

**Ontario Species at Risk Evaluation Report for
Beluga Whale (James Bay Population)**

Béluga

Qilalugaq

(Delphinapterus leucas)

Committee on the Status of Species at Risk in Ontario
(COSSARO)

Assessed by COSSARO as Not at Risk

April 2021

Béluga (population de la baie James)

Les bélugas, des baleines à dents de taille moyenne, sont très mobiles et peuvent tolérer un large éventail de conditions environnementales. Leurs types d'habitats préférés semblent varier selon les saisons. En été, les bélugas se trouvent à la fois dans les eaux côtières et extracôtières, mais la majeure partie de leur aire de répartition estivale est axée sur les estuaires. La plupart des populations de bélugas hivernent dans des polynies et dans des zones où la couverture de glace est suffisamment brisée pour permettre un accès fiable à l'air.

Les bélugas sont très mobiles et leurs migrations saisonnières suivent la formation et la fonte de la glace de mer. Les bélugas de l'unité désignable de la baie James s'y regroupent l'été et peut-être également dans le sud-ouest de la baie d'Hudson, cette espèce ayant été observée en train de prolonger son aire le long de la côte de la baie James en Ontario. La présence des bélugas a été documentée dans les embouchures et les estuaires associés aux rivières Albany, Attawapiskat, Ekwan, Harricana et Moose, et l'on sait que de petits groupes de bélugas remontent également la rivière Moose sur 14 à 25 km à marée haute.

L'aire de répartition du béluga est circumpolaire dans les zones arctiques et subarctiques. La répartition de cette espèce est vaste dans le nord du Canada où elle s'étend, vers l'est, de la mer de Beaufort jusqu'à la baie de Baffin et, vers le sud, du Haut-Arctique jusqu'à la baie James et l'estuaire du Saint-Laurent. Les bélugas ont été séparés en huit unités désignables au Canada, la population de la baie James représentant l'une des deux unités qui se trouvent en Ontario. Les populations de bélugas sont identifiées généralement en fonction des estuaires où elles se rassemblent pendant la saison estivale des eaux libres.

Le béluga (population de la baie James) est classé dans la catégorie des espèces non en péril en Ontario par le CDSEPO.

On estime le nombre d'individus matures à 7 218 dans la population de la baie James qui est vraisemblablement stable ou en hausse. Les bélugas de la population de la baie James sont principalement menacés par la perturbation sonore, considérée comme étant à faible incidence.

La population de bélugas de la population de la baie James est classée dans la catégorie des espèces non en péril, car elle ne répond pas au critère permettant de la considérer comme étant en péril.

Cette publication hautement spécialisée n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère l'Environnement, de la Protection de la nature et des Parcs au cossarosecretariat@ontario.ca

Executive summary

Belugas are a medium-sized toothed whale that are highly mobile and able to tolerate a broad range of environmental conditions. Preferred habitat types appear to vary seasonally. Belugas occur in both coastal and offshore waters during the summer, with much of their summer distribution centered on estuaries. Most populations of Belugas overwinter in polynyas and areas where the ice cover is sufficiently broken to allow reliable access to the air.

Belugas are highly mobile, migrating seasonally with the formation and melting of sea ice. Belugas belonging to the James Bay DU aggregate in the summer in James Bay and possibly in southwestern Hudson Bay, with observations of this species in Ontario extending along the coast of James Bay. Belugas have been documented in river mouths and estuaries associated with the Albany, Attawapiskat, Ekwan, Harricana and Moose Rivers, and small aggregations of Belugas are also known to move at least 14 to 25 km upstream in the Moose River on the high tide.

Belugas global range is circumpolar in the Arctic and sub-Arctic. This species has an extensive distribution in northern Canada, occurring from the Beaufort Sea eastward to Baffin Bay and from the High Arctic southward to James Bay and the St. Lawrence Estuary. Belugas in Canada have been separated into eight Designatable Units, with the James Bay Population representing one of two DU's that occur in Ontario. Beluga populations are generally identified on the basis of their estuarine centres of aggregation during the summer open-water season.

The number of mature individuals in the James Bay population was estimated to be 7,218 and this population is likely stable or increasing. Belugas in the James Bay population are primarily threatened by noise disturbance, which is considered a low impact threat.

