APPENDIX 27 2023 MARINE MAMMAL AND SEABIRD OBSERVATION REPORT

PREPARED FOR

AGNICO EAGLE

Agnico Eagle Mines Limited

Meadowbank and Meliadine Mines

Marine Mammal and Seabird Annual Report, 2023

DATE
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Meadowbank and Meliadine Mines

Marine Mammal and Seabird Annual Report, 2023

March 2024

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ACRONYMS AND ABBREVIATIONS

Agnico Eagle	Agnico Eagle Mines Limited
AIC	Akaike's Information Criterion
AIS	Automatic Identification System
CI	Confidence Interval
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
ECSAS	Eastern Canada Seabirds at Sea
GIS	Geographic Information System
GPS	Global Positioning System
km	Kilometre
m	Metre
MEMP	Marine Environmental Management Plan
MMMMP	Marine Mammal Management and Monitoring Plan
MMSO	Marine Mammal and Seabird Observer
NIRB	Nunavut Impact Review Board
PC	Project Certificate
RSA	Regional Study Area
SARA	*Species at Risk Act*
SE	Standard Error
SMP	Shipping Management Plan
SOP	Standard Operating Procedure
VTS	Vessel Traffic Services
Woodward	Woodward Group and Companies

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) operates two mines in eastern Nunavut: the Meadowbank Complex (Meadowbank and Whale Tail Mines), approximately 85 kilometres (km) north of Baker Lake, and the Meliadine Mine, approximately 25 km north of Rankin Inlet. Agnico Eagle supplies these projects through annual sea-lifts during the open water season. The shipping company Groupe Desgagnés ships dry cargo, and the Woodward Group of Companies (Woodward) supplies fuel to Meadowbank and Meliadine.

Agnico Eagle holds three Project Certificates (PCs) from the Nunavut Impact Review Board (NIRB) for Meadowbank Mine (No. 004 and 008) and the Meliadine Mine (No. 006). These PCs include conditions related to protection of marine mammals and seabirds, including avoiding sensitive breeding and habitat areas for marine mammals and seabirds and conducting a Marine Mammal and Seabird Observer (MMSO) program by vessel crew (see Table 1 for Compliance to Project Conditions).

The objective of this report is to present a summary of the MMSO data collected by Groupe Desgagnés and Woodward during the 2023 MMSO program to support Agnico Eagle's 2023 annual report to the NIRB. Results from the previous years for Meliadine (2017 to 2022) and Meadowbank (2018 to 2022) are also provided as a comparison between years.

From 2020 through to 2023, ERM provided updated training materials for vessel crew that were delivered by Agnico Eagle to shipping companies supplying Meadowbank and Meliadine. These training materials were provided to Groupe Desgagnés and Woodward and included updated instructions for vessel crew on: 1) setbacks from sensitive marine wildlife habitats such as marine mammal haul-outs and seabird colonies, 2) mitigation procedures should marine mammals or seabirds be observed in or near the vessel path, and 3) training materials for dedicated MMSO crew observers including detailed methods for marine mammal and seabird surveys, data sheets, and training videos.

The 2023 MMSO program continues to see greater survey effort compared to pre-2020. A total of 23 Groupe Desgagnés and Woodward vessels serviced the Projects between July and October during the 2023 shipping season: nine for Meadowbank, six for Meliadine, and eight serviced both Meadowbank and Meliadine. Datasheets were obtained from 18 of the 23 vessels in 2023, which is similar to the last three years (21 of the 27 vessels in 2022, 23 of the 29 vessels in 2021, and 19 of the 25 vessels in 2020), , all of which are greater than previous years (six vessels providing datasheets in 2019, and only two participating vessels in 2018).

TABLE 1 PROJECT CERTIFICATES, CONDITIONS, COMPLIANCE, AND DOCUMENT SECTION

Project Certificate and Condition #	Compliance	Section
Meadowbank PC 004, Condition 36 Cumberland shall ensure the placement of local area marine mammal monitors onboard all vessels transporting fuel or materials for the Project through Chesterfield Inlet.	**In Compliance** Local area marine mammal monitors have conducted surveys aboard vessels transiting between Chesterfield Inlet and Baker Lake between 2008 and 2019 and 2022 to 2023. During 2020 and 2021, due to COVID-19, local monitors could not board vessels and vessel crew conducted the monitoring.	1.6 Overview 3.4 Results
Meadowbank PC 004, Condition 41 Subject to vessel and human safety considerations, Cumberland shall require shippers carrying cargo to the Project through Chesterfield Inlet to follow the following mitigation procedures in the event that marine mammals are in the vicinity of the shipping activities: a. Wildlife will be given right of way; b. Ships will maintain a straight course, constant speed, and will avoid erratic behaviour; and c. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will stop until the mammals have moved away from the area.	**In Compliance** In 2020, Agnico Eagle updated the maps and training materials showing the setbacks and mitigation measures when marine mammals and seabirds are observed. These materials were presented to Groupe Desgagnés and Woodward for distribution to all captains and bridge crew of vessels supplying Agnico Eagle Nunavut mines from 2020 through 2023. Vessel tracks, where sufficient data are available, show vessels avoiding sensitive areas for marine wildlife.	1.3 Training 1.4 Mitigation 3.1 Results
Whale Tail PC 008, Condition 38 The Proponent shall ensure that marine shipping activities avoid sensitive wildlife habitat and species along the shipping route and use a routing south of Coats Island as the primary shipping route, subject to vessel and human safety considerations.	**In Compliance** In 2023, Agnico Eagle emphasized the importance of routing south of Coats Island. As a result, captains were required to travel north of Coats Island on five occasions due to safety issues associated with inclement weather south of Coats Island.	3.1 Results
Whale Tail PC 008, Condition 39 The Proponent shall ensure that, subject to vessel safety requirements, a setback distance of at least 500 m is maintained from colonies and aggregations of seabirds and marine mammals during Project shipping transiting through Hudson Strait, Hudson Bay, and Chesterfield Inlet.	**In Compliance** In 2020, Agnico Eagle updated the maps and training materials showing the setbacks and mitigation measures when marine mammals and seabirds are observed. These materials were presented to Groupe Desgagnés and Woodward for distribution to all captains and bridge crew of vessels supplying Agnico Eagle Nunavut mines from 2020 through 2023. Vessel tracks, where sufficient data are available, show vessels avoiding sensitive areas for marine wildlife.	1.3 Training 1.4 Mitigation 3.1 Results

Project Certificate and Condition #	Compliance	Section
Whale Tail PC 008, Condition 40 The Proponent shall develop and implement a ship-based marine mammal monitoring program, as part of a Marine Mammal Management and Monitoring Plan, in consultation with Fisheries and Oceans Canada, communities, and other interested parties. The Proponent shall report any accidental contact by project vessels with marine mammals or seabird colonies to applicable responsible authorities including Fisheries and Oceans Canada and Environment and Climate Change Canada.	**In Compliance** In 2020, Agnico Eagle updated the training materials for MMSO monitoring. These materials were presented to Groupe Desgagnés and Woodward for distribution to all captains and bridge crew of vessels supplying Agnico Eagle Nunavut projects from 2020 through 2023. Results of MMSO monitoring show compliance with updated training materials. No vessel strikes with marine mammals or seabirds were reported.	1.3 Training 1.4 Mitigation 3.2 Marine Mammal Results 3.3 Seabird Results Appendices A, B, C (Training documents including Mitigation Summary and SOPs)
Meliadine PC 006, Condition 82 The Proponent shall require all contracted shipping companies to provide full-time marine wildlife monitoring using trained observers and established data collection and recording protocols. Monitoring plans should include provisions for all *Species At Risk Act* (SARA) and for the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed species (birds and mammals).	**In Compliance** In 2020, Agnico Eagle updated the training materials for MMSO monitoring. These materials were presented to Groupe Desgagnés and Woodward for distribution to all captains and bridge crew of vessels supplying Agnico Eagle Nunavut mines from 2020 through 2023. Results of MMSO monitoring show compliance with updated training materials. No vessel strikes with marine mammals or marine birds were reported.	1.3 Training 1.4 Mitigation 3.2 Marine Mammal Results 3.3 Seabird Results
Meliadine PC 006, Condition 83 The Proponent shall ensure that, subject to vessel and human safety considerations, all Project shipping adhere to the following mitigation procedures while in the vicinity of marine mammals (including polar bear) and birds: a. Marine mammals will be given right of way; b. Ships will, when possible, maintain a straight course and constant speed, avoiding erratic behaviour; and c. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife have moved away from the immediate area.	**In Compliance** In 2020, Agnico Eagle updated the maps and training materials showing the setbacks and mitigation measures when marine mammals and seabirds are observed. These materials were presented to Groupe Desgagnés and Woodward for distribution to all captains and bridge crew of vessels supplying Agnico Eagle Nunavut mines from 2020 through 2023. Vessel tracks, where sufficient data are available, show vessels avoiding sensitive areas for marine wildlife.	1.3 Training 1.4 Mitigation 3.1 Results

Setbacks from Sensitive Habitats

In compliance with Whale Tail Mine Certificate No. 008, Term and Condition 39, project vessels must follow a setback distance of 500 m from colonies and aggregations of seabirds and marine mammals while transiting through the Hudson Strait, Hudson Bay, and Chesterfield Inlet. In addition, vessels must follow a setback distance of 2 km from Marble Island, as per Meliadine's Shipping Management Plan (Agnico Eagle 2022b).

Vessel tracks were mapped along with identified sensitive areas for wildlife; where detailed data was available, vessels were shown to avoid these areas where safe to do so. Groupe Desgagnés and/or Woodward vessel tracks appeared to potentially cross through the 2 km setback polygon at Marble Island on 10 occasions, and at the Coats Island setback polygon on two occasions. However, when examining the data, it appears that a vessel only entered the 2 km Marble Island buffer on two occasions. Track data is based on satellite AIS (Automatic Identification System); therefore, ship track intersections likely occurred due to lack of ship track resolution and the intersection of existing points to create a continuous shipping track. Agnico Eagle will continue to investigate alternative commercial AIS suppliers in 2024; however, Vesseltracker remains the most reliable at this time. In addition, Agnico Eagle continues to train vessel captain regularly and remind them of the importance of maintain sensitive habitat buffers prior to the start of the shipping season.

Vessel Mitigation

Vessels are required to transit south of Coats Island whenever the weather is safe to do so. The majority (78%) of vessels servicing the Meadowbank and Meliadine projects in 2023 travelled south of Coats Island, apart from five occasions, four of which occurred in June (one occasion) and July (three occasions) due to shipping route conditions, and the other one occurred in October due to inclement weather.

Marine Mammal Monitoring

In 2023, 64 transects were surveyed for marine mammals, and 62 stationary surveys were completed. There was a total of 20 sightings (five during dedicated surveys and 15 incidentally) of marine mammals during the 2023 shipping season, compared to 32 (surveys and incidentally) in 2022, 35 (surveys and incidentally) in 2021, 12 (surveys and incidentally) in 2020, seven (all during surveys) in 2019, none in 2018, and six (all incidental) in 2017. The majority of all marine mammal sightings between 2017 and 2023 were recorded in the Hudson Strait or near Marble Island and Chesterfield Inlet. There is an insufficient number of marine mammal sightings recorded to conduct a density analysis. No marine mammal-vessel interactions (e.g., strikes) were recorded by Groupe Desgagnés or Woodward in 2023, or in previous years (2017 through 2022).

Seabird Monitoring

No interactions between vessels and seabirds were recorded during the MMSO in 2023, or in previous years. Seabird survey effort on moving vessels in 2023 was lower than 2022 and 2021 but higher than early years, with 116 surveys completed with spatial effort. The decrease in moving vessel survey spatial effort is likely attributed to a more consistent adoption of new survey methods (reinforced in 2022 and 2023), an increase in errors on survey data sheets associated

with incorrect coordinates or missing coordinates, and on fewer vessels travelling to site in 2023 (23) compared to previous years (e.g., 27 vessels in 2022 and 29 vessels in 2021). Over six years of moving vessel surveys for seabirds between 2018 and 2023, 48 species and 10,608 individual birds were recorded. The surf scoter was observed for the first time during moving surveys in 2023. The most common species recorded in 2023 were northern fulmar, razorbill, herring gull, and Wilson's storm-petrol. In 2023 northern fulmar continued to be one of the most reported species. Herring gulls were reported in a higher abundance than previous years, however, unknown gulls were under reported compared to previous years suggesting surveyors may have been more likely to identify previously unknown individuals as herring gulls. Previous to 2023 both common and thick-billed murre were recorded in relatively high abundance, however, in 2023 during moving surveys there were only two observations for both species combined. This suggests that common and thick-billed murre may have occurred at lower abundances in 2023 or they were more likely to be misidentified.

Seabird detectability and density were estimated using models which account for lower detectability of birds with greater distance from survey transects. Detectability estimates were mostly consistent between years, with the highest estimate in 2022, followed by 2019 and 2021. The detectability estimate in 2023 was the second lowest since modelling started in 2018, however, 2023 had the second highest predicted seabird density in the same time span. Both the spatial effort of surveys in 2023 and the number of seabirds detected during moving surveys were lower than previous years. The differences in estimated density reflect variability in the effort and number of birds detected between years.

Stationary vessel survey effort was approximately 82% higher than in 2022 and this is due to more consistent reporting of survey effort. A total of 134 stationary surveys were completed in 2023 which was the most out of all years, however, survey effort was only the third highest. This could be attributed to fewer vessels overall travelling to site in 2023 and to a change in survey methods in 2022 for shorter consecutive surveys which was more successfully implemented in 2023. A total of 3,602 individuals from 39 species were recorded during stationary vessel surveys from 2019 to 2023. The detection rate for stationary vessel surveys more than half of that for moving vessel surveys. This result is generally consistent with the data, which indicates that both detections and number of birds recorded per survey were lower for stationary surveys compared to moving surveys.

