FJMC 2013), with ongoing support and collaboration from DFO. The objective of the beluga monitoring program is to collect annual beluga harvest data to support the management and conservation of the EBS beluga stock, and to

monitor and evaluate changes in the stock trend and condition of individual whales (e.g., blubber thickness measurements) (Harwood *et al.* 2015). Each summer local community members are hired as Beluga Monitors to deliver the field portion of the program. Beluga Monitors are stationed at the main subsistence whaling camps during the hunting season, and work with the Inuvialuit hunters to document the size, efficiency, location and timing of harvest and to record characteristics of the individual harvested whales (e.g., color, sex), as well as indicators of health based on Inuvialuit Knowledge (Ostertag *et al.* 2018). Beluga Monitors also collect aging structures for stock assessment and tissues used for long-term contaminants monitoring under the Northern Contaminants Program (Government of Canada 2018).

Beginning in 2000, the ISR Beluga Subsistence Harvest Monitoring Program expanded to include enhanced scientific, health-based collections including reproductive information (Harwood *et al.* 2015), incidence of disease (e.g., Nielsen *et al.* 2018, Sharma *et al.* 2018), contaminant loads (e.g., Loseto *et al.* 2015, Noel *et al.* 2018) and hormone levels (Loseto *et al.* 2018). The program has continued to evolve and respond to community questions and resource management needs (Loseto *et al.* 2018), and has engaged innovative scientific methods to understand beluga health and responses to emerging stressors such as climate change (Choy *et al.* 2019). The expanded Health Research and Monitoring is led by DFO and sampling occurs at Hendrickson Island (Figure 1). A local Research Monitor position was initiated in 2020 due to the COVID-19 pandemic travel restrictions, to collect a reduced suite of samples from harvested whales.

The objective of this report series is to provide a summary of harvest and morphometric data collected (e.g., harvest, time and location, physical observations and measurements), as well as field sampling methods. The reports serve to document the extent and type of sampling that occurred at various sites across the ISR each year, and any unusual events (e.g., rare species, standing or mortality events, atypical weather) observed and shared by local harvesters. The data reports will act as the repository of raw data for applications assessing the status and trend of the EBS beluga stock, including for MPA monitoring. Results from analyses of tissues/samples collected are reported elsewhere in discipline-specific articles.

MATERIALS AND METHODS

Study Area

Traditional whaling camps are land-based sites where families camp and hunt in coastal waters (Figure 2). However, hunt locations can vary annually depending on access and availability of whales. Community members from Inuvik typically camp and hunt from Kendall Island and East Whitefish. Harvesters from Tuktoyaktuk typically hunt in Kugmallit Bay and land their whale at

Hendrickson Island for butchering, with some hunters towing their catch to Tuktoyaktuk Harbour. Beluga harvesters from Aklavik are typically based at Shingle Point (see Worden *et al.* 2020 for more information). Beluga harvesters from Paulatuk access and use a number of harvest locations in and around Darnley Bay, including Brown's Harbour, Johnny Green Bay, Fish Lake, Argo Bay, Egg Island, and Tippitiuyak (Figure 3).

In 2022, beluga monitors were selected by the local HTC's to record, sample, and measure beluga harvested at Hendrickson Island, East Whitefish, Kendall Island, Darnley Bay (and surrounding area), Shingle Point (and surrounding area), and Ulukhaktok. Monitors in the Mackenzie Estuary area were stationed at camps for approximately one month from early to late July in an attempt to be available for the core harvest period. Specific dates vary between camps and years. Darnley Bay had two monitors that were staggered over time and traveled throughout the Bay to where harvest occurred. Ulukhaktok monitors were also staggered over time, and were stationed on-call in the community to sample any whales landed in or around Ulukhaktok. New for 2022 was a Fall Monitor position based in Tuktoyaktuk from mid-September to mid-October to sample any whales harvested later in the season. This position was created at the request of the Tuktoyaktuk HTC to increase the likelihood of fall harvested whales being sampled and to study the fall diet as an approach to examine fall inshore movement and migration. A Harvester Reward Program was also in place for hunters to collect and submit samples and measurements from their harvested whales when a Beluga Monitor was not present (i.e., due to the harvest taking place at a time or in a location outside of the regular monitoring areas).

Science field plans in 2022 saw a return to some of the pre-COVID-19 field activities missing from the program over the past 2 years. A small DFO Science crew was present on Hendrickson Island to collect specialized samples, and the Research Monitor position developed in response to COVID-19 was continued to work with the DFO crew to collect samples and receive hands-on training in laboratory subsampling methods. A member of DFO Marine Planning and Conservation (MPC) staff and the Joint Secretariat (JS) MPA intern also joined the crew on Hendrickson Island for a short period of time to learn about the program.

Beluga harvest data and samples were collected from the various ISR whaling camps between June 29 and August 24, 2022 (Table 1). The collection dates are not a reflection of the entire harvest period at each hunt location and while the Beluga Monitors make every effort to sample all landed whales, not all whales were sampled.

Table 1. Periods of recorded beluga harvest in each area of the ISR, as well as names and timing of Beluga Monitors stationed in each area.

Area	Date Range of Recorded Harvest	Monitor(s)	Monitoring Period
Mackenzie Delta (Hendrickson Island, East Whitefish, and Kendall Island)	July 6 to August 13, 2022	Hendrickson Island – Ronald “Innung” Felix (Sr. Monitor) and Derek Panaktalok	July 4 to August 12, 2022
		Hendrickson Island – Hazel Nuyaviak (Research Monitor)	July 4 – July 28
		Hendrickson Island – DFO Science	July 1 – July 18
		East Whitefish – Linley Day	July 4 to July 30, 2022
		Kendall Island – Hank Angasuk	July 4 to July 30, 2022
Darnley Bay and surrounding area	June 29 to August 7, 2022	Jody Illasiak and Angus Green	June 29 to July 18, 2022
		Shayne Nakimayak	July 19 to August 07, 2022
Shingle Point	June 30 to August 24, 2020	Allie Gordon and Fred Gordon	June 22 to July 03, 2022
		Cody Kogiak and Cameryn Charlie	July 11 to July 27, 2022
Ulukhaktok	N/A	Corrie Joss and Buddy Alikamik	July 15 to August 13, 2022