The James Bay Population of Beluga Whale is classified as Not at Risk in Ontario based on not meeting criterion to be considered at risk.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Beluga Whale was first described in western science by Pallas (1776). The Beluga Whale is the only species of its genus, and along with Narwhal are the only species in the family Monodontidae (COSEWIC 2016). There are no recognized subspecies of Beluga Whale.

1.1.2. Designatable units

An assessment of designatable units was conducted by COSEWIC in 2016 and resulted in the delineation of eight designatable units in Canada (COSEWIC 2016). Populations are generally defined based on non-overlapping summer distributions informed by variation in migratory pattern and timing, genetics, and environmental chemicals. Portions of the James Bay and Western Hudson Bay designatable units occur in Ontario.

The James Bay DU is new and was not recognized in the 2004 status assessment (COSEWIC 2004). Additional research (satellite tagging, genetic studies), combined with ATK, supports recognition of James Bay Belugas as a separate DU (COSEWIC 2016). The approximate 15,000 whales in this non-migratory population remains in the James Bay area year-round, instead of migrating to Hudson Strait like Belugas from the WHB and EHB DUs (COSEWIC 2016). Since this is a recently recognized and still poorly understood DU, there is substantial uncertainty on how to calculate EOO or AOO (COSEWIC 2020). For the purposes of the 2020 COSEWIC assessment, the entirety of James Bay was considered to be the EOO and AOO, which is an area of >90,000km². Knowledge of habitat use, movements and relative density is not sufficient to distinguish between EOO and AOO, therefore the metrics are considered to be equal (COSEWIC 2020).

1.1.3. Native status

Beluga Whale is native to Ontario (COSEWIC 2020).

1.1.4. Occurrence

Beluga Whale occurs in Ontario (COSEWIC 2020).

1.2. Eligibility Results

Beluga Whale (*Delphinapterus leucas*) is eligible for status assessment in Ontario. It should be noted that this species is primarily associated with Marine environments outside of Ontario jurisdiction, however summer use of estuaries and rivers along the James Bay coast qualifies this species as eligible for status assessment.

2. Background information

2.1. Current designations

- GRANK: G5TNR (NatureServe 2020)
- IUCN: Least Concern (2017)
- NRANK Canada: NNR
- COSEWIC: Not at Risk (November 2020)
- SARA: No Status (new DU in 2020 assessment)
- ESA 2007: not listed (new DU in 2020)
- SRANK: SNR (new DU in 2020)

2.2. Distribution in Ontario

Beluga Whales are highly mobile, migrating seasonally with the formation and melting of sea ice. Belugas belonging to the James Bay DU aggregate in the summer in James Bay (satellite-tagging and aerial survey observations) and possibly in southwestern Hudson Bay (ATK observations) (COSEWIC 2016). Feeding Belugas were reported to be present in October in southern James Bay, near Moose Factory and in Hannah Bay (McDonald et al. 1997). Belugas are also present along the Ontario coast of Hudson Bay, near the Severn and Winisk rivers, in May through September, however it is not known if these individuals are from the Western Hudson Bay or James Bay populations (COSEWIC 2016).

Observations of this species in Ontario extend along the coast of James Bay. Ontario's Natural Heritage Information Centre (NHIC) records 12 observations since 2007, producing an EOO of 12,013 km² and AOO of 40 km². It should be noted that these points represent the summer range only and that the NHIC EO's are located in nearshore areas (0-4km from shore) or at the mouth of the Albany River. It should also be noted that much of the EOO occurs in James Bay, outside of Ontario jurisdiction, and therefore the actual EOO in Ontario is smaller than reported.

Observations of Beluga in the river mouths and estuaries of the Ekwana, Attawapiskat, Moose and Harricana Rivers have also been reported (Armstrong 2013). Small aggregations of Belugas are also known to move at least 14 to 25 km upstream in the Moose River on the high tide (Armstrong 2013).

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

Beluga Whales global range is circumpolar in the Arctic and sub-Arctic (NAMMCO 2018). Their distribution is close to continuous in the northern waters of Canada, the United States (western and central Alaska), Russia, Greenland (western), and Norway (Svalbard), with notable gaps off northern and eastern Greenland and possibly certain parts of the central North American Arctic and the central Russian Arctic (COSEWIC 2020). Some populations undertake long migrations that appear to be driven by seasonal changes in ice cover and prey availability (COSEWIC 2020).