Marine Wildlife Observations – Baker Lake

Agnico Eagle conducts a program of community wildlife observers on barges ferrying supplies between Helicopter Island and Baker Lake within Chesterfield Inlet. Community wildlife observers record wildlife sightings incidentally. In 2023, incidental surveys were conducted over 27 days by local wildlife monitors between Helicopter Island and Baker Lake in July, August, and October. Wildlife were observed on 199 occasions in 2023. There were 195 separate sightings of birds (total of 663 individuals), one sighting of caribou (one individual), two sightings of muskox (13 individuals), and one sighting of an unknown seal species (one individual). The most frequently recorded birds were unknown gull species.

In addition to community wildlife observers, the shipping companies continued to record marine wildlife sightings while vessels were at anchor near Helicopter Island, or on the tugs/barges between Helicopter Island and Baker Lake to supplement the community observer effort. In 2023, crew members onboard the tugs (Atlantic Beech and Atlantic Elm) recorded a total of 36 incidental sightings while transiting between Helicopter Island and Baker Lake over 35 separate days between July 13 and August 31. Two marine mammals were recorded incidentally in July (one harbour seal and one bearded seal), and a total of 265 seabirds were recorded across 13 different species.

In addition to the incidental sightings by the barges, vessels also completed stationary surveys while anchored at Helicopter Island and moving transect surveys when conditions allowed. In 2023 there were 42 stationary surveys for marine mammals completed at Helicopter Island. No marine mammals were observed during any of these surveys. For seabirds, 94 stationary surveys were completed (one of which had temporal effort recorded) and 17 moving transect surveys. During stationary seabird surveys, 792 individuals across 10 different species were observed, and during moving transect surveys, 282 individual seabirds across 11 different species were observed.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

Agnico Eagle Mines Limited (Agnico Eagle) contracts the shipping company Groupe Desgagnés to ship cargo and Woodward Group and Companies (Woodward) to ship fuel from Bécancour, Quebec, to its Nunavut Operations, Meadowbank and Meliadine. Since 2017, Agnico Eagle has required shipping companies to conduct vessel-based monitoring of marine mammals and seabirds using the vessel crew.

The Marine Mammal and Seabird Observer (MMSO) Annual Report summarizes results of the 2023 shipping season. The MMSO monitoring program and report satisfies the following Project Certificate Conditions from the Nunavut Impact Review Board (NIRB):

- Whale Tail NIRB Project Certificate No. 008, Terms and Conditions 38, 39, and 40 (NIRB 2020);
- Meliadine Mine NIRB Project Certificate No 006, Terms and Conditions 82 and 83 (NIRB 2022); and
- Meadowbank NIRB Project Certificate No. 004, Terms and Conditions 36 and 41 (NIRB 2018).

This monitoring program is described in:

- the Meadowbank Shipping Management Plan Version 4 (Agnico Eagle 2022a); and
- the Meliadine Shipping Management Plan Version 9 (Agnico Eagle 2022b).

In 2020, the MMSO program was improved following comments from interveners on previous years' MMSO reports. ERM worked with Agnico Eagle to:

- develop training materials, Standard Operating Procedures (SOPs), and data sheets for Groupe Desgagnés and Woodward personnel who would be acting as MMSO observers (Appendices A to C);
- develop mitigation SOPs for vessel crew when marine mammals and seabirds are observed; and
- develop and present training workshops for MMSO observers.

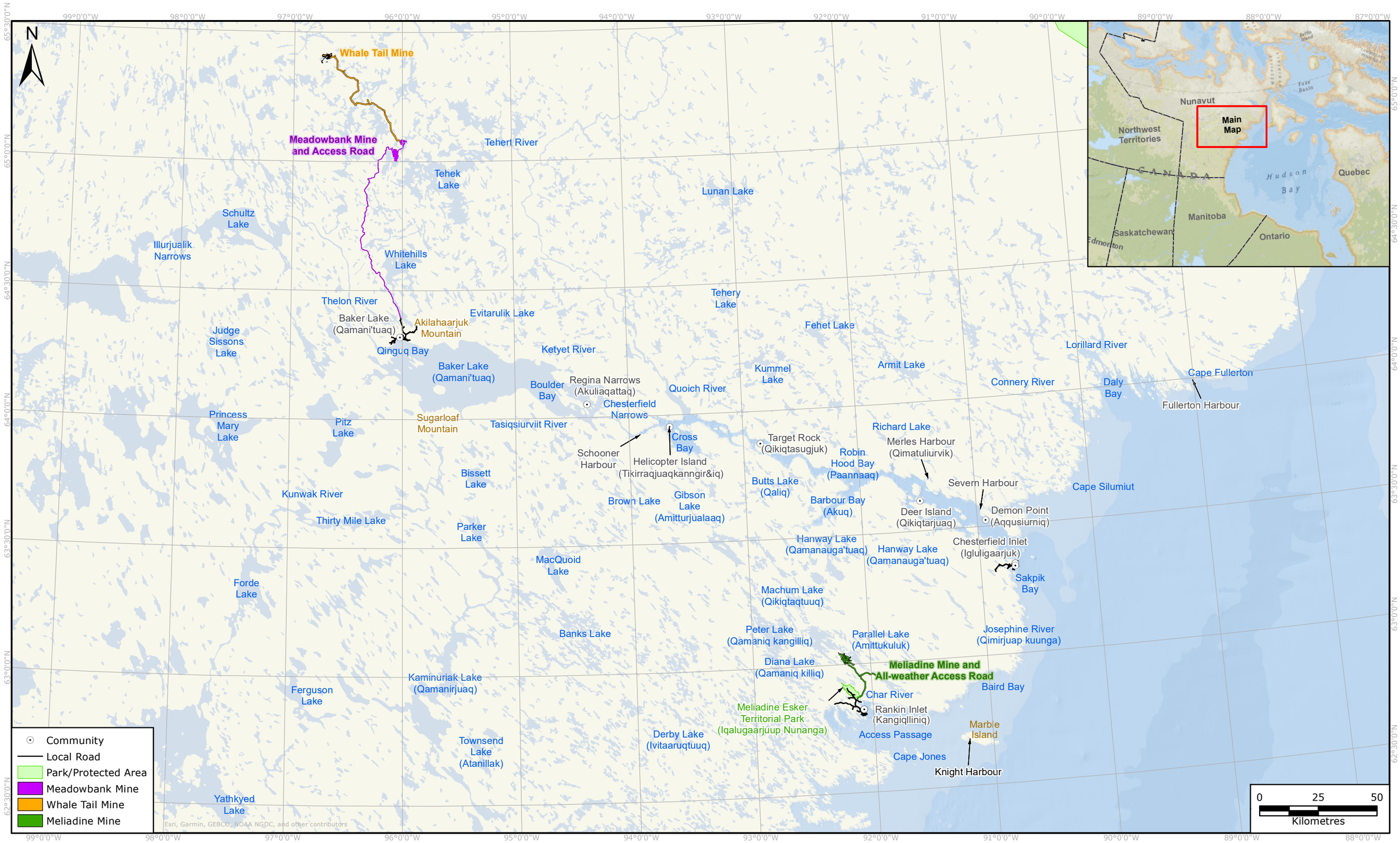
Since the requirements for the Meadowbank and Meliadine projects are very similar, and as initiated in 2020, the 2023 MMSO Annual Report addresses reporting for both projects.

1.1.1 AGNICO EAGLE MEADOWBANK COMPLEX

Agnico Eagle – Meadowbank Complex operates the Meadowbank and Whale Tail Mines (Figure 1.1-1). The Meadowbank Complex holds NIRB Project Certificates 004 and 008.

Shipping is carried out during the open water season (typically from July to late October) and follows recommended shipping routes that are presently in use for the annual sea lift to Chesterfield Inlet, Baker Lake, and other communities. The shipping route extends through Hudson Strait and across Hudson Bay to Chesterfield Inlet (Figure 1.1-2). There, dry cargo is lightered onto tug-assisted barges and fuel is lightered onto smaller shuttle tankers for Groupe Desgagnés and/or Woodward through the Baker Lake access passage (Chesterfield narrows, south channel) to the Meadowbank Mine barge unloading facilities and laydown area in Baker Lake.

FIGURE 1.1-1 MELIADINE AND MEADOWBANK MINE LOCATIONS



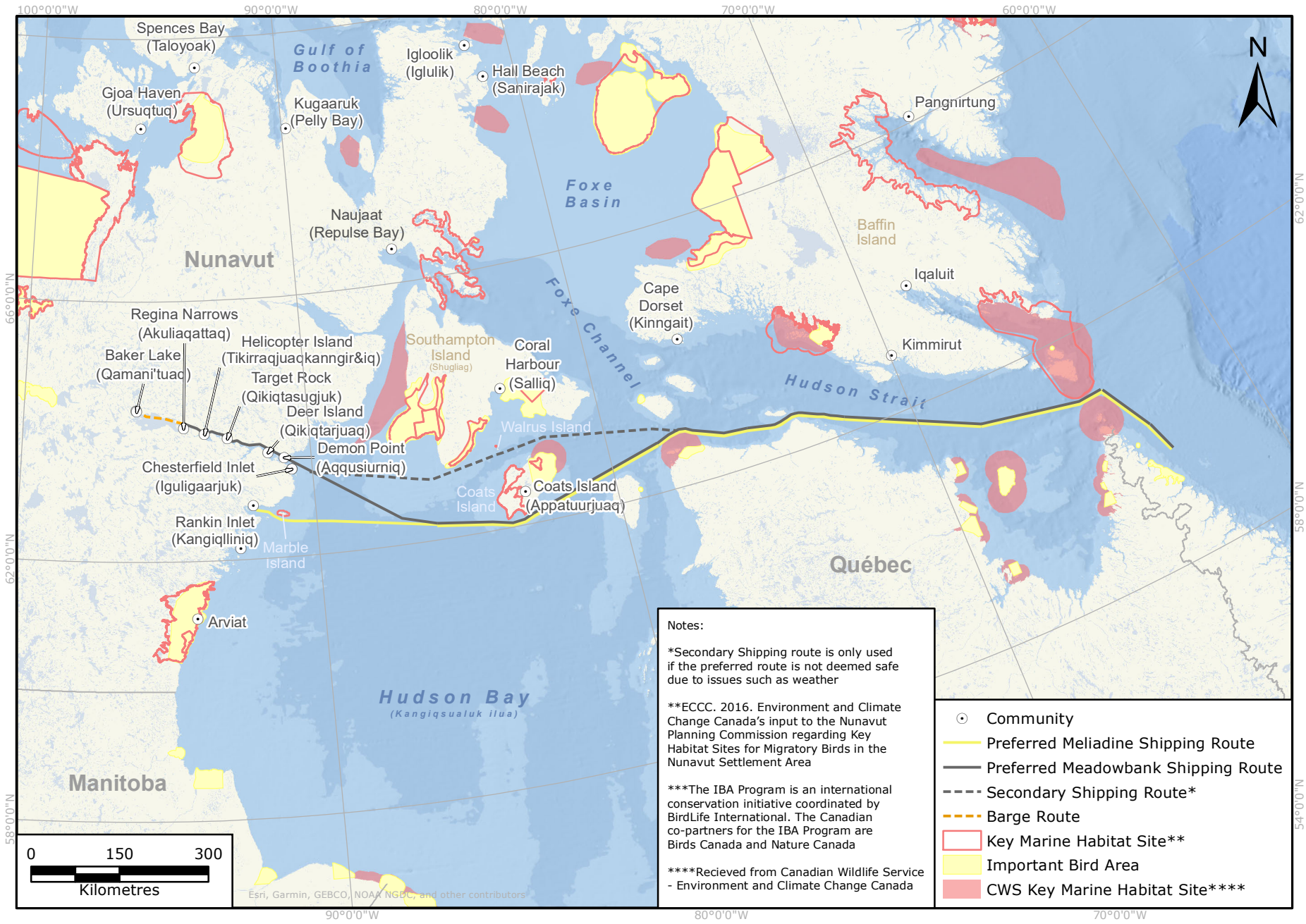
ERM

CLIENT: Agnico Eagle Mines Limited
GIS NUMBER: AEG-15-074a

DATE: 02/02/2024

PROJECTION: Canada Lambert Conformal Conic
SCALE: 1:1,500,000 when printed at 11x17

FIGURE 1.1-2 MARINE MAMMAL AND SEABIRD OBSERVER PROGRAM STUDY AREA ALONG SHIPPING ROUTE TO MELIADINE AND MEADOWBANK MINES



ERM

CLIENT: Agnico Eagle Mines Limited
GIS NUMBER: AEG-15-074b

DATE: 02/02/2024

PROJECTION: Canada Lambert Conformal Conic
SCALE: 1:9,000,000 when printed at 8.5x11

In addition, the Meadowbank Complex is required to place a local area marine wildlife monitor on-board all vessels transporting fuel or materials for the Project through Chesterfield Inlet to satisfy the NIRB Project Certificate No. 004, Term and Condition 36.

Whale Tail Mine Certificate No. 008, Term and Condition 39 requires that project vessels must follow a setback distance of 500 m from colonies and aggregation of seabirds and marine mammals while transiting through the Hudson Strait, Hudson Bay, and Chesterfield Inlet. To support compliance with this condition, setback polygons were created (Figure 1.1-2).

1.1.2 AGNICO EAGLE MELIADINE DIVISION

Agnico Eagle – Meliadine Division operates the Meliadine Mine (Figure 1.1-1). The Meliadine Project holds the NIRB Project Certificate 006.

Shipping is carried out during the open water season (typically from July to late October) and follows the recommended shipping routes presently in use for the annual sea lift to Rankin Inlet and other Kivalliq communities. The shipping route study area extends through Hudson Strait and across Hudson Bay to Rankin Inlet, with vessels anchoring either outside or inside Melvin Bay (Figure 1.1-2).