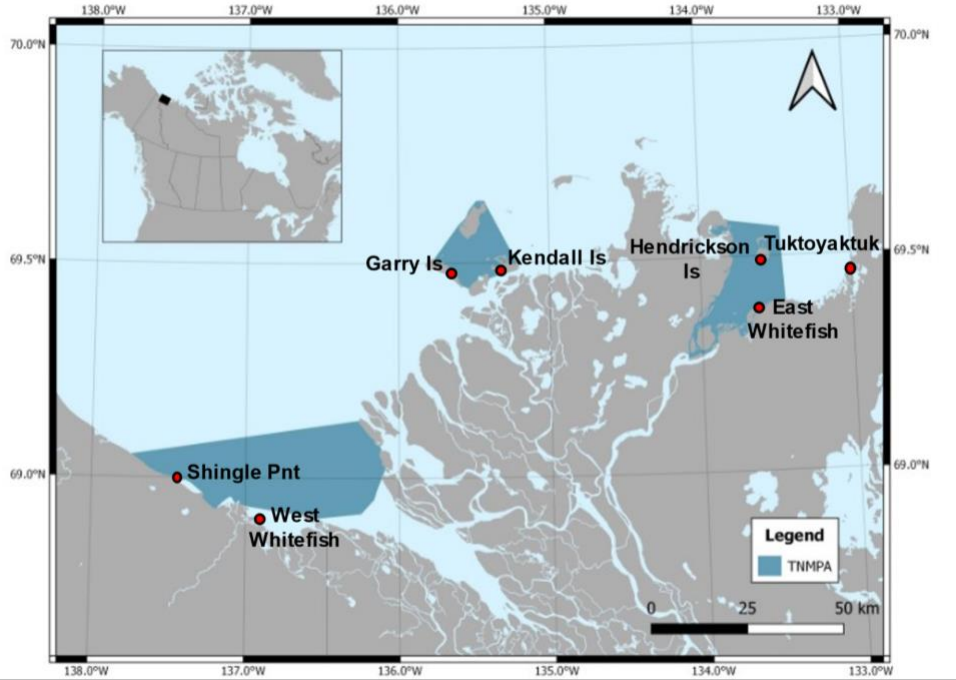


Figure 2. Traditional whaling camps and general locations of the beluga harvest in the Mackenzie Delta area of the Inuvialuit Settlement Region.

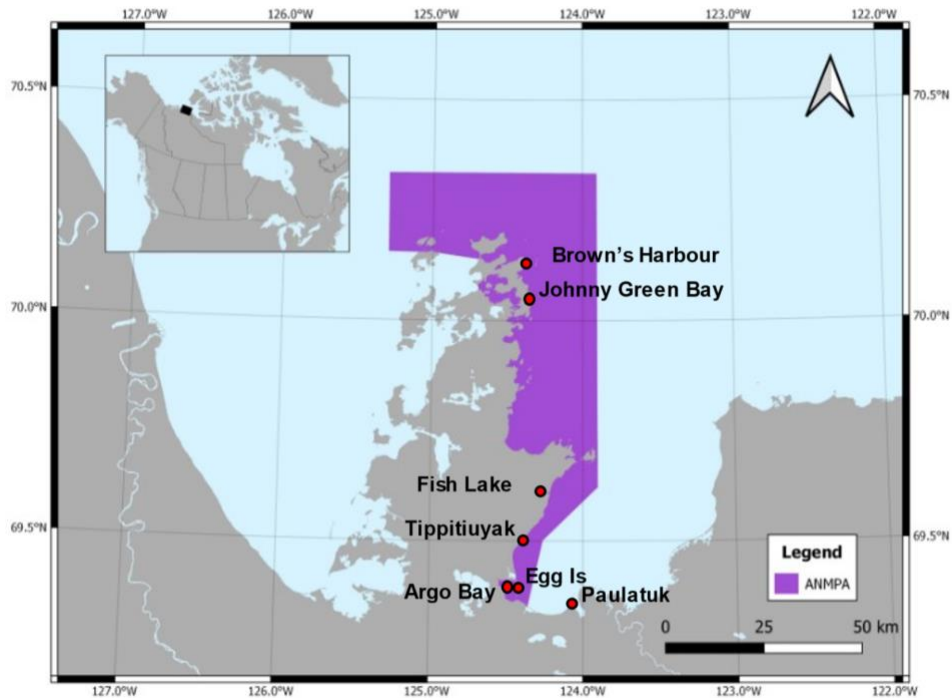


Figure 3. Traditional whaling camps and general locations of the beluga harvest in the Darnley Bay area of the Inuvialuit Settlement Region.

A) Field Sampling

Materials and methods for the 2022 core sample collection were conducted similar to past field seasons (e.g., Harwood *et al.* 2002), except that blubber thickness was recorded in both imperial and metric units, the former to allow comparison to long-term data and the latter to allow for more sensitivity in the data (see MacMillan *et al.* 2019). Contents and the assembly processes for Marine Mammal Sample Kits are included in Appendix 2. Local and Traditional Ecological Knowledge (TEK) indicators (Ostertag *et al.* 2018) were recorded for each whale. Beluga Monitors also recorded daily observations of weather, marine mammals, birds, and fish in notebooks.

I) ISR Beluga Subsistence Harvest Monitoring Program - Core Program

After each hunt, Beluga Monitors interviewed each hunt captain to collect information based on Traditional Ecological Knowledge indicators (Ostertag *et al.* 2018), including the duration of the hunt, the number of whales seen, the number of calves seen, the presence of ‘love handles’ (abdominal fat deposits) on the harvested whale, if the harvested whale seemed tired, and the number of whales that were struck, landed, and lost (Figure 4 and 5). The Beluga Monitors also examined the harvested whale and recorded descriptions of any scars present and potential signs of sickness like unusual smells or signs of infection (Figure 4 and 5).

The Beluga Monitors then asked the hunt captain for permission to measure and sample each harvested whale. All data were recorded on the monitoring data sheet labeled with a unique ID for each harvested whale (Figure 4 and 5). The colour of the whale was recorded as white, yellow, grey, dark grey, or brown. Sex was determined through external examination and palpitation of the genitalia. Standard length, fluke width, maximum half girth, half girth at anus, and ventral blubber thickness at sternum and at anus) were measured using an open reel tape measurer and a ruler. Most measurements were recorded in imperial units to be comparable with past data, except for blubber thickness which was recorded in millimeters for increased precision.

2022 FISH & MARINE MAMMAL
COMMUNITY MONITORING
PROGRAM DATASHEET

date _____
location _____

monitor name _____
AR _____-DL-22-_____
match sample kit number _____

hunt

hunter's names:
captain _____

total # hours hunting _____

whales seen on hunt _____

chase time for this whale _____

whales you have harvested this season
0 1 2 3 4 5 other _____

group size _____ no unsure

calves seen _____ no unsure

sick whales seen
yes no if yes - include details in comments (see back)

calf with whale:
yes no unsure

calf colour:
brown grey black unsure other _____

whales struck and lost:
0 1 2 3

whale tired:
yes no unsure if yes - see back for additional sampling



whale information

'love handles':
yes no

backbone 'sticking out':
yes no unsure

colour:
brown
dark grey
grey
white
yellow

circle the shapes which best match the whale's back

front view  back view 

measurements

total length snout to tail
ft _____ in _____

blubber thickness at breast bone
mm _____

blubber colour _____

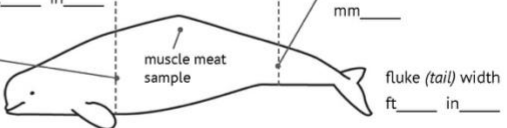
½ widest girth halfway around
ft _____ in _____

½ girth at anus
ft _____ in _____

blubber thickness above anus
mm _____

fluke (tail) width
ft _____ in _____

muscle meat sample



tissue collection freeze » all tissues as soon as possible (fist size) dry » only jaws

lower jaws attach tag, remove meat & dry before bagging
 blubber with skin, full depth
 skin small piece in DMSO vial

blood vial
 muscle meat
 eyeballs
 liver

stomach contents:
Empty full
some food
didn't check

if food was present,
collect sample & photo
 sample collected
 photo taken

flip page ↻

Figure 4. Data collection sheet used by Beluga Monitors for the 2022 Beluga Monitoring Program, front-side.

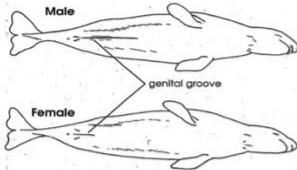
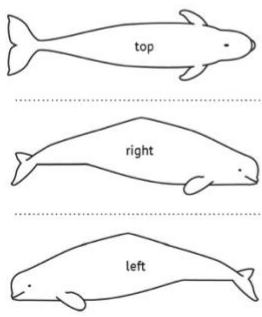
<p>SEX male female</p> 	<p>female</p> <p>giving milk: yes no didn't check milk colour _____</p> <p>collect sample in milk vial provided <input type="checkbox"/> sample collected</p>	<p>fetus</p> <p>yes no didn't check</p> <p>4-5ft foot fetus: ft ___ in ___ male female don't know</p> <p>smaller fetus: bag, label & freeze whole fetus</p>
<p>signs of infection, wounds or abnormalities</p> <p>spots on the liver: yes no</p> <p>'different' or unusual smell when whale was opened up: yes no</p> <p>unusual scarring yes no</p>	<p>sign of infection: <i>i.e. infected wound, disintegrating muktuk, lump in muktuk</i> yes no ↓ if yes, take photo and collect sample of the infected area including uninfected area next to wound <input type="checkbox"/> sample collected <input type="checkbox"/> photo taken <input type="checkbox"/> location of infection marked on diagram below</p>	<p>hunter said whale seemed tired: ↓ <i>sample the following organs, put samples in ziploc bags, label bags with whale id and freeze</i></p> <p><input type="checkbox"/> liver areas with & without spots <input type="checkbox"/> kidney <input type="checkbox"/> lung <input type="checkbox"/> heart <input type="checkbox"/> photos of unusual looking organs</p>
<p>draw abnormalities</p> 	<p>description & comments</p>	<p>photo</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>overall health of whale very healthy <input type="checkbox"/> healthy <input type="checkbox"/> unhealthy <input type="checkbox"/> very unhealthy <input type="checkbox"/></p> <p>comments _____</p>		

Figure 5. Data collection sheet used by Beluga Monitors for the 2022 Beluga Monitoring Program, back-side.

Blood was collected from skeletal muscle beneath the scapula in one scintillation tube and blubber/skin was collected (full depth) from the side of the whale in line with the breastbone (1 sample with skin frozen at -20°C, 1 sample preserved in DMSO for genetic sex determination). The lower jaw was removed by the monitor using a hacksaw, and whole eyeballs were extracted using a knife. Dorsal muscle was collected and a subsample was provided to the Research Monitor (if present). The abdominal cavity was then opened to sample liver tissue, and the stomach opened to check for contents (and collected if there were). If the whale was a female the

monitor would check for lactation and collect a sample of milk if present, as well as the presence of a fetus, and record fetus sex and crown-rump length. If a fetus was present and first term (12-18cm), it was frozen intact and whole. If a fetus was near full-term (e.g., 1.5m), measurements and samples were taken and recorded as a separate whale.

II) Expanded Beluga Health Research and Monitoring

At the Hendrickson Island Camp additional samples and sample processing were conducted by the DFO Science team and Research Monitor from July 1 to 18, and by the Research Monitor only from July 18 to 28. Blood from skeletal muscle beneath the scapula was collected (avoiding contamination with ocean water) and processed for the collection of serum (using BD SST™ vacutainers) and plasma (using BD Sodium Heparin^N vacutainers). Additional samples of skin, blubber, eyeball, muscle, and liver samples were taken, as well as collection of stomach, colon, skeletal muscle, heart, brain, spleen, urine, kidney, and kidney parasite samples. When only the Research Monitor was present a reduced number of samples were taken including: serum, blubber, liver, and muscle.



Figure 6. Monitor in training Derek Panaktalok (left) and Senior Monitor Ronald Nuyaviak (right) with beluga (ARLD-HI-22-12) landed at Hendrickson Island, July 19, 2022. Photo Credit: DFO.

B) Sample Processing

Tissue samples taken by Beluga Monitors for the core ISR Beluga Subsistence Harvest Monitoring Program were frozen at camp in household electric chest freezers (0.11m³, ~ -18°C) except for the jaws, which were cleaned, split, labeled with a paper tag, and hung to air-dry.

Sample processing for the expanded Beluga Health Research and Monitoring included the collected blood in vacutainers being gently inverted 5-8 times and left to coagulate at room temperature for 20 minutes. The blood was then centrifuged for 10 minutes at 1900g (VWR® Clinical 50 Centrifuge). Separated serum and plasma were pipetted into 2 mL cryovials using plastic transfer pipettes and placed in a cryoshipper (-150°C). Blubber and skin, liver, and muscle samples were placed in a cryoshipper. Heart, brain, muscle, spleen, urine, and kidney samples were placed in a chest freezer. Liver, skin, and blubber were also sub-sampled into RNA preserving solution. Lenses were extracted from eyeballs. Whole stomachs and a portion of the colon were tied off at all openings using leather string/twine and placed in bags. These bags were then placed into white buckets and frozen in chest freezers. Photographs of blubber were taken with a light box to determine blubber colour. A Research Support Services community position (Jimmy Kalinek - Only Way Outfitting) managed the logistics of shipping, receiving, and staging samples and equipment in Inuvik, alongside DFO Science and Area office staff.

C) Laboratory Processing and Analyses

Samples were subsampled and stored at -80°C once received by DFO in Winnipeg, and many different types of laboratory processing were/will be conducted on them. Table 2 summarizes the types of samples collected and the type of analysis conducted (and references for analysis methods if applicable). In 2022 whale ages were estimated through aspartic acid racemization (Pleskach *et al.* 2016, Yasunaga *et al.* 2017), using a calibration developed from an ageing study currently being prepared for peer review (Elliott and Loseto *in prep*).

Table 2. Sampling conducted on beluga whales as part of the 2022 Beluga Monitoring Program, and type of analysis conducted with these samples.