Belugas have an extensive distribution in northern Canada, occurring from the Beaufort Sea eastward to Baffin Bay and from the High Arctic southward to James Bay and the St. Lawrence Estuary (NAMMCO 2018). Roughly half of the world distribution (and two thirds of the total world abundance) of the species is in Canada (COSEWIC 2020).

Belugas in Canada have been separated into eight Designatable Units (COSEWIC 2016). These are Eastern Beaufort Sea (Not at Risk - COSEWIC 2004), Eastern High Arctic – Baffin Bay (Special Concern - COSEWIC 2020), Cumberland Sound (Endangered - COSEWIC 2020), Ungava Bay (Endangered - COSEWIC 2020), Western Hudson Bay (Not at Risk - COSEWIC 2020), Eastern Hudson Bay (Threatened - COSEWIC 2020), St. Lawrence Estuary (Endangered - COSEWIC 2014) and James Bay (Not at Risk - COSEWIC 2020).

Both ATK and scientific research confirm non-migratory nature of this DU. Jonkel (1969) first reported over-wintering of Belugas in James Bay, after observing whales in open leads around the major islands while conducting Polar Bear research in 1969. Inuit have long known about the existence of overwintering whales in James Bay (COSEWIC 2016).

Beluga populations (as defined by COSEWIC 2004) are generally identified on the basis of their estuarine centres of aggregation during the summer open-water season (COSEWIC 2016). The summer distribution of one population is generally separate from other populations. Since the winter range of Belugas in the James Bay population is not likely to overlap with other DU's, the broader biologically relevant geographic range for the James Bay population is considered to be the extent of the James Bay DU.

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Quebec	Unknown	S2	Eastern Hudson Bay (EHB) and Ungava Bay (UB) populations occur in Quebec. UB population considered Endangered and EHB population considered Threatened. Potential contribution to Ontario portion of James Bay DU unknown.
Manitoba	Unknown	S2	Large portion of Western Hudson Bay population in Manitoba during the summer. Potential relevance to the JB population unknown.
Michigan	NA		
Minnesota	NA		
Nunavut	Unknown	S4	Other populations in Nunavut not likely to contribute to JB population.

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
New York	NA		
Ohio	NA		
Pennsylvania	NA		
Wisconsin	NA		

2.4. Ontario conservation responsibility

The total population of mature Belugas in Canada is estimated to be approximately 78,000 to 90,000 individuals (COSEWIC 2020), and assuming the James Bay population is comprised of 7218 mature individuals, the James Bay DU represents approximately 8-9% of the total Beluga Population in Canada.

It was noted in COSEWIC (2020) that the 2015 surveys did not cover the coast of Ontario, where ~14,800 Belugas were estimated during the 2004 survey (Richard 2005). It is not known what portion of these individuals belong to the James Bay and Western Hudson Bay populations. It should be further noted that no data is available to determine what portion of Beluga Whales in the James Bay DU occur in Ontario.

2.5. Direct threats

Belugas in the James Bay population are primarily threatened by noise disturbance, which is considered a low impact threat by COSEWIC (2020). The exceptional acoustic complexity of Beluga Whales makes anthropogenic underwater noise an important consideration for conservation management (COSEWIC 2020).

Anthropogenic noise has been documented to have both short-term and long-term effects on whale behaviour, as well as disrupt communication. Finley et al. (1990) reported that Belugas in the Canadian High Arctic displayed a strong avoidance reaction to an approaching icebreaker at distances of 35–50 km and acoustic behaviour suggested that Belugas were aware of the icebreaker at a distance of approximately 80 km. Belugas were documented to have deserted the area as the icebreaker passed and did not return for nearly two days (Finley et al. 1990).

In a modeling study of acoustical impacts on Beluga Whales in the Beaufort Sea, propeller cavitation noise from a Canadian Coast Guard icebreaker was estimated to be audible at distances of 35–78 km, affect behaviour at slightly smaller distances and mask Beluga communication signals at 14–71 km (Erbe and Farmer 2000). It was also estimated that temporary hearing damage can occur if a Beluga stays within 1–4 km of the icebreaker for at least 20 min (Erbe and Farmer 2000).