1.1.3 MMSO ANNUAL REPORT OVERVIEW

This MMSO Annual Report provides an overview of:

- training, mitigation, and monitoring required on vessels (Section 1.3, 1.4, 1.5);
- the vessels that supplied Meadowbank Complex and Meliadine in 2023 (Section 3.1);
- mitigation measures conducted by these vessels, including setbacks from sensitive habitats, traveling south of Coats Island and avoiding marine mammals and seabirds observed at sea (Sections 3.1.1, 3.1.2, 3.1.3);
- marine mammal monitoring conducted from 2017 to 2023 (2017 was for Meliadine only; Section 3.2);
- seabird monitoring conducted from 2018 to 2023 (Section 3.3); and
- community surveys carried out from barges between Helicopter Island in Chesterfield Inlet and the Hamlet of Baker Lake from 2008 to 2023 (with the exception of 2020 and 2021, when these surveys were completed by Groupe Desgagnés and Woodward due to restrictions related to the Covid-19 pandemic; Section 3.4). The shipping companies continued to record sightings in 2022 and 2023 to supplement the community effort (Section 3.4.1).

1.2 MMSO PROGRAM OBJECTIVES

The Meadowbank and Meliadine Shipping Management Plans (SMPs) outline a MMSO program within the Meadowbank Complex Marine Mammal Management and Monitoring Plan (MMMMP; Agnico Eagle 2022c) and Meliadine Marine Environmental Management Plan (MEMP; Agnico Eagle 2022d) that is implemented by Agnico Eagle shipping contractors (Agnico Eagle 2022a, 2022b). Groupe Desgagnés and Woodward are required to implement a MMSO program during shipping activities in the marine Regional Study Area (RSA; Hudson Strait through Hudson Bay) and in Chesterfield Inlet.

The objectives of the MMSO program are to:

1. mitigate interactions between marine mammals and seabirds and Project vessels;
2. collect information on marine wildlife presence along the shipping route; and
3. engage local community members to record sightings of wildlife opportunistically while travelling through Chesterfield Inlet.

As the MMSO related Terms and Conditions are similar between Meadowbank and Meliadine, the MMSO program is presented in one consolidated report in 2023, as has been done since 2020. This report presents a summary of the MMSO data collected by Groupe Desgagnés and Woodward on-board their vessels during the 2023 MMSO program to provide information to support Agnico Eagle's 2023 Annual Reports to the NIRB. This report also includes a summary of all data collected between 2017 and 2023.

1.3 MMSO TRAINING

Training provided by Agnico Eagle for the assigned MMSOs was updated in 2020. Minor updates to the seabird datasheets were completed in 2021, 2022, and 2023, and the seabird SOP in 2023 following comments from Environment and Climate Change Canada (ECCC) to encourage MMSOs to improve data collection using five-minute survey intervals for seabird surveys (see survey methods in Section 2.3). In March, 2023, Agnico Eagle presented at a Desgagnes seminar to remind the crews of obligations related to the MMSO program (PC requirements, mitigation, etc.) and the importance of program for compliance. Training was also provided to vessel captains and crew, as well as holding monthly meetings with the shipping companies to provide additional recommendations and feedback on data collection. The enhanced training material included the following:

- A Marine Shipping Mitigation Summary Brochure (Appendix A), which is required to be reviewed by all captains and assigned MMSOs, and to be kept by captains onboard the vessel at all times for easy and quick reference. This is a 10-page document summarizing guidelines for operation of vessels (e.g., how to transit near animals, preferred routes), mitigation measures for captains based on Section 4.2 of the SMPs, as well as a summary of the monitoring program and survey techniques.
- A pre-trip training presentation/webinar was created and recorded in 2020 and was required to be reviewed by vessel crew members in 2023. The recorded webinar is also available on the ship for review by MMSOs as needed.
- All MMSOs and captains are required to review and become proficient with the material provided in the Marine Mammal Monitoring SOP (Appendix B) and the Seabird Monitoring SOP (Appendix C), which details the methods for conducting both types of surveys.
- Crew are required to learn marine mammal and seabird identification, including common species (identification guides have been provided and updated posters were provided in 2023).
- All MMSOs and captains are required to review how to fill out the *Marine Mammal Sightings Form, Seabird Sightings Form, Incidental Marine Wildlife Sightings Form*, and the *Marine Mammal and Seabird Observer (MMSO) Incident Report Form* (Attachments in Appendices B and C).
- A one-page fact sheet for marine mammal surveys and a one-page fact sheet for seabird surveys were created in 2022 and provided to the shipping companies again in 2023 to emphasize survey methodologies for the MMSOs.

In addition, the Marine Mammal Sightings Form, Seabird Sightings Form, Incidental Marine Wildlife Sightings Form, and the Marine Mammal and Seabird Observer (MMSO) Incident Report Form have continually been updated between 2020 and 2023 to improve data collection and simplify the process for the MMSOs onboard the vessels. These data sheets are provided as attachments within Appendices B and C.

1.4 MARINE MAMMAL AND SEABIRD MITIGATION

Project Certificates 004, 006, and 008 require vessels supplying the Meadowbank Complex and Meliadine mines to avoid sensitive marine mammal and seabird habitats such as haul-outs and breeding colonies. Mitigation and management measures (summarized from Section 4.2 of the Shipping Management Plans for Meadowbank and Meliadine; Agnico Eagle 2022a, 2022b) include the following:

1. General navigational requirements while travelling through Hudson Straight to Helicopter Island or Rankin Inlet, include the following:
    - ships will, when possible, maintain a straight course and constant speed, and avoid erratic behaviour;
    - marine mammals will be given right of way as safe navigation allows;
    - the ship will not be operated in such a way as to separate an individual member(s) of a group of marine mammals from other members of the group;
    - ships will maintain the required setback distances (500 m) around marine mammals and seabirds on land;
    - ships will use a routing south of Coats Island as the primary shipping route;
    - ships travelling for the Meliadine mine will remain at least 2 km from Marble Island to avoid disturbing seals, walrus and marine birds that might be in the vicinity; and
    - ships will maintain the required setback distances around marine mammals and seabirds in the water (between 100 m and 500 m depending on group size or behaviour of animals, see Appendix A).
2. As part of the shipping companies' standard operating procedures, ship crews will monitor for marine mammals and seabirds from Hudson Strait to the lightering point near Helicopter Island (Meadowbank) or Rankin Inlet (Meliadine).
3. The ship's Master will be notified if there is a concern of the ship striking a marine mammal.
4. Ship personnel are required to take actions to avoid a possible collision by implementing management measures (e.g., reduce speed, stop vessel until animal moves away), if safe to do so.
5. If a collision occurs, the appropriate people will be contacted and the incident will be documented.

This report describes the vessel routes, and their avoidance of sensitive wildlife areas. The report also describes any observations of marine mammals and seabirds that would trigger mitigation and the mitigation that occurred, if any.

1.5 MMSO PROGRAM MONITORING ON VESSELS

The MMSO Program was developed to meet commitments made during the NIRB hearings related to marine shipping. The MMSO program is required to be conducted during all routine shipping activities along the shipping route from Hudson Strait to the project. The program includes collection of information on marine wildlife species presence along the shipping route. In addition, surveys are occasionally conducted while the vessel is anchored at Helicopter Island or Rankin Inlet. The marine mammal and seabird monitoring is conducted by ship's crew and methods are provided in Section 2 and Appendices B and C. Results of MMSO monitoring at sea are reported in Sections 3.2 and 3.3.

1.6 MARINE WILDLIFE OBSERVATIONS – BAKER LAKE

When transporting dry cargo and fuel from Bécancour to Baker Lake, deep-water vessels can enter Chesterfield Inlet, but must stop at Helicopter Island (Tikirraqjuaqkanngir&iq) at the west end of the Inlet. There, material is loaded aboard barges, and tugs move the barges through the narrow passage connecting Chesterfield Inlet to Baker Lake, and then on to the hamlet of Baker Lake.

To satisfy NIRB Project Certificate No. 004, Term and Condition 36, Agnico Eagle's Meadowbank Complex is required to engage a local area marine wildlife monitor onboard all vessels transporting fuel or dry cargo for the mine on barge shipping between Helicopter Island and Baker Lake. Local area marine wildlife observers record all observations of wildlife as incidental sightings. Note that in 2020 and in 2021, community members were not permitted to board vessels due to health and safety restrictions in place related to the Covid-19 pandemic. Therefore, Groupe Desgagnés and Woodward had their MMSOs record sightings of marine mammals and seabirds when possible while travelling on the barge. Results of marine wildlife monitoring between Helicopter Island and Baker Lake are reported in Section 3.4. In addition to local monitors, both Groupe Desgagnés and Woodward MMSOs continued to complete marine wildlife observations in 2022 and 2023 between Helicopter Island and Baker Lake. These results are presented in Sections 3.2 and 3.3 and summarized in Section 3.4.1.

2. METHODS

Groupe Desgagnés and Woodward crew members were assigned MMSO duties and were trained to complete the surveys following the SOPs (Appendices B and C) and in accordance with the methods outlined in the SMPs (Agnico Eagle 2022a, 2022b). These methods are summarized below and described in detail in Appendices B and C.

2.1 VESSEL TRACKS

Agnico Eagle provided ERM with a list of vessel names and dates of delivery for shipments to Meadowbank and Meliadine. Each vessel is required by Transport Canada to transmit Automatic Identification System (AIS) data via a transceiver on board. These data are used by other vessels and Vessel Traffic Services (VTS) to monitor vessel movements. ERM acquired archived AIS data from Vesseltracker, a commercial AIS supplier that aggregates AIS data from satellite and shore-based stations. These data vary in frequency based on distance from shore, location of shore-based stations, and position of satellites. In some cases, AIS position data is available on an hourly or sub-hourly basis, but in other cases, position data can be 12 hours or more between fixes.

Tracks for the vessel names and dates provided by Agnico Eagle were downloaded from Vesseltracker (2023) and plotted using ArcGIS 10.8.1. Only vessels traveling to Meadowbank or Meliadine are presented in this report. In addition, important bird areas and marine mammal aggregations were buffered by 500 m, and Marble Island was buffered by 2 km, as defined by the SMPs (Agnico Eagle 2022a, 2022b), to establish setback polygons. A Geographic Information System (GIS) was used to perform an overlay and near analysis to identify which lines and points intersected or were in close proximity to these buffered areas.

2.2 MARINE MAMMALS

MMSO observations were completed while the vessels were traveling to Agnico Eagle mines. Surveys are carried out by the dedicated MMSO from a high location on the vessel, either on the bow or in the wheelhouse, depending on weather. One to three surveys are completed daily from the same location on the vessel each time. Marine mammal surveys last for a minimum of 1.5 hours to not more than two hours to mitigate observer fatigue and eyestrain. A precise scan routine is carried out throughout the marine mammal observation period as described in the MMMMP and the Marine Mammal Survey SOP (Agnico Eagle 2022c, 2022d; Appendix B).

All marine mammals observed during the dedicated marine mammal survey periods are recorded on the *Marine Mammal Sightings Form*(Appendix B), including GPS location, distance to animal, angle to animal, number of individuals, species, and behaviour. If a marine mammal is observed during the voyage outside of the dedicated marine mammal observation period (i.e., off-effort), this is recorded as an incidental sighting on the *Incidental Marine Wildlife Sightings Form* (Appendix B).

Further details regarding survey methods for marine mammals are provided in the SOP provided in Appendix B, and within the MMMMP (Agnico Eagle 2022c, 2022d).

2.2.1 MARINE MAMMAL DATA ANALYSIS

This section outlines the methods used to summarize the environmental conditions, observer effort, and marine mammal sightings related to the information recorded by Groupe Desgagnés and Woodward. There were not enough marine mammal sightings recorded during the MMSO programs to conduct a density analysis. However, after an additional shipping season and due to the improvement in data collection in recent years, the possibility for a density analysis will be revisited annually.

2.2.1.1 TEMPORAL AND SPATIAL OBSERVATION EFFORT

Temporal (hours) and spatial (km) marine mammal observation effort was defined as the effort dedicated to marine mammal surveys as recorded by Groupe Desgagnés and Woodward on the MMSO datasheets. Marine mammal spatial effort was calculated as linear kilometres using GPS coordinates that were recorded at the start and end of each MMSO survey transect. Start and end times were recorded on the datasheets and were used to determine temporal effort (i.e., the time spent completing marine mammal surveys). If a start or end location, or a start or end time was not entered in the datasheet, then spatial and/or temporal effort could not be calculated for that survey and was excluded from the survey effort.

2.2.1.2 ENVIRONMENTAL VARIABLES

Environmental variables were recorded on the datasheets during surveys. These variables include wind speed and direction, sea state (Beaufort scale), weather (e.g., precipitation and cloud conditions), visibility (in km), and sun glare. Environmental variables were summarized as a percentage of observation effort.

2.3 SEABIRDS

Dedicated MMSOs are directed to complete surveys from moving and stationary platforms according to the Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic surveys from moving and stationary platforms (Gjerdrum et al. 2012). Surveys for seabirds were conducted by the dedicated MMSO from a high location on the vessel, either on the bridge or in the wheelhouse, depending on weather. Surveys are carried out at the same location on the vessel as much as possible. Surveys are best completed along a transect line; therefore, it is best to start a seabird observation period when the vessel is and will be moving in a straight line for an extended period of time (i.e., Moving Vessel Surveys, Appendix C Section 2.4.3). If the vessel is stationary (e.g., anchored) for a day or portion of a day, then a seabird survey will be required while anchored to ensure the minimum of one survey per day is met (i.e., Stationary Vessel Survey, Appendix C Section 2.4.4). Training for crew members focused on following the ECSAS protocol, which involves surveys conducted in 5-minute snapshot intervals, as per recommendations by ECCC.

For both survey types (moving and stationary), binoculars or spotting scopes are used to confirm species identification and other details when necessary. All seabirds observed during surveys are recorded including species, number of individuals, location (in flight or on water), distance to the vessel, and behaviour. Additional information regarding the seabird surveys can be found in Appendix C.

MMSOs are directed to complete each seabird survey period on a moving vessel during six consecutive five-minute periods and repeated three times a day to capture morning, afternoon and evening periods, when possible. A precise scan routine is conducted within 300 m from the vessel as described in the MMMMP and the Seabird Survey SOP (Agnico Eagle 2022c, 2022d; Appendix C). All birds observed within this 300 m transect, whether flying or on the water, are recorded and considered in-transect sightings.