Type of Sample Collected	Research Question or Objective
Eyeballs and Jaw (teeth)	Estimate age of whale (e.g., Stewart <i>et al.</i> 2012, Pleskach <i>et al.</i> 2016, Elliot and Loseto <i>in prep</i>)
Blubber/skin	Fat content, quality and profile to understand diet (e.g., Loseto <i>et al.</i> 2009, Choy <i>et al.</i> 2020), stress hormones (e.g., cortisol, Loseto <i>et al.</i> 2018b), mercury stable isotopes in skin (e.g., Loseto <i>et al.</i> 2015), organic pollutants in blubber (Noel <i>et al.</i> 2018), genetics (sex determination).
Blood (whole)	Archived for <i>Brucella</i> and future requests,
Blood (serum)	Hormones, genomics metabolomics, transcriptomic (e.g., Loseto <i>et al.</i> 2018b, Simond <i>et al.</i> 2022)
Blood (plasma)	Genomics
Muscle	Stable isotopes, mercury, diseases (<i>Toxoplasma gondii</i>) (Sharma <i>et al.</i> 2018)
Liver	Contaminants, diet indicators (highly-branched isoprenoids, stable isotopes) (e.g., Loseto <i>et al.</i> 2008)
Spleen	<i>Bartonella sp.</i>
Brain, heart	<i>Toxoplasma gondii</i> (e.g., Sharma <i>et al.</i> 2018)
Kidney	Parasites (worms)
Stomach contents (presence/absence)	Diet
Milk	Evidence of lactation; archive
Stomach and colon	Microplastics

D) Data Compilation

All information recorded on the Beluga Monitoring Program field sheets in 2022 was compiled in Microsoft Excel and added to the master database maintained by the FJMC. Original (raw) data sheets, photocopies, and scanned copies are archived with the FJMC (Inuvik, NT), and with DFO (Freshwater Institute, Winnipeg, MB). Daily observations from Beluga Monitor daily logbooks were compiled by the FJMC (Inuvik, NT) and notable or consistent observations were included in the results section of this report.

RESULTS

A total of 88 belugas were reported harvested in the ISR in 2022, between June 29 and August 24, 2022 (Table 3 and Figure 6). Overall, 75 of those whales were sampled by Beluga Monitors (Table 3), and the Research Monitor sampled 18 whales and the DFO Science team sampled 7 whales for the Expanded Beluga Health Research and Monitoring Program (Table A3), and no whales were sampled by hunters as part of the FJMC's Harvester Reward Program. The harvested whales not sampled by beluga monitors or through the Harvester Reward Program were communicated for this report through community members and harvest monitor logbooks. Consequently, those whales have no samples and limited to no data associated with them. One whale was reported struck-and-lost from the Shingle Point area on June 30, 2022 (Table 3). Two belugas were reported as stranded, one near Hendrickson Island at Summer Island (August 5), and one at Kendall Island (September 19).

Beluga harvesting in the Mackenzie Delta area started late relative to recent years, due to sea ice around the estuary that didn't break up until late-June. Sea ice also stayed longer around Ulukhaktok, breaking up in late-July to early-August. Belugas were sighted around Ulukhaktok in 2022, but because of the ice conditions and weather, harvesting took place in deeper waters and harvesters were not successful in landing a whale.

Harvesters from Kendall Island noted that belugas were not coming into sanctuary area (the Okeevik subarea of the TNMPA), as they usually did; whales were present in the area but stayed outside of the islands. Belugas were also sighted in places they are not usually found. On July 15, a group of 15-20 belugas (including 2 neonates) were sighted in the Mackenzie Delta at Holmes Creek, north of Swimming Point. On August 9, a lone beluga was sighted upriver around Inuvik and Airport Channel. An unidentified large dark mammal was spotted in the Kendall Island area on July 17, at Pelly Island, close to Gary Island.

Table 3. Number of belugas struck, landed, lost, and sampled, by hunting area in 2022.

Location	No. Whales Landed	No. Whales Sampled	No. Whales Struck-and-Lost	No. Recorded Strandings
Hendrickson Island	37	36	0	1
Tuktoyaktuk Harbour	0	0	0	0
East Whitefish	12	8	0	0
Kendall Island	5	5	0	1
Sachs Harbour	0	0	0	0
Ulukhaktok	0	0	0	0
Darnley Bay and surrounding area	31 (5 at Paulatuk Bay, 3 at Egg Island, 1 at Billy's Creek, 2 at Bennett Point, 11 at Kamakark, and 3 unspecified)	22	0	0
Shingle Point Area	3	2	1	0
Total	88	73	1	2

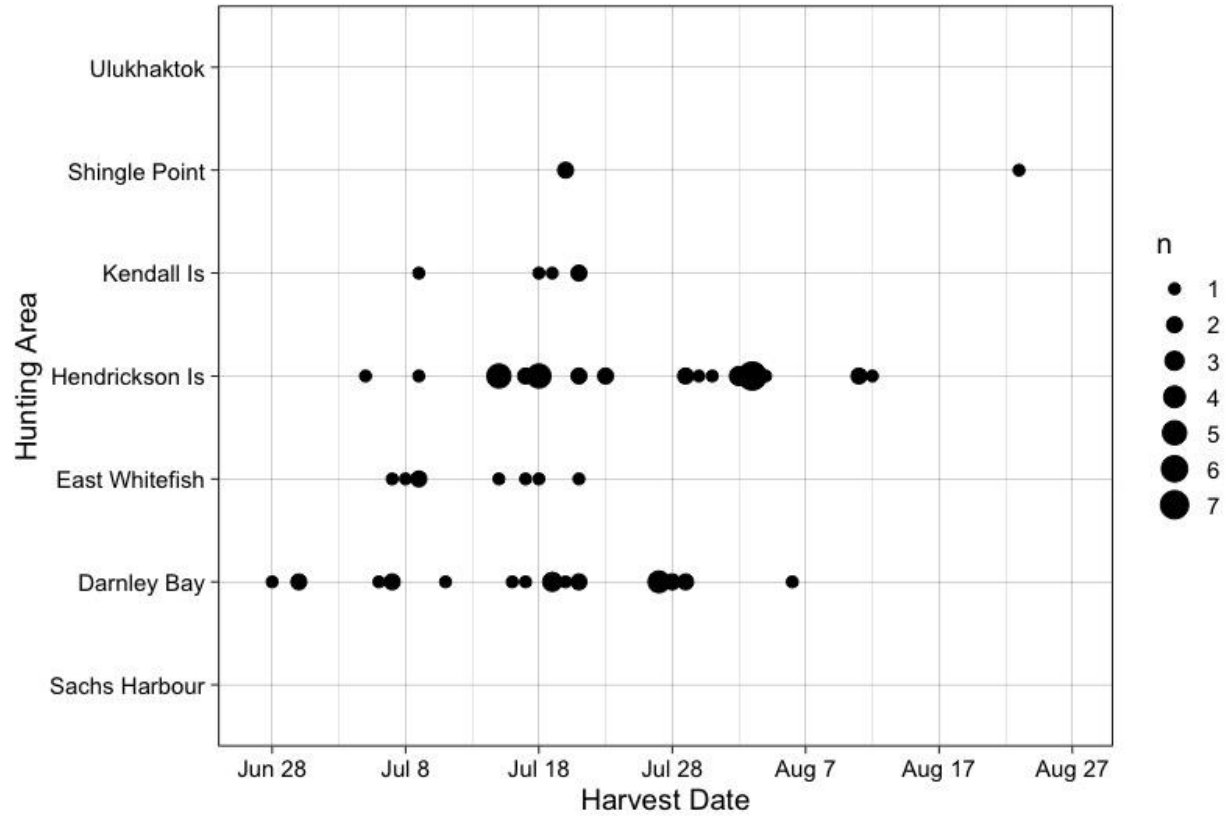


Figure 7. Number and timing of belugas landed in each hunting area. All belugas from the 2022 harvest were hunted between June 29 and August 24, 2022.

Of the 88 belugas harvested in 2022, 67 were male, 4 were female, and the sex of the remaining 17 belugas was unidentified (Figure 7). Beluga from all hunt locations varied in colour from white, yellow, and dark grey (Table A3). The standard length of all sampled belugas ranged from 342.9 to 455.9 cm for males and 365.8 to 426.7 cm for females (Table A1).

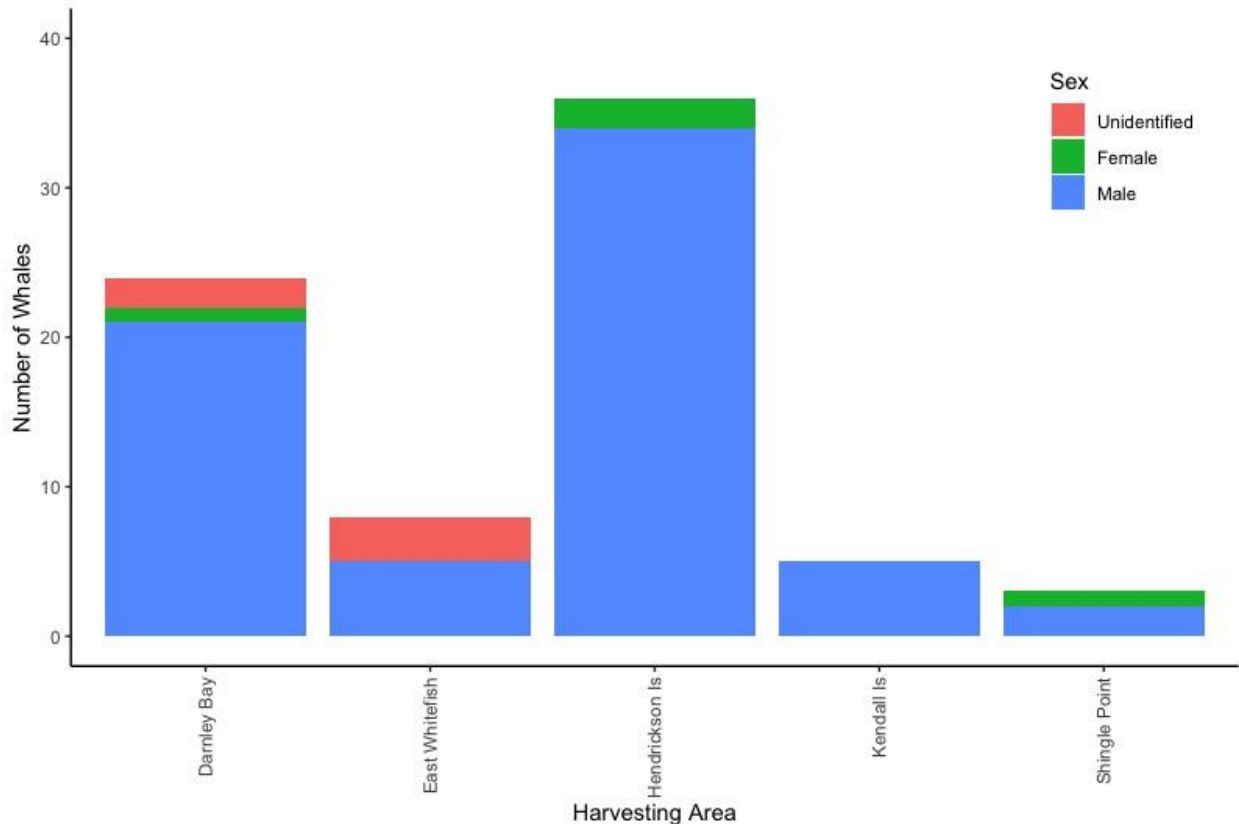


Figure 8. Number of male and female beluga harvested and recorded by beluga monitors and harvesters for each whale camp. Cases where sex was not determined are also reported.

The fluke width of all sampled belugas ranged from 31.8 to 114.3 cm for males and 44.5 to 96.5 cm for females (Table A1). The blubber thickness measured at the sternum of all sampled belugas ranged from 0.6 to 14.6 cm for males and 1.3 to 8.5 cm for females (Table A1). The blubber thickness measured at the anus of all sampled belugas ranged from 0.3 to 11.0 cm for males and 0.6 to 7.5 cm for females (Table 12). The maximum half girth ranged from 83.8 to 144.8 cm in males and 91.4 to 99.1 cm in females (Table A1). The half girth at anus ranged from 33.0 to 121.9 cm in males and 53.3 to 71.1 cm in females. The age of harvested whales ranged from 7.68 to 99.7 years in males and 24.5 to 37.4 years in females. The 99.7-year-old male was harvested in Darnley Bay.

Of the 73 sampled whales, 42 had empty stomachs at the time they were harvested, 2 had some stomach contents, and the remaining 29 belugas were not checked for stomach contents (Table A4). Of the 4 female belugas harvested in 2022, none were carrying a first-term fetus, none were producing milk at the time they were harvested, and one was observed with calves (Table A5). Local and Traditional Ecological Knowledge (TEK) indicators collected from harvesters included that 32 whales were reported to have ‘love handles’ (indicator of a healthy whale), 17

had their backbone sticking out (indicator of a skinnier whale), 8 had scarring, and 1 had an unusual smell when opened up (Table A6). The average number of belugas seen while hunting ranged from 7.5 (Shingle Point) to 42.5 (East Whitefish), by location. The average group size of the landed beluga ranged from 1.5 (Hendrickson Island) to 7.53 (Darnley Bay and surrounding area), by location. The average number of calves seen while hunting ranged from 0 (Shingle Point) to 10.0 (Kendall Island), by location (Table A7). In general, response rates for the TEK indicators were low, but higher than in previous years.

SUMMARY

This report provides an overview and inventory of beluga data collected in 2022 from the long-term ISR Beluga Subsistence Harvest Monitoring Program. Notable points include:

- There were 88 harvested belugas reported in the ISR in 2022, between June 29 and August 24, with 75 of those whales sampled by Beluga Monitors and 18 sampled under the Expanded Beluga Health Research and Monitoring Program.
- Sex was field-identified for 71 belugas, of which 67 were reported to be male (94.4%).
- Of the 4 females landed, one was reported to have been accompanied by calves, none were lactating, and none had a first-term fetus.
- Two beluga strandings were reported, one near Hendrickson Island and one near Kendall Island. The stranded whales were not sampled.
- The local Research Monitor worked alongside the DFO Science team to collect science samples.

This report provides Inuvialuit community members and organizations, co-management boards, and scientists with important information on the subsistence harvest of Eastern Beaufort Sea beluga in the Inuvialuit Settlement Region, including harvest numbers, TEK indicators, basic morphometrics, and the samples collected from harvested beluga whales in 2022. Together with other sources of information and data including scientific research, these monitoring results contribute to the management and monitoring of MPAs in the ISR (e.g., TNMPA and ANMPA). Continued monitoring is important to support resource management to conserve this ecologically and culturally important species, while ensuring continued subsistence harvesting opportunities for the Inuvialuit.

AUTHOR CONTRIBUTIONS

Kiyo Campbell supported implementation and logistics for the ISR Beluga Subsistence Harvest Monitoring Program, managed harvest data, and contributed to writing the report. Laura Murray wrote the original draft and supported design, implementation, and logistics for the 2022 Beluga Health Research and Monitoring Program. Shannon MacPhee oversaw project proposals, budget, and contracts for the Research Monitor and Research Support Services in response to COVID-19, and provided overall program design and coordination between DFO, Joint Secretariat staff, and the Tuktoyaktuk HTC. Ashley Elliot processed and analyzed aging data for 2022 harvested beluga. Kayla Hansen-Craik oversaw MPA funding and administered contracts with the AHTC and PHTC for their beluga monitors. Lisa Loseto is the Principal Investigator for DFO Science and acquired funding and collaborators for sample analyses, as well as for the In-training Monitor at Hendrickson Island through the National Contaminants Program. All authors reviewed and edited the manuscript.

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APPENDIX A: DATA AND METADATA

Table A1. Morphometric measurements, sex, and age of beluga whales landed during the 2022 Beluga Monitoring Program, by camp (NR= not recorded).

Harvest date (2020)	Sample ID	Camp location	Sex	Age	Total length (cm)	Fluke width (cm)	Maximum half-girth (cm)	Half-girth at anus (cm)	Blubber thickness at sternum (cm)	Blubber thickness at anus (cm)
29-Jun	ARPA-DL-22-01	Darnley Bay	M	56.4	408.9	94.0	96.5	55.9	1.3	0.6
1-Jul	ARPA-DL-22-02	Darnley Bay	M	67.3	411.5	96.5	99.1	55.9	1.3	0.6
1-Jul	ARPA-DL-22-03	Darnley Bay	M	20.6	396.2	88.9	88.9	50.8	0.6	0.3
6-Jul	ARHI-DL-22-01	Hendrickson Is	M	25.3	411.5	62.2	134.6	101.0	8.9	5.7
7-Jul	ARPA-DL-22-05	Darnley Bay	M	NR	406.4	91.4	94.0	53.3	1.3	0.6
8-Jul	AREW-DL-22-01	East Whitefish	M	32.1	424.2	94.0	-*	83.8	9.0	9.0
8-Jul	ARPA-DL-22-06	Darnley Bay	F	35.7	426.7	96.5	91.4	71.1	1.3	0.6
8-Jul	ARPA-DL-22-07	Darnley Bay	M	27.2	449.6	106.7	96.5	58.4	1.3	0.6
9-Jul	AREW-DL-22-02	East Whitefish	M	NR	375.9	76.2	-*	88.9	14.6	NR
10-Jul	AREW-DL-22-03	East Whitefish	NR	50.4	406.4	96.5	-*	96.5	7.0	9.0
10-Jul	AREW-DL-22-04	East Whitefish	M	33.7	416.6	99.1	-*	50.8	5.5	7.0
10-Jul	ARKI-DL-22-01	Kendall Is	M	42.7	381.0	86.4	124.5	71.1	6.0	5.0
10-Jul	ARHI-DL-22-02	Hendrickson Is	M	20.0	419.1	48.3	109.2	81.3	9.4	7.0
12-Jul	ARPA-DL-22-08	Darnley Bay	M	69.0	345.4	86.4	99.1	61.0	3.8	2.5
16-Jul	AREW-DL-22-05	East Whitefish	NR	20.4	411.5	95.3	-*	50.8	10.0	7.0
16-Jul	ARHI-DL-22-03	Hendrickson Is	M	40.0	426.7	39.4	119.4	45.7	8.0	11.0
16-Jul	ARHI-DL-22-04	Hendrickson Is	M	27.7	430.5	44.5	118.1	118.1	5.9	6.0
16-Jul	ARHI-DL-22-05	Hendrickson Is	M	15.4	353.1	48.9	116.8	55.2	7.5	4.1

Harvest date (2020)	Sample ID	Camp location	Sex	Age	Total length (cm)	Fluke width (cm)	Maximum half-girth (cm)	Half-girth at anus (cm)	Blubber thickness at sternum (cm)	Blubber thickness at anus (cm)
16-Jul	ARHI-DL-22-06	Hendrickson Is	M	15.4	370.8	45.7	104.1	48.3	4.5	7.1
16-Jul	ARHI-DL-22-07	Hendrickson Is	M	15.8	381.0	43.2	100.3	73.7	6.5	5.0
17-Jul	ARPA-DL-22-09	Darnley Bay	M	25.6	421.6	99.1	106.7	61.0	3.8	2.5
18-Jul	AREW-DL-22-06	East Whitefish	NR	28.4	416.6	101.6	119.4	78.7	10.0	8.0
18-Jul	ARPA-DL-22-11	Darnley Bay	M	99.7	393.7	86.4	83.8	50.8	0.6	0.6
18-Jul	ARHI-DL-22-08	Hendrickson Is	M	24.7	396.2	31.8	101.6	58.4	6.0	5.5
18-Jul	ARHI-DL-22-09	Hendrickson Is	M	19.2	416.6	31.8	110.5	121.9	6.5	4.5
19-Jul	AREW-DL-22-07	East Whitefish	M	24.9	403.9	91.4	86.4	83.8	6.5	9.0
19-Jul	ARKI-DL-22-02	Kendall Is	M	12.1	426.7	91.4	104.1	78.7	6.0	6.0
19-Jul	ARHI-DL-22-10	Hendrickson Is	M	22.3	452.1	52.1	116.8	68.6	5.1	7.6
19-Jul	ARHI-DL-22-11	Hendrickson Is	M	36.4	444.5	54.6	NR	33.0	3.0	2.5
19-Jul	ARHI-DL-22-12	Hendrickson Is	M	32.4	454.7	52.1	133.4	NR	10.2	10.2
19-Jul	ARHI-DL-22-13	Hendrickson Is	M	16.7	389.9	74.9	115.6	40.6	7.0	7.6
19-Jul	ARHI-DL-22-14	Hendrickson Is	M	19.1	381.0	44.5	114.3	77.5	6.4	3.8
20-Jul	ARKI-DL-22-03	Kendall Is	M	13.9	396.2	101.6	104.1	66.0	6.0	5.5
20-Jul	ARPA-DL-22-04	Darnley Bay	M	16.4	381.0	86.4	96.5	55.9	5.1	5.1
20-Jul	ARPA-DL-22-12	Darnley Bay	M	23.5	426.7	96.5	109.2	88.9	7.0	3.8
20-Jul	ARPA-DL-22-13	Darnley Bay	M	41.5	431.8	96.5	104.1	68.6	5.4	5.4
21-Jul	ARSP-DL-22-04	Shingle Point	M	16.0	408.9	88.9	114.3	68.6	5.3	4.5
21-Jul	ARSP-DL-22-01	Shingle Point	F	37.4	416.6	91.4	99.1	68.6	8.5	7.5
21-Jul	ARPA-DL-22-14	Darnley Bay	M	38.1	426.7	106.7	111.8	68.6	7.6	7.6
22-Jul	AREW-DL-22-08	East Whitefish	M	28.4	403.9	101.6	104.1	61.0	5.5	7.0

Harvest date (2020)	Sample ID	Camp location	Sex	Age	Total length (cm)	Fluke width (cm)	Maximum half-girth (cm)	Half-girth at anus (cm)	Blubber thickness at sternum (cm)	Blubber thickness at anus (cm)
22-Jul	ARKI-DL-22-04	Kendall Is	M	41.3	426.7	114.3	116.8	81.3	7.3	6.0
22-Jul	ARKI-DL-22-05	Kendall Is	M	36.0	434.3	106.7	121.9	86.4	9.0	6.0
22-Jul	ARPA-DL-22-15	Darnley Bay	NR	21.8	383.5	78.7	96.5	53.3	7.6	7.6
22-Jul	ARPA-DL-22-16	Darnley Bay	M	15.6	353.1	78.7	83.8	50.8	7.6	7.6
22-Jul	ARHI-DL-22-15	Hendrickson Is	M	31.6	434.3	49.5	113.0	66.0	7.6	2.5
22-Jul	ARHI-DL-22-16	Hendrickson Is	M	19.8	455.9	52.1	129.5	61.0	10.2	5.7
24-Jul	ARHI-DL-22-17	Hendrickson Is	M	17.4	378.5	67.3	96.5	97.8	10.2	7.6
24-Jul	ARHI-DL-22-18	Hendrickson Is	M	23.4	431.8	80.0	144.8	35.6	7.6	5.1
28-Jul	ARPA-DL-22-17	Darnley Bay	M	21.6	360.7	88.9	106.7	63.5	5.0	3.0
28-Jul	ARPA-DL-22-18	Darnley Bay	M	20.6	360.7	77.5	96.5	78.7	3.0	2.0
28-Jul	ARPA-DL-22-19	Darnley Bay	M	8.45	360.7	83.8	109.2	81.3	8.0	NR
28-Jul	ARPA-DL-22-20	Darnley Bay	M	28.2	342.9	83.8	88.9	71.1	10.2	7.6
29-Jul	ARPA-DL-22-21	Darnley Bay	M	13.6	414.0	66.0	111.8	63.5	4.0	4.5
29-Jul	ARPA-DL-22-22	Darnley Bay	NR	11.7	388.6	86.4	104.1	68.6	5.5	4.5
30-Jul	NR	Darnley Bay	M	NR	434.3	NR	96.5	76.2	NR	NR
30-Jul	NR	Darnley Bay	M	NR	426.7	NR	127.0	68.6	NR	NR
30-Jul	ARHI-DL-22-19	Hendrickson Is	M	12.1	411.5	49.5	116.8	35.6	5.1	3.8
30-Jul	ARHI-DL-22-20	Hendrickson Is	M	13.4	398.8	47.0	104.1	83.8	5.1	3.8
31-Jul	ARHI-DL-22-21	Hendrickson Is	M	20.3	421.6	54.6	124.5	71.1	5.1	3.8
1-Aug	ARHI-DL-22-22	Hendrickson Is	M	16.1	396.2	47.0	104.1	57.2	6.4	5.1
3-Aug	ARHI-DL-22-23	Hendrickson Is	M	7.68	355.6	47.0	91.4	71.1	3.8	2.5
3-Aug	ARHI-DL-22-24	Hendrickson Is	M	23.8	439.4	54.6	119.4	116.8	6.4	5.1

Harvest date (2020)	Sample ID	Camp location	Sex	Age	Total length (cm)	Fluke width (cm)	Maximum half-girth (cm)	Half-girth at anus (cm)	Blubber thickness at sternum (cm)	Blubber thickness at anus (cm)
3-Aug	ARHI-DL-22-25	Hendrickson Is	M	29.1	424.2	49.5	106.7	63.5	5.1	3.8
3-Aug	NR	Hendrickson Is	NR	NR	NR	NR	NR	NR	NR	NR
4-Aug	ARHI-DL-22-26	Hendrickson Is	M	17.5	396.2	47.0	114.3	53.3	6.4	5.1
4-Aug	ARHI-DL-22-27	Hendrickson Is	M	22.7	426.7	52.1	134.6	105.4	NR	NR
4-Aug	ARHI-DL-22-28	Hendrickson Is	M	10.9	360.7	44.5	91.4	58.4	5.1	3.3
4-Aug	ARHI-DL-22-29	Hendrickson Is	F	24.5	391.2	44.5	94.0	53.3	5.1	3.8
4-Aug	ARHI-DL-22-30	Hendrickson Is	M	25.7	383.5	100.3	114.3	86.4	6.4	5.1
4-Aug	ARHI-DL-22-31	Hendrickson Is	M	26.0	363.2	41.9	99.1	66.0	5.1	4.4
4-Aug	ARHI-DL-22-32	Hendrickson Is	F	35.9	365.8	44.5	99.1	63.5	4.4	2.5
5-Aug	ARHI-DL-22-33	Hendrickson Is	M	27.2	408.9	49.5	119.4	100.3	10.8	10.2
7-Aug	ARPA-DL-22-23	Darnley Bay	M	37.9	436.9	94.0	129.5	81.3	4.5	3.5
12-Aug	ARHI-DL-22-34	Hendrickson Is	M	21.2	398.8	52.1	111.8	53.3	10.2	7.6
12-Aug	ARHI-DL-22-35	Hendrickson Is	M	36.0	419.1	50.8	127.0	66.0	11.4	7.6
13-Aug	ARHI-DL-22-36	Hendrickson Is	M	27.9	373.4	47.0	129.5	99.1	8.9	7.6
24-Aug	NR	Shingle Point	M	NR	426.7	NR	NR	NR	NR	NR

**Measurement was omitted because it was unclear whether the full maximum girth was measured, as opposed to the half-girth.*

Table A2. Tissue samples taken from belugas harvested as part of the Beluga Monitoring Program in 2022 by camp.

Camp	Samples taken								
	Eyeballs	Blood Vial	Milk Vial	Genetics Vial	Blubber	Lower Jaws	Muscle Meat	Liver	Kidney
Hendrickson Is	36	36	-	36	36	36	36	36	-
Tuktoyaktuk Harbour	-	-	-	-	-	-	-	-	-
East Whitefish	8	8	-	7	8	8	8	8	-
Kendall Is	5	5	-	5	5	5	5	5	-
Darnley Bay (and surrounding area)	22	22	-	21	22	14	22	22	-
Ulukhaktok	-	-	-	-	-	-	-	-	-
Shingle Point (and surrounding area)	2	2	-	2	2	2	2	1	-
Sachs Harbour	-	-	-	-	-	-	-	-	-

Table A3. Tissue samples taken from the 18 belugas sampled by the Research Monitor, and 7 sampled by DFO Science at Hendrickson Island, for the Expanded Beluga Health Research and Monitoring Program in 2022.

Sample type	Number of whales sampled
Blood (serum)	17
Blubber	18
Muscle	18
Heart	7
Spleen	7
Brain	3

Table A4. Color of harvested beluga whales recorded during the 2022 Beluga Monitoring Program, by camp.

Camp (number of whales landed)	Colour				
	Yellow	White	Grey	Brown	Not reported
Hendrickson Is (37)	0	31 (6 white/yellow)	0	0	6
Tuktoyaktuk Harbour (0)	-	-	-	-	-
East Whitefish (12)	1	7	0	0	4
Kendall Is (5)	0	3	1 (dark grey)	0	1
Darnley Bay (and surrounding area) (31)	3	19 (2 white/yellow)	0	0	9
Ulukhaktok (0)	-	-	-	-	-
Shingle Point (and surrounding area) (3)	1	1	0	0	1
Sachs Harbour (0)	-	-	-	-	-

Table A5. Presence/absence of beluga stomach contents for whales harvested during the 2022 Beluga Monitoring Program, by camp. Any details on contents are included as comments.

Camp (number of whales sampled)	Stomach Contents			Comments
	Yes	No	Not reported	
Hendrickson Is (36)	0	12	24	NA
Tuktoyaktuk Harbour (0)	-	-	-	NA
East Whitefish (8)	0	4	4	NA
Kendall Is (5)	0	4	1	NA
Darnley Bay (and surrounding area) (22)	1	21	0	NA
Ulukhaktok (0)	-	-	-	NA
Shingle Point (and surrounding area) (2)	1	1	-	NA
Sachs Harbour (0)	-	-	-	NA

Table A6. Reproductive information collected on harvested female belugas in 2022. Presence of calves was communicated to Beluga Monitors by harvesters. Information was not able to be collected for all female belugas and asterisks have been used to identify where the recorded values may not be representative of the actual values due to low response numbers.

Camp (number of female beluga)	First-term Fetus	Calf Seen with Female	Lactating Female
Hendrickson Is (2)	not recorded	not recorded	not recorded
Tuktoyaktuk Harbour (not reported)	-	-	-
East Whitefish (0)	-	-	-
Kendall Is (0)	-	-	-
Darnley Bay (and surrounding area) (1)	0	1	0
Ulukhaktok (0)	-	-	-
Shingle Point (and surrounding area) (1)	0	0	0
Sachs Harbour (0)	-	-	-

Table A7. Other information collected on landed belugas in 2022, based on local and TEK indicators (Ostertag et al., 2018), as communicated to Beluga Monitors by harvesters. Asterisks have been used to provide more information on the scarring or other signs of infection.

Camp (number of whales sampled)	Love handles	Backbone sticking out	Scarring	Signs of infection and other observations
Hendrickson Is (36)	14	2	0	0
Tuktoyaktuk Harbour (0)	not recorded	not recorded	not recorded	not recorded
East Whitefish (8)	2	0	0	0
Kendall Is (5)	4	3	1	0
Darnley Bay (and surrounding area) (22)	11	10	7	1*
Ulukhaktok (0)	not recorded	not recorded	not recorded	not recorded
Shingle Point (and surrounding area) (2)	1	1	0	0
Sachs Harbour (0)	not recorded	not recorded	not recorded	not recorded

*Unusual smell when whale was opened up.

Table A8. Other information related to observations made while harvesters were conducting beluga hunts in 2022, as communicated to Beluga Monitors by harvesters. Information was not able to be collected for all beluga hunts and asterisks have been used to identify where the recorded values may not be representative of the actual values due to low response numbers.

Camp	Average number of other belugas seen while hunting	Landed beluga average group size	Average number of beluga calves seen while hunting
Hendrickson Is	7.63	1.50	0.45
Tuktoyaktuk Harbour	not recorded	not recorded	not recorded
East Whitefish	42.5	5.75***	0.17
Kendall Is	11.7	not recorded	10*
Darnley Bay (and surrounding area)	10.2	7.53	0.40
Ulukhaktok	not recorded	not recorded	not recorded
Shingle Point (and surrounding area)	7.5**	4.0**	0
Sachs Harbour	not recorded	not recorded	not recorded

*Average based on 1 response.

**Average based on 2 responses.

***Average based on 4 responses.

APPENDIX B: MARINE MAMMAL SAMPLE KIT CONTENTS

ISR Beluga Subsistence Harvest Monitoring Program - Core FJMC Program

Marine Mammal Sample Kits were assembled by DFO Science staff at the Freshwater Institute (FWI). All sample containers were labelled externally (with a label taped on with packing tape) with Animal ID and tissue type. Beluga Monitor kits included:

- Whirl-pak® for: eyeballs (2), blubber sample, muscle, liver
- Scintillation vials (HDPE) for: milk, whole blood
- Wide mouth Nalgene vial (30 mL) with DMSO for: skin
- Labelled tag for: lower jaw

Harvesting kits were then sent to Inuvik where the FJMC added equipment needed to collect samples before sending kits out to the communities. This equipment included:

- Nitrile gloves (1 - 2 boxes)
- Open reel measuring tape (inches and cm)
- Ruler (cut to 0 cm)
- Hacksaw, extra hacksaw blades
- Waterproof/shockproof camera
- Binder with datasheets for each harvested whale
- Knives (2 or more)
- Pencils, pens, erasers
- Cooler(s) for storage
- Freezer
- Generator
- Marine radio
- 1st aid kit
- Face masks
- Hand sanitizer

Expanded Beluga Health Research and Monitoring - DFO Program

Marine Mammal Harvest Kits, supplementary lab kits, sampling equipment, and general equipment for the Research Monitor was assembled by DFO at the FWI for use at Hendrickson Is. These included:

Harvesting kits:

- Whirl-pak® for tissues (brain, heart, skeletal muscle, spleen, lung)
- Serum collection tubes (x 6) (BD SST™ tubes 8.5 mL with silica clot activator, polymer gel, silicone-coated interior)
- Viral swab (sterile Dacron swab in 2mL capacity Corning cryovial containing virus transport media)

- Latex gloves
- Cotton swab

Lab kits:

- Transfer pipettes (6 x 3 mL)
- Blubber vials (5 x 5 mL)
- Cryovial skin vials (1 x 5 g)
- Cryovial serum (12 x 1.2 mL)
- Scalpels and sharps disposal bin

Sampling equipment ('Go' Kits – 2 kits provided):

- Whale ID and beluga anatomy sheets
- Paper plates
- Butcher knives (2 x 8")
- Boning knife (2 x 6")
- Pens, pencils, white board markers, sharpies
- Camera with SD card

General equipment:

- Centrifuge (Hettich EBA 200) with associated equipment (manual, hex head wrench, fuses, power cord)
- Lab camera
- GoPro (camera, charger, head strap, chest strap, SD card, battery, case)
- Forceps/tweezers
- Lab coats
- Scissors
- Tape (dry erase, packing, scotch)
- Kim wipes
- Aluminum foil
- Face masks
- Hand sanitizer