2.6. Specialized life history or habitat use characteristics

Belugas are highly mobile and able to tolerate a broad range of environmental conditions. Preferred habitat types appear to vary seasonally, and there are also

significant differences in habitat preferences between males and females (Barber et al. 2001). Belugas occur in both coastal and offshore waters during the summer, however much of their summer distribution is centered on estuaries (COSEWIC 2020).

The significance of estuarine habitat is not certain and may vary between populations (COSEWIC 2004), however feeding opportunities (Frost and Lowry 1990) and the stimulation of epidermal molt by immersion in relatively warm, fresh water (St. Aubin et al. 1990) are thought to be two potential factors influencing the use of these areas. Although less likely in the James Bay population, use of estuaries by Belugas may also be related to predator avoidance (Smith et al. 2017).

Aside from their use of estuarine habitat, Belugas are often closely associated with pack ice. The formation and melting of sea ice and its movement, which is driven by wind and currents, appear to have helped to shape the movement phenology of Belugas (COSEWIC 2020). Most populations overwinter in polynyas and areas where the ice cover is sufficiently broken to allow reliable access to the air (COSEWIC 2020).

3. Ontario status assessment

3.1. Application of endangered/threatened status in Ontario

3.1.1. Criterion A – Decline in total number of mature individuals

Does not apply.

Number of mature individuals in the James Bay population estimated to be 7,218 (COSEWIC 2020). There is uncertainty concerning whether the Belugas observed along the Ontario coast belong to the James Bay population or the Western Hudson Bay population, however there is no indication of any decline in the James Bay population (COSEWIC 2020).

3.1.2. Criterion B – Small distribution range and decline or fluctuation

Does not apply.

The extent of occurrence for Beluga Whales in Ontario, established from NHIC observations (see section 2.2), was 12,013 km². This index of EOO meets the threshold for Threatened, however sub-criterion a, b and c are not satisfied. COSEWIC (2016) reported the EOO for the JB DU as >90,000km².

The area of occupancy was also calculated from NHIC observations and determined to be 40 km². This AOO meets the threshold for Endangered, however sub-criterion a, b and c are not met.

3.1.3. Criterion C – Small and declining number of mature individuals

Does not apply.

Number of mature individuals in the James Bay population estimated to be 7,218 (COSEWIC 2020). This population size meets the threshold for Threatened, however sub-criterion C1 and C2 are not met.

3.1.4. Criterion D – Very small or restricted total population

Does not apply.

Number of mature individuals in the James Bay population estimated to be 7,218 (COSEWIC 2020).

3.1.5. Criterion E – Quantitative analysis

Does not apply.

No assessment completed by COSEWIC (2020).

3.2. Application of Special Concern in Ontario

Does not apply.

The population of Beluga Whales in the James Bay Population appears to be stable and ongoing threats appear to be minimal.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Does not apply.

Due to its large extent of occurrence in James Bay and Hudson Bay, Ontario has a low conservation responsibility for Beluga Whales in the JB population. Small portion of the JB population occurs in Ontario, however data insufficient to determine actual value.

3.3.2. Status modification based on rescue effect or level of risk in broader biologically relevant geographic range

Status modification due to rescue effect does not apply. Potential contribution from adjacent populations not known. Nearest population is Western Hudson Bay, however the potential for rescue effect is not known. Rescue effect from Ungava Bay population unlikely and Eastern Hudson Bay is unknown.

Status modification due to BBRGR does not apply.

3.4. Other status categories

3.4.1. Data deficient

Does not apply.

3.4.2. Extinct or extirpated

Does not apply.

3.4.3. Not at risk

Applies. The population of Beluga Whales in the James Bay Population appears to be stable and ongoing threats appear to be minimal.

4. Summary of Ontario status

The James Bay Population of Beluga Whale (*Delphinapterus leucas*) is classified as Not at Risk in Ontario based on not meeting criterion to be considered at risk.

5. Information sources

Armstrong, E.R. 2013. Management Plan for the Beluga (*Delphinapterus leucas*) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 58 pp.

Barber, D.G., E. Saczuk, and P.R. Richard. 2001. Examination of beluga-habitat relationships through the use of telemetry and a Geographic Information System. *Arctic* 54:305-316.

COSEWIC 2004. COSEWIC assessment and update status report on the beluga whale *Delphinapterus leucas* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 70 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2016. Designatable Units for Beluga Whales (*Delphinapterus leucas*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 73 pp.