Stationary vessel surveys are carried out as a 180° semi-circle scan of the surrounding area from the front (bow) of the vessel. Birds within 300 m are considered inside the survey area; however, birds beyond 300 m are still recorded. The survey ends when all seabirds within the semi-circle have been recorded, or if no seabirds are seen during the initial scan, the survey is complete.

If a seabird is observed during the voyage outside of the dedicated seabird observation period (i.e., off-effort), this is recorded as an incidental sighting on the *Incidental Marine Wildlife Sightings Form* (Appendix B).

2.3.1 SEABIRD DATA ANALYSIS

2.3.1.1 TEMPORAL AND SPATIAL OBSERVATION EFFORT

The number of survey hours and kilometres (km) were recorded as indices of effort for seabird surveys. Seabird spatial effort was calculated as linear kilometres using GPS coordinates that were recorded by Groupe Desgagnés and Woodward at the start and end of each survey interval. Start and end times recorded on datasheets were used to determine temporal effort (i.e., the time spent completing seabird surveys). Spatial effort is reported for moving vessel surveys only, while temporal effort is reported for both moving vessel and stationary vessel surveys.

Starting in 2022, crew member training focused on emphasizing five-minute interval surveys, as per the Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic surveys from moving and stationary platforms (Gjerdrum et al. 2012). Shipping companies recorded start/end time and position for each five-minute interval of a survey (for moving vessel surveys). Each survey consisted of six five-minute intervals. Survey effort was summarized by incorporating all six intervals. However, each five-minute interval was considered separately for distance models because the precise start and end locations are required for modelling.

2.3.1.2 ENVIRONMENTAL VARIABLES

Environmental conditions were recorded on survey datasheets: wind speed (Beaufort scale) and direction, sea state, weather (e.g., precipitation and cloud conditions), visibility, and sun glare. Environmental variables were summarized according to the number of seabird detections so that any trends with poorer weather or visibility conditions could be visually assessed.

2.3.1.3 DATA ANALYSIS

Distance analyses estimate the diminishing detectability of objects (e.g., birds) with greater distance from observers. For example, a bird flying within 50 m is more likely to be seen and identified than a bird flying 300 m away from an observer. Because birds at greater distances are more likely to be missed during surveys, the number of birds recorded does not represent the

true abundance of birds in the area. Distance models take these detectability changes into account and allow more accurate estimation of seabird density (Buckland et al. 2001). Seabird monitoring records included observations of seabirds at varying distances from the vessel. Data from a moving vessel can be approximated as sampling along line transects. This analysis is also possible for point data (i.e., stationary vessel surveys), but estimates of seabird density require repeated observations at the same point locations. Therefore, the analysis of the stationary vessel surveys only includes detection estimates, but not density estimates.

2.3.1.4 MOVING VESSEL SURVEYS – DATA ANALYSIS

Density of seabirds was estimated via distance modelling of moving vessel surveys, with comparison of results between years of surveying. Distance model selection did not include environmental variables, due to low sample size limiting modelling fitting capabilities (Buckland et al. 2001); visual assessment of variation in detection rate according to environmental variables was conducted to determine if any major anomalies were present with poor weather such as rain, snow, or fog.

Analysis of seabird data was performed using the Distance software adapted for R (Distance package v 1.0.7, run on R v 4.1.1; Miller et al. 2019, R Core Team 2021). First, model key functions are fit to the data to determine the general shape of the model curve, which describes the change in detection with distance. The three main key functions are: hazard rate, half-normal, and uniform. For example, a uniform function indicates that detection drops off consistently with distance (e.g., a bird is less likely to be seen at 50 m than 0 m, and less likely still to be seen at 100 m). Hazard rate and half-normal curves maintain consistent detection for a certain distance, but detection drops off more steeply at farther distances (e.g., a bird is just as likely to be detected if it is within 100 m but much less likely to be detected past 150 m; Miller et al. 2019). These key functions can have adjustment terms which refine the main model fit: cosine, simple polynomial, and hermite polynomial (a type of orthogonal polynomial) adjustments. All model key function and adjustment combinations were tested for fitting the data.

The observation data were binned into distance categories for analysis: 0-50 m, 50 to 100 m, 100 to 200 m, and 200 to 300 m. The closest distance bins were considered for grouping in case of evasive movements causing an abnormal detection distribution (e.g., if there are more sightings > 50 m away because birds dive or fly away as the ship approaches), but there did not appear to be any anomalies in the data requiring the distance bins to be grouped differently. Models accounted for variable detection according to group size; density estimates results are presented as individuals per km^2. Analyses included only on-transect sightings and did not use re-sightings of the same birds.

Models were selected using the minimum Akaike's Information Criterion (AIC; Akaike 1973). AIC values provide relative rankings between models fit with the same data, where the lowest AIC ranked model is considered the best fit to the data. Top models were also checked for adequate goodness of fit indices including plotting model curves against the data.

2.4 MARINE WILDLIFE OBSERVATIONS – BAKER LAKE

When transporting equipment and fuel from Bécancour to Baker Lake, deep-water vessels can enter Chesterfield Inlet, but must stop at Helicopter Island (Tikirraqjuaqkanngir&iq) at the west end of the Inlet. There, material is loaded aboard barges, and tugs move the barges through the narrow passage connecting Chesterfield Inlet to Baker Lake, and then on to the hamlet of Baker Lake.

To satisfy NIRB Project Certificate No. 004, Term and Condition 36, Agnico Eagle's Meadowbank Complex is required to engage a local area marine wildlife monitor onboard all vessels transporting fuel or materials for the Mine on barge shipping between Helicopter Island and Baker Lake. Local area marine wildlife observers record all observations of wildlife as incidental sightings. Note that in 2020 and in 2021, community members were not permitted to board vessels due to health and safety restrictions in place related to the Covid-19 pandemic. Therefore, during those years, Groupe Desgagnés and Woodward had their MMSOs record sightings of marine mammals and seabirds when possible while travelling on the barge, following methods described in Section 2.2 and 2.3. Local monitors and Groupe Desgagnés and Woodward MMSOs completed the marine wildlife surveys in 2023, with results from the vessel companies presented in Sections 3.2 and 3.3 and summarized in Section 3.4.1.

3. RESULTS

3.1 SHIPPING ACTIVITY IN 2023

During the 2023 shipping season, a total of 23 vessels, (two of which were tugs, 13 cargo, and eight fuel) travelled to Meadowbank (nine vessels), Meliadine (six vessels), or to both Meadowbank and Meliadine (eight vessels) between July 1 and October 31, 2023 (Table 3.1-1; Figures 3.1-1 through 3.1-4). Vessel tracks broadcast using Automated Information System (AIS) vessel positioning were downloaded from Vesseltracker (2023) and plotted using ArcGIS 10.8.1.

TABLE 3.1-1 SUMMARY OF GROUPE DESGAGNÉS AND WOODWARD VESSELS DURING THE SHIPPING SEASON, JULY TO OCTOBER 2023

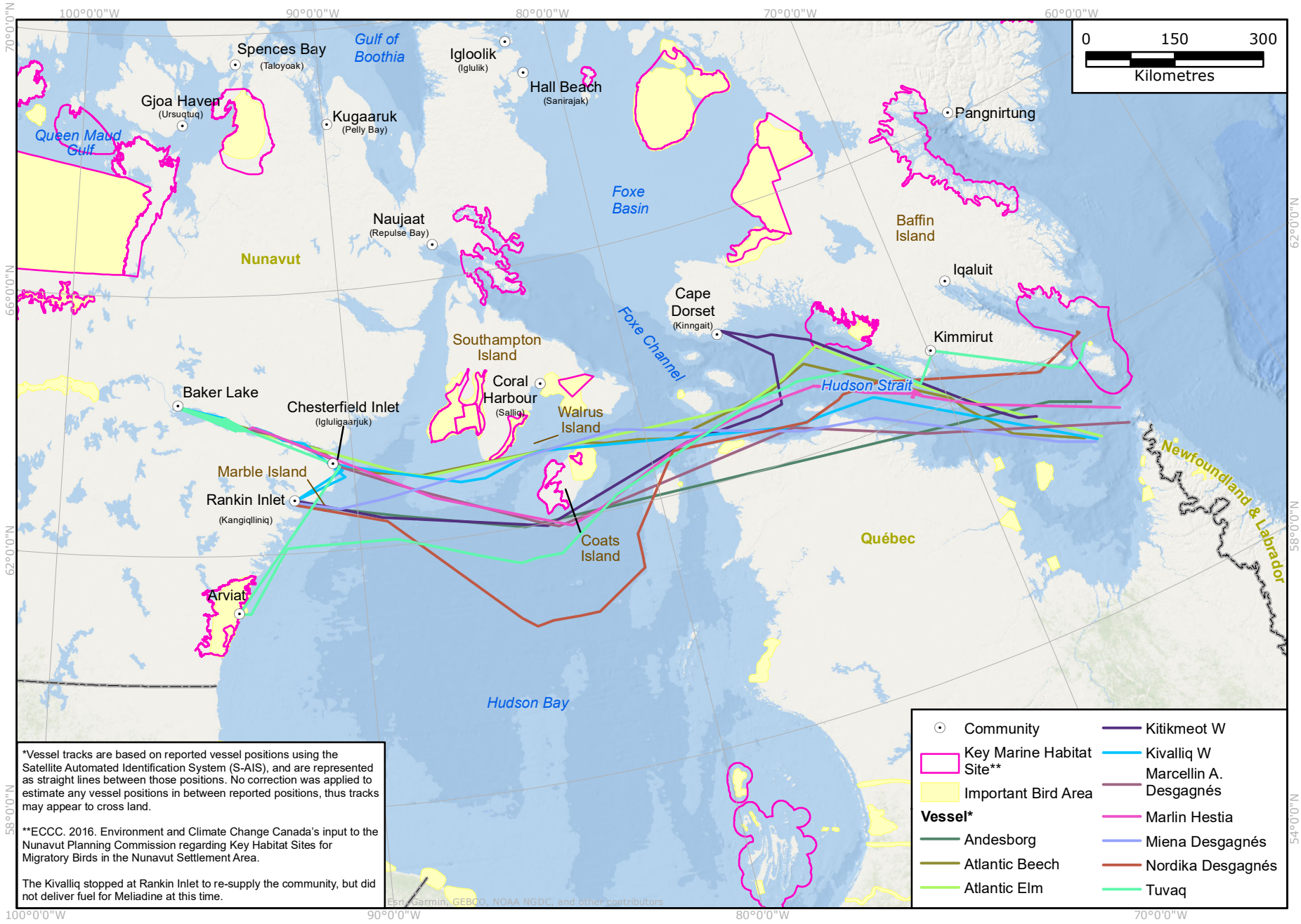
Vessel Name	Fuel or Cargo	Project and Number of Trips			Total Trips
		Meadowbank	Meliadine	Meadowbank and Meliadine	
Kivalliq W	Fuel	1	-	1	**2**
Kitikmeot W	Fuel	-	1	-	**1**
Tuvaq W[1]	Fuel	2	-	-	**2**
Marlin Hestia	Fuel	1	-	1	**2**
Marlin Amber	Fuel	-	-	1	**1**
Nordika Desgagnés	Cargo	1	2	1	**4**
Atlantic Elm Tug[2]	Cargo	1	-	-	**1**
Atlantic Beech Tug[2]	Cargo	1	-	-	**1**
Marcelline A.	Cargo	1	1	2	**4**
Andesborg	Cargo	-	1	-	**1**
Miena Desgagnés	Cargo	1	1	2	**4**
Total		**9**	**6**	**8**	**23**

[1] The Tuvaq W. was also transiting between Helicopter Island and Baker Lake for the Meadowbank mine between July 19 and August 26, and between October 9 and October 19; however, this is not included as separate trips due to the nature of the vessel transiting only locally.
[2] The Atlantic Elm and Atlantic Beech Tugs were also transiting between Helicopter Island and Baker Lake for the Meadowbank mine between July and October; however, these are not all considered separate trips due to the nature of the tug transiting only locally.

Most (74%) of these vessels delivered cargo and fuel exclusively for Agnico Eagle, while six trips also conducted community re-supply before visiting Agnico Eagle mines, including the following:

- Four vessels in July (Kivalliq W., Kitikmeot W., Tuvaq W. and Nordika Desgagnés.; Figure 3.1-1).
- Two vessels in October (Tuvaq W. and Kivalliq W; Figure 3.1-4).

FIGURE 3.1-1 GROUPE DESGAGNÉS AND WOODWARD SHIPPING TRACKS, JUNE AND JULY 2023



*Vessel tracks are based on reported vessel positions using the Satellite Automated Identification System (S-AIS), and are represented as straight lines between those positions. No correction was applied to estimate any vessel positions in between reported positions, thus tracks may appear to cross land.

**ECCC. 2016. Environment and Climate Change Canada's input to the Nunavut Planning Commission regarding Key Habitat Sites for Migratory Birds in the Nunavut Settlement Area.

The Kivalliq stopped at Rankin Inlet to re-supply the community, but did not deliver fuel for Meliadine at this time.

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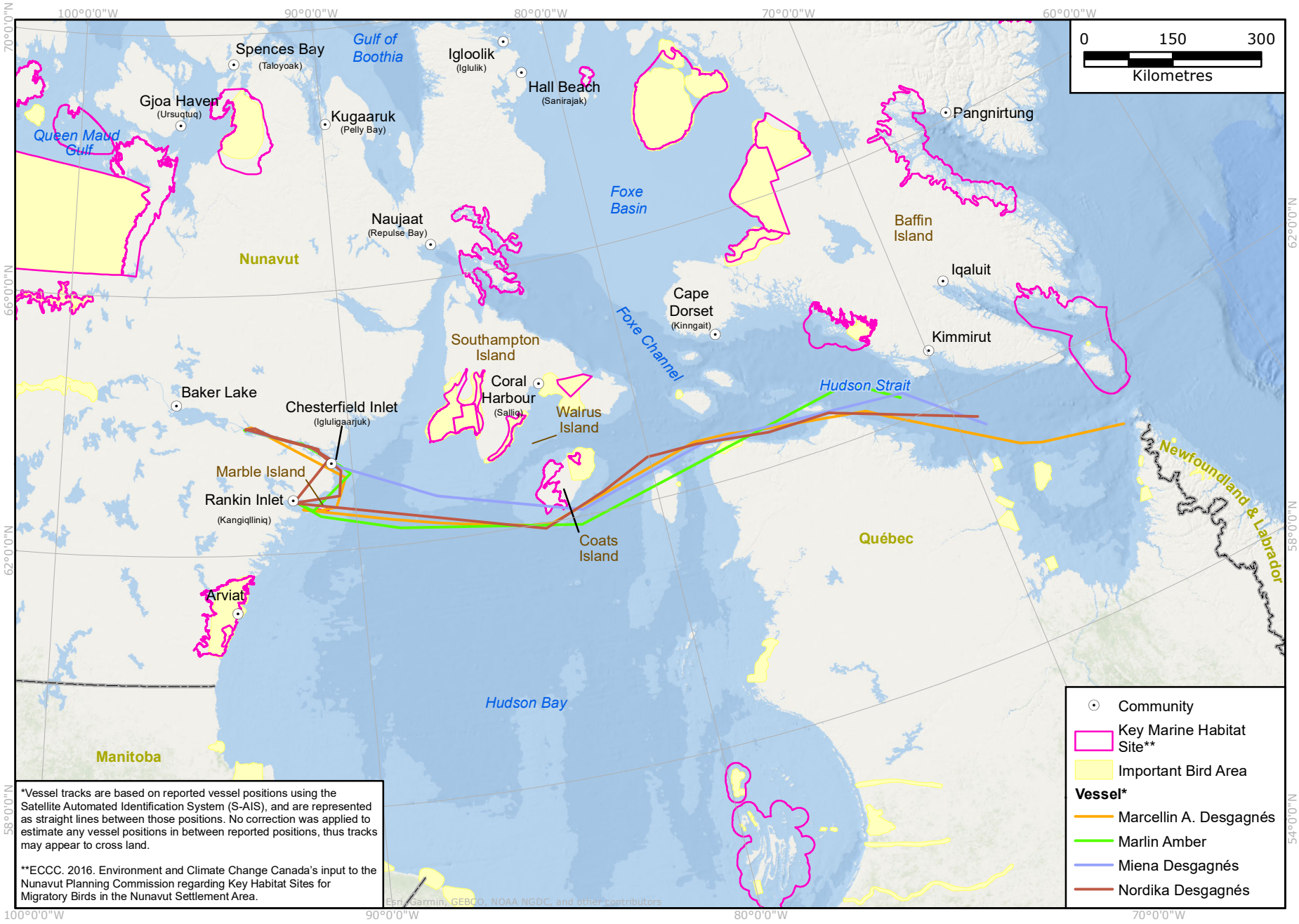
FIGURE 3.1-2 GROUPE DESGAGNÉS AND WOODWARD SHIPPING TRACKS, AUGUST 2023



*Vessel tracks are based on reported vessel positions using the Satellite Automated Identification System (S-AIS), and are represented as straight lines between those positions. No correction was applied to estimate any vessel positions in between reported positions, thus tracks may appear to cross land.

**ECCC. 2016. Environment and Climate Change Canada's input to the Nunavut Planning Commission regarding Key Habitat Sites for Migratory Birds in the Nunavut Settlement Area.

ERM

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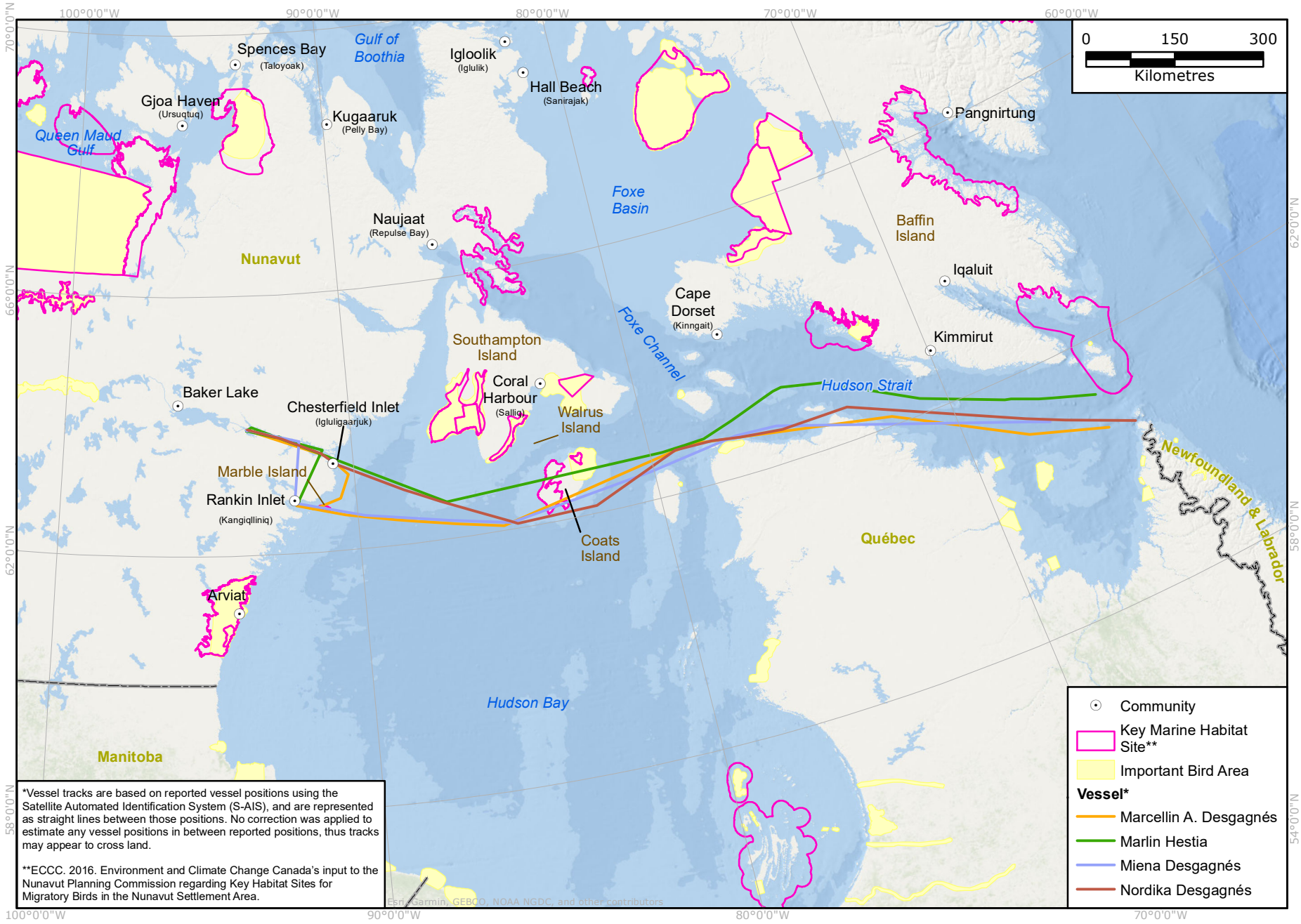
FIGURE 3.1-3 GROUPE DESGAGNÉS AND WOODWARD SHIPPING TRACKS, SEPTEMBER 2023



ERM

CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: AEG-23-034c

DATE: 01/24/2024

PROJECTION: Canada Lambert Conformal Conic
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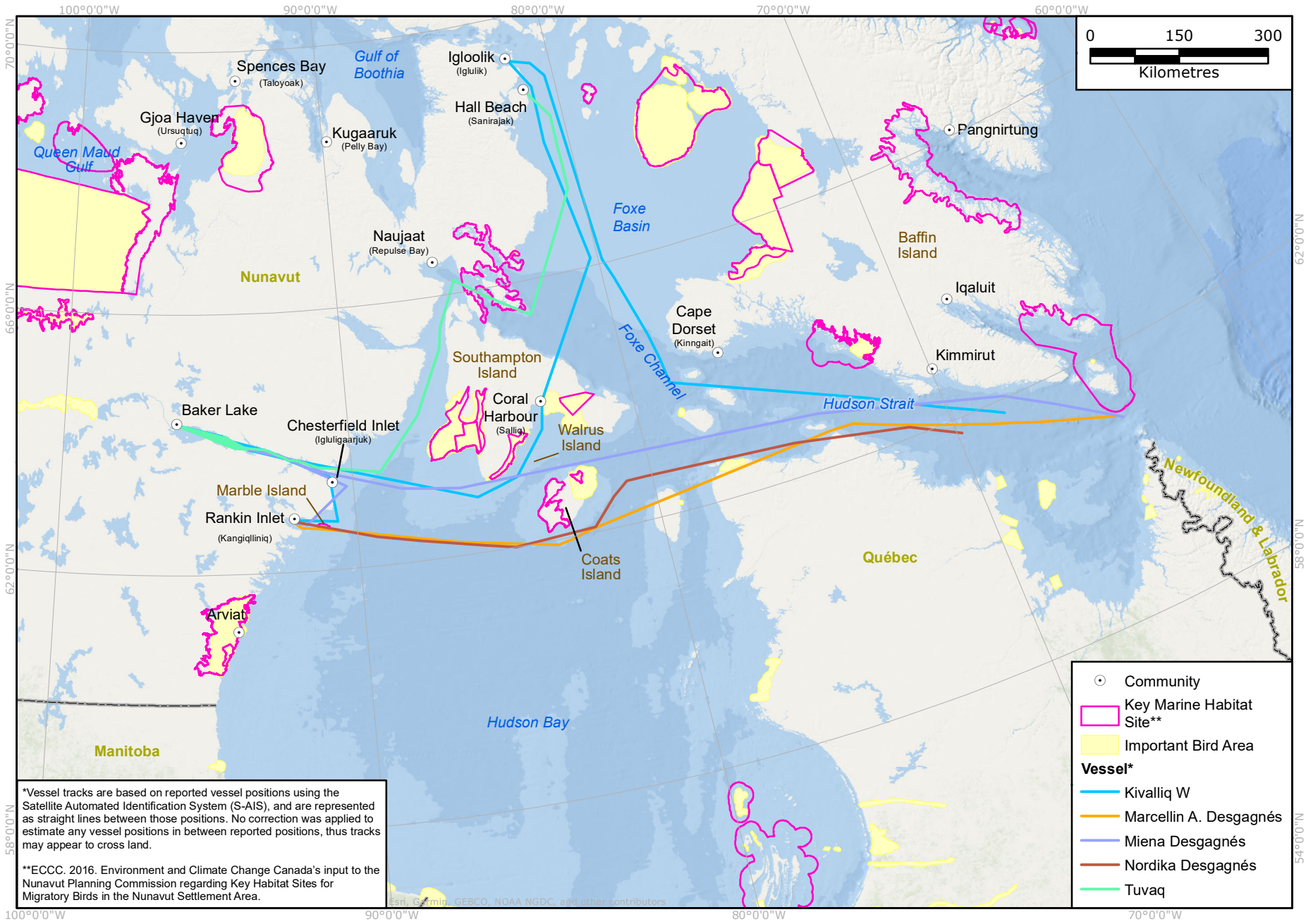
FIGURE 3.1-4 GROUPE DESGAGNÉS AND WOODWARD SHIPPING TRACKS, OCTOBER 2023



*Vessel tracks are based on reported vessel positions using the Satellite Automated Identification System (S-AIS), and are represented as straight lines between those positions. No correction was applied to estimate any vessel positions in between reported positions, thus tracks may appear to cross land.

**ECCC. 2016. Environment and Climate Change Canada's input to the Nunavut Planning Commission regarding Key Habitat Sites for Migratory Birds in the Nunavut Settlement Area.

ERM

CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: AEG-23-034d

DATE: 01/24/2024

PROJECTION: Canada Lambert Conformal Conic
SCALE: 1:9,000,000 when printed at 8.5x11

3.1.1 MITIGATION MEASURES – SETBACKS FROM SENSITIVE HABITATS

All vessels are required to follow a setback distance of 500 m from colonies and aggregation of seabirds and marine mammals while transiting through the Hudson Strait, Hudson Bay, and Chesterfield Inlet, and a setback distance of 2 km from Marble Island, as defined by the SMPs (Agnico Eagle 2022a, 2022b). Maps were produced that included these locations, buffers, and the vessel tracks.

Where AIS data was recorded frequently (every hour), vessel tracks avoided the setback areas. However, in some cases, the AIS data was recorded less frequently (every 6 to 12 hours). These long delays between position fixes create erroneous vessel tracks, with vessels in some cases appearing to cross dry land and in other cases appearing to cross the setback areas. For example, during a vessel trip by the Marlin Hestia in September (Figure 3.1-3), no positions were recorded over two days between September 16 and September 18; therefore, the vessel track appears as a straight line going directly across Coats Island, while in fact the vessel traveled south of Coats Island. In October, the Kivalliq W. appears to cross over Southampton Island (Figure 3.1-4), as no positions were recorded over 24 hours, and the vessel made a stop in the community of Coral Harbour. Due to the poor resolution of these data, information (e.g., route, setbacks) regarding these trips cannot be extrapolated with confidence. Agnico Eagle will continue to investigate alternative commercial AIS suppliers in 2024; however, Vesseltracker remains the most reliable at this time.

Track data is based on satellite positioning; therefore, ship track intersections likely occurred due to lack of ship track resolution and the intersection of existing points to create a continuous shipping track. Groupe Desgagnés and/or Woodward vessel tracks appeared to potentially cross through the 2 km setback polygon at Marble Island on 10 occasions, and at the Coats Island setback polygon on two occasions (Figures 3.1-1 through 3.1-4). However, when examining the data, it appears that a vessel only entered the 2 km Marble Island buffer on two occasions, described below.

In all cases where track lines appeared to intersect the setbacks, the point locations were investigated further. From these 10 tracks, only two location points received from the satellite AIS were located within the setback polygons: on one occasion in August, the Marcellin A Desgagnés appeared to be within the 2 km setback buffer around Marble Island (1.2 km from Marble Island), and on another occasion in October, when the same vessel was 1.85 km from Marble Island. No other points were recorded within the Marble Island setback. The closest ship track point to the Coats Island setback was recorded by the Atlantic Beech in July, 8.3 km from the setback polygon. Therefore, it is unlikely that the ship passed directly through the setbacks and that the intersections are due to lack of ship track resolution. Vessel captains will be reminded of the importance of maintaining a 2 km buffer around Marble Island prior to the start of the 2024 shipping season.

3.1.2 MITIGATION MEASURES – COATS ISLAND

The corridor between Southampton and Coats Islands has been identified by the community of Coral Harbour as an important breeding ground for walrus and marine birds, and as a potential migration route for marine mammals. Due to concerns that vessel traffic between Coats Island, Walrus Island (north of Coats Island) and Southampton Island may disturb these animals, vessels are required to transit south of Coats Island whenever the weather is safe to do so.

Of the 23 vessels servicing the Meadowbank and Meliadine mines in 2023, the majority (78%, 18 trips) travelled south of Coats Island. Vessels travelled north of Coats Island on the following five occasions (Figures 3.1-2 and 3.1-4):

1. On June 30 the Miena Desgagnés was required to use the north passage due to unsafe conditions along the shipping route in Hudson Bay.
2. On July 4, the Kivalliq W. travelled north due to conditions along the shipping route to the south of Coats Island.
3. On July 13, the Atlantic Beech travelled north of Coats Island to avoid unsafe sea conditions south of the Island.
4. On July 14, the Atlantic Elm was required to use the north passage due to unsafe conditions along the shipping route south of Coats Island.
5. On October 4, the Miena Desgagnés was required to use the north passage due to high winds and unsafe sea conditions.

The Kivalliq W. vessel track in October also travelled between the two islands; however, it was required to stop in Coral Harbour on the way to the mine sites.

3.1.3 MITIGATION MEASURES – AVOIDANCE OF MARINE MAMMALS AND SEABIRDS

Ships are required to follow mitigation measures outlined in Section 4.2 of the SMPs (Agnico Eagle 2022a, 2022b), summarized in Section 1.4 and Appendix A. In 2023, none of the marine mammal or seabird sightings triggered mitigation measures, such as slowing the vessel or changing course. No incidents with marine mammals or seabirds were reported for the 2023 shipping season.

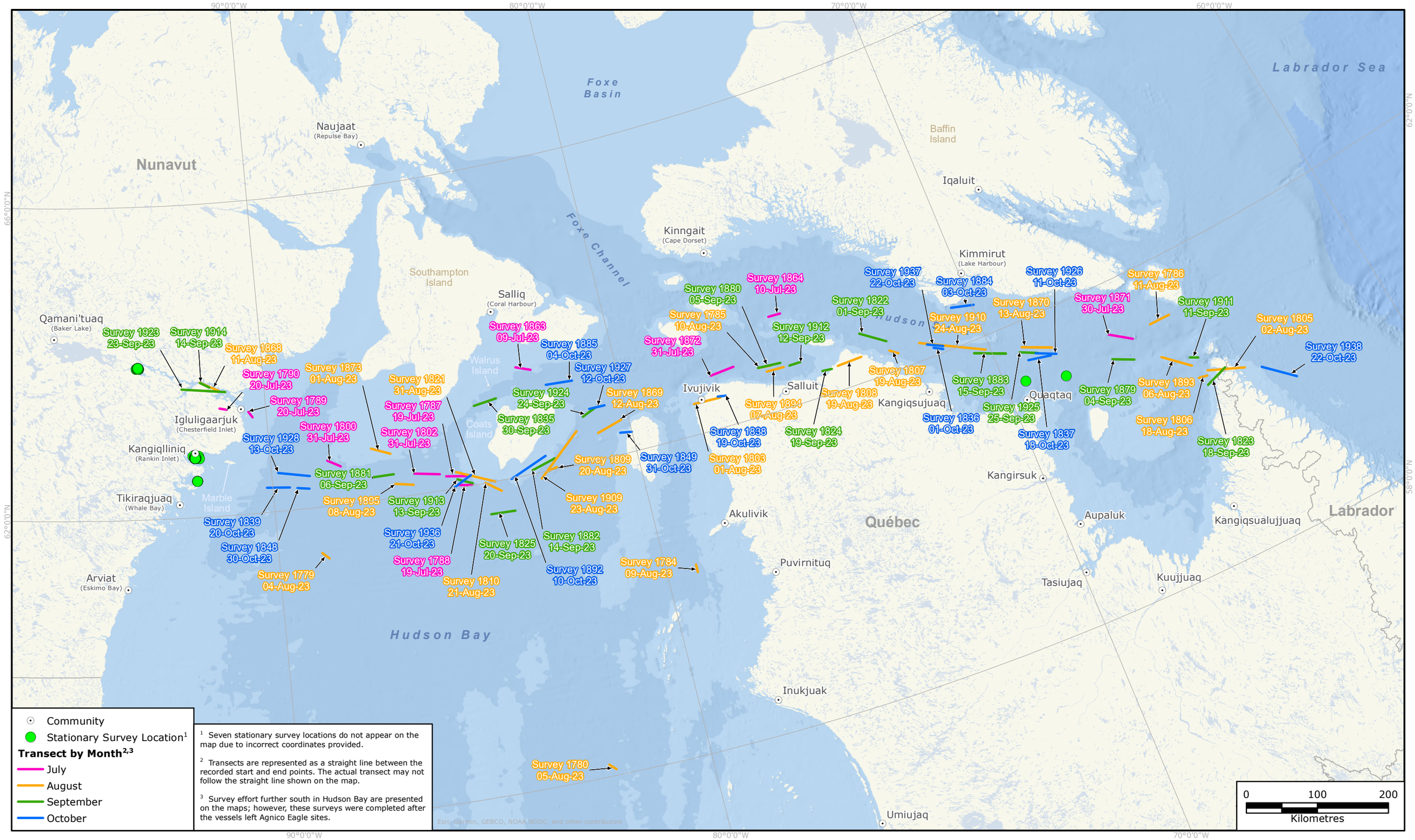
3.2 MARINE MAMMAL OBSERVATIONS

3.2.1 SURVEY EFFORT

Surveys were conducted in 2023 by dedicated crew MMSOs between Hudson Straight and Rankin Inlet/Helicopter Island between July 3 and November 1 on board various Groupe Desgagnés and Woodward vessels. A total of 172 marine mammal surveys were conducted in 2023. However, of the 172 surveys, 46 (10 moving vessel surveys and 36 stationary surveys) were excluded from the analysis of survey effort due to missing start and/or end times, or missing start and/or end latitudes or longitudes. Therefore, a total of 126 marine mammal surveys (64 while the vessel was moving, and another 62 surveys while the vessel was stationary) were completed in 2023.

The 64 transects surveyed while the vessel was moving included a total spatial effort of 1,996.4 km of marine mammal transects over 79.7 hours (Figure 3.2-1; Table 3.2-1). An additional 72.3 hours of surveying was completed while the vessel was anchored. Of the 62 stationary surveys completed while the vessel was anchored, the majority were conducted in Chesterfield Inlet near Helicopter Island and in Rankin Inlet (Figure 3.2-1). Appendix D summarizes all marine mammal surveys and sightings information.

FIGURE 3.2-1 MARINE MAMMAL SURVEY TRANSECTS AND STATIONARY SURVEY LOCATIONS, JULY TO OCTOBER, 2023



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DATE: 02/29/2024

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TABLE 3.2-1 MARINE MAMMAL SURVEY EFFORT, 2017 TO 2023

Year of Survey	Moving Surveys			Stationary Surveys
	Number of Transects Surveyed	Total km Surveyed (Spatial Effort)	Total Time (hr) Surveyed (Temporal Effort)	Total Time (hr) Anchored Vessel
2017	11	NA[1]	10.3	0.00
2018	31	1,155.7	29	0.00
2019	38	1,898.3	62.8	59.3
2020	58	2,354.7	112.3	92.5
2021	56	2,824.9	110.5	80.4
2022	92	2,765.8	109.3	56.6
2023[2]	64	1,996.4	79.7	72.4
Total	**350**	**12,995.8**	**513.9**	**361.1**

[1] Spatial data for the 2017 surveys are not available.
[2] A total of 172 surveys were completed in 2023 (74 moving, 95 stationary, and three unknown); however, due to incomplete survey effort being recorded (start or end positions or times missing), they are not included in the calculation of survey effort. Therefore, survey effort in 2023 was in fact greater, but due to data recording errors not all surveys are included in calculations of survey effort. In addition, fewer surveys were completed in 2023 due to fewer vessels travelling to Agnico Eagle in 2023 (23 vessels) compared to previous years (e.g., 27 vessels in 2022 and 29 vessels in 2021).

According to the observation datasheets completed by Groupe Desgagnés and Woodward, marine mammal observer effort in 2023 was similar to 2020, 2021, and 2022 (Table 3.2-1). In 2023, observer effort during transit was 79.7 hours and 1,996.4 km, and an additional 72.4 hours of effort while the vessel was anchored. Datasheets with missing survey times, dates and/or GPS coordinates were not incorporated into the effort analysis. In 2023, there were 10 transects while the vessel was moving that were missing either a start or end time, or the GPS coordinates for the start or end location of the transect, and 36 stationary surveys that were missing start or end times (i.e., no temporal effort). Sightings during these surveys are reported as incidental observations (see Table 3.2.3). The lower survey effort for moving transects during 2023 compared to 2020 through 2022 is attributed to these 10 additional transects with missing survey effort data, and to overall fewer vessels travelling to Agnico Eagle in 2023 (23 vessels compared to 27 in 2022 and 29 in 2021).Therefore, survey effort in 2023 was in fact greater, but due to data recording errors, not all surveys are included in calculations of survey effort.

3.2.1.1 ENVIRONMENTAL VARIABLES AND WEATHER CONDITIONS

The weather conditions (Figure 3.2-2a) for the 2023 marine mammal observation program were predominantly partly cloudy or clear (39% and 33% of the survey effort, respectively). Rain and fog were present for a combined 8% of the survey time, while snow was present for 1% of the survey effort. Average visibility extended to approximately 9 km, with a maximum estimate of 30 km and minimum of 100 m.

The sea state (Figure 3.2-2b) ranged from sea state 0 (calm) to sea state 6 (large waves with white foam crests); however, the sea state fell predominantly within states 0 (calm), 1 (ripples), and 2 (small wavelets all over; 15%, 40% and 26% of the survey effort, respectively). Large wavelets, few whitecaps (sea state 3) occurred 9% of the survey effort while sea state 4 (small waves, frequent whitecaps) occurred 3% of the survey effort. Sea state 5 (moderate waves, many whitecaps) and 6 (large waves and white foam crests) occurred rarely (1% and 1% of survey effort), and 5% of the survey effort lacked sea state data.

Glare conditions were generally favourable during surveys in 2023; however, 14% of the 2023 marine mammal surveys proceeded with bright glare (Figure 3.2-2c). Glare was recorded as none and slight/grey 65% and 17% of the time respectively, and glare data is absent for 4% of the survey effort.

3.2.2 MARINE MAMMAL OBSERVATIONS 2023

Marine mammals were observed during dedicated surveys and incidentally in 2023. Survey results, incidental sightings, and species descriptions are provided in the following sections.

3.2.2.1 MARINE MAMMAL OBSERVATIONS DURING SURVEYS, 2023

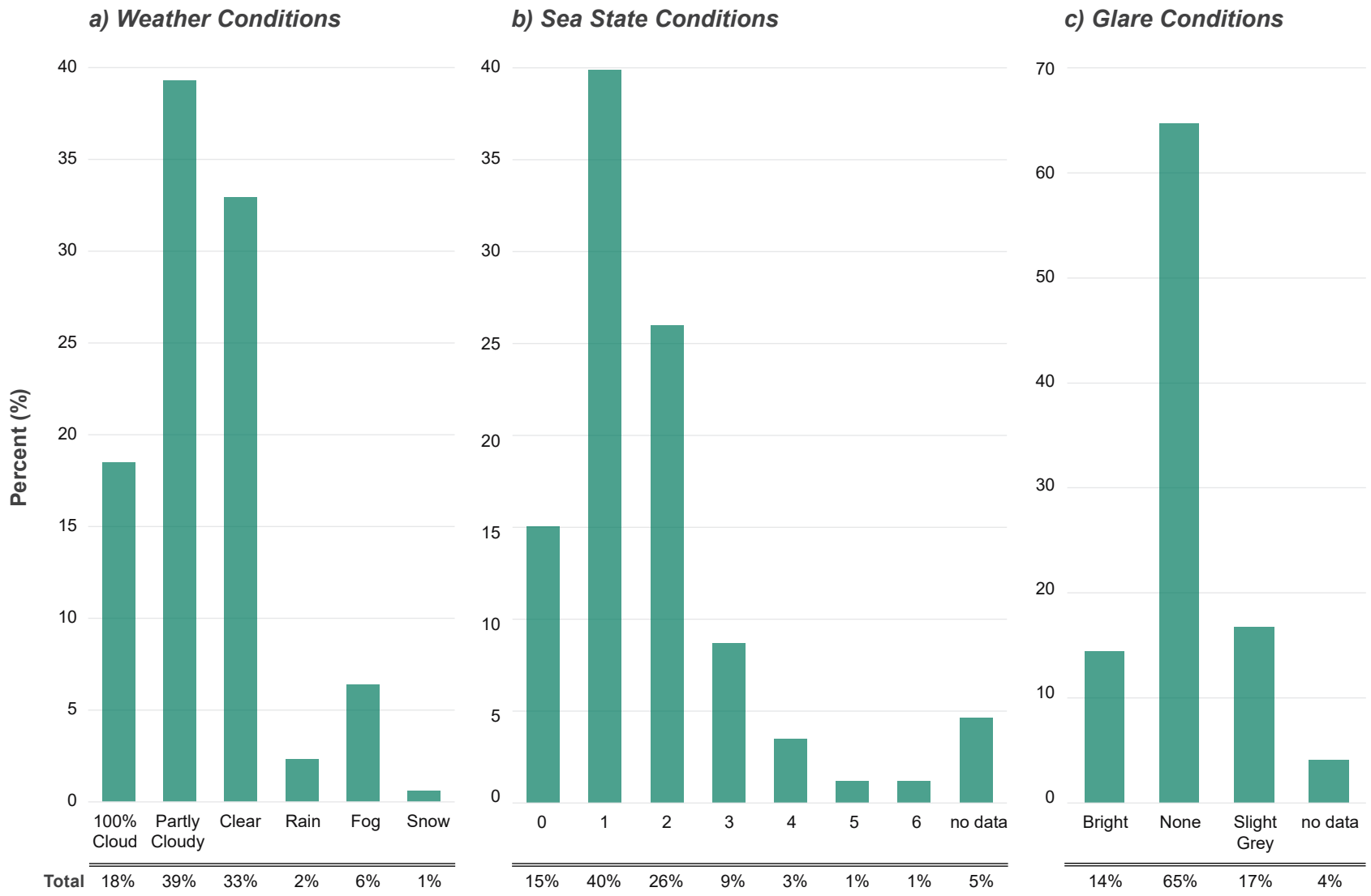
During dedicated marine mammal surveys, there were five separate sightings of marine mammals (27 animals) by Groupe Desgagnés and Woodward during the MMSO Program in 2023 (Table 3.2-2; Figure 3.2-3). Species observed included harp seal (*Pagophilus groenlandicus*) and beluga whale (*Delphinapterus leucas*). In addition, there were two separate sightings of seals that were not identified to species, as well as one sighting of unknown whale species.

TABLE 3.2-2 MARINE MAMMAL OBSERVATIONS DURING SURVEYS, AUGUST AND SEPTEMBER 2023

Month	Species Observed	Number of Sightings	Number of Animals Observed
August	Unknown Seal	2	5
	Harp Seal	1	10
	Beluga Whale	1	10
September	Unknown Whale	1	2
Total		**5**	**27**

Most of the sightings occurred in August (four sightings), while one sighting of unknown whales occurred in September in Hudson Strait. The most commonly observed species were harp seal (one group of 10 individuals in Chesterfield Inlet) and beluga whale (one sighting of 10 individuals in Hudson Strait), both observed in August. One sighting of two unknown whales traveling together was recorded in Hudson Strait on September 15. No additional notes were taken to assist in species identification.

FIGURE 3.2-2 PERCENT WEATHER, SEA STATE, AND GLARE CONDITIONS DURING MARINE MAMMAL SURVEYS CONDUCTED IN 2023



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GRAPHICS NUMBER: AGN-24ERM-002

FIGURE 3.2-3 MARINE MAMMALS OBSERVED DURING SURVEYS, AUGUST AND SEPTEMBER, 2023

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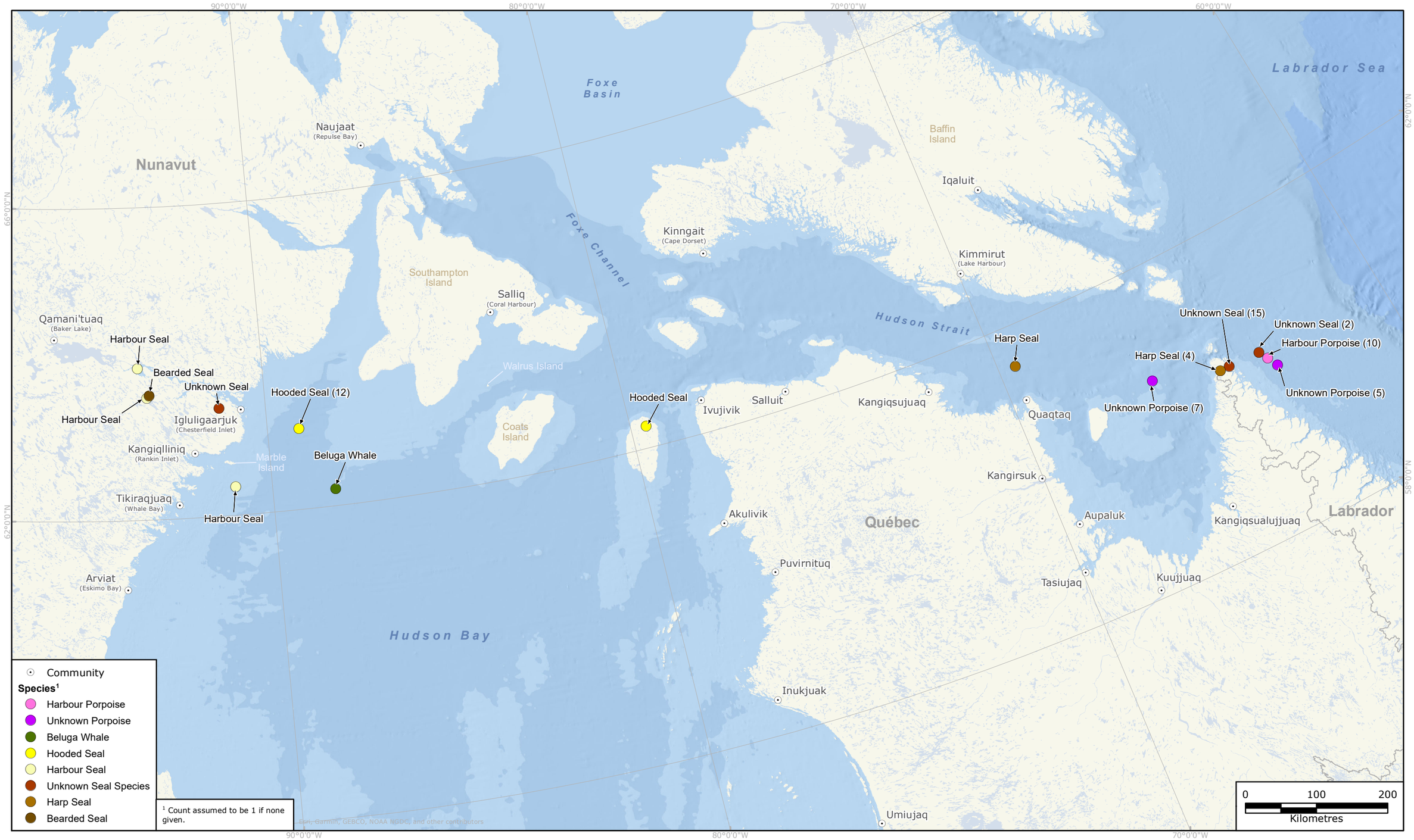
3.2.2.2 MARINE MAMMALS OBSERVED INCIDENTALLY, 2023

Incidental observations of marine mammals are sightings of animals while on the vessel, but outside of the dedicated MMSO survey time (i.e., "off-effort" sightings). There were 15 incidental observations (63 animals) during 2023 (Table 3.2-3; Figure 3.2-4). Six species were observed incidentally: beluga whale (*Delphinapterus leucas*), harbour porpoise (*Phocoena phocoena*), harbour seal (*Phoca vitulina*), harp seal (*Pagophilus groenlandicus*), hooded seal (*Cystophora cristata*), and bearded seal (*Erignathus barbatus*). In addition, unknown seal species were observed on three separate occasions and unknown porpoise species on two different occasions. Marine mammals were observed incidentally between July and October 2023.

TABLE 3.2-3 INCIDENTAL OBSERVATIONS OF MARINE MAMMALS, JULY TO OCTOBER 2023

Month	Species Observed	Number of Sightings	Number of Animals Observed
July	Bearded Seal	1	1
	Beluga Whale	1	1
	Harbour Seal	2	2
	Hooded Seal	1	1
August	Harp Seal	1	1
	Hooded Seal	1	12
	Unknown Porpoise	1	7
	Unknown Seal	1	1
September	Unknown Seal	1	15
October	Harbour Porpoise	1	10
	Harp Seal	1	4
	Harbour Seal	1	1
	Unknown Porpoise	1	5
	Unknown Seal	1	2
Total		**15**	**63**

FIGURE 3.2-4 INCIDENTAL OBSERVATIONS OF MARINE MAMMALS, JULY TO OCTOBER, 2023



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DATE: 02/29/2024

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3.2.2.3 SPECIES OBSERVED IN 2023

A summary of the marine mammal sightings by the MMSOs in 2023 is provided in the following sections.

Beluga Whale

Beluga whales were observed twice in 2023; once during dedicated surveys in August and once incidentally in July. A group of 10 beluga whales was observed on August 13 in Hudson Strait during a marine mammal moving vessel survey, and one beluga was observed incidentally on July 18 in Hudson Bay between Coats Island and Rankin Inet.

There are seven distinct populations of beluga in Canada; the whales that could occur along the shipping route belong to the Western Hudson Bay Population (COSEWIC 2004). This population's core summer range is concentrated in the Churchill, Nelson, and Seal River estuaries in southern Hudson Bay (COSEWIC 2004). During fall migration (late-August or early September), the whales pass Rankin Inlet heading north, and travel between Coats Island and Southampton Island, and through Hudson Strait (COSEWIC 2004).

Unknown Whale Species

One group of two whales was observed during a transect survey on September 15 in Hudson Strait. No additional information was provided on this sighting; therefore, the species of whale remains unknown.

Harbour Porpoise

One harbour porpoise was observed incidentally on October 18 near the tip of Labrador. A group of approximately 10 animals was observed swimming in multiple small groups. In addition, two groups of porpoises were observed incidentally – one group of seven animals was observed on August 6, and one group of five animals was observed on October 18. Both groups were observed in Hudson Strait. Both sightings occurred near the tip of Labrador and were likely harbour porpoises.

Seals

A total of 14 separate sightings of seals were recorded in 2023: three separate occasions during dedicated marine mammal surveys (Figure 3.2-3) and 11 separate incidental sightings (Figure 3.2-4). During dedicated surveys, harp seals were observed on one occasion (total of 10 individuals) near the mouth of Chesterfield Inlet, and there were two separate sightings of unknown seal species; one individual was observed in Hudson Strait, and a group of four was observed in Hudson Bay (to the southeast). Seals were only observed in August during dedicated surveys (three separate sightings of 15 individuals; Table 3.2-2).

Seals were observed incidentally (i.e., off-effort) on an additional 11 occasions in 2023 (Figure 3.2-4). Three separate sightings of unknown seal species occurred in August (one individual), September (15 individuals), and October (two individuals; Figure 3.2-4; Table 3.2-3). There was one sighting of a single bearded seal in July, and two sightings (two individuals) of harbour seals

in July (Figure 3.2-4; Table 3.2-3). Hooded seals were observed on two separate occasions, in July and August (one and 12 individuals, respectively) and harp seals were also observed on two separate occasions, in August and October (one and four individuals, respectively; Figure 3.2-4; Table 3.2-3). The largest group of seals observed was of approximately 15 individual unknown seals, observed on September 11 near the entrance to Hudson Strait.

3.2.3 MARINE MAMMAL OBSERVATIONS 2017 TO 2023

Marine mammals have been observed during surveys and incidentally between 2017 and 2023 (Figures 3.2-5 and 3.2-6). A total of six different species were identified along the shipping route in 2023, and an additional three unknown species (unknown whale species, unknown porpoise species, and unknown seal species). This is a similar number to previous years, with the exception of 2021, when more species were observed. In 2022, seven species were identified, in 2021, 13 species were identified, in 2020, four species were recorded, in 2019, five species were recorded, and there were no recorded observations of marine mammals during surveys in 2018 or 2017; however, marine mammals were observed incidentally (off-effort) in 2017 (Table 3.2-4). From 2017 to 2022, the number of marine mammal individuals observed increased (Figure 3.2-7), with 2023 presenting less individuals observed than 2021 and 2022. The diversity of species (i.e., number of different species observed) has fluctuated (Figure 3.2-7), with the highest diversity observed in 2021 (13 species, excluding unknowns) and 2022 (seven species, excluding unknowns).

Species observed in previous years are summarized in Table 3.2-4. Sightings during 2022 included fin whale, pilot whale, walrus, polar bear, and seals. Sightings during 2021 included white-beaked dolphin, white-sided dolphin, blue whale, minke whale, beluga whale, fin whale, killer whale, walrus, polar bears and seals. Sightings during surveys in 2020 included white-beaked dolphins, walrus, polar bears, and seals. Sightings during surveys in 2019 included bowhead whale (*Balaena mysticetus;* one sighting of three to four individuals), fin whale (one sighting of one individual), harp seal *(*one sighting of four individuals), killer whale (three sightings totaling eight individuals), and polar bear (one sighting of one individual; Table 3.2-4). All sightings of whales in 2019 were within Hudson Strait (Figure 3.2-5). No unidentified marine mammals were recorded during the 2019 MMSO program.

In 2017, marine mammals were only observed incidentally (i.e., off-effort), and no marine mammals were observed during dedicated surveys. The marine mammals observed incidentally in 2017 included walrus (three sightings of three, two, and one individual), harp seal (one sighting of one individual), and unidentified seal species (two sightings of one individual each; Table 3.2-4). The walruses were observed near Marble Island and near Charles Island in Hudson Strait (Figure 3.2-6).

FIGURE 3.2-5 MARINE MAMMALS OBSERVED DURING MMSO SURVEYS, 2019 TO 2023

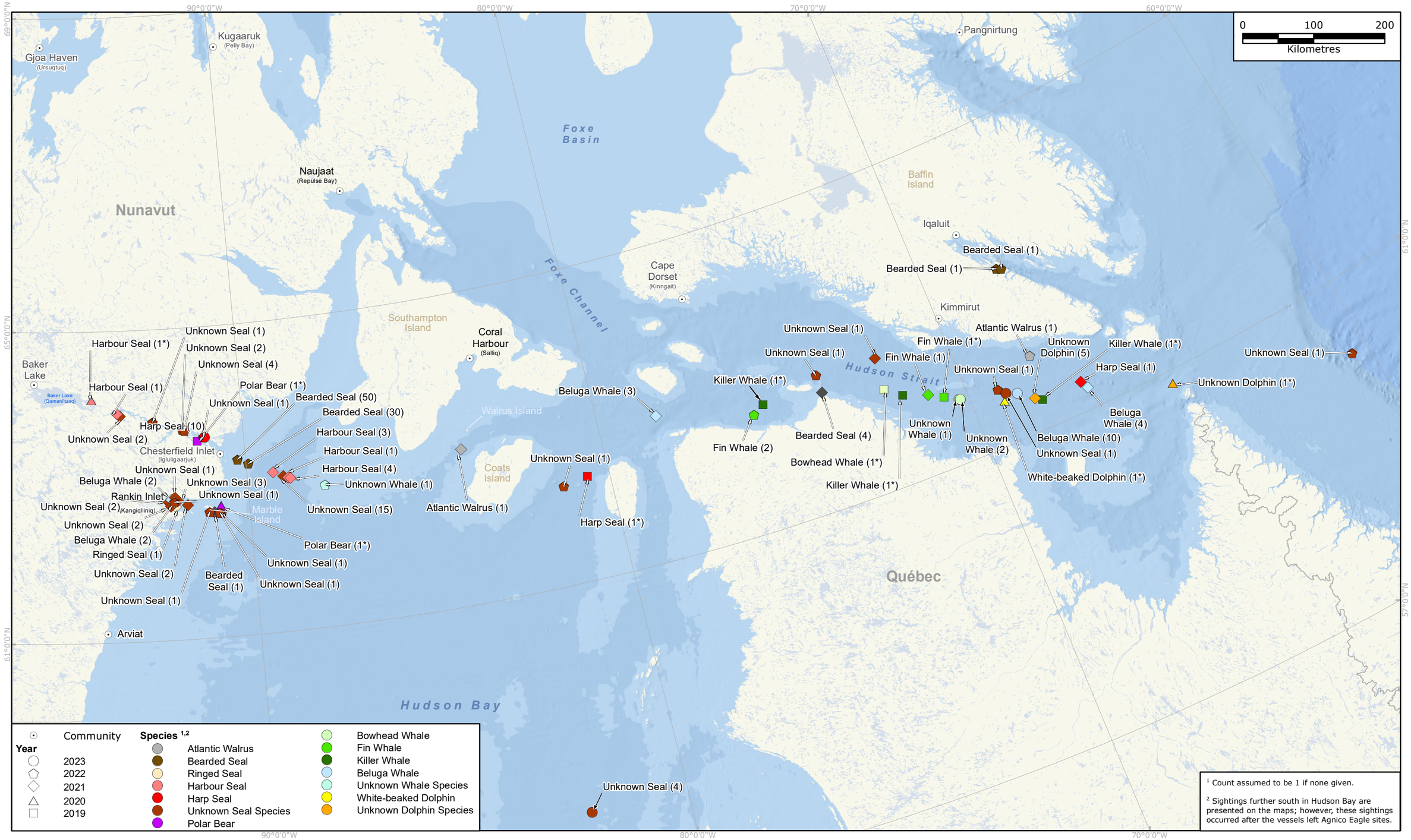

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FIGURE 3.2-6 INCIDENTAL OBSERVATIONS OF MARINE MAMMALS, 2017 TO 2023

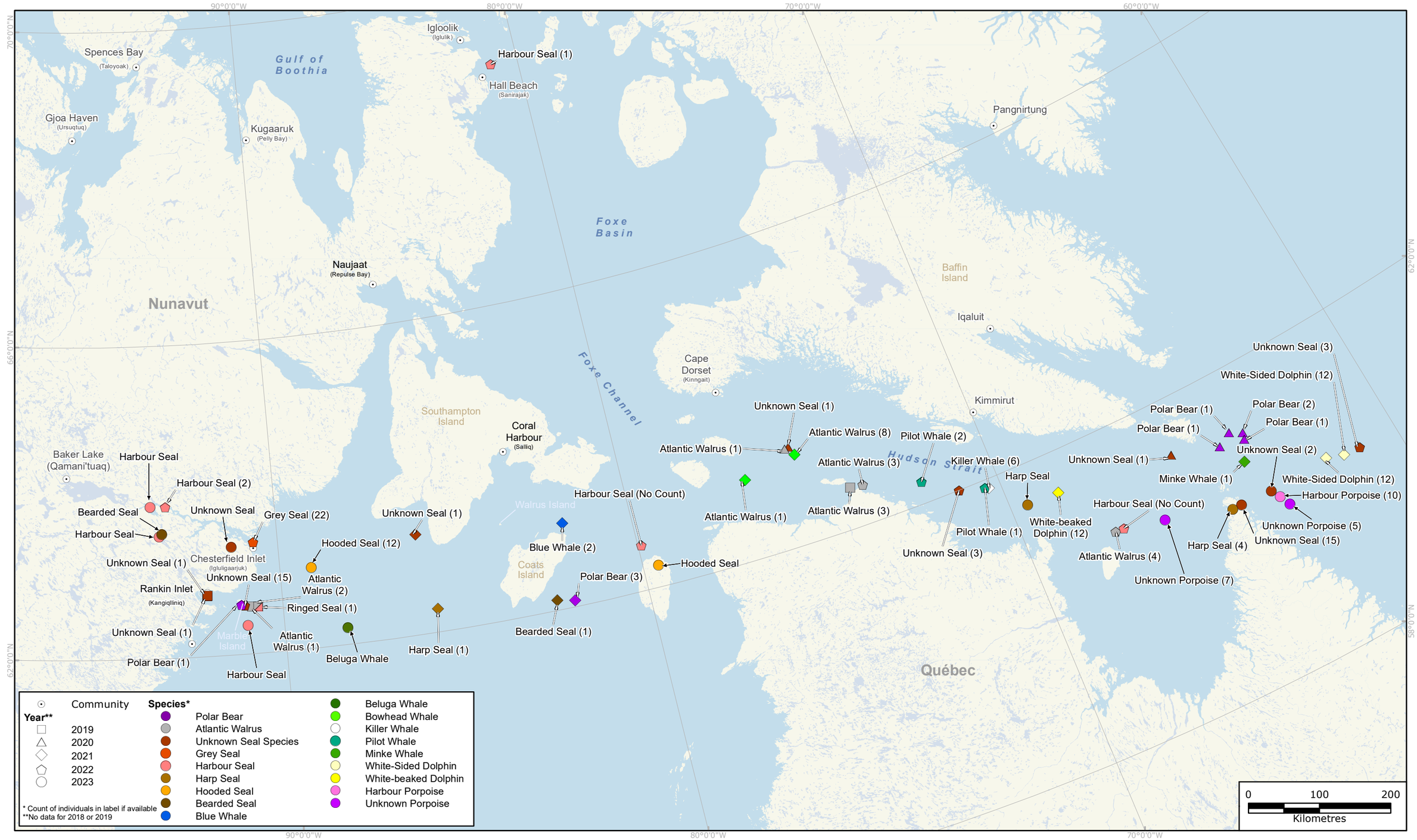

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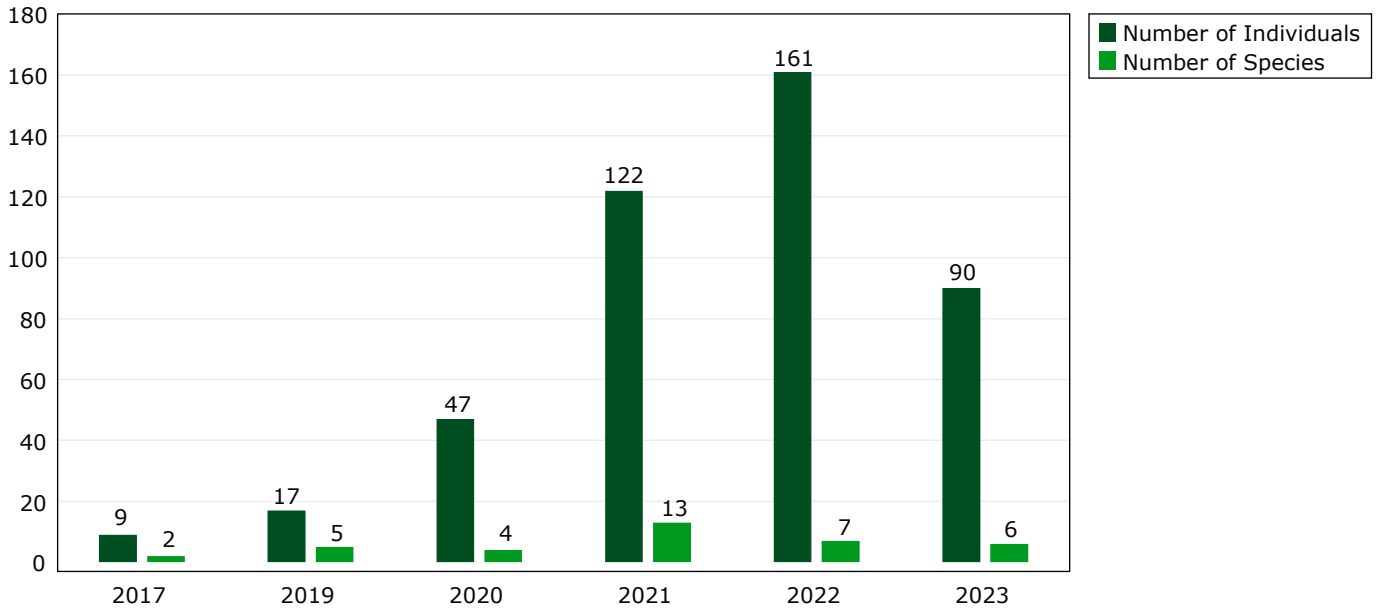
TABLE 3.2-4 NUMBER[1] OF MARINE MAMMALS OBSERVED DURING SURVEYS AND INCIDENTALLY[2] BETWEEN 2017 AND 2023[3]

Species	2017	2019	2020	2021	2022	2023	Total
Bowhead whale	-	3	-	-	-	-	**3**
Fin whale[4]	-	1	-	1	2	-	**4**
Killer whale	-	8	-	6	-	-	**14**
White-beaked dolphin	-	-	15	12	-	-	**27**
Unknown dolphin species	-	-	15	5	-	-	**20**
Harp seal	-	4	-	2	-	15	**21**
Harbour seal	-	-	1	9	5	3	**17**
Ringed seal	1	-	-	1	-	-	**2**
Unknown seal	2	-	4	29	37	23	**95**
Atlantic Walrus	6	-	4	10	8	-	**28**
Polar bear[4]	-	1	8	3	1	-	**13**
Blue whale[4,5]	-	-	-	2	-	-	**2**
Minke whale	-	-	-	1	-	-	**1**
White-sided dolphin	-	-	-	24	-	-	**24**
Long-finned Pilot Whale	-	-	-	-	3	-	**3**
Beluga whale	-	-	-	11	-	11	**22**
Unknown Whale	-	-	-	-	1	2	**3**
Grey Seal	-	-	-	-	22	-	**22**
Bearded seal	-	-	-	6	82	1	**89**
Harbour Porpoise	-	-	-	-	-	10	**10**
Hooded Seal	-	-	-	-	-	13	**13**
Unknown Porpoise	-	-	-	-	-	12	**12**
Total	**9**	**17**	**47**	**122**	**161**	**90**	**446**

[1] Numbers are given as individuals observed not number of separate sightings.
[2] Marine mammals observed both during dedicated surveys and off-effort are included in the table. Note that all sightings in 2017 were incidental, in 2019 were during dedicated surveys, and during 2020 through 2023 were both during surveys and incidental.
[3] No sightings were recorded in 2018.
[4] Species listed on Schedule 1 of the federal *Species at Risk Act* (SARA).
[5] It is possible that the blue whale sighting was not identified properly while on the vessel, as it would be a rare occurrence for a blue whale to be recorded in Hudson Bay.

FIGURE 3.2-7 NUMBER OF MARINE MAMMAL INDIVIDUALS AND NUMBER OF SPECIES OBSERVED, 2017 TO 2023



3.3 SEABIRD OBSERVATIONS

3.3.1 SURVEY EFFORT

Seabird surveys have been conducted each year since 2018. In 2023, 116 transects with known distance effort were surveyed while vessels were moving, with a total of 2,658 km of seabird survey distance recorded over 68 hours (Table 3.3-1; Figure 3.3-1). An additional 106 hours of stationary surveys were conducted while the vessels were anchored (Table 3.3-2).

TABLE 3.3-1 TEMPORAL AND SPATIAL EFFORT FOR MOVING VESSEL SEABIRD SURVEYS, 2018 TO 2023

Year	Temporal Effort			Spatial Effort		
	Effort (hr)	No. of Transects with Effort	No. of Transects with No Effort[1]	Effort (km)	No. of Transects with Effort	No. of Transects with No Effort[2]
2018	139.87	72	7	407.1	33	46
2019	119.85	87	4	2,290.8	79	12
2020	111.88	84	14	3,614.8	79	20
2021	173.87	173	24	7,176.7	170	27
2022	98.47	182	46	10,423.3	163	65
2023[3]	68.47	123	5	2,657.9	116	12

[1] Surveys without distance effort did not have location coordinates recorded at the start and/or end of the surveys.
[2] Surveys without temporal effort did not have the start and/or end times recorded.
[3] Fewer vessels travelled to Agnico Eagle in 2023 (23 vessels, compared to 27 vessels in 2022 and 29 in 2021), partially accounting for the lower survey effort.

TABLE 3.3-2 TEMPORAL EFFORT FOR STATIONARY SEABIRD SURVEYS, 2018 TO 2023

Year	Effort (hr)	No. of Points with Effort	No. of Points with No Effort[1]
2018	18.75	5*	0
2019	19.82	15	27
2020	152.00	104	40
2021	152.37	111	3
2022	19.65	41	105
2023	106.43	134	23

* Surveys in 2018 did not include locations; therefore, these observations were not used in analysis.
[1] Surveys with No Effort did not have start and/or end times recorded.