COSEWIC. 2020. IN PRESS. COSEWIC assessment and status report on the Beluga Whale *Delphinapterus leucas*, Eastern High Arctic - Baffin Bay population, Cumberland Sound population, Ungava Bay population, Western Hudson Bay population, Eastern Hudson Bay population and James Bay population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 84 pp. (<https://www.canada.ca/en/environment-climate-change/services/species-risk-publicregistry.html>).

Erbe, C. and D.M. Farmer. 2000. Zones of impact around icebreakers affecting beluga whales in the Beaufort Sea. *Journal of the Acoustical Society of America* 108, 1332: <https://doi.org/10.1121/1.1288938>

Finley, K.J., G.W. Miller, R.A. Davis, and C.R. Greene. 1990. Reactions of belugas, *Delphinapterus leucas*, and narwhals, *Monodon monoceros*, to ice-breaking ships in the Canadian High Arctic. *Canadian Bulletin of Fisheries and Aquatic Sciences* 224:97-117.

Frost, K.J. and L.F. Lowry 1990. Distribution, abundance, and movements of beluga whales, *Delphinapterus leucas*, in coastal waters of western Alaska. *Canadian Bulletin of Fisheries and Aquatic Sciences* 224:39-57.

Jonkel, C.J. 1969. White whales wintering in James Bay. *Journal of the Fisheries Research Board of Canada* 26:2205-2207.

NAMMCO. 2018. Report of the Global Review of Monodontids, 13-16 March 2017, Hillerød, Denmark. North Atlantic Marine Mammal Commission, Tromsø, Norway

St. Aubin, D.J., T.G. Smith, and J.R. Geraci. 1990. Seasonal epidermal molt in beluga whales, *Delphinapterus leucas*. *Canadian Journal of Zoology* 68:359-367.

Appendix 1: Technical summary for Ontario

Species: Beluga Whale (*Delphinapterus leucas*)

Demographic information

Demographic attribute	Value
Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.	28.6 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	No. Likely stable or increasing
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Unknown
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future.	Unknown
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	a. N/A b. N/A c. N/A
Are there extreme fluctuations in number of mature individuals?	No

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	12,013km ²
Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	40km ²
Is the total population severely fragmented? i.e., is >50% of its total area of occupancy is in habitat patches that are: (a) smaller than would be required to support a viable population, and	a. No b. No

Extent and occupancy attributes	Value
(b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	
Number of locations. <i>See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.</i>	N/A
Number of NHIC Element Occurrences	12
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Unknown
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Unknown
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	N/A
Is there an observed, inferred, or projected continuing decline in number of locations?	N/A
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Inferred decline in habitat quality
Are there extreme fluctuations in number of populations?	N/A
Are there extreme fluctuations in number of locations?	N/A
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

Number of mature individuals in each sub-population or total population (if known)

Sub-population (or total population)	Number of mature individuals
<i>Sub-population (estimate)</i>	7218

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculator was completed as part of the most recent COSEWIC assessment (2020). Assigned overall threat impact: **Low**, based on the following impacts:

- Low:
 - o Pollution (Excess energy)

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes
Status of outside population(s) most likely to provide immigrants to Ontario	S2, Manitoba; S2, Quebec; S4, Nunavut
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Yes
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes
Are conditions deteriorating in Ontario?	No
Is the species of conservation concern in bordering jurisdictions?	Yes.
Is the Ontario population considered to be a sink?	Unknown
Is rescue from outside populations likely?	Possible, but probability unknown

Sensitive species

This species is not sensitive.

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada
COSSARO: Committee on the Status of Species at Risk in Ontario
ESA: Endangered Species Act
EO: Element occurrence (as defined by NHIC)
EOO: extent of occurrence
GRANK: global conservation status assessments
IAO: index of area of occupancy
IUCN: International Union for Conservation of Nature and Natural Resources
MNRF: Ministry of Natural Resources and Forestry
NHIC: Natural Heritage Information Centre
NNR: Unranked
NRANK: National conservation status assessment
SARA: Species at Risk Act
SNR: unranked
SRANK: subnational conservation status assessment
S1: Critically Imperiled
S2: Imperiled
S3: Vulnerable
S4: Apparently Secure
S5: Secure
IUCN: International Union for Conservation of Nature and Natural Resources
CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario