Appendix 47

Meadowbank and Whale Tail 2020 Wildlife Monitoring Summary Report

REPORT

2020 Wildlife Monitoring Summary Report

Meadowbank Division

Submitted to:

Agnico Eagle Mines Limited

Submitted by:

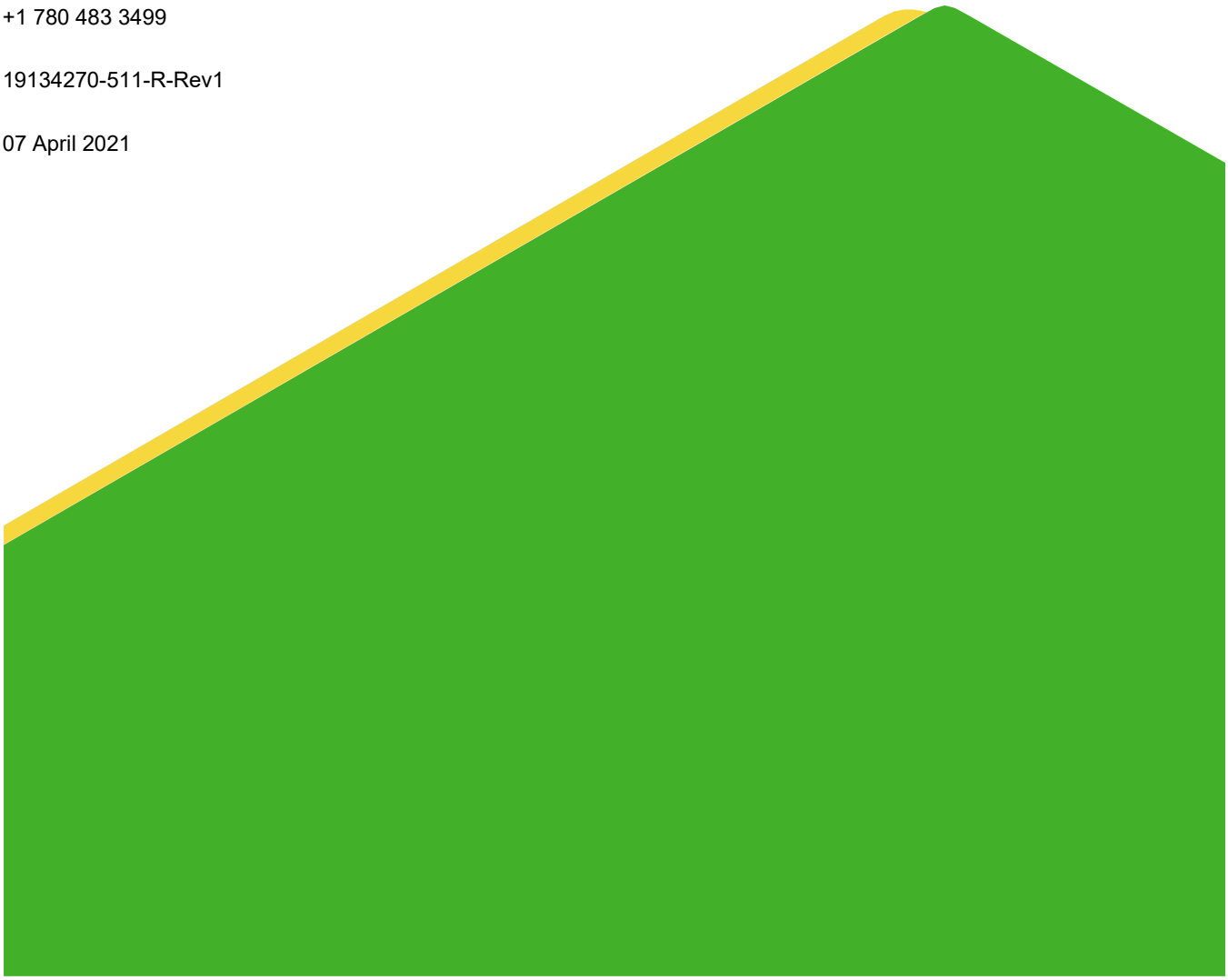
Golder Associates Ltd.

16820 107 Avenue, Edmonton, Alberta, T5P 4C3, Canada

+1 780 483 3499

19134270-511-R-Rev1

07 April 2021



DISTRIBUTION LIST

1 electronic copy - Agnico Eagle Mines Limited

1 electronic copy - Golder Associates Limited

EXECUTIVE SUMMARY

As a requirement of the NIRB Project Certificate, the 2020 Wildlife Monitoring Summary Report (2020 Annual Report) represents the 15th of a series of annual reports for the Agnico Eagle Mines Limited (Agnico Eagle) Meadowbank Mine (the Project). Baseline and monitoring programs were first initiated in 1999 and will continue through the life of the Mine. Details of the wildlife monitoring program for the Project are provided in the Terrestrial Ecosystem Management Plan (Version 7, Agnico Eagle 2019). The 2020 Annual Report provides the monitoring objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2020 Annual Report builds on data presented in previous reports and incorporates monitoring recommendations from these reports, as well as recommendations and requests from intervenors on past reports made during the NIRB review process. Below is a summary of the results from each component of the 2020 Annual Report.

Road Surveys

- In 2020, 132 road surveys were conducted along the AWAR and 161 were conducted along the WTHR.
- A total of 43,244 caribou were observed along the AWAR (327.6 caribou per survey) and 17,172 caribou were detected along the WTHR (106.7 caribou per survey).
- Road surveys helped facilitate mitigation decisions along the AWAR and WTHR. Traffic along the AWAR was restricted for a total of 59 days in 2020, and traffic along the WTHR was restricted for a total of 16 days.

Pit and Mine Site Ground Surveys

- The incidental wildlife forms were used consistently throughout 2020 to document wildlife seen around the Project. Total incidental wildlife observations were much higher in 2020 than previous years.
- Notable wildlife sightings in 2020 include a single pine marten, a single grizzly bear, a single red fox, and a total of 73,465 caribou. Bird sightings throughout the year included bald eagle, peregrine falcon, rough-legged hawk, and snowy owl.
- Wildlife deterrents were used on 43 occasions in 2020, and were used for Arctic fox, caribou, wolf, and wolverine.
- Wildlife mortalities were reported for Arctic fox (4) and wolverine (2).

Wildlife Habitat Monitoring

- Change in footprint for the Meadowbank Mine and Vault sites, the AWAR, and the Whale Tail Pit and Haul Road was assessed as less than 25% of predicted values. Therefore, the next comprehensive habitat analysis will be completed in 2021.

Caribou Satellite-Collaring Program

- Results from this program are pending availability of data.

Viewshed Surveys

- The viewshed surveys implemented in 2020 are to act as an early-warning system for caribou approaching the WTHR. A total of 163 surveys were conducted in 2020, primarily in the summer (57%) and winter (20%) months.
- Caribou were observed on just 10 surveys, 80% of which were during the spring. A total of 252 caribou were recorded from the 2020 viewshed surveys.

Remote Camera Program

- Caribou crossing events were detected at three locations on the WTHR.
- The limited number of caribou crossing events from the remote camera program in 2020 do not allow statistical analysis of the relationship between caribou crossing events, road parameters, and vehicle traffic.

Blast Monitoring

- The 2020 blast monitoring program was limited due to COVID-19. Blasting measurements were collected in December 2020 at two locations in the vicinity of the Whale Tail Pit, and caribou behaviour was monitored in relation to blasts throughout 2020.
- Blasting was cancelled on a single occasion due to caribou presence in the vicinity of the Whale Tail Pit.

Caribou Management Decision Tree

- Decision tree process used data from the road, Mine site, viewshed surveys, and satellite collaring to determine the scale of caribou monitoring and management required.

Hunter Harvest Survey

- The study included more than 60 participants of which 43 reported harvesting caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Baker Lake, the HHS represents from 12% to 14% of hunters in the community.
- A total caribou harvest of 652 was reported in 2020, the total caribou harvest in Baker Lake is estimated to range from 4,657 to 5,433 caribou.
- Compared to other years, caribou were harvested at a lower percentage within 5 km of the AWAR and within the Regional Study Area. As such, harvest levels in 2020 in close proximity to mining facilities were well within threshold levels.
- Lake trout and Arctic char were the most common species caught by fisherman. Unlike 2019, very few lake whitefish were caught, which may be due either to a decline in fishing effort in winter (e.g., nets set under the ice) and/or lower abundance of this species.

Predatory Mammal Den Monitoring

- Potential effects due to Project-related activities were not identified to trigger monitoring of predatory mammal dens. Monitoring of predatory mammal dens were conducted informally in 2020 through observations recorded during other monitoring programs.

Raptor Nest Monitoring

- Raptor nest monitoring in 2020 occurred in all quarries along the WTHR and AWAR. Raptor activity and potential nest locations were also noted on other surveys including road surveys, viewshed surveys, freshet monitoring, and on-site environmental monitoring. Six previously established peregrine falcon nests in quarries along the AWAR were identified and monitored.
- Raptor nest management plans were not developed at the active nest sites, as Mine-related activity was already restricted within the quarries where Falcons were observed.

Waterbird Nest Monitoring

- A field program was not completed in 2020 due to COVID-19. Results of the 2018 and 2019 programs, and plans for future monitoring are provided in (Appendix E).

PRISM

- Pending approval, a new program to assist with regional monitoring efforts is currently under discussion with ECCC and should be enforce in 2021.

Non-Native Plant Surveys

- Three non-native plant species were identified during surveys in 2020. Recommendations for management of non-native plants are provided.

Special Studies

- A pilot snow study was implemented in 2020 to evaluate the effectiveness of the survey techniques and to guide future monitoring activities. Year two monitoring planned for 2021 should aim to collect a full suite of data (i.e., six plots sampled) from at least ten survey locations along the WTHR in 2021.
- Agnico Eagle initiated a pilot study of caribou behaviour data collection that focussed on measuring different behaviour activities of caribou in relation to mine-related activities (Appendix H). The results of the program will be reviewed with the TAG.

Table of Contents

1.0 OVERVIEW 1-1

1.1 Background 1-1

1.2 Project Description 1-1

1.3 Study Area Boundaries 1-4

1.3.1 Meadowbank Mine, Vault Pit, and AWAR 1-4

1.3.2 Whale Tail Pit and Haul Road 1-4

1.4 Monitoring Approach 1-4

1.5 Report Objectives 1-5

1.6 Inuit Involvement 1-5

1.7 Terrestrial Advisory Group 1-6

1.8 Mitigation Audit 1-6

2.0 ROAD SURVEYS 2-1

2.1 Overview 2-1

2.2 Objectives 2-1

2.3 Duration 2-1

2.4 Methods 2-1

2.5 Historical Results 2-2

2.6 2020 Results 2-2

2.6.1 AWAR Results 2-2

2.6.2 WTHR Surveys 2-4

2.6.3 Traffic Data and Caribou Movement 2-9

2.6.4 Wildlife Species Encountered on Road Surveys 2-11

2.6.5 Road-related Mitigation 2-19

2.6.6 Caribou Responses to Mitigation 2-19

2.6.7 Road-related Wildlife Mortality 2-22

2.7 Accuracy of Impact Predictions 2-24

2.8 Management Recommendations 2-24

3.0 PITS AND MINE SITE GROUND SURVEYS 3-1
3.1 Overview 3-1
3.2 Objectives 3-1
3.3 Duration 3-1
3.4 Methods 3-1
3.4.1 Incidental Mine Site Wildlife Observations 3-2
3.5 2020 Results 3-2
3.5.1 Incidental Wildlife Observations 3-2
3.5.2 Wildlife Deterrent Records 3-4
3.5.3 Waterbird Monitoring 3-5
3.5.4 Raptor Monitoring 3-6
3.5.5 Predatory Mammal Deterrence and Protection 3-6
3.5.6 Wildlife Mortality – Meadowbank and Whale Tail Sites 3-6
3.5.7 Helicopter Activity 3-8
3.6 Accuracy of Impact Predictions 3-8
3.7 Management Recommendations 3-10
4.0 WILDLIFE HABITAT MONITORING 4-1
4.1 Overview 4-1
4.2 Objective 4-1
4.3 Duration 4-2
4.4 Methods 4-2
4.5 Historical Results 4-4
4.5.1 Meadowbank Mine Site 4-4
4.5.2 AWAR 4-4
4.5.3 Whale Tail Pit and Haul Road 4-5
4.6 Management Recommendations 4-5
5.0 CARIBOU SATELLITE-COLLARING PROGRAM 5-1
5.1 Overview 5-1
5.2 Objectives 5-1

5.3 Duration 5-1
5.4 Methods 5-1
5.5 Historical Results 5-2
5.6 2020 Results 5-2
5.7 Caribou Migration Patterns 5-2
5.8 Accuracy of Impact Predictions 5-2
5.9 Management Recommendations 5-2
6.0 VIEWSHED SURVEYS 6-1
6.1 Overview 6-1
6.2 Objectives 6-1
6.3 Duration 6-1
6.4 Methods 6-1
6.5 Historical Results 6-1
6.6 2020 Results 6-2
6.7 Management Recommendations 6-6
7.0 REMOTE CAMERA PROGRAM 7-1
7.1 Overview 7-1
7.2 Objectives 7-1
7.3 Duration 7-1
7.4 Methods 7-1
7.4.1 Camera Deployment and Settings 7-1
7.4.2 Photograph Review 7-2
7.4.3 Data Analysis 7-2
7.5 Results 7-3
7.6 Management Recommendations 7-6
8.0 BLAST MONITORING 8-1
8.1 Overview 8-1
8.2 Objectives 8-1
8.3 Duration 8-1

8.4 Methods....8-1
8.4.1 Overview....8-1
8.4.2 Methods....8-2
8.5 Results....8-4
8.6 Management Recommendations....8-5
9.0 CARIBOU MANAGEMENT DECISION TREE....9-1
9.1 Overview....9-1
9.2 Objectives....9-1
9.3 Duration....9-1
9.4 Methods....9-1
9.5 Results....9-2
9.6 Accuracy of Impact Predictions....9-2
9.7 Management Recommendations....9-2
10.0 HUNTER HARVEST SURVEY....10-1
10.1 Overview....10-1
10.2 Objectives....10-1
10.3 Methods....10-1
10.4 Results....10-2
10.5 Accuracy of Impact Predictions....10-2
10.6 Management Recommendations....10-3
11.0 INTEGRATED CARIBOU MONITORING RESULTS....11-1
11.1 Integrated Results....11-1
12.0 PREDATORY MAMMAL DEN MONITORING....12-1
12.1 Objectives....12-1
12.2 Methods....12-1
12.3 Results....12-1
12.4 Accuracy of Impact Predictions....12-1
12.5 Management Recommendations....12-1
13.0 RAPTOR NEST MONITORING....13-1

13.1 Overview 13-1
13.2 Objectives....13-1
13.3 Duration....13-1
13.4 Methods....13-1
13.5 Results 13-2
13.6 Accuracy of Impact Predictions....13-6
13.7 Management Recommendations 13-6
14.0 WATERBIRD NEST MONITORING 14-1
14.1 Overview 14-1
15.0 BREEDING BIRD MONITORING 15-1
15.1 Overview 15-1
15.2 2020 Update....15-1
15.3 Management Recommendations 15-1
16.0 NON-NATIVE PLANT SURVEYS....16-1
16.1 Overview 16-1
16.2 Methods....16-1
16.3 Results 16-1
16.4 Management Recommendations 16-4
17.0 SPECIAL STUDIES 17-1
17.1 Snow Study 17-1
17.1.1 Overview 17-1
17.1.2 Methods 17-1
17.1.3 Results 17-2
17.1.4 Management Recommendations....17-3
17.2 Caribou Behaviour 17-4
17.2.1 Overview 17-4
17.2.2 Methods 17-4
17.2.3 Results 17-4
17.2.4 Management Recommendations....17-5

18.0 SUMMARY 18-1

18.1 Accuracy of Impact Predictions 18-1

19.0 LITERATURE CITED 19-1

TABLES

Table 1: Inuit Involvement in Baseline and Monitoring Programs for the Meadowbank Mine 1-5

Table 2: Details of All-Weather Access Road Wildlife Surveys from 2007 to 2020 2-2

Table 3: Average Number of Caribou Observed Per Survey Trip along the All-Weather Access Road from 2007 to 2020 2-3

Table 4: Details of Whale Tail Haul Road Surveys from 2017 to 2020 2-4

Table 5: Average Number of Caribou Observed Per Survey Trip along the Whale Tail Haul Road from 2017 to 2020 2-4

Table 6: Monthly Traffic Data for the Meadowbank All-Weather Access Road in 2020 2-10

Table 7: Monthly Traffic Data for the Meadowbank Whale Tail Haul Road in 2020 2-10

Table 8: Species Detected During Road Surveys at All-Weather Access Road (AWAR) and Whale Tail Haul Road (WTHR) in 2020 2-11

Table 9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road 2020 2-13

Table 10: Summary of Road Restrictions Related to Ungulate Activity Along the Whale Tail Haul Road in 2020 2-18

Table 11: Observations of Caribou Crossing Mine Roads in 2020 2-19

Table 12: Wildlife Mortalities Related to the All-Weather Access Road, and Whale Tail Haul Road and Non-Mine Related Mortalities in 2020 2-23

Table 13: Summary of Road-related Wildlife Mortality Records (2007 to 2020) 2-23

Table 14: Accuracy of Impact Predictions - Sensory Disturbance and Mortality along the All-Weather Access Road and Whale Tail Haul Road in 2020 2-24

Table 15: Incidental Wildlife Observations in 2020 3-2

Table 16: Records of Deterrence Activities at the Project in 2020 3-4

Table 17: Summary of Wildlife Deterrence Records from the Project in 2020 3-5

Table 18: Summary of Deterred Mammals at the Meadowbank Mine and Whale Tail Sites from 2015 to 2020 3-6

Table 19: Wildlife Mortalities at Meadowbank Mine and Whale Tail in 2020 3-7

Table 20: Summary of Project-Related Wildlife Mortality Records for Caribou and Predatory Mammals (2007 to 2020) 3-7

Table 21: Helicopter Flight Totals in 2020 3-8

Table 22: Accuracy of Impact Predictions – Mine Site Wildlife Disturbances 3-9

Table 23: Habitat Mapping Monitoring Parameters, Predicted Footprint Losses, Permitted Areas, and Thresholds for the Meadowbank Mine, All-Weather Access Road, and Vault Haul Road 4-1

Table 24: Habitat Mapping Monitoring Parameters, Predicted Footprint Losses, Permitted Areas, and Thresholds for the Whale Tail Pit and Haul Road....4-2

Table 25: Total Number of Wildlife Observed during Height of Land Surveys along the Whale Tail Haul Road in 2019 6-2

Table 26: Viewshed Survey Effort by Season, 2020 6-2

Table 27: Viewshed Surveys Completed and Number of Caribou Observed in 2020 6-3

Table 28: Detailed Caribou Sightings Observed during Viewshed Surveys, 2020 6-4

Table 29: Total Number of Wildlife Observed during Viewshed Surveys along the Whale Tail Haul Road in 2020....6-4

Table 30: Remote Camera Locations along the Whale Tail Haul Road....7-2

Table 31: Caribou Photograph Rates by Camera Pair and Season 7-3

Table 32: Caribou Crossing Events on the Whale Tail Haul Road 7-4

Table 33: 2020 Blasting Measurement Locations 8-2

Table 34: 2020 Blasting Measurements....8-4

Table 35: Accuracy of Impact Predictions - Baker Lake Hunter Harvest Survey....10-3

Table 36: Summary of Caribou Monitoring Activities and Management Responses in 2020 11-1

Table 37: Summary of Mine-related Effects on Caribou in 2020 11-2

Table 38: Accuracy of Impact Predictions - Disturbance to Denning Predatory Mammals for the Meadowbank and Whale Tail Projects....12-1

Table 39: Record of Peregrine Falcon Nesting along the All-Weather Access Road and in the Meadowbank Local Study Area between 2009 and 2020 13-3

Table 40: Peregrine Falcon Nests Identified and Monitored along the All-Weather Access Road in 2020....13-4

Table 41: Accuracy of Impact Predictions to Nesting Raptors and Raptor Mortality....13-6

Table 42: Snow Measurement Metrics Collected at Survey Plots on the Upwind and Downwind Side of the Haul Road 17-3

Table 43: Potential Project Effects, Thresholds, and Results of Monitoring in 2020 18-1

FIGURES

Figure 1: Meadowbank Complex Location and Monitoring Studies Boundaries 1-3

Figure 2: Caribou Density along the All-Weather Access Road and Whale Tail Haul Road, Year Round (2020) 2-6

Figure 3: Caribou Density along the All-Weather Access Road and Whale Tail Haul Road, Spring-Summer (2020) 2-7

Figure 4: Caribou Density along the All-Weather Access Road and Whale Tail Haul Road, Fall-Winter (2020) 2-8

Figure 5: Total Number of Caribou Observed each Year during All-Weather Access Road and Whale Tail Haul Road Surveys 2-9

Figure 6: Total Vehicle Traffic (One-way Trips) Along All-Weather Access Road and Whale Tail Haul Road per Month in 2020 2-11

Figure 7: Number of Caribou Observed Crossing the All-Weather Access Road and Whale Tail Haul Road each Month in 2020 2-22

Figure 8: Total Incidental Sightings of Wolverine, Wolf, Caribou, and Birds by Month at the Meadowbank and Whale Tail Sites, 2020 3-3

Figure 9: Whale Tail Footprint Comparison (2018 to 2020) 4-3

Figure 10: Location of Viewshed Surveys along Whale Tail Haul Road, 2020 6-5

Figure 11: 2020 Caribou Remote Camera Monitoring Locations 7-5

Figure 12: Blasting Measurement Locations 8-3

Figure 13: 2020 Peregrine Falcon Nests Locations 13-5

Figure 14: Non-Native Plant Survey Locations 16-3

Figure 15: Survey Plot Configuration Used During Year 1 Snow Survey Monitoring Along the Haul Road, 2020 17-2

APPENDICES

Appendix A
Wildlife Observations

Appendix B
Tolerant Caribou Observations

Appendix C
Wildlife Mortality Report (Caribou)

Appendix D
Wildlife Mortality Reports

Appendix E
Waterbird Mitigation Project – 2020 Progress Report

Appendix F
All Helicopter Flights Logged in 2020

Appendix G
Hunter Harvest Survey

Appendix H
Non-Native Plant Survey Results

Appendix I
Caribou Behaviour Monitoring

1.0 OVERVIEW

1.1 Background

The Agnico Eagle Mines Limited (Agnico Eagle) Meadowbank Mine (the Project) is located in the Kivalliq Region of Nunavut (Figure 1) and received a Project Certificate No. 004 from the Nunavut Impact Review Board (NIRB) in 2006. The subsequent Water Licence, Government of Nunavut (GN) and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) Land Lease, and Kivalliq Inuit Association (KIA) Land Use Production Lease, allowed for the construction of a gold mine and ancillary facilities including an All-weather Access Road (AWAR), barge unloading facilities, lay-down area, and a fuel tank farm near the Hamlet of Baker Lake. The Whale Tail Pit Project, an extension of the Meadowbank Mine, received a Project Certificate No. 008 from NIRB in 2018. The Project Certificates, and subsequent Water Licence and land leases, allowed development of five gold deposits in the 11 years since the start of operations at Meadowbank and the first phase of the Whale Tail satellite deposit including construction of the Whale Tail Haul Road (WTHR).

Up to 2017, annual reports were based on the Terrestrial Ecosystem Management Plan (TEMP) developed by Cumberland Resources (Cumberland 2006). The TEMP was a requirement of the Meadowbank Project Certificate No. 004, Condition 54 and Whale Tail Pit Project Certificate No. 008, Condition 28. Since 2018, the TEMP Version 7 has incorporated the Whale Tail component of the Project and reflects changes in management and monitoring approaches since 2006 (Agnico Eagle 2019). The revised TEMP also benefitted from collaborative input from the Government of Nunavut Department of Environment (GN), the Kivalliq Inuit Association (KivIA), and the Hunters and Trappers Organization (HTO) of Baker Lake through annual report reviews, technical reviews, workshops, and discussions within the Terrestrial Advisory Group (TAG). The April 2020, Version 8 TEMP was prepared and reviewed by the TAG and to serve as the basis for the 2020 Annual Report. However, due to uncertainties and on-going discussions with TAG over TEMP Version 8 updates, Version 7 of the TEMP continued as the basis for 2020 monitoring and mitigation. The scope of the TEMP is to report on monitoring of the Mine during construction, operation, maintenance, reclamation, and closure.

This annual report includes data collected in 2020, the 11th year of Mine operation, and is the 15th of a series of annual Wildlife Monitoring Summary Reports for the Project. The purpose of this report is to summarize 2020 data collected from wildlife monitoring programs, and to describe natural variation and potential Mine-related changes in wildlife populations within and adjacent to the Meadowbank Gold Mine (including the approved Whale Tail Project). The 2020 Annual Report describes monitoring objectives and methods, historical and current year results, mitigation activities, and management recommendations based on 2020 monitoring results. Furthermore, comments received from various intervenors through the NIRB review of the 2019 annual report were incorporated, where possible, into analyses and reporting in this document.

1.2 Project Description

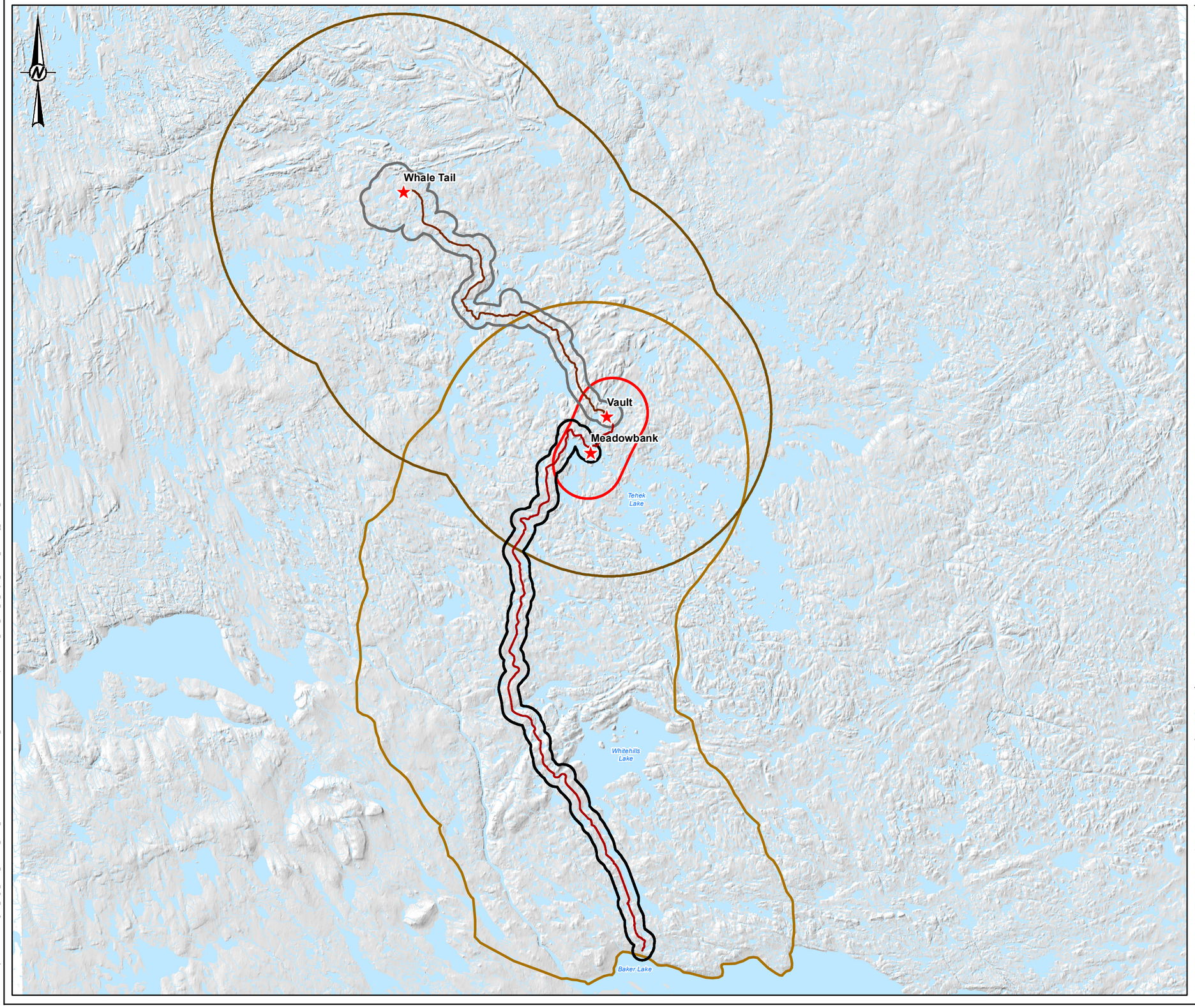
The Meadowbank Gold Mine is located approximately 90 km north of the community of Baker Lake. The Whale Tail Pit extension, with an expected operating life of seven (7) years (2019 to 2025), is located approximately 180 km north of Baker Lake. The Whale Tail Pit extension is an open-pit mine connected to Meadowbank Mine by a 64 km all season haul road. The local physiography is characterized by numerous lakes and low, rolling hills covered mainly by lichen/rock complexes, and heath tundra.

Environmental baseline studies were conducted prior to Meadowbank and Whale Tail Mine approvals and integrated into Project designs according to the Cumberland (2006) and Agnico Eagle (2019) TEMPs. Wildlife Valued Ecosystem Components (VECs) for the Meadowbank Project were identified in consultation with regulatory agencies and Baker Lake residents, and considered criteria such as conservation status, relative abundance within the Project study area, importance in subsistence lifestyle and economy, importance in predator-prey systems, habitat requirement size and sensitivity, and contribution to local area concerns. Based on these selection criteria, key terrestrial VECs determined for the Meadowbank Project were wildlife habitat, ungulates, predatory mammals, small mammals, raptors, waterbirds, and upland breeding birds. Because of limited evidence that small mammals were affected by the Project, this VEC was not included in the Whale Tail Project or revised TEMP. Further details can be found in the Final Environmental Impact Statements (FEIS) for the Meadowbank Project (Cumberland 2005) and the Whale Tail Pit (Golder 2016).

Construction of a 106.8 km AWAR between the community of Baker Lake and the Meadowbank Mine was completed in March 2008 and provides Mine site access and re-supply, while on-site Mine haul and access roads connect open-pit areas to ancillary facilities. Meadowbank Mine site facilities include a mill, power plant, maintenance facilities, tank farm for fuel storage, water treatment plant, sewage treatment plant, airstrip, and accommodations. Mine components include open pits, waste rock storage facilities, and a tailings storage facility.

In 2008, construction of numerous camp infrastructure facilities was completed, while in 2009, principal Mine site construction commenced. Mine operation commenced in early 2010. Mining at Goose Pit was finished in 2015 while Agnico Eagle continued ongoing mining operations at Portage and Vault pits and investigated expansion of the Vault area into Phaser Lake. In 2018, an expansion was made in pit E (Portage) to extend mining and mill feed to bridge the gap between the end of mining activities in Meadowbank and the start of mining activities at Whale Tail Pit. As a result, mining activities at Meadowbank in 2020 were only ongoing in Whale Tail Pit with ore from this pit being processed at the mill at the Meadowbank site.

To extend Mine operations and milling at Meadowbank Mine, Agnico Eagle has developed the Whale Tail Pit and Haul Road Project, approximately 55 km north of the Meadowbank Mine, on a satellite deposit located on the Amaruq property in the Kivalliq Region of Nunavut. The Amaruq Exploration Access Road (AEAR) was built in 2016 and 2017 to access the Amaruq exploration site from the Meadowbank complex. The AEAR was modified into the WTHR (enlargement) following regulatory approval and was completed in 2018. Construction of the Whale Tail Dike in 2018 allowed for Whale Tail Lake North Basin dewatering starting in Q1, 2019, the pre-stripping of future Whale Tail Pit, and the construction of major infrastructures including the permanent camp, with accommodation and kitchen facilities, sewage treatment plan, tank farm for fuel storage, and freshwater intake. Open-pit mining operation at the Whale Tail deposit began in Q3 (September 30th), 2019. Permitting to expand the Whale Tail operation and extend the Mine life to 2026 was approved in February 2020 (refer to Project Certificate No. 008, Amendment 001. Expansion of the WTHR for widening to allow two-way haul traffic was assessed under this Project Certificate Amendment 001. Widening of the Haul Road has not been completed to date.



LEGEND

- ALL-WEATHER ACCESS ROAD (AWAR)
- WHALE TAIL HAUL ROAD (WTHR)
- AWAR LOCAL STUDY AREA (LSA)
- WTHR LOCAL STUDY AREA (LSA)
- WTHR REGIONAL STUDY AREA (RSA)
- MEADOWBANK LOCAL STUDY AREA (LSA)
- MEADOWBANK REGIONAL STUDY AREA (RSA)
- WATERCOURSE
- WATERBODY



0 12 24

1:600,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA. COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

MEADOWBANK MINE PROJECT LOCATION AND MONITORING STUDIES BOUNDARIES

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	CC
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\19134270\4000\4040\002_PRODUCTION\MXD\Report\19134270_4000_4040_01_Project_Location_Monitoring_Studies_Boundaries.mxd PRINTED ON: 2021-03-24 AT: 3:18:26 PM

1.3 Study Area Boundaries

1.3.1 Meadowbank Mine, Vault Pit, and AWAR

The Meadowbank Mine Local Study Area (LSA) includes a 5 km radius area centred on the Mine Site and a 5 km radius around the Vault Site creating an elliptical shape with a total area of 194 km^2. The AWAR LSA consists of a 3 km wide corridor centred on the AWAR between Baker Lake and the Meadowbank Mine. The Regional Study Area (RSA) encompasses an area that includes a 25 km radius area around the Meadowbank Mine and Vault sites and a 50 km wide corridor along the AWAR for a total area of 5,106 km^2 (Figure 1).

1.3.2 Whale Tail Pit and Haul Road

The Whale Tail LSA is a 3 km corridor centered on the WTHR and borrow site access roads (i.e., 1.5 km on either side of the road and 1.5 km around borrow areas) and includes an approximate 1.5 km buffer around development areas at the Whale Tail Pit area, for a total area of 282 km^2. The Whale Tail RSA is a 50 km corridor centred on the WTHR alignment (i.e., 25 km on either side of the WTHR and borrow site access roads, and 25 km around borrow areas), with a total area of 5,017 km^2 (Figure 1).

1.4 Monitoring Approach

Wildlife monitoring is an essential tool in protecting and maintaining wildlife occurring near the Project. A comprehensive monitoring strategy, along with quantitative monitoring indicators, has been implemented and, as required, is adapted to evaluate the accuracy of impact predictions and to meet the objectives of the management strategy set out in the TEMP (Agnico Eagle 2019, 2020a). Monitoring programs are designed to assess Project-related impact predictions and the effectiveness of mitigation measures. Measures on the effectiveness of mitigation will inform on whether monitoring or mitigation require adaptive management. Adaptive management is an on-going process of learning by doing that evolves throughout the life of the Project. Outcomes of adaptive management include increasing or decreasing, or no change, to mitigation or monitoring. Further study intended to better understand Mine-related effects may also be an outcome based on requests from individual stakeholders or the TAG. Ongoing review of the TEMP and annual Wildlife Monitoring Summary Reports (which provide results of TEMP monitoring programs) by regulatory agencies, technical reviewers, and stakeholders will further support that local and regional concerns have been adequately addressed.

Environmental staff monitor wildlife near Project facilities (i.e., Meadowbank Mine and Whale Tail Pit) and along the AWAR and WTHR on a regular basis (Section 2.6). Where unacceptable risks to wildlife are observed, mitigation measures are implemented to avert animals from site activities and hazards in accordance with the TEMP (Agnico Eagle 2019). Detailed reporting protocols (e.g., a dangerous animal occurrence, monthly wildlife reports submitted to the GN, road closure notification to GN, KIA, HTO, etc.) are established and implemented by on-site environmental staff. During these events, Agnico Eagle representatives communicate any issues directly with the GN Department of Environment (DoE) Conservation Officer, KIA, and the local HTO.

1.5 Report Objectives

The primary objectives of the 2020 Wildlife Monitoring Summary Report are to:

- Report the results of the 2020 wildlife monitoring programs.
- Summarize the monitoring strategy implemented over the course of the year.
- Evaluate the function and validity of implemented monitoring strategies.
- Summarize adaptive management strategies.
- Provide management recommendations for 2021.
- Allow regulators to contribute toward improvements of wildlife mitigation and monitoring.
- Include a summary of all caribou-related monitoring, mitigation, and Project management actions in one consolidated section.

1.6 Inuit Involvement

Since 1999, local Inuit from the community of Baker Lake have been involved in all wildlife-related baseline and monitoring surveys. Participation in monitoring during 2020 included members of the Baker Lake Hunters and Trappers Organization (HTO) and the Kivalliq Inuit Association (KivIA). Due to the COVID-19 pandemic during 2020, community participation was adapted in accordance with Territorial health guidelines to prevent introduction of the virus into Nunavut communities. A HTO wildlife monitor completed road surveys from January to March 2020 and resumed monitoring in July 2020. There were regular KivIA road inspections from September to November.

Table 1: Inuit Involvement in Baseline and Monitoring Programs for the Meadowbank Mine

Survey Description	Years Conducted (# of Years)	Average # of Inuit Involved
RSA Aerial Survey	1999, 2002 to 2008 (8) – discontinued	2
LSA Aerial Survey	1999, 2002 to 2008 (8) – discontinued	2
Breeding Bird Plots	2003 to 2012; 2015 (11)	2 to 3
Breeding Bird Transects	2005 to 2011; 2015 (8) - discontinued	2
Waterfowl Nest Surveys	2004 to 2012 (9) - discontinued	3
Whale Tail Waterbird Nest Surveys	2018 and 2019 (2)	2
Raptor Nest Surveys	2004 to 2007, 2010 to 2020 (15)	3 to 4
AWAR Ground Surveys	2004 to 2020 (17)	2 to 3
Vault Haul Road Surveys	2017 to 2020 (4)	1 to 2
Whale Tail Haul Road Surveys	2018 to 2020 (3)	1 to 2
Height of Land Surveys	2018 to 2020 (3)	1 to 2
Habitat Mapping	2004 to 2005, 2010, 2012, 2014, 2017, 2018 (7)	1
Phenology Plots	2003 to 2005 (3) - discontinued	2

As required by the IIBA, “Anything done by Agnico in order to implement the TEMP […] shall incorporate Inuit Qaujimanituqaugit”; therefore, traditional knowledge or IQ has been incorporated in this annual report.

1.7 Terrestrial Advisory Group

As per Project Certificate No.008, Condition 27 of the Whale Tail Pit Final Environmental Impact Statement (EIS) Addendum (Golder 2016), Agnico Eagle has established a Terrestrial Advisory Group (TAG) consisting of representatives from Agnico Eagle, the Government of Nunavut Department of Environment (GN-DoE), Environment and Climate Change Canada (ECCC), the KivIA, and the HTO.

An MOU and Terms of Reference has been developed and signed by all parties in July 2019. Agnico Eagle provided a summary of TAG meeting outcomes to the NIRB since 2019.

The purpose of the TAG is to:

- Measure the relevant environmental effects of the Project on terrestrial wildlife.
- Confirm that the Project and mining activities are carried out within the terms and conditions of the Project Certificates No.004 and No.008 relating to the protection of terrestrial wildlife.
- Assess the accuracy of the predictions contained in the final environmental impact statement filed by Agnico Eagle with NIRB.
- Identify and select appropriate target species, indicators, and linkages for monitoring.
- Evaluate the effectiveness of mitigation measures and to support any required adaptive management of those measures.
- Identify any unforeseen Project-related effects.
- Provide an early warning mechanism to identify any Project-related effects.
- Determine and identify any cause-and-effect interactions between the Project and the environment.

In 2020, TAG meetings were held on April 20th, July 7th, October 28th and December 10th. The focus of TAG discussion in these meetings included updates to the TEMP caribou monitoring and mitigation for the WTHR and AWAR and changes to mitigation trigger values and methods of calculating caribou Group Size Thresholds.

1.8 Mitigation Audit

A mitigation audit is an annual requirement outlined in the 2019 TEMP (Agnico Eagle 2019). Mitigation approaches applied at the Project stem from current practices at existing mines or were suggested during the environmental assessment review process. However, an auditing system supports evaluation on the use and effectiveness of the mitigation consistent with the principals of adaptive management and may identify or recommend changes to mitigation or monitoring. As an example, per Project Certificate No.008, Condition 32, Agnico Eagle engages with the Baker Lake HTO and other relevant parties to ensure that safety barriers, berms, and designed crossings associated with Project infrastructure, including the WTHR, are constructed and operated as necessary to allow for the safe passage of caribou and other terrestrial wildlife.

The audit is to be undertaken annually and summarized in the annual report, and will focus specifically on mitigation listed in Section 4.1 of the TEMP Version 7 (Agnico Eagle 2019). The audit will evaluate:

- what mitigation was implemented
- which mitigation is perceived or shown to be effective
- whether new mitigation has been implemented in response to new issues
- whether some mitigation is redundant or unnecessary

2.0 ROAD SURVEYS

2.1 Overview

A systematic ground survey monitoring program for the AWAR, and WTHR has been designed to evaluate sensory disturbance for wildlife, particularly caribou (*Rangifer tarandus*), muskoxen (*Ovibos moschatus*), and predatory mammals utilizing habitats adjacent to the roads. The program also monitors incidental mortality of species as they are encountered within the Project infrastructure, but in particular near the roads. In previous years, the Vault Road has been surveyed and reported on separately from the WTHR, but in 2020 the Vault Road was considered part of the WTHR and thus not reported separately.

2.2 Objectives

The primary objectives of the road ground survey monitoring program are to:

1) Document wildlife utilization along the AWAR and WTHR corridors.

2) Evaluate wildlife trends along the road corridors, including identifying areas where higher densities of wildlife are observed.

3) Inform on the need for adaptive mitigation, such as temporary road closures during peak caribou migration periods.

4) Inform whether mortality thresholds for wildlife are exceeded.

5) Monitor road-related injuries or mortalities of caribou. The Project-wide threshold mortality level for ungulates is two (2) individuals per year (as per TEMP Version 7).

6) Monitor road-related injuries or mortalities of predatory mammals. The Project-wide threshold mortality level for predatory mammals is two (2) individuals per year (as per TEMP Version 7).

2.3 Duration

The AWAR and WTHR systematic ground surveys are ongoing over the operational phase of the Mine and are scheduled to be conducted a minimum of once per week throughout the year, twice per week during caribou migration (i.e., contingent on weather, road access and personnel availability), and every two days if caribou or muskox Group Size Thresholds (GST) are exceeded (see Figures 7 and 8 in 2019 TEMP). Agnico Eagle is committed to conducting a minimum of 75 road surveys per year along the AWAR and WTHR. Monitoring of vehicle collisions and wildlife mortality is continual along all road segments.

2.4 Methods

Road surveys were expanded beyond the AWAR to include the Vault Haul Road, beginning in 2017, the WTHR beginning in 2018, and then the Vault and Whale Tail segments combined as the WTHR beginning in 2020. For the WTHR, Agnico Eagle has signed an MOU with the Baker Lake HTO for a wildlife monitor on the road beginning in October 2018.

The survey team typically includes two observers (one is the driver) in a vehicle. The terrain on both sides of the road (to a maximum horizontal distance of approximately 1 km perpendicular from the road edge, or as far as the observer can see pending site conditions) is surveyed as the vehicle progresses at a maximum speed of 30 km per hour. For each sighting, the vehicle is safely parked in a road pullout and UTM coordinates are recorded along with the estimated distance of the animal(s) from the road, nearest road marker, species, number, direction of

travel and a variety of other information (e.g., behavior). All data are recorded electronically in tablet forms. Where animals are sighted close to roads and a risk of collision with vehicles is possible, the environmental monitor/observers report the number of animals, location, and direction of travel to the Mine radio dispatcher who informs all vehicle operators. In addition, all vehicle operators report ungulates and predatory mammals seen along the road to the dispatcher.

Regular data provided to Mine site personnel from the caribou satellite-collaring program are also used to track caribou movement and potential interactions with roads and Project facilities.

2.5 Historical Results

Ground surveys commenced shortly following the onset of AWAR construction in 2007. Sampling intensity has been comparable along the entire length of the AWAR since 2009. Surveys along the Vault Haul Road have been irregular since its completion but were included as part of regular AWAR surveys in 2016 and conducted separately beginning in 2017. Since beginning surveys in 2007, surveys along the AWAR have been conducted every 2.6 to every 6.1 days with an average survey frequency of every 4.9 days (Table 2). Surveys along the WTHR began in 2017 and have been conducted every 2.0 to every 7.7 days with an average survey frequency of every 4.4 days (Table 4)

2.6 2020 Results

2.6.1 AWAR Results

The number of AWAR surveys completed each season in 2020 is provided in Table 2. The number of systematic road surveys completed in 2020 (n=132) is considerably higher than the annual average of 78 surveys over the previous 13 years and the annual goal of 75 surveys. In 2020, surveys were conducted on average every 2.6 days, and were conducted between 17 January and 26 December. Survey frequency was highest in the summer and fall seasons and lowest in winter. By month, the highest numbers of surveys were conducted in April, August and September corresponding with higher numbers of caribou observed within the LSA.

Safety restrictions due to the COVID-19 pandemic resulted in reduced HTO participation from March to June. The KIA participated in monitoring from September to November. Electronic recording of observations began in October 2019 and written data forms are no longer used.

Table 2: Details of All-Weather Access Road Wildlife Surveys from 2007 to 2020

Season	Number of AWAR Surveys													
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*	2017	2018	2019	2020
Spring (Apr 01 to May 25)	13	15	15	9	10	14	9	11	17	10	19	9	37	26
Summer (May 26 to Sep 21)	24	7	10	9	9	13	13	7	16	14	16	12	39	54
Fall (Sep 22 to Dec 15)	8	15	8	12	11	12	10	11	11	16	14	16	39	41
Winter (Dec 16 to Mar 31)	33	57	25	36	33	38	31	38	32	38	36	35	22	11
Year End Total	78	94	58	66	63	77	63	67	76	78	85	72	137	132
Duration	Mar 01 to Dec 31	Jan 02 to Dec 29	Jan 09 to Dec 16	Jan 21 to Dec 17	Jan 10 to Dec 30	Jan 04 to Dec 29	Feb 02 to Dec 27	Jan 12 to Dec 30	Jan 03 to Dec 18	Jan 02 to Dec 27	Jan 03 to Dec 29	Jan 03 to Dec 29	Jan 04 to Dec 27	Jan 17 to Dec 26
Average Frequency of Surveys (over duration)*	4.1 days	3.9 days	6.1 days	5.6 days	6.0 days	4.7 days	6.0 days	5.5 days	4.7 days	4.7 days	4.3 days	5.0 days	2.6 days	2.6 days

* Frequency refers to the number of days between surveys, on average over the year

A total of 43,244 caribou were detected across 132 AWAR road surveys (i.e., 327.6 caribou per survey), and were recorded in all months except January, February, and July. The highest average caribou observed per survey occurred in September and October (Table 3). Record numbers of average caribou per survey were observed for March, April, May, June, August, September, October, and November 2020 (Table 3).

Table 3: Average Number of Caribou Observed Per Survey Trip along the All-Weather Access Road from 2007 to 2020

Month	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average
January	0	14.3	12.0	5.3	3.0	5.1	0	3.2	5.8	3.7	8.0	6.4	0	0	4.8
February	0	11.5	10.7	4.1	1.0	5.3	68.1	10.5	7.0	2.3	0	12.3	0	0	9.5
March	11.4	11.4	16.7	6.7	6.0	6.0	39.8	10.5	14.4	6.0	3.5	14.4	6.0	107.6	18.6
April	14.0	12.7	11.4	10.8	34.0	15.2	0	27.2	22.4	23.8	4.0	51.4	77.6	263.2	40.6
May	15.4	12.1	13.0	18.0	25.3	14.2	11.0	8.4	14.1	13.2	0	27.7	22.8	430	44.7
June	7.1	3.5	8.2	9.0	12.5	3.1	5.3	1.5	6.3	6.9	1.0	12.3	5.7	52	9.6
July	1.5	13.3	0	1.1	1.0	0	0	0	2.0	0	0	1.0	1.0	0	1.5
August	1.1	5.4	3.6	5.6	63.0	1.0	1.0	1.0	3.0	2.7	3.4	23.4	1.3	185.2	21.5
September	10.8	12.5	8.5	4.8	10.3	1.0	6.5	33.1	12.3	3.3	5.3	23.7	1.0	483.9	44.1
October	18.4	44.3	25.4	197.2	71.6	60.0	6.0	101.8	41.5	73.0	63.3	38.8	145.8	485.7	98.1
November	72.4	90.7	13.0	106.0	2.3	116.5	455.2	48.4	148.9	2.0	12.6	40.6	79.0	556	124.5
December	18.4	10.3	11.0	7.9	7.8	169.7	16.8	17.6	275.0	15.7	5.4	1.0	4.0	2.3	40.2

Data show the average number of caribou observed for a month of the year, including data from all surveys done that month. Data are based on the observed number, which might be more inaccurate for larger groups or groups that are further away.

Maps were produced to depict the total number of caribou sighted along the AWAR and WTHR, summarized as density estimates for each 2 km stretch of road. Cumulative caribou density along the AWAR for 2020 are shown summarizing year-round totals (Figure 2), the spring and summer totals (Figure 3), and the fall and winter totals (Figure 4). Year-round caribou density along the AWAR was relatively constant, with relatively higher densities reported from KM 48 to 56 as well as a small section just north of Baker Lake at KM 14 to 18. Caribou density did not exceed 1,750 individuals per km along the AWAR throughout the year. During the spring months, caribou primarily occurred along the northern half of the AWAR, with few sightings near Baker Lake. Caribou densities were low along the AWAR in the spring but were observed consistently along the north half of the AWAR. During the summer months, caribou were observed along the entire length of the AWAR, with higher densities observed along the southern half, and slightly higher densities along the northern half. Few caribou were observed in the Meadowbank LSA during the summer. During the fall, caribou density was highest from KM 32 to 56, along with a high-density pocket observed at KM 16 to 18 near Baker Lake. Low densities of caribou persisted near the Meadowbank LSA during the fall. Caribou density was very low along the AWAR during the winter, with scattered low-density observations throughout. The 2019 analysis revealed that from 2008 to 2019 the highest cumulative caribou densities along the AWAR occur in areas closest to the community of Baker Lake and south and north of Whitehills Lake (Agnico Eagle 2020b); the 2020 road survey data is consistent with this result, showing a similar pattern of year-round caribou distribution along the AWAR. The stretch of road from KM 14 to KM 18 along the AWAR stood out as a high-density congregation area for caribou, particularly in the summer and fall. This stretch of the AWAR occurs between adjacent lakes, which may act as a natural funnel where caribou navigate around these lakes during these seasons.

2.6.2 WTHR Surveys

In previous years, survey routes were separated into the Vault and Whale Tail segments of the WTHR but were analyzed as a single unit (WTHR) in 2020. The total number of surveys conducted in 2020 was 161 (2.2 days per survey), down slightly from the 173 (2.0 days per survey) conducted in 2019, but much higher than in 2017 and 2018 (Table 4). Surveys were relatively evenly distributed among season in 2020, but the most surveys were conducted in the summer.

Table 4: Details of Whale Tail Haul Road Surveys from 2017 to 2020

Season	Number of Haul Road Surveys			
	2017	2018	2019	2020
Spring (01 Apr to 25 May)	9	4	62	47
Summer (26 May to 21 Sep)	7	1	39	50
Fall (22 Sep to 15 Dec)	7	7	45	32
Winter (16 Dec to 31 Mar)	24	47	27	32
Year End Total	47	59	173	161
Duration	Jan 03 to Dec 29	Jan 30 to Dec 30	Jan 8 to Dec 23	Jan 7 to Dec 26
Average Frequency of Surveys (over duration)	7.7 days	5.7 days	2.0 days	2.2 days

* Frequency refers to the number of days between surveys, on average over the year Combined Vault and WTHR surveys from 2017-2019 and recalculated average frequency.

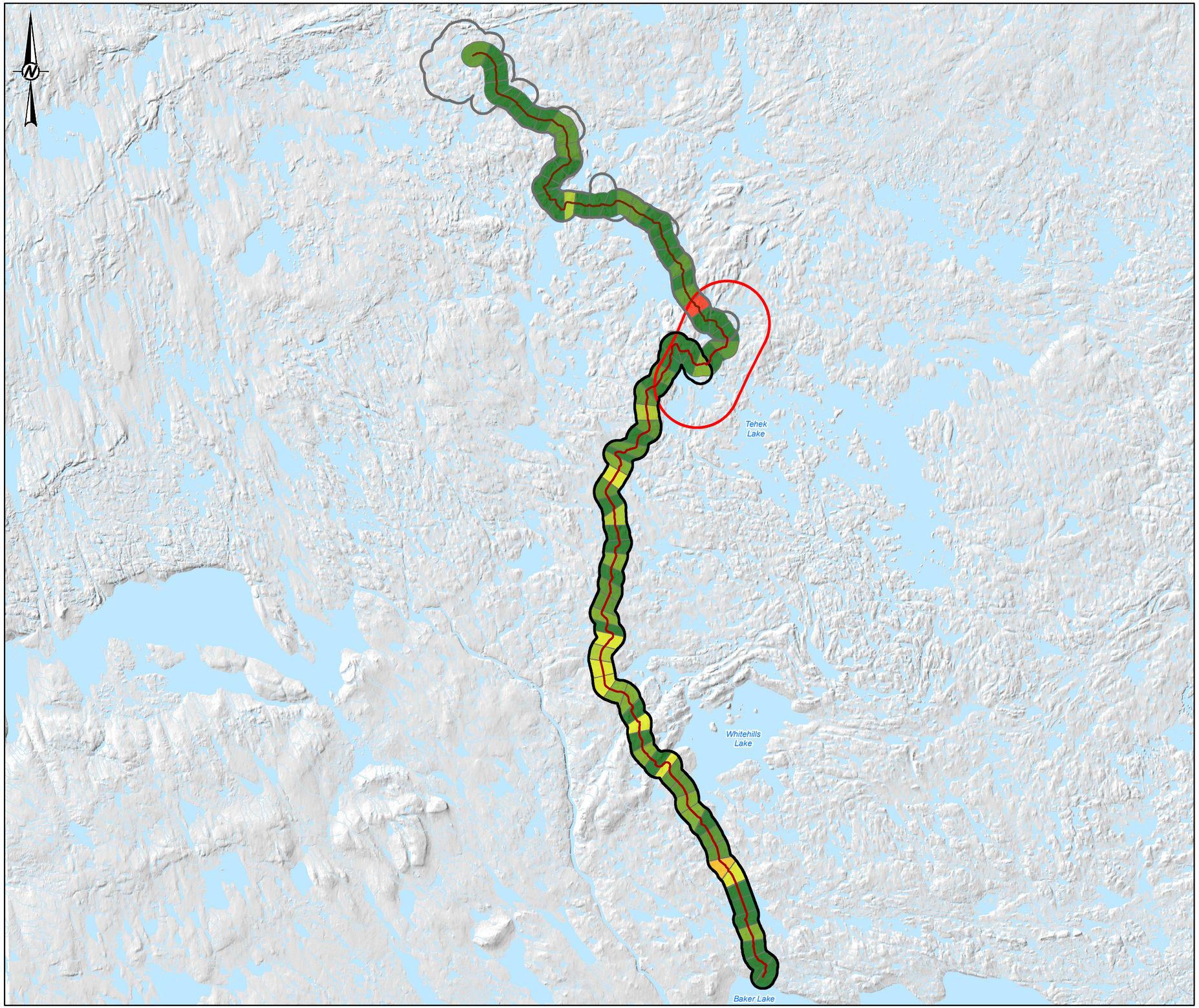
A total of 17,172 caribou were detected across 161 WTHR surveys (i.e., 106.7 caribou per survey) in 2020, and were recorded in all months of the year. The majority of caribou sightings were observed in the spring months of April and May (Table 5). The average number of caribou observed along the WTHR was higher in 2020 than in previous years, but below average numbers were recorded from July to December (Table 5).

Table 5: Average Number of Caribou Observed Per Survey Trip along the Whale Tail Haul Road from 2017 to 2020

Month	2017	2018		2019		2020	Average
	Vault	Whale Tail	Vault	Whale Tail	Vault		
January	0	0	0	4.0	0	1.3	1.3
February	5	0	2	0	0	2.8	2.5
March	9	0	5	4.0	89.2	64.3	42.9
April	5	120.4	46.3	75.5	27.9	235.1	128.7
May	0	0	0	96.9	0	523.8	160.8
June	0	0	0	8.8	0	5.8	3.3
July	0	8.4	0	1.3	0	0.3	2.6
August	0	0	0	32.4	0	7.4	13.1
September	3	15.2	77	3.3	0	6.2	26.1
October	0	104.7	10	83.8	0	0.3	47.7
November	6	18.3	0	3.7	0	8.6	9.2
December	0	13.5	0	8.3	0	2.4	6.1

Data show the average number of caribou observed for a month of the year, including data from all surveys done that month. Data are based on the observed number, which might be more inaccurate for larger groups or groups that are further away

The year-round caribou densities along the WTHR were relatively low and constant throughout the length of the road, except for a high-density pocket from KM 118 to 120 within the Meadowbank LSA. Caribou density along the WTHR was highest in the spring, while caribou numbers along the WTHR were very low in all other seasons and only occurred at a few spots along the road. In the fall, caribou were only observed from KM 144 to KM 152 along the WTHR, and during the winter caribou were primarily observed from KM 110 to KM 122 immediately north of the Meadowbank main camp. These results are consistent with last year's findings although in 2020 year-round densities were relatively lower near the Whale Tail pit, and higher near the Meadowbank main camp in the winter (Agnico Eagle 2020b).



LEGEND

- ALL-WEATHER ACCESS ROAD (AWAR)
- WHALE TAIL HAUL ROAD (WTHR)
- AWAR LOCAL STUDY AREA (LSA)
- WTHR LOCAL STUDY AREA (LSA)
- MEADOWBANK LOCAL STUDY AREA (LSA)
- WATERCOURSE
- WATERBODY

CARIBOU DENSITY (per km)

- 1 - 250
- 251 - 500
- 501 - 750
- 751 - 1000
- 1001 - 1250
- 1251 - 1500
- 1501 - 1750
- 1751 - 2000
- 2001 - 2250
- 2251 - 3918

0 10 20

1:500,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.
COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

CARIBOU DENSITY ALONG THE ALL-WEATHER ACCESS ROAD AND WHALE TAIL HAUL ROAD, YEAR ROUND (2020)

CONSULTANT

GOLDER

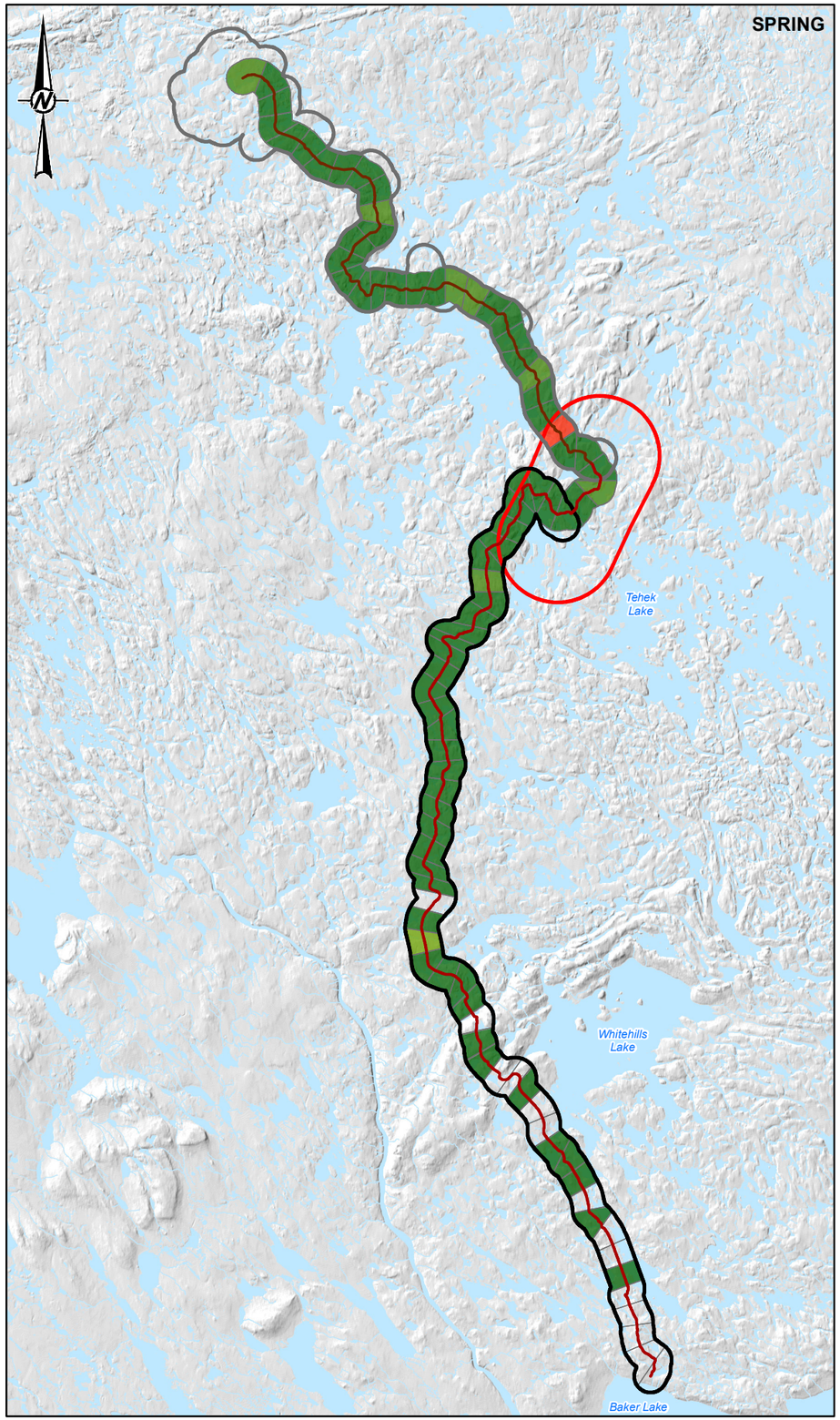
YYYY-MM-DD	2021-03-24
DESIGNED	CC
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

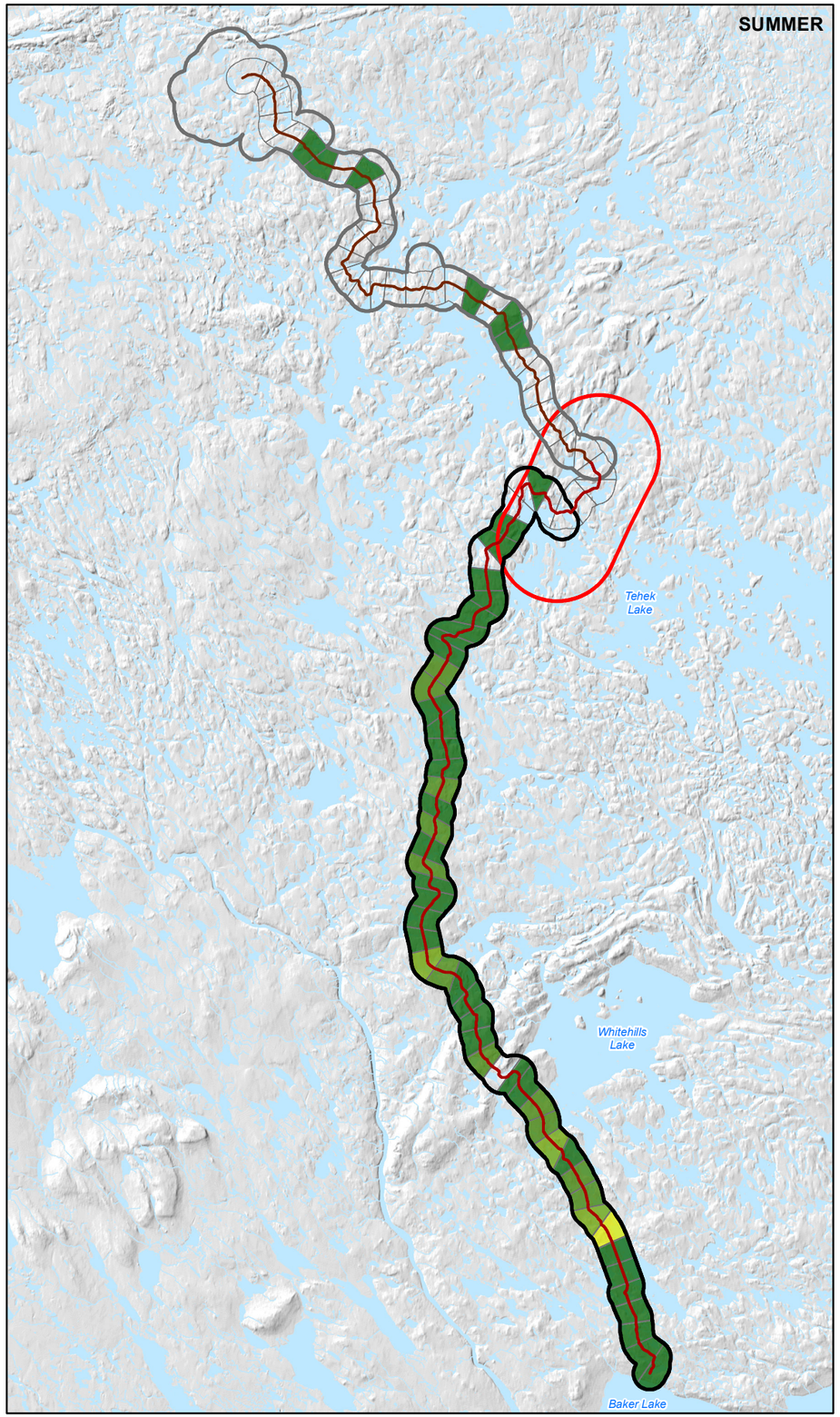
PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9_PROJECTS\19134270\4000\4040\02_PRODUCTION\MXD\Report\19134270_4000_4040_02_Caribou_Density_2020.mxd PRINTED ON: 2021-03-24 AT: 3:54:24 PM





LEGEND

- ALL-WEATHER ACCESS ROAD (AWAR)
- WHALE TAIL HAUL ROAD (WTHR)
- AWAR LOCAL STUDY AREA (LSA)
- WTHR LOCAL STUDY AREA (LSA)
- MEADOWBANK LOCAL STUDY AREA (LSA)
- WATERCOURSE
- WATERBODY

CARIBOU DENSITY (per km)*

- 1 - 250
- 251 - 500
- 501 - 750
- 751 - 1000
- 1001 - 1250
- 1251 - 1500
- 1501 - 1750
- 1751 - 2000
- 2001 - 2250
- 2251 - 3918

*EMPTY SECTIONS REFLECT CARIBOU DENSITY = 0

0 10 20

1:500,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.
COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

CARIBOU DENSITY ALONG THE ALL-WEATHER ACCESS ROAD AND WHALE TAIL HAUL ROAD, SPRING AND SUMMER (2020)

CONSULTANT

GOLDER

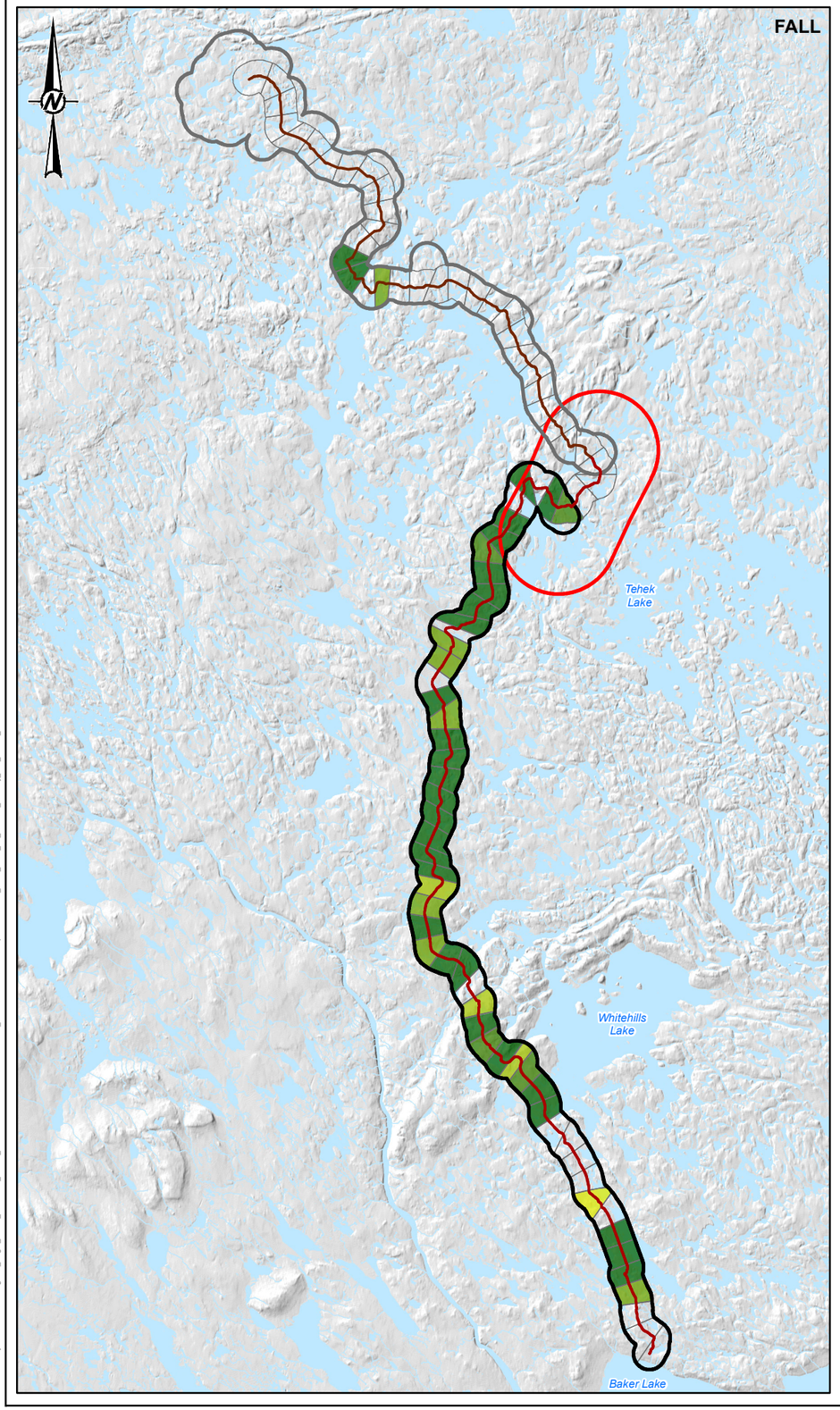
YYYY-MM-DD	2021-03-24
DESIGNED	CC
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

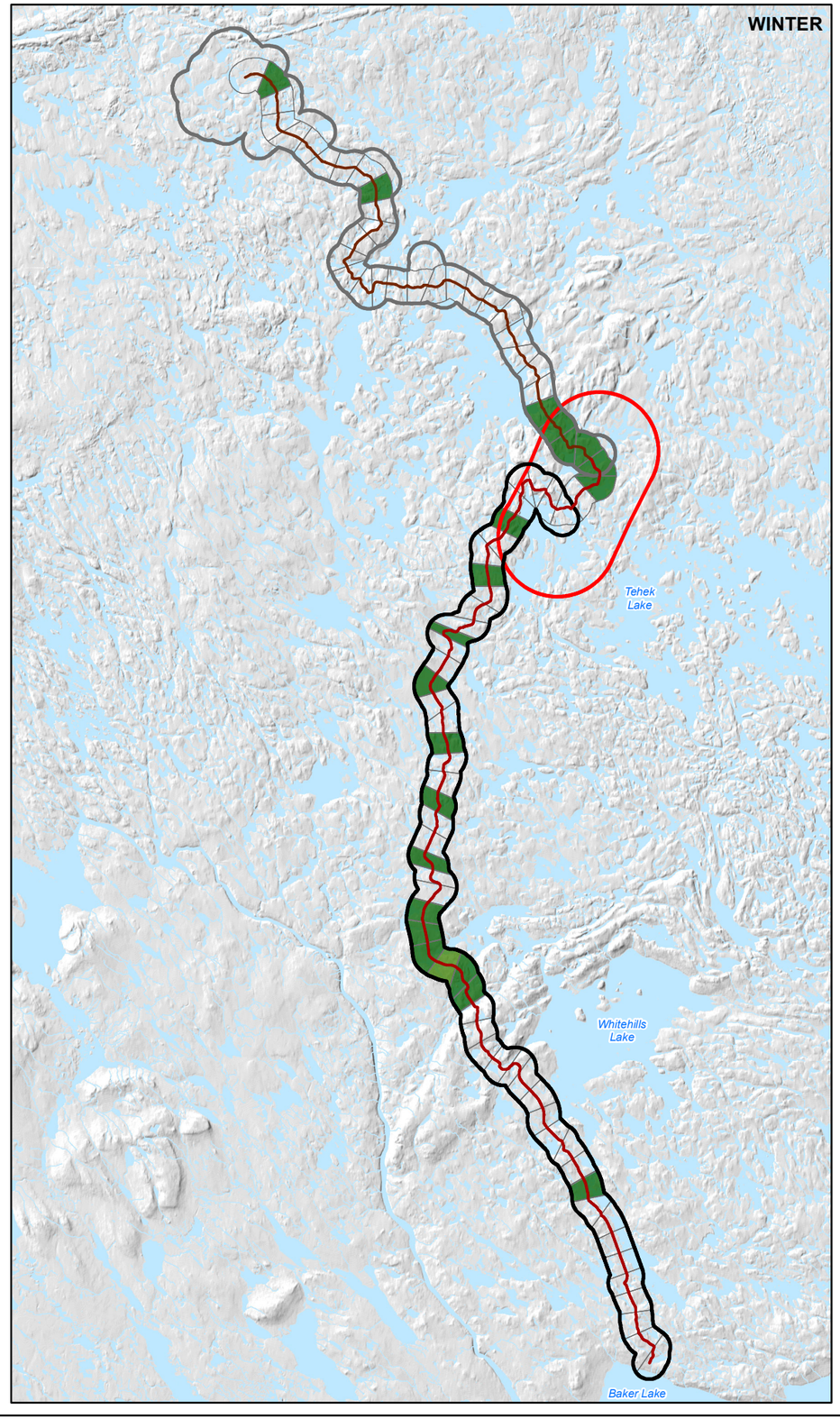
PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9\9_PROJECTS\19134270\4000\4040\02_PRODUCTION\MXD\Report\19134270_4000_4040_03_Caribou_Density_Spring_Summer_2020.mxd PRINTED ON: 2021-03-24 AT: 3:57:05 PM





LEGEND

- ALL-WEATHER ACCESS ROAD (AWAR)
- WHALE TAIL HAUL ROAD (WTHR)
- AWAR LOCAL STUDY AREA (LSA)
- WTHR LOCAL STUDY AREA (LSA)
- MEADOWBANK LOCAL STUDY AREA (LSA)
- WATERCOURSE
- WATERBODY

CARIBOU DENSITY (per km)*

- 1 - 250
- 251 - 500
- 501 - 750
- 751 - 1000
- 1001 - 1250
- 1251 - 1500
- 1501 - 1750
- 1751 - 2000
- 2001 - 2250
- 2251 - 3918

*EMPTY SECTIONS REFLECT CARIBOU DENSITY = 0

0 10 20

1:500,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA. COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED: MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

CARIBOU DENSITY ALONG THE ALL-WEATHER ACCESS ROAD AND WHALE TAIL HAUL ROAD, FALL AND WINTER (2020)

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	CC
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\Journal\y\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9\9_PROJECTS\19134270\4000\404040\02_PRODUCTION\MXD\Report\19134270_4900_4040_04_Caribou_Density_Fall_Winter_2020.mxd PRINTED ON: 2021-03-24 AT 3:59:46 PM

Total number of caribou observed in 2020 along the AWAR were similar to 2019 numbers, while the number of caribou observed along the WTHR were intermediate between 2018 and 2019 (Figure 5). The total number of caribou observed during road surveys remains much higher in the last two years than in any previous year of survey.

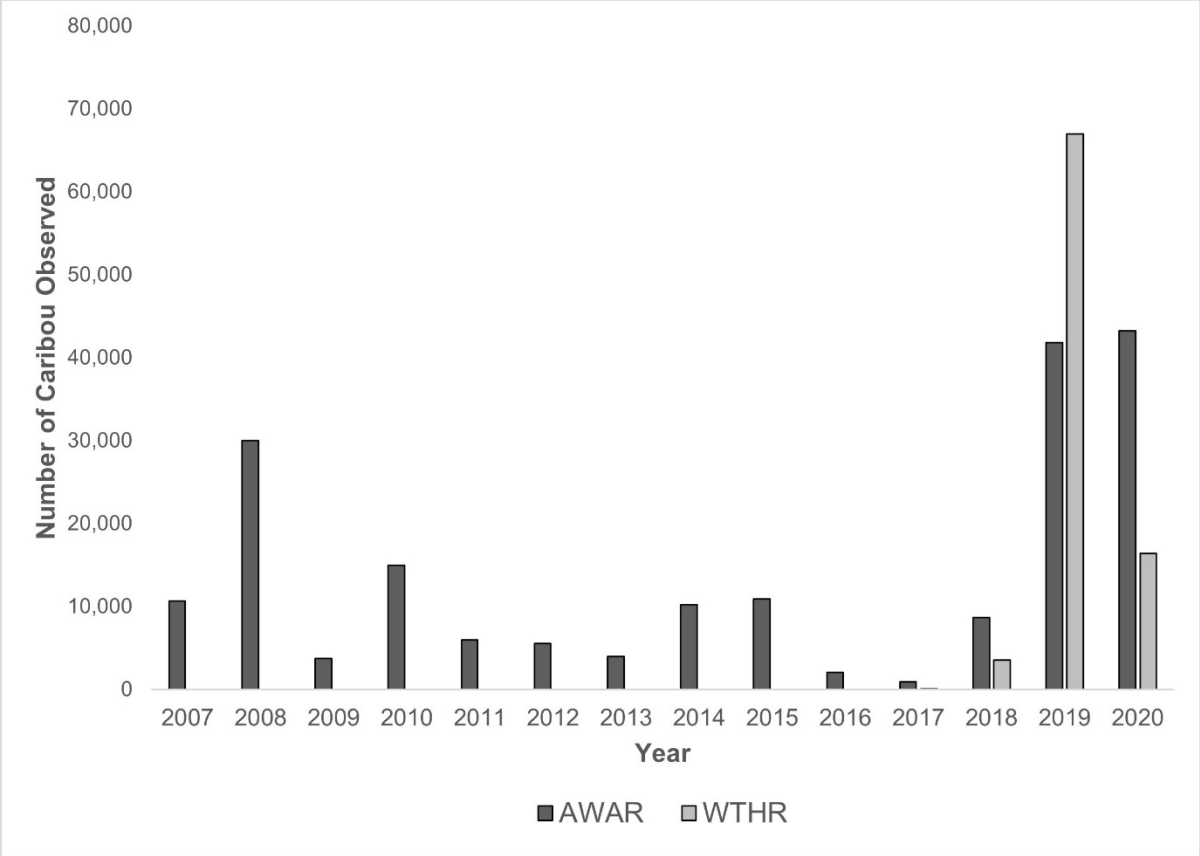


Figure 5: Total Number of Caribou Observed each Year during All-Weather Access Road and Whale Tail Haul Road Surveys

2.6.3 Traffic Data and Caribou Movement

Total one-way traffic along the AWAR in 2020 included 26 heavy equipment, 12,871 medium equipment, and 9,619 light equipment vehicles for a total of 22,516 vehicles (Table 6). Total traffic along the WTHR included 40,432 long-haul, 4,342 medium equipment, and 5,667 light equipment vehicles, for a total of 50,441 vehicles (Table 7). Total traffic along the AWAR was about one-third lower in 2020 than during 2019 and twice as high along the WTHR in 2020 than in 2019 (Agnico Eagle 2020b). Monthly vehicle traffic for the AWAR and WTHR were relatively constant throughout the year, except for April when caribou were migrating through the Project and road closures to non-essential vehicles were implemented and traffic volume was reduced in response to the COVID-19 restrictions (Figure 6).

Table 6: Monthly Traffic Data for the Meadowbank All-Weather Access Road in 2020

Month	Heavy Equipment	Medium Equipment	Light Equipment	Total
January	0	1091	959	**2050**
February	0	1077	735	**1812**
March	0	754	685	**1439**
April	0	403	389	**792**
May	0	836	477	**1313**
June	0	1191	1050	**2241**
July	8	1437	1446	**2891**
August	12	1372	759	**2143**
September	3	1475	913	**2391**
October	1	1134	654	**1789**
November	2	1128	865	**1995**
December	0	973	687	**1660**
Total	**26**	**12,871**	**9,619**	**22,516**

Table 7: Monthly Traffic Data for the Meadowbank Whale Tail Haul Road in 2020

Month	Long-Haul	Medium Equipment	Light Equipment	Total
January	3136	378	618	**4132**
February	2784	421	642	**3847**
March	2162	381	592	**3135**
April	0	190	359	**549**
May	2540	317	404	**3261**
June	3170	253	406	**3829**
July	4316	382	589	**5287**
August	4112	324	435	**4871**
September	4570	457	419	**5446**
October	4480	478	384	**5342**
November	4822	454	462	**5738**
December	4340	310	354	**5004**
Total	**40,432**	**4,342**	**5,667**	**50,441**

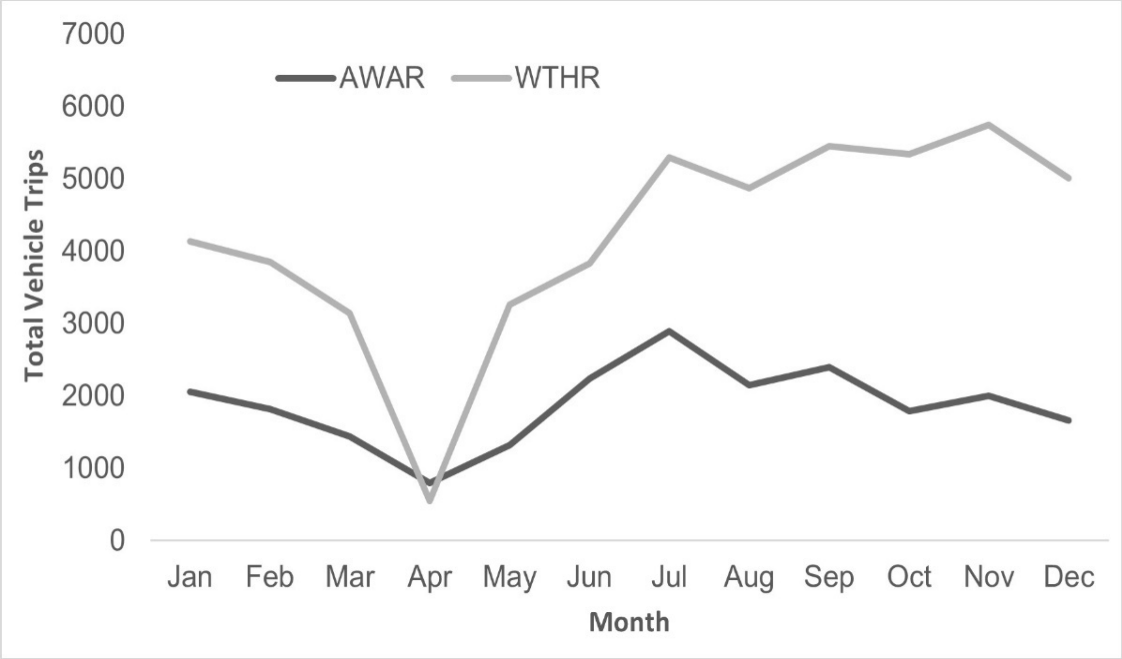


Figure 6: Total Vehicle Traffic (One-way Trips) Along All-Weather Access Road and Whale Tail Haul Road per Month in 2020

2.6.4 Wildlife Species Encountered on Road Surveys

Seven mammalian species and seven avian species were detected and identified during road surveys in 2020 (Table 8). Arctic fox, Arctic ground squirrel, Arctic hare, caribou, grey wolf, muskox, and wolverine were all detected along both the AWAR and WTHR. Canada goose, sandhill crane, common raven, peregrine falcon, and snow goose were detected on both the AWAR and WTHR, and bald eagle and rough-legged hawk were detected along the AWAR (Table 8). Five unidentified birds were observed during road surveys: eagle sp. (most likely bald eagle), duck sp., goose sp., ptarmigan sp., and swan sp. (most likely tundra swan).

Table 8: Species Detected During Road Surveys at All-Weather Access Road (AWAR) and Whale Tail Haul Road (WTHR) in 2020

Species Group	Common Name	Scientific Name	AWAR[(a)]	WTHR[(a)]
Mammal	Arctic fox	*Vulpes lagopus*	X	X
	Arctic ground squirrel	*Urocitellus parryii*	X	X
	Arctic hare	*Lepus arcticus*	X	X
	Caribou	*Rangifer tarandus*	X	X
	Grey wolf	*Canis lupus*	X	X
	Grizzly bear	*Ursus arctos*		X
	Muskox	*Ovibos moschatus*	X	X
	Wolverine	*Gulo gulo*	X	X

Table 8: Species Detected During Road Surveys at All-Weather Access Road (AWAR) and Whale Tail Haul Road (WTHR) in 2020

Species Group	Common Name	Scientific Name	AWAR[(a)]	WTHR[(a)]
Bird	American crow	*Corvus brachyrhynchos*	X	
	Bald eagle	*Haliaeetus leucocephalus*	X	
	Canada goose	*Branta canadensis*	X	X
	Common raven	*Corvus corax*	X	X
	Peregrine falcon	*Falco peregrinus*	X	X
	Rough-legged hawk	*Buteo lagopus*	X	
	Sandhill crane	*Grus canadensis*	X	X
	Snow goose	*Chen caerulescens*	X	X
	Snowy owl	*Bubo scandiacus*	X	
	Duck species	N/A		X
	Eagle species	N/A	X	
	Goose species	N/A	X	
	Gull species	N/A	X	
	Ptarmigan species	N/A	X	X
	Swan species	N/A	X	

[(a)]X denotes at least one individual detected during 2020 road surveys.

AWAR Closures

Significant movements of caribou occurred along the Meadowbank AWAR from approximately mid-April to late April, from mid-August to late September, and from mid-October through mid-November in 2020, resulting in multiple closures to Project-related traffic. The AWAR was fully closed on 38 days, and partially closed on 21 days, for a total of 59 days with restriction in 2020 (Table 9). Restrictions were generally due to presence of caribou, however mitigation measures such as reduced speeds were instituted due to the presence both muskox and caribou herds in mid-August (17 Aug; Table 9).

WTHR Closures

Significant movements of caribou during the spring from approximately mid-March to early-May 2020, and in the summer in early August resulted in multiple closures of the WTHR. The WTHR was fully closed on 11 days, and partially closed on 5 days, for a total of 16 days with restriction in 2020 (Table 10).

Table 9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road 2020

Date	Cause	Closure Status	Wildlife Observed	Number of Individuals Observed	Distance from Road	Monitoring Method	Hours Closed	Viewshed	Road Surveys	Collaring Data Reviewed	Convoy	Reason for Re-opening	Additional Comments
2020-04-03	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Closed 15:00	N/A	0	Yes	No	N/A	The AWAR was closed was closed this afternoon due to small groups of caribou at KM90, KM70, and KM30.
2020-04-04	Weather, Caribou	Closure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	N/A	The AWAR also remained closed today but due to blowing conditions along the road, no monitoring was completed.
2020-04-05	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log		N/A	0	N/A	No	N/A	The AWAR also remained closed today due to caribou presence along the road. Small, scattered groups of caribou were observed at KM100, KM92, and KM59.
2020-04-06	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	N/A	1	Yes	No	N/A	The AWAR also remained closed today due to caribou presence along the road. Groups of caribou were observed at KM96, KM60, KM53 and KM46.
2020-04-07	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed today due to caribou presence along the road. Groups of caribou were observed at KM86 and KM70, as well as a larger group which was scattered between KM56 to KM52. Two groups of approximately 100 caribou were observed crossing the road from west to east at KM70 and KM55. The AWAR will remain closed this evening and monitoring will continue again throughout the day tomorrow.
2020-04-08	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log		N/A	0	Yes	No	N/A	The AWAR remained closed today due to caribou presence along the road. Groups of caribou were observed at KM92, KM53, KM49, KM45, and KM40. All of the caribou observed were on the west side of the road. The AWAR will remain closed this evening and monitoring will continue again throughout the day tomorrow.
2020-04-09	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	N/A	2	Yes	No	N/A	The AWAR remained closed today due to scattered caribou presence along the road. Groups of caribou were observed between KM104-101, KM46 and as well at KM11. All of the caribou observed were on the west side of the road. The AWAR will remain closed this evening and monitoring will continue again throughout the day tomorrow.
2020-04-10	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log		N/A	0	Yes	Yes	N/A	The AWAR remained closed today due to scattered caribou presence along the road. Groups of caribou were observed between KM99, KM86, KM53 and KM42. All of the caribou observed were on the west side of the road but a group of approximately 50 caribou also crossed to the east at KM99. The AWAR will remain closed this evening and monitoring will continue again throughout the day tomorrow.
2020-04-11	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log		N/A	0	N/A	Yes	N/A	The AWAR remained closed today due to scattered caribou presence along the road. Groups of caribou were observed between KM97, KM88, KM80, KM68, and KM59. All of the caribou observed were on the west side of the road but a group of approximately 20 caribou also crossed to the east at KM100. The AWAR will remain closed this evening and monitoring will continue again throughout the day tomorrow.
2020-04-12	Weather, Caribou	Closure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	N/A	The AWAR was closed today due to blizzard like conditions. Monitoring will continue on both roads once the weather permits.
2020-04-13	Weather, Caribou	Closure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	N/A	The AWAR was closed today due to blowing conditions and snow build up along sections of the road. Environment was present on sections of the AWAR and WTHR road where snow had been cleared. Group of caribou were observed on the west side at KM160 and KM123 as well as KM105 and KM86 along the AWAR. Monitoring will continue on both roads tomorrow once the weather permits.
2020-04-14	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed today due to presence of caribou at KM102, KM95, and KM85 – groups of caribou were also observed on the east side of the road at the same locations.
2020-04-15	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Opened 11:00	N/A		Yes	No	Project-tolerant caribou observed.	The AWAR was reopened today at 11:00am after an assessment of the road this morning. Caribou monitoring continued throughout the day along the AWAR and only a few scattered caribou were observed at KM60, KM78 and KM85. Smalls groups of caribou at KM91 and KM102 were observed on the east side of the road and moving east.
2020-04-20	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Closed 18:00	N/A	0	Yes	No	N/A	The AWAR remained open today and monitoring continued throughout the day. Scattered groups of caribou were observed between KM82 and KM86. One group of caribou was also observed at KM62 crossing the road from west to east. Due to caribou presence along the road – the AWAR will be closed for the evening at the end of day shift.
2020-04-21	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	Closed 18:00	N/A	1	Yes	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR remained open today and monitoring continued throughout the day. Scattered groups of caribou were observed between KM82 and KM86. One group of caribou was also observed at KM60 and KM84 crossing the road from west to east. Due to caribou presence along the road – the AWAR will be closed for the evening at the end of day shift.

Table 9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road 2020

Date	Cause	Closure Status	Wildlife Observed	Number of Individuals Observed	Distance from Road	Monitoring Method	Hours Closed	Viewshed	Road Surveys	Collaring Data Reviewed	Convoy	Reason for Re-opening	Additional Comments
2020-04-22	Weather, Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Closed 12:00	N/A	0	Yes	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR was closed this afternoon due to blizzard conditions. Scattered groups of caribou were observed along the AWAR between KM40 and KM80. Monitoring will continue again tomorrow along both roads, once the weather permits.
2020-04-23	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Closed 18:00	N/A	0	N/A	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR was opened today and caribou monitoring continued throughout the day. Small scattered groups of caribou were observed along the AWAR on the west side of the road between KM48 and KM68. One group of approximately 100 caribou was observed at KM83 crossing the road from west to east. Due to caribou presence along the road – the AWAR will be closed for the evening at the end of day shift. Monitoring will continue throughout the day again tomorrow.
2020-04-24	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Closed 18:00	N/A	0	Yes	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR was open today and caribou monitoring continued throughout the day. Small scattered groups of caribou were observed along the AWAR on the west side of the road. One group of approximately 200+ caribou was observed at KM21 crossing the road from west to east. Small groups of caribou were also observed crossing from west to east at KM50 and KM87. Due to caribou presence along the road – the AWAR will be closed for the evening at the end of day shift.
2020-04-25	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	Closed 18:00	N/A	1	N/A	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR was open today and caribou monitoring continued throughout the day. Small scattered groups of caribou were observed along the AWAR on the west side of the road. Groups of approximately 50 caribou were observed crossing the road from west to east at KM21 at KM30. Due to caribou presence along the road – the AWAR will be closed for the evening at the end of day shift.
2020-04-26	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	Closed 18:00	N/A	2	N/A	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR was open today and caribou monitoring continued throughout the day. Small scattered groups of caribou were observed along the AWAR on the west side of the road. One group of approximately 500 caribou was observed far from the road at KM89. Due to caribou presence along the road – the AWAR will be closed for the evening at the end of day shift.
2020-04-27	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	Closed 18:00	N/A	2	Yes	No	Project-tolerant caribou observed. Closed at night to encourage passage.	The AWAR was open today with limited speed and caribou monitoring continued throughout the day. Small scattered groups of caribou were observed along the AWAR on the west side of the road from kilometer 80 to 100.
2020-08-09	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, Wildlife Log	Closed 05:30	N/A	1	N/A	No	N/A	N/A
2020-08-10	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed today, due to a large scattered group, between KM 87 and 89. Some small groups were seen crossing the road. AWAR will remain closed this evening, and monitoring will resume throughout the day tomorrow.
2020-08-11	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Wildlife Log		N/A	0	Yes	No	N/A	The AWAR remained closed today. Large groups of caribou were seen scattered around KM 69,76,81,93. A group was observed crossing east to west near KM77. The AWAR will remain closed this evening, and monitoring will resume throughout the day tomorrow.
2020-08-12	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Wildlife Log		N/A	0	Yes	No	N/A	The AWAR remained closed today. Inspection of the road was only partially completed today, due to the large presence of caribou. Caribou were reported from KM15 up to the exploration camp, with two large groups around KM71 and 81. Some groups were observed crossing east to west. The AWAR will remain closed this evening, and monitoring will resume throughout the day tomorrow.
2020-08-13	Caribou	Partial Closure	Caribou	Groups smaller than GST (25)	< 1.5 km from road	Road Survey	Opened 17:30	N/A	1	Yes	No	Observations from monitoring did not exceed GST (25).	The AWAR was closed today. Road monitoring was performed, and only two small groups around KM71 and KM64 were noted. Both groups being under the GST, the AWAR is now reopening. Speed restrictions of 30 KM/h will be enforced in areas where caribou are present. Monitoring will resume throughout the day tomorrow.
2020-08-17	Caribou	Partial Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	N/A	N/A	1	N/A	No	N/A	The AWAR was closed this afternoon, as of 1PM, following the observation of groups surpassing the threshold size, around KMs 9 and 46, as well as a group of muskox KM 95. The road will remain closed throughout the night. Monitoring of the road will resume tomorrow morning.
2020-08-18	Caribou	Partial Closure	Caribou	Groups smaller than GST (25)	< 1.5 km from road	Road Survey	N/A	N/A	1	Yes	No	Observations from monitoring did not exceed GST (25).	The AWAR was closed this morning, with a progressive opening as of 5PM. No large group of caribou were observed this afternoon at any point on the road. A group of muskox was observed, and speed reduction of 30KM/h will be enforced from main camp through to the exploration camp. The road will remain open with speed restriction throughout the night. Monitoring of the road will resume early tomorrow morning.
2020-09-11	Caribou	Partial Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	Closed 19:00	N/A	1	Yes	No	N/A	The AWAR was closed this evening. Groups of 150 and 110 caribou were seen on the east side of the AWAR, at KMs 22 and 28, while a group of 146 caribou were seen on the west side of road, having just crossed. The road will remain closed overnight, and monitoring will resume early tomorrow.

Table 9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road 2020

Date	Cause	Closure Status	Wildlife Observed	Number of Individuals Observed	Distance from Road	Monitoring Method	Hours Closed	Viewshed	Road Surveys	Collaring Data Reviewed	Convoy	Reason for Re-opening	Additional Comments
2020-09-12	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	N/A	N/A	2	N/A	No	N/A	The AWAR was closed all day today. A large group of 150 caribou was seen on the east side of the AWAR, around KM38. Smaller scattered group were also observed, notably around KM53. Many ATVs were observed along the road, which could explain the scattered groups. The road will remain closed throughout the night, and monitoring will resume early tomorrow.
2020-09-13	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	N/A	N/A	2	N/A	Yes	N/A	The AWAR was closed all day today, with a fuel convoy occurring during the afternoon. A few scattered groups were noticed, with the largest group being about 100 caribou, around KM22. The road will remain closed throughout the night, and monitoring will resume tomorrow.
2020-09-14	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	N/A	N/A	2	N/A	Yes	N/A	The AWAR was closed all day today, with a convoy occurring during the afternoon. Large groups were noticed, specifically around KMs 15 and 30. Large groups crossed the road at KMs 15 and 22. The road will remain closed throughout the night to all personnel, including road maintenance equipment. No convoys are planned tomorrow. caribou monitoring will resume throughout the day tomorrow.
2020-09-15	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, KIA present for monitoring	N/A	N/A	1	Yes	No	N/A	The AWAR was closed all day today, monitoring was performed on the road by Agnico and KIA. Large groups were noticed throughout Baker Lake and KM 50, specifically around KMs 23 and 45. Large groups crossed the road at KMs 15 and 22. The road will remain closed throughout the night to all personnel, including road maintenance equipment. No convoys are planned tomorrow. Monitoring will resume tomorrow morning.
2020-09-16	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	Yes	Yes	N/A	The AWAR was closed all day today, monitoring was performed on the road by Agnico, HTO and KIA. Groups were noticed throughout Baker Lake and KM57. A Large group crossed was give right of way to cross the road. The road will remain closed throughout the night to all personnel. Convoys are planned tomorrow, departing at 5AM and 9AM from Meadowbank. Monitoring will continue throughout the day.
2020-09-17	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, KIA present for monitoring	N/A	N/A	2	Yes	Yes	N/A	The AWAR remained closed throughout the day today. A convoy for fuel and material was completed and monitoring was performed on the road by Agnico and KIA. Small groups were of approximately 50 caribou were observed off the road at KM31 and KM54 as well as a larger group of approximately 100 caribou at KM38. The road will remain closed throughout the night to all personnel. Convoys are planned tomorrow, departing at approximately 5AM and 9AM from Meadowbank. Monitoring will continue throughout the day with assistance from KIA and HTO.
2020-09-18	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	Yes	Yes	N/A	The AWAR remained closed throughout the day today. A convoy for fuel and material was completed and monitoring was performed by Agnico and HTO. Scattered groups of caribou were observed from KM6 up to KM54 along the AWAR. Approximately 150 caribou were observed crossing from east to west at KM21 this morning and approximately 1000 were observed crossing from east to west at KM14 this afternoon. A group of approximately 250 caribou were also observed crossing from west to east at KM56 this morning. The road will remain closed throughout the night to all personnel. Convoys will continue tomorrow departing at approximately 5am and 9am from Meadowbank. Monitoring will continue throughout the day with assistance from KIA and HTO.
2020-09-19	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	N/A	Yes	N/A	The AWAR remained closed throughout the day today. A convoy for fuel and material was completed and monitoring was performed by Agnico and HTO. Only a few scattered groups of caribou were observed along the AWAR - the largest group of approximately 25 caribou were observed crossing from east to west at KM57 this morning and a group of approximately 25 caribou were observed crossing from east to west at KM14 this afternoon. The road will remain closed throughout the night. Convoys will continue tomorrow departing at approximately 5am and 9am from Meadowbank. Monitoring will continue throughout the day with assistance from KIA and HTO.
2020-09-20	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	N/A	Yes	N/A	The AWAR remained closed throughout the day today. A convoy for fuel and material was completed and monitoring was performed by AEM Environment. Only a few scattered caribou were observed along the AWAR. The road will remain closed throughout the night and convoys will continue tomorrow departing at approximately 5am and 9am from Meadowbank. Monitoring will continue throughout the day with assistance from KIA and HTO.
2020-09-21	Caribou	Partial Closure	Caribou	Groups smaller than GST (25)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	Opened 10:00	N/A	1	Yes	Yes	Observations from monitoring did not exceed GST (25).	The AWAR reopened at 10:00am today after monitoring of the road was completed. Only a few scattered caribou were observed along the AWAR between KM51 and KM87. Monitoring will continue along the road tomorrow with assistance from HTO.

Table 9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road 2020

Date	Cause	Closure Status	Wildlife Observed	Number of Individuals Observed	Distance from Road	Monitoring Method	Hours Closed	Viewshed	Road Surveys	Collaring Data Reviewed	Convoy	Reason for Re-opening	Additional Comments
2020-10-24	Caribou	Partial Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Wildlife Log, HTO	Closed 17:00	N/A	0	N/A	No	N/A	During our wildlife monitoring today along the AWAR – a group of approximately 2000 caribou were observed at KM5 on the east side of the road approximately 1.5KM – 2KM away from the road. Equipment along the AWAR was allowed to finish trips in progress with a speed reduction of 30KM between the gatehouse and KM3. The road was closed at 5pm and will remain closed throughout the night to all personnel until further notice. Environment will continue monitoring throughout the day tomorrow.
2020-10-25	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey	N/A	N/A	2	N/A	No	N/A	The AWAR remained closed today due to a large group of caribou presence at KM15. A group of approximately 2000 caribou were observed at KM15 on the east side of the road. Approximately 1000 caribou crossed the road and were moving west. The road will remain closed tonight and until further notice. Environment will continue monitoring throughout the day tomorrow.
2020-10-26	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	1	N/A	No	N/A	Monitoring of the AWAR was completed by AEM ENV, KIA, and HTO throughout the day. Morning observations showed only a few scattered caribou along the road and the road was reopened at 13:00. At 14:30, KIA monitor stopped traffic at KM23 due to the presence of a large group at KM11. Traffic was eventually turned around and sent back to MBK. The road was closed for the night and monitoring will continue today.
2020-10-27	Caribou	Partial Closure	Caribou	Groups smaller than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	Opened 13:00	N/A	2	N/A	No	Observations from monitoring did not exceed GST (110).	Caribou monitoring along the AWAR this morning was completed by AEM ENV, HTO, and KIA. Only a few scattered caribou were observed near the gatehouse and at KM11. The AWAR was reopened at 13:00 and monitoring will continue throughout the day. Morning observations showed only a few scattered caribou along the road between the Baker Lake gate house and KM9.
2020-10-28	Caribou	Partial Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Wildlife Log, HTO and KIA present for monitoring	Closed 18:00	N/A	0	Yes	No	N/A	The AWAR remained open until 18:00 on October 28. Monitoring of the AWAR was completed by AEM ENV, KIA, and HTO throughout the day today. Morning observations showed only a few scattered caribou along the road between Meadowbank and Baker Lake. A group of approximately 300 caribou was observed close to the road at KM20 moving North. KIA monitored the area until traffic passed and the road was closed later in the day. The road is currently closed this morning until an assessment can be completed during daylight. Environment will continue monitoring the road today with assistance from KIA and HTO.
2020-10-29	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed throughout the day. Monitoring of the AWAR was ongoing throughout the day. Observations showed scattered groups between KM14 and 27, with evidence of road crossing. A group of approximately 200 caribou was observed at the end of the day on the east side at KM19. The road will remain closed until further assessment can be completed during daylight. Environment will resume monitoring of the road tomorrow with assistance from KIA and HTO.
2020-10-30	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	N/A	No	N/A	The AWAR remained closed throughout the day. Monitoring of the AWAR was ongoing throughout the day. Large group of caribou were observed walking northbound, following the road between KM30 and 41. The road will remain closed until further assessment can be completed during daylight. Environment will resume monitoring of the road tomorrow with assistance from KIA and HTO.
2020-10-31	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	N/A	No	N/A	The AWAR remained closed throughout the day. Monitoring of the AWAR was ongoing throughout the day. Over 300 caribou were seen crossing the road near KM52. Large groups of caribou were spotted on the east side of the road near KM 35 and 44. The road will remain closed until further assessment can be completed during daylight. Environment will resume monitoring of the road tomorrow with assistance from KIA and HTO.
2020-11-01	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	2	N/A	No	N/A	The AWAR remained closed throughout the day. Monitoring of the AWAR was ongoing throughout the day. A small group of 26 caribou was seen near KM73, while a large group was seen the road near KM55. It is estimated that roughly 1,000 caribou crossed the road near KM52 between October 31st and today. The road will remain closed until further assessment can be completed during daylight. Environment will resume monitoring of the road tomorrow with assistance from KIA and HTO.
2020-11-02	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	1	N/A	No	N/A	The AWAR remained closed throughout the day. Monitoring of the AWAR was ongoing throughout the day. Three separate groups, for a total of around 300 caribou were observed to have crossed the AWAR between KM49 and 56. The caribou were still in the vicinity of the road, and the road will therefore remain closed through the night. A fuel convoy is plan to depart from Meadowbank at 8AM. The convoy will be led by AEM ENV until they meet up with KIA (around KM70), at which point, KIA will lead the convoy.

Table 9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road 2020

Date	Cause	Closure Status	Wildlife Observed	Number of Individuals Observed	Distance from Road	Monitoring Method	Hours Closed	Viewshed	Road Surveys	Collaring Data Reviewed	Convoy	Reason for Re-opening	Additional Comments
2020-11-03	Caribou	Partial Closure	Caribou	Groups smaller than GST (110)	< 1.5 km from road	Road Survey, KIA present for monitoring	Opened 11:45	N/A	1	N/A	Yes	Observations from monitoring did not exceed GST (110). Consultation with GN, HTO, and KIA.	The AWAR was opened yesterday at 11:45AM, following consultation with GN, HTO and KIA. A convoy led by Agnico and KIA departed Meadowbank at 8AM and no large group of wildlife was observed. Monitoring will continue over the next few days.
2020-11-14	Caribou	Partial Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Wildlife Log	Closed 10:00	N/A	0	N/A	No	N/A	The AWAR was closed at 10:00am this morning due to caribou presence between KM54 and KM45. A group of approximately 500+ caribou were observed approximately 1KM east of the road and moving SW. Equipment on the road was allowed to finish trips in progress while ENV monitored the area where caribou were present. The road will remain closed until further notice. Monitoring of the road will continue tomorrow morning and over the next few days.
2020-11-15	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Wildlife Log		N/A	0	N/A	No	N/A	The AWAR remained closed throughout the day on November 15, 2020 due to caribou presence near KM70, KM52, and KM40. A group of approximately 200+ caribou crossed the road from east to west at KM52 and a group of approximately 100 caribou was observed on the east and west side of the road at KM40. The road will remain closed this morning until further notice and an assessment during daylight can be completed. Monitoring of the road will continue throughout the day.
2020-11-16	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Wildlife Log		N/A	0	N/A	No	N/A	The AWAR remained closed throughout the day on November 16, 2020 due to scattered caribou presence along the AWAR between KM80 and KM83. A group of approximately 500+ caribou was observed on the west side of the road at KM45, and a group of approximately 500 caribou was observed on the east side of the road at KM73. The road will remain closed this morning until further notice and an assessment during daylight can be completed. Monitoring of the road will continue throughout the day with assistance from HTO and KIA.
2020-11-17	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed throughout the day on November 17, 2020 due to scattered caribou presence along the AWAR. A group of approximately 250+ caribou was observed on the east side of the road between KM 93-90, and again between KM78-73. Smaller groups of approximately 50+ caribou were observed on the east side of the road at KM29 and on the west side of the road at KM48. The road will remain closed for the evening and monitoring of the road will continue throughout the day tomorrow with assistance from HTO and KIA.
2020-11-18	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed throughout the day on November 18, 2020 due to scattered caribou presence along the AWAR. Groups of approximately 400 (KM53), 700 (KM73), and 1000 (KM81) caribou were observed on the east side of the road. Smaller groups of approximately 100+ caribou were observed on the east side of the road at KM79 and KM86. A group of approximately 100+ caribou were observed on the west side of the road at KM48. The road will remain closed for the evening and monitoring of the road will continue throughout the day tomorrow with assistance from HTO and KIA.
2020-11-19	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO and KIA present for monitoring	N/A	N/A	1	Yes	No	N/A	N/A
2020-11-20	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey	N/A	N/A	1	Yes	No	N/A	The AWAR remained closed throughout the day on November 20, 2020 due to caribou presence along the AWAR. A group of approximately 250 caribou crossed the road from east to west at KM90 and a group of approximately 100 caribou crossed the road from east to west at KM101. Smaller groups of approximately 50 caribou were observed on the east side of the road at KM85 and KM95. The road will remain closed for the evening and monitoring of the road will continue throughout the day tomorrow with assistance from HTO.
2020-11-21	Caribou	Closure	Caribou	Groups larger than GST (110)	< 1.5 km from road	Road Survey, HTO present for monitoring	N/A	N/A	1	N/A	No	N/A	The AWAR remained closed throughout the day on November 21, 2020 due to caribou presence along the AWAR. Monitoring was completed by AEM Environment and HTO. A group of approximately 250 caribou was observed between KM72 and KM69 and a group of approximately 100+ caribou were seen at KM86 far from the road and moving North. Smaller groups of 30 or less caribou were scattered between MBK and KM50. All caribou observed were on the east side of the road. The road will remain closed until further notice and monitoring will continue throughout the day today with assistance from HTO.
2020-11-22	Caribou	Partial Closure	Caribou	Groups smaller than GST (110)	< 1.5 km from road	Road Survey, HTO present for monitoring	Opened 14:00	N/A	1	N/A	No	Observations from monitoring did not exceed GST (110).	The AWAR was reopened this afternoon at 2:00pm after an assessment of road between Baker Lake and Meadowbank was completed by HTO and AEM Environment. Small scattered groups of caribou were observed but far from the road on the North portion of the road between KM50 & Meadowbank. No caribou were observed between Baker Lake and KM46. A speed restriction of 30KM/hr. will be enforced if caribou are observed. Monitoring will continue throughout the day tomorrow with assistance from HTO.

Table 10: Summary of Road Restrictions Related to Ungulate Activity Along the Whale Tail Haul Road in 2020

Date	Cause	Closure Status	Wildlife Observed	Number of Individuals Observed	Distance from Road	Monitoring Method	Hours Closed	Viewshed	Road Surveys	Collaring Data Reviewed	Convoy	Reason for Re-opening	Additional Comments
2020-03-23	Caribou	Partial Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	N/A	9:30 to 22:00	0	0	Yes	No	Observations from monitoring did not exceed GST (25).	N/A
2020-03-29	Caribou	N/A	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	9:00 to 9:45	0	1	N/A	No	Caribou moved away from road.	Group of 75 caribou almost crossed the road from W to E at KM116, but turned around. Road was closed for 45 minutes (9:00 to 9:45) between KM115 and 118.
2020-04-01	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Viewshed, Wildlife Log	Closed 14:00	1	0	Yes	No	N/A	Road closed at 14:00 due to caribou presence near KM120 and KM160.
2020-04-02	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	N/A	0	0	Yes	Yes	N/A	Road closed due to presence of caribou between KM115 and KM133, KM149 and KM160.
2020-04-03	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	N/A	0	0	Yes	Yes	N/A	Road closed due to presence of caribou on the west side of the road between KM115 and KM125, KM135, KM150, KM160, and KM170.
2020-04-04	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	N/A	0	0	N/A	Yes	N/A	Road closed due to presence of caribou on the west side of the road between KM115 and KM135, KM160 and KM170.
2020-04-05	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	0	1	N/A	Yes	N/A	Road closed due to caribou presence on the west side of the road between KM110 and KM120, KM132, KM160, and KM176. Four groups of caribou were observed crossing the road from west to east at KM119, KM127, KM138, and KM160.
2020-04-06	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	N/A	0	0	Yes	Yes	N/A	Road closed due to presence of caribou on the west side of the road between KM110 and KM130, KM160, and KM176. Small groups of caribou were observed crossing the road from west to east at KM119, KM125, and KM133.
2020-04-07	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey	Opened 11:30	0	2	Yes	Yes	Caribou observed crossed road.	Reopened at 11:00am with a speed restriction of 30km/hr. Environment personnel were monitoring along the road throughout the day. Approximately 300 caribou observed crossing the road from west to east at KM111, and approximately 50 crossed from west to east at KM132. Groups of caribou were observed grazing far from the road at KM160 and KM125 on the west side.
2020-04-30	Caribou	Partial Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Wildlife Log	Closed 18:00	0	1	Yes	No	N/A	Road open with a speed restriction of 30km/hr between Meadowbank and the Whale Tail Pit. Road closed at the end of day shift due to increasing caribou numbers were observed during the afternoon along the southern portion of the road.
2020-05-01	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	0	1	Yes	No	N/A	Road remained closed throughout the day. Monitoring also continued during the day. Increasing numbers were still observed during the day along the Whale Tail road.
2020-05-02	Caribou	Closure	Caribou	Groups larger than GST (12)	< 1.5 km from road	Road Survey, Wildlife Log	N/A	0	1	N/A	Yes	N/A	The Whale Tail Haul road remained closed throughout the day. Monitoring also continued during the day. A convoy with essential vehicles was led by the Environmental Department during the day. Number have decreased during the day's monitoring.
2020-08-05	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	N/A	0	1	Yes	Yes	N/A	N/A
2020-08-06	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Wildlife Log	N/A	0	0	Yes	Yes	N/A	N/A
2020-08-07	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Wildlife Log	N/A	0	0	N/A	Yes	N/A	N/A
2020-08-08	Caribou	Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Road Survey	N/A	0	1	N/A	Yes	N/A	N/A
2020-08-09	Caribou	Partial Closure	Caribou	Groups larger than GST (25)	< 1.5 km from road	Wildlife Log	Opened 01:00	0	1	N/A	No	Project-tolerant caribou observed.	N/A

2.6.5 Road-related Mitigation

Road-related monitoring and mitigation is implemented according to Figures 7 and 8 of the TEMP (Agnico Eagle 2019). Collar location maps were instrumental in assessing the need for increased road monitoring. Road-related mitigation related to caribou presence in 2020 resulted in road closures and a corresponding reduction in total vehicle movements in the spring (Section 2.6.3). Road closures were implemented or vehicle movements were restricted (e.g., light vehicles only, speed limited enforced) in response to high caribou numbers. Convoys were organized by Environment staff, which had the training to decide whether vehicles could continue along the road when caribou were sighted.

Regular wildlife warnings were dispatched based on observation and monitoring data. The road supervisors and operators also ensured protection of wildlife by assisting in surveillance and closing roads as needed. Radio notices reminding operators of the appropriate speed limit were made frequently by dispatchers. During caribou peak migration, notices were sent to all road occupants, regulatory agencies, local groups and wildlife consultants were notified, and road survey efforts were increased.

2.6.6 Caribou Responses to Mitigation

Caribou Crossings

The frequency of road surveys in 2020 demonstrate Agnico Eagle's commitment to preventing impacts to caribou from the AWAR, WTHR (including Vault Haul Road). Mitigation measures such as reduced speeds, convoys, and multiple road closures function to minimize road-related effects including mortality and caribou passage. Incidental sightings in 2020 recorded in the Wildlife Log (Appendix A) and road surveys showed that caribou crossed roads throughout the year, with especially high numbers during spring and fall migration (Table 11). The TEMP Version 7 defines Project tolerant caribou as:

> *"An animal or group of animals (i) observed within a mitigation distance buffer for greater than 72 hours during the winter or 48 hours during other season; and (ii) not visibility disturbed by the Project"*

On 15 occasions, caribou were determined to be Project tolerant as defined in TEMP Version 7 (Agnico Eagle 2019) (Table 11). A total of 11,198 caribou were observed crossing the AWAR and 1,473 caribou were observed crossing the WTHR in 2020. The greatest number of caribou were observed crossing the AWAR and WTHR during fall migration in September and October, with a steady increase during spring migration from March to May (Figure 7). Only in January and December were no caribou crossing events observed along either the AWAR or WTHR (Figure 7). Caribou movement patterns continue to require close monitoring and analysis in 2021.

Table 11: Observations of Caribou Crossing Mine Roads in 2020

Date	Number	Location	Notes
Meadowbank AWAR and Mine Site			
31 March	255	KM 121	Wildlife Log
06 April	130	KM 46	Tolerant Observations
06 April	50	KM 119	Wildlife Log
07 April	66	KM 132	Wildlife Log
07 April	90	KM 55	-
13 April	50	KM 54	Wildlife Log
13 April	20	KM 58	Tolerant Observations
20 April	22	KM 60	Wildlife Log
20 April	22	KM 62	Tolerant Observations
21 April	300	KM 82	Wildlife Log

Table 11: Observations of Caribou Crossing Mine Roads in 2020

Date	Number	Location	Notes
22 April	2	KM 56	Wildlife Log
24 April	20	KM 55	Tolerant Observations
24 April	6	KM 50	Tolerant Observations
24 April	200	KM 21	Tolerant Observations
25 April	40	KM 30	Tolerant Observations
01 May	19	KM 116	Wildlife Log
03 May	1,352	KM 52	-
08 May	10	KM 104	Wildlife Log
16 May	5	KM 100	Tolerant Observations
22 May	11	KM 89	Wildlife Log
27 May	20	KM 134	Wildlife Log
06 June	4	KM 104	-
24 June	12	KM 112	Wildlife Log
28 July	2	KM 104	Wildlife Log
08 August	1	KM 76	-
09 August	20	KM 78	-
09 August	10	KM 86	-
09 August	10	KM 85	-
10 August	10	KM 90	-
10 August	2	KM 191	Cow and calf
14 August	2	KM 75	-
18 August	1	KM 40	-
22 August	18	KM 39	-
11 September	29	KM 45	-
13 September	4	KM 58	-
13 September	27	KM 13	-
13 September	18	KM 22	18 out of 100 in the group crossed. Walking west.
13 September	66	KM 38	-
13 September	100	KM 22	Wildlife Log
14 September	11	KM 33	-
14 September	71	KM 28	-
14 September	375	KM 27	-
14 September	400	KM 4	-
14 September	189	KM 39	-
14 September	500	KM 22	-
14 September	500	KM 29	-
14 September	43	KM 48	-
15 September	750	KM 48	-
17 September	350	KM 58	All caribou successfully crossed the road
17 September	80	KM 56	-
18 September	250	KM 53	-
18 September	175	KM 21	-
18 September	1500	KM 14	-
18 September	14	KM 52	-
19 September	17	KM 22	-
19 September	15	KM 17	Running from hunters

Table 11: Observations of Caribou Crossing Mine Roads in 2020

Date	Number	Location	Notes
25 October	2000	KM 15	-
30 October	2	KM 40	Most 200 m east of road crossing lake. Two bulls crossed. Regular influx of caribou from south
30 October	200	KM 33	Groups on west and east side of road. 200 crossed road from west to east (west group moved to east side). Overall animals moving NE with more coming from the south, east side of road.
30 October	15	KM 39	Injured bull crossing road east to west
31 October	297	KM 52	297 animals crossed road right at km52 marker east to west. May be more since blowing snow obscured the road for periods of time.
1 November	11	KM 53	11 crossed E to W. About 960 on west side 10-1500 m west of road most about 200+ m. Originally about 160 close to east side of road but they continued NE to join other group at km55.
2 November	70	KM 56	-
9 November	52	KM 57	-
15 November	19	KM 53	Wildlife Log
16 November	200	KM 40	Wildlife Log
16 November	20	KM 75	Wildlife Log
16 November	26	KM 65	Wildlife Log
28 November	20	KM 55	Wildlife Log
Total	**11,198**		
WTHR			
28 February	10	KM 120	Wildlife Log
31 March	240	KM 121	Around 240 crossed, truck scared the rest
11 April	9	KM 140	-
5 April	20	KM 119	20 crossed the road. Convoy stopped
5 April	250	KM 138	Actively crossing. GPS 138 cross marker
6 April	20	KM 133	Tolerant Observations
6 April	20	KM 119	Tolerant Observations
7 April	300	KM 110	Tolerant Observations
7 April	50	KM 132	Tolerant Observations
7 April	10	KM 119	Tolerant Observations
16 April	39	KM 147	-
29 April	50	KM 113	Wildlife Log
2 May	27	KM 123	-
3 May	100	KM 112	Wildlife Log
6 May	4	KM 142	Tolerant Observations
6 May	6	KM 143	-
15 May	10	KM 122	Tolerant Observations
2 July	1	KM 111	-
3 August	1	KM 144	-
6 August	265	KM 153	Wildlife Log
7 August	32	KM 161	Wildlife Log
9 August	6	KM 143	Wildlife Log
9 August	1	KM 164	-
13 August	1	KM 165	-
13 August	1	KM 172	Walking north on the road
Total	**1,473**		

- Denotes that notes were not recorded for the observations.

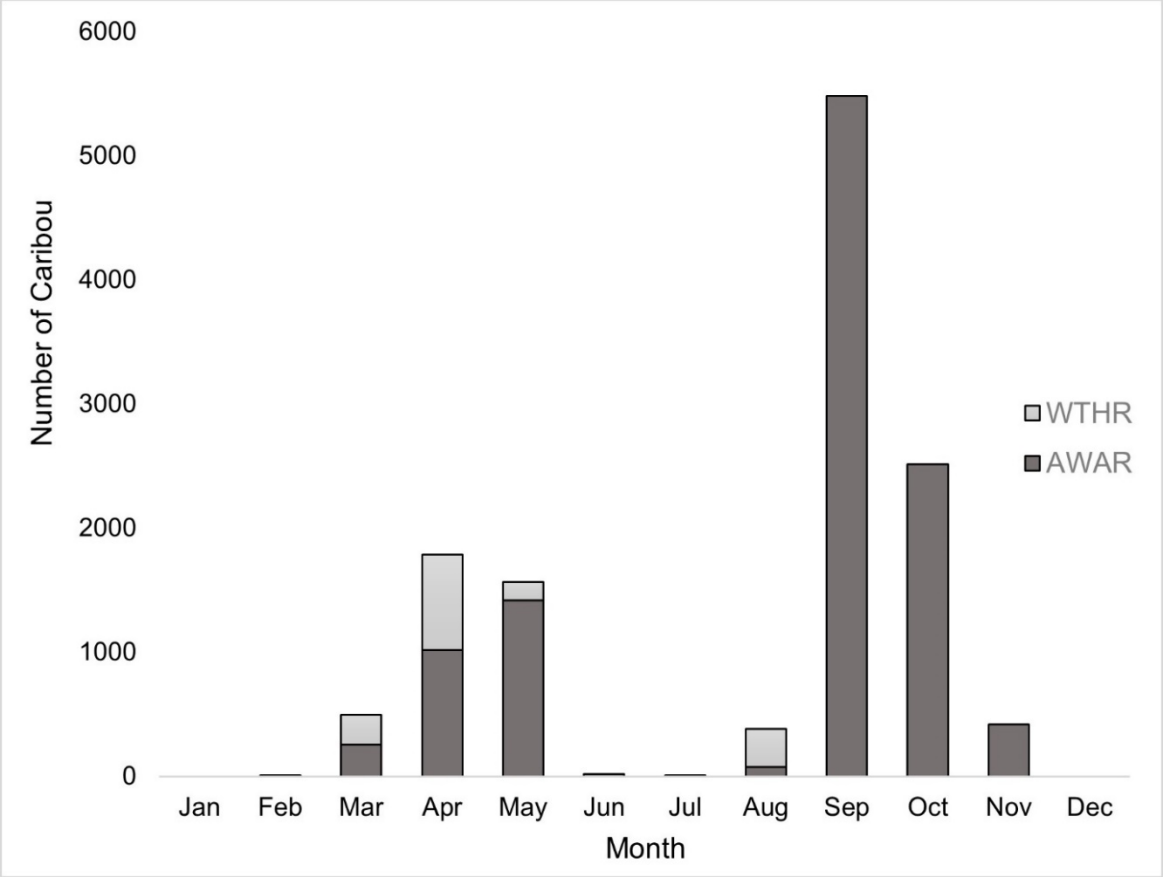


Figure 7: Number of Caribou Observed Crossing the All-Weather Access Road and Whale Tail Haul Road each Month in 2020

Tolerant Caribou Observations

Observations of tolerant caribou along the AWAR and WTHR contribute to assessing risk and the success of mitigation measures. A list of all records of tolerant caribou observations is contained in Appendix B. A total of 252 unique observations of tolerant caribou were recorded along the AWAR, totalling 10,167 tolerant caribou. A total of 287 observations of tolerant caribou were recorded along the WTHR, totalling 12,173 tolerant caribou.

2.6.7 Road-related Wildlife Mortality

The following wildlife mortalities, associated with the AWAR, and WTHR were recorded in 2020 (Table 12). One Project-related caribou mortality was recorded associated with the AWAR in 2020 (Appendix C), and no caribou mortalities were associated with the WTHR in 2020. Two caribou mortalities were reported along the WTHR, one on 8 April at KM 139 and one on 3 June at KM 122, and both of these incidents were suspected wolf kills. Two caribou carcasses were reported at KM 28 of the AWAR on 5 June, and these were also suspected to be wolf kills and not associated with Project traffic.

On 2 March, a single juvenile male caribou carcass was reported at KM 89 of the AWAR. The carcass was spotted and reported after it had frozen and been partly scavenged. No traffic or wildlife incident was reported by Project staff, but the incident was determined likely caused by a traffic interaction due to the proximity to the road and the blood spatter. The carcass was retrieved and delivered to the GN Conservation Officer in Baker Lake.

Upon discovery of any unreported roadkill remains, environment staff and/or road supervisors reminded employees of road rules and the need to enforce these rules. All employees are regularly reminded at toolbox meetings that all Project-related incidents are to be reported and that wildlife have the right-of-way at all times. Mine staff are required to stop vehicles and wait for wildlife to cross the road. No feeding wildlife and waste management practices are also regularly reviewed with employees.

Table 12: Wildlife Mortalities Related to the All-Weather Access Road, and Whale Tail Haul Road and Non-Mine Related Mortalities in 2020

Date	Species	Count	Mine Related	Location	Comments
2 Mar	Caribou	1	Yes	AWAR KM 89 3m West of road	Suspected vehicle collision
8 Apr	Caribou	1	No	WTHR KM 139	Suspected wolf kill
3 Jun	Caribou	1	No	WTHR KM 122 26m East of road	Wolf kill
5 Jun	Caribou	2	No	AWAR KM28 (approximately 250m from the road)	Suspected wolf kill

One Mine-related wildlife mortality associated with the AWAR was reported in 2020, which was a caribou (Table 13). There were no AWAR Mine-related grizzly bear, wolverine or wolf mortalities in 2020.

Table 13: Summary of Road-related Wildlife Mortality Records (2007 to 2020)

Year	Caribou	Grizzly Bear	Wolverine	Wolf	Fox	Small Mammals	Small Birds	Unidentified Small Animal
AWAR								
2007	31	0	0	0	0	3	3	0
2008	102	0	0	2	13	7	17	0
2009	13	0	0	0	1	6	2	0
2010	1	0	0	0	2	6	2	0
2011	23	0	0	1	0	5	4	0
2012	24	0	1	0	0	3	1	0
2013	5	0	0	0	1	1	1	0
2014	0	0	0	0	0	0	0	0
2015	0	0	0	0	1	4	2	1
2016	0	0	0	0	2	0	1	0
2017	0	0	0	0	5	3	3	0
2018	0	0	0	0	0	2	0	0
2019	0	0	0	0	0	3	0	0
2020	1	0	0	0	0	0	0	0
WTHR								
2018	0	0	0	0	0	2	0	0
2019	0	0	0	0	1	1	1	0
2020	0	0	0	0	0	0	0	0

2.7 Accuracy of Impact Predictions

The summary of the impact predictions identified in the TEMP Version 7 (Agnico Eagle 2019) are listed in Table 14. The 2020 AWAR and WTHR survey data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. None of the thresholds were exceeded in 2020.

Table 14: Accuracy of Impact Predictions - Sensory Disturbance and Mortality along the All-Weather Access Road and Whale Tail Haul Road in 2020

Potential Effect	Threshold	Threshold Exceeded (2020)	Adaptive Management Implemented	Monitoring Methods
Sensory Disturbance	No threshold but Decisions Trees followed when caribou are seen near mine facilities	NA	Yes. Multiple road closures and notices, good engagement of Wildlife Log by site staff. Use of Decision Tree for Management and Monitoring.	AWAR and WTHR Surveys, Wildlife Log, Mortality Reporting. Satellite-collaring data
Project-related Mortality (ungulates)	Threshold level of mortality is two (2) individuals per year.	NO	NO	AWAR and WTHR surveys Satellite-collaring data surveys
Project-related Mortality (predatory mammals)	Predatory mammals (i.e., grizzly bear, wolverine, wolf) will not be killed or injured by vehicle collisions. Threshold level of mortality is two (2) individuals per year.	NO	NO	AWAR, and WTHR surveys Security surveys
Project-related Mortality	Raptors or waterbirds will not be killed along Project roads. Threshold is one (1) individual due to vehicle collision per year.	NO	NO	AWAR and WTHR surveys

2.8 Management Recommendations

The AWAR and WTHR survey data are important for documenting sensitive periods when the area near the road is utilized by various wildlife species and for evaluating the need, if any, to adaptively manage mitigation (e.g., temporary road closures and radio announcements). It is recommended that road surveys along the WTHR are scaled back in favour of increased frequency of viewshed surveys (Section 6.7). No other management mitigations are recommended at this time.

3.0 PITS AND MINE SITE GROUND SURVEYS

3.1 Overview

The Mine site ground survey monitoring program (i.e., for Meadowbank, Vault, and Whale Tail) has been designed to verify that impacts to wildlife in and around the Project LSA are not occurring. The program has a strong emphasis on monitoring mortality and disturbance of various wildlife groups utilizing habitats near the Project. In addition, the Mine site ground survey monitoring program is an integral component of the monitoring strategy for evaluating sensory disturbance indicators for caribou.

3.2 Objectives

The primary objectives of the Mine site ground surveys are to:

1) Use Decisions Trees when caribou are seen near Project facilities to determine the level of adaptive management (e.g., suspending activities) required.

2) Confirm that caribou will not be killed through other Project-related mortality such as falling in pits, tailings sludge, or other means. The cumulative Project threshold level of mortality is two (2) individuals per year.

3) Verify that measures are in place such that grizzly bears (*Ursus arctos*), wolverines or wolves will not need to be destroyed at the Project site. The threshold level of mortality for predatory mammals is two (2) individuals per year.

4) Verify that disturbance to high value habitats (e.g., sedge meadows) is avoided, and all activities within 100 m of a bird nest site during the latter part of the nest stage (i.e., fledgling) are avoided.

3.3 Duration

The Mine site ground surveys are to be conducted regularly by Agnico Eagle environmental personnel over the operation and closure phases of the Project to verify that changes to habitats around the Project do not cause effects to wildlife and their use of habitat.

3.4 Methods

In 2020, environmental personnel conducted regular Mine site inspections focusing on waste management, spills, hazardous waste management, and wildlife monitoring. Formal Mine site inspections were carried out at least weekly as part of broader environmental on-site management. During these inspections, if non-conformities were identified they are rapidly addressed by the responsible department.

Weekly inspections included:

- Regular monitoring of caribou and muskox near the facilities. Large mammal presence within the Project is documented during daily and weekly (formal) inspections. Any issues related to safety or proximity effects are identified and the appropriate mitigation is implemented. If risks to animal health are perceived, efforts are made to avoid the wildlife and provide them the right of way. In 2020, Mine-site ground survey inspections were conducted at minimum once per week.
- Regular monitoring of all large mammals in the Project LSA.
- Regular monitoring of breeding birds (especially in the spring), raptors, and nests located in the Project LSA.
- Inspections of waste management areas, bins, and hazardous material storage.

Environment department inspections and wildlife ground surveys focus on migratory birds, ungulates, Arctic fox, wolf, grizzly bear, and wolverine. Through these observations and those of other Agnico Eagle employees (i.e., incidental observations), and incidence reports provided to the environment department, technicians follow up as needed to ensure the protection of wildlife near the Project. Monthly summary reports and wildlife observation data are submitted to the GN, while quarterly reports are submitted to the KIA.

3.4.1 Incidental Mine Site Wildlife Observations

All Mine site personnel, including construction and support staff, are required to document and report wildlife observed within the LSA of the Project as well as ancillary areas (e.g., AWAR and WTHR). The protocol involves notifying staff in the environment department, which is intended to ensure that potential problem animals are identified. Pertinent data, and daily and weekly Mine site inspection reports are consolidated and entered into an electronic database. Monthly summary reports and wildlife observation data are submitted to the GN. Quarterly reports are submitted to the KIA.

3.5 2020 Results

3.5.1 Incidental Wildlife Observations

Mine site incidental observations were consolidated from the daily and weekly inspection reports, and observations by Mine personnel in the Wildlife Log (Appendix A). Observations were used by environmental personnel to monitor wildlife activity within the Project and to identify potential problematic or sensitive animals requiring deterrence. Total incidental wildlife observations were considerably higher in 2020 than in 2019, particularly driven by the number of caribou documented in the Wildlife Log from March to November (Table 15). Seven mammal species were reported in 2020 including a single grizzly bear in June, and a single pine marten in January (Table 15). Wolverine sightings peaked in March and remained low through the summer months, while wolf sightings fluctuated throughout the year (Figure 8).

As expected, total bird sightings were highest in the summer months (Figure 8), and a total of 12 species or species groups (i.e., duck sp.) were recorded. Peregrine falcon observations were recorded from May to September. Snow goose numbers were highest in June and September, reflecting the spring and fall migrations through the Project (Table 15). A single snowy owl was observed in May.

Caribou were observed incidentally in all months of the year, with peak numbers occurring in April during spring migration where 23,347 individuals were reported. Caribou numbers dropped off substantially in July with just 48 individuals observed, and then increased substantial in August and remained high through November (Figure 8). Number of individuals observed should be interpreted cautiously, as incidental observations do not control for double counting or survey effort.

Table 15: Incidental Wildlife Observations in 2020

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mammals												
Arctic fox	1	2	2	1	5	6	11	6	1	5	3	4
Arctic ground squirrel					9	3	2	3		2		
Arctic hare		1		20	28	7	3	9		12		
Caribou	52	168	3,032	23,347	5,551	1,481	48	9,369	11,261	7,321	11,831	4
Grizzly bear						1						
Pine marten	1											
Muskox	101	5	388	362	110	20	110	229	536	353	467	66

Table 15: Incidental Wildlife Observations in 2020

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Red fox	1											
Wolf	9	5	3	16	2	7			1	14	13	4
Wolverine	9	9	14	1			1	1		1	5	5
Birds												
Bald eagle								1	5			
Canada goose					21	131	6		14			
Common raven				9	5	4	1	4			2	
Duck sp.					50	3						
Gull sp.					35	27						
Peregrine falcon					2	2	2	9	6			
Ptarmigan sp.	3	1	43	44	288	22	1			90	38	
Rough-legged hawk					2	1			1			
Sandhill cranes					42	62	2	10	7			
Snow goose					71	1,717		30	1,050			
Snowy owl					1							
Tundra swan						2	1					

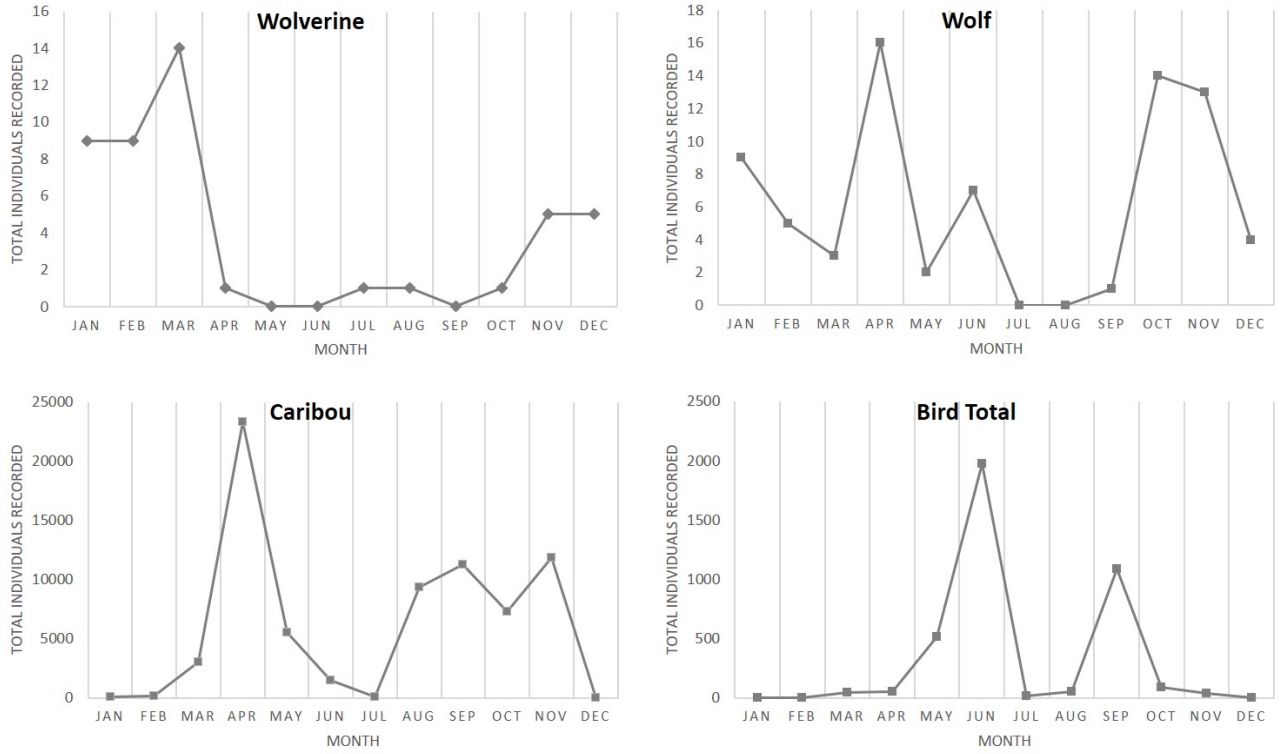


Figure 8: Total Incidental Sightings of Wolverine, Wolf, Caribou, and Birds by Month at the Meadowbank and Whale Tail Sites, 2020

3.5.2 Wildlife Deterrent Records

Wildlife deterrents are implemented when habituated or problematic wildlife pose a threat to the wildlife or Mine personnel through human-wildlife conflict. Necessary deterrent strategies are determined and implemented by the Environment Department based on the severity of risk and the nature of the interaction.

Wildlife deterrents were used and reported throughout 2020 at the Project. A total of 43 deterrence activities were reported from interactions with four species: Arctic fox, caribou, wolf, and wolverine (Table 16). The total number of deterrence actions was substantially higher in 2020 than in previous years (2019 – 31, 2018 – 32, 2017 – 21); however, this is the result of more proactive deterrence actions or more thorough reporting of minor deterrence events (e.g., honking a truck horn). The increase in deterrence actions reported does not indicate of an increase in problematic or habituated wildlife at the Project. Deterrence actions in the winter months were primarily related to wolverine and wolf, whereas in the summer deterrence actions were related mostly to caribou (Table 16). All wolf and wolverine deterrence action was taken at Meadowbank, while caribou action was taken at both Meadowbank and Whale Tail, and the only Arctic fox deterrence occurred at Whale Tail (Table 17). Of the 43 deterrence actions taken, 39 were successful and just 4 were unsuccessful (Table 17), indicating a success rate of 91% (2019 success rate was 87%).

Table 16: Records of Deterrence Activities at the Project in 2020

Date	Species	Number	Location	Behaviour	Action
January					
16 January	Wolverine	1	Dorm 12, main entrance, Dorm 7	Running	Deterred. Successful
16 January	Wolverine	1	Main camp, geology tent	Running	Deterred. Successful
17 January	Wolf	1	Landfill	Running	Deterred. Successful
February					
8 February	Wolverine	1	Landfill then CN burn pad	Eating	Deterred. Successful
15 February	Wolf	1	Landfill and east dyke	Walking	Deterred. Successful
18 February	Wolverine	1	Landfill	Running	Deterred. Successful
19 February	Wolf	1	14W 637291m E 7216645m N	Walking	Deterred. Successful
21 February	Wolverine	1	Meadowbank	Observing	Deterred. Successful
21 February	Wolverine	1	Landfill	Observing	Deterred. Unsuccessful
27 February	Wolverine	1	Incinerator	Running	Deterred. Successful
March					
1 March	Wolverine	1	Incinerator	Running	Deterred. Successful
1 March	Wolf	1	Landfill	Eating	Deterred. Successful
15 March	Wolverine	1	Fresh water barge	Running	Deterred. Successful
15 March	Wolverine	1	Incinerator	Running	Deterred. Successful
16 March	Wolverine	1	Meadowbank	Running	Deterred. Successful
19 March	Wolverine	2	Incinerator	Running	Deterred. Successful
20 March	Wolverine	1	Third Portage Lake	Running	Deterred. Successful
24 March	Wolverine	1	Assay Lab	Running	Deterred. Successful
April					
29 April	Caribou	5	WTHR. KM 176 150m W of road	Grazing	Deterred. Successful
June					
3 June	Wolf	1	South cell tailing - near landfarm	Walking	Deterred. Successful

Table 16: Records of Deterrence Activities at the Project in 2020

Date	Species	Number	Location	Behaviour	Action
July					
3 July	Peregrine falcon	1	Quarry 22	Nesting	Deterred, Successful
20 July	Caribou	1	Transit pad	Resting	Deterred. Successful
20 July	Caribou	1	Air strip	Walking	Deterred. Successful
22 July	Caribou	1	Air strip	Eating	Deterred. Successful
22 July	Caribou	1	Near air strip	Walking	Deterred. Unsuccessful
23 July	Caribou	1	Near maintenance shop	Resting	Deterred. Unsuccessful
24 July	Caribou	1	Air strip	Grazing	Deterred. Successful
24 July	Caribou	1	Between camp wings	Resting	Deterred. Successful
28 July	Caribou	2	Meadowbank	Grazing	Deterred. Successful
29 July	Fox	1	Sea can near Sana office	Hiding	Deterred. Successful
August					
1 August	Caribou	1	Between camp wings	Resting	Deterred. Unsuccessful
2 August	Caribou	1	Site service building	Grazing	Deterred. Successful
2 August	Peregrine falcon	1	Quarry 16	Nesting behaviour	Deterred, Unsuccessful
19 August	Caribou	1	Amaruq. By WRSF and dyke.	Grazing	Deterred. Successful
28 August	Caribou	3	Dyno road	Grazing	Deterred. Successful
November					
5 November	Wolverine	2	Airstrip	Running	Deterred. Successful
December					
7 December	Fox	2	Whale tail pit	NR	Deterred. Unsuccessful
11 December	Wolverine	1	Amaruq. Behind wing 25	NR	Deterred. Successful
14 December	Caribou	NR	Amaruq. IVR pit vicinity	NR	Deterred. Successful

Table 17: Summary of Wildlife Deterrence Records from the Project in 2020

Species	Number of Individuals Deterred					
	Meadowbank			Whale Tail		
	Successful	Unsuccessful	Total	Successful	Unsuccessful	Total
Arctic fox	0	0	**0**	1	0	**1**
Caribou	8	3	**11**	9	0	**9**
Peregrine falcon	1	1	**2**	0	0	**0**
Wolf	5	0	**5**	0	0	**0**
Wolverine	16	1	**17**	0	0	**0**
Totals	**29**	**4**	**33**	**10**	**0**	**10**

3.5.3 Waterbird Monitoring

Waterbird monitoring is completed to minimize accidental waterbird confinement around the Meadowbank and Whale Tail sites, entrapment in the tailings, and mortality, regular inspections were completed throughout the migratory period and during weekly or daily inspections, as deemed necessary by environmental personnel.

The 2020 field program intended to determine behavioural response to flooding (i.e., nest density and recolonization time in the area post-flooding), but was not completed due to COVID-19. The program will be completed in 2021, pending COVID-19 related restrictions. Further details on the program are outlined in the '2020 Migratory Bird Protection Report' (Appendix E).

3.5.4 Raptor Monitoring

Raptor monitoring was conducted as part of routine Mine site inspections of the pit and other areas to ensure adequate bird protection and management. Peregrine falcons were observed and reported in the Wildlife Log around Mine facilities from May to September. Rough-legged hawks were observed on several occasions in May, June, and September. Other raptor species observed include bald eagle (August to September), and a single snowy owl in May (Table 15). Deterrence activities were required for quarry 22 in 2020 and were unsuccessful. Once the raptor nest became active, further activities in the area were avoided (Table 16).

3.5.5 Predatory Mammal Deterrence and Protection

Improved practices for waste segregation and incineration, the use of enclosed food waste facilities, and skirting around buildings have improved Arctic fox protection and decreased fox-human interactions (Table 18).

Table 18: Summary of Deterred Mammals at the Meadowbank Mine and Whale Tail Sites from 2015 to 2020

Species	2015	2016	2017	2018	2019	2020
Mammals						
Arctic fox	6	6	2	0	4	1
Red fox	1	0	0	0	0	0
Wolf	1	4	9	14	9	5
Wolverine	5	3	10	17	16	17
Totals	**23**	**37**	**21**	**31**	**31**	**43**

Wolverines were regularly observed around the Project particularly during the winter months in 2020 (Figure 8). Deterrence actions for wolverines, which followed the Wildlife Protection and Response Plan (Appendix C in 2019 TEMP), were required on 17 occasions at the Meadowbank site, but no deterrence actions were required at Whale Tail for wolverines (Table 17). One wolverine, which was not successfully deterred from the main camp was dispatched on 21 January with approval from the GN DoE (Appendix D). Well-defined food-handling practices and employee awareness programs have minimized wolverine fatalities or wolverine-human interactions but the number of deterrence efforts were similar to 2018 and 2019 (Table 18).

Wolves were also regularly observed around the Meadowbank and Whale Tail sites primarily in the winter months (Figure 8). Deterrence actions were required on five occasions from January to March and one in June (Table 16). Notices are sent to Meadowbank employees regarding the presence of wildlife, waste management procedures, and requesting all sea cans and doorways be closed when a non-conformity occurs.

A single grizzly bear was recorded in the Wildlife Log in June (Table 15). No deterrence action was required.

3.5.6 Wildlife Mortality – Meadowbank and Whale Tail Sites

A total of 7 wildlife mortalities from 2 species (Arctic fox and wolverine) were observed around the Meadowbank and Whale Tail sites in 2020 (Table 19). Six of these mortalities were attributed to Mine-related activities. Road-related mortalities are tabulated and discussed in Section 2.6.7.

Table 19: Wildlife Mortalities at Meadowbank Mine and Whale Tail in 2020

Date	Species	Count	Mine Related	Location	Comments
21 Jan	Wolverine	1	Yes	North of Meadowbank Camp at the North Cell Tailings Sludge Dump	Following GN Conservation Officer approval to dispatch
29 Jan	Arctic fox	1	Yes	On road #8, by the ramp of the waste rock storage facility (WRSF)	Suspected vehicle collision
29 Feb	Arctic fox	1	Yes	On road #7, across from the Exploration Camp and FWTP	Vehicle collision
06 Mar	Arctic fox	1	Yes	On road #22, Approx. 400m on the road going to Emulsion plant	Suspected vehicle collision
12 Mar	Arctic fox	1	No	EMR, beside the roll-off bin	Unknown cause of death
10 Nov	Arctic fox	1	Yes	WT Pit Road	Suspected vehicle collision
28 Nov	Wolverine	1	Yes	WT Pit Road	Suspected vehicle collision

Table 20: Summary of Project-Related Wildlife Mortality Records for Caribou and Predatory Mammals (2007 to 2020)

Year	Caribou	Grizzly Bear	Wolverine	Wolf
2007	0	0	0	0
2008	0	0	0	2
2009	0	0	0	4
2010	0	0	0	1
2011	0	0	1	4
2012	0	0	0	1
2013	0	0	1	0
2014	0	0	0	1
2015	0	0	0	1[(a)]
2016	0	0	0	0
2017	0	0	1	2
2018	0	0	1	2[(b)]
2019	0	0	1	0
2020	0	0	2	0

(a) Naturally injured wolf that needed to be euthanized.
(b) Wolf died at Mine site of head injuries; did not need to be dispatched

Caribou

No caribou mortalities related to Project activities were reported at the Project in 2020.

Predatory Mammals

All incident reports, observations, deterrence activities, and environment team responses to predatory mammal sightings are included in Appendix D.

Two wolverine mortalities associated with the Mine site were reported in 2020. A wolverine had become habituated to the front door/main camp area and had been trying to gain access below the kitchen grease trap. From 13 January to 20 January deterrents were utilized to try to deter the animal away from site, including pickup truck horn, bear bangers, screamers, and rubber bullets. The wolverine continued returning to the same area and was euthanized on 21 January following GN Conservation Officer approval. Approval from GN Conservation Officers of Baker Lake for wildlife destruction was received on 17 January and a report of Wildlife Destruction was

submitted on 21 January to GN by Meadowbank Environment. A wolverine carcass was discovered along the Whale Tail Pit road on November 28 and suspected to be the result of a vehicle collision. The carcass was removed and incinerated. Details of these incidents are contained in Appendix D.

Other Wildlife

Four Arctic fox mortalities associated with the Mine site were reported in 2020.

3.5.7 Helicopter Activity

Helicopters are utilized at the Project for various reasons including transport, exploration, surveying, monitoring, and reconnaissance. Pilots are required to review an air traffic management procedure that includes flight restrictions:

- Long-range flights are a minimum of 650 m above ground level, except for take off and landing.
- Short-range flights are a minimum of 300 m above ground level, except for take off and landings.
- Notification of caribou, muskox or other wildlife sightings within 1 km of the helicopter pad.
- Caribou groups of 50 or more animals, and muskoxen of 10 or more animals must be avoided by a minimum of 1,000 m vertically and 1,500 m horizontally. Flocks of migratory birds must be avoided by 1,100 m vertically and 1,500 m horizontally. Flying over known raptor nests will be avoided.
- Harassing wildlife (flying below 300 m) is expressly forbidden unless animals pose an immediate danger to humans.

In 2020, helicopters were used from 18 June to 19 October, and there were a total of 112 days where flights occurred. No helicopter flights were documented in the spring or winter caribou seasons. A total of 90 flight days occurred during the summer caribou season, and 22 flight days (19.6% of flight days and 19.3% of total flights) occurred during the fall caribou season (Table 21). Flight durations averaged 23 minutes (± 1SD: 27 minutes), so were short-range in nature. Available altitude flight data for 79 days during 1 August to 19 October indicated a mean daily altitude was 247.2 metres above ground level (range: 0.0 to 983.0 magl), including take-offs and landings. Helicopters gradually ascend and descend during take-offs and landings, respectively, so average daily altitude is likely biased low. A list of all helicopter flights logged in 2020 is provided in Appendix F.

Table 21: Helicopter Flight Totals in 2020

Season	Flight Days	Total Flights	Total Distance Flown (nm)	Total Flight Hours
Summer	90	1,086	17,082	483.8
Fall	22	259	4,059	118.6

3.6 Accuracy of Impact Predictions

A summary of the impact predictions identified in the TEMP Version 7 (Agnico Eagle 2019) that are evaluated, in part, by the Mine site ground surveys is presented in Table 22. Specifically, the 2020 Mine site ground survey monitoring data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. None of the thresholds were exceeded in 2020.

Table 22: Accuracy of Impact Predictions – Mine Site Wildlife Disturbances

Potential Effect	Threshold	Threshold Exceeded? (2020)	Adaptive Management Implemented	Monitoring Methods
Sensory Disturbance	No threshold but Decisions Trees followed when caribou are seen near mine facilities	NA	YES. Multiple road closures and notices. Use of Decision Tree for Management and Monitoring.	Satellite-collaring data Road surveys Daily and weekly pit and Mine-site ground surveys Incidental wildlife reporting Remote camera program
Disturbance to Nesting Raptors	Raptor nest failures will not be caused by Project-related activities. Threshold is one (1) nest failure per year.	NO	NO	Daily and weekly pit and Mine-site ground surveys Incidental wildlife reporting Dedicated raptor nest surveys Road surveys
Disturbance of Nesting, Roosting or Moulting Waterfowl	Mine facilities and activities will not affect the breeding success of waterbirds occurring in the area or disturb large concentrations of roosting or moulting waterbirds. Threshold level is one (1) nest failure per year.	NO	NO	Daily and weekly pit and Mine-site ground surveys Waterbird nest surveys Incidental wildlife reporting
Project-related Mortality	Destruction of two (2) problem grizzly bear, wolverine, or wolf per year.	NO. Two (2) wolverine dispatched in 2020	YES. All crews were reminded on wildlife right-of-way and reporting incident reporting requirements	Daily and weekly pit and Mine-site ground surveys Wildlife deterrents and mortality reporting
Project-related Mortality	Two (2) caribou or muskoxen mortality per year because of Project-related activities (e.g., falling into pits, tailing, sludge or other means)	NO	NO	Daily and weekly pit and Mine-site ground surveys Incidental wildlife reporting Wildlife mortality reporting
Project-related Mortality	Raptors and waterbirds will not be killed at the Mine site. Threshold is one (1) individual per year.	NO	NO	Daily and weekly pit and Mine-site ground surveys

3.7 Management Recommendations

The 2020 Mine site ground surveys were an effective source of monitoring to address the impact predictions for managing ungulates, predatory mammals, nesting raptors, and Project-related mortalities. No changes to this monitoring is recommended for 2021, but similar survey effort should be attempted as was achieved in 2020.

The following are specific management recommendations for the Mine site ground survey monitoring program:

- Continue to conduct formal daily and weekly pit and Mine surveys to document wildlife activity and to verify that effects to wildlife are not occurring from Project-related activities.
- Continue raptor nest monitoring within the Meadowbank and Whale Tail LSAs, and along the AWAR and WTHR.
- Continue to document the use of deterrents to prevent habituation of wildlife near the Project or to relocate problematic wildlife.
- Continue to apply the Wildlife Protection and Response Plan (Appendix C, 2019 TEMP Version 7), which includes waste provisions, training, incident reporting, and protocols for problem wildlife. Efforts should be taken to ensure all perishable garbage is directed to the incinerator.
- Continue training and education to ensure that incidental wildlife reporting is completed by all Mine site personnel so that environmental personnel can remain informed of pertinent wildlife-related activity near the Mine site.
- Monitor tailings ponds daily during the waterbird migration period, beginning in mid-May. Increase the frequency of deterrent use if required.
- Gather detailed information (e.g., sex, age, photos) on deceased animals and include in incident reports, when possible.

4.0 WILDLIFE HABITAT MONITORING

4.1 Overview

The wildlife habitat mapping monitoring program was developed to describe the overall area of different Ecological Land Classification (ELC) units lost due to Mine-related activities (i.e., during construction, operation, decommissioning, and post-closure phases) at three primary locations: Meadowbank Main and Vault sites (which together encompass the Mine site), the AWAR, and the Whale Tail Pit and WTHR.

The initial strategy in the impact assessments for Meadowbank and Whale Tail was to compare predicted habitat losses due to Mine development to actual losses (i.e., from the environmental assessments); however, regular infrastructure extensions and expansions, changes to the Project, and subsequent regulatory approvals, made this approach difficult to implement. The current approach is to compare habitat losses from development to permitted areas, which encompass all proposed development. Habitat mapping monitoring is completed every three years post-construction, or if changes are greater than 25% of the overall Mine site footprint from the previous evaluation. The last comprehensive analysis was completed in 2018. Significant change to footprint was not expected for the Meadowbank Mine and Vault sites, and AWAR in 2020. The change in footprint for the Whale Tail Pit and WTHR was assessed as less than 25%. Similar to the analysis at the Meadowbank Mine, all habitat losses within the Whale Tail Pit and WTHR were well within areas available in permitted areas based on comprehensive analysis completed in 2018. since 2018, therefore the next comprehensive analysis is schedule for 2021.

4.2 Objective

The primary initial objective of the habitat mapping monitoring program was to confirm that habitat losses identified in the TEMP (Agnico Eagle 2019, 2020a) and the Whale Tail Pit EIS Addendum (Golder 2016) for the Mine sites, haul roads, and AWAR, plus any subsequent approved extensions, have not exceeded threshold limits. This approach was difficult to execute due to regular Mine plan changes and subsequent approvals; therefore in 2018, habitat losses are compared to permitted areas, which encompass Mine development areas. A summary of each monitoring parameter, predicted losses, permitted areas, and thresholds for the Meadowbank Mine and Whale Tail components is included in Table 23 and Table 24, respectively.

Table 23: Habitat Mapping Monitoring Parameters, Predicted Footprint Losses, Permitted Areas, and Thresholds for the Meadowbank Mine, All-Weather Access Road, and Vault Haul Road

Monitoring Parameter	Mine Site Predicted Loss	Mine Site Permitted Area	AWAR / Vault Predicted Loss	Threshold
Wildlife Habitat	867 ha	1,532 ha	281 ha[1]	>5% Predicted
Ungulate – High Suitability Habitat	240 ha (growing) 191 ha (winter)	531 ha (growing) 407 ha (winter)	63 ha (growing) 188 ha (winter)	>10% Predicted
Small Mammals – High Suitability Habitat	Given the minimal effects associated with the Meadowbank Project, habitat loss effects on Small Mammals were screened out during the EA (Golder 2016)			
Waterbirds – High Suitability Habitat	518 ha	417 ha	22 ha	>10% Predicted
Breeding Birds – High Suitability Habitat	322 ha	736 ha	170 ha	>10% Predicted

[1] Permitted areas along the AWAR and Vault Haul Road is 348 ha.

Table 24: Habitat Mapping Monitoring Parameters, Predicted Footprint Losses, Permitted Areas, and Thresholds for the Whale Tail Pit and Haul Road

Monitoring Parameter	Whale Tail Predicted Loss	Whale Tail Permitted Area	Threshold
Wildlife Habitat	820 ha	1,473 ha	>5% Predicted
Ungulate – High Suitability Habitat	30 ha (growing) 342 ha (winter)	76 ha (growing) 602 ha (winter)	>10% Predicted
Small Mammals – High Suitability Habitat	Given the minimal effects associated with the Meadowbank Project, habitat loss effects on small mammals were screened out during the EA (Golder 2016)		
Waterbirds – High Suitability Habitat	Given the minimal effects associated with the Meadowbank Project, habitat loss effects on waterbirds were screened out during the EA (Golder 2016)		
Breeding Birds – High Suitability Habitat	Given the minimal effects associated with the Meadowbank Project, habitat loss effects on breeding birds were screened out during the EA (Golder 2016)		

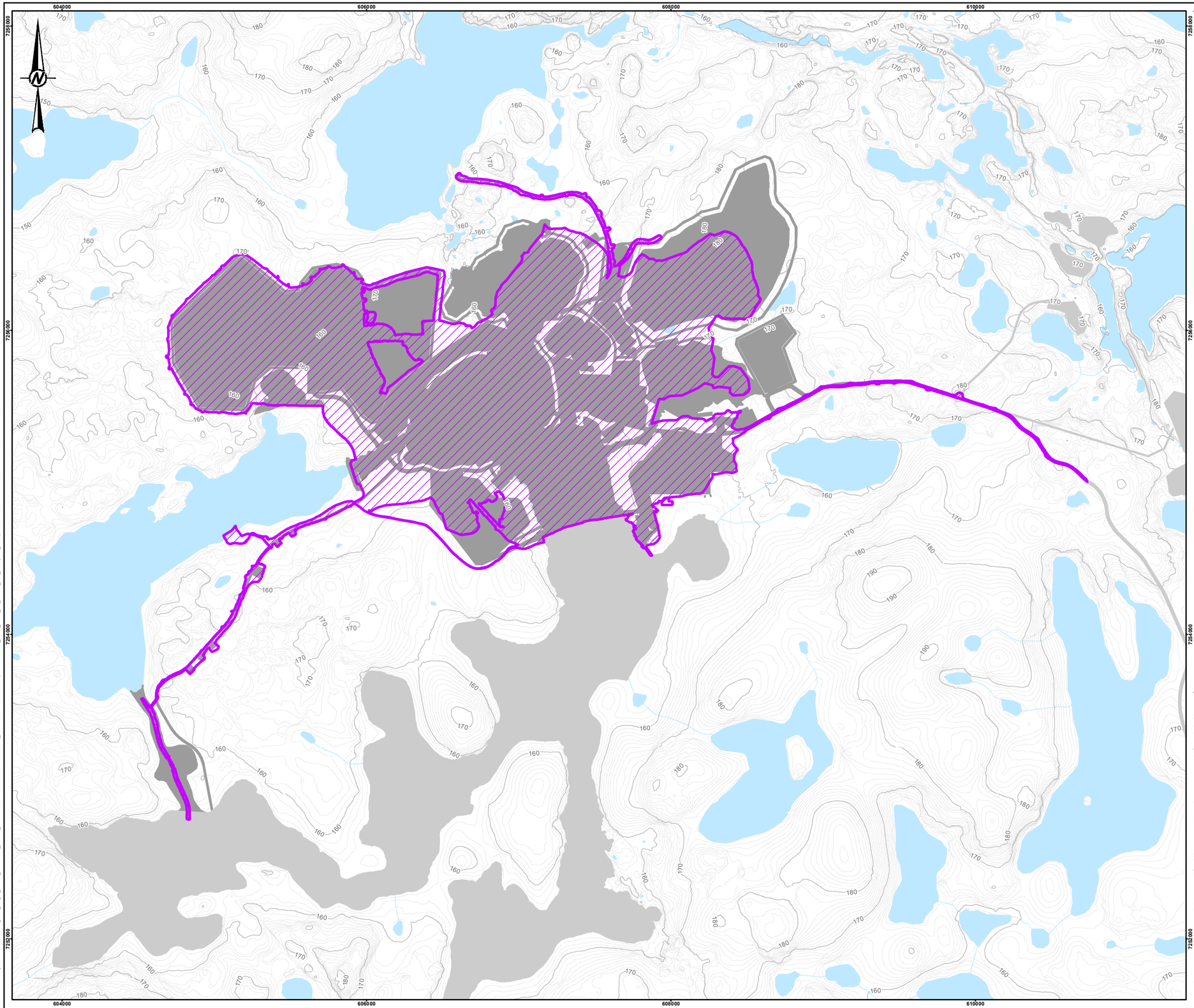
4.3 Duration

The total area of habitat disturbance associated with Mine site and ancillary facility construction was mapped following significant construction completion (2010) and was to be mapped annually during the operation phase as detailed in the TEMP (Cumberland 2006). At the end of 2010, a detailed ELC habitat loss analysis found that habitat losses to date were substantially lower than predicted and that no habitat loss thresholds for VECs were exceeded. Given this outcome, another detailed ELC habitat loss analysis was not provided until the 2012 report, which had similar conclusions as those in 2010. The 2014 habitat analysis determined that habitat losses were still below predicted losses but that some of the thresholds were being reached. A partial analysis was conducted in 2017 while a full and through analysis using a revised approach (Section 4.1) was completed in 2018.

The current habitat mapping monitoring program is intended to be completed every three years post-construction or if changes are greater than 25% of the overall Mine site footprint from the previous year evaluation. This frequency may be reduced during the operation phase if the amount of new disturbance and reclamation areas is relatively unchanged. Following decommissioning, vegetation mapping will be conducted in the first two years post-closure and every three years thereafter until Year 11 post-closure to verify that thresholds have been met. The next complete habitat analysis is scheduled for 2021.

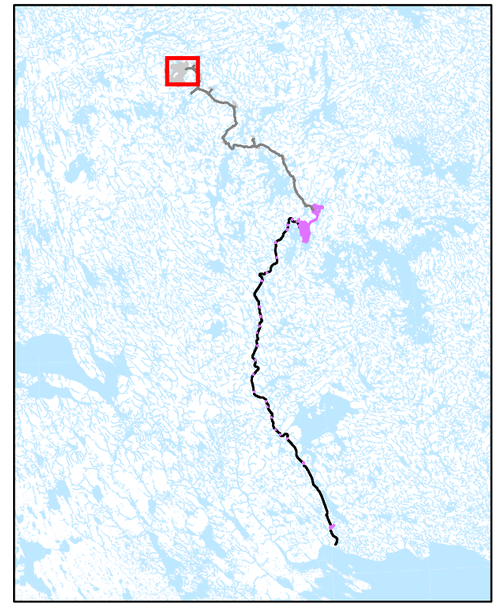
4.4 Methods

Expansion of the AWAR and Meadowbank site did not occur in 2020. Further development of the Whale Tail site did occur. The CAD file of the 2020 Whale Tail footprint was overlayed on the proposed 2018 Whale Tail footprint.



LEGEND

- CURRENT WHALE TAIL FOOTPRINT (2020)
- PROPOSED WHALE TAIL FOOTPRINT INCLUDED IN COMPARISON (2018)
- PROPOSED WHALE TAIL FOOTPRINT EXCLUDED FROM COMPARISON (2018)
- CONTOUR (1 m)
- CONTOUR (10 m)
- WATERCOURSE
- WATERBODY



0 500 1,000

1:25,000 METRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.
3. CONTOUR DATA OBTAINED FROM PHOTOSAT (2015).

COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

WHALE TAIL FOOTPRINT COMPARISON (2018 TO 2020)

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\Journalby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9_PROJECTS\19134270\4000\404\02_PRODUCTION\MXD\Report\19134270_4900_4040_09_Whale_Tail_Footprint_Comparison.mxd PRINTED ON: 2021-03-24 AT: 3:06:30 PM

4.5 Historical Results

4.5.1 Meadowbank Mine Site

In 2014, construction of the Main Site construction was almost complete, including most of the infrastructure for the Vault Pit area, although much of the pit and waste rock storage area had not yet been disturbed. ELC results for the Mine site footprint, based on as-built drawings from 2014, were compared to predicted ELC unit losses from the 2005 EIS, plus approved extensions. Measured habitat loss for the Mine site in 2014 was calculated to be 775.7 ha, which was 91.1 ha (10.5%) less than the predicted total habitat loss of 866.8 ha for the Mine site. Differences between predicted and actual habitat losses were greatest in heath tundra, birch and riparian shrub, and lichen ELC units, all of which are high suitability habitat for ungulates during the winter season. Although no thresholds (>5 to 10% above predicted losses) for the loss of high suitability habitat were exceeded for any VECs, threshold levels for the Mine site were almost reached in 2014. Consequently, commitments were made to remove the material stored in the NPAG extension area (which was approved by NWB) and use it for capping of the North Cell Tailings Storage Facility during the closure/reclamation phase of the Mine.

In 2017, the Mine development footprint had changed substantially since the 2014 analysis. The Vault Pit was fully operational and had expanded into the Phaser Lake area. Although the Phaser Lake extension was completed with approval from the NIRB and the Nunavut Water Board (NWB), the size of the extension area was not available for habitat calculations in the 2017 report. Measured habitat loss for the Mine site in 2017 was calculated to be 1,021 ha, which was 154 ha (17.8%) more than the predicted total habitat loss of 867 ha for the Mine site. The difference between predicted and actual habitat losses was primarily attributable to the final extent of the Vault waste dump, the Phaser Lake extension of the Vault Pit area (i.e., these were not included in the 867 ha calculation), and the as-built layout of the NPAG expansion of the Portage Waste Rock Facility. Differences between predicted and actual habitat losses were greatest for the sedge, and birch and riparian shrub ELC units, both of which are High suitability habitat for ungulates during the winter season. Greater than 10% differences between predicted and actual habitat losses were also observed in heath tundra, lichen, lichen-rock, and rock and boulder ELC units. Additionally, losses of high suitability habitat exceeded established thresholds for ungulates (growing and winter season), small mammals, and other breeding birds.

For the 2018 habitat analysis, the approach was revised to compare habitat losses to total area within Agnico Eagle's permitted areas, which also encompasses future approved work. For all ELC units combined, overall measured habitat losses (i.e., 1,129 ha) were 26% less than the habitat available within permitted areas (i.e., 1,532 ha) of the Meadowlark Mine site; therefore, thresholds were not surpassed. Similar to the measured habitat loss assessment, high suitability habitat losses for ungulates, small mammals, waterbirds, and other breeding birds were all well below available high suitability habitats within permitted areas, also not surpassing any thresholds.

4.5.2 AWAR

The ELC results for the AWAR had not changed since the 2010 analysis, and habitat loss analyses were not required. The 2010 ELC results for the AWAR were compared to ELC unit losses predicted in the 2005 EIS report. Construction of the AWAR required 38.4% less area (173 ha) than predicted in the 2005 EIS (281 ha) and for each ELC unit, actual habitat losses were less than predicted. ELC habitat loss values for the AWAR in 2010 were compared to predicted high suitability habitat losses for ungulates (growing and winter season), waterbirds, other breeding birds, and small mammals. In all cases, the measured high suitability habitat losses were significantly less than predicted losses and no thresholds (i.e., >5 to 10% above predicted losses) were exceeded.

4.5.3 Whale Tail Pit and Haul Road

The area of the proposed footprint from 2018 was assessed as 5.04 km^2, and the area of the 2020 footprint of the Whale Tail Pit was assessed as 5.20 km^2 (Figure 9). The Whale Tail Lake, borrow areas, and WTHR present in the proposed 2018 footprint were excluded from comparison with the 2020 footprint. Change in footprint for the Whale Tail Pit (3.2%) was assessed as less than 25% since 2018, therefore the next comprehensive analysis is schedule for 2021 (Figure 9). Similar to the analysis at the Meadowbank Mine, all habitat losses within the Whale Tail Pit and WTHR were well within areas available in permitted areas based on comprehensive analysis completed in 2018.

4.6 Management Recommendations

Measured change in footprint for the Meadowbank Mine and Vault sites, the AWAR, and the Whale Tail Pit and WTHR was assessed as less than 25% of predicted values. Therefore, the next comprehensive habitat analysis will be completed in 2021.

5.0 CARIBOU SATELLITE-COLLARING PROGRAM

5.1 Overview

Agnico Eagle continues to collaborate with the GN DoE in a caribou satellite-collaring program that includes data collected within the Meadowbank RSA. The GN biologists discuss collar deployments with hunters and Elders and get approval prior to proceeding. Discussions are ongoing between Agnico Eagle, GN, and other partners on the best path forward to ensure caribou migration maps continue to integrate Elders and local HTO input.

Information pertaining to the identification and location of various herds that use the Meadowbank and Whale Tail RSAs at different times of the year are important components of ongoing monitoring and management efforts at the Mine site and along Project roads. Collar data has also been used to understand Mine-related effects.

5.2 Objectives

The satellite-collaring program was developed to provide information on the distribution of caribou occurring within the Meadowbank RSA and contribute data to ongoing satellite-collaring programs for the Ahiak, Qamanirjuaq, and other herds that are used by the GN for herd management. The satellite-collaring program, along with GN DoE regional data, is an important monitoring and management tool that provides a regional perspective on caribou activity near Mine operations. Another key objective of the program is to provide timely information for the caribou management and monitoring strategy at the Meadowbank and Whale Tail sites (i.e., Decision Tree approach; see 2019 TEMP [Agnico Eagle 2019]).

5.3 Duration

The satellite-collaring program was initially designed to continue for five consecutive years in accordance with the original TEMP (Cumberland 2006), but collar deployments have continued beyond this period as part of a long-term caribou monitoring strategy for the region. Caribou in the Baker Lake area were first collared in May 2008, and the program has continued for more than a decade. Monitoring of collars continued in 2020 and is expected to continue through 2021.

5.4 Methods

Caribou collaring methods and deployment are administered by the GN. Caribou are carefully netted by the contracted satellite-collaring crew via helicopter and fitted with either an Advanced Research and Global Observation Satellite (ARGOS) GPS Type IV or Iridium satellite-collar. Collar data are regularly[1] retrieved electronically via satellite and distributed to GN DoE and Nunavut Environmental personnel by CLS America, the data-management company.

Deployed collar data were included in a population distribution analysis completed for the GN (Nagy et al. 2011). The clustering and movements of each collared caribou are examined and assigned to the sub-population (i.e., Ahiak, Beverly, Lorillard, Qamanirjuaq, and Wager Bay herds) that best fits the animal's movement characteristics.

[1] Data are often retrieved on a daily basis but may vary depending on signal strength and weather conditions.

5.5 Historical Results

Collaring was originally scheduled to commence in 2007 but was postponed for one year due to logistical constraints. Seven deployments, with a total of 115 collars, have been completed in the area around Baker Lake since Agnico Eagle became involved in the collaring program. The following numbers of collars were successfully deployed since 2008:

- 9 collars (Agnico Eagle) in May 2008
- 21 collars (shared by Agnico Eagle and AREVA) in November 2009
- 13 collars (Agnico Eagle) in April 2011
- 15 collars (shared by Agnico Eagle and AREVA) in April 2013
- 10 collars (Agnico Eagle) in April 2015
- 13 collars (Agnico Eagle) in May 2016
- 34 collars (Agnico Eagle) in April 2018

Also included in Section 5.0 figures are collared caribou from the Qamanirjuaq herd, which are part of a separate GN program and collars from a Government of the Northwest Territories (GNWT) program on the Beverly herd. These telemetry data are included because of the proximity of animals to the Meadowbank RSA. As discussed above, historical collar data have all been assigned to one of the five major sub-populations (Nagy et al. 2011).

5.6 2020 Results

Agnico Eagle requested access to 2020 collared caribou data on October 27, 2020. The data had not been received at the time of publication of this report.

5.7 Caribou Migration Patterns

Could not be completed.

5.8 Accuracy of Impact Predictions

Could not be completed.

5.9 Management Recommendations

Collared caribou data for 2020 was not available for analysis and formulate management recommendations.

6.0 VIEWSHED SURVEYS

6.1 Overview

Viewshed surveys were implemented in 2020 to survey standardized and readily accessible survey locations along the WTHR that would maximize detection of approaching caribou because topography around the WTHR is variable. The viewshed surveys serve as an early warning system for caribou approaching the WTHR to support mitigation measures during migration. The existing height-of-land (HOL) surveys were completed from 2017 through to February 2020 and then replaced by the viewshed surveys for the remainder of 2020. In 2019, Agnico Eagle advanced the idea of using viewshed survey points instead of HOL locations because of safety and logistical concerns. A viewshed analysis and report were prepared by Golder (2020a) to establish 12 viewshed survey locations along the WTHR that maximized the total habitat around the WTHR that could be surveyed. Agnico Eagle began using the viewshed survey locations in February 2020.

6.2 Objectives

The viewshed surveys provide an ‘early warning’ system of the presence of caribou in proximity to the WTHR. The viewshed surveys provide a series of standardized locations to repeatedly and safely survey throughout the year to produce robust estimates of caribou moving through the Project.

6.3 Duration

In 2020, the viewshed surveys were completed on 5 days during the spring, 8 days during the summer, 1 day in the fall, and 5 days in the winter, for a total of 19 days in 2020.

6.4 Methods

From 2017 to 2019, five height-of-land (HOL) locations were surveyed along the WTHR. The locations were within 500 m of the WTHR and provided an unobstructed view of the surrounding terrain. In 2020, the HOL surveys were replaced by viewshed surveys. Twelve viewshed survey locations were established along the WTHR in a desktop review to maximize the area around the WTHR that could be surveyed (Golder 2020a). Survey locations were established to cover the length of the WTHR (Figure 10). While conducting the viewshed surveys, observers spent 10 minutes surveying for wildlife using a combination of naked eye, binoculars, and spotting scopes to maximize sighting distance. If a caribou group is observed, the observer estimates the number of individuals, direction from observer, distance from road, behaviour, direction of travel, and habitat. These results are then used to determine if a Group Size Threshold has been reached and if mitigation action is required.

6.5 Historical Results

A total of 12 species were observed during HOL surveys in 2019; six species were only observed during the summer caribou season (Table 25). The highest number of caribou was observed during the spring caribou season, followed by the fall and then summer seasons (Table 25). No caribou were observed during the winter caribou season.

Table 25: Total Number of Wildlife Observed during Height of Land Surveys along the Whale Tail Haul Road in 2019

Species	Caribou Seasons			
	Spring 01 Apr to 25 May	Summer 26 May to 21 Sep	Fall 22 Sep to 15 Dec	Winter 16 Dec to 31 Mar
Mammals				
Arctic hare	2	3	3	0
Caribou	842	177	529	0
Muskox	17	16	0	32
Wolf	0	0	1	0
Wolverine	0	0	1	1
Birds				
Canada goose	0	6	0	0
Geese sp.	0	167	0	0
Gull sp.	0	2	0	0
Owl sp.	0	2	0	0
Ptarmigan sp.	0	19	15	0
Snow bunting	0	10	0	0
Snow goose	0	346	0	0

6.6 2020 Results

Twelve viewshed survey locations established in 2020 (TEMP V8, Agnico Eagle 2020a) were surveyed on 19 dates in 2020, though not all locations were surveyed each day. Each location was surveyed a minimum of 11 times each throughout the year, with a maximum of 16 survey visits and a total of 163 surveys conducted. Surveys were conducted between 8 January and 12 December, with the highest survey effort occurring in the summer (57%), moderate effort in the winter (20%) and spring (16%) and the lowest effort in the fall (7%, Table 26).

Table 26: Viewshed Survey Effort by Season, 2020

Season	Survey Days	Surveys Completed (% of total effort)
Spring	5	26 (16%)
Summer	8	93 (57%)
Fall	1	12 (7%)
Winter	5	32 (20%)
Total	**19**	**163 (100%)**

Of the 163 viewshed surveys completed in 2020, only 10 surveys (6%) had caribou sightings, and a total of 252 caribou were reported (Table 27). Three caribou sightings occurred at survey location Viewshed 3, three from Viewshed 6, and one each from Viewshed 2, Viewshed 4, Viewshed 5, and Viewshed 11. Of the 10 sightings, 8 occurred during the spring and 2 during the summer. Group sizes ranged from 1-80 individuals (Table 28). Caribou were typically sighted to the north or west, and the average sighting distance was 630 m from the road. In all cases where caribou were observed, the recorded visibility was up to 1 km, indicating these surveys are most effective in good visibility conditions.

Other species recorded during viewshed surveys include sandhill crane, common raven, Arctic hare, and muskox (Appendix A).

Table 27: Viewshed Surveys Completed and Number of Caribou Observed in 2020

Date	Survey Location											
	Viewshed 1	Viewshed 2	Viewshed 3	Viewshed 4	Viewshed 5	Viewshed 6	Viewshed 7	Viewshed 8	Viewshed 9	Viewshed 10	Viewshed 11	Viewshed 12
Spring Caribou Season (01 Apr – 25 May)												
1-Apr-20	0	**37**	0	0	0	0	0	0	0	0	**27**	0
2-Apr-20	-	-	-	-	-	-	-	0	-	-	-	-
3-Apr-20	-	-	-	-	-	-	-	0	-	-	-	-
11-Apr-20	0	0	**21**	0	**22**	**80**	-	-	-	-	-	-
20-Apr-20	0	0	**53**	0	0	**7**	-	-	-	-	-	-
Summer Caribou Season (26 May – 21 Sep)												
30-Jun-20	0	0	0	0	0	0	0	0	0	0	0	0
22-Jul-20	0	0	0	0	0	0	0	0	0	0	0	0
26-Jul-20	0	0	0	0	0	0	0	0	0	0	0	0
3-Aug-20	0	0	0	0	0	**1**	0	0	0	0	0	0
14-Aug-20	0	0	0	0	0	0	-	0	0	-	-	0
19-Aug-20	0	0	0	0	0	0	0	0	0	0	0	0
21-Aug-20	0	0	0	0	0	0	0	0	0	0	0	0
19-Sep-20	0	0	0	**4**	0	0	0	0	0	0	0	0
Fall Caribou Season (22 Sep – 15 Dec)												
15-Oct-20	0	0	0	0	0	0	0	0	0	0	0	0
Winter Caribou Season (16 Dec – 31 Mar)												
18-Nov-20	0	0	0	0	0	0	0	0	0	0	0	0
12-Dec-20	0	0	0	0	0	0	0	0	0	0	0	-

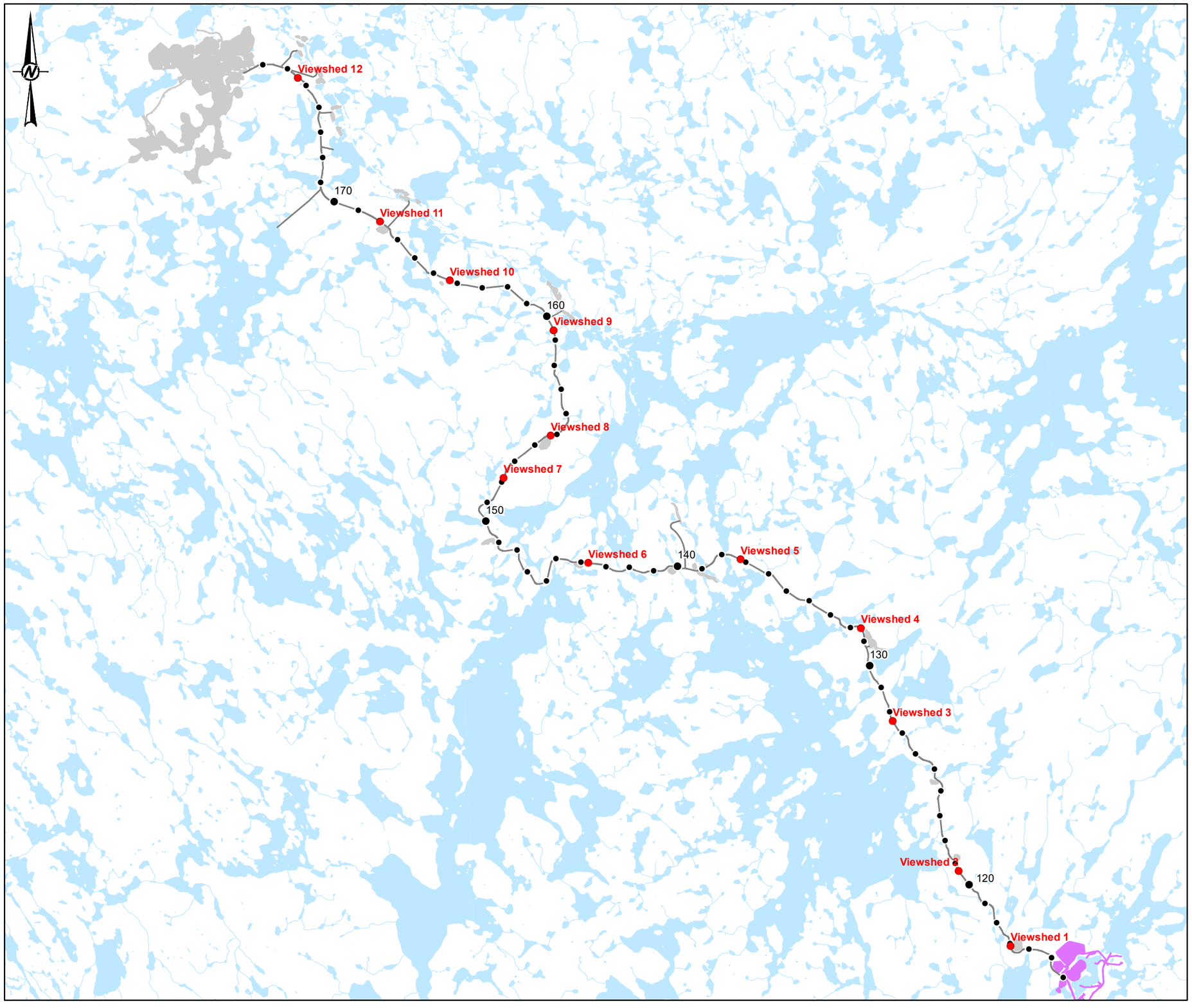
Dashed line indicates survey location was not surveyed.

Table 28: Detailed Caribou Sightings Observed during Viewshed Surveys, 2020

Survey Location	Date	Temperature (°C)	Wind Speed (km/hr)	Visibility	Precipitation	Cardinal Direction	Number	Habitat	Behaviour	Distance from Road (m)
Spring Caribou Season (01 Apr to 25 May)										
Viewshed 2	1-Apr-20	-41	30	1 km	none	North	37	Frozen Lake	Walking	1000
Viewshed 11	1-Apr-20	-41	30	1 km	none	North	27	Tundra	Walking	400
Viewshed 6	11-Apr-20	-18	30	1 km	none	West	80	HT	Foraging/Walking	500
Viewshed 5	11-Apr-20	-18	30	1 km	none	West	22	HT	Foraging	1000
Viewshed 3	11-Apr-20	-18	30	1 km	none	West	21	HT	Foraging	500
Viewshed 6	20-Apr-20	-25	10	1 km	light snow	West	7	HT	Foraging	1000
Viewshed 3	20-Apr-20	-25	10	1 km	light snow	West	6	HT	Foraging	400
Viewshed 3	20-Apr-20	-25	10	1 km	light snow	North	47	HT	Walking	500
Summer Caribou Season (26 May To 21 Sep)										
Viewshed 6	3-Aug-20	28	49	1 km	none	North	1	Tundra	Walking	0
Viewshed 4	19-Sep-20	3	6	1 km	none	East	4	Tundra	foraging	1000

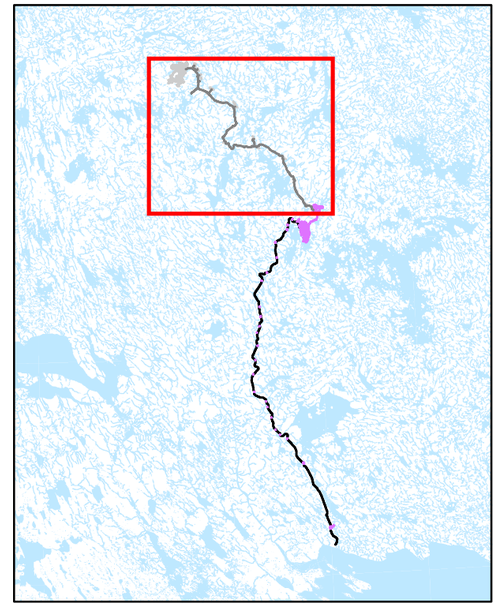
Table 29: Total Number of Wildlife Observed during Viewshed Surveys along the Whale Tail Haul Road in 2020

Species	Caribou Seasons			
	Spring 01 Apr to 25 May	Summer 26 May to 21 Sep	Fall 22 Sep to 15 Dec	Winter 16 Dec to 31 Mar
Mammals				
Arctic hare	1	0	0	0
Muskox	1	7	0	0
Birds				
Common raven	0	1	0	0
Sandhill crane	0	1	0	0



LEGEND

- VIEWSHED SURVEY LOCATION
- KILOMETRE MARKER
- WHALE TAIL MINE SITE
- HAUL ROAD
- MEADOWBANK MINE SITE
- WATERBODY
- WATERCOURSE



0 3 6

1:150,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.

COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

LOCATION OF VIEWSHED SURVEYS ALONG WHALE TAIL HAUL ROAD (2020)

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	CC
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9_PROJECTS\19134270\4000\4040\02_ PRODUCTION\MXD\Report\19134270_4000_4040_10_Viewshed_Survey_Locations_2020.mxd PRINTED ON: 2021-03-24 AT: 4:03:02 PM

6.7 Management Recommendations

The change from HOL surveys to viewshed was intended to improve logistics and health and safety conditions for observers, which was accomplished. The viewshed surveys were also implemented to improve long-distance monitoring of caribou, which was also accomplished. The goal for the viewshed surveys was to conduct surveys once per week in the winter and twice per week in the spring, summer, and fall. Nineteen days of viewshed surveys were conducted in 2020, while the majority of monitoring along the WTHR was conducted using the standard road surveys (Section 2.6.2). Road surveys should continue to be used along the AWAR and the WTHR, but increasing the frequency of viewshed surveys in 2021 should be a primary objective, particularly during spring migration.

7.0 REMOTE CAMERA PROGRAM

7.1 Overview

The initial remote camera study design (October 2018 to November 2019) was intended to collect general trends on caribou crossing events and traffic or road activities on the WTHR, to inform fine scale traffic mitigation. An updated study design was implemented in November 2019, to examine the permeability of the WTHR to caribou movement as those interactions relate to the physical parameters of the road. Results from the 2020 remote camera program are summarized below. Results from the 2019 remote camera program will be presented in a separate technical memo.

7.2 Objectives

The primary objective of the remote camera program is to monitor caribou behavioural interactions with the WTHR, and adapt management practices (i.e., traffic mitigation) as required. The current remote camera program allows for comparisons to determine if caribou crossing locations along the WTHR are related to the physical parameters of the road (i.e., backfill height, slope and material grain size) and traffic rates (Appendix K, Agnico Eagle 2020a).

7.3 Duration

The use of remote cameras will continue throughout the year but camera results will be analyzed and discussed at TAG meetings to ensure that the monitoring objectives are being achieved.

7.4 Methods

7.4.1 Camera Deployment and Settings

The locations of the 16 paired remote cameras along the WTHR were selected based on high-frequency caribou crossing locations, and stratified across road height (Table 30). Backfill material and slope at camera locations were determined from construction surveys (WSP 2019). Backfill slope along the WTHR is typically 2:1. In areas where backfill height exceeds 3 m, slope was recontoured to 4:1 for safety purposes, and to facilitate wildlife crossings (WSP 2019).

The program uses Reconyx HyperFire 2 Professional Covert IR Camera OD Green cameras. At each location, the first camera in the pair was placed facing parallel to the WTHR (i.e., recording observations of caribou crossing the road) in one direction (e.g., north). The second camera in the pair was placed facing parallel to the road in the opposite direction of the first camera (e.g., south). Cameras were placed in close proximity to the road (within 5 m, approximately 1 m above ground level), to provide a field of view that would capture road traffic and caribou interactions with the road. Camera timing was set to the continuous motion-triggered setting, with additional timed interval photos occurring every hour. Maintenance checks were performed approximately every one to two months to back up photographs and remove dust, snow, or ice accumulated on cameras.

Table 30: Remote Camera Locations along the Whale Tail Haul Road

Camera Pair	Camera Label	KM Location Reference	Road Height (m)	Backfill Material	Backfill Slope	UTM Coordinates (NAD83; Zone 14W)	
						Easting	Northing
1	AECC01/AECC02	117	>3	Rock	4:1	638118	7221663
2	AECC03/AECC04	132	>3	Rock	4:1	631995	7233610
3	AECC05/AECC06	136	1.5 to 3	Rock	2:1	628545	7235909
4	AECC07/AECC08	172	1.5 to 3	Esker	2:1	611531	7251976
5	AECC09/AECC10	157	1.5 to 3	Esker	2:1	620735	7243322
6	AECC11/AECC12	152	<1.5	Mix	2:1	618378	7239002
7	AECC15/AECC16	161	<1.5	Esker	2:1	619354	7246436
8	AECC17/AECC18	170	<1.5	Esker	2:1	612385	7250126

> = greater than; < = less than; KM = kilometre; m = metre; UTM = Universal Transect Mercator

7.4.2 Photograph Review

Photograph review was limited to the sensitive period where caribou are likely to interact with the WTHR (spring: 1 April – 25 May; fall: 22 September – 15 December). The program Timelapse2 was used to review photographs (Greenberg and Godin 2015).

Analyses were restricted to motion-triggered photos to eliminate potential bias of recording the same individual(s) or vehicles, and additional photos (i.e., time lapse photos) were only considered to document incidental wildlife occurrences and caribou crossing events. The number of photos for each wildlife species was determined by counting the number of separate detections, initiated by the first trigger of an identified wildlife species. For a particular species event, additional photos were not counted until an hour had passed or until there was a distinguishable difference between separate individuals triggering the camera. Caribou behaviours (e.g., crossing, deflection, stressed, neutral, or calm) were recorded where applicable (Table 3, Appendix K, Agnico Eagle 2020a).

Each vehicle pass of the camera was counted to document relative traffic rates, with the exception of road maintenance vehicles (e.g., graders), which were only counted as new vehicles after an hour had passed, due to repeated passes of maintenance vehicles in front of cameras. Vehicles were classified into general categories (e.g., haul truck, heavy duty, light duty) during photograph review, and summarized into a relative vehicle rate at each camera pair.

The data underwent a QA/QC process, whereby all wildlife occurrences, and 10% of the photos from each camera were reviewed to determine if species and number of individuals observed were identified correctly.

7.4.3 Data Analysis

Sampling effort or number of days each camera was considered active was determined at each camera based on hourly time lapse photographs. Motion triggered photographs were used (based on the first and last motion triggered image from each maintenance period) to determine active days when time lapse photographs were not available. Photographs with obstructed field of view (e.g., covered with snow) were flagged and excluded from analysis and calculation of active days.

A photograph rate was calculated for caribou as a metric for relative abundance, based on the number of detections divided by the camera station sampling effort in days for spring and fall. Rates of other species were not calculated due to overall low detection rates. To prevent double counting caribou at camera pairs, the maximum count from each camera pair was summarized by season.

Camera pairs differed in their ability to capture caribou crossing events and traffic rates due to placement in relation to the road. In other words, some camera pairs were position to capture large volumes of vehicle images, while others were better positioned to capture wildlife activity adjacent to the road, and captured fewer vehicle images. For this reason, there were few instances where caribou behaviour could be assessed in relation to WTHR traffic. Time between caribou crossing events and vehicles detected on remote cameras was calculated. Only events where caribou were photographed on the road, or individuals of a group were observed on either side of the road were considered crossing events. Due to infrequent capture of caribou crossing events by remote cameras, events from both motion triggered and time lapse photos were considered in this analysis.

7.5 Results

A total of 133,268 motion triggered photographs and 35,398 timed photographs were collected within the sensitive period. Wildlife were documented in 490 photographs; the majority of remaining photographs were of vehicles or caused by wind. The average number of days cameras were active (i.e., able to collect photographs without obstructed field of view by ice or dust) was 49.0 ± 10.2 days (mean ± standard deviation), or 91% of 54 potential days in the spring. The average number of fall active days was 67.2 ± 15.4 days, or 80% of 84 potential days (Table 31).

Caribou were detected in the spring season at four different camera pairs, and at one camera pair in the fall (Table 31; Figure 11). Calm, neutral, and crossing behaviours were observed. No obvious deflection or stress related behaviours in relation to the road or traffic were observed, however there were instances where caribou would appear to remain in the vicinity of the road prior to crossing, or would appear curious of cameras.

Other species, or species groups, detected at cameras include Arctic hare, Arctic fox, muskox, wolverine, falcon sp. (most likely peregrine falcon), common raven (*Corvus corax*), and rock ptarmigan (*Lagopus muta*).

Table 31: Caribou Photograph Rates by Camera Pair and Season

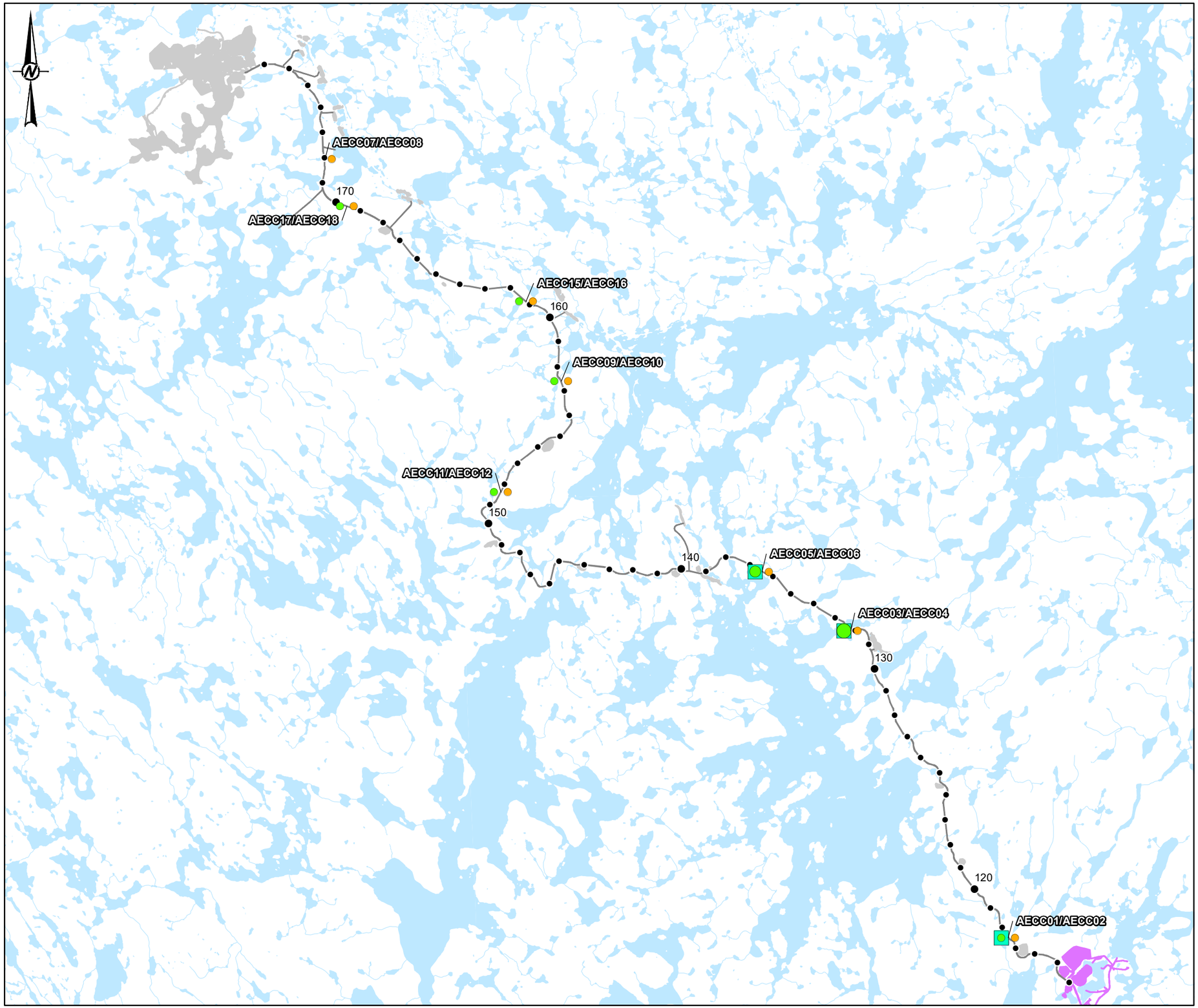
Camera Pair	Season	Active Days	Caribou Rate (Individuals/Active Day)	Crossing Events
1	spring	55	0.02	6
	fall	68	0.00	0
2	spring	55	0.67	1
	fall	76	0.00	0
3	spring	55	0.35	4
	fall	46	0.00	0
4	spring	0	N/A[(b)]	0
	fall	46	0.05	0[(a)]
5	spring	34	0.00	0
	fall	61	0.00	0
6	spring	55	0.07	0[(a)]
	fall	89	0.00	0
7	spring	55	0.00	0
	fall	74	0.00	0
8	spring	34	0.00	0
	fall	78	0.00	0

(a) Potential crossing event could not be confirmed due to camera placement.
(b) Not applicable; camera not deployed for spring season.

Crossing events were documented at camera pairs 1, 2, and 3. There were potential crossing events at camera pairs 4 in spring, and 6 in fall that could not be confirmed (i.e., photographs of caribou moving towards road, but not observed on or crossing roads). Camera pairs 1 and 2 are located at the highest road height category (>3 m), with 4:1 slope and rock backfill. Camera pair 3 is in the 1.5 to 3 m road height category, with rock backfill and 2:1 slope. All documented crossing events occurred on time lapse photographs, with the exception of the event at camera pair 3 on 5 Apr at 07:00 that was also captured on motion-triggered images. All crossing events were documented during road closures, with the exception of one event where speed was limited on a portion of the road away from the camera (Table 32). The time between documented caribou crossing events and previous vehicle traffic ranged from 2:30 to 85:10 hours (Table 32).

Table 32: Caribou Crossing Events on the Whale Tail Haul Road

Camera Pair	Crossing Date and Time	Count of Individuals	Type of Previous Vehicle	Time Since Previous Vehicle (Hours)	Road Status
2	2 Apr 2020 20:00:00	6	Light Duty	04:51	Road closed at 14:00 on 1 Apr due to caribou presence at KM120 and KM160. Road reopened at 11:00 on 7 Apr with 30 km/hr speed restriction.
1	5 Apr 2020 06:00:00	2	Heavy Duty	85:10	
3	5 Apr 2020 07:00:00	6	Light Duty	11:12	
3	5 Apr 2020 09:00:00	4	Light Duty	13:12	
3	5 Apr 2020 10:00:00	9	Light Duty	14:12	
1	6 Apr 2020 11:00:00	22	Convoy	17:20	
3	25 Apr 2020 05:00:00	16	Unknown Vehicle	02:30	Road open with a 30km/hr speed restriction between KM170 and KM180 (camera pair 3 at KM136).
1	2 May 2020 22:00:00	7	Light Duty	30:29	Road closed at the end of the day shift on 30 Apr due to increasing caribou numbers observed during the afternoon along the southern portion of the road. A convoy was led by environment northbound and southbound on 2 May.
1	3 May 2020 04:00:00	24	Light Duty	36:29	
1	3 May 2020 05:00:00	6	Light Duty	37:29	
1	24 May 2020 05:00:00	7	Haul Truck	48:54	Road closed due to weather conditions.



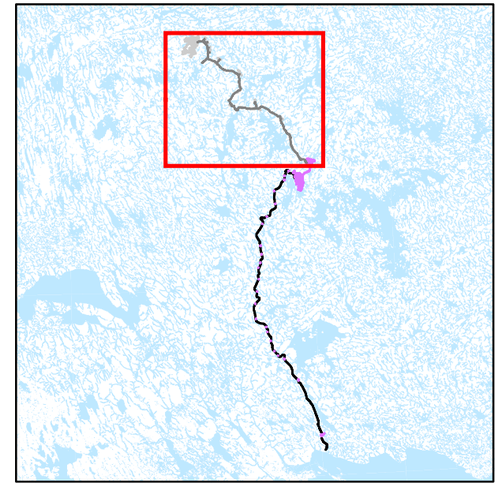
LEGEND

SPRING CARIBOU PHOTOGRAPH RATE (INDIVIDUALS/ACTIVE DAY)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75

FALL CARIBOU PHOTOGRAPH RATE (INDIVIDUALS/ACTIVE DAY)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- DOCUMENTED CARIBOU CROSSING EVENT
- KILOMETRE MARKER
- WHALE TAIL MINE SITE
- HAUL ROAD
- MEADOWBANK MINE SITE
- WATERBODY
- WATERCOURSE



0 3 6

1:150,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.

COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

WHALE TAIL HAUL ROAD REMOTE CAMERA PROGRAM (2020)

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	11

PATH: Y:\Au\maby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\19134270\4000\4040\02_PRODUCTION\MXD\Report\19134270_4000_4040_11_Remote_Camera_Program_2020.mxd PRINTED ON: 2021-03-24 AT: 3:11:54 PM

© THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

0

7.6 Management Recommendations

The limited number of caribou crossing events from the remote camera program do not allow statistical analysis of the relationship between caribou crossing events, road parameters, and vehicle traffic. The amount of time since last vehicle passed is shorter when the WTHR is open than closed, which suggests that caribou are not responding immediately to WTHR closures. These inferences are preliminary given the limited number of cameras, camera locations and crossing events. Increasing camera effort would be an approach to increase the number of crossing events observed. Fine scale analysis of caribou behaviour in relation to vehicle traffic was not possible at this time because all crossing events, with the exception of one, occurred during road closures. Differences in caribou detections and crossing events across cameras may be related to differences in camera field of view, and number of active days. Analysis of data from the 2019 program will contribute to development of management recommendations from this program.

Current recommendations for the camera program include:

- Adjustment of camera field of views to ensure that a similar length of WTHR is observed by each camera, and both sides of the WTHR are within the field of view to allow proper documentation of caribou crossing events and vehicle rates.
- Increase the number of camera pairs along WTHR to increase likelihood of capturing crossing events.
- Examine caribou rates and crossing behaviour in relation to data from WTHR traffic summaries (Section 2.6.3).
- There were several instances where caribou were documented in the background of photographs that were motion-triggered by vehicles, or in time lapse photos, meaning that there are likely events where caribou are present but not detected by cameras. These individuals may have been too far from cameras to trigger the camera. More frequent time-lapse photos during the sensitive window could increase detection of caribou crossing events.
- Ensure that cameras are programmed to collect time-lapse photographs to accurately calculate survey effort.
- Continue to maintain cameras frequently to prevent accumulation of snow, ice, and dust on camera lenses.

8.0 BLAST MONITORING

8.1 Overview

The purpose of the blast monitoring program is to measure noise and vibration from explosive blasts at the Whale Tail Pit, and understand how these factors relate to caribou behaviour. The program aims to establish site-specific relationships between noise/vibration levels and blasting parameters (e.g., charge mass, burden depth), environmental conditions (e.g., air temperature, wind direction), and propagation distances. The program includes monitoring of caribou sensory disturbance related to blasting. Blasting is required to be delayed when caribou or other wildlife are observed within the blast danger zone (typically 600 m from the blast centre). Blasting is also delayed when caribou GST is observed within 4 km during the sensitive season, or within 5 km during the calving period, or when muskox GST is observed within 1 km (Agnico Eagle 2019, 2020a). Relaxing distance restrictions to better understand effects to caribou from blasting was discussed with the TAG in March 2021.

8.2 Objectives

The purpose of the blast monitoring program is to determine if blasts conducted at the Whale Tail Pit exceed noise and vibration annoyance and damage thresholds, and to characterize the behavioural response of caribou to blasting.

8.3 Duration

The blast monitoring program will continue until a sufficient sample size is collected to establish site-specific relationships between noise/vibration levels and blasting parameters, and behaviour of caribou at different distances from blasting is characterized after accounting for the influence of natural factors.

8.4 Methods

8.4.1 Overview

Monitoring noise and vibration from explosive blasting at the Whale Tail Pit began in August 2019, following discussions with the TAG in 2018 and 2019. Blasting impacts are typically assessed using two different parameters:

- Peak Particle Velocity (PPV), which characterizes ground vibration (i.e., physical shaking of the ground as a result of an explosive blast). PPV values are usually measured in millimetres per second (mm/s).
- Peak Pressure Level (PPL), which characterizes airblast overpressure (i.e., movement of air as a result of an explosive blast). PPL values are usually measured in linear decibels (dBL).

The program uses four Instantel Minimate units (Model No. 716A3001) to measure blast data. The Minimate units make use of triaxial geophones to measure PPV and characterize ground vibration, and linear microphones to measure PPL.

There are very few guidelines intended to address sensory disturbance to wildlife from explosive blasting. Human guidelines for damage and annoyance due to blasting may act as a starting point for assessment of potential impacts to caribou, in the absence of wildlife-specific thresholds or limits. The caribou hearing threshold for low frequency noise is higher than humans, meaning that humans may be able to a detect blasting related PPL at greater distances than caribou (Agnico Eagle 2020a). According to IQ, caribou may be able to detect blasting vibrations at greater distances than humans. The EIS estimated PPV due to blasting to be 0 mm/s at 4 km from the Whale Tail Pit. This distance was used as an estimate of the distance that caribou would be able to detect blasting vibrations from the Whale Tail Pit (Agnico Eagle 2019, 2020a).

The NIRB did not recommended specific guidelines for assessing environmental impacts from blasting. The EIS used methods and guidelines from the Ontario Ministry of Environment and Noise Pollution Control (NPC) Publication 119 (OMOE 1978). Most guideline limits on PPV and PPL from blasting are intended to protect against minor cosmetic damage to buildings and other structures. For example, the Environment Canada *Environmental Code of Practice for Metal Mines* (Environment Canada 2009) recommends that PPV be limited to 12.5 mm/s and PPL be limited to 128 dBL at nearby receptors.

An additional document that is commonly referenced in blasting assessments is the Australian and New Zealand Environment Council (ANZEC) *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (ANZEC 1990). To protect against impacts associated with annoyance, the ANZEC document recommends that PPV be limited to 5 mm/s and PPL be limited to 115 dBL at nearby receptors.

Blasting measurements were collected using the four Instantel Minimate units in August, September, and December 2019 (Figure 12; Golder 2020a). Only two of the four Minimate units were outfitted with linear microphones per available equipment, therefore PPL could only be measured at 2 locations (R1 and R2). All measured PPV values were below the 12.5 mm/s damage threshold (Environment Canada 2009) and well-below the 5 mm/s annoyance threshold (ANZEC 1990). All but one of the measured PPL values were below the 128 dBL damage threshold (Environment Canada 2009). Seven of the 12 blasts measured during the first year of the program resulted in PPL values above the 115 dBL annoyance threshold (ANZEC 1990) at the measurement location approximately 500 metres from the edge of the Whale Tail Pit (R1). This suggests that airblast overpressure may result in annoyance impacts at receptors in close proximity to the blast site.

Recommendations from the 2019 program included procurement of linear microphones to allow collection of PPL at all four locations, use of external power sources that would allow for deployments to log data from multiple blasts, and enclosing units in rugged outdoor cases that would protect them from the elements. Future PPL measurements at more distant locations (i.e., R2, R3, and R4) should help to characterize the maximum distance to which PPL-related annoyance impacts may extend.

8.4.2 Methods

The 2020 blast monitoring program was limited due to COVID-19. Eleven blast events were monitored at two locations by Agnico Eagle in December 2020 (Table 33; Figure 12). Caribou monitoring was conducted prior to blasts throughout 2020 by Agnico Eagle to determine presence of caribou within a 5 km radius of the blast pattern.

Table 33: 2020 Blasting Measurement Locations

Location Identification Code	Universal Transverse Mercator Coordinates[a] [Zone 14]		Description
	Easting [m]	Northing [m]	
R1	607418	7255413	Approximately 193 metres from the edge of the Whale Tail Pit
R2	608376	7255023	Approximately 569 metres from the edge of the Whale Tail Pit

[a] General measurement locations were selected to be downwind from the blast site (based on prevailing wind conditions in the area). Specific measurement locations were selected in the field after considering local ground conditions and site access limitations.

606000
608000
610000
612000
7256000
7254000
7252000

WHALE TAIL
WASTE ROCK
STORAGE FACILITY

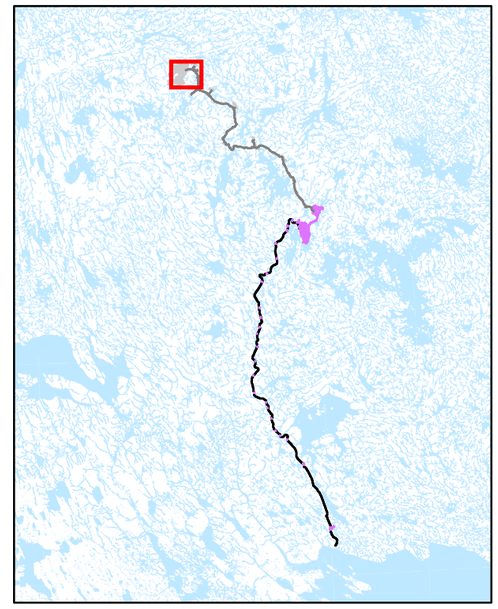
WHALE TAIL PIT

R1
R2
R1
R2
R3
R4

KM 177
KM 176
KM 175
KM 174
KM 173
KM 172
KM 171

LEGEND

- BLASTING MEASUREMENT LOCATION (2019)
- BLASTING MEASUREMENT LOCATION (2020)
- KILOMETRE MARKER
- CONTOUR (1 m)
- CONTOUR (10 m)
- WATERCOURSE
- WATERBODY
- WHALE TAIL MINE SITE
- HAUL ROAD



0 500 1,000
1:25,000 METRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.
3. CONTOUR DATA OBTAINED FROM PHOTOSAT (2015).

COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

BLASTING MEASUREMENT LOCATIONS

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	SW
PREPARED	CDB/LH
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	12

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25mm

PATH: Y:\Burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9_PROJECTS\19134270\4000\4040\02_PRODUCTION\MXD\Report\19134270_4000_4040_12_Blasting_Measurement_Locations.mxd PRINTED ON: 2021-03-24 AT: 3:03:31 PM

8.5 Results

Two blasts in 2020 exceeded the PPV annoyance threshold of 5 mm/s (ANZEC 1990), and one blast exceed the 12.5 mm/s damage threshold (Environment Canada 2009) at the measurement location closest to the Whale Tail Pit (R1; Table 34). This suggests that ground vibration from blasting may result in annoyance impacts at receptors close to the blast site. Results from 2020 contrast results from 2019, where no blasts exceeded annoyance or damage thresholds (Golder 2020a).

All blasts measured resulted in PPL values below the 128 dBL damage threshold (Environment Canada 2009). However, the 115 dBL annoyance threshold (ANZEC 1990) was exceeded for 5 of the 11 blasts at the measurement location 193 m from the Whale Tail Pit (R1; Table 34), and 2 of the 11 blasts for the measurement location 569 m from the Whale Tail Pit (R2; Table 34). This suggests that airblast overpressure from blasting may result in annoyance impacts at receptors in close proximity to the blast site as the monitoring locations (193 m and 569 m from pit edge) are closer to the bast site than the 4 km caribou GST. Results from 2020 are similar to 2019 results, with the exception of a single blast exceeding damage thresholds in 2019 (Golder 2020a).

Caribou were observed sporadically during blast monitoring in spring and fall 2020. Caribou observed were considered as either Project tolerant (described in Section 9.5), or outside the 5 km threshold to trigger blast postponement. Project tolerant caribou observed during blasting displayed no observable behavioural response (e.g., 9 September 2020). There was one instance where blasting was canceled (4 April 2020) due to observation of 25 caribou approximately 2 km from the Whale Tail Pit.

Table 34: 2020 Blasting Measurements

Date	Ground Vibration; Peak Particle Velocity [mm/s]		Airblast Overpressure; Peak Pressure Level [dBL]		Comment
	R1	R2	R1	R2	
03 December	1.98	0.78	114.8	101.9	
06 December	3.58	N/D[b]	114.0	N/D[b]	Multiple blast patterns at the same time
09 December	2.25	1.43	125.2	121.5	
10 December	1.97	0.93	123.8	115.9	
13 December	2.74	1.06	112.3	100.0	
14 December	2.66	1.51	121.6	104.9	
22 December	2.85	0.93	114.8	112.8	
23 December	4.50	1.96	109.2	98.8	
27 December	15.12	N/A[a]	117.8	N/A[a]	
28 December	8.96	1.85	115.4	108.0	Multiple blast patterns at the same time
31 December	0.65	N/D[b]	94.0	N/D[b]	

(a) Measurement data not available for this blast.
(b) No Data (Monitor was installed and operating, but did not record anything)

8.6 Management Recommendations

Further measurements are required to characterize relationships between noise/vibration levels and blasting parameters (e.g., charge mass, burden depth), environmental conditions (e.g., air temperature, wind direction), and propagation distances. More comprehensive blasting measurement is planned for 2021 at four monitoring locations, in winter (temperatures below 0°C). Units will be equipped to measure both PPL and PPV.

More comprehensive blasting measurements will allow relationships with caribou behaviour to be established when caribou are present during blasting events. Focal scan monitoring (i.e., continuous monitoring of individual caribou) is recommended in addition to existing caribou group behaviour monitoring during blasting. This will allow measurement of the length of time individual caribou are influenced by noise and vibration related to blasting events.

9.0 CARIBOU MANAGEMENT DECISION TREE

9.1 Overview

Introduced in 2018, the 2019 TEMP Version 7 (Agnico Eagle 2019) describes the use of decision trees or charts that outline adaptive monitoring and mitigation for ungulates for each of five phases: 1) caribou and mining operations; 2) caribou and haul roads; 3) caribou and the AWAR; 4) caribou and blasting; and 5) muskox and Operations (see Agnico Eagle 2019).

9.2 Objectives

The monitoring objectives are to:

1) Detect if effect thresholds have been exceeded.

2) Test the efficacy of mitigation.

3) Understand Project-related effects to ungulates. For ungulates, the decision trees are also an objective to manage sensory disturbance to caribou approaching the Project. Monitoring to detect caribou intensifies as caribou approach the Project and mitigation intensifies to reduce sources of sensory disturbance.

Monitoring activities for ungulates will be carried out prior to, during, and following construction. The use of decision trees for managing disturbance to ungulates is an ongoing and continuous monitoring strategy for the life of the Project. Monitoring intensity is increased as ungulates approach the Project.

9.3 Duration

Monitoring activities for ungulates were carried out prior to, during, construction and operations. The use of decision trees for managing disturbance to ungulates is an ongoing and continuous monitoring and mitigation strategy for the life of the Project. Monitoring and mitigation intensity is increased as ungulates approach the Project.

9.4 Methods

The approach involves monitoring the number of ungulates in close proximity to mining operations through various monitoring tools including caribou collaring data, viewshed surveys, AWAR and road surveys, and pit and Mine site grounds surveys. Depending on the number of ungulates observed (i.e., caribou Group Size Threshold – GST), proximity to the road, and time of year, different monitoring levels are triggered (i.e., Level 1, Level 2, Level 3). For example, triggers may result in pit and Mine site ground surveys and/or haul road surveys increased up to every two days, and caribou satellite data reviewed on a daily basis.

For the purposes of monitoring, a “group of caribou” is defined as: “An aggregation of caribou that are sufficiently close together that they can see and react to another animal’s behaviour, and have the potential of responding should one or more animal in the aggregation become startled.” For further details on the reasoning behind caribou GSTs and the decision chart approach, refer to the 2019 TEMP Version 7 (Agnico Eagle 2019). The GST approach and monitoring/management outcomes is reviewed by the TAG on a regular basis to determine whether an acceptable balance has been achieved between mining operations and conserving caribou populations. As GSTs are the main trigger for mitigation and management, understanding their efficacy for overall herd protection is of high importance.

9.5 Results

The decision tree and trigger approach was used on multiple occasions in 2020. In many cases where groups of caribou were observed close to the road, closures or restrictions were implemented (Table 11). Project tolerant animals are defined in the TEMP Version 7 as an animal or group of animals observed within a mitigation distance buffer for greater than 72 hours during the winter or 48 hours during other seasons; and not visibly disturbed by the Project. To understand visible disturbance to the animals, behavioural monitoring (i.e., group scans) will be completed when the animal(s) are encountered and at least once per day until they are deemed Project-tolerant. A total of 10,167 tolerant caribou were recorded along the AWAR, and 12,173 tolerant caribou were recorded along the WTHR in 2020. Substantially more caribou deterrence activities were reported in 2020 relative to the past three years (Table 18), which may be indicative of the use of more proactive methods of controlling caribou around the Project. Deterring caribou from spending time near Project infrastructure may help reduce Project impacts on caribou in terms of time budgets, stress, or direct loss.

9.6 Accuracy of Impact Predictions

An objective of the decision tree approach is to reduce sensory disturbance to caribou approaching the Project. The objective is not linked to an impact prediction as the monitoring is to trigger mitigation rather than to test a prediction.

9.7 Management Recommendations

A dedicated log of decisions and outcomes should be kept in 2021 to facilitate future analyses of the effectiveness of this monitoring and mitigation approach. Tolerant caribou observations should continue to be logged in 2021.

10.0 HUNTER HARVEST SURVEY

10.1 Overview

As outlined in the TEMP (Cumberland 2006) and as a requirement of NIRB Project Certificate No. 004 Terms and Conditions 51 and 54, the Baker Lake Hunter Harvest Study (HHS) was initiated in March 2007 by Agnico Eagle in association with the Baker Lake HTO to monitor and document the spatial distribution, seasonal patterns, and harvest rates of hunter kills and angler catches within the Meadowbank RSA.

After low participation during the first year of the study, methods were strategically adapted, participation increased steadily, and valuable information on harvest patterns in the Baker Lake area was collected. The HHS, through regular visits, contributed to developing a strong relationship with local harvesters, the HTO, and GN DoE. Data were provided annually in monitoring reports from 2007 to 2015. The HHS was suspended for three years (2016 and 2018) to develop new approaches and direction.

Following consultation with the HTO, KivIA, GN, and other agencies in November 2016 and June 2017, Agnico Eagle reinitiated the HHS in March 2019 and continued through 2020. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study.

10.2 Objectives

The primary objective of the HHS are to monitor potential Project-related effects on harvesting of wildlife by residents of Baker Lake. This objective is achieved by estimating the following key metrics:

1) The distribution of caribou, muskox, and wolverine harvest by residents of Baker Lake; and

2) The total level (or an index of) caribou, muskox, and wolverine harvest by residents of Baker Lake.

Other objectives of the HHS established in consultation with TAG or other participants include:

- Supporting creel surveys by gathering information on Arctic char (*Salvelinus alpinus*), lake trout (*Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis*), and Arctic grayling (*Thymallus arcticus*) catch rates and Inuit-use patterns in the Baker Lake area.
- Understanding regional distribution of hunting and fishing activity.
- Investigating seasonal timing of hunting and fishing activity.
- Determining whether increased harvest and catch rates are associated with the AWAR.

As discussed during consultation with stakeholders, HHS will further seek to: a) increase and maintain the hunter participant rate in the future of the program; b) improve resource protection; c) improve hunter awareness and education; d) increase the integration of Inuit Qaujimajatuqangit and Traditional Knowledge; f) increase availability of data to support a collective approach to understanding wildlife harvest; and g) assist Agnico Eagle in mitigative actions and the GN in management decisions.

10.3 Methods

The wildlife species that are the focus of the HHS are caribou, muskox and wolverine; however, harvest data on other species, such as wolf, Arctic fox, geese and other birds is also collected. The few species in the study were deliberately chosen to make data entry and collection as simple as possible. To support creel surveys, data on fish harvest (Arctic char, lake trout, lake whitefish, and Arctic grayling) are also collected.

Inuit and non-Inuit residents, at least 16 years of age, are eligible to participate in the harvest survey. Harvest calendars are provided on a household basis rather than an individual basis in order to simplify data entry and collection, and reflect household hunting patterns. The harvest calendar is attractive and consists of local photographs of wildlife and Baker Lake residents (see Appendix A in Appendix G attached to this report for 2020 calendar). Space is provided for each calendar day where harvest details can be documented. A map is provided at the end of the calendar that delineates a 4 km^2 UTM grid within the Baker Lake and Meadowbank areas. Each grid has a unique code to facilitate recording of information. When calendars are issued, participants or participating households are encouraged to write harvest details (e.g., number of animals, sex, age and location [i.e., grid code]) for the appropriate date on the calendar.

Participants were interviewed in person only two times during the year (i.e., October 2020 and February 2021) by the harvest study coordinator. The lower number of visits in 2020 reflects logistical issues associated with Covid-19 (e.g., a mandatory 14-day quarantine was required in Winnipeg prior to travelling to Baker Lake). During the February 2021 interviews, remaining data from 2020 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and collect incidental information to compliment calendar data, including notable caribou movements, aggregations, and unique observations. Between interview periods, participants were often contacted by phone or social media to encourage recording of harvest data.

Features of the 2020 Hunter Harvest Study included:

1) increasing the amount of time researchers spent in the community interacting with participants on each visit

2) building long-term relationships between participants and researchers

3) increasing engagement with participants on social media platforms such as Facebook and Instagram

4) increasing incentives for participating in the study (e.g., gas vouchers and prizes)

10.4 Results

The study included more than 60 participants of which 43 reported harvesting caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Baker Lake, the HHS represents from 12% to 14% of hunters in the community. With a total reported caribou harvest of 652 in 2020, the total caribou harvest in Baker Lake is estimated to range from 4,657 to 5,433 caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Baker Lake Hunters and Trappers Organization members) in the community.

Compared to other years, caribou were harvested at a lower percentage within 5 km of the AWAR and within the Regional Study Area. As such, harvest levels in 2020 in close proximity to mining facilities were well within threshold levels.

Lake trout and Arctic char were the most common species caught by fisherman. Unlike 2019, very few lake whitefish were caught, which may be due either to a decline in fishing effort in winter (e.g., nets set under the ice) and/or lower abundance of this species. Further details of the HHS program are provided in Appendix G.

10.5 Accuracy of Impact Predictions

A summary of the impact predictions identified in the TEMP Version 7 (Agnico Eagle 2019) that are evaluated by the HHS is presented in Table 35. Specifically, the 2020 HHS monitoring data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. The threshold was not exceeded in 2020.

Table 35: Accuracy of Impact Predictions - Baker Lake Hunter Harvest Survey

Potential Effect	Threshold	Threshold Exceeded (2020)	Adaptive Management Implemented	Status
AWAR				
Hunting by Baker Lake Residents	The AWAR will not result in significant changes in the spatial distribution, seasonal pattern, or harvest levels of caribou by Baker Lake hunters. Changes will not exceed 20% of historical harvest activities within the RSA	NO	NO	Hunter Harvest Study (including the Creel Survey)
WTHR				
Hunting by Baker Lake Residents	No change in harvest	NO	NO	Hunter Harvest Study Satellite-Collaring Program

10.6 Management Recommendations

The HHS (including the creel survey) should be continued on an annual basis to monitor the hunting and fishing patterns of Baker Lake residents, and the potential effects of the mine. Meetings with participants every four months (3 times/year) in 2021 are particularly important in maintaining contact, building relationships, expanding the study and collecting good harvest data. The total number of planned visits per year was reduced to three from four because of the added logistical constraints associated with mandatory quarantine prior to travel to Nunavut. Despite the decrease in visits, participation rates can be maintained by continuing to use social media platforms such as Facebook and Instagram, expanding connections on these platforms, ensuring that all participants are visited during the three scheduled field visits, and continuing with distribution of the well-received gas vouchers and year-end prizes while in the community.

11.0 INTEGRATED CARIBOU MONITORING RESULTS

Various caribou monitoring programs have been developed (Sections 2.0 to 10.0) to understand and manage Mine-related effects on caribou. This section summarizes caribou monitoring data collected in 2020 and lists potential Mine-related effects.

11.1 Integrated Results

Table 36 summarizes results from each of the nine programs that monitored caribou activity and responses to Mine-related activity in 2020, while Table 37 summarizes potential Mine-related effects on caribou in 2020.

Table 36: Summary of Caribou Monitoring Activities and Management Responses in 2020

Monitoring Program	Summary of 2020 Monitoring Results	Summary of 2020 Management Responses
Road Surveys (Section 2.0)	A total of 132 surveys completed on the AWAR, and 161 on the WTHR. High caribou numbers observed along the AWAR in May, September, October, and November. High numbers of caribou observed along the WTHR in March, April, and May.	Traffic along the WTHR was restricted for 16 days in 2020, and traffic along the AWAR was restricted for 59 days in 2020.
Pits and Mine Site Ground Surveys (Section 3.0)	Mine site surveys conducted on a weekly basis at minimum. Caribou were observed throughout the year, with highest numbers reported in April.	Deterrent actions were implemented to keep caribou safe from site hazards. Tolerant caribou and road crossing data thoroughly collected throughout the year to support mitigation decisions.
Wildlife Habitat Monitoring (Section 4.0)	Comprehensive analysis not required in 2020 but will be completed in 2021.	Not Applicable.
Caribou Satellite-Collaring Program (Section 5.0)	Data were requested in October 2020 and not received at the time of reporting.	Data were not accessible.
Viewshed Surveys (Section 6.0)	A total of 163 viewshed surveys were completed in 2020, with the highest numbers of caribou observed in April.	Viewshed surveys informed road closure by acting as an early warning system for caribou approaching the WTHR.
Remote Camera (Section 7.0)	Sixteen cameras were deployed on WTHR. Caribou crossings were documented at five camera locations.	No management response based on remote camera program in 2020.
Blast Monitoring (Section 8.0)	Caribou monitoring conducted prior to blasts throughout 2020. Measurements collected at two locations for eleven blasts in December 2020.	One blast postponed due to presence of caribou in the vicinity of the Whale Tail Pit.
Caribou Management Decision Tree (Section 9.0)	Decision tree used when caribou were close to Project facilities as outlined in the 2019 TEMP Version 7.	Decision tree process uses data from the road, Mine site, viewshed surveys, and satellite collaring to determine the scale of caribou monitoring and management required.
Hunter Harvest Study (Section 10.0)	Total reported caribou harvest of 652 in 2020.	HHS results support that harvest was less than threshold. Management actions are not required.

Table 37: Summary of Mine-related Effects on Caribou in 2020

Monitoring Program	Potential Effect	Threshold	Threshold Exceeded (2020)	Adaptive Management Implemented
Road Surveys (Section 2.0)	Sensory Disturbance	No threshold. Decisions Trees followed when caribou are seen near mine facilities.	NA	YES. Multiple road closures and notices, good engagement of Wildlife Log by site staff. Use of Decision Trees for Management and Monitoring.
	Project-related Mortality	Caribou or muskoxen will not be killed or injured by vehicle collisions. Threshold level of mortality is two (2) individuals per year.	NO	NO.
Pits and Mine Site Ground Surveys (Section 3.0)	Sensory Disturbance	No threshold. Decisions Trees followed when caribou are seen near mine facilities.	NA	YES. Deterrent actions were used to keep caribou safe from site hazards. Use of Decision Tree for Management and Monitoring.
Wildlife Habitat Monitoring (Section 4.0)	Habitat Loss	10% above total loss of high suitability habitat.	NA	NA. Comprehensive analysis not performed in 2020.
Caribou Satellite-Collaring Program (Section 5.0)	Sensory Disturbance	No threshold. Decisions Trees followed when caribou are seen near mine facilities.	NA	YES. Multiple road closures and notices. Use of Decision Tree for management and monitoring. Ongoing analysis by GN (in partnership with Agnico Eagle)
Viewshed Surveys (Section 6.0)	Sensory Disturbance	No threshold. Decisions Trees followed when caribou are seen near mine facilities.	NA	YES. Multiple road closures and notices. Use of Decision Tree for Management and Monitoring.
Remote Camera (Section 7.0)	Sensory Disturbance	No threshold.	NA	NA. Results in this report represent first formal analysis from remote camera program.
Blast Monitoring (Section 8.0)	Sensory Disturbance	NPC-119 criteria. Monitoring is continuous, but with increasing intensity as caribou approach the blasting site.	YES	YES. Blasting postponed on one occasion because caribou were within 4 km . Use of Decision Tree for management and monitoring.
Caribou Management Decision Tree (Section 9.0)	Sensory Disturbance	No threshold but Decisions Trees followed when caribou are seen near mine facilities	NA	YES. Multiple road closures and notices. Use of Decision Tree for Management and Monitoring.
Hunter Harvest Study (Section 10.0)	Hunting by Baker Lake Residents	The AWAR will not result in significant changes in the spatial distribution, seasonal pattern, or harvest levels of caribou kills by Baker Lake hunters. Changes will not exceed 20% of historical harvest activities within the RSA.	NO	NO. Future discussion with HTO and GN representatives required to identify management options.
		No change in harvest along the WTHR	NO	

12.0 PREDATORY MAMMAL DEN MONITORING

Predatory mammals, representing a valued ecosystem component (VEC), occur and are known to den in the vicinity of the Meadowbank and Whale Tail Project facilities. Sensory disturbances near active dens such as blasting, vehicles and, most significantly, ground personnel, may negatively impact denning success by inducing stress responses in the adult mammals, which can result in den abandonment.

Predatory mammal den monitoring is applicable to four species: grey wolf (natal dens), grizzly bear (natal/overwintering dens), Arctic fox (natal dens), and wolverine (natal dens).

12.1 Objectives

The purpose of the predatory mammal den monitoring program is to identify and monitor active dens in close proximity to mining operations in order to protect any detected dens from disturbance.

12.2 Methods

Data will be collected on Predatory mammal abundance and behaviour during ground surveys, vehicle surveys, and Viewshed surveys. Active den sites identified during baseline studies will also be monitored. If a wildlife technician suspects or confirms that an active den is present within the active footprint and vicinity of Project facilities or roads, a den management plan will be prepared. The plan will include consultation with the GN with respect to obligations under *The Wildlife Act*, SNU 2003, c. 26. Ground personnel and vehicle access will be restricted in the vicinity of the den as needed to minimize disturbances at the den. The den management plan outlines a monitoring schedule (dependent on seasonal timing) and will inform further mitigation strategies as required. See Figure 13 and Appendix I of the 2019 TEMP Version 7 (Agnico Eagle 2019) for den management and protection plan components.

12.3 Results

Monitoring of predatory mammal dens were conducted informally in 2020 through observations recorded during other monitoring programs. Potential effects due to Project-related activities were not identified to trigger monitoring of predatory mammal dens. No predatory mammal dens were observed or monitored in 2020.

12.4 Accuracy of Impact Predictions

A summary of the impact predictions identified in the TEMP (Agnico Eagle 2019 Version7) is provided in Table 38; however, no impacts to denning predators were observed in 2020.

Table 38: Accuracy of Impact Predictions - Disturbance to Denning Predatory Mammals for the Meadowbank and Whale Tail Projects

Potential Effect	Threshold	Threshold Exceeded	Adaptive Management Implemented	Monitoring Methods
Disturbance to Denning Predators	Predatory mammal den failures will not be caused by Mine-related activities. Threshold is one den failure per year.	No	No	Road Surveys, daily and weekly systematic pit and Mine site ground surveys, viewshed, incidentals and vehicle encounter

12.5 Management Recommendations

When an active den site is identified in close proximity to Project facilities, a den management plan should be developed that outlines a monitoring schedule and appropriate mitigation strategies.

13.0 RAPTOR NEST MONITORING

13.1 Overview

The raptor nest monitoring program is designed to determine Project-related effects, and the success of mitigation strategies to prevent disturbance to nesting raptors. Within the Meadowbank LSA and AWAR LSA, peregrine falcons have previously nested in quarries along the AWAR, the Portage Pit, and Goose Pit. Monitoring of peregrine falcon nests in quarries along the AWAR has been conducted since 2009. The Portage, Goose, Vault, Whale Tail, and IVR Pits are inspected for peregrine falcon activity daily prior to and during the nesting season, and managed under the Peregrine Falcon Management and Protection Plan (Appendix E, Agnico Eagle 2019, 2020a).

Surveys from 2015, 2016, 2017, and 2019 identified 58 raptor nesting sites in the Whale Tail RSA. Peregrine falcon and rough-legged hawk nesting sites were located within 1.5 km of Project facilities in the Whale Tail LSA. Annual monitoring of these nests was recommended, however these nests are not expected to be directly impacted by the Project due to their distance from Mine activity (Appendix L, Agnico Eagle 2020b).

The number of nests currently monitored annually does not allow for statistical analysis to determine the relationship between nest success and Mine activity. Development of a study design that supported analysis of nest success in relation to Mine activity for the Meadowbank, AWAR, and Whale Tail sites was proposed for 2020, but was not completed due to COVID-19. Monitoring in 2020 included surveys for nests associated with pits and quarries along the AWAR and WTHR. Raptor activity and potential nest locations were also noted on other surveys including road surveys, viewshed surveys, freshet monitoring, and on-site environmental monitoring.

13.2 Objectives

The objectives of the raptor nest survey monitoring program are to monitor disturbance to nesting raptors, and Project-related mortality to raptors. Nest management plans are developed for nests in proximity to the Project. One mortality, and one nest failure are thresholds for the Project.

13.3 Duration

Raptor nest monitoring will continue throughout operation and closure stages of the Mine to evaluate if mitigation measures to prevent disturbance to nesting raptors are successful.

13.4 Methods

Raptor nests within 1.5 km of the active footprint and Project facilities require monitoring from 1 May to 15 September. Daily monitoring is required for nests within the active footprint, or within 500 m of Project facilities (i.e., the area of concern; Agnico Eagle 2019), and weekly monitoring is required for nests outside the area of concern. Nest management plans are developed as required, in consultation with subject matter experts and the GN, which include establishment of no-disturbance buffers in accordance with BC Guidelines for Raptor Conservation or TAG recommendations. The Portage, Goose, Vault, Whale Tail, and IVR Pits are inspected daily for presence of nesting peregrine falcons from 25 May to 1 July. Management and mitigation approaches for peregrine falcon nests in proximity to pits and facilities are outlined in the ‘Peregrine Falcon Management and Protection Plan on the Meadowbank Gold Project Site' (Appendix E, Agnico Eagle 2019, 2020a). Raptor activity is also noted on other surveys including pit and Mine site inspections, road surveys, and Viewshed surveys.

Raptor nest monitoring in 2020 included monitoring of raptor nests in quarries along the AWAR and WTHR. Peregrine falcons have nested in quarries along the AWAR since 2009, and surveys of these quarries have been performed since 2010. Quarries along the WTHR were also checked regularly for raptor nesting evidence. Quarries along the AWAR (listed in Table 39) were visited on an approximately weekly basis between 19 April and 4 September in 2020. Raptor activity and potential nest locations were also noted on other surveys including road surveys, viewshed surveys, freshet monitoring, and on-site environmental monitoring. Surveys in pits or other areas were conducted when raptors were observed during Mine site inspections or incidental observations.

Nest sites are monitored using non-disruptive techniques, which include monitoring from vehicles within the quarry or from the road, to ensure that active nests are not approached by Agnico Eagle personnel. Presence of aggressive adults, eggs, and chicks are used to identify active nests. To minimize direct disturbance to nesting birds and as per recommendations, intensive monitoring, which would require approaching nests by foot, is not conducted.

13.5 Results

Thirteen peregrine falcon nesting sites have been recorded in the Meadowbank LSA and AWAR LSA since nest monitoring began in 2009 (Table 39). Six active peregrine falcon nests were documented in Quarries 2, 7, 9, 16, 19, and 21 along the AWAR in 2020. Nests have been identified at all six of these quarries in previous years Table 39). No nesting evidence was observed at previous nest sites at Quarries 3, 8, 17, 18, and 22 (Table 39). In addition to the six active nest sites in 2020, peregrine falcon activity was observed at Quarries 1, 3, 8, 14, 15, 17, 18, 22, and 30 during the monitoring program. Quarries 10, 26, 30, 35, 50, and 52 were monitored along the WTHR in 2020. No raptor nesting evidence was observed in quarries along the WTHR in 2020, however one falcon was observed at Quarry 30 on 21 August. No other nests were identified during pit checks or incidentally during other surveys in 2020.

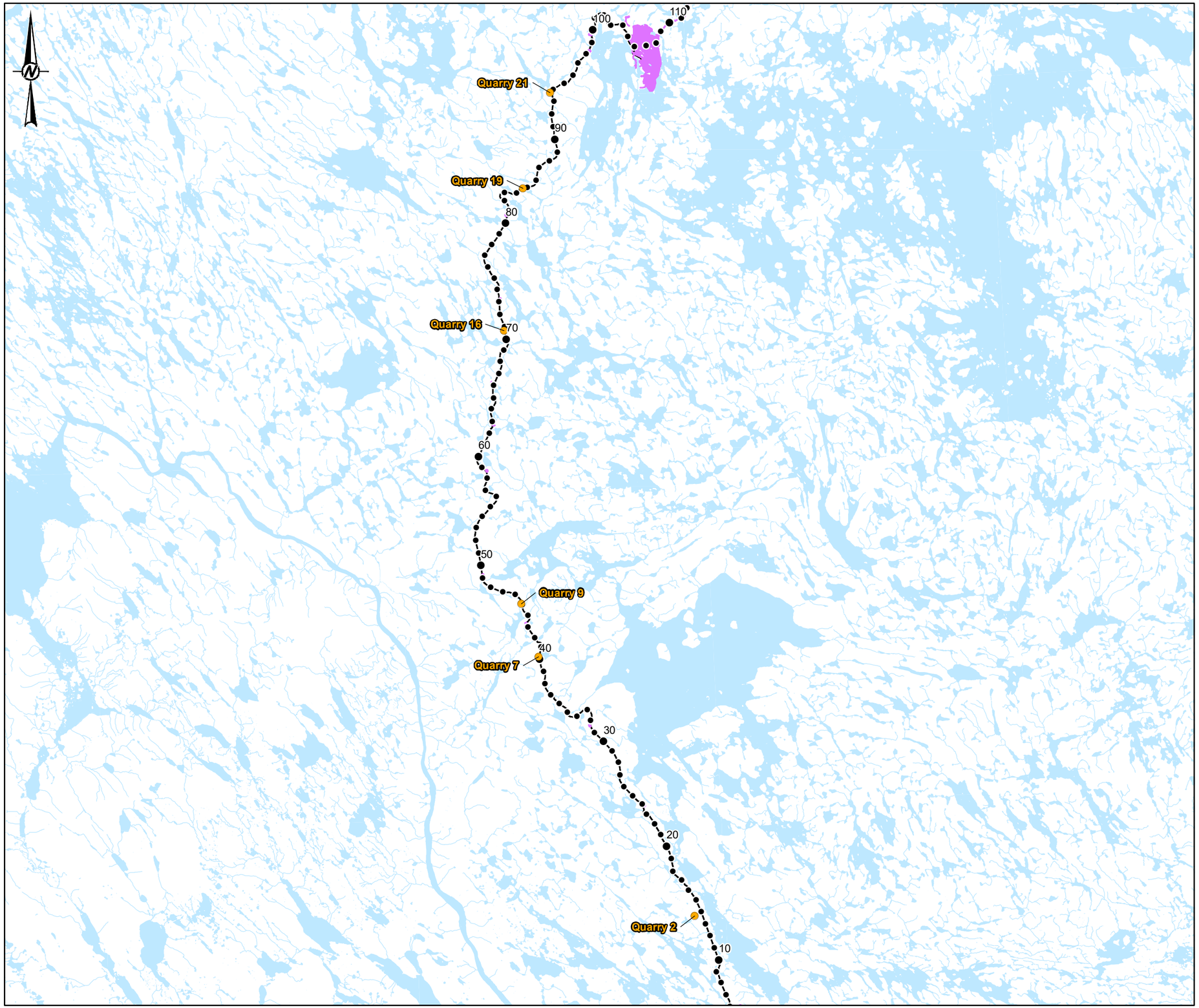
A summary of observations made at the six peregrine falcon nests along the AWAR in 2020 is detailed in Table 40. Raptor nest management plans were not developed at the active nest sites, as Mine-related activity was already restricted within the quarries, with the only disturbance being traffic on the nearby AWAR. Intensive monitoring, which would include approaching nests by foot, was not conducted. Nest locations are not publicized to prevent inadvertent disturbance by curious Mine employees.

Table 39: Record of Peregrine Falcon Nesting along the All-Weather Access Road and in the Meadowbank Local Study Area between 2009 and 2020

Location	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Comments
Quarry 1	No	No	No	No	No	No	No	No	No	No	No	No	One falcon observed
Quarry 2	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	Yes	No	**Yes**	Nest with two eggs observed
Quarry 3	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	One falcon observed
Quarries 4 to 6	No	No	No	No	No	No	No	No	No	No	No	No	No raptor activity observed
Quarry 7	No	No	No	No	No	No	No	**Yes**	**Yes**	No	No	**Yes**	Nest with three eggs observed
Quarry 8	No	No	No	No	No	No	No	No	**Yes**	No	No	No	Two falcons observed
Quarry 9	No	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	Nest and two falcons observed
Quarries 10 to 14	No	No	No	No	No	No	No	No	No	No	No	No	One falcon observed (Quarry 14)
Quarry 15	No	No	No	No	No	No	No	No	No	No	No	No	One falcon observed
Quarry 16	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Nest with three eggs; one chick observed
Quarry 17	No	No	No	No	No	No	No	No	**Yes**	No	No	No	One falcon observed
Quarry 18	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	No	One falcon observed
Quarry 19	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	Nest and two falcons observed
Quarry 20	No	No	No	No	No	No	No	No	No	No	No	No	No raptor activity observed
Quarry 21	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Nest with three eggs
Quarry 22	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	Two falcons observed
Quarry 26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No raptor activity observed
Quarry 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	One falcon observed
Quarry 35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No raptor activity observed
Quarry 50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No raptor activity observed
Quarry 52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No raptor activity observed
Portage Pit	No	No	No	**Yes**	**Yes**	No	No	No	No	No	No	No	No raptor activity observed
Vault Pit	N/A	N/A	N/A	N/A	No	No	No	No	No	No	No	No	No raptor activity observed
Goose Pit	N/A	N/A	No	No	No	No	No	**Yes**	No	No	No	No	No raptor activity observed

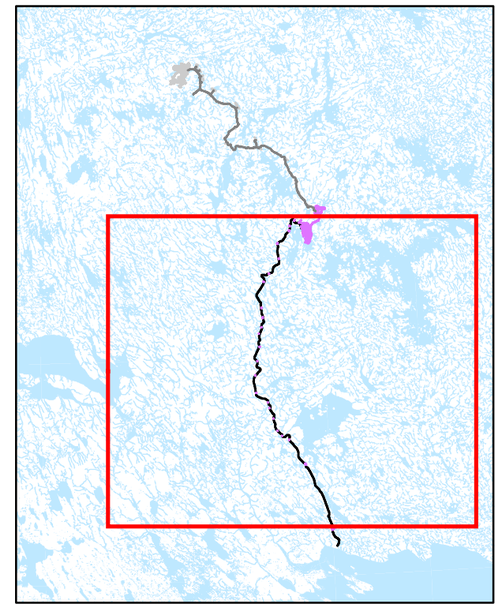
Table 40: Peregrine Falcon Nests Identified and Monitored along the All-Weather Access Road in 2020

Date	Quarry 2 (14W 0642042 7147644)	Quarry 7 (14W 0629886 7167799)	Quarry 9 (14W 0628548 7171923)	Quarry 16 (14W 0627198 7193178)	Quarry 19 (14W 0628674 7204265)	Quarry 21 (14W 0630777 7211703)
29 Apr 2020	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed
07 May 2020	No falcons observed	No falcons observed, unknown species in area	No falcons observed	No falcons observed	No falcons observed	No falcons observed
15 May 2020	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed
22 May 2020	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed
30 May 2020	No falcons observed	No falcons observed	Nest observed, unknown species in area	No falcons observed	No falcons observed	No falcons observed
06 Jun 2020	-	-	-	Two falcons observed	One falcon observed	-
07 Jun 2020	-	-	-	Two falcons observed	Two falcons and nest observed	-
13 Jun 2020	No falcons observed, unknown species in area	Evidence of falcons observed, but no individuals observed	Two falcons observed	One falcon and nest observed, individual was aggressive	No falcons observed	Evidence of falcons observed, but no individuals observed
19 Jun 2020	Two falcons and two eggs in nest observed	Two falcons and three eggs in nest observed	Two falcons and nest observed, individuals were aggressive	Two falcons and three eggs in nest observed	Two falcons observed, potentially two nesting attempts at quarry	No falcons observed
26 Jun 2020	One falcon and two eggs in nest observed	Two falcons and three eggs in nest observed	No falcons observed	Two falcons and three eggs in nest observed	No falcons observed	Two falcons and three eggs in nest observed
03 Jul 2020	Falcon present, did not approach	Falcon present, did not approach	Falcon present, did not approach	Falcon present, did not approach	Falcon present, did not approach	One falcon and three eggs in nest observed
08 Jul 2020	Falcon present, did not approach	Falcon present, did not approach	Falcon present, did not approach	Falcon present, did not approach	Falcon present, did not approach	One falcon and three eggs in nest observed
17 Jul 2020	One falcon observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed	One falcon observed
23 Jul 2020	One falcon observed	No falcons observed	Two falcons observed	No falcons observed	One falcon observed, left area upon arrival	One falcon observed
02 Aug 2020	Two falcons observed, left area upon arrival	No falcons observed	One falcon observed, left area upon arrival	Two falcons and one chick in nest observed	No falcons observed	No falcons observed
04 Aug 2020	One falcon observed, left area upon arrival	No falcons observed	Two falcons observed, left area after circling quarry	Falcon present, did not approach	No falcons observed	Two falcons observed
08 Aug 2020	One falcon observed	No falcons observed	No falcons observed	Two falcons observed	No falcons observed	No falcons observed
14 Aug 2020	One falcon observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed	One falcon observed
20 Aug 2020	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed	No falcons observed
28 Aug 2020	-	-	-	-	-	One falcon and nest observed, left area upon arrival
04 Sep 2020	Two falcons and nest observed	One falcon and nest observed	One falcon observed	One falcon and nest observed	No falcons observed	Two falcons and nest observed



LEGEND

- ACTIVE PEREGRINE FACON NEST LOCATION (2020)
- KILOMETRE MARKER
- WHALE TAIL MINE SITE
- HAUL ROAD
- MEADOWBANK MINE SITE
- ALL WEATHER ACCESS ROAD
- WATERBODY
- WATERCOURSE



0 6 12

1:300,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.

COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 14N

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

PEREGRINE FALCON NEST LOCATIONS (2020)

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9_PROJECTS\19134270\4000\4040\02_PRODUCTION\MXD\Report\19134270_4000_4040_13_Peregrine_Falcon_Nest_Locations_2020.mxd PRINTED ON: 2021-03-24 AT: 4:07:09 PM

13.6 Accuracy of Impact Predictions

A summary of the impact predictions identified in the TEMP Version 7 (Agnico Eagle 2019,) is provided in Table 41. No impacts to raptors were observed in 2020, however the number of nests monitored in 2020 did not allow statistical analysis of the relationship between Mine activity and raptor nest success. No thresholds were surpassed in 2020.

Table 41: Accuracy of Impact Predictions to Nesting Raptors and Raptor Mortality

Potential Effect	Threshold	Threshold Exceeded (2020)	Adaptive Management Implemented	Monitoring Methods
Disturbance to Nesting Raptors	Raptor nest failures will not be caused by Mine-related activities. Threshold is one nest failure per year.	No	No	Active raptor nest monitoring Daily and weekly systematic pit and Mine site ground surveys
Raptor Mortality	One (1) individual	No	No	AWAR and WTHR surveys Daily and weekly systematic pit and Mine site ground surveys Incident and vehicle encounter reports

13.7 Management Recommendations

Agnico Eagle will continue to monitor raptor nests in accordance with the TEMP Version 7 (Agnico Eagle 2019). This includes annual raptor nest surveys of quarries along the AWAR, WTHR, pits, and waste rock piles; development of nest management plans; and implementation of the Peregrine Falcon Management and Protection Plan when required. Active nests will be monitored throughout the season to determine nest success or failure. Agnico Eagle will continue to document raptor observations during other programs (e.g., road surveys, Viewshed surveys).

Development of a comprehensive raptor nest survey of the Meadowbank LSA, AWAR LSA, and Whale Tail LSA is planned for 2021 to allow more rigorous analysis of the relationship between Mine activity and raptor nest success.

14.0 WATERBIRD NEST MONITORING

14.1 Overview

The Whale Tail expansion required the construction of two dykes within Whale Tail Lake to divert water from the proposed pit to surrounding lakes and tributaries, resulting in flooding that with potential impacts to migratory birds and their nests. Trent University, in collaboration with Environment and Climate Change Canada and Agnico Eagle, conducted a research study to investigate mitigation options to minimize flooding-related impacts to birds in the Whale Tail South area. The objectives of the study were to:

- Determine the effectiveness of audio and visual deterrents for prevention of flood-zone nesting.
- Estimate the number of nests and species composition lost due to flooding.
- Examine the behavioural response of birds to flooding (i.e., whether birds re-nested after flooding) and deterrents (i.e., impact on duration of nesting).

Visual and audio deterrents tested in the 2018 and 2019 programs were not recommended as effective mitigation measures for preventing bird nest loss. Nest densities observed from 2018 and 2019 were used to estimate nest displacement during 2018 to 2020. Nest displacement to date was estimated to be lower than FEIS Addendum predictions (Appendix E). The 2020 field program intended to determine behavioural response to flooding (i.e., nest density and recolonization time in the area post-flooding), but was not completed due to COVID-19. The program will be completed in 2021, pending COVID-19 related restrictions. Further details on the program are outlined in the ‘2020 Migratory Bird Protection Report’ (Appendix E).

15.0 BREEDING BIRD MONITORING

15.1 Overview

The breeding bird PRISM (Program for Regional and International Shorebird Monitoring) plot and bird transect monitoring programs were designed to evaluate potential Project-related changes in breeding bird species abundance, richness, and diversity over time. The program is one component of the larger monitoring strategy to evaluate the success of mitigation measures implemented to minimize the amount of vegetation (i.e., bird habitat) removed or degraded (e.g., dust fall) by the Project, and whether certain Mine activities such as the Mine site or AWAR have resulted in reduced or compromised habitat function or effectiveness (i.e., zone of influence) for breeding birds.

For the breeding bird transects, data analysis in 2011 and 2015 indicated that no road-related effects had occurred to date, and thresholds had not been exceeded; therefore, annual transect surveys were permanently suspended after 2015. In 2019, the Canadian Wildlife Service requested a detailed analysis of all PRISM and bird transect data to date and a comprehensive report outlining protocols and analytical results. If no effects are evident, bird monitoring can be shifted to: 1) PRISM plots randomly selected by CWS staff; and 2) a Breeding Bird Survey (BBS) as per standard BBS protocols.

15.2 2020 Update

On 3 December 2020 Agnico Eagle sent ECCC the comprehensive 2003-2015 analysis of all PRISM and breeding bird transect data (Agnico Eagle 2020c). The analysis determined there were no significant effects of the Project or Mine-related infrastructure on bird abundance, diversity, or community composition. Pending approval, a new program to assist with regional monitoring efforts will be enforce in 2021.

15.3 Management Recommendations

Results of the comprehensive analysis determined there were no significant effects of the Project or Mine-related infrastructure on bird abundance, diversity or community composition, which supports that mitigation is effective. Determination of future PRISM and BBS monitoring objectives will be determined following ECCC’s review of Agnico Eagle (2020).

16.0 NON-NATIVE PLANT SURVEYS

16.1 Overview

This section includes the methods, results, and mitigation measures to minimize the spread of non-native invasive plant species resulting from Project construction. The Government of Nunavut (GN) and Environment and Climate Change Canada (ECCC) define a non-native species as ‘an organism that is not normally found in a region’ (CESCC 2010). Any introductions of non-native plant species must be promptly reported to the GN Department of Environment. In 2019, Agnico Eagle initiated a non-native plant monitoring study to assess and monitor the potential introduction of non-native plant species, including weeds or invasive species (Golder 2020b). A second monitoring event occurred in July 2020. Subsequent surveys will be completed annually as per the TEMP Version 7 (Agnico Eagle 2020a).

16.2 Methods

Surveys at the Meadowbank Complex were conducted by a Golder vegetation ecologist between July 24 to August 2, 2020. The Meadowbank Complex area includes the AWAR, WTHR, Baker Lake tank farm, Whale Tail site, and Meadowbank Mine site areas.

The Canadian Endangered Species Conservation Council (CESCC) identified 17 species not normally found in Nunavut with a potential for becoming established, 14 of which are vascular (non-native) plants to the region (CESCC 2010; Table 1). Species were documented as they were encountered. Non-native plant surveys consisted of targeted surveys focused within high-priority or potential areas. The high-potential areas were identified as the Project area perimeter, along existing roads/trails or areas of disturbance within the Project area, as well as adjacent to the AWAR and WTHR road.

Given the length of the AWAR and WTHR, the roads were travelled via vehicle at slow speeds, while observers looked for obvious signs of weed infestations along road margins. Periodic stops were undertaken to complete meanders in areas with high potential (e.g., pull-outs, work areas, road-side quarries and other areas with disturbed substrates). A total of 176 individual locations were surveyed for non-native plants.

When non-native or invasive plant species were encountered, the following information was recorded: site ID; surveyor name; GPS coordinates; photos of the occurrence / infestation; species name; estimated area of infestation; estimated number of plants (e.g., <10, 10 to 100, 100 to 1,000, >1,000) of each species; estimated cover of bare ground; growth stage (i.e., seedling, in bud, seed set, expired); recommended action for each species; and record of any hand pulling completed.

16.3 Results

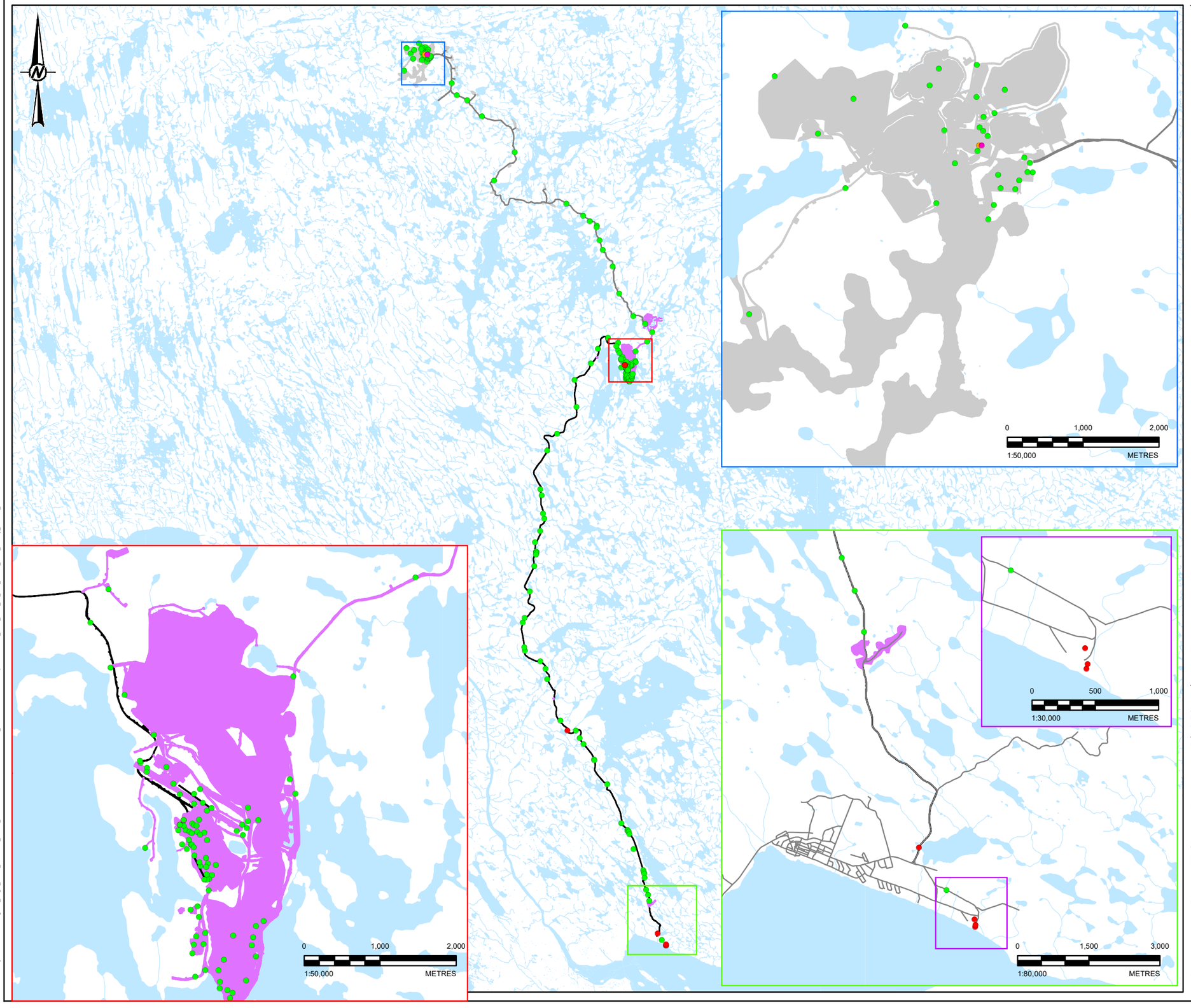
No non-native plants, as identified by the CESCC, were recorded along the AWAR, WTHR, Baker Lake tank farm, Whale Tail and Meadowbank Mine sites. A full report of non-native species observed during the 2020 surveys is included in Appendix H.

Although not listed as a non-native species by the CESCC, populations of scentless chamomile (*Tripleurospermum inodorum*), which is non-endemic to the Arctic, were observed at seven of the surveyed locations. There was also a population of alsike clover (*Trifolium hybridum*) and lamb’s quarters (*Chenopodium album*) observed at one location (Figure 14). The non-native plant surveys in 2019 identified one location of scentless chamomile at the Meadowbank Mine site.

Scentless chamomile was observed in three large populations at the Baker Lake tank farm, once along the AWAR road near the community of Baker Lake and once at a quarry near kilometer 35 on the AWAR. It was observed in two small populations near the geology shack at the Meadowbank Mine site. The most effective method of treatment for this species is hand pulling (GOA 2007). A crew of Agnico Eagle staff was instructed how to identify this species and pulled the populations by hand between July 28 and August 2, 2020. The plants were collected in garbage bags and incinerated.

The population of three individuals of lamb's quarters was observed near the former exploration camp at the Whale Tail site; this species is an introduced weed from Europe (Dickinson 2006). It is one of Canada's most widespread and abundant agricultural weeds and prefers disturbed soils (ABMI 2019a). The isolated population was removed by hand.

The population of approximately 50 individuals of alsike clover was also found near the former exploration camp at the Whale Tail site. It is an introduced forage crop from Europe and Asia and can be found throughout Canada including north of the Arctic Circle (Dickinson 2006). It is typically found in disturbed or cultivated sites (ABMI 2019b). The isolated population was removed by hand.



LEGEND

- SURVEY LOCATIONS – NO NON-NATIVE PLANTS OBSERVED
- ALSIKE CLOVER (*Trifolium hybridum*)
- LAMB'S QUARTERS (*Chenopodium album*)
- SCENTLESS CHAMOMILE (*Tripleurosperum inodorum*)
- TRANSECT
- WHALE TAIL MINE SITE
- HAUL ROAD
- MEADOWBANK MINE SITE
- ALL WEATHER ACCESS ROAD
- WATERBODY
- WATERCOURSE
- ROAD

0 10 20
1:530,000 KILOMETRES

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.

COORDINATE SYSTEM: CANADA ALBERS EQUAL AREA CONIC

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

NON-NATIVE PLANT SURVEY RESULTS (2020)

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-24
DESIGNED	SOD/CS
PREPARED	CC/CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4040	0	14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\9_PROJECTS\19134270\4000\4040\002_PRODUCTION\MXD\Report\19134270_4000_4040_14_Non_Native_Plant_Survey_Results_2020.mxd PRINTED ON: 2021-03-24 AT: 3:50:40 PM

16.4 Management Recommendations

Although not listed as a non-native plant by the CESCC, scentless chamomile is listed as Secondary Noxious and Noxious in the Canadian Weed Seeds Order (GOC 2016). The Government of Alberta states that noxious weeds have the ability to spread rapidly, degrade habitats and reduce biodiversity, and must be controlled to prevent further establishment and spread (GOA 2012). Although the populations were reduced by hand pulling, the plants had already gone to seed and will likely return next year. Areas that were known to have populations of scentless chamomile should be continually monitored and controlled to prevent further infestations. Pulling by hand is an appropriate method at this time because the populations are not widespread across the Meadowbank Complex.

Lamb's quarters is considered a Tier 3 noxious weed in the province of Manitoba (GoM 2020). However, it is not considered a noxious weed in any other Province or Territory in Canada. The isolated population was removed by hand and is not anticipated to need further control. Continued monitoring for new populations will help prevent its spread at the Meadowbank Complex.

Although not native to Canada, alsike clover is not considered a noxious weed in any Canadian Province or Territory. The isolated population of alsike clover observed was removed by hand and is not predicted to need further control. Continued monitoring for new populations will help prevent its spread at the Meadowbank Complex.

Efforts for non-native plant management, including identified non-endemic species, should continue and added diligence should be undertaken with regards to areas of high traffic. Continued and thorough cleaning of equipment and materials prior to entering the site, per the TEMP Version 7, will prevent seed of non-native species from being introduced. Surveys for the 14 non-native plant species identified by CESCC as well as other non-native species should continue to be completed annually. Mechanical control such as mowing or hand pulling, as appropriate for the site setting, is recommended for any identified non-native plant species.

Chemical herbicide treatments are not recommended to be used at this point as the tundra is a very sensitive ecosystem. As a further measure of prevention, the CESCC (2010) has developed posters that show non-native species in Nunavut. We recommend that these be displayed at the Meadowbank Complex and incorporated into on-boarding materials, which could be used to supplement non-native plant information and posters used on-site. These materials can also be displayed at the Agnico office/crew house in Baker Lake and potentially in other areas within the community.

A management plan for non-native plant species employing adaptive management may be implemented if the non-endemic and other non-native plant species continue to be observed and/or are observed to spread further within the Meadowbank Complex area. A non-native plant management plan would describe the methods for the eradication, control and/or minimization of the encroachment of non-native plant species into new areas, and outline additional measures such as on-boarding and training in the identification of non-native plant species for the area.

17.0 SPECIAL STUDIES

17.1 Snow Study

17.1.1 Overview

Collared caribou from the Lorillard herd have historically interacted with the AWAR and WTHR during their spring and fall migrations. Spring migration occurs annually between April 5 to May 28 as defined by the Government of Nunavut. During this period, collared caribou have interacted with the WTHR and AWAR annually between approximately late April to early May, from 2011 to 2019. The following sections focus exclusively on characterizing snow conditions and caribou interaction along the WTHR (see Section 2.6 for information on caribou interaction with the AWAR).

The direction of travel for these animals crossing the WTHR has always been from the west to the east in the spring. Snow is removed periodically from the WTHR to promote safe driving conditions for the transport of Meadowbank Mine staff and supplies and mined ore between Whale Tail pit and the Meadowbank Mine site. Snow is removed or redistributed from the road surface to areas adjacent to the roads. The snow is redistributed in a way to minimize the size of any snow berms formed on the side of the roads (i.e., snow is pushed to the eastern, downwind side of the road).

Per Whale Tail Expansion Project commitment 9 from the TAG Meeting held in Baker Lake June 11-13, 2019, Agnico Eagle committed to complete a three-year snow monitoring program as part of the TEMP that measures snow conditions adjacent to the WTHR. The goal of the snow monitoring is to determine whether changes to snow resulting from snow removal along the WTHR result in conditions that potentially inhibit caribou movements. The primary questions to be answered by the snow study monitoring were:

1) How do snow conditions within the managed snow area where caribou are crossing the WTHR differ from the snow conditions in adjacent portions of the berm where crossing did not occur?

2) How do snow conditions and caribou track characteristics differ between areas within the snow berm and areas beyond the berm where snow conditions have not been altered by snow removal activity?

The first year of snow condition monitoring along the WTHR was completed in 2020. The 2020 monitoring year was considered a “pilot” study year; the methods and preliminary results obtained during the snow monitoring program are outlined below.

17.1.2 Methods

Five survey locations along the WTHR were established by Agnico staff in May 2020. Survey locations were sampled on May 27 and May 28, 2020. Surveyors established six plots at each survey location and collected data on the snow depth, snow hardness, caribou track depth, as well as the height and slope of the snow-managed berm that occurred adjacent to the WTHR. Snow and caribou track depth were measured using a metre stick while snow hardness was measured using a mechanical dynamometer (i.e., push-pull gauge; Lundmark and Ball 2008). Three plots were established on the upwind side of the WTHR (i.e., the side of the road that the prevailing wind blows from - the west) and three plots were established on the downwind side of the WTHR (i.e., the east side of the road).

The three survey plots on each side of the road included a “use” plot, a “snow-management control” plot and a “unmanaged control” plot (Figure 15). The use plot occurred within the snow-managed berm in an area where caribou had left tracks while crossing the WTHR. The snow-managed control plot occurred approximately 5.0 m from the use plot, within the snow-managed berm but in a portion of it that did not contain caribou tracks. The unmanaged control plot occurred beyond the snow-managed berm and in an area where caribou tracks were present (Figure 15).

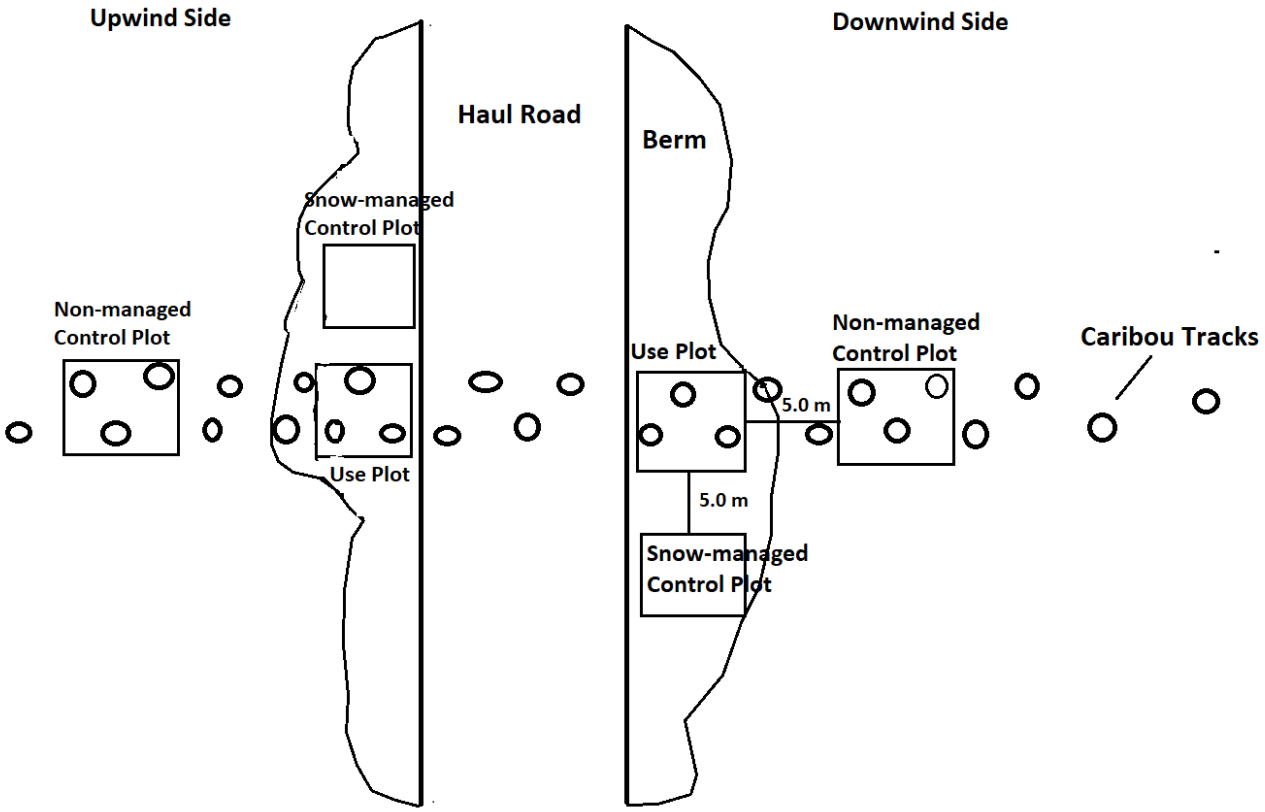


Figure 15: Survey Plot Configuration Used During Year 1 Snow Survey Monitoring Along the Haul Road, 2020

17.1.3 Results

Apart from caribou track depth data in unmanaged control plots, a full suite of data was collected at six plots per survey location. Information on caribou track depth in the unmanaged control plots was not collected in May 2020 due to errors in datasheet printing. The datasheets printed in May 2020 did not display the boxes for where the caribou track information was to be recorded so the field staff did not have the reminder to collect this component of the data.

Table 42 provides a summary of snow depth and snow hardness measurements recorded in the use and control plots during the 2020 survey period. Across all survey plots sampled, snow depth was, on average, deeper on the upwind (west) side of the haul road (38.92 ± 6.97 cm [± 1.0 standard error]) than the downwind (east) side of the road (30.92 ± 7.09 cm) (Table 42). Average snow depth in use plots on the upwind side of the road (38.73 ± 12.07 cm) was similar to the average snow depth in the snow-managed control plots (i.e., plots within the berm but not used by caribou) on the upwind side of the road (39.10 ± 12.08 cm). Snow depths in the downwind plots showed a similar trend; however, use plots (28.87 ± 9.29 cm) had slightly lower average snow depths compared to snow-managed control plots (32.97 ± 14.63 cm). The 95% confidence interval for snow depth measured in use plots overlapped with the confidence interval calculated for snow depth measured in snow-managed control plots suggesting that the difference in mean values between the two plot types was not statistically significant.

The snow hardness, as measured using the push-pull gauge, was far higher at plots on the downwind side (average snow hardness = 15.58 ± 3.23 Newtons [N]) = of the WTHR than plots on the upwind side of the road (average snow hardness = 7.40 ± 1.53 N) = On both the upwind and downwind sides of the WTHR, average snow hardness was lower (i.e., softer snow present) in use plots compared to the two types of control plots (Table 42).

Table 42: Snow Measurement Metrics Collected at Survey Plots on the Upwind and Downwind Side of the Haul Road

Sampling Location	Average Snow Depth ± 1.0 SE (cm)	Average Snow Hardness ± 1.0 SE (N)
Upwind Plots (West)		
Use Plot	38.73 ± 12.07	6.13 ± 1.52
Snow-management Control	39.10 ± 12.08	8.90 ± 3.37
Unmanaged Control	-	7.16 ± 2.59
All Upwind Plots	***38.92 ± 6.97***	***7.40 ± 1.53***
Downwind Plots (East)		
Use Plot	28.87 ± 9.29	11.66 ± 3.27
Snow-management Control	32.97 ± 14.63	21.26 ± 7.60
Unmanaged Control	-	13.82 ± 3.91
All Downwind Plots	***30.92 ± 7.09***	***15.58 ± 3.23***

Note: SE = standard error; cm = centimetre; N = Newtons of force

17.1.4 Management Recommendations

For any future data collection, the caribou track depth information should be collected in the use plot and in the unmanaged control plot to facilitate comparison between the snow conditions in the berm and beyond the berm. Datasheets should be double-checked when printed to ensure that this category is visible on the forms.

Surveyors in the field should carry an implement that can measure snow depths greater than 1.0 metre (i.e., a tape measure). Most snow depth measurements collected in 2020 were less than 1.0 metre so could be effectively collected with a metre stick; however, an accurate measurement of depth needs to be taken should the snow depth exceed 1.0 m (i.e., snow depths greater than 1.0 m should not be recorded as “> 1.0 m”).

The 2020 monitoring year acted as a pilot study to evaluate the effectiveness of the survey techniques and to guide future monitoring activities. Year two monitoring planned for 2021 should aim to collect a full suite of data (i.e., six plots sampled) from at least ten survey locations along haul roads in 2021. Once a full suite of monitoring data has been collected, a power analysis will be completed to determine if the ten survey locations provide sufficient survey effort to answer the study questions listed above using proposed statistical techniques (i.e., repeated measures ANOVAs or ANCOVAs).

17.2 Caribou Behaviour

17.2.1 Overview

Agnico collects different types of behaviour data on caribou that are used to inform on mine-related effects to caribou and mitigation effectiveness (Sections 5, 6, 7 and 8). In 2020, Agnico initiated a pilot study of data collection that focussed on measuring different behaviour activities of caribou in relation to mine-related effects (Appendix I). The objectives of the pilot study were to:

1) Implement a standardized monitoring method to collect data on caribou behaviours to determine whether it is appropriate in this area, with these caribou, and at this time of year.

2) to collect a set of 100 samples of caribou behaviour through conducting surveys comparing caribou behaviour: a) near vs. far, and b) with and without disturbances.

Prior to spring migration, a wildlife biologist from ERM conducted a virtual classroom and practical training program for Agnico environmental technicians dedicated to the task of behaviour observations. Field studies of caribou behaviour were conducted in April, May, August, and November 2020 at the Meadowbank Gold Mine, AWAR, and WTHR to monitor for potential Project effects on caribou.

17.2.2 Methods

The overall method for the field surveys was to identify caribou groups visible from the Meadowbank mine site, AWAR and WTHR, to select some groups for observation, and to record the behaviour scans of individuals in groups of different sizes including their responses without any disturbance and in response to mine-related activities and natural factors. Surveys were conducted in 2020 during the spring migration and fall migration, when caribou pass through the Meadowbank mine, Whale Tail site and WTHR and AWAR areas.

Behaviour categories and their definitions were standardized following GNWT (2017) classifications. The behaviour categories were: feeding, lying down, standing, alert, walking, and trotting or running. At each three-minute interval, surveyors recorded the numbers of individuals in the group exhibiting each behaviour at that time. If the group was too large to be counted in each interval, an identifiable subset of the group was surveyed during each interval and the total group size was recorded on the datasheet. In the case that a disturbance event occurred during the survey, such as a vehicle driving on the road, the time and type of disturbance was recorded. Further details on monitoring and analysis methods and are provided in Appendix I.

17.2.3 Results

A total of 116 behaviour surveys were conducted in 2020 when groups of caribou were near infrastructure, including 19 surveys in April, 52 surveys in May, 31 surveys in August, and 14 surveys in November. Surveys were conducted opportunistically whenever caribou were encountered during daily reconnaissance drives, primarily along the AWAR and WTHR but also around the Meadowbank site when the opportunity arose. Key results of the 2020 monitoring presented in Append I include:

- Caribou were within 300 m of the road at the start of the survey on seven occasions, and of these, most were of groups smaller than 50 individuals. Caribou mostly exhibited the non-response behaviours of standing, laying, feeding, and walking.
- An analysis of the first year's data indicated that there is a weak trend for caribou at greater distance from the road (>1,000 m) to have a lower proportion of response behaviours (alert and running). The analysis should be interpreted with caution with only one year of data.

- The proportion of caribou with response behaviours in a group was unrelated to environmental variables including temperature and wind speed.
- During periods when large groups of caribou are present, the AWAR and WTHR are closed following a decision tree in the Meadowbank Mine Terrestrial Ecosystem Management Plan (TEMP), reducing the potential to record interactions between vehicles and caribou.
- Approximately 70% of the surveys included a disturbance event; typically, haul traffic and light trucks from the mine, and occasionally all-terrain vehicles (ATVs) used by community members on the AWAR for travel and harvesting.
- Following a disturbance event, the proportion of response behaviours in a group of caribou rose but generally returned to baseline behaviours within one or two sampling intervals (i.e., 3 or 6 minutes).
- The method of group scans allowed for the estimation of baseline behaviour, response to disturbance, and return to baseline behaviour. Few, if any, surveys ended before caribou returned to baseline behaviour. Thus, 30 minutes appears to be an appropriate amount of survey duration.

Additional details on monitoring and analysis results are available in Appendix I.

17.2.4 Management Recommendations

Use of a range finder to measure the distance to caribou groups from observers on a continuous scale instead of categorically (e.g., distance bins). Following the 2020 pilot program, Agnico Eagle plans to review the methods and results of this monitoring program with the Meadowbank TAG. Based on this review, the program may be updated for the 2021 field season.

18.0 SUMMARY

The 2020 Annual Report describes the data collected to date from the various monitoring programs associated with the TEMP Version 7 (Agnico Eagle 2020a). The 2020 Annual Report describes natural and Project-related effects on wildlife populations and plant communities occurring near the Project.

In 2020, monitoring efforts focused on areas immediately around the Meadowbank Mine and Whale Tail sites, along the AWAR and the WTHR. Surveying and monitoring efforts focused on evaluating current habitat losses, monitoring nesting success of raptors, and monitoring and managing wildlife presence, particularly caribou, near the Project facilities and infrastructure. A summary of potential Project effects, threshold levels, and the 2020 monitoring results is provided in Table 43.

18.1 Accuracy of Impact Predictions

Table 43: Potential Project Effects, Thresholds, and Results of Monitoring in 2020

Potential Effect	Thresholds	Monitoring Methods	Frequency	Completed in 2020	Threshold Exceeded (2020)
Vegetation (Wildlife Habitat)					
Habitat Loss (Compared to Permitted Areas)	Meadowbank = 1,532 ha AWAR = 348 ha Whale Tail = 1,473 ha Threshold is >5% habitat loss of permitted area	Ground Surveys; Mapping and GIS analyses – ELC habitat mapping	Every three years	NO	**NO –** Comparison of 2020 Whale Tail development is less than predicted. More comprehensive analysis is scheduled for 2021
Habitat Reclamation following Mine Closure	NA	Ground Surveys; Mapping and GIS analyses – ELC habitat mapping	Every three years to 11 years post-closure	NO	**NA**
Ungulates					
Habitat Loss and Degradation (Compared to Permitted Areas)	Meadowbank Growing = 531 ha Winter = 407 ha Whale Tail Growing = 76 ha Winter = 602 ha	Ground Surveys; Mapping and GIS analyses – ELC habitat mapping	Every three years	NO	**NO –** More comprehensive analysis is scheduled for 2021
Sensory Disturbance	No threshold but Decisions Trees followed when caribou are seen near mine facilities	AWAR, Vault Haul Road, and WTHR surveys; Satellite-collaring data; HOL surveys; Daily and weekly pit and Mine-site ground surveys; Incidental wildlife reporting; Motion sensing cameras	Daily / weekly	YES	**NA**
Project-related Mortality - Vehicle Collisions	2 individuals (cumulative across Project)	AWAR and WTHR surveys; daily and weekly pit and Mine-site ground surveys; collision reporting system	Mine site – daily AWAR and haul roads – up to every two days at peak migration	YES	**NO –** 1 caribou mortality resulting from assumed vehicle strike in 2020
Hunting by Baker Lake Residents	20% Change in Harvest Patterns in RSA from Historic	Hunter Harvest Study	Yearly	YES	**NO**

Table 43: Potential Project Effects, Thresholds, and Results of Monitoring in 2020

Potential Effect	Thresholds	Monitoring Methods	Frequency	Completed in 2020	Threshold Exceeded (2020)
Other Project-related Mortality	2 individuals (cumulative across Project)	Daily and weekly pit and Mine-site ground surveys; collision reporting system	Daily	YES	**NO**
Predatory Mammals					
Disturbance to denning predators	1 den failure	Den site surveys	As required	NO	**NO**
Project-related Mortality	2 individuals (cumulative across Project)	AWAR and WTHR surveys; daily and weekly pit and Mine-site ground surveys; collision reporting system	Mine site – daily AWAR and haul roads – up to every two days at peak migration	YES	**NO.** 2 wolverine dispatched in 2020
Raptors					
Disturbance of Nesting Raptors	1 Nest Failure	Daily and weekly pit and Mine-site ground surveys; Incidental wildlife reporting; Dedicated raptor nest surveys; AWAR, Vault Haul Road, and WTHR surveys	Nests within 200 m - daily Nests from 200 to 1000 m - weekly	YES	**NO**
Project-related Mortality	1 individual (cumulative across Project)	AWAR, Vault Haul Road, and WTHR surveys; Daily and weekly pit and Mine-site ground surveys; Collision reporting system	Mine site – daily AWAR and haul roads – up to every two days at peak migration	YES	**NO**
Waterbirds					
Disturbance of Nesting Waterfowl	1 Nest Failure	Daily and weekly pit and Mine-site ground surveys; Waterbird nest surveys	Yearly - for active nests within 200 m	NO	**NO**
Project-related Mortality	1 individual (cumulative across Project)	AWAR, Vault Haul Road, and WTHR surveys; Collision reporting system	Mine site – daily AWAR and haul roads – up to every two days at peak migration	YES	**NO**
Other Breeding Birds					
Changes in Breeding Bird Populations	20% Change from Natural	Breeding bird PRISM Plots and Transects	PRISM – every three years Transects - suspended	NO	**NA**

19.0 LITERATURE CITED

ABMI (Alberta Biodiversity Monitoring Institute). 2019a. Lamb's Quarters (Chenopodium album). Available at https://abmi.ca/home/data-analytics/biobrowser-home/species-profile?tsn=99004274%20 [Accessed November 2020].

ABMI. 2019b. Alsike Clover (*Trifolium hybridum*).]. Available at: https://www.abmi.ca/home/data-analytics/biobrowser-home/species-profile?tsn=99003745 [Accessed November 2020].

Agnico Eagle (Agnico Eagle Mines Ltd). 2019. Terrestrial Ecosystem Management Plan, Meadowbank Division. Version 7, June 2019. 222 p.

Agnico Eagle. 2020a. Terrestrial Ecosystem Management Plan, Meadowbank Division. Version 8, April 2020. 239 p.

Agnico Eagle. 2020b. Meadowbank Mine 2019 Wildlife Monitoring Summary. April 2020. 147 p + Appendices .

Agnico Eagle. 2020c. Bird Survey Data Analyses – 2003 to 2015. November 2020. 164 p.

ANZEC (Australian and New Zealand Environment Council). 1990. Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration. 7 p.

CESCC (The Canadian Endangered Species Conservation Council). 2010. Non-Native & Invasive Species in Nunavut. [Accessed November 2020]. Available at https://www.gov.nu.ca/environment/documents/non-native-invasive-species-nunavut-brochure[Accessed November 2020].

Cumberland Resources Ltd. 2006. Meadowbank Gold Mine Project Terrestrial Ecosystem Management Plan (TEMP). Final Report, December 2006.

Dickinson, R and Feance, R. 2006. Weeds of Canada. University of Alberta and Lone Pine Publishing. 434 p.

Environment Canada. 2009. Environmental Code of Practice for Metal Mines. 108 p.

GNWT (Government of the Northwest Territories). 2017. Caribou behaviour monitoring field protocols. Government of the Northwest Territories, Department of Environment and Natural Resources.

Environment and Natural Resources, 10 page unpublished document. Yellowknife, NT.

GoA (Government of Alberta). 2007. Scentless Chamomile: Biology and Control. Available at https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex871/$file/640-6.pdf?OpenElem [Accessed November 2020].

GoA 2012. Noxious Weeds Available at: https://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/prm14063/$FILE/noxious.pdf [Accessed November 2020].

GoC (Government of Canada) 2016. Weed Seeds Order. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-93/page-2.html [Accessed November 2020].

Golder (Golder Associates Ltd). 2020a. Whale Tail Pit – blasting measurements from August, September, and December 2019. Unpublished Technical Memorandum prepared for Agnico Eagle Mines Ltd. 7 p.

Golder. 2020b. 2019 Meadowbank Non-native Plant Monitoring Study. Unpublished Technical Memorandum prepared for Agnico Eagle Mines Ltd. 12 p.

GoM (Government of Manitoba). 2020. Declaration of Noxious Weeds in Manitoba. Available at: https://www.gov.mb.ca/agriculture/crops/weeds/declaration-of-noxious-weeds-in-mb.html. [Accessed November 2020].

Greenberg S, Godin T. 2015. A tool supporting the extraction of angling effort data from remote camera images. Fisheries 40(6): 276-287.

Nagy JA, Johnson DL, Campbell MW, Derocher AE, Dummond M, Allaire D, Croft B. 2011. Subpopulation structure of caribou (*Rangifer tarandus L.*) in Arctic and Subarctic Canada. Ecological Applications 21:2334–2348.

OMOE (Ontario Ministry of Environment). 1978. Model Municipal Noise Control By-Law – Final Report. Noise Pollution Control Publication 119. 131 p.

WSP. 2019. Whale Tail Haul Road Construction Report. Prepared for Agnico Eagle Mines Ltd. 30 p.

Signature Page

Golder Associates Ltd.

ORIGINAL SIGNED

Corey De La Mare, P.Biol
Principal, Project Director & Senior Wildlife Biologist

For:

Connor Charchuk, MSc., P.Biol
Terrestrial Biologist

ORIGINAL SIGNED

Corey De La Mare, P.Biol
Principal, Project Director & Senior Wildlife Biologist

ORIGINAL SIGNED

Dan Coulton, Ph.D., R.P.Bio.
Wildlife Biologist

CB/CDML/jp/jlb

Golder and the G logo are trademarks of Golder Associates Corporation

https://golderassociates.sharepoint.com/sites/119161/project files/5 technical work/4000_reporting_datamgmt/aem temp report comments/rev 0/19134270-511-r-2020 report-rev0-06apr2021.docx

APPENDIX A

Wildlife Observations

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
JANUARY 2020						
January 9, 2020	12:52 PM	Haul Road	Arctic Fox	1	Joe Putumiraqtuq	Derek Nateela
January 10, 2020	12:17 PM	Haul Road	Musk Ox	1	Joe Putumiraqtuq	Derek Nateela
January 15, 2020	2:07 PM	Haul Road	Arctic Hare	2	Joe Putumiraqtuq	Derek Nateela
January 16, 2020	1:42 PM	Haul Road	Caribou	5	Joe Putumiraqtuq	Derek Nateela
January 17, 2020	2:37 PM	AWAR	Musk Ox	100	Derek Nateela	Joe Putumiraqtuq
January 29, 2020	3:33 PM	Haul Road	Caribou	5	Joe Putumiraqtuq	Simon
FEBRUARY 2020						
February 5, 2020	7:04 PM	Haul Road	Caribou	5	Joe Putumiraqtuq	Simon
February 7, 2020	2:58 PM	AWAR	Arctic Hare	1	Joe Putumiraqtuq	Laurence Archambault
February 7, 2020	2:58 PM	AWAR	Ptarmigan	1	Joe Putumiraqtuq	Laurence Archambault
February 17, 2020	4:17 PM	Amaruq	Caribou	1	Derek Nateela	Isabelle Couture
February 19, 2020	12:20 PM	Haul Road	Caribou	5	Joe Putumiraqtuq	
February 19, 2020	12:20 PM	Haul Road	Musk Ox	30	Joe Putumiraqtuq	
February 25, 2020	5:54 PM	Haul Road	Caribou	2	Joe Putumiraqtuq	
February 25, 2020	5:54 PM	Haul Road	Caribou	13	Joe Putumiraqtuq	
February 25, 2020	5:54 PM	Haul Road	Musk Ox	2	Joe Putumiraqtuq	
February 26, 2020	1:49 PM	Haul Road	Caribou	2	Joe Putumiraqtuq	
February 26, 2020	1:49 PM	Haul Road	Caribou	1	Joe Putumiraqtuq	
February 27, 2020	12:48 PM	Haul Road	Arctic Fox	1	Joe Putumiraqtuq	
MARCH 2020						
March 4, 2020	3:31 PM	AWAR	Caribou	88	Joe Putumiraqtuq	
March 4, 2020	3:31 PM	AWAR	Caribou	39	Joe Putumiraqtuq	
March 5, 2020	2:51 PM	Amaruq	Caribou	2	Derek Nateela	Simon CB
March 5, 2020	2:51 PM	Amaruq	Musk Ox	2	Derek Nateela	Simon CB
March 10, 2020	6:07 PM	Haul Road	Arctic Fox	1	Joe Putumiraqtuq	
March 10, 2020	6:07 PM	Haul Road	Caribou	6	Joe Putumiraqtuq	
March 10, 2020	6:07 PM	Haul Road	Musk Ox	35	Joe Putumiraqtuq	
March 11, 2020	2:01 PM	AWAR	Caribou	30	Derek Nateela	
March 11, 2020	2:01 PM	AWAR	Caribou	200	Derek Nateela	
March 11, 2020	2:01 PM	AWAR	Caribou	30	Derek Nateela	
March 11, 2020	11:26 AM	Haul Road	Musk Ox	23	Joe Putumiraqtuq	
March 12, 2020	11:42 AM	Haul Road	Musk Ox	40	Joe Putumiraqtuq	
March 12, 2020	1:52 PM	AWAR	Caribou	26	Derek Nateela	
March 12, 2020	1:52 PM	AWAR	Caribou	4	Derek Nateela	
March 12, 2020	1:52 PM	AWAR	Caribou	75	Derek Nateela	
March 12, 2020	11:42 AM	Haul Road	Ptarmigan	13	Joe Putumiraqtuq	
March 13, 2020	12:18 PM	Haul Road	Musk Ox	46	Joe Putumiraqtuq	
March 13, 2020	12:18 PM	Haul Road	Caribou	46	Joe Putumiraqtuq	
March 13, 2020	12:18 PM	Haul Road	Caribou	196	Joe Putumiraqtuq	
March 13, 2020	1:03 PM	AWAR	Caribou	50	Derek Nateela	
March 13, 2020	1:03 PM	AWAR	Caribou	10	Derek Nateela	
March 13, 2020	1:03 PM	AWAR	Caribou	18	Derek Nateela	
March 13, 2020	1:03 PM	AWAR	Ptarmigan	10	Derek Nateela	
March 14, 2020	2:00 PM	AWAR	Caribou	53	Laurence Archambault	
March 14, 2020	2:00 PM	AWAR	Caribou	29	Laurence Archambault	
March 14, 2020	6:31 PM	Amaruq	Caribou	2	Derek Nateela	
March 17, 2020	10:36 PM	Amaruq	Caribou	22	Derek Nateela	
March 20, 2020	7:26 PM	Haul Road	Caribou	1	Isabelle Couture	
March 22, 2020	12:16 PM	Haul Road	Caribou	3	Isabelle Couture	
March 22, 2020	12:16 PM	Haul Road	Caribou	100	Isabelle Couture	
March 25, 2020	5:26 PM	AWAR	Caribou	6	Isabelle Couture	
March 25, 2020	5:26 PM	AWAR	Caribou	9	Isabelle Couture	
March 25, 2020	5:26 PM	AWAR	Caribou	15	Isabelle Couture	
March 25, 2020	5:26 PM	AWAR	Caribou	31	Isabelle Couture	
March 28, 2020	2:16 PM	AWAR	Caribou	26	Nicolas Saucier	
March 28, 2020	2:16 PM	AWAR	Caribou	8	Nicolas Saucier	
March 28, 2020	2:16 PM	AWAR	Caribou	12	Nicolas Saucier	
March 28, 2020	2:16 PM	AWAR	Caribou	80	Nicolas Saucier	
March 28, 2020	2:16 PM	AWAR	Ptarmigan	10	Nicolas Saucier	
March 28, 2020	2:16 PM	AWAR	Caribou	22	Nicolas Saucier	
March 28, 2020	7:33 PM	Haul Road	Caribou	1	Rowan Woodall	
March 28, 2020	7:33 PM	Haul Road	Caribou	16	Rowan Woodall	
March 29, 2020	2:44 PM	Haul Road	Caribou	75	Nicolas Saucier	
March 31, 2020	8:18 PM	Haul Road	Musk Ox	34	Laurence Archambault	Philip Roy
March 31, 2020	8:18 PM	Haul Road	Caribou	2	Laurence Archambault	Philip Roy
March 31, 2020	8:18 PM	Haul Road	Caribou	3	Laurence Archambault	Philip Roy
March 31, 2020	8:18 PM	Haul Road	Caribou	1	Laurence Archambault	Philip Roy
March 31, 2020	8:18 PM	Haul Road	Caribou	1	Laurence Archambault	Philip Roy
March 31, 2020	8:18 PM	Haul Road	Caribou	255	Laurence Archambault	Philip Roy
APRIL 2020						
April 1, 2020	10:16 AM	AWAR	American crow	2	Laurence Archambault	
April 1, 2020	11:00 AM	AWAR	American crow	1	Philip Roy	
April 1, 2020	1:16 PM	AWAR	Arctic Hare	3	Daphne Morin	
April 1, 2020	1:16 PM	AWAR	Caribou	6	Daphne Morin	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
April 1, 2020	1:16 PM	AWAR	Caribou	20	Daphne Morin	Isabelle Couture
April 1, 2020	1:16 PM	AWAR	Caribou	20	Daphne Morin	
April 1, 2020	1:16 PM	AWAR	Caribou	24	Daphne Morin	
April 1, 2020	1:16 PM	AWAR	Caribou	250	Tom Thompson	Philip Roy
April 1, 2020	1:16 PM	AWAR	Caribou	60	Tom Thomson	
April 5, 2020	1:45 PM	Haul Road	Caribou	250	Daphne Morin	
April 5, 2020	1:45 PM	Haul Road	Ptarmigan	15	Laurence Archambault	
April 5, 2020	1:45 PM	Haul Road	Caribou	26	Louis Dubois	
April 5, 2020	1:45 PM	Haul Road	Caribou	27	Louis Dubois	
April 5, 2020	1:45 PM	Haul Road	Arctic Hare	10	Philip Roy	
April 5, 2020	1:45 PM	Haul Road	Caribou	2	Philip Roy	
April 5, 2020	1:45 PM	Haul Road	Caribou	6	Philip Roy	
April 5, 2020	1:45 PM	Haul Road	Caribou	8	Rowan Woodall	
April 5, 2020	1:45 PM	Haul Road	Caribou	21	Robin Allard	
April 5, 2020	1:45 PM	Haul Road	Caribou	25	Samuel Tapp	
April 5, 2020	1:45 PM	Haul Road	Caribou	4	Tom Thompson	Philip Roy
April 5, 2020	1:45 PM	Haul Road	Caribou	40	Tom Thompson	Philip Roy
April 5, 2020	1:45 PM	Haul Road	Caribou	50	Tom Thompson	Philip Roy
April 5, 2020	1:45 PM	Haul Road	Caribou	50	Tom Thomson	
April 6, 2020	12:32 PM	AWAR	American Crow	4	Philip Roy	
April 6, 2020	2:18 PM	AWAR	Caribou	11	Daphne Morin	Isabelle Couture
April 6, 2020	2:18 PM	AWAR	Caribou	11	Daphne Morin	
April 6, 2020	2:18 PM	AWAR	Grey Wolf	2	Daphne Morin	
April 6, 2020	2:18 PM	AWAR	Wolverine	1	Fanny Laporte	
April 6, 2020	2:18 PM	AWAR	Caribou	30	Fanny Laporte	
April 6, 2020	2:18 PM	AWAR	Caribou	62	Fanny Laporte	
April 6, 2020	2:18 PM	AWAR	Caribou	120	Nicolas Saucier	
April 6, 2020	2:18 PM	AWAR	Caribou	20	Philip Roy	
April 6, 2020	2:18 PM	AWAR	Caribou	20	Philip Roy	
April 6, 2020	2:18 PM	AWAR	Caribou	5	Philip Roy	
April 6, 2020	2:18 PM	AWAR	Caribou	37	Robin Allard	
April 6, 2020	2:18 PM	AWAR	Caribou	7	Samuel Tapp	
April 6, 2020	2:18 PM	AWAR	Caribou	400	Tom Thompson	Philip Roy
April 7, 2020	4:58 PM	Haul Road	Caribou	7	Philip Roy	
April 7, 2020	4:58 PM	Haul Road	Caribou	9	Rowan Woodall	
April 7, 2020	4:58 PM	Haul Road	Caribou	38	Robin Allard	
April 7, 2020	4:58 PM	Haul Road	Caribou	26	Samuel Tapp	
April 7, 2020	4:58 PM	Haul Road	Caribou	37	Samuel Tapp	
April 7, 2020	5:11 PM	AWAR	Caribou	1	Daphne Morin	
April 7, 2020	5:11 PM	AWAR	Caribou	40	Laurence Archambault	
April 7, 2020	5:11 PM	AWAR	Caribou	72	Laurence Archambault	
April 7, 2020	5:11 PM	AWAR	Caribou	28	Louis Dubois	
April 7, 2020	5:11 PM	AWAR	Caribou	4	Philip Roy	
April 7, 2020	5:11 PM	AWAR	Caribou	9	Philip Roy	
April 7, 2020	5:11 PM	AWAR	Caribou	20	Philip Roy	
April 7, 2020	5:11 PM	AWAR	Caribou	17	Philip Roy	
April 7, 2020	5:11 PM	AWAR	Caribou	21	Robin Allard	
April 7, 2020	5:11 PM	AWAR	Caribou	25	Robin Allard	
April 7, 2020	5:11 PM	AWAR	Caribou	31	Robin Allard	
April 7, 2020	5:11 PM	AWAR	Caribou	10	Tom Thompson	Philip Roy
April 7, 2020	5:11 PM	AWAR	Caribou	80	Tom Thompson	Philip Roy
April 7, 2020	9:48 PM	Haul Road	Caribou	3	Laurence Archambault	
April 7, 2020	9:48 PM	Haul Road	Caribou	5	Philip Roy	
April 8, 2020	12:20 PM	Haul Road	Caribou	8	Rowan Woodall	Katelyn Proulx
April 9, 2020	12:07 PM	AWAR	Caribou	3	Daphne Morin	Isabelle Couture
April 9, 2020	12:07 PM	AWAR	Caribou	20	Daphne Morin	
April 9, 2020	12:07 PM	AWAR	Caribou	8	Daphné Morin	
April 9, 2020	12:07 PM	AWAR	Caribou	5	Fanny Laporte	
April 9, 2020	12:07 PM	AWAR	Caribou	12	Isabelle Couture	
April 9, 2020	12:07 PM	AWAR	Caribou	34	Louis Dubois	
April 9, 2020	12:07 PM	AWAR	Caribou	125	Nicolas Saucier	
April 9, 2020	12:07 PM	AWAR	Caribou	30	Philip Roy	
April 9, 2020	12:18 PM	Haul Road	Caribou	70	Daphne Morin	Isabelle Couture
April 9, 2020	12:18 PM	Haul Road	Caribou	30	Fanny Laporte	
April 9, 2020	12:18 PM	Haul Road	Caribou	25	Louis Dubois	
April 9, 2020	12:18 PM	Haul Road	Caribou	34	Louis Dubois	
April 9, 2020	12:18 PM	Haul Road	Caribou	9	Philip Roy	
April 9, 2020	12:18 PM	Haul Road	Caribou	20	Philip Roy	
April 9, 2020	12:18 PM	Haul Road	Caribou	50	Robin Allard	
April 9, 2020	6:38 PM	AWAR	Caribou	35	Isabelle Couture	
April 9, 2020	6:38 PM	AWAR	Caribou	38	Isabelle Couture	
April 9, 2020	6:38 PM	AWAR	Caribou	22	Laurence Archambault	
April 9, 2020	6:38 PM	AWAR	Caribou	35	Louis Dubois	
April 9, 2020	6:38 PM	AWAR	Caribou	275	Louis Dubois	
April 9, 2020	6:38 PM	AWAR	Caribou	4	Philip Roy	

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
April 9, 2020	6:38 PM	AWAR	Caribou	12	Philip Roy	
April 9, 2020	6:38 PM	AWAR	Caribou	20	Philip Roy	
April 9, 2020	6:38 PM	AWAR	Caribou	10	Rowan Woodall	
April 9, 2020	6:38 PM	AWAR	Caribou	5	Robin Allard	
April 9, 2020	6:38 PM	AWAR	Caribou	9	Robin Allard	
April 9, 2020	6:38 PM	AWAR	Caribou	19	Robin Allard	
April 9, 2020	6:38 PM	AWAR	Caribou	23	Robin Allard	
April 10, 2020	11:56 AM	Haul Road	Caribou	100	Daphne Morin	Isabelle Couture
April 10, 2020	11:56 AM	Haul Road	Caribou	100	Fanny Laporte	
April 10, 2020	11:56 AM	Haul Road	Caribou	130	Fanny Laporte	
April 10, 2020	11:56 AM	Haul Road	Caribou	3	Laurence Archambault	
April 10, 2020	11:56 AM	Haul Road	Caribou	3	Laurence Archambault	
April 10, 2020	11:56 AM	Haul Road	Caribou	6	Philip Roy	
April 10, 2020	11:56 AM	Haul Road	Caribou	6	Philip Roy	
April 10, 2020	11:56 AM	Haul Road	Caribou	20	Philip Roy	
April 10, 2020	11:56 AM	Haul Road	Caribou	21	Rowan Woodall	
April 10, 2020	11:56 AM	Haul Road	Caribou	34	Rowan Woodall	
April 10, 2020	11:56 AM	Haul Road	Caribou	75	Robin Allard	
April 10, 2020	12:26 PM	Haul Road	Caribou	8	Fanny Laporte	
April 10, 2020	12:26 PM	Haul Road	Caribou	11	Laurence Archambault	
April 10, 2020	12:26 PM	Haul Road	Caribou	55	Nicolas Saucier	
April 10, 2020	12:26 PM	Haul Road	Caribou	160	Nicolas Saucier	
April 10, 2020	12:26 PM	Haul Road	Caribou	2	Philip Roy	
April 10, 2020	12:26 PM	Haul Road	Caribou	5	Philip Roy	
April 10, 2020	12:26 PM	Haul Road	Grey Wolf	2	Rowan Woodall	
April 10, 2020	7:04 PM	Haul Road	Caribou	11	Laurence Archambault	
April 10, 2020	7:04 PM	Haul Road	Arctic Fox	1	Philip Roy	
April 10, 2020	7:04 PM	Haul Road	Caribou	150	Tom Thomson	
April 11, 2020	1:53 PM	Haul Road	Caribou	75	Daphne Morin	
April 11, 2020	1:53 PM	Haul Road	Caribou	75	Daphne Morin	
April 11, 2020	1:53 PM	Haul Road	Arctic Fox	1	Laurence Archambault	
April 11, 2020	1:53 PM	Haul Road	Caribou	58	Nicolas Saucier	
April 11, 2020	1:53 PM	Haul Road	Arctic Fox	1	Philip Roy	
April 11, 2020	1:53 PM	Haul Road	Common Raven	4	Philip Roy	
April 11, 2020	1:53 PM	Haul Road	Caribou	3	Philip Roy	
April 11, 2020	1:53 PM	Haul Road	Caribou	7	Robin Allard	
April 11, 2020	1:53 PM	Haul Road	Caribou	23	Robin Allard	
April 11, 2020	9:02 PM	Haul Road	Caribou	60	Philip Roy	
April 11, 2020	9:02 PM	Haul Road	Caribou	2	Robin Allard	
April 11, 2020	9:02 PM	Haul Road	Caribou	8	Rowan Woodall	Katelyn Proulx
April 11, 2020	9:02 PM	Haul Road	Caribou	34	Rowan Woodall	Katelyn Proulx
April 14, 2020	1:10 PM	Haul Road	Arctic Hare	1	Philip Roy	
April 14, 2020	1:10 PM	Haul Road	Caribou	21	Philip Roy	
April 14, 2020	1:10 PM	Haul Road	Caribou	60	Philip Roy	
April 14, 2020	1:10 PM	Haul Road	Caribou	5	Rowan Woodall	Katelyn Proulx
April 14, 2020	1:26 PM	Haul Road	Caribou	35	Fanny Laporte	
April 14, 2020	1:26 PM	Haul Road	Caribou	70	Philip Roy	
April 14, 2020	1:26 PM	Haul Road	Caribou	6	Philip Roy	
April 14, 2020	1:26 PM	Haul Road	Caribou	53	Samuel Tapp	
April 14, 2020	5:45 PM	AWAR	Caribou	75	Daphne Morin	
April 14, 2020	5:45 PM	AWAR	Caribou	38	Fanny Laporte	
April 14, 2020	5:45 PM	AWAR	Caribou	2	Fanny Laporte	
April 14, 2020	5:45 PM	AWAR	Caribou	22	Laurence Archambault	
April 14, 2020	5:45 PM	AWAR	Caribou	47	Laurence Archambault	
April 14, 2020	5:45 PM	AWAR	Caribou	80	Laurence Archambault	
April 15, 2020	1:14 PM	Haul Road	Caribou	65	Laurence Archambault	
April 15, 2020	1:14 PM	Haul Road	Caribou	3	Rowan Woodall	
April 15, 2020	1:14 PM	Haul Road	Caribou	6	Rowan Woodall	
April 16, 2020	12:19 PM	AWAR	Caribou	9	DaphneMorin	
April 16, 2020	12:19 PM	AWAR	Caribou	11	Fanny Laporte	
April 16, 2020	12:19 PM	AWAR	Arctic Hare	1	Laurence Archambault	
April 16, 2020	12:19 PM	AWAR	Caribou	35	Louis Dubois	
April 16, 2020	12:19 PM	AWAR	Caribou	3	Philip Roy	
April 16, 2020	12:19 PM	AWAR	Caribou	27	Rowan Woodall	
April 16, 2020	12:19 PM	AWAR	Caribou	150	Tom Thompson	Philip Roy
April 16, 2020	1:15 PM	Haul Road	Caribou	65	Nicolas Saucier	
April 16, 2020	1:15 PM	Haul Road	Caribou	23	Philip Roy	
April 16, 2020	1:15 PM	Haul Road	Caribou	23	Philip Roy	
April 16, 2020	1:15 PM	Haul Road	Caribou	70	Philip Roy	
April 16, 2020	1:15 PM	Haul Road	Caribou	250	Philip Roy	
April 16, 2020	1:15 PM	Haul Road	Arctic Hare	1	Philip Roy	
April 16, 2020	1:15 PM	Haul Road	Caribou	20	Philip Roy	
April 16, 2020	1:15 PM	Haul Road	Caribou	13	Samuel Tapp	
April 17, 2020	11:55 AM	AWAR	Caribou	30	Daphne Morin	
April 17, 2020	11:55 AM	AWAR	Caribou	120	Daphné Morin	

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
April 17, 2020	11:55 AM	AWAR	Arctic Hare	2	Laurence Archambault	
April 17, 2020	11:55 AM	AWAR	Caribou	4	Philip Roy	
April 17, 2020	11:55 AM	AWAR	Caribou	34	Robin Allard	
April 17, 2020	1:20 PM	Haul Road	Caribou	30	Philip Roy	
April 19, 2020	12:07 PM	Haul Road	Caribou	30	Daphne Morin	
April 19, 2020	12:07 PM	Haul Road	Caribou	12	Laurence Archambault	
April 19, 2020	12:07 PM	Haul Road	Caribou	23	Laurence Archambault	
April 19, 2020	12:07 PM	Haul Road	Caribou	20	Louis Dubois	
April 19, 2020	12:07 PM	Haul Road	Caribou	20	Louis Dubois	
April 19, 2020	12:07 PM	Haul Road	Caribou	24	Philip Roy	
April 19, 2020	12:07 PM	Haul Road	Caribou	150	Tom Thomson	
April 19, 2020	12:43 PM	AWAR	Caribou	39	Fanny Laporte	
April 19, 2020	12:43 PM	AWAR	Caribou	6	Robin Allard	
April 21, 2020	11:43 AM	AWAR	Caribou	13	Daphne Morin	
April 21, 2020	11:43 AM	AWAR	Caribou	25	Daphne Morin	
April 21, 2020	11:43 AM	AWAR	Caribou	125	Daphne Morin	
April 21, 2020	11:43 AM	AWAR	Caribou	175	Daphne Morin	
April 21, 2020	11:43 AM	AWAR	Caribou	8	Fanny Laporte	
April 21, 2020	11:43 AM	AWAR	Caribou	35	Louis Dubois	
April 21, 2020	11:43 AM	AWAR	Caribou	45	Louis Dubois	
April 21, 2020	11:43 AM	AWAR	Caribou	24	Philip Roy	
April 21, 2020	11:43 AM	AWAR	Caribou	73	Philip Roy	
April 21, 2020	11:43 AM	AWAR	Caribou	5	Rowan Woodall	
April 21, 2020	11:43 AM	AWAR	Caribou	39	Samuel Tapp	
April 21, 2020	11:43 AM	AWAR	Caribou	100	Tom Thomson	
April 22, 2020	12:44 PM	Haul Road	Caribou	40	Tom Thompson	Philip Roy
April 22, 2020	1:57 PM	Haul Road	Arctic Hare	1	Philip Roy	
April 22, 2020	1:57 PM	Haul Road	Caribou	200	Samuel Tapp	
April 23, 2020	11:35 AM	Haul Road	Caribou	50	Louis Dubois	
April 23, 2020	11:35 AM	Haul Road	Caribou	5	Philip Roy	
April 23, 2020	11:35 AM	Haul Road	Caribou	35	Philip Roy	
April 23, 2020	11:35 AM	Haul Road	Caribou	17	Samuel Tapp	
April 23, 2020	6:14 PM	Haul Road	Caribou	7	Philip Roy	
April 23, 2020	6:14 PM	Haul Road	Caribou	77	Philip Roy	
April 23, 2020	6:14 PM	Haul Road	Caribou	80	Philip Roy	
April 24, 2020	12:09 PM	Haul Road	Caribou	50	Fanny Laporte	
April 24, 2020	12:09 PM	Haul Road	Caribou	23	Laurence Archambault	
April 24, 2020	12:09 PM	Haul Road	Caribou	7	Nicolas Saucier	
April 24, 2020	12:09 PM	Haul Road	Caribou	7	Philip Roy	
April 24, 2020	12:09 PM	Haul Road	Caribou	9	Philip Roy	
April 24, 2020	12:09 PM	Haul Road	Caribou	2	Rowan Woodall	
April 24, 2020	12:09 PM	Haul Road	Caribou	30	Rowan Woodall	
April 24, 2020	1:48 PM	Haul Road	Caribou	2	Rowan Woodall	Katelyn Proulx
April 25, 2020	12:06 PM	Haul Road	Caribou	9	Philip Roy	
April 25, 2020	12:06 PM	Haul Road	Caribou	15	Philip Roy	
April 25, 2020	12:06 PM	Haul Road	Caribou	34	Philip Roy	
April 25, 2020	12:06 PM	Haul Road	Caribou	40	Philip Roy	
April 25, 2020	12:06 PM	Haul Road	Caribou	80	Philip Roy	
April 25, 2020	12:06 PM	Haul Road	Caribou	20	Tom Thompson	Philip Roy
April 25, 2020	1:26 PM	AWAR	Caribou	15	Daphne Morin	
April 25, 2020	1:26 PM	AWAR	Caribou	35	Daphne Morin	
April 25, 2020	1:26 PM	AWAR	Caribou	35	Daphne Morin	
April 25, 2020	1:26 PM	AWAR	Caribou	23	Daphne Morin	Isabelle Couture
April 25, 2020	1:26 PM	AWAR	Caribou	15	DaphneMorin	
April 25, 2020	1:26 PM	AWAR	Caribou	30	DaphneMorin	
April 25, 2020	1:26 PM	AWAR	Caribou	23	Fanny Laporte	
April 25, 2020	1:26 PM	AWAR	Caribou	30	Fanny Laporte	
April 25, 2020	1:26 PM	AWAR	Caribou	10	Fanny Laporte	
April 25, 2020	1:26 PM	AWAR	Caribou	50	Fanny Laporte	
April 25, 2020	1:26 PM	AWAR	Caribou	7	Louis Dubois	
April 25, 2020	1:26 PM	AWAR	Caribou	50	Louis Dubois	
April 25, 2020	1:26 PM	AWAR	Caribou	5	Philip Roy	
April 25, 2020	1:26 PM	AWAR	Caribou	21	Samuel Tapp	
April 26, 2020	11:29 AM	Haul Road	Caribou	16	Louis Dubois	
April 26, 2020	11:29 AM	Haul Road	Caribou	100	Philip Roy	
April 26, 2020	2:45 PM	AWAR	Caribou	50	Daphne Morin	Isabelle Couture
April 26, 2020	2:45 PM	AWAR	Caribou	6	Laurence Archambault	
April 26, 2020	2:45 PM	AWAR	Caribou	7	Laurence Archambault	
April 26, 2020	2:45 PM	AWAR	Caribou	5	Louis Dubois	
April 26, 2020	2:45 PM	AWAR	Caribou	30	Philip Roy	
April 26, 2020	2:45 PM	AWAR	Caribou	40	Philip Roy	
April 26, 2020	2:45 PM	AWAR	Caribou	130	Philip Roy	
April 26, 2020	2:45 PM	AWAR	Common Raven	1	Philip Roy	
April 26, 2020	2:45 PM	AWAR	Caribou	60	Tom Thompson	Philip Roy
April 26, 2020	6:36 PM	AWAR	Caribou	50	Daphne Morin	Isabelle Couture

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
April 26, 2020	6:36 PM	AWAR	Caribou	10	Fanny Laporte	
April 26, 2020	6:36 PM	AWAR	Caribou	39	Laurence Archambault	
April 26, 2020	6:36 PM	AWAR	Caribou	25	Louis Dubois	
April 26, 2020	6:36 PM	AWAR	Caribou	14	Nicolas Saucier	
April 26, 2020	6:36 PM	AWAR	Arctic Hare	1	Philip Roy	
April 26, 2020	6:36 PM	AWAR	Caribou	8	Philip Roy	
April 26, 2020	6:36 PM	AWAR	Caribou	42	Philip Roy	
April 26, 2020	6:36 PM	AWAR	Caribou	10	Robin Allard	
April 26, 2020	6:36 PM	AWAR	Caribou	100	Robin Allard	
April 27, 2020	3:07 PM	AWAR	Caribou	35	Fanny Laporte	
April 27, 2020	3:07 PM	AWAR	Caribou	22	Fanny Laporte	
April 27, 2020	3:07 PM	AWAR	Caribou	60	Fanny Laporte	
April 27, 2020	3:07 PM	AWAR	Arctic Hare	3	Laurence Archambault	
April 27, 2020	3:07 PM	AWAR	Caribou	35	Nicolas Saucier	
April 27, 2020	3:07 PM	AWAR	Arctic Hare	3	Philip Roy	
April 27, 2020	5:42 PM	Haul Road	Caribou	50	Daphne Morin	
April 27, 2020	5:42 PM	Haul Road	Caribou	175	Daphne Morin	
April 27, 2020	5:42 PM	Haul Road	Caribou	25	Fanny Laporte	
April 27, 2020	5:42 PM	Haul Road	Caribou	13	Fanny Laporte	
April 27, 2020	5:42 PM	Haul Road	Caribou	8	Laurence Archambault	
April 27, 2020	5:42 PM	Haul Road	Caribou	14	Philip Roy	
April 27, 2020	5:42 PM	Haul Road	Caribou	26	Philip Roy	
April 27, 2020	5:42 PM	Haul Road	Caribou	41	Philip Roy	
April 27, 2020	5:42 PM	Haul Road	Caribou	62	Rowan Woodall	
April 27, 2020	5:42 PM	Haul Road	Caribou	400	Tom Thompson	Philip Roy
April 27, 2020	8:46 PM	AWAR	Caribou	200	Daphne Morin	
April 27, 2020	8:46 PM	AWAR	Caribou	14	Laurence Archambault	
April 27, 2020	8:46 PM	AWAR	Caribou	50	Louis Dubois	
April 27, 2020	8:46 PM	AWAR	Caribou	56	Philip Roy	
April 28, 2020	11:19 AM	Haul Road	Caribou	52	Daphne Morin	
April 28, 2020	11:19 AM	Haul Road	Caribou	110	Fanny Laporte	
April 28, 2020	11:19 AM	Haul Road	Caribou	18	Fanny Laporte	
April 28, 2020	11:19 AM	Haul Road	Caribou	19	Fanny Laporte	
April 28, 2020	11:19 AM	Haul Road	Caribou	9	Laurence Archambault	
April 28, 2020	11:19 AM	Haul Road	Caribou	50	Philip Roy	
April 28, 2020	12:05 PM	AWAR	Caribou	23	Laurence Archambault	
April 28, 2020	12:05 PM	AWAR	Caribou	87	Philip Roy	
April 28, 2020	12:05 PM	AWAR	Common Raven	1	Philip Roy	
April 28, 2020	3:17 PM	Haul Road	Caribou	2	Philip Roy	
April 28, 2020	3:17 PM	Haul Road	Caribou	130	Philip Roy	
April 28, 2020	3:17 PM	Haul Road	Caribou	6	Robin Allard	
April 28, 2020	3:17 PM	Haul Road	Caribou	500	Robin Allard	
April 28, 2020	9:00 PM	AWAR	Caribou	30	Fanny Laporte	
April 28, 2020	9:00 PM	AWAR	Caribou	10	Rowan Woodall	Katelyn Proulx
April 29, 2020	1:11 PM	Haul Road	Caribou	120	Fanny Laporte	
April 29, 2020	1:11 PM	Haul Road	Arctic Hare	4	Laurence Archambault	
April 29, 2020	1:11 PM	Haul Road	Caribou	35	Nicolas Saucier	
April 29, 2020	4:15 PM	Haul Road	Caribou	40	Laurence Archambault	
April 29, 2020	4:15 PM	Haul Road	Caribou	4	Philip Roy	
April 29, 2020	4:15 PM	Haul Road	Caribou	4	Robin Allard	
April 29, 2020	4:15 PM	Haul Road	Musk Ox	23	Tom Thompson	Philip Roy
April 29, 2020	7:07 PM	AWAR	Caribou	15	Laurence Archambault	
April 29, 2020	7:07 PM	AWAR	Caribou	100	Louis Dubois	
April 29, 2020	7:07 PM	AWAR	Caribou	130	Louis Dubois	
April 29, 2020	7:07 PM	AWAR	Caribou	9	Philip Roy	
April 29, 2020	7:07 PM	AWAR	Caribou	27	Philip Roy	
April 29, 2020	7:07 PM	AWAR	Caribou	29	Philip Roy	
April 29, 2020	7:07 PM	AWAR	Caribou	90	Philip Roy	
April 29, 2020	7:07 PM	AWAR	Ptarmigan	1	Philip Roy	
April 29, 2020	7:07 PM	AWAR	Caribou	10	Robin Allard	
April 29, 2020	7:07 PM	AWAR	Caribou	13	Robin Allard	
April 29, 2020	7:07 PM	AWAR	Caribou	300	Samuel Tapp	
April 29, 2020	7:07 PM	AWAR	Caribou	20	Tom Thompson	Philip Roy
April 30, 2020	12:10 PM	AWAR	Caribou	21	Daphne Morin	
April 30, 2020	12:10 PM	AWAR	Caribou	49	Nicolas Saucier	
April 30, 2020	12:10 PM	AWAR	Caribou	8	Philip Roy	
April 30, 2020	12:10 PM	AWAR	Caribou	90	Philip Roy	
April 30, 2020	12:10 PM	AWAR	Caribou	61	Samuel Tapp	
April 30, 2020	12:52 PM	Haul Road	Caribou	67	Daphne Morin	
April 30, 2020	2:35 PM	AWAR	Caribou	150	Philip Roy	
April 30, 2020	2:35 PM	AWAR	Caribou	16	Robin Allard	
April 30, 2020	2:35 PM	AWAR	Caribou	105	Samuel Tapp	
April 30, 2020	5:56 PM	AWAR	Common Raven	2	Laurence Archambault	
April 30, 2020	5:56 PM	AWAR	Ptarmigan	5	Laurence Archambault	
April 30, 2020	5:56 PM	AWAR	Caribou	29	Philip Roy	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
April 30, 2020	8:14 PM	AWAR	Caribou	26	Daphne Morin	
April 30, 2020	8:14 PM	AWAR	Caribou	25	Fanny Laporte	
April 30, 2020	8:14 PM	AWAR	Caribou	10	Louis Dubois	
April 30, 2020	8:14 PM	AWAR	Caribou	2	Samuel Tapp	
MAY 2020						
May 1, 2020	12:52 PM	Amaruq	Arctic Hare	2	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	4	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	7	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	10	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	17	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	24	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	30	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	40	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Musk Ox	40	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Musk Ox	40	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	47	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	50	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	70	Gilles Ladouceur	Isabelle Couture
May 1, 2020	12:52 PM	Amaruq	Caribou	80	Gilles Ladouceur	Isabelle Couture
May 2, 2020	12:28 PM	Amaruq	Caribou	2	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	5	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	6	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	7	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	8	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	9	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	9	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	10	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	14	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	15	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	27	Daphné Morin	
May 2, 2020	12:28 PM	Amaruq	Caribou	60	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Arctic Fox	1	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	3	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	5	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	9	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	12	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	15	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	25	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	27	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	70	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	80	Daphné Morin	
May 3, 2020	1:24 PM	AWAR	Caribou	1352	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Arctic Fox	1	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	2	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	5	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	5	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	8	Daphné Morin	
May 4, 2020	8:46 PM	AWAR	Caribou	12	Cedric Godbout-Parent	Daphné Morin
May 4, 2020	8:46 PM	AWAR	Caribou	17	Cedric Godbout-Parent	Daphné Morin
May 4, 2020	11:25 AM	Amaruq	Caribou	27	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	27	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	31	Daphné Morin	
May 4, 2020	11:25 AM	Amaruq	Caribou	52	Daphné Morin	
May 4, 2020	8:46 PM	AWAR	Caribou	30200220	Cedric Godbout-Parent	Daphné Morin
May 5, 2020	12:14 PM	AWAR	Caribou	2	Daphné Morin	
May 5, 2020	11:20 AM	Haul Road	Caribou	10	Cedric Godbout-Parent	
May 5, 2020	12:14 PM	AWAR	Caribou	10	Daphné Morin	
May 5, 2020	12:14 PM	AWAR	Caribou	12	Daphné Morin	
May 5, 2020	11:20 AM	Haul Road	Caribou	16	Cedric Godbout-Parent	
May 5, 2020	11:20 AM	Haul Road	Caribou	23	Cedric Godbout-Parent	
May 5, 2020	11:20 AM	Haul Road	Caribou	31	Cedric Godbout-Parent	
May 5, 2020	12:14 PM	AWAR	Caribou	50	Daphné Morin	
May 5, 2020	11:20 AM	Haul Road	Caribou	60	Cedric Godbout-Parent	
May 6, 2020	7:26 PM	Haul Road	Caribou	4	Katelyn Proulx	
May 6, 2020	7:26 PM	Haul Road	Caribou	4	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	6	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	6	Katelyn Proulx	
May 6, 2020	7:26 PM	Haul Road	Caribou	6	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	7	Katelyn Proulx	
May 6, 2020	7:26 PM	Haul Road	Caribou	7	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	8	Katelyn Proulx	
May 6, 2020	7:26 PM	Haul Road	Caribou	10	Katelyn Proulx	
May 6, 2020	7:26 PM	Haul Road	Caribou	11	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	15	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	15	Katelyn Proulx	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
May 6, 2020	12:05 PM	Haul Road	Caribou	16	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	21	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	21	Katelyn Proulx	
May 6, 2020	12:05 PM	Haul Road	Caribou	22	Katelyn Proulx	
May 7, 2020	1:29 PM	AWAR	Caribou	1	Cedric Godbout-Parent	
May 7, 2020	12:06 PM	Haul Road	Caribou	3	Katelyn Proulx	
May 7, 2020	1:29 PM	AWAR	Caribou	4	Cedric Godbout-Parent	
May 7, 2020	1:29 PM	AWAR	Caribou	5	Cedric Godbout-Parent	
May 7, 2020	12:06 PM	Haul Road	Caribou	5	Katelyn Proulx	
May 7, 2020	1:29 PM	AWAR	Caribou	9	Cedric Godbout-Parent	
May 7, 2020	12:06 PM	Haul Road	Caribou	19	Katelyn Proulx	
May 8, 2020	4:02 PM	Haul Road	Caribou	13	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Wolverine	1	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Caribou	3	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Caribou	4	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Caribou	4	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Caribou	8	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Ptarmigan	10	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Caribou	15	Josée Brazeau	
May 9, 2020	12:15 PM	Haul Road	Ptarmigan	20	Josée Brazeau	
May 10, 2020	12:32 PM	Haul Road	Caribou	32	Josée Brazeau	
May 10, 2020	12:32 PM	Haul Road	Caribou	7333	Josée Brazeau	
May 11, 2020	3:53 PM	Haul Road	Caribou	7	Josée Brazeau	
May 11, 2020	3:53 PM	Haul Road	Caribou	8	Josée Brazeau	
May 11, 2020	3:53 PM	Haul Road	Caribou	23	Josée Brazeau	
May 11, 2020	3:53 PM	Haul Road	Caribou	75	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Arctic Hare	1	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Arctic Hare	1	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	2	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	8	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	10	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	15	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	15	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	28	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Caribou	31	Josée Brazeau	
May 12, 2020	12:34 PM	Haul Road	Ptarmigan	48	Josée Brazeau	
May 13, 2020	10:57 AM	Haul Road	Caribou	8	Josée Brazeau	
May 13, 2020	10:57 AM	Haul Road	Caribou	8	Josée Brazeau	
May 13, 2020	10:57 AM	Haul Road	Caribou	13	Josée Brazeau	
May 14, 2020	5:41 PM	Haul Road	Caribou	4	Josée Brazeau	
May 14, 2020	5:41 PM	Haul Road	Caribou	8	Josée Brazeau	
May 14, 2020	5:41 PM	Haul Road	Caribou	17	Josée Brazeau	
May 15, 2020	11:09 AM	Haul Road	Caribou	4	Josée Brazeau	
May 15, 2020	11:09 AM	Haul Road	Caribou	8	Josée Brazeau	
May 16, 2020	11:55 AM	Haul Road	Caribou	5	Josée Brazeau	
May 16, 2020	11:55 AM	Haul Road	Caribou	6	Josée Brazeau	
May 16, 2020	11:55 AM	Haul Road	Caribou	10	Josée Brazeau	
May 16, 2020	11:55 AM	Haul Road	Caribou	20	Josée Brazeau	
May 17, 2020	1:48 PM	Haul Road	Caribou	5	Josée Brazeau	
May 17, 2020	1:48 PM	Haul Road	Caribou	8	Josée Brazeau	
May 17, 2020	1:48 PM	Haul Road	Caribou	10	Josée Brazeau	
May 17, 2020	1:48 PM	Haul Road	Caribou	12	Josée Brazeau	
May 17, 2020	1:48 PM	Haul Road	Snow goose	26	Josée Brazeau	
May 28, 2020	2:10 PM	AWAR	Gull species	1	Virginie Durand	Philip Roy
May 28, 2020	2:32 PM	AWAR	Gull species	1	Virginie Durand	Philip Roy
May 28, 2020	3:23 PM	AWAR	Gull species	1	Virginie Durand	Philip Roy
May 28, 2020	3:26 PM	AWAR	Gull species	12	Virginie Durand	Philip Roy
May 30, 2020	1:00 AM	AWAR	Gull species	12	Virginie Durand	Nicolas Saucier
May 30, 2020	12:00 PM	AWAR	Gull species	10	Virginie Durand	Nicolas Saucier
May 30, 2020	3:00 PM	AWAR	Snow owl	1	Virginie Durand	Nicolas Saucier
JUNE 2020						
June 4, 2020	3:37 PM	AWAR	Gull species	10	Virginie Durand	
June 5, 2020	11:27 AM	AWAR	Gull species	10	Virginie Durand	
June 6, 2020	11:35 AM	AWAR	Caribou	2	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Caribou	1	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Caribou	1	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Caribou	2	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Caribou	1	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Caribou	1	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Caribou	2	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Sandhill Crane	2	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Sandhill Crane	2	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Sandhill Crane	1	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Canada goose	1	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Sandhill Crane	2	Cedric Godbout-Parent	Katelyn Proulx

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
June 6, 2020	11:35 AM	AWAR	Sandhill Crane	2	Cedric Godbout-Parent	Katelyn Proulx
June 6, 2020	11:35 AM	AWAR	Canada Goose	1	Jade	Kathleen Newberry
June 6, 2020	11:35 AM	AWAR	Sandhill Crane	1	Jade	Kathleen Newberry
June 6, 2020	11:35 AM	AWAR	Snow goose	4	Kathleen Newberry	Eric Hayley
June 8, 2020	10:12 AM	AWAR	Gull species	7	Virginie Durand	
June 13, 2020	11:31 AM	AWAR	Arctic Hare	6	Kathleen Newberry	Math
June 13, 2020	11:31 AM	AWAR	Arctic Hare	3	Kathleen Newberry	Math
June 13, 2020	11:31 AM	AWAR	Caribou	3	Kathleen Newberry	Eric Hayley
June 13, 2020	11:31 AM	AWAR	Caribou	2	Laurence Archambault	Katelyn Proulx
June 13, 2020	11:31 AM	AWAR	Caribou	3	Laurence Archambault	Katelyn Proulx
June 13, 2020	11:31 AM	AWAR	Caribou	5	Laurence Archambault	Katelyn Proulx
June 13, 2020	11:31 AM	AWAR	Caribou	2	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Caribou	11	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Caribou	20	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Caribou	2	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Caribou	2	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Musk Ox	2	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	ough-Legged haw	3	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Sandhill Crane	3	Laurence Archambault	
June 13, 2020	11:31 AM	AWAR	Snow goose	6	Laurence Archambault	
June 19, 2020	12:34 PM	AWAR	Arctic Hare	7	Laurence Archambault	
June 19, 2020	12:34 PM	AWAR	Arctic Hare	1	Laurence Archambault	Katelyn Proulx
June 19, 2020	12:34 PM	AWAR	Arctic Hare	8	Laurence Archambault	Katelyn Proulx
June 19, 2020	12:34 PM	AWAR	Caribou	12	Laurence Archambault	Katelyn Proulx
June 19, 2020	12:34 PM	AWAR	Caribou	14	Laurence Archambault	Katelyn Proulx
June 19, 2020	12:34 PM	AWAR	Caribou	1	Laurence Archambault	Katelyn Proulx
June 19, 2020	12:34 PM	AWAR	Caribou	2	Laurence Archambault	
June 19, 2020	12:34 PM	AWAR	Caribou	3	Laurence Archambault	
June 19, 2020	12:34 PM	AWAR	Ptarmigan	10	Laurence Archambault	
June 19, 2020	12:34 PM	AWAR	Sandhill Crane	21	Laurence Archambault	
June 19, 2020	12:34 PM	AWAR	rctic ground squirr	6	Laurence Archambault	
June 25, 2020	6:06 PM	Haul Road	Caribou	1	Laurence Archambault	Katelyn Proulx
June 25, 2020	6:06 PM	Haul Road	Caribou	1	Laurence Archambault	Katelyn Proulx
June 25, 2020	6:06 PM	Haul Road	Musk Ox	1	Laurence Archambault	Katelyn Proulx
June 26, 2020	5:59 PM	AWAR	Arctic Fox	10	Laurence Archambault	
June 26, 2020	1:01 PM	Haul Road	Caribou	10	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Musk Ox	11	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Musk Ox	5	Laurence Archambault	
June 26, 2020	1:01 PM	Haul Road	Musk Ox	4	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Sandhill Crane	4	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Ptarmigan	5	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Sandhill Crane	10	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Goose species	10	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Goose species	27	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	Peregrine Falcon	1	Laurence Archambault	
June 26, 2020	5:59 PM	AWAR	rctic ground squirr	1	Laurence Archambault	
June 27, 2020	5:37 PM	Haul Road	Caribou	7	Laurence Archambault	
June 27, 2020	5:37 PM	Haul Road	Caribou	22	Laurence Archambault	
June 28, 2020	12:35 PM	Haul Road	Musk Ox	8	Laurence Archambault	
June 28, 2020	12:35 PM	Haul Road	Musk Ox	8	Laurence Archambault	
June 28, 2020	5:00 PM	Haul Road	Grizzly Bear	1		
JULY 2020						
July 1, 2020	5:53 PM	Haul Road	Peregrine Falcon	1	Virginie Durand	Cedric Godbout-Parent
July 2, 2020	2:38 PM	Haul Road	Caribou	1	Virginie Durand	Cedric Godbout-Parent
July 2, 2020	2:38 PM	Haul Road	Musk Ox	1	Virginie Durand	Isabelle Couture
July 3, 2020	12:50 PM	AWAR	Common Raven	1	Virginie Durand	Isabelle Couture
July 3, 2020	12:50 PM	AWAR	Musk Ox	1	Virginie Durand	Isabelle Couture
July 3, 2020	12:50 PM	AWAR	Musk Ox	2	Virginie Durand	Isabelle Couture
July 3, 2020	12:50 PM	AWAR	Ptarmigan	2	Virginie Durand	Isabelle Couture
July 3, 2020	12:50 PM	AWAR	Sandhill Crane	2	Virginie Durand	Isabelle Couture
July 3, 2020	12:50 PM	AWAR	Sandhill Crane	1	Nicolas Saucier	Kathleen Newberry
July 5, 2020	1:28 PM	Haul Road	Canada Goose	1	Nicolas Saucier	Kathleen Newberry
July 5, 2020	1:28 PM	Haul Road	Musk Ox	2	Nicolas Saucier	Kathleen Newberry
July 5, 2020	1:28 PM	Haul Road	Musk Ox	3	Nicolas Saucier	Kathleen Newberry
July 5, 2020	1:28 PM	Haul Road	Musk Ox	4	Perle Dion-Trudel	Kathleen Newberry
July 6, 2020	2:49 PM	AWAR	Arctic Hare	2	Cedric Godbout-Parent	
July 6, 2020	2:49 PM	AWAR	Musk Ox	2	Cedric Godbout-Parent	
July 6, 2020	2:49 PM	AWAR	Musk Ox	9	Cedric Godbout-Parent	
July 8, 2020	5:58 PM	Haul Road	Caribou	25	Cedric Godbout-Parent	
July 14, 2020	3:59 PM	Haul Road	ctic Ground Squir	1	Cedric Godbout-Parent	
July 14, 2020	3:59 PM	Haul Road	Caribou	1	Cedric Godbout-Parent	
July 14, 2020	3:59 PM	Haul Road	Musk Ox	1	Cedric Godbout-Parent	
July 17, 2020	1:56 PM	AWAR	ctic Ground Squir	1	Cedric Godbout-Parent	
July 17, 2020	1:56 PM	AWAR	Musk Ox	1	Cedric Godbout-Parent	
July 17, 2020	1:56 PM	AWAR	Musk Ox	1	Cedric Godbout-Parent	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
July 20, 2020	11:33 AM	AWAR	Musk Ox	1	Cedric Godbout-Parent	
July 20, 2020	11:33 AM	AWAR	Musk Ox	2	Cedric Godbout-Parent	
July 20, 2020	11:33 AM	AWAR	Musk Ox	1	Kathleen Newberry	
July 20, 2020	11:33 AM	AWAR	Sandhill Crane	1	Kathleen Newberry	
July 22, 2020	5:47 PM	Haul Road	Musk Ox	1	Kathleen Newberry	
July 22, 2020	5:47 PM	Haul Road	Musk Ox	1	Kathleen Newberry	
July 23, 2020	12:48 PM	AWAR	ctic Ground Squir	1	Kathleen Newberry	
July 23, 2020	12:48 PM	AWAR	Musk Ox	2	Kathleen Newberry	
July 23, 2020	12:48 PM	AWAR	Musk Ox	17	Kathleen Newberry	
July 23, 2020	12:48 PM	AWAR	Ptarmigan	1	Virginie Durand	
July 26, 2020	2:29 PM	Haul Road	Musk Ox	1	Virginie Durand	
July 28, 2020	12:36 PM	Haul Road	Caribou	1	Virginie Durand	
July 28, 2020	12:36 PM	Haul Road	Musk Ox	1	Virginie Durand	
July 28, 2020	12:36 PM	Haul Road	Musk Ox	1	Virginie Durand	
July 28, 2020	12:36 PM	Haul Road	Sandhill Crane	2	Virginie Durand	
July 31, 2020	11:29 AM	Haul Road	ctic Ground Squir	2	Virginie Durand	
July 31, 2020	11:29 AM	Haul Road	Musk Ox	2	Virginie Durand	
AUGUST 2020						
August 1, 2020	1:51 PM	AWAR	Arctic Fox	4	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Arctic Hare	1	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Arctic Hare	1	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Musk Ox	1	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Musk Ox	25	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Musk Ox	1	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Sandhill Crane	2	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	Sandhill Crane	2	Virginie Durand	Cederic Godbout-Parent
August 1, 2020	1:51 PM	AWAR	ctic Ground Squir	3	Virginie Durand	Cederic Godbout-Parent
August 3, 2020	12:54 PM	Haul Road	Arctic Hare	2	Virginie Durand	
August 3, 2020	12:54 PM	Haul Road	Arctic Hare	1	Virginie Durand	
August 3, 2020	12:54 PM	Haul Road	Caribou	1	Virginie Durand	
August 3, 2020	12:54 PM	Haul Road	Common Raven	2	Virginie Durand	
August 4, 2020	11:33 AM	AWAR	Arctic Hare	2	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Arctic Hare	2	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Musk Ox	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Musk Ox	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Musk Ox	2	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Musk Ox	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Musk Ox	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Musk Ox	2	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Canada goose	13	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Canada goose	13	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Peregrine Falcon	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Peregrine Falcon	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Peregrine Falcon	1	Katelyn Proulx	
August 4, 2020	11:33 AM	AWAR	Peregrine Falcon	1	Katelyn Proulx	
August 5, 2020	12:59 PM	Haul Road	Caribou	60	Katelyn Proulx	
August 5, 2020	12:59 PM	Haul Road	Musk Ox	1	Katelyn Proulx	
August 5, 2020	12:59 PM	Haul Road	Musk Ox	1	Katelyn Proulx	
August 8, 2020	11:20 AM	AWAR	Arctic Fox	1	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Arctic Fox	1	Virginie Durand	
August 8, 2020	12:13 PM	Haul Road	Arctic Fox	1	Eric Haley	
August 8, 2020	11:20 AM	AWAR	Arctic Hare	1	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Arctic Hare	1	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Arctic Hare	1	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	2	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	500	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	200	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	1	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	800	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	100	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Caribou	1	Virginie Durand	
August 8, 2020	12:13 PM	Haul Road	Caribou	2	Eric Haley	
August 8, 2020	12:13 PM	Haul Road	Caribou	75	Eric Haley	
August 8, 2020	12:13 PM	Haul Road	Caribou	2	Eric Haley	
August 8, 2020	12:13 PM	Haul Road	Caribou	4	Eric Haley	
August 8, 2020	11:20 AM	AWAR	Musk Ox	1	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Musk Ox	15	Virginie Durand	
August 8, 2020	11:20 AM	AWAR	Musk Ox	1	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	10	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	7	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	20	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	450	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	300	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	325	Virginie Durand	
August 9, 2020	12:22 PM	AWAR	Caribou	20	Virginie Durand	

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
August 9, 2020	12:22 PM	AWAR	Caribou	10	Virginie Durand	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 9, 2020	12:22 PM	AWAR	Musk Ox	1	Virginie Durand	
August 9, 2020	6:57 PM	Haul Road	Duck species	4	Katelyn Proulx	
August 9, 2020	6:57 PM	Haul Road	Duck species	4	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	2	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	10	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	15	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	19	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	3	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	500	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	25	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	400	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	3	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Caribou	1	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Musk Ox	1	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Musk Ox	18	Katelyn Proulx	
August 10, 2020	4:42 PM	AWAR	Musk Ox	21	Katelyn Proulx	
August 11, 2020	4:16 PM	Haul Road	Caribou	3	Katelyn Proulx	
August 11, 2020	4:16 PM	Haul Road	Caribou	1	Katelyn Proulx	
August 11, 2020	4:16 PM	Haul Road	Canada goose	16	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Arctic Fox	4	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Arctic Fox	1	Katelyn Proulx	
August 13, 2020	12:39 PM	Haul Road	Caribou	1	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Caribou	2	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Caribou	1	Nancy Duquet-Harvey	
August 13, 2020	6:03 PM	AWAR	Caribou	2	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Caribou	1	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Caribou	7	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Caribou	4	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Caribou	21	Katelyn Proulx	
August 13, 2020	6:03 PM	AWAR	Caribou	17	Katelyn Proulx	
August 13, 2020	12:39 PM	Haul Road	Musk Ox	1	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Musk Ox	1	Nancy Duquet-Harvey	
August 13, 2020	6:03 PM	AWAR	Musk Ox	5	Katelyn Proulx	
August 13, 2020	12:39 PM	Haul Road	Canada Goose	8	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Sandhill Crane	2	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Canada Goose	15	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Canada Goose	60	Nancy Duquet-Harvey	
August 13, 2020	12:39 PM	Haul Road	Canada Goose	21	Nancy Duquet-Harvey	
August 13, 2020	6:03 PM	AWAR	Eagle species	1	Katelyn Proulx	
August 14, 2020	12:06 PM	AWAR	Arctic Fox	5	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Caribou	11	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Caribou	1	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Caribou	2	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Caribou	6	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Caribou	2	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Caribou	2	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	3:14 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 14, 2020	3:14 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 14, 2020	12:06 PM	AWAR	Musk Ox	5	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	3:14 PM	Haul Road	Musk Ox	1	Kathleen Newberry	
August 14, 2020	12:06 PM	AWAR	Canada goose	50	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Sandhill crane	2	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Sandhill Crane	2	Katelyn Proulx	Perle Dion-Trudel
August 14, 2020	12:06 PM	AWAR	Sandhill crane	8	Katelyn Proulx	Perle Dion-Trudel
August 16, 2020	12:03 PM	Haul Road	Caribou	2	Amy Lemay	Katelyn Proulx
August 16, 2020	12:03 PM	Haul Road	Musk Ox	1	Amy Lemay	Katelyn Proulx
August 16, 2020	12:03 PM	Haul Road	Musk Ox	1	Amy Lemay	Katelyn Proulx
August 16, 2020	12:03 PM	Haul Road	Musk Ox	5	Amy Lemay	Katelyn Proulx
August 16, 2020	12:03 PM	Haul Road	Musk Ox	1	Amy Lemay	Katelyn Proulx
August 16, 2020	12:03 PM	Haul Road	Musk Ox	1	Amy Lemay	Katelyn Proulx

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
August 17, 2020	11:47 AM	AWAR	Caribou	2	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	6	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	2	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	24	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	20	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	26	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	1	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	8	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Caribou	70	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Musk Ox	18	Katelyn Proulx	
August 17, 2020	11:47 AM	AWAR	Musk Ox	8	Katelyn Proulx	
August 18, 2020	4:35 PM	AWAR	Caribou	1	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Caribou	5	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Caribou	4	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Caribou	3	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Caribou	1	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Caribou	34	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Musk Ox	28	Cederic Godbout-Parent	
August 18, 2020	4:35 PM	AWAR	Musk Ox	12	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Caribou	1	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Caribou	3	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Caribou	4	Cederic Godbout-Parent	
August 19, 2020	12:15 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 19, 2020	12:15 PM	Haul Road	Caribou	3	Kathleen Newberry	
August 19, 2020	12:15 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 19, 2020	12:15 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 19, 2020	12:15 PM	Haul Road	Caribou	4	Kathleen Newberry	
August 19, 2020	12:15 PM	Haul Road	Caribou	6	Kathleen Newberry	
August 19, 2020	2:07 PM	AWAR	Caribou	5	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Caribou	2	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Caribou	2	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Musk Ox	9	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Musk Ox	16	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Musk Ox	1	Cederic Godbout-Parent	
August 19, 2020	12:15 PM	Haul Road	Musk Ox	2	Kathleen Newberry	
August 19, 2020	2:07 PM	AWAR	Musk Ox	33	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Musk Ox	5	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Musk Ox	1	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Musk Ox	12	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Musk Ox	35	Cederic Godbout-Parent	
August 19, 2020	2:07 PM	AWAR	Musk Ox	6	Cederic Godbout-Parent	
August 19, 2020	9:58 AM	AWAR	Sandhill Crane	2	Cederic Godbout-Parent	
August 20, 2020	12:14 PM	Haul Road	Caribou	2	Kathleen Newberry	
August 20, 2020	12:14 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 20, 2020	12:36 PM	AWAR	Caribou	8	Cederic Godbout-Parent	
August 20, 2020	12:36 PM	AWAR	Caribou	2	Cederic Godbout-Parent	
August 20, 2020	12:36 PM	AWAR	Caribou	21	Cederic Godbout-Parent	
August 20, 2020	12:36 PM	AWAR	Musk Ox	9	Cederic Godbout-Parent	
August 20, 2020	12:36 PM	AWAR	Musk Ox	9	Cederic Godbout-Parent	
August 20, 2020	12:36 PM	AWAR	Musk Ox	16	Cederic Godbout-Parent	
August 20, 2020	12:14 PM	Haul Road	Snow goose	30	Kathleen Newberry	
August 20, 2020	12:36 PM	AWAR	Peregrine Falcon	1	Cederic Godbout-Parent	
August 21, 2020	2:26 PM	Haul Road	Caribou	10	Kathleen Newberry	
August 21, 2020	2:26 PM	Haul Road	Caribou	3	Kathleen Newberry	
August 21, 2020	2:26 PM	Haul Road	Caribou	3	Kathleen Newberry	
August 21, 2020	2:26 PM	Haul Road	Musk Ox	14	Kathleen Newberry	
August 21, 2020	2:26 PM	Haul Road	Musk Ox	5	Kathleen Newberry	
August 21, 2020	2:26 PM	Haul Road	Sandhill crane	2	Kathleen Newberry	
August 22, 2020	1:30 PM	AWAR	Caribou	2	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	2	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	1	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	3	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	18	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	45	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	150	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	4	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	29	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	4	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	26	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Caribou	7	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Musk Ox	14	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Musk Ox	7	Cederic Godbout-Parent	
August 22, 2020	1:30 PM	AWAR	Musk Ox	3	Cederic Godbout-Parent	
August 23, 2020	12:06 PM	AWAR	Arctic Hare	1	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Caribou	11	Laurence Archambault	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
August 23, 2020	12:06 PM	AWAR	Caribou	6	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Caribou	1	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Caribou	2	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Caribou	4	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Caribou	2	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Caribou	2	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Musk Ox	11	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Musk Ox	12	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Musk Ox	4	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Canada goose	18	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Swan species	1	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Goose species	100	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	ough-Legged Hav	1	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Goose species	100	Laurence Archambault	
August 23, 2020	12:06 PM	AWAR	Sandhill Crane	2	Laurence Archambault	
August 24, 2020	3:36 PM	Haul Road	Caribou	1	Kathleen Newberry	
August 24, 2020	3:36 PM	Haul Road	Musk Ox	10	Kathleen Newberry	
August 24, 2020	3:36 PM	Haul Road	Musk Ox	10	Kathleen Newberry	
August 24, 2020	3:36 PM	Haul Road	Musk Ox	1	Kathleen Newberry	
August 24, 2020	4:55 PM	AWAR	Musk Ox	1	Cederic Godbout-Parent	
August 24, 2020	4:55 PM	AWAR	Musk Ox	19	Cederic Godbout-Parent	
August 24, 2020	4:55 PM	AWAR	Musk Ox	15	Cederic Godbout-Parent	
August 26, 2020	12:48 PM	Haul Road	Caribou	5	Felix Harvey	Tom Thompson
August 26, 2020	12:48 PM	Haul Road	Caribou	2	Felix Harvey	Tom Thompson
August 26, 2020	3:52 PM	AWAR	Caribou	6	Cederic Godbout-Parent	
August 26, 2020	3:52 PM	AWAR	Caribou	1	Cederic Godbout-Parent	
August 26, 2020	3:52 PM	AWAR	Caribou	6	Cederic Godbout-Parent	
August 26, 2020	3:52 PM	AWAR	Caribou	8	Cederic Godbout-Parent	
August 26, 2020	3:52 PM	AWAR	Caribou	4	Cederic Godbout-Parent	
August 26, 2020	4:11 PM	Haul Road	Caribou	1	Felix Harvey	
August 26, 2020	5:01 PM	Haul Road	Caribou	1	Felix Harvey	
August 26, 2020	12:48 PM	Haul Road	Musk Ox	2	Felix Harvey	Tom Thompson
August 26, 2020	3:52 PM	AWAR	Musk Ox	23	Cederic Godbout-Parent	
August 26, 2020	3:52 PM	AWAR	Musk Ox	5	Cederic Godbout-Parent	
August 26, 2020	12:48 PM	Haul Road	Snow Goose	150	Felix Harvey	Tom Thompson
August 27, 2020	1:26 PM	Haul Road	Caribou	1	Felix Harvey	
August 27, 2020	3:43 PM	AWAR	Caribou	3	Felix Harvey	
August 27, 2020	3:43 PM	AWAR	Caribou	25	Felix Harvey	
August 27, 2020	5:27 PM	AWAR	Musk Ox	0	Felix Harvey	
August 27, 2020	3:43 PM	AWAR	Sandhill Crane	2	Felix Harvey	
August 28, 2020	1:50 PM	AWAR	Arctic Fox	1	Felix Harvey	
August 28, 2020	1:50 PM	AWAR	Arctic Fox	1	Felix Harvey	
August 28, 2020	12:21 AM	Haul Road	Caribou	3	Felix Harvey	
August 28, 2020	12:39 PM	Haul Road	Caribou	2	Felix Harvey	
August 28, 2020	1:50 PM	AWAR	Caribou	1	Felix Harvey	
August 28, 2020	1:50 PM	AWAR	Caribou	5	Felix Harvey	
August 28, 2020	8:02 PM	Haul Road	Caribou	1	Felix Harvey	
August 28, 2020	12:21 AM	Haul Road	Musk Ox	27	Felix Harvey	
August 28, 2020	12:21 AM	Haul Road	Musk Ox	13	Felix Harvey	
August 28, 2020	1:14 PM	Haul Road	Musk Ox	0	Felix Harvey	
August 28, 2020	1:14 PM	Haul Road	Snow Goose	0	Felix Harvey	
August 28, 2020	1:50 PM	AWAR	Snow Goose	200	Felix Harvey	
August 29, 2020	2:05 PM	AWAR	Caribou	3	Felix Harvey	Perle Dion-Trudel
August 29, 2020	2:05 PM	AWAR	Caribou	3	Felix Harvey	Perle Dion-Trudel
August 29, 2020	4:11 PM	AWAR	Caribou	2	Felix Harvey	TP
August 29, 2020	6:48 PM	AWAR	Caribou	3	Felix Harvey	TP
August 29, 2020	7:48 PM	Haul Road	Caribou	2	Felix Harvey	
August 29, 2020	9:10 PM	Haul Road	Caribou	1	Felix Harvey	
August 29, 2020	4:57 PM	AWAR	Musk Ox	1	Felix Harvey	TP
August 29, 2020	7:34 PM	Haul Road	Musk Ox	10	Felix Harvey	
August 29, 2020	7:36 PM	Haul Road	Musk Ox	14	Felix Harvey	
August 29, 2020	7:41 PM	Haul Road	Musk Ox	123	Felix Harvey	
August 30, 2020	12:51 PM	Haul Road	Caribou	1	TP	Felix Harvey
August 30, 2020	2:50 PM	Haul Road	Caribou	4	TP	Felix Harvey
August 30, 2020	12:21 PM	Haul Road	Musk Ox	12	TP	Felix Harvey
August 30, 2020	12:51 PM	Haul Road	Musk Ox	1	TP	Felix Harvey
August 30, 2020	12:51 PM	Haul Road	Musk Ox	1	TP	Felix Harvey
August 30, 2020	12:51 PM	Haul Road	Musk Ox	3	TP	Felix Harvey
August 30, 2020	3:32 PM	Haul Road	Musk Ox	1	TP	Felix Harvey
SEPTEMBER 2020						
September 2, 2020	12:41 PM	Haul Road	Caribou	2	TP	
September 2, 2020	12:41 PM	Haul Road	Caribou	2	TP	
September 2, 2020	12:41 PM	Haul Road	Musk Ox	1	TP	
September 2, 2020	12:41 PM	Haul Road	Musk Ox	1	TP	
September 2, 2020	12:41 PM	Haul Road	Musk Ox	13	TP	

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
September 3, 2020	8:02 PM	Haul Road	Caribou	2	Felix Harvey	
September 3, 2020	8:02 PM	Haul Road	Musk Ox	15	Felix Harvey	
September 4, 2020	3:19 PM	AWAR	Caribou	1	Felix Harvey	
September 4, 2020	3:19 PM	AWAR	Musk Ox	1	Felix Harvey	
September 4, 2020	3:19 PM	AWAR	Musk Ox	1	Felix Harvey	
September 4, 2020	3:19 PM	AWAR	Musk Ox	2	Felix Harvey	
September 4, 2020	3:19 PM	AWAR	Musk Ox	29	Felix Harvey	
September 4, 2020	3:19 PM	AWAR	Sandhill Crane	25	Felix Harvey	
September 11, 2020	11:57 AM	AWAR	Caribou	1	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	5	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	14	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	27	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	29	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	33	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	33	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	34	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	47	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	110	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	146	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	150	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Caribou	200	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Musk Ox	1	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Musk Ox	1	Nicolas Saucier	Isabelle Couture
September 11, 2020	11:57 AM	AWAR	Musk Ox	2	Nicolas Saucier	Isabelle Couture
September 12, 2020	3:37 PM	AWAR	Caribou	2	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	2	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	3	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	3	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	3	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	3	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	4	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	4	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	9	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	9	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	11	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	11	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	40	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	40	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	77	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Caribou	77	Spencer Knowles	Nicolas Saucier
September 12, 2020	8:43 PM	AWAR	Caribou	160	Nicolas Saucier	Spencer Knowles
September 12, 2020	3:37 PM	AWAR	Grey Wolf	1	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Grey Wolf	1	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Musk Ox	14	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Musk Ox	14	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Sand hill crane	2	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Sand hill crane	2	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Snow Goose	150	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Snow Goose	150	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Snow Goose	300	Spencer Knowles	Nicolas Saucier
September 12, 2020	3:37 PM	AWAR	Snow Goose	300	Spencer Knowles	Nicolas Saucier
September 13, 2020	12:17 PM	AWAR	Arctic Fox	1	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Arctic Hare	1	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	3	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	4	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	6	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	7	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	9	Isabelle Couture	Spencer Knowles
September 13, 2020	10:54 PM	AWAR	Caribou	10	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	11	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	14	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	18	Spencer Knowles	Isabelle couture
September 13, 2020	12:17 PM	AWAR	Caribou	27	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	30	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	33	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	38	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Caribou	47	Isabelle Couture	Spencer Knowles
September 13, 2020	10:54 PM	AWAR	Caribou	61	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	63	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	66	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	75	Spencer Knowles	Isabelle couture
September 13, 2020	10:54 PM	AWAR	Caribou	100	Spencer Knowles	Isabelle couture
September 13, 2020	12:17 PM	AWAR	Musk Ox	10	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Musk Ox	11	Isabelle Couture	Spencer Knowles
September 13, 2020	10:54 PM	AWAR	Musk Ox	11	Spencer Knowles	Isabelle couture

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
September 13, 2020	10:54 PM	AWAR	Musk Ox	61	Spencer Knowles	Isabelle couture
September 13, 2020	12:17 PM	AWAR	Sand hill crane	2	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Bald Eagle	2	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Sand hill crane	2	Isabelle Couture	Spencer Knowles
September 13, 2020	12:17 PM	AWAR	Snow Goose	600	Isabelle Couture	Spencer Knowles
September 14, 2020	2:35 PM	Haul Road	Caribou	1	Rowan Woodall	
September 14, 2020	2:35 PM	Haul Road	Caribou	1	Rowan Woodall	
September 14, 2020	2:35 PM	Haul Road	Caribou	3	Rowan Woodall	
September 14, 2020	2:35 PM	Haul Road	Caribou	3	Rowan Woodall	
September 14, 2020	2:35 PM	Haul Road	Caribou	4	Rowan Woodall	
September 14, 2020	2:35 PM	Haul Road	Caribou	4	Rowan Woodall	
September 14, 2020	1:24 PM	AWAR	Caribou	7	Spencer Knowles	Isabelle Couture
September 14, 2020	2:35 PM	Haul Road	Caribou	7	Rowan Woodall	
September 14, 2020	1:24 PM	AWAR	Caribou	8	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Caribou	8	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Caribou	11	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	13	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	14	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	15	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	20	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	25	Spencer Knowles	Isabelle couture
September 14, 2020	8:48 PM	AWAR	Caribou	26	Spencer Knowles	Isabelle couture
September 14, 2020	8:48 PM	AWAR	Caribou	43	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	55	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	70	Spencer Knowles	Isabelle couture
September 14, 2020	8:48 PM	AWAR	Caribou	70	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	71	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	80	Spencer Knowles	Isabelle couture
September 14, 2020	8:48 PM	AWAR	Caribou	110	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	189	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	300	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	375	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Caribou	400	Spencer Knowles	Isabelle Couture
September 14, 2020	8:48 PM	AWAR	Caribou	400	Spencer Knowles	Isabelle couture
September 14, 2020	8:48 PM	AWAR	Caribou	500	Spencer Knowles	Isabelle couture
September 14, 2020	8:48 PM	AWAR	Caribou	500	Spencer Knowles	Isabelle couture
September 14, 2020	1:24 PM	AWAR	Caribou	800	Spencer Knowles	Isabelle Couture
September 14, 2020	2:35 PM	Haul Road	Musk Ox	1	Rowan Woodall	
September 14, 2020	8:48 PM	AWAR	Musk Ox	1	Spencer Knowles	Isabelle couture
September 14, 2020	2:35 PM	Haul Road	Musk Ox	8	Rowan Woodall	
September 14, 2020	1:24 PM	AWAR	Musk Ox	11	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Musk Ox	14	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Musk Ox	60	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Bald Eagle	2	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Sand hill crane	3	Spencer Knowles	Isabelle Couture
September 14, 2020	1:24 PM	AWAR	Peregrine Falcon	2	Spencer Knowles	Isabelle Couture
September 14, 2020	2:35 PM	Haul Road	ctic Ground Squir	1	Rowan Woodall	
September 14, 2020	2:35 PM	Haul Road	ctic Ground Squir	1	Rowan Woodall	
September 15, 2020	3:26 PM	AWAR	Caribou	14	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Caribou	19	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Caribou	34	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Caribou	38	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Caribou	93	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Caribou	180	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Caribou	750	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Musk Ox	2	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Musk Ox	8	Nicolas Saucier	
September 15, 2020	3:26 PM	AWAR	Bald eagle	1	Nicolas Saucier	
September 16, 2020	10:24 AM	AWAR	Caribou	2	Spencer Knowles	
September 16, 2020	2:38 PM	AWAR	Caribou	6	Spencer Knowles	
September 16, 2020	2:38 PM	AWAR	Caribou	10	Spencer Knowles	
September 16, 2020	10:24 AM	AWAR	Caribou	11	Spencer Knowles	
September 16, 2020	2:38 PM	AWAR	Caribou	14	Spencer Knowles	
September 16, 2020	10:24 AM	AWAR	Caribou	15	Spencer Knowles	
September 16, 2020	10:24 AM	AWAR	Caribou	21	Spencer Knowles	
September 16, 2020	10:24 AM	AWAR	Caribou	38	Spencer Knowles	
September 16, 2020	10:24 AM	AWAR	Caribou	55	Spencer Knowles	
September 16, 2020	10:24 AM	AWAR	Caribou	150	Spencer Knowles	
September 16, 2020	2:38 PM	AWAR	Caribou	175	Spencer Knowles	
September 16, 2020	2:38 PM	AWAR	Canada goose	14	Spencer Knowles	
September 16, 2020	2:38 PM	AWAR	Peregrine Falcon	3	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	8	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	14	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	27	Spencer Knowles	
September 17, 2020	7:42 PM	AWAR	Caribou	27	Spencer Knowles	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
September 17, 2020	7:42 PM	AWAR	Caribou	37	Spencer Knowles	
September 17, 2020	7:42 PM	AWAR	Caribou	52	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	62	Spencer Knowles	
September 17, 2020	7:42 PM	AWAR	Caribou	80	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	120	Spencer Knowles	
September 17, 2020	7:42 PM	AWAR	Caribou	150	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	300	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	300	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	350	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	400	Spencer Knowles	
September 17, 2020	7:42 PM	AWAR	Caribou	400	Spencer Knowles	
September 17, 2020	10:15 AM	AWAR	Caribou	1000	Spencer Knowles	
September 17, 2020	7:42 PM	AWAR	Musk Ox	15	Spencer Knowles	
September 18, 2020	10:19 AM	AWAR	Caribou	5	Spencer Knowles	
September 18, 2020	10:19 AM	AWAR	Caribou	13	Spencer Knowles	
September 18, 2020	10:19 AM	AWAR	Caribou	14	Spencer Knowles	
September 18, 2020	5:39 PM	AWAR	Caribou	14	Spencer Knowles	
September 18, 2020	5:39 PM	AWAR	Caribou	29	Spencer Knowles	
September 18, 2020	5:39 PM	AWAR	Caribou	35	Spencer Knowles	
September 18, 2020	5:39 PM	AWAR	Caribou	39	Spencer Knowles	
September 18, 2020	10:19 AM	AWAR	Caribou	150	Spencer Knowles	
September 18, 2020	10:19 AM	AWAR	Caribou	175	Spencer Knowles	
September 18, 2020	10:19 AM	AWAR	Caribou	250	Spencer Knowles	
September 18, 2020	5:39 PM	AWAR	Caribou	400	Spencer Knowles	
September 18, 2020	5:39 PM	AWAR	Caribou	1500	Spencer Knowles	
September 19, 2020	12:11 PM	Haul Road	Caribou	3	Laurence Archambault	
September 19, 2020	12:11 PM	Haul Road	Caribou	4	Laurence Archambault	
September 19, 2020	5:40 PM	AWAR	Caribou	15	Spencer Knowles	
September 19, 2020	10:11 AM	AWAR	Caribou	17	Spencer Knowles	
September 19, 2020	10:11 AM	AWAR	Caribou	27	Spencer Knowles	
September 19, 2020	10:11 AM	AWAR	Caribou	48	Spencer Knowles	
September 19, 2020	10:11 AM	AWAR	Caribou	55	Spencer Knowles	
September 19, 2020	12:11 PM	Haul Road	Musk Ox	1	Laurence Archambault	
September 19, 2020	5:40 PM	AWAR	Musk Ox	8	Spencer Knowles	
September 19, 2020	5:40 PM	AWAR	Musk Ox	15	Spencer Knowles	
September 19, 2020	5:40 PM	AWAR	Musk Ox	23	Spencer Knowles	
September 19, 2020	12:11 PM	Haul Road	Musk Ox	30	Laurence Archambault	
September 19, 2020	10:11 AM	AWAR	Peregrine Falcon	1	Spencer Knowles	
September 20, 2020	4:07 PM	AWAR	Caribou	5	Spencer Knowles	
September 20, 2020	4:07 PM	AWAR	Caribou	9	Spencer Knowles	
September 20, 2020	10:04 AM	AWAR	Caribou	16	Spencer Knowles	
September 20, 2020	4:07 PM	AWAR	Caribou	28	Spencer Knowles	
September 20, 2020	10:04 AM	AWAR	Caribou	31	Spencer Knowles	
September 20, 2020	10:04 AM	AWAR	Caribou	40	Spencer Knowles	
September 21, 2020	1:46 PM	AWAR	Caribou	5	Spencer Knowles	
September 21, 2020	1:46 PM	AWAR	Caribou	11	Spencer Knowles	
September 21, 2020	1:46 PM	AWAR	Musk Ox	25	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	Caribou	2	Spencer Knowles	
September 22, 2020	3:39 PM	AWAR	Caribou	3	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	Caribou	5	Spencer Knowles	
September 22, 2020	3:39 PM	AWAR	Caribou	13	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	Caribou	19	Spencer Knowles	
September 22, 2020	3:39 PM	AWAR	Caribou	22	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	Caribou	24	Spencer Knowles	
September 22, 2020	3:39 PM	AWAR	Musk Ox	10	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	Musk Ox	21	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	Musk Ox	27	Spencer Knowles	
September 22, 2020	12:48 PM	AWAR	ough-Legged Hav	1	Spencer Knowles	
September 23, 2020	1:53 PM	AWAR	Caribou	3	Louis Dubois	
September 23, 2020	1:53 PM	AWAR	Musk Ox	22	Louis Dubois	
September 23, 2020	1:53 PM	AWAR	Musk Ox	27	Louis Dubois	
September 24, 2020	1:09 PM	AWAR	Caribou	2	Spencer Knowles	
September 24, 2020	1:09 PM	AWAR	Caribou	7	Spencer Knowles	
September 24, 2020	1:09 PM	AWAR	Musk Ox	1	Spencer Knowles	
September 24, 2020	1:09 PM	AWAR	Musk Ox	24	Spencer Knowles	
September 26, 2020	1:55 PM	AWAR	Arctic Fox	1	Perle Dion-Trudel	
September 26, 2020	1:55 PM	AWAR	Arctic Fox	1	Perle Dion-Trudel	
September 26, 2020	5:51 PM	Haul Road	Caribou	1	Laurence Archambault	Samuel Tapp
September 26, 2020	1:55 PM	AWAR	Musk Ox	1	Perle Dion-Trudel	
September 26, 2020	5:51 PM	Haul Road	Musk Ox	7	Laurence Archambault	Samuel Tapp
September 29, 2020	2:46 PM	AWAR	Caribou	29	Perle Dion-Trudel	
OCTOBER 2020						
October 2, 2020	5:23 PM	AWAR	Arctic Hare	1	Simon CB	
October 2, 2020	1:33 PM	Haul Road	Caribou	1	Perle Dion-Trudel	
October 2, 2020	1:33 PM	Haul Road	Caribou	2	Perle Dion-Trudel	

Wildlife Observations						
Date	Time	Location	Wildlife Species	Quantity	Observer Name #1	Observer Name #2
October 2, 2020	5:23 PM	AWAR	Musk Ox	3	Simon CB	
October 2, 2020	1:33 PM	Haul Road	Musk Ox	13	Perle Dion-Trudel	
October 2, 2020	5:23 PM	AWAR	Ptarmigan	4	Simon CB	
October 2, 2020	5:23 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 2, 2020	5:23 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 2, 2020	5:23 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 2, 2020	5:23 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 2, 2020	5:23 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 5, 2020	3:17 PM	Haul Road	ctic Ground Squir	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	Arctic Hare	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	Arctic Hare	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	Arctic Hare	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	Arctic Hare	3	Simon CB	
October 6, 2020	1:42 PM	AWAR	Arctic Hare	4	Simon CB	
October 6, 2020	1:42 PM	AWAR	Caribou	40	Simon CB	
October 6, 2020	1:42 PM	AWAR	Musk Ox	4	Simon CB	
October 6, 2020	1:42 PM	AWAR	Musk Ox	4	Simon CB	
October 6, 2020	1:42 PM	AWAR	Musk Ox	25	Simon CB	
October 6, 2020	1:42 PM	AWAR	Ptarmigan	18	Simon CB	
October 6, 2020	1:42 PM	AWAR	Ptarmigan	20	Simon CB	
October 6, 2020	1:42 PM	AWAR	Ptarmigan	38	Simon CB	
October 6, 2020	1:42 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 6, 2020	1:42 PM	AWAR	ctic Ground Squir	1	Simon CB	
October 9, 2020	2:07 PM	AWAR	Musk Ox	2	Nicolas Saucier	
October 10, 2020	8:02 PM	Haul Road	Arctic Fox	1	Spencer Knowles	
October 10, 2020	8:02 PM	Haul Road	Musk Ox	9	Spencer Knowles	
October 16, 2020	1:27 PM	AWAR	Musk Ox	4	Louis Dubois	
October 23, 2020	2:25 PM	Haul Road	Musk Ox	2	Michael Schumacher	
October 23, 2020	8:13 PM	AWAR	Musk Ox	17	Michael Schumacher	
October 24, 2020	7:40 PM	Haul Road	Arctic Fox	1	Michael Schumacher	Laurence Archambault
October 24, 2020	2:12 PM	Haul Road	Caribou	2	Michael Schumacher	
October 24, 2020	2:12 PM	Haul Road	Musk Ox	2	Michael Schumacher	
October 25, 2020	2:04 PM	AWAR	Caribou	11	Laurence Archambault	
October 25, 2020	2:04 PM	AWAR	Caribou	2000	Laurence Archambault	
October 25, 2020	5:18 PM	Haul Road	Grey Wolf	3	Michael Schumacher	
October 25, 2020	1:50 PM	Haul Road	Musk Ox	2	Michael Schumacher	
October 26, 2020	3:23 PM	AWAR	Caribou	1	Tom Thompson	
October 26, 2020	3:23 PM	AWAR	Caribou	3	Tom Thompson	
October 26, 2020	3:23 PM	AWAR	Caribou	4	Tom Thompson	
October 26, 2020	6:30 PM	Haul Road	Musk Ox	2	Michael Schumacher	
October 26, 2020	6:30 PM	Haul Road	Wolverine	1	Michael Schumacher	
October 27, 2020	5:39 PM	AWAR	Caribou	3	Michael Schumacher	
October 27, 2020	2:15 PM	AWAR	Caribou	11	Michael Schumacher	
October 27, 2020	2:15 PM	AWAR	Musk Ox	11	Michael Schumacher	
October 29, 2020	2:15 PM	Haul Road	Arctic Fox	1	Michael Schumacher	
October 29, 2020	2:35 PM	AWAR	Musk Ox	1	I.Couture	
October 29, 2020	5:58 PM	Haul Road	Musk Ox	1	Michael Schumacher	
October 29, 2020	2:15 PM	Haul Road	Musk Ox	2	Michael Schumacher	
October 29, 2020	2:35 PM	AWAR	Musk Ox	12	I.Couture	
October 30, 2020	7:04 PM	AWAR	Arctic Fox	1	Michael Schumacher	
October 30, 2020	7:04 PM	AWAR	Caribou	15	Michael Schumacher	
October 30, 2020	7:04 PM	AWAR	Caribou	16	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Caribou	29	Michael Schumacher	
October 30, 2020	7:04 PM	AWAR	Caribou	270	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Caribou	550	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Caribou	570	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Caribou	600	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Caribou	800	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Musk Ox	6	Michael Schumacher	
October 30, 2020	2:10 PM	AWAR	Musk Ox	12	Michael Schumacher	
October 30, 2020	7:04 PM	AWAR	Musk Ox	21	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	1	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	4	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	4	Michael Schumacher	
October 31, 2020	7:42 PM	AWAR	Caribou	57	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	140	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	310	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	350	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	497	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Caribou	710	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Musk Ox	1	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Musk Ox	6	Michael Schumacher	
October 31, 2020	7:42 PM	AWAR	Musk Ox	13	Michael Schumacher	
October 31, 2020	1:58 PM	AWAR	Musk Ox	30	Michael Schumacher	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
NOVEMBER 2020						
November 1, 2020	2:00 PM	AWAR	Caribou	1	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Caribou	27	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Caribou	47	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Caribou	170	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Caribou	220	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Caribou	240	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Caribou	1120	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Musk Ox	2	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Musk Ox	13	Michael Schumacher	
November 1, 2020	2:00 PM	AWAR	Musk Ox	66	Michael Schumacher	
November 2, 2020	1:30 PM	AWAR	Caribou	70	Eric Haley	
November 2, 2020	1:30 PM	AWAR	Caribou	92	Eric Haley	
November 2, 2020	1:30 PM	AWAR	Common Raven	2	Eric Haley	
November 2, 2020	1:30 PM	AWAR	Musk Ox	18	Eric Haley	
November 3, 2020	1:18 PM	AWAR	Musk Ox	27	I.Couture	
November 3, 2020	1:18 PM	AWAR	Musk Ox	67	I.Couture	
November 6, 2020	12:52 PM	AWAR	Caribou	1	Katelyn Proulx	
November 6, 2020	12:52 PM	AWAR	Caribou	25	Katelyn Proulx	
November 6, 2020	12:52 PM	AWAR	Caribou	75	Katelyn Proulx	
November 6, 2020	12:52 PM	AWAR	Musk Ox	3	Katelyn Proulx	
November 6, 2020	12:52 PM	AWAR	Musk Ox	24	Katelyn Proulx	
November 6, 2020	12:52 PM	AWAR	Ptarmigan	8	Katelyn Proulx	
November 7, 2020	2:27 PM	AWAR	Caribou	8	Spencer Knowles	Katelyn Proulx
November 7, 2020	2:27 PM	AWAR	Grey Wolf	1	Spencer Knowles	Katelyn Proulx
November 7, 2020	2:27 PM	AWAR	Musk Ox	1	Spencer Knowles	Katelyn Proulx
November 7, 2020	2:27 PM	AWAR	Musk Ox	1	Spencer Knowles	Katelyn Proulx
November 7, 2020	2:27 PM	AWAR	Musk Ox	3	Spencer Knowles	Katelyn Proulx
November 7, 2020	2:27 PM	AWAR	Ptarmigan	30	Spencer Knowles	Katelyn Proulx
November 9, 2020	1:44 PM	AWAR	Caribou	21	Spencer Knowles	
November 9, 2020	1:44 PM	AWAR	Caribou	52	Spencer Knowles	
November 11, 2020	2:48 PM	Haul Road	Musk Ox	4	Spencer Knowles	
November 11, 2020	2:48 PM	Haul Road	Musk Ox	65	Spencer Knowles	
November 12, 2020	1:26 PM	Haul Road	Musk Ox	4	Spencer Knowles	Nicolas Saucier
November 12, 2020	1:26 PM	Haul Road	Musk Ox	12	Spencer Knowles	Nicolas Saucier
November 14, 2020	6:21 PM	Haul Road	Musk Ox	4	Spencer Knowles	
November 14, 2020	3:10 PM	Haul Road	Musk Ox	13	Spencer Knowles	
November 16, 2020	6:53 PM	Haul Road	Arctic Fox	1	Spencer Knowles	Tom Thomson
November 16, 2020	6:53 PM	Haul Road	Arctic Fox	1	Spencer Knowles	Tom Thomson
November 17, 2020	3:35 PM	AWAR	Caribou	5	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	6	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	6	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	10	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	10	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	11	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	19	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	33	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	48	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	69	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	150	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	150	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	200	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Caribou	300	Louis Dubois	
November 17, 2020	3:35 PM	AWAR	Musk Ox	7	Louis Dubois	
November 18, 2020	2:32 PM	AWAR	Arctic Fox	1	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	12	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	24	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	27	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	79	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	82	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	85	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	149	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	400	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	700	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Caribou	1000	Spencer Knowles	
November 18, 2020	2:32 PM	AWAR	Musk Ox	5	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	11	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	12	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	21	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	39	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	48	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	53	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	73	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	120	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Caribou	400	Spencer Knowles	

Wildlife Observations						
Date	**Time**	**Location**	**Wildlife Species**	**Quantity**	**Observer Name #1**	**Observer Name #2**
November 19, 2020	2:31 PM	AWAR	Caribou	700	Spencer Knowles	
November 19, 2020	2:31 PM	AWAR	Musk Ox	24	Spencer Knowles	
November 20, 2020	2:51 PM	AWAR	Caribou	59	Spencer Knowles	
November 20, 2020	2:51 PM	AWAR	Caribou	60	Spencer Knowles	
November 20, 2020	2:51 PM	AWAR	Caribou	247	Spencer Knowles	
November 21, 2020	3:11 PM	Haul Road	Caribou	15	Tom Thompson	Samuel Tapp
November 21, 2020	7:21 PM	AWAR	Caribou	15	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	23	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	25	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	25	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	30	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	50	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	50	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	100	Tom Thompson	
November 21, 2020	7:21 PM	AWAR	Caribou	150	Tom Thompson	
November 21, 2020	3:11 PM	Haul Road	Musk Ox	2	Tom Thompson	Samuel Tapp
November 21, 2020	3:11 PM	Haul Road	Musk Ox	2	Tom Thompson	Samuel Tapp
November 21, 2020	3:11 PM	Haul Road	Musk Ox	4	Tom Thompson	Samuel Tapp
November 22, 2020	3:19 PM	AWAR	Caribou	20	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	20	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	23	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	26	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	27	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	33	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	42	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	74	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Caribou	84	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Musk Ox	3	Louis Dubois	
November 22, 2020	3:19 PM	AWAR	Musk Ox	19	Louis Dubois	
November 23, 2020	4:37 PM	AWAR	Caribou	20	Tom Thompson	
November 23, 2020	4:37 PM	AWAR	Caribou	80	Tom Thompson	
November 23, 2020	4:37 PM	AWAR	Caribou	100	Tom Thompson	
November 24, 2020	4:04 PM	Haul Road	Caribou	15	Laurence Archambault	
November 24, 2020	4:04 PM	Haul Road	Caribou	31	Laurence Archambault	
November 24, 2020	4:04 PM	Haul Road	Musk Ox	4	Laurence Archambault	
November 26, 2020	6:44 PM	AWAR	Caribou	3	Isabelle Couture	
November 26, 2020	3:22 PM	AWAR	Caribou	14	Isabelle Couture	
November 26, 2020	6:44 PM	AWAR	Caribou	31	Isabelle Couture	
November 26, 2020	3:22 PM	AWAR	Musk Ox	21	Isabelle Couture	
DECEMBER 2020						
December 4, 2020	6:17 PM	AWAR	Caribou	7	Nicolas Saucier	
December 5, 2020	5:58 PM	Haul Road	Caribou	2	Fanny Laporte	
December 5, 2020	5:58 PM	Haul Road	Musk Ox	45	Fanny Laporte	
December 11, 2020	3:13 PM	AWAR	Musk Ox	2	Spencer Knowles	
December 11, 2020	7:36 PM	Haul Road	Musk Ox	46	Laurence Archambault	
December 26, 2020	3:38 PM	Amaruq	Caribou	10	Samuel Tapp	
December 26, 2020	4:40 PM	AWAR	Ptarmigan	2	Isabelle Couture	

APPENDIX B

Tolerant Caribou Observations

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
03 April	am	99	6	Grazing	East	100m	West	
	am	97	60	Grazing	East	200m		
	am	91	60	Walking	East	100m	West	
	am	68	60	Grazing		600m	South	
	pm	56	2	Walking	West	200m	South	
	pm	30	50	Walking	West	200m	South	
	pm	44	22	Walking		200m	West	
	pm	69	58	Walking		500m	South	
	pm	71	26	Grazing	West	500m	South	
	pm	72	54	Grazing	West	300m	South	
	pm	81		Grazing	West	300m	Na	
	pm	86	12	Grazing	West	300m	Na	
06 April	am	103	8	Walking	West		South east	
	am	102	4	Walking	West	250m	South west	
	am	96	23	Grazing	West	700m	West	
	am	93	29	Walking	West	250m	North east	
	am	88	4	Walking	West	800m	North west	
	am	79	29	Grazing	West	350m	Na	
	am	61	41	Grazing	West	450m	South west	
	am	53	100	Grazing	West	800m	North west	
	am	46	130	Crossing		50m	East	
	am	26	6	Grazing	West	1000m		

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
07 April	pm	97	7	Walking	West	400m	South west	
	pm	92	20	Walking	West	150m	North west	
	pm	90	24	Walking	West	700m	North west	
	pm	83	15	Walking	West	1000m	North west	
	pm	82	26	Walking	West	350m	West	
	pm	86	80	Walking	West	800m	North west	
	pm	70	50	Grazing	East	700m	Na	
	pm	56	250	Grazing	West	150m	Na	
	pm	55	90	Crossing the Road	East		East	
	pm	53	70	Grazing	West	800m	West	
	pm	52	87	Walking	West	350m	North west	
08 April	am	105	21	Grazing	West	400m	Na	
	am	84	44	Grazing	West	250m	North	
	am	54	31	Resting	West	200m	Na	
	am	53	87	Walking	West	400m	North	
	am	52	39	Walking	West	100m	North	
	am	50	28	Walking	West	100m	North	
	am	49	76	Grazing	West	100m	Na	
	am	45	77	Walking	West	250m	South	
	am	40	68	Walking	West	300m	North	
	pm	92	250	Walking	West	300m	North	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
09 April	am	104	70	Grazing	West	250m	Na	
	am	101	80	Grazing	West	500m	Na	
	am	97	20	Grazing	West	500m	Na	
	am	97	20	Grazing	East	500m	Na	
	am	92	20	Grazing	West	250m	Na	
	am	86	27	Grazing	West	600m	Na	
	am	46	34	Grazing	West	150m	East	
	am	45	23	Grazing	West	150m	South east	
	pm	11	60	Resting	West	800m	Na	Hunters near by
	pm	23	21	Walking	West	800m	North west	
	pm	25	24	Walking	West	600m	South west	
10 April	am	99	30	Grazing	West	350m	Na	
	am	99	30	Standing	East	600m	Na	
	am	98	50	Walking	West	800m	South west	
	am	87	100	Grazing	West	500m	North west	
	am	86	120	Grazing	West	350m	North west	
	am	85	80	Walking	West	450m	North west	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
11 April	am	100	15	Grazing	East	150m	Na	
	am	97	60	Walking	West	400m	West	
	am	90	80	Grazing	West	400m	Na	
	am	88	200	Grazing	West	600m	Na	
	am	83	90	Grazing	West	300m	Na	
	am	80	60	Walking	West	400m	South west	
	am	79	60	Grazing	West	450m	Na	
	am	77	30	Grazing	West	500m	Na	
	am	72	30	Grazing	West	800m	Na	
	am	68	60	Grazing	West	400m	Na	
	am	59	60	Walking	West	250m	North west	
	am	37	20	Grazing	West	1000m	Na	
	am	29	12	Grazing	West	800m	Na	
	pm	46	15	Standing	West	1000m	Na	
	pm	52	80	Resting	West	400m	Na	
	pm	53	20	Grazing	West	500m	Na	
	pm	71	80	Resting	West	1000m	Na	
	pm	83	60	Grazing	West	400m	Na	
	pm	85	15	Grazing	East	200m	Na	
	pm	86	50	Grazing	West	350m	Na	
	pm	100	20	Standing	East	200m	Na	
	pm	100	80	Grazing	West	400m	Na	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
13 April	pm	104	32	Grazing	East	100m	Na	
	pm	103	10	Grazing	East	250m	Na	
	pm	97	25	Walking	West	600m	North	
	pm	90	50	Grazing	West	1000m	Na	
	pm	89	20	Walking	West	350m	Na	
	pm	69	25	Grazing	West	350m	Na	
	pm	68	30	Walking	West	300m	West	
	pm	64	50	Standing	West	600m	West	
	pm	63	12	Grazing	West	500m	Na	
	pm	58	20	Crossing	West		East	
	pm	54	50	Crossing	West		East	
14 April	pm	102	14	Resting	West	100m	Na	
	pm	95	15	Resting	West	1000m	Na	
		85	12	Walking	West	50m	South east	
15 April	am	104	5	Grazing	East	300m	Na	
	am	102	12	Grazing	East	100m	Na	
	am	91	10	Grazing	East	300m	Na	
	am	85	15	Grazing	West	350m	Na	
	am	83	6	Walking	West	100m	West	
	am	57	2	Resting	West	50m	Na	
	pm	66	16	Walking	West	250m	South east	
	pm	60	45	Walking	West	600m	West	
	pm	78	19	Grazing	West	250m	West	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
16 April	am	100	20	Walking	East	600m	East	
	am	83	40	Walking	West	1000m	South west	
	am	69	60	Walking	West	600m	South west	
	pm	63	50	Grazing	West	300m	West	
	pm	67	20	Grazing	West	150m	West	
	pm	69	70	Grazing	West	600m	East	
	pm	79	15	Grazing	West	600m	West	
17 April	am	78	50	Walking	West	150m	South	
	am	65	90	Grazing	West	400m	Na	
	am	52	40	Walking	West	350m	South west	
19 April	am	43	70	Walking	West	100m	South east	
20 April	am	101	12	Grazing	West	400m	Na	
	am	86	12	Grazing	West	600m	Na	
	am	85	70	Grazing	West	150m	Na	
	am	83	42	Grazing	West	600m	Na	
	am	62	22	Crossing	Na	na	East	
	am	58	21	Resting	West	1000m	Na	
	am	18	14	Running	West	100m	South west	Hunters pursuing
	pm	50	20	Grazing	West	300m	Na	
	pm	64	56	Grazing	West	1000m	Na	
	pm	106	15	Grazing	East	250m	East	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
21 April	am	91	35	Walking	West	300m	South east	
	am	90	20	Walking	West	300m	South east	
	am	87	150	Grazing	West	450m	Na	
	am	76	30	Grazing	West	1000m	Na	
	am	60	56	Grazing	West	400m	Na	
	am	55	20	Grazing	West	200m	Na	
	pm	61	123	Grazing	West	1000m	South east	
	pm	63	54	Grazing	West	350m	South east	
	pm	84	300	Crossing	West	200m		
	pm	106	18	Grazing	West	250m	East	
22 April	am	101	10	Grazing	West	500m	Na	
	am	98	35	Grazing	West	400m	Na	
	am	94	20	Grazing	West	350m	Na	
	am	89	150	Grazing	West	150m	Na	
	am	86	16	Grazing	West	150m	Na	
	am	78	100	Walking	West	500m	South	
	am	77	70	Walking	West	25m	South west	
	am	76	25	Grazing	West	500m	Na	
	am	70	25	Grazing	West	400m	West	
	am	69	170	Grazing	West	300m	Na	
	am	65	50	Grazing	West	400m	Na	
	am	64	40	Grazing	West	200m	Na	
	am	60	40	Grazing	West	200m	Na	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
	am	59	65	Grazing	West	200m	Na	
	am	58	20	Grazing	West	400m	Na	
	am	51	35	Grazing	West	300m	Na	
	am	48	16	Grazing	West	400m	Na	
	am	47	40	Grazing	West	600m	Na	
	am	42	52	Walking	West	150m	South east	
	am	32	35	Walking	West	200m	Walk	
	am	16	20	Walking	West	200m	South east	
23 April	am	104	6	Grazing	East	350m		
	am	100	100	Resting	West	200m	Na	
	am	96	50	Grazing	West	350m	Na	
	am	95	40	Grazing	West	350m	Na	
	am	91	20	Grazing	West	400m	Na	
	am	89	50	Grazing	West	400m	Na	
	am	82	15	Grazing	West	700m	Na	
	am	68	20	Grazing	West	300m	Na	
	am	66	35	Grazing	West	250m	Na	
	am	54	30	Grazing	West	500m	Na	
	am	48	25	Grazing	West	300m	Na	
	am	42	22	Grazing	West	200m	Na	
	am	37	60	Grazing	West	150m	Na	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
24 April	am	104	7	Resting	East	50m		
	am	93	8	Grazing	West	150m		
	am	91	10	Walking	West	500m		
	am	87			East			Crossing
	am	56	20	Grazing	West	300m		
	am	55	20	Grazing	East	400m		Crossing
	am	55	16	Grazing	West	150m		
	am	50	6	Crossing	West	na	East	Crossing
	am	41	47	Walking	West	300m		
	am	33	30	Grazing	West	500m	Na	
	am	30	61	Walking	West	100m		
	am	21	200	Crossing	West	na	East	Crossing
25 April		99	18	Grazing	West	800m	Na	
		95	20	Grazing	West	150m	Na	
		71	21	Grazing				
		57	25	Grazing	West	150m	Na	
		50	20	Walking	West	700m	East	
		39	20	Grazing	West	150m	Na	
		37	95	Walking	West	200m	South east	
		30	130	Walking	West	350m	South east	Approx. 40 Crossed to East side
		26	45	Resting	West	400m	West	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
26 April	am	96	10	Walking	West	300m	North	
	am	93	30	Walking	West	350m	North	
	am	89	500+	Walking	West	300m	North	
	am	86	19	Walking	East	1000m	North	
	am	82	37	Walking	West	1000m	North	
	am	79	40	Walking	West	1500m	North	
	am	68	16	Walking	West	800m	North	Snowmobile Tracks crossing
	am	51	34	Walking	West	700m	South	
	am	19	50	Walking	West	1000m	North	
	am	17	21	Walking	West	500m	North	
07 May		KM90	9	Grazing	West	N/A	N/a	
		KM95	5	Walking	East	500M	N/a	
08 May		KM98	7	Foraging	East	300m	N/a	
		KM86	19	Walking	West	200M	West	
		KM85	13	Foraging	West	100M	N/a	
		KM77	8	Walking	East	1000M	West	
		KM106	10	Crossing	West	0	East	
09 May		KM89	6	Na	W	100m	Na	
		KM83	15	Na	W	500m	Na	
		KM52	5	Na	E	300M	Na	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
10 May		KM90	3	Grazing	E	100m	Na	
		KM60	14	Walking	W	1KM	W	
		KM53	38	Walking	W	150M	South	
		KM16	14	Walking	W	300M	South	
		KM93	6	Walking	E	100M	E	
		KM108	23	Grazing	E	50M	Na	
11 May		KM105	5	Grazing	E	75m	Na	
		KM93	15	Na	W	700m	Na	
12 May		KM97	120	Grazing	W	800m	Na	
		KM53	15	Walking	W	800M	South	
		KM86	45	Walking	W	1300M	North	
		KM87	75	Grazing	W	900M	Na	
		KM99	8	Grazing	W	400M	Na	
		KM102	3	Grazing	E	75M	Na	
		KM95	48	Resting	W	500M	Na	
13 May		KM102	10	Grazing	E	50M	Na	
14 May		KM89	9	Grazing	E	50M	Na	
		KM64	4	Walking	W	300M	North	
		KM69	13	Walking	W	400M	Nw	
		KM86	9	Walking	W	250M	South	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
15 May		KM92	25	Sleeping	W	1KM	Na	
		KM90	7	Foraging	E	75M	Na	
		KM84	25	Walking	W	500M	South	
		KM86	11	Grazing	W	300M	Na	
		KM91	45	Walking	W	200M	South	
		KM100	15	Grazing	W	75M	Na	
		KM99	35	Walking	W	900M	South	
		KM102	20	Grazing	W	300M	Na	
		KM103	2	Grazing	W	200M	Na	
16 May		KM104	10	Sleeping	E	750M	Na	
		KM100	5	Crossing	W	NA	E	
		KM101	100	Sleeping	W	300m	Na	
		KM94	10	Sleeping	W	100m	Na	
		KM90	34	Walking	W	200m	N	
		KM85	7	Foraging	W	2000	Na	
		KM74	14	Walking	W	400m	N	
		KM93	40	Foraging	W	1000m	Na	
		KM94	40	Walking	W	200m	W	
		KM97	100+	Walking	W	500m	Nw	
		KM106	37	Sleeping	W	NA	Na	
		KM96	67	Grazing	W	500M	Na	
		KM93	12	Grazing	E	75M	Na	
		KM92	75	Grazing	W	800M	Na	

Table 1: Tolerant Caribou Observations along AWAR, 2020.

Date	am/pm	KM	Group Size	Behaviour	Side of Road	Distance from Road	Direction of Travel	Comments
		KM89	32	Walking	Na	1000M	South	
		KM86	2	Sleeping	E	400M	Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
31 March	pm	119-122	200		Crossing the road			Approximately 170 crossed from West to East
01 April	am	119-122	30		Grazing			
	am	162-165	60		Grazing			
	pm	162-165	400		Bedded Down			
	pm	155-165	200		Bedded Down			
	pm	122	50		Bedded Down			
02 April	am	165-155	200		Grazing			
	am	149	150					
	pm	115	60					
	pm	133	40					
	pm	149	80					
03 April	am	110	20					
	am	116	55	West	Walking		South	
	am	117	49	West	Walking		South	
	am	126	85	West	Walking		South	
	am	128	50	West	Grazing		Na	
	am	133	120	West	Resting		Na	
	am	136	14	West	Grazing		Na	
	am	150	125	West	Grazing		Na	
	am	154	24	West	Walking		West	
	am	158	55	West	Walking		South	
	am	160	25					
	am	163	9	West	Grazing		Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	am	166	30					
	am	176	10	West	Grazing		Na	
	pm	176	60	West	Grazing			
	pm	172	12	West	Walking		North	
	pm	135	4	East	Resting		Na	
	pm	131	57	West	Walking		South	
	pm	130	32	West	Walking		South	
	pm	128	12	West	Grazing		Na	
	pm	121	2	West	Grazing		Na	
	pm	120	2	East	Resting		Na	
	pm	116	48	West	Grazing		Na	
04 April	am	177	15	West	Walking		North	
	am	174	60					
	am	173	60		Walking		South	
	am	170	60	West	Grazing		Na	
06 April	am	174	12	West	Grazing	200m	Na	
	am	172	4	West	Grazing	800m	Na	
	am	167	20	West		800m	South	
	am	166	30	West		800m	South	
	am	133	15	West	Crossing	200m	East	
	am	133	5	East	Crossing		East	
	am	125	40	West	Running	400m		
	am	119	20	East	Crossing			
	am	119	20	West	Grazing			

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	am	110	30	West				
	pm	176	10	West		700m		
	pm	174	60			2000m		
	pm	167	20			300m		
	pm	165	25			400m		
07 April	am	110	300	West	Crossed	Na	East	
	am	116	10	West	Walking	1000m	South	
	am	117	20	West	Walking	600m	South	
	am	118	90	West	Grazing	800m	Na	
	am	125	20	West	Grazing	1000m	Na	
	am	160	15	West	Walking	700m	North	
	am	162-164	150	West	Grazing	700m	Na	
	am	166	10	West	Grazing	400m	Na	
	am	167	10	West	Grazing	700m	Na	
	am	168	10	West	Grazing	800m	Na	
	am	174	6	West	Grazing	500m	Na	
	am	176	60	West	Grazing	250m	Na	
	pm	178	60	West	Grazing	100m	Na	
	pm	175	50	West	Grazing	100m	Na	
	pm	164	150	West	Grazing	100m	South	Some small groups out to 1KM+
	pm	159	100	West	Grazing	200m	South	
	pm	158	150	West	Grazing	500m	South	
	pm	132	50	West	Crossing	Na	East	Crossed the road
	pm	125	17	West	Walking	1000m	South	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	pm	123	72	West	Grazing	700m	Na	
	pm	119	10	East	Grazing	50m	East	Crossed the road
	pm	118	35	West	Walking	800m	West	
08 April	am	178	200	West	Grazing			
	am	162	120	West	Grazing	200m	Na	
	am	161	15	West	Grazing	100m	Na	
	am	137	25	West	Grazing	1000m	Na	
	am	133	40	East	Grazing	1000m	Na	
	am	127	17	West	Grazing	1000m	Na	
	am	122	100	West	Walking	1000m	North	
	am	121	15	West	Grazing	1000m	North	
	am	120	16	West	Grazing	1000m	Na	
	am	116	16	West	Grazing	1000m	Na	
	am	111	160	West	Grazing	500m	Na	
	pm	169	100	West	Resting	1000m	Na	
	pm	163	200	West	Resting	1000m	Na	
	pm	158	100	West	Resting	2000m	Na	
	pm	137	39	West	Walking	1000m	North	
	pm	136	39	West	Grazing	1000m	Na	
	pm	125	30	West	Grazing	200m	North West	
	pm	110	15	East	Grazing	100m	Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
09 April	am	175	16	West	Walking	1000m	North	
	am	169	100	West	Resting	1000m	Na	
	am	160	50	West	Walking	500m	South West	
	am	160	100	West	Grazing	100m	Na	
	am	158	50	West	Grazing	1000m	Na	
	am	158	100	West	Grazing	2000m	Na	
	pm	177	27	West	Grazing	1000M	Na	
	pm	173	13	West	Grazing	2000m	Na	
	pm	170	26	West	Grazing	1000m	Na	
	pm	159	50	West	Grazing	5000m	Na	
	pm	133	42	West	Walking	1000m	North	
	pm	123	41	West	Walking	300m	North	
	pm	111	25	West	Grazing	300m	Na	
10 April	am	178	25	West	Walking	1000m	South	
	am	170	25	West	Running	500m	West	
	am	158	100	West	Resting	500m	Na	
	am	156	62	West	Resting	250m	Na	
	am	131	23	West	Grazing	1000m	Na	
	am	125	22	West	Walking	300m	South	
	am	119	47	West	Resting	400m	Na	
	am	111	40	West	Grazing	500m	South	
	am	110	65	West	Grazing	500m	Na	
	pm	167	23	West	Grazing	200m	Na	
	pm	164	23	Wet	Grazing	150m	North	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	pm	160	60	West	Resting	1000m	Na	
	pm	158	50	West	Grazing	250m	Na	
	pm	123	23	West	Walking	450m	North	
11 April	am	174	50	West	Walking	1500m	North	
	am	170	25	West	Running	500m	West	
	am	144	100	West	Grazing	500m	North	
	am	143	39	West	Running	700m	West	Spooked by Tractor Trailer
	am	140	40	West	Grazing	400m	Na	
	am	138	22	West	Grazing	1000m	Na	
	am	128	21	West	Grazing	500m	Na	
	am	126	72	West	Walking	700m	South	
	am	123	23	West	Walking	300m	South	
	am	120	65	West	Resting	600m	Na	
	am	117	35	West	Walking	500m	North	
	am	116	50	West	Grazing	1000m	Na	
	am	114	125	West	Grazing	400M	Grazing	
	am	112	120	West	Walking	250m	South	
13 April	am	167	110	West	Walking	300m	South	
	am	164	14		Walking	300m	South East	
	am	160	30	West	Grazing	900m	Na	
	am	158	23	West	Walking	1500m	Na	
	am	125	42	West	Grazing	300m	Na	
	am	123	160	West	Walking	700m	South	
	am	122	35	West	Grazing	1000m	West	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	am	112	49	West	Resting	250m	Na	
15 April	am	45	West	Grazing	1000m	Na	167	
	am	50	West	Walking	800m	Na	162	
	am	50	West	Grazing	25m	Na	157	
	am	58	West	Grazing	400m	Na	136	
	am	55	West	Grazing	200m	Na	123	
	am	14	East	Grazing	50m	Na	112	
16 April	am	172	30	West	Grazing	150m	Na	
	am	167	50	West	Grazing	800m	Na	
	am	161	22	West	Resting	600m	Na	
	am	160	125	West	Grazing	600m	Na	
	am	159	39	West	Resting	500m	Na	
	am	147	39	West	Walking	500m	South	
	am	141	35	West	Grazing	500m	Na	
17 April	am	158	50	West	Grazing	1000m	Na	
	am	138	19	West	Walking	600m	West	
	am	112	43	West	Grazing	400m	Na	
	am	141	35	West	Grazing	500m	Na	
19 April	am	162	13	West	Grazing	1000m	Na	
	am	160	19	West	Grazing	1000m	Na	
	am	140	18	West	Grazing	800m	Na	
	am	137	30	West	Grazing	300m	Na	
	am	136	40	West	Grazing	300m	Na	
	am	136	14	West	Milling	250m	Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	am	119	25	West	Grazing	600m	Na	
	am	115	25	West	Walking	500m	South	
	am	111	22	East	Grazing	75m	Na	
20 April	am	128	13	West	Walking	500m	South	
	am	127	43	West	Grazing	500m	Na	
	am	122	40	West	Grazing	100m	Na	
	am	111	30	West	Walking	500m	South	
21 April	am	164	30	West	Grazing	500m	Na	
	am	116	84	West	Walking	1000m	South East	
22 April	am	167	40	West	Grazing	600m	Na	
23 April	am	177	50	West	Walking	800m	East	
	am	166	20	West	Running	1000m	South	
	am	162	130	West	Resting	400m	Na	
	am	158	45	West	Grazing	1000m	Na	
	pm	169	35	West	Resting	500m	Na	
	pm	165	35	West	Grazing	250m	Na	
	pm	163	25	West	Grazing	500m	Na	
24 April	am	173	53	West	Walking	250m	North	
	am	168	13	West	Resting	150m	Na	
	am	166	21	West	Grazing	200m	Na	
	am	164	25	West	Grazing	150m	Na	
	am	138	26	West	Walking	800m	North	
	am	136	105	West	Grazing	300m	Na	
	am	132	7	West	Walking	200m	North	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
25 April	pm	178	275	West	Grazing	500m	South	
	pm	176	35	West	Resting	500m	Na	
	pm	172	34	West	Walking	600m	Na	
	pm	164	34	West	Walking	800m	South	
	pm	153	26	West	Grazing	500m	Na	
26 April	am	178	17	West	Grazing	75m	Na	
	am	164	37	West	Walking	1000m	East	
	am	147	85	West	Walking	200m	North East	
	am	138	20	West	Grazing	150m	Na	
	am	137	100	West	Grazing	300m	Na	
	am	135	35	West	Walking	50m	South West	
	am	127	23	West	Walking	200m	South	
	am	120	60	West	Grazing	150m	Na	
	am	115	90	West	Resting	200m	Na	
	am	112	200	West	Walking	250m	South	Approximately 200 cross from West to East
05 May	am	178	5	West	Na	Na	Na	
	am	168	36	West	Na	1000m	Na	
	am	164	43	West	Resting	900m	Na	
	am	151	48	West	Na	1000m	Na	
	am	150	54	West	Na	800m	Na	
	am	140	40	West	Na	600m	Na	
	am	138	60	West	Na	900m	Na	
	am	130	22	W	Walking slowly	800m	N	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	am	116	6	East	Grazing	50m		
	am	111	7	East	Grazing	100m	Na	
06 May	am	178	18	W	Na	1.5km	Na	
	am	176	21	W	Na	500m	Na	
	am	163	15	W	Na	900m	Na	
	am	158	16	W	Na	500m	Na	
	am	153	15	W	Na	1.3km	Na	
	am	146	8	W	Na	Na	Na	
	am	142	4	W	Crossing	0	East	
	am	119	7	E	Eating	300m	Na	
	am	112	6	W	Walking	400m	East	
	pm	111	22	E	Sleeping	1.5km	Na	
	pm	116	12	W	Walking	1.5km	Na	
	pm	119	7	W	Na	800m	Na	
	pm	127	15	W	Walking	500m	East	
	pm	176	32	W	Resting	1.5km	Na	
	pm	177	30	W	Grazing	300m	Na	
07 May	am	172	15	W	Grazing	Na	Na	
	am	133	19	W	Grazing	440m	Na	
	pm	111	8	W	Walking	75m	North	
	pm	130	41	W	Walking	1km	North	
	pm	134	6	W	Walking	2km	South	
	pm	150	3	W	Walking	1km	South	
	pm	158	4	W	Grazing	1.5km	Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
	pm	161	19	W	Walking	Na	Se	
	pm	161	6	W	Grazing	200m	Na	
08 May	am	134	7	E	Grazing	300m	Na	
	pm	114	50	W	Walking	200m	North	
	pm	117	14	W	Grazing	500m	Na	
	pm	124	9	W	Running	Na	South	
	pm	135	5	W	Running	1km	West	
09 May	am	178	4	W	Grazing	1.5km	Na	
	am	177	15	W	Grazing	1km	Na	
	am	155	3	W	Walking	200m	North	
	am	125	4	W	Grazing	1.5km	Na	
10 May	am	138	1	W	Grazing	1.5km	Na	
	am	120	12	W	Na	500m	Na	
	pm	133	32	W	Grazing	1.5km	Na	
	pm	119	6	E	Resting	300m	Na	
	pm	121	1	E	Grazing	100m	Na	
	pm	124	10	W	Walking	800m	South	
	pm	143	5	W	Walking	800m	North	
	pm	160	11	W	Grazing	700m	Na	
11 May	pm	116	7	E	Grazing	800m	Na	
	pm	128	23	W	Grazing	1km	Na	
	pm	137	8	W	Walking	800m	South	
	pm	155	13	W	Grazing	2km	Na	
	pm	178	75	W	Grazing	300-1km	Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
12 May	am	178	28	W	Grazing	250m	Na	
	am	163	8	W	Walking	1.5km	North	
	am	162	20	W	Grazing	2km	Na	
	am	160	15	W	Resting	1km	Na	
	am	139	15	E	Walking	800m	Ne	
	am	138	31	W	Walking	Na	Nw	
	am	124	10	E	Grazing	50m	Na	
	pm	118	7	W	Grazing	300m	Na	
	pm	125	15	W	Walking	1km	North	
	pm	126	35	W	Grazing	1.2km	Na	
	pm	129	21	W	Walking	1km	South	
	pm	120	50	W	Na	150m	Na	
	pm	159	70	W	Walking	1km	South	
	pm	178	60	W	Grazing	1km	Na	
13 May		132	8	W	Grazing	250m	Na	
		120	8	E	Grazing	100m	Na	
		161	13	W	Grazing	350m	Na	
14 May		121	8	E	Grazing	250m	Na	
		156	17	E	Grazing	1.5km	Na	
		174	4	W	Resting	500m	Na	
15 May		122	10	W	Crossing	Na	E	
		157	4	E	Grazing	500m	Na	
		121	8	E	Grazing	300m	Na	

Table 2: Tolerant Caribou Observations along WTHR, 2020.

Date	am/pm	KM	Group Size	Side of Road	Behaviour	Distance from Road	Direction of Travel	Comments
16 May		178	6	W	Walking	800m	N	
		154	5	E	Resting	300m	Na	
		135	10	W	Walking	1500m	N	
		115	20	W	Grazing	800m	Na	
		117	8	W	Grazing	200m	Na	
		125	6	W	Walking	1000m	S	
		138	5	W	Grazing	2000m	Na	
		167	10	W	Walking	800m	N	
17 May		151	5	W	Feeding	25m	Na	
		124	10	W	Walking	500m	W	
		119	8	E	Grazing	150m	Na	

APPENDIX C

Wildlife Mortality Report (Caribou)

Wildlife Incident Report Form

Date:	2020-03-02	**Time:**	14:00
Individuals involved:	Rowan Woodall	Simon Charron Bigras	
	Nancy Duquet Harvey		
Species:	Caribou		
Number, gender, age:	1, male, juvenile		
Location (description):	AWAR Km 89 3m West of road		
Location (UTM):	64 58 18.266N / 96 13 17.059W		
Digital photo numbers:			

Describe the incident or accident that occurred. Was there a threat to wildlife or human safety? What was the situation that caused it?

A caribou corpse was spotted on the AWAR road at km 89 and reported to Nancy Duquet Harvey. She forwarded the information to Rowan Woodall. Him and Simon Charron-Bigras (Environmental Technicians) went to investigate, the caribou corpse was found at the reported location, 3 meters from the road, probably gutted by animals, frozen solid. While there was no traffic or wildlife incident reported to Agnico, the proximity to road and blood splatter suggests an interaction with traffic. Further investigation is ongoing.

Describe any use of wildlife deterrents: Describe any wildlife mortality:

There was some crows eating on the carcass but they fled when the technicians approached. No deterrents used.
One Caribou corpse found, probably gutted by animals.

Describe any communication with GN-DOE:

GN-DoE Russell Toolooktook was contacted by Nancy Duquet-Harvey on March 2, 2020. It was agreed that the carcass will be retrieved and delivered to the GN Conservation Office in Baker Lake. The Wildlife Mortality Report was sent on March 3, 2020.

What immediate measures were taken to reduce risk or harm?

No immediate risk, deterrents gear was brought in case of scavenger wildlife presence.

What measures are recommended to prevent future occurrences?

Report prepared by:	Simon CB	**Reviewed by:**	Nancy Duquet-Harvey

Picture 1: Carcass distance from the road ~3m



Picture 2: Carcass had been preyed upon by scavenging animals



Picture 3: Blood around read-end of carcass



APPENDIX D

Wildlife Mortality Reports

Wildlife Incident Report Form

Date:	2020-01-21	**Time:**	15:00
Individuals involved:	Tom Thomson – Env		
Species:	Wolverine		
Number, gender, age:	N/A		
Location (description):	North of Meadowbank Camp at the North Cell Tailings Sludge Dump		
Location (UTM):	14 W 0637278 7216072		
Digital photo numbers:	See below		

Describe the incident or accident that occurred. Was there a threat to wildlife or human safety? What was the situation that caused it?

Wolverine was trying to get access under the main camp (below kitchen grease trap). The wolverine was also observed numerous times near by the front doors of main camp, the smoke shack across from the front doors of the main camp, and the Incinerator. The wolverine had a tendency to run under the steps at the main camp when deterring efforts were used. Employees were getting worried of their safety working outdoors as the wolverine had become habituated to the front door/main camp area.

Describe any use of wildlife deterrents: Describe any wildlife mortality:

Between Jan 13 and Jan 20 – Environment responded to frequent calls for the Wolverine (min. 3 a day) at the main camp near the kitchen grease trap area. A number of methods were used to deter the animal away from site (Horn of pick up truck, Bangers, Screamers, and Rubber Bullets). The opportunity to deter more aggressively with snowmobile did not present itself after receiving approval on Jan 17.

On Jan 21 @ 14:00 during a patrol – the Wolverine was seen trying to dig it's way under the skirting around the main camp by the kitchen grease trap area. The wolverine was deterred with the horn of the truck. ENV returned to the scene approximately 20 minutes later and the wolverine again was trying to access the area. ENV was able to deter with bangers out to the tailings area. ENV Coordinator Tom Thomson had a clear shot at the animal and dispatched it at 15:00.

Describe any communication with GN-DOE:

Emails exchange between Meadowbank Environment Coordinators and GN Conservation Officers of Baker Lake on January 16, 2020. Approval of more aggressive deterring methods and wildlife destruction authorization received on January 17, 2020. Report of Wildlife destruction on January 21, 2020 @ 16:00 between Rob Arsenault (GN) and Tom Thomson (MBK ENV). The animal will be brought to the GN Conservation office on January 22, 2020.

What immediate measures were taken to reduce risk or harm?

Respond to sightings immediately
Hold tool box meetings with different departments
Ensure no food waste is present
Place additional gravel at the location where animal was trying to access

What measures are recommended to prevent future occurrences?

Continue to educate departments on Wildlife interactions, food waste and attractants.
Ensure additional gravel/material is compacted and placed at any gaps between skirting around the camp and ground.

Report prepared by:	Tom Thomson	Reviewed by:	Tom Thomson

Photo 1: Material placed and where wolverine tried to access



Photo 2: Kitchen/Main camp area



Photo 3: North Cell Tailings Area

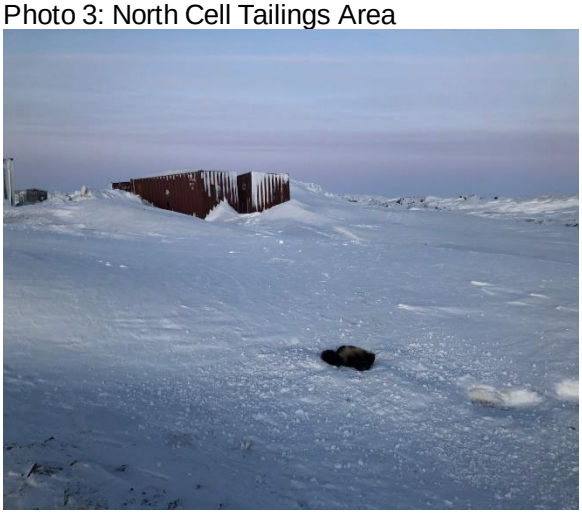


Photo 4: Wolverine





APPENDIX E

Waterbird Mitigation Project – 2020 Progress Report

AGNICO EAGLE

MEADOWBANK COMPLEX

2020 Migratory Bird Protection Report

In Accordance with NIRB Project Certificate No.008

Prepared by:
Agnico Eagle Mines Limited – Meadowbank Complex

March, 2021

EXECUTIVE SUMMARY

Through collaboration with Trent University and ECCC, research studies were initiated in 2018 to determine the effectiveness of flood mitigation measures for migratory birds in the Whale Tail South area. The three objectives of this research study were to:

1. Determine the efficacy of various audio and visual deterrents (for preventing flood-zone nesting).
2. Estimate the number of nests and the species composition lost due to the flooding.
3. Examine the behavioural response of birds to the flooding (determine whether birds re-nested or moved after the flooding events) and behavioural response to deterrents (e.g., impacts to duration on the nest).

Although the third and final field season in 2020 was unable to proceed due to COVID-related restrictions, sufficient data was collected in 2018 and 2019 to fulfill Objectives 1 and 2, and to examine various behavioural responses of birds to deterrents. The examination of behavioural response to flooding (whether birds re-nest nearby) will be examined if feasible by the Trent/ECCC research team during field studies in 2021.

Based on the results of this research study in 2018 and 2019, the tested mitigation methods were found to be ineffective in deterring nesting birds, and their continued use was not recommended by the Trent/ECCC research team. Therefore, in accordance with the updated Migratory Bird Protection Plan (March, 2020), these measures were not implemented in 2020.

Both the FEIS for the Whale Tail Pit Project (Agnico Eagle, 2016) and the FEIS Addendum for the Whale Tail Expansion Project (Agnico Eagle, 2018) made predictions for the number of nest sites estimated to be displaced by flooding in the vicinity of the Project site. Nest displacement was re-estimated here using nesting densities observed by the research team in 2018 and 2019, along with measured peak water levels during the 2018 – 2020 nesting seasons. Based on these calculations, estimated impacts of flooding on nesting birds have been lower to date than FEIS Addendum estimates, despite changes in flood rates compared to FEIS predictions.

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **II**

SECTION 1 • INTRODUCTION **1**

SECTION 2 • WATER LEVELS **2**

2.1 Whale Tail South 2
2.2 Northeast Diversion 5

SECTION 3 • MITIGATION MEASURES **8**

SECTION 4 • ESTIMATED NEST DISPLACEMENT **8**

SECTION 5 • RESEARCH STUDY SUMMARY **10**

5.1 Introduction 10
5.2 Methods 11
5.2.1 2018 Field Studies 11
5.2.2 2019 Field Studies 11
5.2.3 2020/2021 Field Studies 12
5.3 Results 12
5.3.1 Objective 1 – Effectiveness of Deterrents 12
5.3.2 Objective 2 - Whale Tail Flood Zone Impact Assessment 12
5.3.3 Objective 3 – Behavioural Responses 13
5.4 Conclusion 13

APPENDICES

Appendix A: 2020 Trent University/ECCC Study Summary Report

LIST OF TABLES

Table 1. FEIS Addendum predictions for change in flooded area and number of displaced nests in the absence of mitigation (from Agnico Eagle, 2018; Table 5.5-11). Under this Project, flooding was only planned for the Whale Tail South area. However, since flooding of the Northeast Diversion did occur in 2019, updated total nest displacement includes both flood zones. 9

LIST OF FIGURES

Figure 1. Predicted and measured water levels in Whale Tail South (2020). 3

Figure 2. Measured (single point or 3-h interval, as indicated) and predicted (monthly interval) water levels in Whale Tail South. Predicted water levels from FEIS Addendum for the Whale Tail Pit Expansion Project, Appendix 6-O, Table D-14. 4
Figure 3. Measured (3-h interval and monthly mean, as indicated) and predicted water levels in the Whale Tail South flood zone. Predicted water levels from FEIS Addendum for the Whale Tail Pit Expansion Project, Appendix 6-O, Table D-14. Monthly mean water levels are shown for the months of May, June, July and August, 2020, and plotted by the month start date. 5
Figure 4. Predicted and measured water levels in the Northeast Diversion area (2019). In 2020, this area was dewatered to permit construction of the IVR pit. 7

SECTION 1 • INTRODUCTION

In 2018, Agnico Eagle Mines Ltd. (Agnico) was issued NIRB Project Certificate No. 008 the Whale Tail site, a satellite deposit at the Meadowbank Mine. Two water diversions were constructed as part of water management activities for this project, potentially impacting nesting success in shoreline areas due to flooding.

The Whale Tail Lake (South Basin) diversion (Figure 1) was initiated through construction of the Whale Tail Dike to divert flow from Whale Tail Lake and tributary lakes through waterbody A45, just south of Lake A16 (Mammoth Lake). Flooded tributary lakes include Lake A18, Lake A19, Lake A20, Lake A21, Lake A22, Lake A55, Lake A62, Lake A63, Lake A65, Pond A-P1, and Pond A-P53. In-water construction of the Whale Tail Dike was completed September 2018, and dewatering of the North Basin of Whale Tail Lake began in March, 2019. The rise in water levels from baseline (~152.5 masl) to the FEIS-predicted maximum of 156.00 masl of this area was planned to occur throughout 2019 and 2020, causing approximately 157 ha of terrestrial flooding (Agnico Eagle, 2016). In 2018, updated modeling was conducted as part of the FEIS Addendum for the Whale Tail Expansion Project (Agnico Eagle, 2018). Acquisition of higher resolution LiDAR data allowed the Whale Tail South flood predictions to be more accurate, and these calculations determined that at peak flood of 156.0 masl, 148.5 ha of terrestrial habitat would be flooded.

The Northeast diversion consists of construction of the Northeast dike to divert Lake A46 and tributary lakes through Lake C44 in the Lake C38 (Nemo Lake) watershed. Flooded tributary lakes included Lake A47, Lake A48, Lake A113, Pond A-P38, and Pond A-P68. The main construction activities for the Northeast dike were carried out from September 2018 to February 2019. Flooding of this area occurred in spring 2019, and the estimated total flooded terrestrial area was 18 ha. In 2020, the formerly flooded waterbodies in this area were fished out and dewatered to permit development of the Whale Tail Pit Expansion Project. No future flooding in this area is planned as part of the Expansion Project.

Flooding of these two areas was determined to have the potential for incidental disturbance and destruction of migratory birds and their nests. As per Nunavut Impact Review Board (NIRB) Project Certificate No.008 Condition 34, the Migratory Birds Protection Plan (the Plan) describes how these impacts are mitigated through use of visual and audio bird deterrents, and regular sweeps by personnel to discourage nesting. Mitigation was planned to be focused between 2018 and 2020, or until water levels reach their maximum flood plain.

Since the effectiveness of deterrents used in discouraging nesting was largely unknown for the resident bird species prior to 2018, a research study was initiated to assess their effectiveness and make recommendations on deterrent use during the 2019-2020 flooding. This study was developed in collaboration with Environment and Climate Change Canada (ECCC) and Trent University.

This report describes actual measured water levels during flooding to date (2019 and 2020), the mitigation measures that have been implemented according to the Plan and estimates of nesting bird displacement due to flooding. It also provides a summary of results of the Trent/ECCC research study, with the full 2020 research report provided as Appendix A.

SECTION 2 • WATER LEVELS

2.1 WHALE TAIL SOUTH

In-water construction of the Whale Tail Dike was complete in September, 2018, and dewatering of Whale Tail Lake (North Basin) began in March, 2019, initiating the planned flooding of the Whale Tail South flood zone. Dewatering was completed in May, 2020.

Maximum predicted water levels in the Whale Tail South flood zone are shown in Figure 1 (156.0 masl), along with measured peak flood levels in 2020 (155.7 masl on June 17), and post-freshet low water levels in 2020 (155.1 masl on December 27, 2020).

Due to record rainfall, peak water levels in 2019 exceeded predictions in July, but did not reach the maximum predicted final flood level of 156.0 masl. Following discussions with NWB, Agnico temporarily pumped non-contact water from the Whale Tail South (WTS) flood zone directly to Mammoth Lake, from October 21 to December 18, 2019. Construction of the South Whale Tail Channel (SWTC) to connect Whale Tail South to Mammoth Lake was complete prior to freshet in 2020. This channel now passively manages water levels in Whale Tail South.

In 2020, water levels in Whale Tail South were predicted in the FEIS Addendum to remain near the peak flood level of 156 masl following freshet. However, just prior to its' construction in early 2020, the final design of the South Whale Tail Channel was changed to reduce its inlet invert elevation by 0.5 m (to 155.3 masl), to better accommodate flood events. Operational water levels are therefore now expected to be lower than the 156.0 masl prediction.

The progression of flooding (measured water levels) is shown in Figure 2 and 3, in relation to FEIS Addendum predictions. Figure 2 shows the long-term trend in predicted water levels in relation to available baseline, dewatering- and operations-phase measurements. However, it is noted that FEIS-predicted water levels were calculated as monthly timesteps in a mean annual water balance, whereas measured water levels are assessed every 3 hours. Measured values may therefore be expected to vary around the prediction, due to both inter-annual climate variability and scale of measurement. Figure 3 more closely examines this variability for the period since flooding began (2019) and demonstrates in particular how the very rapid flood peak that is observed during freshet with multiple daily water level measurements is substantially smoothed when monthly means are plotted for better comparison with predictions.

The anticipated impact of the observed annual water level variations on predictions for nest displacement is further discussed in Section 4.

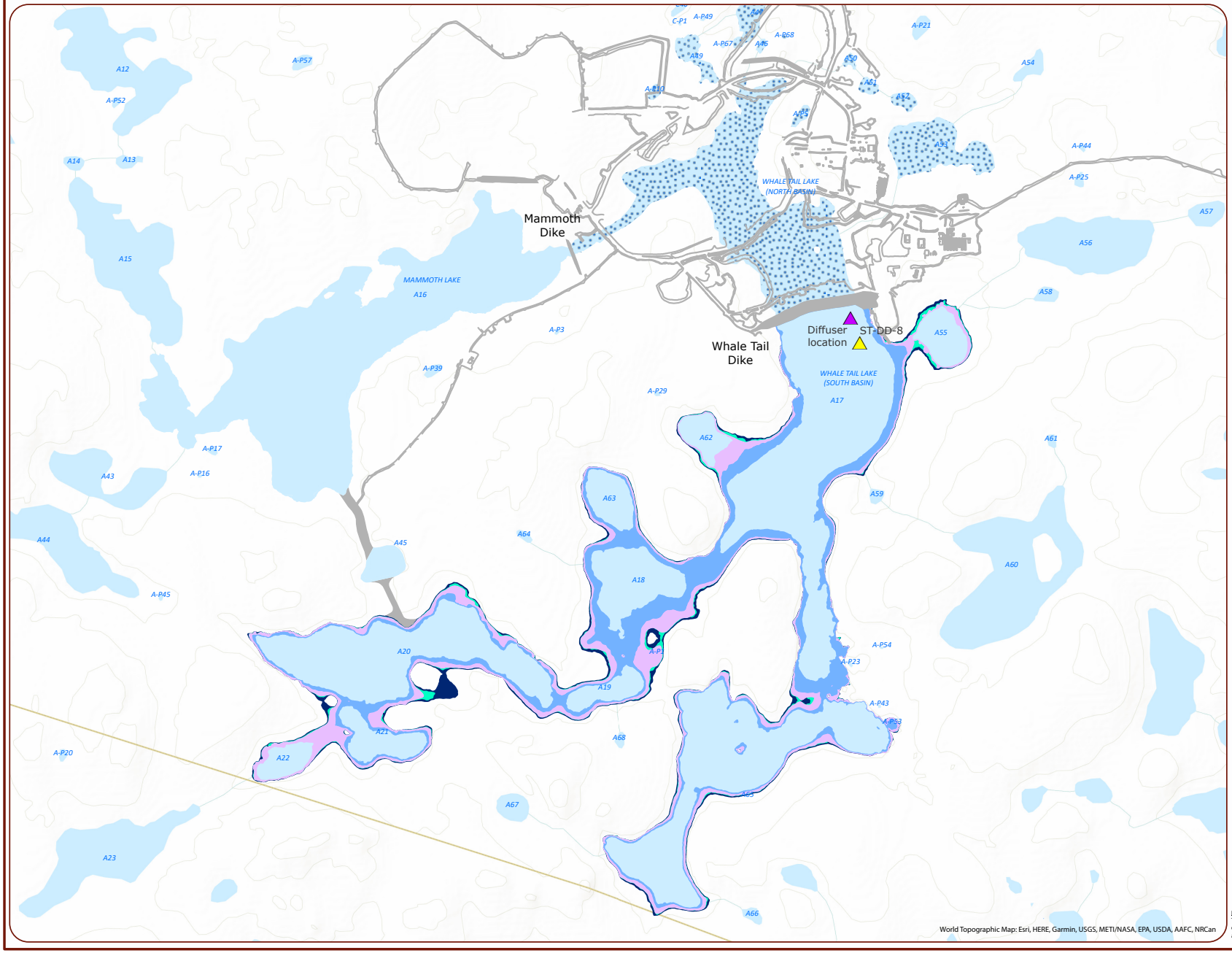
PROJECT: DA111-062-08

CLIENT: Agnico-Eagle Mines Ltd. Meadowbank Division

DATE: 12, March 2021

DRAWN BY: Janel Sauder

Figure 1: Whale Tail South Flood Zone Water Levels (2020)



Legend

- Dewatering Monitoring Locations
- Diffuser location
- Infrastructure
- Dewatered Lake

South Whale Tail Lake Elevations

- Baseline Water Level
- 2020 Post-Freshet Low Water Level (155.1 masl, December 27)
- 2020 Measured Peak Flood Level (155.7 masl, June 23)
- Measured Peak Flood Level (155.84 masl, 2019)
- Max Predicted Water Level (156 masl)

0 0.25 0.5 1

Kilometres

SCALE: 1:22,000

N

UTM Zone 17N NAD83

AGNICO EAGLE

DOUGAN & ASSOCIATES ECOLOGICAL CONSULTING BY DESIGN

Disclaimer:
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations, features, or roads, nor as a guide to navigation.

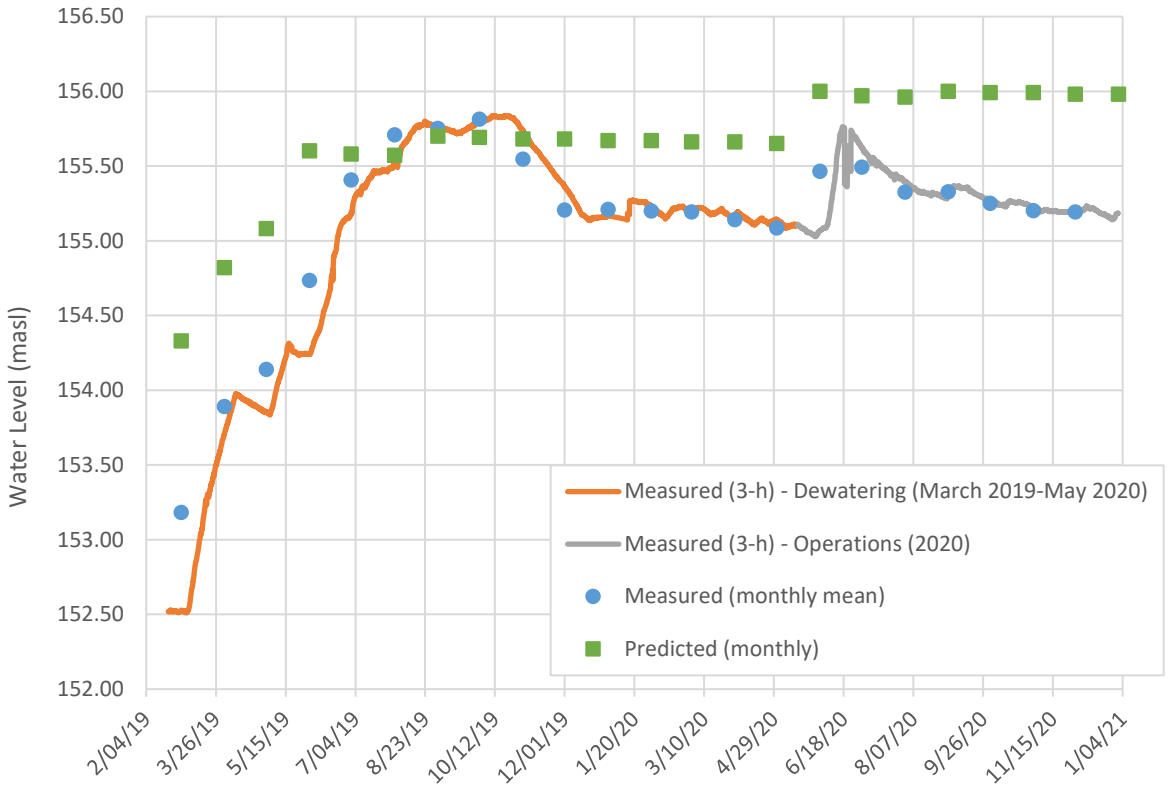


Figure 3. Measured (3-h interval and monthly mean, as indicated) and predicted water levels in the Whale Tail South flood zone. Predicted water levels from FEIS Addendum for the Whale Tail Pit Expansion Project, Appendix 6-O, Table D-14. Monthly mean water levels are shown for the months of May, June, July and August, 2020, and plotted by the month start date.

2.2 NORTHEAST DIVERSION

The Northeast Dike was constructed from September 2018 to February 2019. Maximum FEIS-predicted water levels in the Northeast flood zone are shown in Figure 3, along with measured peak flood levels in 2019, and final water levels (December, 2019). Original Whale Tail FEIS (Agnico Eagle, 2016) water management plans indicated that this flood water would increase to the maximum elevation of 156.6 masl, and then flow naturally through a tundra pond system to Nemo Lake. The maximum predicted flood level in this area (156.6 masl) was reached on July 6, 2019. At that point, it was observed that the topography toward Nemo Lake would not allow water to overflow naturally before overtopping the dike liner. As a result, following approval by NWB (see 2019 Annual Report for further details), non-contact water was pumped out of that area beginning in July, 2019, to maintain safe water operating levels against the Northeast Dike. Water was pumped from July to October 2019, and June to July 2020 towards the watershed of Nemo Lake.

Waterbodies in this area were then fished out and dewatered to permit construction of the Whale Tail Pit Expansion Project (IVR Pit area), and the Northeast Dike was dismantled. This area will undergo mine development activities, and no future flooding is planned.

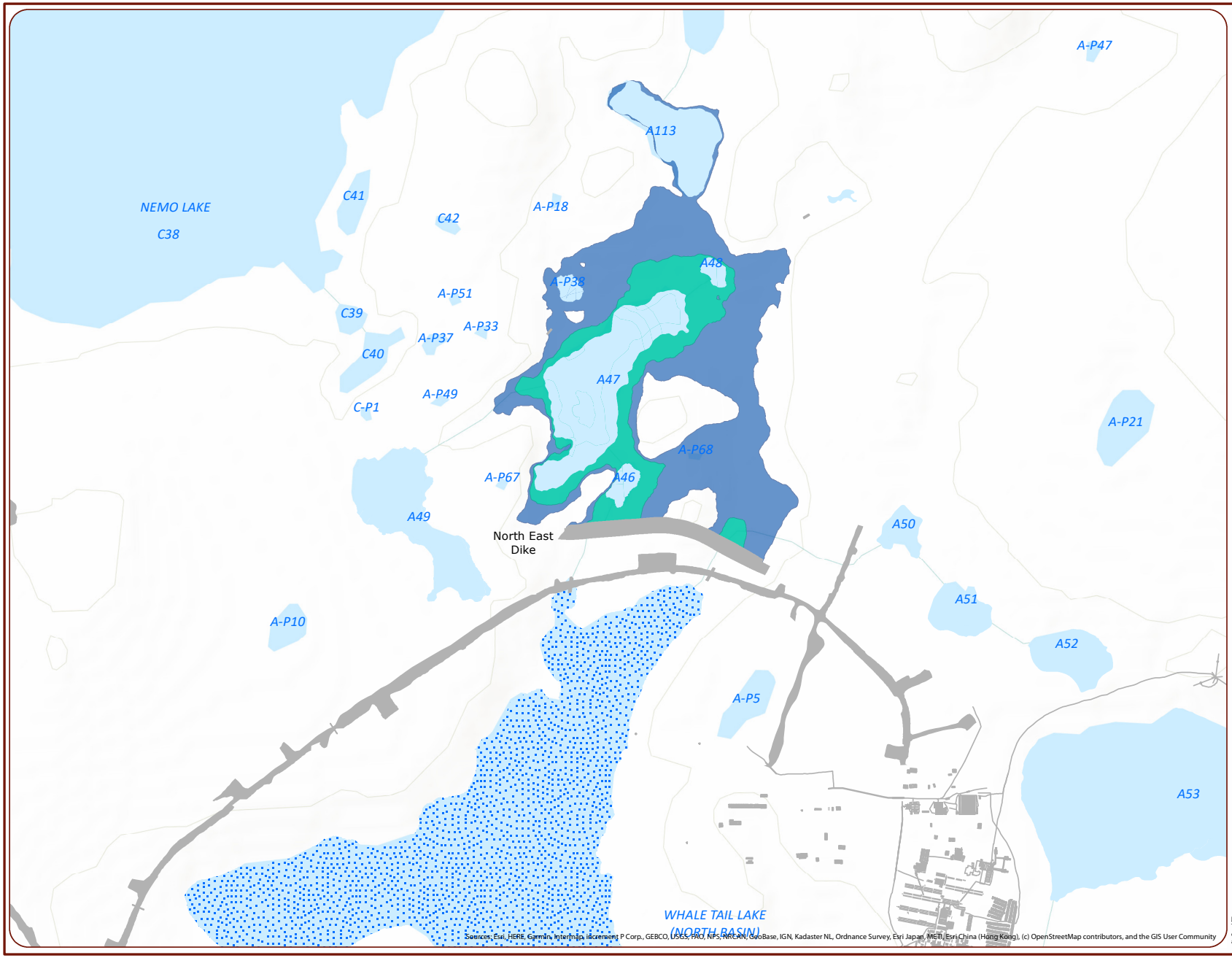
PROJECT: DA11-062-08

CLIENT: Agnico-Eagle Mines Ltd. Meadowbank Division

DATE: 12, March 2020

DRAWN BY: Janel Sauder

Figure 4: North East Diversion Flood Zone Water Levels (2019)



Legend

- Infrastructure
- Dewatered Lake

North East Diversion Lake Elevations

- Baseline water level
- Final 2019 water level (155.66 masl)
- Final predicted water level and peak 2019 water level (156.66 masl)

0 0.075 0.15 0.3

Kilometres

SCALE: 1:7,000

N

UTM Zone 17N NAD83

AGNICO EAGLE

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer:
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations, features, or roads, nor as a guide to navigation.

SECTION 3 • MITIGATION MEASURES

According to the Migratory Bird Protection Plan (Version 1; July, 2018), the following mitigation measures were planned to be implemented in 2018 and 2019 to deter nesting of waterbirds in the Whale Tail Lake and Northeast water diversion areas during flooding:

- Deploying visual and audio bird deterrents,
- Regular sweeps by Agnico Eagle staff to discourage nesting through human activity, and to move the visual and audio deterrents;
- While Agnico may in the future consider the feasibility of using habitat modification or exclusion techniques within the flood zone in consultation with ECCC and academic institutions, these methods are not part of the primary mitigation plan.

In the 2018 nesting season, no flooding had yet occurred, so no measures were implemented.

During the 2019 nesting season, mitigation measures were implemented in collaboration with academic partners at Trent University. The crew from Trent University deployed audio and visual deterrents throughout selected plots within the Whale Tail South flood zone (Appendix A) between June 16 and 17, 2019. These were the earliest dates logistically feasible, based on weather conditions (primarily the need to wait for snowmelt). At this time, water levels were at 154.68 masl in Whale Tail South Basin, or approximately 2 m above baseline levels. Deterrents consisted of 20 x 20 m flash tape grids, and audio deterrents. Flood-zone plots were surveyed every four days between June 16 and July 14, for a total of 148 hours of sweeps within the flood zone during the 2019 nesting season. No deterrents were deployed within the Northeast flood zone, since water levels were already near their maximum predicted elevation (156.6 masl) at the beginning of the nesting season (156.3 masl on June 14, 2019).

In March, 2020, the Migratory Bird Protection Plan was updated (Version 3) according to the results of the Trent/ECCC research study in 2018 and 2019. The tested methods were found to be ineffective in deterring nesting birds, and their continued use was not recommended by the Trent/ECCC research team. Therefore, in accordance with the updated Plan, and because flooding was identified to be near complete in 2019[1], these mitigation measures were not implemented in 2020.

SECTION 4 • ESTIMATED NEST DISPLACEMENT

As described in the Whale Tail Pit Project FEIS (Agnico Eagle, 2016), a total of 10 waterbird nests and 88 upland bird territories were predicted to be displaced by flooding of 176 ha in the Whale Tail South and Northeast Diversion areas combined, if no mitigation was undertaken (TEMP Version 5, June 2018;

[1] Agnico Eagle response to ECCC Comments on the 2019 Annual Report to the NIRB (August 21, 2020). Available through the NIRB Public Registry (ID 331212).

Appendix F, Section 2.1). This prediction was made by extrapolating data from limited shoreline surveys conducted in 2015/2016 (98 nests/1.76 km^2 = 56 nests/km^2 or 0.56 nests/ha).

Updated assessments in the FEIS Addendum (Agnico Eagle, 2018) refined the estimate for the Whale Tail South flood zone as shown in Table 1. A total of 89 nests, or 0.6 nests/ha in 148.5 ha of flooding were expected to be displaced based on a maximum water elevation of 156.0 masl in 2021 (86 nests by 2020). No impacts were predicted for the Northeast Diversion area, since flooding of this area was no longer planned under the Whale Tail Expansion Project. Since flooding of this area did occur in 2019 under the Whale Tail Pit Project, prior to permitting of the Expansion Project, estimates of nest displacement made here for both diversion areas combined are conservatively compared to FEIS Addendum predictions for total nest displacement. The progression of flooding in each area and updated calculations for total nest displacement are further discussed below.

Table 1. FEIS Addendum predictions for change in flooded area and number of displaced nests in the absence of mitigation (from Agnico Eagle, 2018; Table 5.5-11). Under this Project, flooding was only planned for the Whale Tail South area. However, since flooding of the Northeast Diversion did occur in 2019, updated total nest displacement includes both flood zones.

Nesting Year	FEIS Addendum Predictions			Updated Calculations	
	Predicted Change in Flooded Terrestrial Area (ha)	Annual Additional Nest Displacement from Sequential Flooding	Total Nest Displacement	Annual Nest Displacement	Total Nest Displacement
2018	2.24	3	3	0	0
2019	+108.26	+62	65	+23-46	23 – 46
2020	+34.66	+21	86	+9 - 16	32 - 62
2021	+3.34	+3	89	-	-
2022	+0	+0	89	-	-

Estimates of nest displacement were updated for 2018 – 2020 (Table 1) based on nest densities observed by the University of Trent/ECCC research team in 2018 and 2019 (0.31 and 0.16 nests/ha, respectively – see Section 5.3.2) and measured peak water levels during each nesting season of May - August. Flooded terrestrial areas for measured water elevations were determined from FEIS Addendum modelling (Appendix 6-F).

In 2018, no flooding occurred so no nests were displaced.

In 2019, dewatering of Whale Tail North was initiated, and flood levels for the Whale Tail South area reached a maximum of 155.8 masl during the nesting season (May – August), flooding approximately 129.5 ha compared to 2018 baseline water levels (152.5 masl), and displacing an estimated 20.7 – 40.1 nests at the nest density rate of 0.16 – 0.31 nests/ha observed by the Trent/ECCC research team. For the Northeast Diversion area, peak flood occurred during the nesting season on July 6, 2019 (156.7 masl), flooding approximately 18 ha and displacing an estimated 2.7 – 5.6 nests based on the nest density observed by the research team. It is noted however that the estimates of nesting density in 2018 and 2019 were for the Whale Tail South area, and no updated estimates were conducted for the Northeast Diversion area. In total, 23 – 46 nests are estimated to have been impacted by flooding in 2019, assuming the applied mitigation measures (nesting deterrents) were ineffective and displaced birds were not able to successfully nest outside the flood zone.

In 2020, dewatering of waterbodies to Whale Tail South continued until May, but volumes were limited compared to 2019. Flood levels in Whale Tail South were at 155.1 masl prior to initiation of the nesting season (May 15[2]). They peaked during the nesting season at 155.7 masl on June 17. This degree of fluctuation in water levels appears to be within natural variation (2015 baseline measurements varied by 0.8 m within the year – Figure 2), and may be expected to continue annually. However, since some dewatering of Whale Tail North did occur in 2020 and for consistency with the FEIS schedule of predictions, impacts to nests of the 2020 flooding during freshet are calculated here. The rise in water levels from 155.1 masl on May 15 to a peak of 155.7 masl on June 17 is estimated to have flooded approximately 52 ha, displacing an estimated 8.3 – 16.0 nests. In the Northeast flood zone, water level measurements did not begin until near ice-off (June 12). From this date, however, no increase in flood levels occurred, as water levels were maintained during June and July for operational purposes, and then this area was dewatered to permit construction of the IVR pit.

Based on these calculations, impacts of flooding on nesting birds to date (Table 1; up to 62 nests) appear to have been lower than FEIS Addendum estimates (up to 86 nests), despite some changes in flood patterns compared to FEIS predictions. FEIS Addendum estimates for nest displacement assumed no mitigation was implemented (Agnico Eagle, 2018; Table 5.5-11), and that mitigation plans would be confirmed in consultation with ECCC. This consultation lead to development of the Trent/ECCC research study, through which audio and visual deterrents were deployed for testing throughout selected plots within the Whale Tail South flood zone during the primary flood season (2019). Through this study, these deterrents were later determined to be largely ineffective (see Section 5.3.1).

These estimates of nest displacement do not differentiate between nests that are lost directly from inundation and potential losses due to territory flooding, and therefore are useful for providing a conservative estimate of impacts. However, final estimates of the number of nests lost due to flooding through direct inundation are still being calculated by the Trent/ECCC research team. These results, along with the analysis of behavioural response to flooding (whether birds re-nested or moved after the flooding events, to be evaluated in 2021 via field studies by the research team, if feasible), will provide a further indication of the actual impacts of flooding on the local breeding bird population.

SECTION 5 • RESEARCH STUDY SUMMARY

5.1 INTRODUCTION

In order to determine the effectiveness of mitigation methods aimed at reducing impacts of Whale Tail site flooding on waterbirds, Agnico is conducting a 3-year study in partnership with Environment and Climate Change Canada (ECCC) and Trent University. Through this project, Agnico is also contributing to advancing the scientific understanding of conservation methods for at-risk species.

The objectives of the research study are primarily to:

1. Determine the efficacy of various audio and visual deterrents for preventing flood-zone nesting.

[2] FEIS Addendum Appendix 6-F indicates the migratory bird nesting season extends from May 17 – August 15.

2. Estimate the number of nests and the species composition lost due to the flooding.
3. Examine the behavioural response of birds to the flooding (determine whether birds re-nested or moved after the flooding events) and behavioural response to deterrents (e.g. impacts to duration on the nest).

5.2 METHODS

5.2.1 2018 Field Studies

A complete summary of 2018 field studies prepared by the research team from Trent University was provided in the 2018 Migratory Bird Protection Report.

Briefly, the objectives of the 2018 field study were to collect preliminary data to assess the effectiveness of visual deterrents in changing bird behaviour during nesting. This portion of the study was carried out at test plots without flooding along the Whale Tail Haul Road (Objective 1). Researchers also collected baseline data on nest abundance in the water diversion flood zones (Objective 2).

Objective 1 – Effectiveness of Deterrents

The field team assessed 21 plots along the Whale Tail Haul Road between the Amaruq Camp and kilometer 163 (formerly km 48) over a 6-week period, beginning June 4, 2018. Plots were chosen with the use of Ecological Land Classification maps and ground truthing. Plots are 200 x 300 meters (6 ha), covering a mix of low-lying wet sedge habitat types representative of the habitats that will be flooded around Whale Tail Lake. The purpose of the plots was to allow spatially-independent samples in which to test deterrents.

Deterrents were planned to be set up prior to bird arrival, to assess differences in nesting between sites, but delays in shipment meant they were not erected until late June. As a result, changes in behaviour of individual birds after set-up of deterrents was assessed. Due to delays in shipment of audio deterrents, their effectiveness could not be assessed in 2018.

Objective 2 – Whale Tail Flood Zone Impact Assessment

Research teams surveyed five general areas the eventual Whale Tail area flood zones over 8 days during peak incubation (June 24 – July 2, 2018). Within the North East Diversion flood zone, a total of 15 nests were found over two days of surveying and within the Whale Tail Diversion flood zone a total of 35 nests were found over 6 days of surveying (see figures in 2018 Migratory Bird Protection Report, Appendix A for locations).

Out of the 50 nests, 30 individual birds of 4 species were banded with individual markers so that they may be identified in the 2019 field season, to determine if they breed nearby once they are prevented from returning to their breeding territories by flooding.

5.2.2 2019 Field Studies

A complete summary of 2019 field studies prepared by the research team from Trent University is provided in the 2019 Migratory Bird Protection Report.

Objective 1 - Effectiveness of Deterrents

At the beginning of the 2019 study season (June 5 – 14), audio and visual deterrents were placed in the same experimental plots established in 2018 along the Whale Tail Haul Road (n = 15 plots).

Experimental plots (300 m x 200 m) were divided into two types of treatment and control plots. Treatment 1 consisted of audio deterrents playing a mix of predatory and distress calls paired with a 20 x 20 m grid of Mylar® flash tape and a Jackite© hawk kite effigy. Treatment 2 consisted of audio deterrents with the use of Jackite© (a hawk kite effigy) only. Control plots had no deterrents present.

Nest and territory densities were compared between 2018 and 2019 using a before-after control-impact design.

Objective 2 - Whale Tail Flood Zone Impact Assessment

During the 2019 field season, sixteen (16) 6-ha plots within four study locations were assessed for migratory bird presence in relation to active flooding and presence of deterrents. Deterrents were placed in the treatment plots (n = 4) within the active flood zone between June 16 – 17, 2019, and nest surveys were conducted every four days until July 14.

Objective 3 – Behavioural Responses

In 2019, monitoring was also conducted to assess behavioural responses to deterrents for the four main study species (Lapland longspur, horned lark, semipalmated sandpiper, and least sandpiper). Behavioural response metrics included territory mapping, nest fate/success, incubation duration, and distance of nesting relocation.

5.2.3 2020/2021 Field Studies

Field studies were planned to continue in 2020 as follows. However, due to COVID-related restrictions, this field season was cancelled. Analyses of data collected in 2019 by the Trent research team continued, particularly to assess observed behavioural responses to deterrents. The originally planned 2020 field study is described below. This work will be completed in 2021 by alternate research team members from Trent University, if feasible, depending on personnel availability and COVID-19 restrictions:

Objective 3 - Behavioural Responses

The study will continue to determine the re-colonisation time of nest densities in the flooded area post-flooding. This will require the monitoring of the 16 plots within the flood zone surrounding Whale Tail Lake. The project is interested in visiting the 16 plots within the flood zone to determine nest densities post-flooding, and to understand how nesting birds react the elimination of previously suitable habitat. Another focus will be to determine how bird densities change between years as the water line moves, and how elevation factors into the selection of nest sites. This will be accomplished by visiting at least 8 of the plots, located on the Eastern shore of Whale Tail Lake and its tributaries (WT1 and WT2).

5.3 RESULTS

5.3.1 Objective 1 – Effectiveness of Deterrents

Complete results describing the effectiveness of the tested deterrents are provided in Appendix A. These results demonstrate that the deterrents had limited success in dissuading birds from nesting, were relatively cost- and labour-intensive, and posed possible risks to other wildlife from entanglement.

As a result, continued use of the deterrents was not recommended for the Whale Tail site.

5.3.2 Objective 2 - Whale Tail Flood Zone Impact Assessment

During the 2018 survey of the Whale Tail study area, a density of 0.31 territories/ha was observed, with an average initiation date of June 16. Upon arrival at the Whale Tail sites in 2019, a vertical shoreline loss of 40 m (or about 1/3) of terrestrial land for plots within the planned flood zone was estimated, which occurred as a result of Whale Tail North dewatering and flood initiation in late winter. Because of this, about half of the proposed flood area plots were under water prior to the nesting season. In 2019, control plots adjacent to the flooded plots had an average density of 0.156 territories per ha. The densities in the control plots surrounding Whale Tail Lake thus decreased by 0.109 territories per ha between 2018 (pre-flooding) and 2019 (post-flooding).

During the flooding, 6 nests of 3 species were documented as lost due to direct impacts of the high water (an average minimum loss of 0.038 nests per ha). A maximum loss of 0.197 nests per ha was estimated based on the original estimated density of 0.31 territories per ha. Despite the nest loss due to flooding and a significant amount of habitat loss, nests found within the proposed flood zone plots had an estimated nest success rate of 56% in 2019.

Direct nest loss due to flooding using measured water levels is still being calculated by the Trent/ECCC research team and results will be provided in subsequent annual reports.

5.3.3 Objective 3 – Behavioural Responses

Behavioural responses of nesting birds to deterrents were assessed using temperature probe data collected in 2019. Results from temperature probe data suggested that, after controlling for environmental and temporal variation in incubation behaviour, birds exposed to deterrents had a significantly increased frequency of breaks in incubation (“off bouts”) compared to birds in control plots, but no difference in the total proportion of time spent off the nest per 12 hour period (i.e., more and shorter incubation recesses). This suggests that birds in treatment plots were disturbed and pushed off their nest more often than birds nesting in control plots. However, despite these behavioural responses to disturbance from the deterrents, birds did not abandon nests, nor was their nest success impacted in comparison to birds nesting in control plots.

Behavioural responses of birds to flooding (distance of displacement) will be assessed by the research team if feasible in 2021, depending on availability of personnel and restrictions related to COVID-19.

5.4 CONCLUSION

In summary, this project demonstrated that Arctic-nesting birds are not easily discouraged from nesting in their preferred locations and show limited responses to visual and audio deterrents. Based on the limited success, the cost of the equipment and the labour required to deploy and maintain, these methods were not recommended for mitigating nest loss in the future.

This research will culminate with a four-chapter MSc dissertation by Gill Holmes at Trent University, expected to be completed by May 2021, including the outstanding assessment of direct nest loss.

The final objective to assess behavioural response of birds to flooding will be completed by the research team in 2021 if feasible (depending on personnel availability and restrictions under COVID-19).

APPENDIX A

2020 Trent University/ECCC Study Summary Report

Waterbird Mitigation Project, Agnico Eagle Mines Ltd

2020 Progress Report



Gillian Holmes

MSc. Student, Trent University

Trent University, Environment and Climate Change Canada, Agnico Eagle Mines Ltd.

Table of Contents

Table of Contents……i

List of Appendices……ii

Introduction…….. 1

Project Overview…… 2

Year 2 – 2019 Overview…….. 3

Methods…… 4

Objective 1. Efficacy of Deterrents…… 4

Objective 2. Flood Zone Impact Assessment…….. 7

Objective 3. Bird Behaviour Response…… 10

Nest and Territory Monitoring…… 10

Marking and Re-sighting…… 11

Results…… 12

Objective 1. Efficacy of Deterrents…… 12

Cost and Maintenance of Deterrents…….. 13

Objective 2. Flood Zone Impact Assessment…….. 15

Objective 3. Bird Behaviour Response…… 16

Discussion……17

References…….. 21

Appendix…… 23

Appendix l…….. 23

List of Appendices

Appendix I……. 22

Introduction

Mining and other forms of resource development frequently result in disturbance to wildlife that is difficult to avoid. Technological options to mitigate these impacts are therefore of great interest to resource developers and conservationists alike. Mining is an important economic driver in the north by providing jobs for people living in northern communities (Cameron and Levitan 2014; Belayneh et al. 2018). In Nunavut alone, 18% of the gross domestic product in 2014 was associated with resource extraction (AMAP 2017). Mineral, oil and gas exploration is expected to increase throughout the Arctic landscape (A.T. Kearney Inc. 2015), leading to land use changes and disturbance of important habitat for wildlife (Wilson et al. 2013). Resource extraction can have detrimental impacts on habitat quality through the modification of landscapes, increased pollutants, and human disturbance (Reijnen et al. 1997; Johnson et al. 2005; Hassan 2016). Studies from Hof et al. (2017) have demonstrated that arctic-nesting birds are especially vulnerable to climate change; with the increase of resource extraction in arctic landscapes leading to additional loss in nesting habitat there is an even greater probability of future species loss (Gajera et al. 2013; Bernath-Plaisted and Koper 2016). Finding a balance between conservation and economic growth is crucial in vulnerable landscapes such as the Arctic, particularly when faced with climatic change (Wauchope 2016).

This report outlines progress made on the Waterbird Mitigation Project during 2020. As for most researchers around the world, our **2020 field season was cancelled due to the Covid-19 global pandemic.** Nevertheless, we were able to make significant progress on analysis and interpretation of results regarding the efficacy of bird deterrents.

Project Overview

Agnico Eagle Mines Ltd. is currently developing the Whale Tail Project, approximately 130km North of Baker Lake, NU. The project included the construction of two dykes within the northern portion of Whale Tail Lake that diverted water from the Whale Tail mining pit into the surrounding lakes and tributaries. This resulted in flooding that elevated the water levels by 4 m above current levels over two years between 2019 and 2020, flooding approximately 157 ha of tundra during the breeding season for arctic birds. The Migratory Birds Convention Act (1994) prohibits the harm of migratory birds and the disturbance or destruction of nests and eggs. Therefore, the company is committed to avoiding or minimizing this harm and developing mitigation strategies.

As part of a collaboration between Trent University, Environment and Climate Change Canada and Agnico Eagle Mines Ltd., this project explored mitigation options for flooding during the construction phase of the Whale Tail Pit. Mitigation options sought to deter birds from nesting in high risk areas, so that the impacts from mining-induced flooding or other localized disturbances could be minimized.

Through the use of both experimental and observational approaches, the objectives of the research were to (1) determine the most effective bird deterrents and the manner in which these deterrents should be applied, (2) assess the degree of risk posed to nesting migratory birds by mining-induced flooding and estimate the number of nests and the species composition lost due to the flooding and (3) examine the behavioural response of birds to the flooding, to determine whether birds re-nested or moved after the flooding events.

Year Two - 2019 Overview

The 2019 field season began on May 23rd with the arrival of Gill Holmes (MSc. Candidate) and technician, Sophie Roy. Late May tasks included assembling the audio deterrents and troubleshooting problems that arose in the field, testing visual deterrents in the field and preparing the other equipment required for the season. Three more technicians arrived on the 1st of June and 3rd of June including Amy Wilson, Joanne Hamilton and Sarah Bonnett.

When the crew arrived on site, flooding had already occurred. Although Whale Tail Lake was frozen, there was a drastic change in the riparian zone edge due to the late winter flooding of Whale Tail Lake's southern basin. Snow melt occurred in the first week of June, with an unexpected snowstorm on the 9th of June, blanketing the landscape with an estimated 8 cm of snow. Whale Tail Lake began to thaw between early- and mid-June, revealing signs of water level changes on the land (Figure 1).



Figure 1: Examples of the shoreline flooding due to the diversion into the southern basin of Whale Tail Lake. Top: A view ground view of the flooding at Whale Tail Three site, Amaruq Mining Camp in the background. Bottom: An above view of the flooding at Whale Tail Three site. Please refer to Figure 4 for detailed map of the Whale Tail site.

Deterrents were deployed between 6 and 17 June, slightly later than planned due to late arrival of gear and the heavy snow on 9 June. The field crew departed the site on 19 July, for a field season length of 57 days.

Methods

Objective 1. Efficacy of Deterrents

Deterrents were tested through a Before-After Control Impact experimental design, carried out along the Amaruq Road. A total of 15 plots (300 m x 200 m) were established during 2018 within 1 km of the Amaruq Road, between the 5 - 14 June (Figure 2). These plots were selected as 5 groups of three, with each group containing two treatment plots (High Intensity Treatment and Low Intensity Treatment, Table 1) and one control plot. In 2018, no deterrents were applied, representing the "before" phase of the experimental design. In 2019, the High Intensity Treatment consisted of audio deterrents playing a mix of predatory and distress calls paired with a Jackite© predator effigy placed in the centre of the plot, and Flash Tape grid covering the entire plot, with tape deployed every 20 m in both directions (Table 1). The High Intensity Treatment was chosen to potentially be the most effective at deterring breeding birds, but was also the most labour-intensive. The Low Intensity Treatment consisted of audio deterrents and an effigy only, and was selected as a less labour-intensive option (Table 1). Control plots contained no deterrents.

Were made repeated visits to the plots to map out the locations of territorial birds, and to attempt to find all nests. For mapped territories, we calculated the proportion of the territory within each plot. In cases nests were found but territories could not be mapped, we assumed that the territory was centred on the nest and had a size equal to the average territory size for the species in our data. We compared territory densities in control and treatment plots between years using a linear mixed-effects model (lmer in R), with Year, Treatment and their interaction as fixed effects. In this BACI design, the deterrents are effective at reducing birds' nesting densities if there is a statistically significant interaction effect

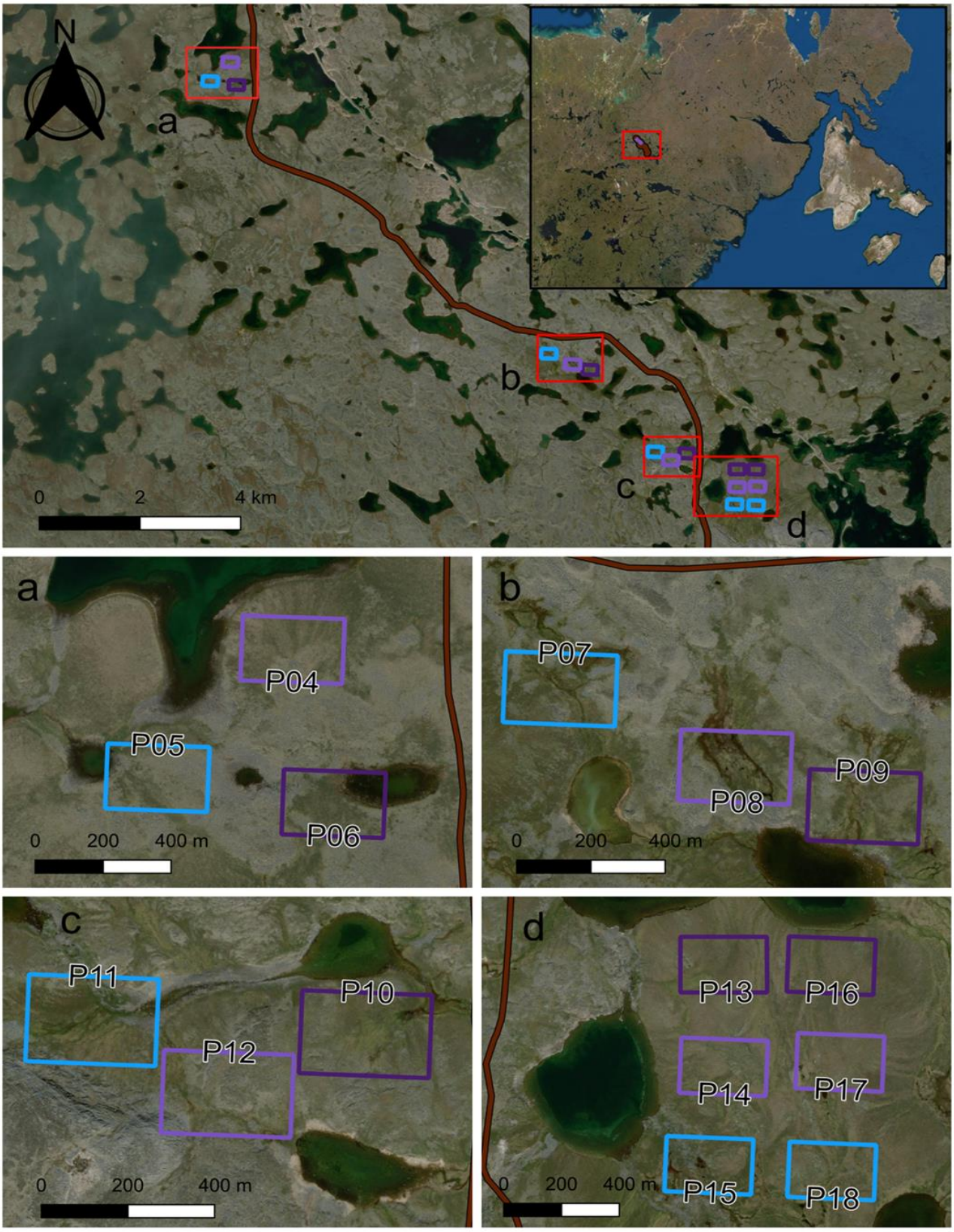


Figure 2: Map of study site Amaruq Road sites located north of Baker Lake, Nunavut along Amaruq Road between Amaruq Mine and Meadowbank Mine run by Agnico-Eagle Ltd. Top map shows the general study area, while the bottom four panels show the five groups of three plots, with dark purple representing High Intensity Treatment, light purple representing Low Intensity Treatment and light blue representing the Control. The site is split by location, with five separate clusters; (a) Cluster One includes plots 4, 5 and 6, (b) Cluster Two includes plots 7, 8, and 9, (c) Cluster Three includes plots 10, 11, and 12, and (d) Cluster Four, includes plots 13, 14, 15, and Cluster Five includes plots 16, 17, and 18.

Table 1: Description of the three treatment types deployed within the plots located within two study sites; the Amaruq Road Sites and Whale Tail Sites. Details include an outline of equipment, description of use, and frequency of use.

Treatment Name	Location	Deterrents Use
High Intensity Treatment	Amaruq Road Sites	• Audio Deterrents: "Super BirdXpeller ® PRO" by Bird-X, Inc. Speakers broadcasting all at once with recordings played randomly in non-sequential order, continuously for 24 hours at 10 - 30-minute intervals. • Hawk Effigy: "Peregrine Falcon Kite" by Margo Supplies. • Flash tape Grid: 20x20m grid.
Low Intensity Treatment	Amaruq Road Sites	• Audio Deterrents: "Super BirdXpeller ® PRO" by Bird-X, Inc. Each speaker broadcasting one at a time with recordings playing in sequential order continuously for 24 hours at 5 - 10-minute intervals. • Hawk Effigy: "Birds of Prey Falcon Kite" by Sutton Agricultural Enterprises. • Flash tape Grid: None
Treatment	Whale Tail Sites	• Audio Deterrents: "Super BirdXpeller ® PRO" by Bird-X, Inc. Speakers broadcasting all at once with recordings played randomly in non-sequential order, continuously for 24 hours at 10 - 30-minute intervals. • Hawk Effigy: None • Flash tape Grid: 20x20m grid.

between the treatments and years, with 2019 (post-treatment) showing lower densities in the treatment plots but not the controls. Because plots were selected in groups of three, we added a random effect for group to the model to account for potential non-independence. We also included the number of hours spent nest searching and monitoring in the plots, as an offset to account for variable search effort. This offset accounts for potential bias that might have arisen because we spent more time in plots assigned as High Intensity Treatment than in other plots, because of the frequent need to maintain the deterrents. We conducted analyses on the following groups of birds: All four study species combined (Figure 3), shorebirds only (Semipalmated Sandpiper, *Calidris pusilla*; and Least Sandpiper, *Calidris*

minutilla) and individually for Lapland Longspur (*Calcarius lapponicus*) and Horned Lark (*Eremophila alpestris*). We excluded all other species with much lower rates of encounter from the analyses of male territory density.



Figure 3: Four main study species, left to right; Lapland Longspur, Horned Lark, Semipalmated sandpiper, Least sandpiper.

Objective 2. Flood Zone Impact Assessment

During the 2018 field season, the predicted flood site (Figure 4) was surveyed for nests between 24th and 25th of June and 29th June – 2nd of July for a total of 40 search hours. These surveys were conducted to obtain an estimate of the densities of breeding birds that would be exposed to the flooding event. The dates were towards the end of the nesting season, later than ideal, due to limited access to the sites. After the initial survey, we divided the Whale Tail site into four main flood zone areas (Figure 5). These areas were selected based on habitat quality (predominantly sedge meadow), and low elevation, and were most likely to support breeding birds that would be impacted by the flooding.

The 2018 survey consisted of four surveyors, each separated by 10 – 20 m, walking parallel to the edge of the lake, and within the proposed flood zone (as described in Appendix 6-F - Flooding During Phases report by Golder Associates and AEM). Surveyors walked together, while watching the ground, to observe flushing birds or other breeding activity. When a bird was observed, all surveyors stopped, and one or more surveyors attempted to find the nest by waiting for the bird to return to its nest, or by searching the area where the bird was initially observed. We used a Garmin© GPS to mark each nest found, and observations and notes were written in a field notebook. Nest locations were plotted in a

QGIS (3.16.0) to ensure that they fell within areas proposed for flooding. Nest densities around Whale Tail Lake were estimated based on nests found during the 2018 surveys, with an estimated 3.4 territories per hectare, within the proposed flood zone of 157 ha.

During the 2019 field season, the four Whale Tail site areas were divided into 2 separate plots of approximately 6 ha, with the addition of two adjacent plots outside of the predicted flood zone to be used as control plots (Figure 5). In each area, the two plots within the flood zone were assigned to either a deterrent treatment, or a no deterrent treatment. The deterrent treatment included a flash tape grid and audio deterrents. Deterrents were placed in the treatment plots (n = 4) between the 16 -17 June 2019. Plots outside the flood zone were considered control plots, with no deterrents applied and no flooding occurring. Whale Tail site plots were surveyed every four days, between the 16 June - 14 July, for a total of 148 search hours within the proposed flood zone and adjacent control plots.

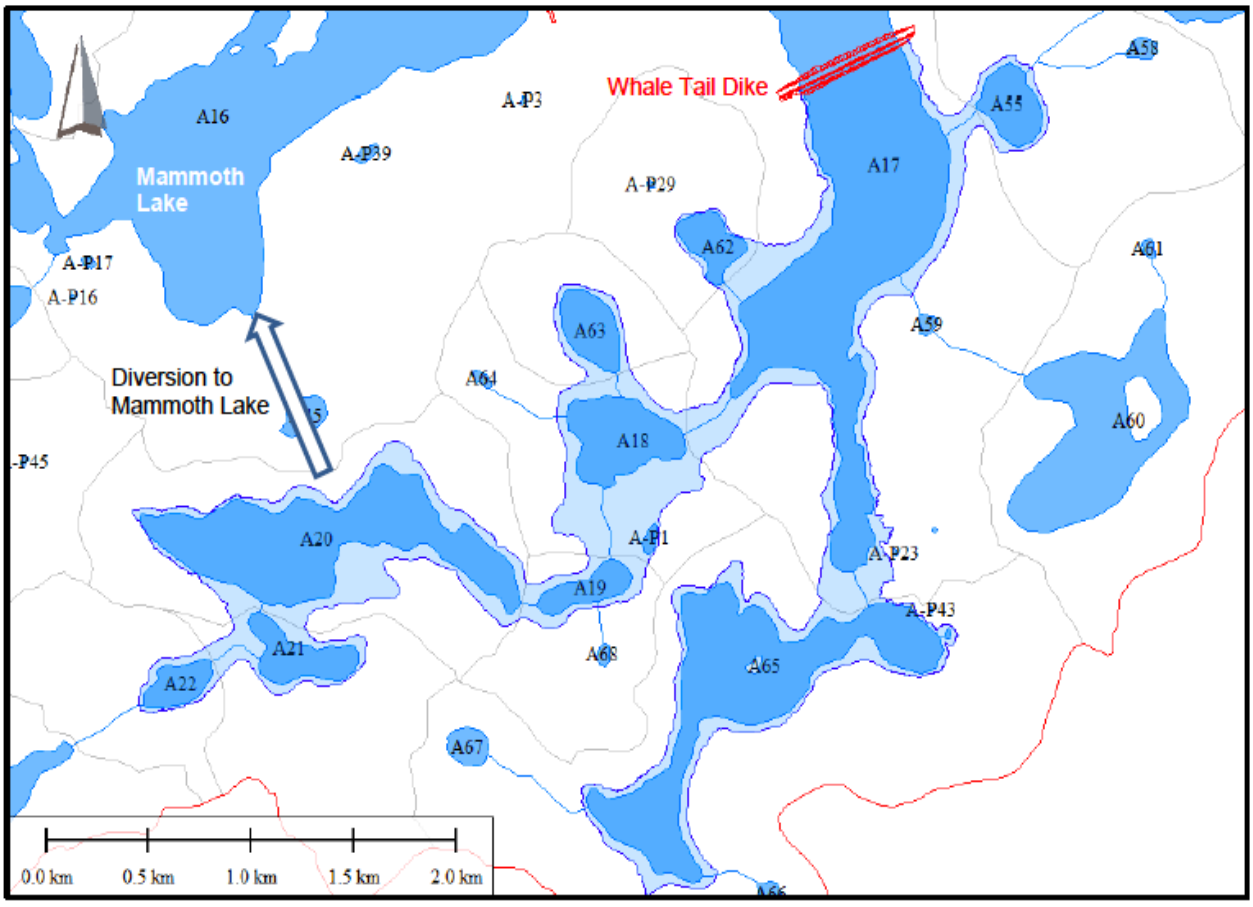


Figure 4: Map of Whale Tail Lake and its adjacent lakes and tributaries including the boundary of the proposed flood area in light blue. Taken from Golder Associates and Agnico Eagle Ltd. June 2016 Vol. 6 Freshwater Environment Report, Appendix 6-F, Flooding During Phases.

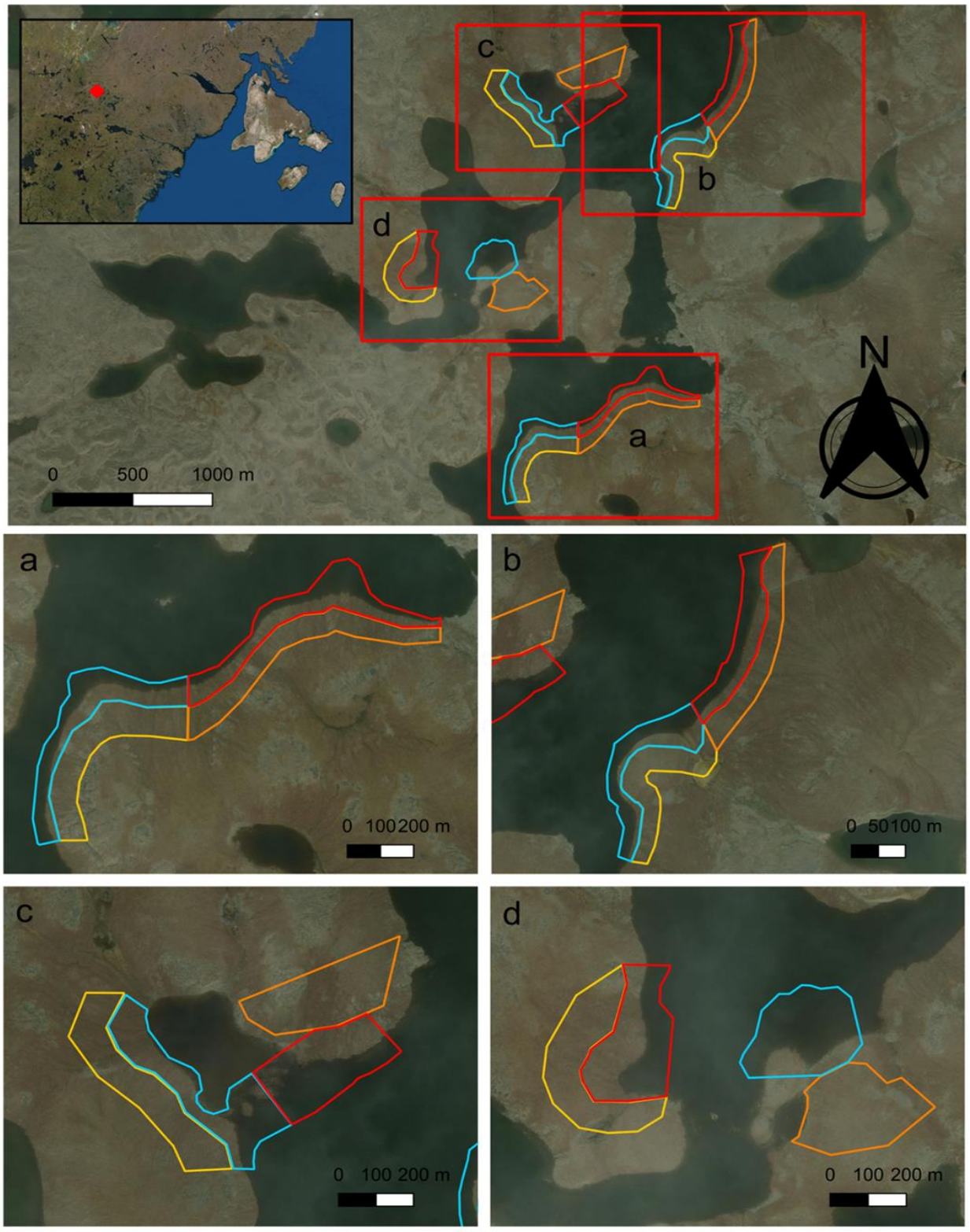


Figure 4: Map of study site Whale Tail Flood Area located north of Baker Lake, Nunavut, part of the Amaruq Mine and includes Whale Tail Lake and its tributaries. Top map shows the general study area, while the bottom four panels show the four groups of four plots, with red representing Treatment, blue representing Flood Control, yellow representing Control One, and orange representing Control Two. Sites are grouped into clusters based on treatment plots, (a) Whale Tail One, (b) Whale Tail Two, (c) Whale Tail Three, (d) Whale Tail Four. Source map is taken post-flooding of the southern basin of Whale Tail Lake. Plot outlines indicate the terrestrial area perimeter pre-flooding in 2018.

Objective 3. Birds' Behavioural Responses to Deterrents

Nest and Territory Monitoring

Monitoring of nesting birds occurred throughout the 2019 breeding season between 6 June - 14 July, within the experimental plots and the flood zone sites. There were four main study species: Lapland Longspur (*Calcarius lapponicus*), Horned Lark (*Eremophila alpestris*), Semipalmated Sandpiper (*Calidris pusilla*) and Least Sandpiper (*Calidris minutilla*) (Figure 2). These species are the most abundant at the study sites, and the easiest species for both locating and monitoring nests, however we did monitor any nest found regardless of species. Territorial mapping occurred primarily at the beginning of the breeding season, once male birds arrived and began to sing and display. Mapping was done by observing the locations of displaying or singing males and marking the location with a waypoint using a Garmin© GPS. A minimum of 10 points were recorded during each visit to the territory.

Nest searching occurred by systematically walking plots and observing behavioural cues of breeding adults (e.g., flushing, mate courtship, alarm calls). Upon discovery of a nest, it was marked with a tongue depressor 5m from the nest in a random direction, labeled with a nest name, along with the distance and bearing to the nest from the marker. We recorded the exact coordinates of the nest using the "average waypoint" function within the GPS unit, the species, number of eggs present, and date found. Nests were visited approximately every 4 days until fates were determined. Methods to assess nest fate depended on the life history of each target species. For species with precocial young (i.e., *Calidris sp*.), nests with at least one hatched egg were considered successful, whereas for species with altricial young (i.e., Passerines), nests with at least one fledged young were considered successful. Signs of predation

(loss of a whole clutch, nest disturbance, large eggshell fragments or yolk) or abandonment (no sign of adults or cold eggs) indicated failed nesting attempts (Mabee 1997).

Twenty Lapland Longspur nests received a temperature logger to monitor patterns in incubation behaviour. Ten nests were monitored within treatment plots, and ten in control plots. Temperature logger data were screened for outliers from equipment failure, and then analyzed with the use of RHYTHYM (1.0; Cooper and Mills 2005) and Raven Lite (2.0) to determine the number of off-bouts for each individual bird. I assessed if there was a significant difference in the proportion of off-bouts and number of off-bouts within a 12 hour period between nests in treatment and control plots, with the use of a linear mixed-effects model. Covariates for time of day (day or night per 12 hour period), average ambient temperature (per time of day), nest concealment, clutch size, and stage of incubation cycle were included in the model, and these variables are all known to potentially impact incubation schedules (Camfield and Martin 2009).

Marking and Re-sighting

In 2018, birds of the four focal study species found within the predicted flood area were captured with the use of a bow net at the nest and banded with individual colour markers. By resighting these individually marked birds, we could determine whether birds banded in 2018 within the predicted flood were dispersed to nearby non-flooded areas due to flood impacts, potentially increasing the densities of birds in the adjacent control plots. Similarly, for nesting birds banded in the predicted flood areas in 2019, resighting allowed us to determine whether the disturbance from the treatment plots or the active flooding caused birds to re-nest in adjacent sites. Resighting occurred during every visit to the plots,

every four days throughout the season. We also planned to return to the study site in 2020 to re-sight previously banded individuals but were unable to due to the cancellation of field work.

We captured adults once their clutch was complete and the nest was in the incubation stage (i.e., the number of eggs in the nest was no longer increasing). We attempted to capture both members of the pair for species where both adult birds incubate (i.e., *Calidris sp*.). For species where only one adult incubates (i.e., Passerines), we captured the incubating bird, although in a few cases both adults were captured. When a bird was captured, we measured the head-bill length, tarsus length, and wing length to the nearest mm and weight in grams. All birds were banded with a standard Canadian Wildlife Service issued stainless-steel metal band that has a unique 10-digit number. In addition, Semipalmated Sandpipers received a white flag with a 3-letter alpha code, and a single plastic coloured band. Least Sandpipers received a white flag and 2 colour bands. Lapland Longspurs and Horned Larks were given a unique combination of 3 plastic colour bands. Band combinations were read from left to right as per standard protocol and were recorded when re-sighting a previously banded bird.

Results

Objective 1. Efficacy of Deterrents

Our results suggested that deterrents did not significantly impact male territory densities for the four study species combined, nor for the shorebird species only, or for Lapland Longspur (Figure 6 a-c). There was no significant treatment*year interaction term in the models for any of these groups of species (P's > 0.05), and the tendency was for higher densities, rather than lower densities, in the year with deterrent treatments. In contrast, Horned Lark territory density was significantly reduced in the High Intensity treatment in 2019, suggesting that Horned Larks avoided plots exposed to the High Intensity

deterrent treatment (Figure 6 d). These results demonstrate that intense deterrent treatments might be successful at reducing densities for some species but are not broadly effective at deterring all bird species from establishing territories and nesting.

Cost and Maintenance of Deterrents

Deterrent deployment occurred over multiple days, taking a total of 198 person hours to deploy over 10 treatment plots, not including the extra 120 hours to assemble and troubleshoot prior to deployment. In most cases, a crew of 6 – 8 people spent 4 hours deploying the flash tape grid within a single High Intensity Treatment 6-ha plot. Deterrent maintenance was done every 4 days, with the time spent in the plot ranging from 20 mins to 4 hours, depending on damage and needs. Examples of maintenance were ensuring that the hawk kite effigy poles were erect and that the kite was still intact, ensuring the fishing line holding together the flash tape grid was taut, and ensuring flash tape was not tangled around hummocks or brush. In some cases, the deterrents were so damaged that it took hours to repair or were completely and could not be repaired. For example, on multiple occasions, the flash tape grid was destroyed when caribou or muskoxen travelled through the plot, causing the entire grid to collapse and requiring re-deployment. This re-deployment took hours, and also demonstrated a possible risk to arctic wildlife, which may have become entangled in the flash tape and fishing line.

Costs for the audio and visual deterrents were also significant. The audio deterrent units (Bird-X Super Bird X-peller Pro) cost $509.99 CAD, with 14 purchased in 2019 for a total of $7,139.06 CAD. This cost included audio chips for each audio unit ($60.00 CAD each). To keep the batteries charged, so the audio deterrents would run for up to 6 weeks, we purchased 14 small solar panels, $89.99 CAD each, for a total of $1259.86 CAD. The 12V car batteries used to run the audio deterrents and hold the solar panel charge,

were donated by Environment and Climate Change Canada. Visual deterrent costs came to a total of $5,131.25 CAD, with Hawk Kite Effigies costing $524.75 CAD for 12 Hawk Kites, with Fiber glass poles (10) totaling $517.50 CAD and replacement strings (7) $42.00 CAD. Flash tape rolls were $5.40 CAD per roll, amounting to $1,917.00 CAD for 355 rolls. Fishing line was used to string the flash tape grid together, costing $850.00 for 34 rolls of 100lb Hercules PE Braided Fishing Line, 4 Strands. Finally, the Aluminum Angle used to erect the flash tape grid, with 640 pieces of 1 m long angles, cost $1,280.00 CAD. The complete cost of deterrents for the project was $13,529.17 CAD.

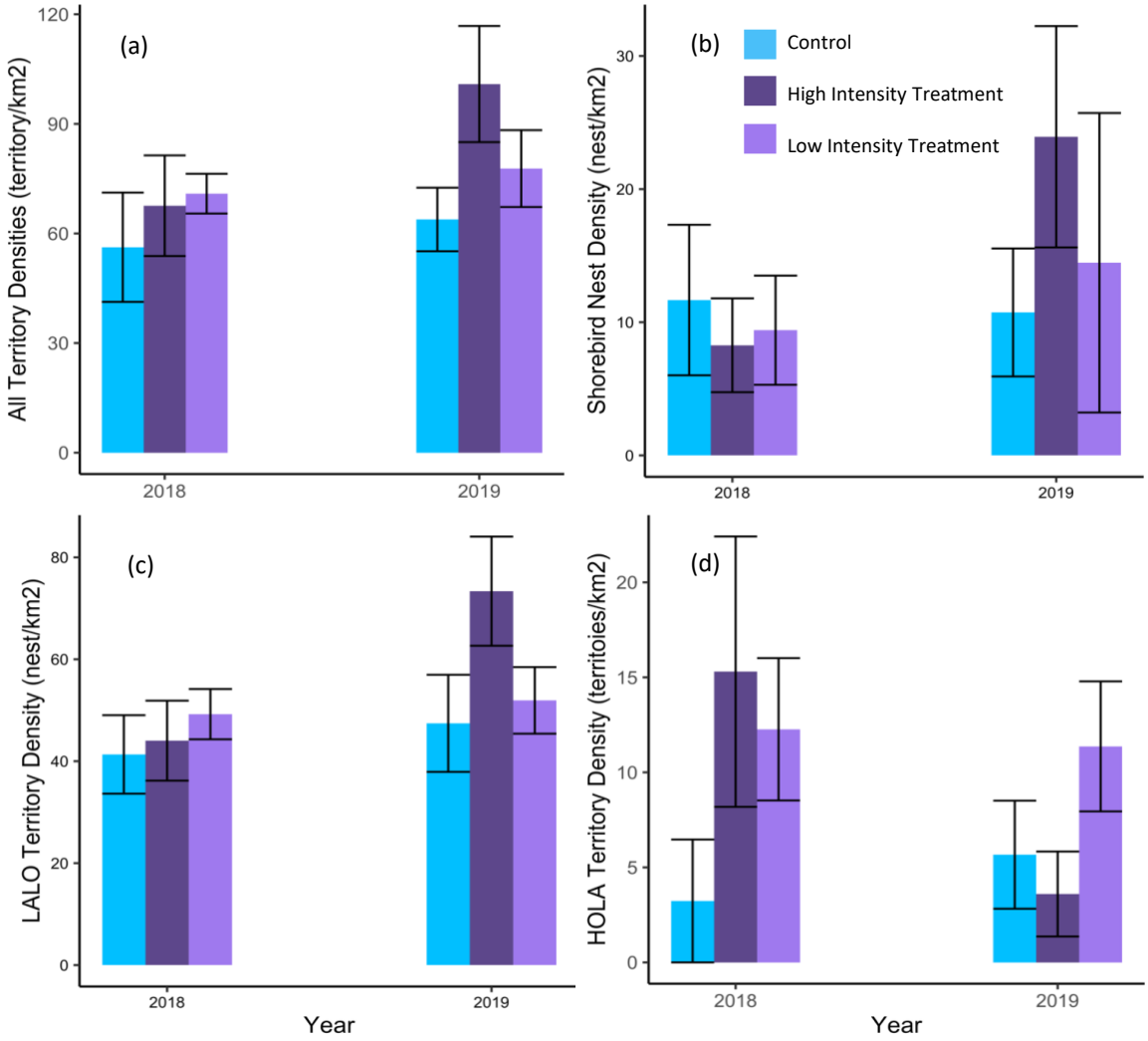


Figure 7: Male territory densities (territories/km^2 ± SE) before (2018) and after (2019) deterrent deployment of two deterrents treatments located in the Amaruq Road sites for, **(a)** All four species combined, **(b)** shorebird species only (Semipalmated Sandpiper and Least Sandpiper), **(c)** Lapland Longspur and **(d)** Horned Lark only. Please refer to Appendix III for exact mean male territory density (territories/km^2) numbers.

Objective 2. Flood Zone Impact Assessment

During the 2018 survey of the Whale Tail study area, we estimated 31 bird territories per km^2, with an average initiation date of 16 June. Given these dates, we concluded that the proposed flooding timeline outlined in Terrestrial Ecosystem Management Plan - Version 4, by Golder Associates, would flood nests along the shore of Whale Tail Lake. When we arrived at the Whale Tail sites in 2019, we estimated a vertical shoreline loss of 40 m (or about 1/3) of terrestrial land for plots within the proposed flood area, which occurred when Agnico Eagle Mines Ltd. flooded in late winter. Because of this loss, about half of the proposed flood area plots were under water prior to the nesting season. In 2019, control plots adjacent to the flooded plots, had an average density of 15.6 territories per km^2. The densities in the control plots surrounding Whale Tail Lake thus decreased by 10.9 territories per km^2 between 2018 (pre-flooding) and 2019 (post-flooding).



Figure 8: A Lapland Longspur nest with four eggs that was found within the Whale Tail Lake flood zone. It was found active, but later in the season became flooded.

During the flooding, we documented 6 nests of 3 species that were lost due to direct impacts of the high water. We estimate an average minimum loss of 3.8 nests per km^2 by taking the number of nests observed to be lost and dividing it by the total proposed flood zone of Whale Tail Lake (1.575 km^2), and a maximum loss of 19.7 nests per km^2 with an estimated density of 31 territories per km^2. The species nests that we observed to be flooded were Lapland Longspur (4; Figure 8), Semipalmated Sandpiper (1) and Herring Gull (1). Despite the nest loss due to flooding and a significant amount of habitat loss, nests

found within the proposed flood zone plots had an estimated nest success rate of 56% in 2019.

Objective 3. Bird Behavioural Responses

During the 2019 field season, 20 temperature probes were deployed in nests within the experimental treatment (n = 10) and control (n = 10) plots. Temperature probes measure birds' trips on and off the nest, which can offer a sensitive measure of disturbance. Results from temperature probe data suggested that, after controlling for environmental and temporal variation in incubation behaviour, birds exposed to deterrents had a significantly increased frequency of breaks in incubation ("off bouts") compared to birds in control plots (Figure 9), but no difference in the total proportion of time spent off

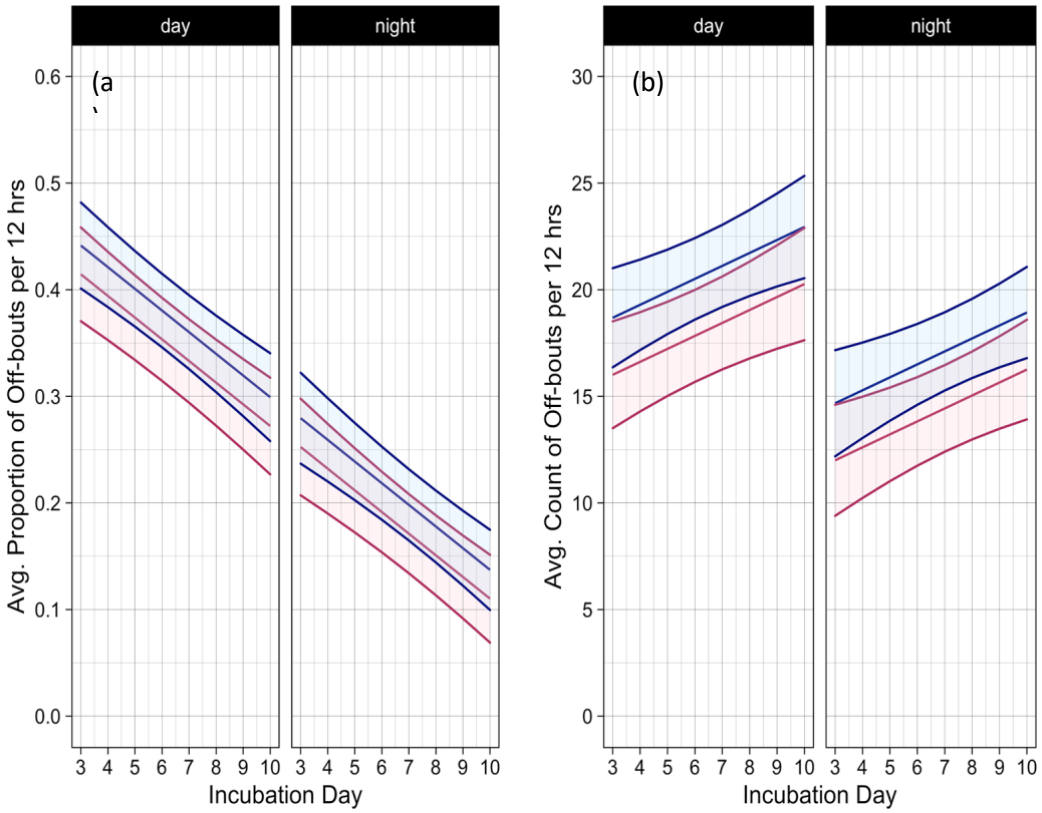


Figure 9: Predicted values from a linear model mixed effects model, with 0.95 confidence intervals, for proportion of off-bouts (a) and count of off-bouts (b) per 12 hour period split between day and night comparing nests within treatment (n = 10; blue line and fill) and control (n = 10; red line and fill) over incubation cycles from day 3 to 10.

the nest per 12 hour period (i.e., more and shorter incubation recesses). This suggests that birds in treatment plots were disturbed and pushed off their nest more often than birds nesting in control plots. However, despite these behavioural responses to disturbance from the deterrents, birds did not abandon nests, nor was their nest success impacted in comparison to birds nesting in control plots.

Birds nesting within the proposed flood zone were captured and banded with unique band combinations in both 2018 and 2019. A total of 13 female Lapland Longspur and 8 Semipalmated Sandpipers were banded in 2018, and only one Semipalmated Sandpiper was resighted in 2019, nesting in the same location as 2018. In 2019, a total of 17 female and 3 male Lapland Longspur and 13 Semipalmated Sandpipers were banded. In the same year, a single Lapland Longspur female re-nested after nest loss due to flooding, nesting approximately 125 m from the original nest and 50 to 100 m away from the proposed flood zone. The original nest was estimated to be lost during the nestling stage due to flooding between 1-3 July and we estimated that the bird initiated a new nest on 3 July.

Discussion

Based on the results of the deterrent experiment, we conclude that the deterrents deployed in this experiment had limited success at dissuading birds from nesting. Moreover, they were relatively cost- and labour-intensive to erect and maintain, relative to their effectiveness. Therefore, we do not recommend their use in future attempts to prevent nest loss of arctic-nesting birds. We are confident that the deterrents we used failed to deter birds from nesting in the flooded areas, resulting in the loss of nests due to mining-induced flooding. A small number of studies in other environments have documented the successful use of deterrents, with similar approaches to those used here. However,

several factors may have contributed to the limited success that we observed, including the birds' life history and the challenges of erecting deterrents sufficiently early in arctic environments.

Our sample is dominated by small, short-lived species such as the Lapland Longspur. These species may be especially reluctant to abandon or forego a breeding attempt in the presence of novel objects such as our deterrents, as they have fewer breeding opportunities compared to long-lived species. Previous studies have demonstrated the successful use of flash tape grids and other visual deterrents to prevent Piping Plover and Least Tern from nesting within gravel pits (Marcus et al. 2007). These species both respond to approaching predators with aggressive of evasive behaviours. In the case of our study, the placid Lapland Longspur showed no signs of obvious distress or disturbance during deterrent use. There were multiple occasions where a nest was found within 5 m of an audio deterrent speaker or directly under a piece of flash tape (Figure 10).

Erecting deterrents sufficiently early was also a challenge. The average nest initiation date in our study was the 13th of June, with the earliest initiation date estimated as the 6th June and the latest the 25th of June in 2019. Deterrents were erected 5-17th June, before 79 - 92% of nests were initiated in the plots where deterrents were deployed within the Amaruq Road Sites. Erecting deterrents this early was challenging; the frozen ground made it difficult to hammer the aluminum angle into the ground, and the melting snow made it difficult to ensure that



Figure 10: An extremely concealed Lapland Longspur nest with a piece of flash tape draped over it.

the audio deterrent speakers stayed upright. Deploying deterrents well before territories were established may have been most effective but would be even more logistically challenging. Erecting deterrents in the late winter and early spring, would mean that the extensive snow cover would obscure the location of ponds and other areas unsuitable for setting up equipment, and freezing temperatures could cause a variety of problems with icing of flash tape, battery failure and other issues.

During the experiment there were a few instances where deterrents were damaged or destroyed due to mammals. In some plots where we found Arctic ground squirrels (*Spermophilus parryii*) or Arctic hare (*Lepus arcticus*) we anticipated that there might be some damage to the wires associated with the audio deterrent units. Damage by Arctic ground squirrels occurred on one occasion when a speaker cord was chewed, but we noticed and replaced the cord quickly. A more concerning issue arose as there was some noticeable impact on large ungulate species such as caribou and muskoxen. There were multiple occasions where visual deterrents were destroyed by caribou or muskoxen walking through the treatment plots, causing aluminum poles to be ripped out of ground and carried away. There was a case where fishing line was found to have blood on it, possibly from a caribou who may have got the fishing line caught around their mouth. These concerns warrant investigation, perhaps through the use of time-lapse cameras near flash tape grids. And caution should be used if flash tape is to be deployed in areas frequented by large mammals.

In summary, our project demonstrates that arctic-nesting birds are not easily discouraged from nesting in their preferred locations and show limited responses to visual and audio deterrents. Based on the limited success, the cost of the equipment and the labour required to deploy and maintain, we would not recommend these methods for mitigating nest loss in the future. Plans for the project sought to

monitor the Whale Tail Lake site post-flooding to assess nest and territory density changes due to the terrestrial area's flooding. However, this was not completed in 2020 due to the Covid-19 pandemic and will not continue into the 2021 season and onward. This research will culminate with a four-chapter master's dissertation by Gill Holmes at Trent University, expected to be completed by May 2021.

References

A.T. Kearney, Inc. 2015. The Council Perspective: The Future of the Arctic. Global Business Policy Council 2(1).

Arctic Monitoring and Assessment Programme (AMAP). 2017. Adaptation actions for a changing arctic (AACA) – Baffin Bay/Davis Strait region overview report. Arctic Council.

Belayneh, A., T. Rodon and S. Scott. 2018. Mining economies: Inuit business development and employment in the eastern subarctic. The Northern Review 47: 59-78.

Bernath-Plaisted, J. and N. Koper. 2016. Physical footprint of oil and gas infrastructure, not anthropogenic noise, reduces nesting success of some grassland songbirds. Biological Conservation 204: 434-441.

Cameron, E. and T. Levitan. 2014. Impact and benefit agreements and the neoliberalization of resource governance and indigenous-state relations in northern Canada. Studies in Political Economy 93(1): 25-52.

Camfield, A.F. and Martin, K. 2009. The influence of ambient temperature on horned lark incubation behaviour in an alpine environment. Behaviour 146:1615-1633.

Cooper, C.B. and Mills, H. 2005. New software for quantifying incubation behavior from times-series recordings. Journal of Field Ornithology, 76(4):352-356.

Gajera, N.B., A.K.R. Mahato and V.V. Kumar. 2013. Status, distribution, and diversity of birds in mining environment of Kachchh, Gujarat. International Journal of Biodiversity.

Hassan, Y.A. 2016. The impacts of mining on arctic environment and society from corporate social responsibility and sustainable development perspectives; the case of Jokkmokk (Kallak) iron mines in northern Sweden. Department of Physical Geography, Stockholm University. 109 p. Accessed from: Diva Portal; Last updated 2016 Apr 29.

Hof, A.R., G. Rodríguez-Castañeda, A.M. Allen, R. Jansson and C. Nilsson. 2017. Vulnerability of subarctic and arctic breeding birds. Ecological Applications 27(1): 219-234.

Johnson, C.J., M.S. Boyce, R.L. Case, H.D. Cluff, R.J. Gau, A. Gunn and R. Mulders. 2005. Cumulative effects of human developments on Arctic wildlife. Wildlife Monographs 160: 1-36.

Mabee, T.J., Wildman, A.M., and Johnson, C.B. 2006. Using egg flotation and eggshell evidence to determine age and fate of Arctic shorebird nests. Journal of Field Ornithology 77(2):163-172.

Marcus, J.F., Dinan, J.J., Johnson, R.J., Blankenship, E.E., and Lackey, J.L. 2007. Directing nest site selection of Least terns and Piping plover. Waterbirds, 30(2): 251-258.

Parliament of Canada, House of Commons. Migratory Birds Convention Act, 1994. S.C. 1994, c. 22. [Online]. Justice Law Website (CA); 2018 Nov 19. Available from https://laws-lois.justice.gc.ca/eng/acts/m-7.01/

Reijnen, R., R. Foppen and G. Veenbaas. 1997. Disturbance by traffic of breeding birds: evaluation of the effect and considerations in planning and managing road corridors. Biodiversity and Conservation 6(4): 567-581.

Smith, P.A., Gilchrist H.G., Forbes, M.R., Martine, J.L. and Allard, K. 2010. Inter-annual variation in the breeding chronology of arctic shorebirds: effects of weather, snowmelt and predators. J. Avian Bio. 41(3): 292-304.

Wauchope, H.S., J.D. Shaw, Ø. Varpe, E.G. Lappo, D. Boertmann, R.B. Lanctot and R.A. Fuller. Rapid climate-drive loss of breeding habitat for Arctic migratory birds. Global Change Biology 23(3).

Williamson FSL. 1968. Alaska longspur. In: Austin OL Jr (ed) Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies. US National Museum Bulletin 237, part 3. pp 1608-1627

Wilson, R.R., J.R. Liebezeit and W.M. Loya. 2013. Accounting for uncertainty in oil and gas development impacts to wildlife in Alaska. Conservation Letters 6(5): 350-358.

APPENDIX I

Table 2: Mean male territory density (territories/km^2) of the four main study species combined, found within the Amaruq Road Site plots, 2018 and 2019.

	2018	2019
Control	56.2	63.8
High Intensity Treatment	67.6	104.1
Low Intensity Treatment	70.9	77.8

Table 3: Mean male territory density estimates (territories/km^2) of shorebirds (Semipalmated Sandpiper and Least Sandpiper) found within the Amaruq Road Site plots between 2018 and 2019.

	2018	2019
Control	11.6	10.7
High Intensity Treatment	8.3	23.9
Low Intensity Treatment	9.4	14.5

Table 4: Mean male territory density estimates (territories/km^2) of Lapland Longspur nests found within the Amaruq Road Site plots between 2018 and 2019.

	2018	2019
Control	41.3	47.4
High Intensity Treatment	44.0	76.6
Low Intensity Treatment	49.2	51.9

Table 5: Mean male territory density estimates (territories/km^2) of Horned Lark found within the Amaruq Road Site plots between 2018 and 2019.

	2018	2019
Control	3.2	5.6
High Intensity Treatment	15.3	3.6
Low Intensity Treatment	12.2	11.3

APPENDIX F

All Helicopter Flights Logged in 2020

Table 1: Helicopter Flight Days

Date	Total Distance Flown (nm)	Total Flight Hours
Summer Caribou Season (26 May to 21 Sep)		
18 June	9	5.14
20 June	116	2.54
21 June	32	2.64
24 June	209	9.27
25 June	125	5.61
26 June	192	5.08
27 June	102	5.49
28 June	65	1.57
29 June	169	5.78
30 June	331	3.94
1 July	149	3.45
2 July	266	8.44
3 July	109	2.7
4 July	188	6.36
5 July	190	5.35
6 July	189	4.63
7 July	469	8.9
8 July	296	7.09
9 July	496	8.28
10 July	318	5.33
11 July	305	6.12
13 July	78	3.43
14 July	117	11.12
15 July	333	11
16 July	116	2.33
17 July	358	9.09
18 July	357	10.29
19 July	674	10.24
20 July	143	2.29
21 July	227	6.29
22 July	84	4.32
23 July	88	9.82
24 July	207	10.15
25 July	218	8.97
26 July	280	8.65
27 July	533	9.02
28 July	293	4.83
29 July	296	6.34
30 July	181	6.68

Table 1: Helicopter Flight Days

Date	Total Distance Flown (nm)	Total Flight Hours
31 July	224	5.57
1 August	184	5.07
2 August	204	8.91
3 August	173	4.46
4 August	105	3.33
5 August	111	2.5
6 August	87	1.94
7 August	186	3.07
8 August	111	1.69
9 August	195	10.99
10 August	134	6.01
11 August	175	7.24
12 August	195	7.29
13 August	289	7.7
14 August	169	4.74
15 August	120	2.75
16 August	193	6.6
17 August	175	2.93
18 August	205	4.25
19 August	31	1
20 August	0	0.94
21 August	166	2.3
22 August	245	4.36
23 August	100	6.08
24 August	87	5.47
25 August	94	1.93
27 August	61	3.07
28 August	8	6.41
29 August	176	4.52
30 August	59	2.79
31 August	55	0.88
2 September	193	5.19
3 September	146	2.76
4 September	197	3.58
5 September	125	5.54
6 September	200	5.86
7 September	127	3.36
8 September	158	5.58
9 September	201	5.12
10 September	202	3.68

Table 1: Helicopter Flight Days

Date	Total Distance Flown (nm)	Total Flight Hours
11 September	130	3.56
12 September	261	9.28
13 September	226	4.78
14 September	182	4.11
15 September	273	7.56
16 September	220	4.18
17 September	276	7.46
18 September	234	3.35
19 September	141	4.44
20 September	129	2.04
21 September	227	6.8
Fall Caribou Season (22 Sep to 15 Dec)		
22 September	157	4.55
23 September	292	5.76
24 September	214	6.62
25 September	160	3.56
26 September	209	6.32
27 September	187	5.97
28 September	197	5.89
29 September	305	6.37
30 September	203	6.48
1 October	244	4.09
2 October	92	3.14
3 October	183	4.31
4 October	142	5.28
5 October	88	8.61
6 October	45	7.36
7 October	8	9.34
8 October	153	5.13
9 October	155	3.66
10 October	156	4.22
11 October	348	7.02
15 October	27	0.3
19 October	494	4.69
22 September	157	4.55
23 September	292	5.76
24 September	214	6.62
25 September	160	3.56
26 September	209	6.32
27 September	187	5.97

Table 1: Helicopter Flight Days

Date	Total Distance Flown (nm)	Total Flight Hours
28 September	197	5.89
29 September	305	6.37
30 September	203	6.48
1 October	244	4.09
2 October	92	3.14
3 October	183	4.31
4 October	142	5.28
5 October	88	8.61
6 October	45	7.36
7 October	8	9.34
8 October	153	5.13
9 October	155	3.66
10 October	156	4.22
11 October	348	7.02
15 October	27	0.3
19 October	494	4.69

APPENDIX G

Hunter Harvest Survey



MEADOWBANK MINE

2020 HUNTER HARVEST STUDY AND CREEL SURVEY SUMMARY REPORT

FINAL

Table of Contents

SECTION 1 • EXECUTIVE SUMMARY 3

SECTION 2 • OVERVIEW 4

SECTION 3 • OBJECTIVES 5

SECTION 4 • METHODOLOGY 6

SECTION 5 • HISTORICAL RESULTS 7

SECTION 6 • 2020 HUNTER HARVEST STUDY RESULTS 8

6.1 Number of Hunters 8
6.2 Distribution of Hunting 8
6.3 Magnitude of Hunting 10
6.4 Seasonal Distribution and Timing of Hunting 14
6.5 Other Wildlife Species 14

SECTION 7 • CREEL SURVEY RESULTS 25

7.1 Number of Fisherman 25
7.2 Composition of Catch 25
7.3 Distribution of Fishing 26
7.4 Magnitude of Fishing 26
7.5 Seasonal Timing of Fishing 26

SECTION 8 • ACCURACY OF IMPACT PREDICTIONS 30

SECTION 9 • MANAGEMENT RECOMMENDATIONS 31

List of Tables

Table 6.1:	Caribou Harvest Distribution along the AWAR and within the Meadowbank LSA and RSA (1996 to 2001 [NWMB], and 2007 to 2015 and 2019 to 2020 [Baker Lake HHS])	10
Table 6.2:	Hunter Caribou Harvest Statistics from the NWMB (2005) Study and Baker Lake HHS (2007 to 2015; 2019 to 2020)	12
Table 7.1:	Number of Fisherman in the Baker Lake Who have Recorded Fishing Success by Year and Month	25
Table 7.2:	Total Number of Fish Caught between 2007 and 2015, and 2019 to 2020	26
Table 8.1:	Accuracy of Impact Predictions – Baker Lake Hunter Harvest Study	30

List of Figures

Figure 6.1:	Total Number of Caribou Harvested in 2020	9
Figure 6.2:	Percent of Caribou Harvest within the RSA from 2007 to 2015 (Years 1 to 9), and 2019 to 2020 (Years 10 and 11) Compared to Baseline and Threshold Levels	11
Figure 6.3:	Seasonal Trends in Caribou Harvest from the Baker Lake Hunter Harvest Study (2007 to 2015; 2019 to 2020) and the NWMB Study (1996 to 2001)	15
Figure 6.4:	Terrestrial Animals Harvested per Month and by Participant in 2020	16
Figure 6.5:	Number of Caribou harvested in each Caribou Season and Proximity to Access Roads in 2020	17
Figure 6.6a:	Total Number of Caribou Harvested in Spring 2020 (Apr 01 to May 25)	18
Figure 6.6b:	Total Number of Caribou Harvested in Summer 2020 (May 26 to Sep 21)	19
Figure 6.6c:	Total Number of Caribou Harvested in Fall 2020 (Sep 22 to Dec 15)	20
Figure 6.6d:	Total Number of Caribou Harvested in Winter 2020 (Dec 16 to Mar 31)	21
Figure 6.7:	Total Number of Wolves and Wolverines Harvested in 2020	22
Figure 6.8:	Total Number of Grizzly Bear, Arctic Fox and Red Fox Harvested in 2020	23
Figure 6.9	Total Number of Birds and Eggs Harvested in 2020	24
Figure 7.1:	Total Number of Fish Caught in 2020 by Harvest Cell	27
Figure 7.2:	Average Number of Fish Caught per Participant in 2020 and the Minimum and Maximum Range from 2007 to 2015 and in 2019	28
Figure 7.3:	Seasonal Trends in Fishing in the Baker Lake Area from 2007 to 2015, and 2019 to 2020	29

List of Appendices

Appendix A 2020 Hunter Harvest Calendar

SECTION 1 • EXECUTIVE SUMMARY

A Hunter Harvest Study (HHS) conducted from 2007 to 2015 was relaunched in 2019 and continued into 2020. The study included more than 60 participants of which 43 reported harvesting Caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Baker Lake, the HHS represents from 12 to 14% of hunters in the community. With a total reported Caribou harvest of 652 in 2020, the total Caribou harvest in Baker Lake is estimated to range from 4,657 to 5,433 Caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Baker Lake Hunters and Trappers Organization members) in the community.

Compared to other years, Caribou were harvested at a lower percentage within 5 km of the All-Weather Access Road and within the Regional Study Area. As such, harvest levels in 2020 in close proximity to mining facilities were well within threshold levels.

Lake Trout and Arctic Char were the most common species caught by fisherman. Unlike 2019, very few Lake Whitefish were caught, which may be due either to a decline in fishing effort in winter (e.g., nets set under the ice) and/or lower abundance of this species.

SECTION 2 • OVERVIEW

As outlined in the original TEMP (Cumberland 2006) and the June 2019 version (Agnico Eagle 2019), and as a requirement of NIRB Project Certificate No. 004 Terms and Conditions 51 and 54, the Baker Lake Hunter Harvest Study (HHS) was initiated in March 2007 by Agnico Eagle. The HHS was conducted in association with the Baker Lake Hunters and Trappers Association (HTO) to monitor and document the spatial distribution, seasonal patterns, and harvest rates of hunter kills and angler catches within the Meadowbank Regional Study Area (RSA).

After low participation during the first year of the study, methods were strategically adapted, participation increased steadily, and valuable information on harvest patterns in the Baker Lake area was collected. The HHS, through regular visits, contributed to developing a strong relationship with local harvesters, the HTO, and the Government of Nunavut, Department of Environment (GN). Data were provided annually in monitoring reports from 2007 to 2015 and in 2019.

The HHS was suspended for three years (2016 and 2018) to develop new approaches and direction. Following consultation with the HTO, Kivalliq Inuit Association (KivIA), GN, and other agencies in November 2016 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study. The study was conducted through 2020 and continues into 2021.

SECTION 3 • OBJECTIVES

The primary objectives of the HHS are to monitor potential project-related effects on harvesting of wildlife by residents of Baker Lake. This objective is achieved by estimating the following key metrics:

1. The distribution of Caribou, Muskox, and Wolverine harvest by residents of Baker Lake; and
2. The total level (or an index of) Caribou, Muskox, and Wolverine harvest by residents of Baker Lake.

Other objectives of the HHS established in consultation with the Terrestrial Advisory Group (TAG) or other participants include:

1) Supporting creel surveys by gathering information on Arctic Char (*Salvelinus alpinus*), Lake Trout (*Salvelinus namaycush*), Lake Whitefish (*Coregonus clupeaformis*), and Arctic Grayling (*Thymallus arcticus*) catch rates and Inuit-use patterns in the Baker Lake area;

2) Understanding regional distribution of hunting and fishing activity;

3) Investigating seasonal timing of hunting and fishing activity; and

4) Determining whether increased harvest and catch rates are associated with the Meadowbank All-Weather Access Road (AWAR) and Whale Tail Hail Road (WTHR).

As discussed during consultation with stakeholders, the HHS will further seek to: a) increase and maintain the hunter participant rate in the future of the program; b) improve resource protection; c) improve hunter awareness and education; d) increase the integration of Inuit Qaujimajatuqangit and Traditional Knowledge; e) increase availability of data to support a collective approach to understanding wildlife harvest; and f) assist Agnico Eagle in mitigative actions and the GN in management decisions.

SECTION 4 • METHODOLOGY

The wildlife species that are the focus of the HHS are Caribou, Muskox and Wolverine; however, harvest data on other species, such as Wolf, Arctic Fox, geese and other birds is also collected. The few species in the study were deliberately chosen to make data entry and collection as simple as possible. To support creel surveys, data on fish harvest (Arctic Char, Lake Trout, Lake Whitefish, and Arctic Grayling) are also collected.

Inuit and non-Inuit residents, at least 16 years of age, are eligible to participate in the harvest survey. Harvest calendars are provided on a household basis rather than an individual basis in order to simplify data entry and collection, and reflect household hunting patterns. The harvest calendar is attractive and consists of local photographs of wildlife and Baker Lake residents (see **Appendix A** for 2020 calendar). Space is provided for each calendar day where harvest details can be documented. A map is provided at the end of the calendar that delineates a 4 km^2 UTM grid within the Baker Lake and Meadowbank areas. Each grid has a unique code to facilitate recording of information. When calendars are issued, participants or participating households are encouraged to write harvest details (e.g., number of animals, sex, age and location (i.e., grid code) for the appropriate date on the calendar.

Participants were interviewed in person only two times during the year (i.e., October 2020 and February 2021) by the harvest study coordinator. The lower number of visits in 2020 reflects logistical issues associated with Covid-19 (e.g., a mandatory 14-day quarantine was required in Winnipeg prior to travelling to Baker Lake). During the February 2021 interviews, remaining data from 2020 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and collect incidental information to compliment calendar data, including notable Caribou movements, aggregations, and unique observations. Between interview periods, participants were often contacted by phone or social media to encourage recording of harvest data.

Features of the 2020 Hunter Harvest Study included: 1) increasing the amount of time researchers spent in the community interacting with participants on each visit; 2) building long-term relationships between participants and researchers; 3) increasing engagement with participants on social media platforms such as Facebook and Instagram; and 4) increasing incentives for participating in the study (e.g., gas vouchers and prizes).

SECTION 5 • HISTORICAL RESULTS

The Baker Lake HTO member list (provided by Ms. Joan Scottie [HTO Board Member] in 2008) consisted of 683 local area hunters/trappers/fishermen (collectively termed 'hunter' for the remainder of this memo), a number that has likely changed since then. The 2008 member count was a highly conservative (i.e., high) estimate of the number of individuals that hunt, trap or fish in the community as the list typically includes entire families. If just the heads of each household are counted, there were 389 potential hunters within the Baker Lake community in 2008. Although this value is still likely conservative (given that many of these individuals do not actively hunt or fish), the number is more comparable to the comprehensive 5-year Nunavut Wildlife Harvest Study (NWMB 2005) in which 336 Baker Lake hunters were contacted and interviewed.

Between 1996 and 2001, 18% of Caribou harvests were estimated to be within 5 km of the AWAR (prior to construction) and 67% of harvests occurred within the RSA (NWMB 2005). In the first year of the HHS study (2007), prior to completion of the AWAR, 34% of harvests were reported within 5 km of the AWAR alignment and 79% were recoded within the RSA. The HHS data (2007 to 2015, and 2019) fluctuated between 34 and 43% of reported harvest within 5 km of the AWAR, and between 64 and 85% within the RSA.

In 2008, 296 Caribou were reported as being harvested by Baker Lake HHS study participants. Harvest numbers steadily increased to 685 in 2011, and then decreased to 269 in 2014, the lowest reported harvest in seven years. In 2019, total Caribou harvested was 647, which was close to the high number recorded in 2011. Assuming that an average of approximately 10% of all Baker Lake hunters actively participated in the study (5% estimated for 2014), extrapolation of historical HHS values suggests approximately 3,000 to 6,000 Caribou are harvested each year in the Hamlet of Baker Lake. These estimates are in general agreement with historical harvest studies. Specifically, using the upper limit of the standard error in the Nunavut Wildlife Harvest Study, between 2,230 and 3,116 Caribou were harvested each year between 1996 and 2001 (NWMB 2005). Similarly, the Interdisciplinary Systems (IDS) report (IDS 1978) estimated an annual Caribou harvest in Baker Lake of 4,100 during the 1970s.

Based on the NWMB (2005) and HHS results (2007 to 2015, and 2019), highest Caribou harvests have occurred in September and October, with a second smaller peak in March and April. The similar pattern between the studies indicates that seasonal hunting preferences have not changed markedly in the last decade.

Reported harvests of Muskox and Wolverine remained low, precluding any interpretation of potential mine-related effects. Low densities of these species and their general aversion to humans require hunters to hunt well away from the AWAR; therefore, the presence of the AWAR is thought to have little effect on participant hunting patterns for Muskox and Wolverine. Wolverine harvest reports decreased from a maximum of 15 animals in 2010 to one (1) animal in 2015; however, in 2019, reported Wolverine harvests were at an all-time high of 18 individuals.

SECTION 6 • 2020 HUNTER HARVEST STUDY RESULTS

6.1 NUMBER OF HUNTERS

The HHS included 64 participants by the end of 2020. Of these, Caribou harvest data had been collected from 43 participants, which is considerably higher than the 28 participants that reported Caribou harvests in 2015, and slightly higher than the 42 hunters reporting harvests in 2019.

Based on the previous discussion of total numbers of hunters in the Hamlet of Baker Lake (**Section 5 Historical Results**), there were 389 potential hunters within the Baker Lake community in 2008. The number is comparable to the comprehensive 5-year Nunavut Wildlife Harvest Study (NWMB 2005) in which 336 Baker Lake hunters were contacted and interviewed. Discussions with Baker Lake HTO members in 2019 suggest the total number of hunters is over 300. Given the historical and current number of hunters in Baker Lake, an estimate of 300 to 350 active hunters is used in this analysis. Based on these numbers, the 43 hunters reporting Caribou harvest in 2020 conservatively represent from 12 to 14 % of total hunters in the community.

6.2 DISTRIBUTION OF HUNTING

Figure 6.1 shows the distribution of Caribou harvest within the HHS data collection area. Hunting is concentrated along the northern and southwestern ends of Baker Lake and along the AWAR to approximately KM 85. Limited harvests were reported along the Thelon River system in the vicinity of Schultz and Aberdeen lakes, and along the Kazan River near its mouth on Baker Lake. Annual variation in harvest location and intensity is attributable to numerous factors. For instance, many hunters have stated during informal discussions that they have a ‘favorite’ hunting area that they frequent each year. Some hunters have stated that they prefer hunting in ‘convenient’ locations, whereas other hunters prefer remote locations well away from frequented areas. A percentage of hunters also enjoyed partaking in long distance hunting trips over multiple days.

Between 1996 and 2001, 18% of Caribou harvests were estimated to be within 5 km of the AWAR (prior to construction) and 67% of harvests occurred within the RSA (NWMB 2005). In the first year of the HHS study (2007), prior to completion of the AWAR, 34% of harvests were reported within 5 km of the AWAR alignment and 79% were recorded within the RSA (see **Table 6.1**). The HHS data (2007 to 2015 and in 2019) fluctuated between 34 and 54% of reported harvest within 5 km of the AWAR, and between 64 and 85% within the RSA. The 2020 HHS data indicated that 30% of reported harvest occurred within 5 km of the AWAR, and 62% occurred within the RSA, representing the lowest proportion of Caribou harvested within 5 km of the AWAR since the road was built (see **Table 6.1**). One of the reasons for this may have been because of the large number of Caribou harvested in the vicinity of Baker Lake in fall 2020 (see **Figure 6.1**). As was the case in other years, threshold levels of 20% set for monitoring the effects of the Meadowbank mine development on the distribution of Caribou harvest were not exceeded (see **Figure 6.2**).

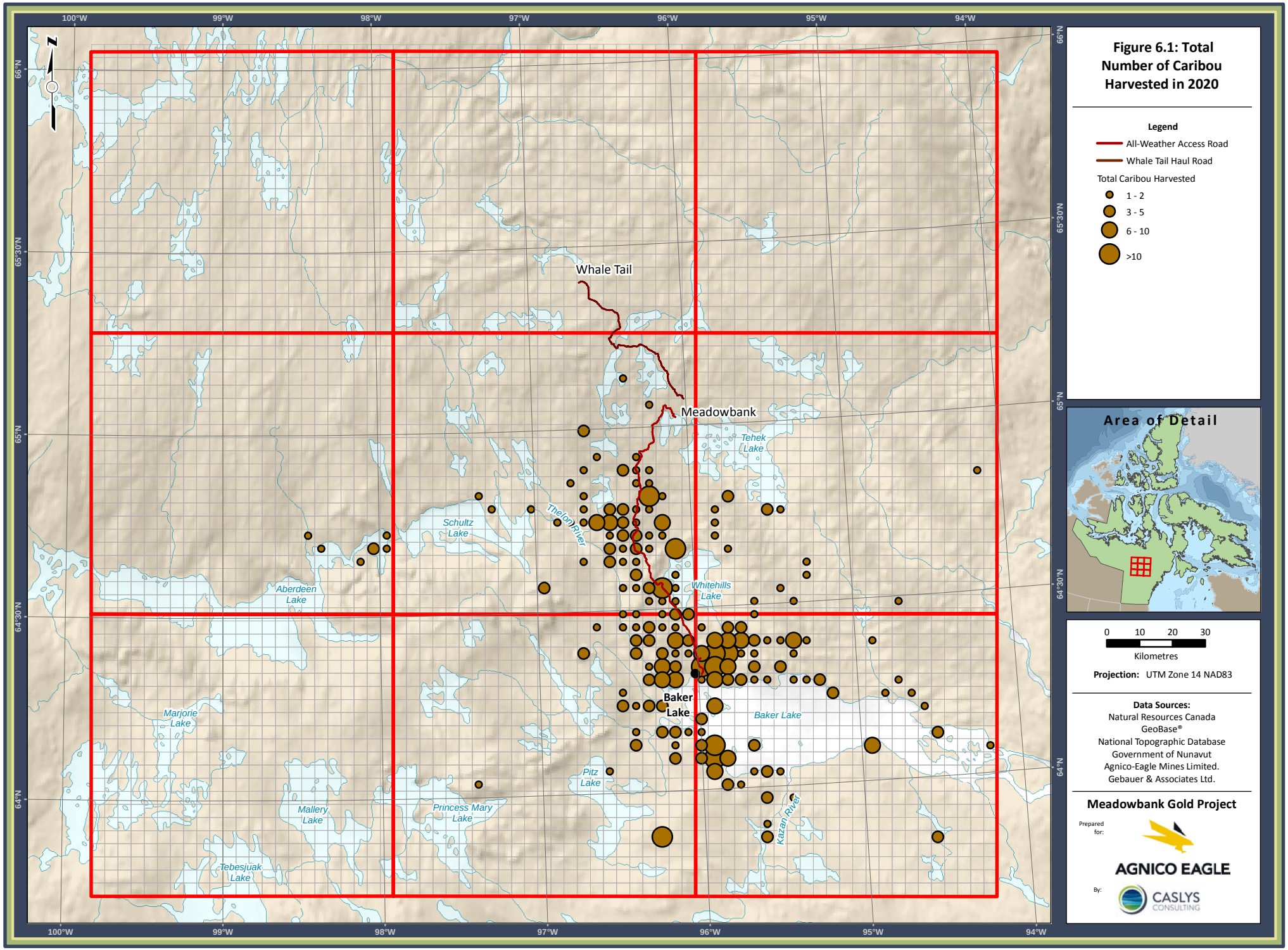

Figure 6.1: Total Number of Caribou Harvested in 2020
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Caribou Harvested
1 - 2
3 - 5
6 - 10
>10
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Kazan River
Mallery Lake
Princess Mary Lake
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
66°N
65°30'N
65°N
64°30'N
64°N

Table 6.1: Caribou Harvest Distribution along the AWAR and within the Meadowbank LSA and RSA (1996 to 2001 [NWMB], and 2007 to 2015 and 2019 to 2020 [Baker Lake HHS]).

Study	Participation Rate within 5 km of AWAR (% of total hunters)	Average Caribou Harvest within 5 km of AWAR per participant	% of annual harvest within 5 km of AWAR	% of harvest within Meadowbank LSA	% of harvest within Meadowbank RSA
NWMB 1996 to 2001	n/a	n/a	18	7	67
Baker Lake HHS 2007	17 (49%)	4.8	34	12	79
Baker Lake HHS 2008	16 (94%)	6.9	37	28	73
Baker Lake HHS 2009	27 (75%)	7.9	36	20	78
Baker Lake HHS 2010	33 (89%)	7.3	38	22	73
Baker Lake HHS 2011	40 (85%)	7.1	42	25	74
Baker Lake HHS 2012	31 (67%)	5.6	35	20	80
Baker Lake HHS 2013	38 (86%)	4.8	43	27	85
Baker Lake HHS 2014	19 (70%)	5.7	40	28	83
Baker Lake HHS 2015	24 (67%)	6.9	54	34	84
Baker Lake HHS 2019	40 (95%)	5.4	34	22	64
Baker Lake HHS 2020	34 (79%)	5.8	30	19	62
Average (2007 to 2020)	29 (78%)	6.2	38	23	76

6.3 MAGNITUDE OF HUNTING

In 2020, a total of 652 Caribou were reported as being harvested by 43 participants (see **Table 6.2**). Given that the 43 hunters represent an estimated 12 to 14% of the Baker Lake hunting community, and assuming that the average number of Caribou shot per hunter is similar, the total estimated number of Caribou harvested in 2020 ranges from 4,657 to 5,433 animals, which is almost identical to estimates for 2019. This estimate is considered to be conservative (i.e., high) since the Baker Lake Hunter Harvest Study targeted known hunters in the community with some known to be particularly successful.

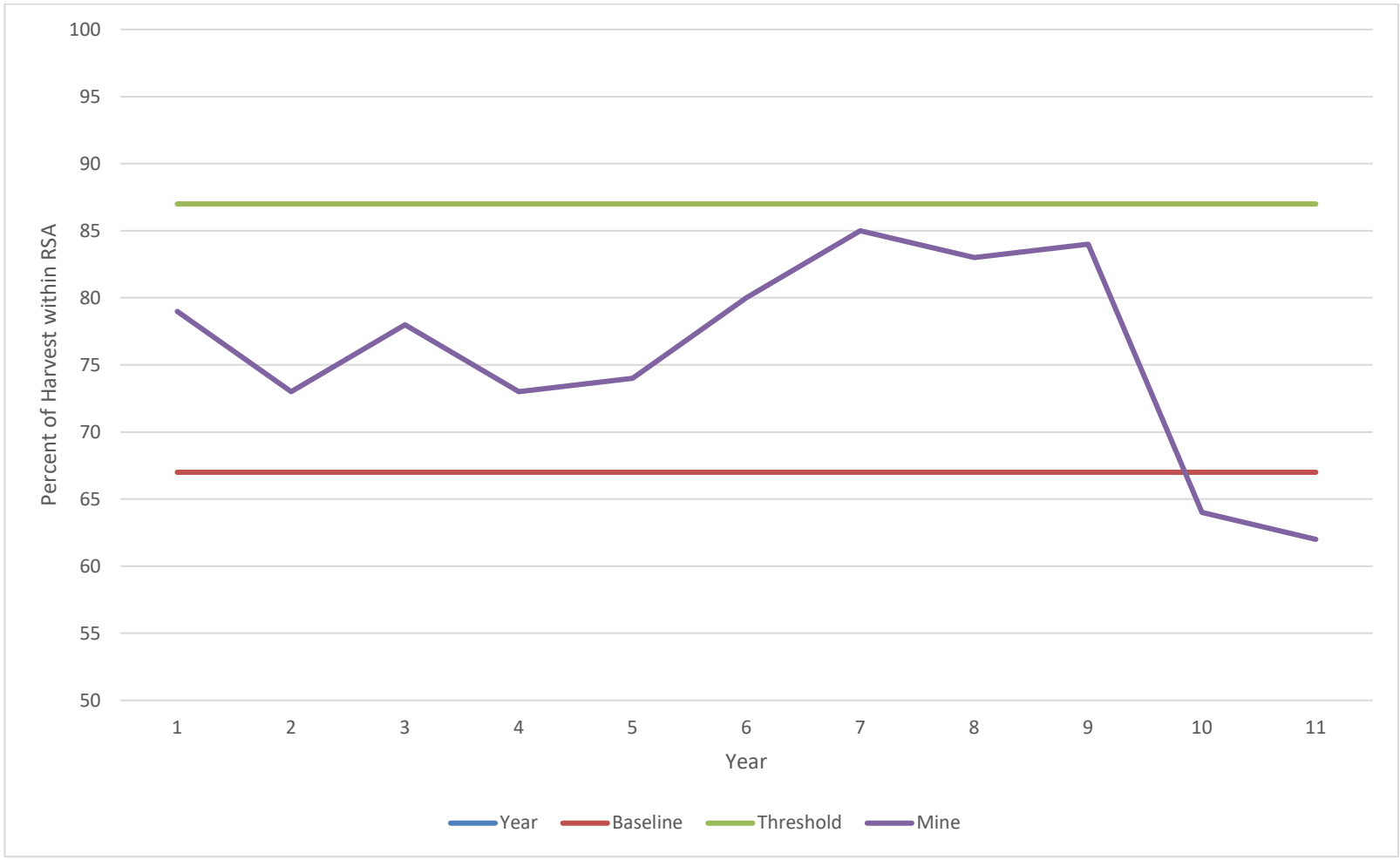


Figure 6.2: Percent of Caribou Harvest within the RSA from 2007 to 2015 (Years 1 to 9), and 2019 to 2020 (Years 10 and 11) Compared to Baseline and Threshold Levels.

Table 6.2: Hunter Caribou Harvest Statistics from the NWMB (2005) Study and Baker Lake HHS (2007 to 2015; 2019 to 2020).

Baker Lake Wildlife Harvest Study – Agnico Eagle Mines Ltd.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
2007		7	89	22	44	6	6	6	37	14	5	2	238
2008	13	15	14	10	19	14	25	34	56	47	24	25	296
2009	42	52	41	28	28	18	30	88	114	102	11	33	587
2010	27	35	34	66	47	41	46	67	82	117	48	18	628
2011	14	47	64	53	78	39	42	35	123	108	2	75	680
2012	43	30	60	71	41	44	13	19	39	37	72	27	496
2013	5	47	55	28	18	18	20	46	76	40	35	32	420
2014	13	26	20	42	7	11	4	5	43	68	14	16	269
2015	7	9	17	13	6	46	12	8	66	74	35	12	305
2019	7	25	72	86	30	39	17	29	52	187	55	48	648
2020	6	14	8	14	12	16	18	95	119	151	88	111	652
Total #	177	307	474	433	330	292	233	432	807	945	389	399	5,218
Average	17.7	27.9	43.1	39.4	30.0	26.5	21.2	39.3	73.4	85.9	35.4	36.3	474.4
% of Total	3.4	5.9	9.1	8.3	6.3	5.6	4.5	8.3	15.5	18.1	7.5	7.6	100.0

Table 6.2: Continued.

Nunavut Wildlife Harvest Study - Nunavut Wildlife Management Board (NWMB)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
1996						141	190	490	428	435	202	178	2,064
1997	118	144	146	167	217	159	162	354	322	553	295	196	2,833
1998	137	124	192	193	159	85	163	153	272	407	254	135	2,274
1999	137	131	99	211	222	111	148	433	528	409	74	66	2,569
2000	96	86	75	135	213	76	187	333	309	98	186	163	1,957
2001	150	126	146	156	127								705
Total #	638	611	658	862	938	572	850	1,763	1,859	1,902	1,011	738	12,402
Average	127.6	122.2	131.6	172.4	187.6	114.4	170	352.6	371.8	380.4	202.2	147.6	2,067
% of Total	5.1	4.9	5.3	7.0	7.6	4.6	6.9	14.2	15.0	15.3	8.2	6.0	100.0

6.4 SEASONAL DISTRIBUTION AND TIMING OF HUNTING

Based on the NWMB (2005) and HHS results (2007 to 2015; 2019 to 2020), highest Caribou harvests have occurred in September and October, with a second smaller peak in March and April (see **Figure 6.3**). The similar pattern between the studies indicates that seasonal hunting preferences have not changed markedly in the last decade. More details on the seasonal timing of harvest in 2020 can be found in **Figure 6.4** (i.e., numbers of animals harvested, numbers of participants, and average number of animals harvested by participant by month) and **Figure 6.5** (i.e., Caribou harvest numbers by season and proximity to the access roads).

The seasonal distribution of hunting is illustrated in **Figure 6.1,** which includes all 2020 results, and **Figures 6.6a** to **6.6d**, representing the spring, summer, fall and winter Caribou seasons outlined in the TEMP. In spring, overall Caribou hunting was low with hunting occurring north of Baker Lake and along the Thelon River system (**Figure 6.6a**). During the summer, Caribou were harvested across a larger area but particularly along the AWAR, just northeast of the Hamlet of Baker Lake, and in areas along Baker Lake accessible by boat (**Figure 6.6b**). In the fall, hunting was much more concentrated along the AWAR and in the Baker Lake area (**Figure 6.6c**). The large numbers harvested just northeast of Baker Lake in the fall reflects the large herd of Caribou that moved through the area in the fall. Some hunting in the fall also occurred along the Kazan River near Baker Lake. In winter, very few Caribou were hunted along the AWAR (**Figure 6.6d**). Successful hunters were those that travelled further afield by snowmobile (e.g., southwest end of Baker Lake, and between Schulz and Aberdeen lakes).

6.5 OTHER WILDLIFE SPECIES

There were no reported harvests for Muskox in 2020, precluding any interpretation of potential mine-related effects. Wolverines (total of 22 in 2020 – the highest yearly tally to date) were hunted close to Baker Lake, north of Aberdeen Lake and in other remote areas (see **Figure 6.7**). Wolves (total of 88 in 2020) were either trapped close to Baker Lake or hunted in larger numbers north of Aberdeen Lake in winter (**Figure 6.7**). Relatively low densities of Wolves and their general aversion to humans requires hunters to hunt well away from the AWAR. The presence of the AWAR is thought to have little effect on participant hunting patterns for Muskox, Wolverine and Wolf.

Arctic Fox (total of 11 in 2020) was primarily trapped in the vicinity of Baker Lake and east of Whitehills Lake, while Red Fox were harvested near Baker Lake and south of Tehek Lake (**Figure 6.8**). Two Grizzly Bear were taken near Pitz Lake, while one was taken in the southeastern end of the study area (**Figure 6.8**). Birds (e.g., goose, duck, ptarmigan etc.) and their eggs were reported as being collected around Baker Lake and north of Princess Mary Lake (**Figure 6.9).**

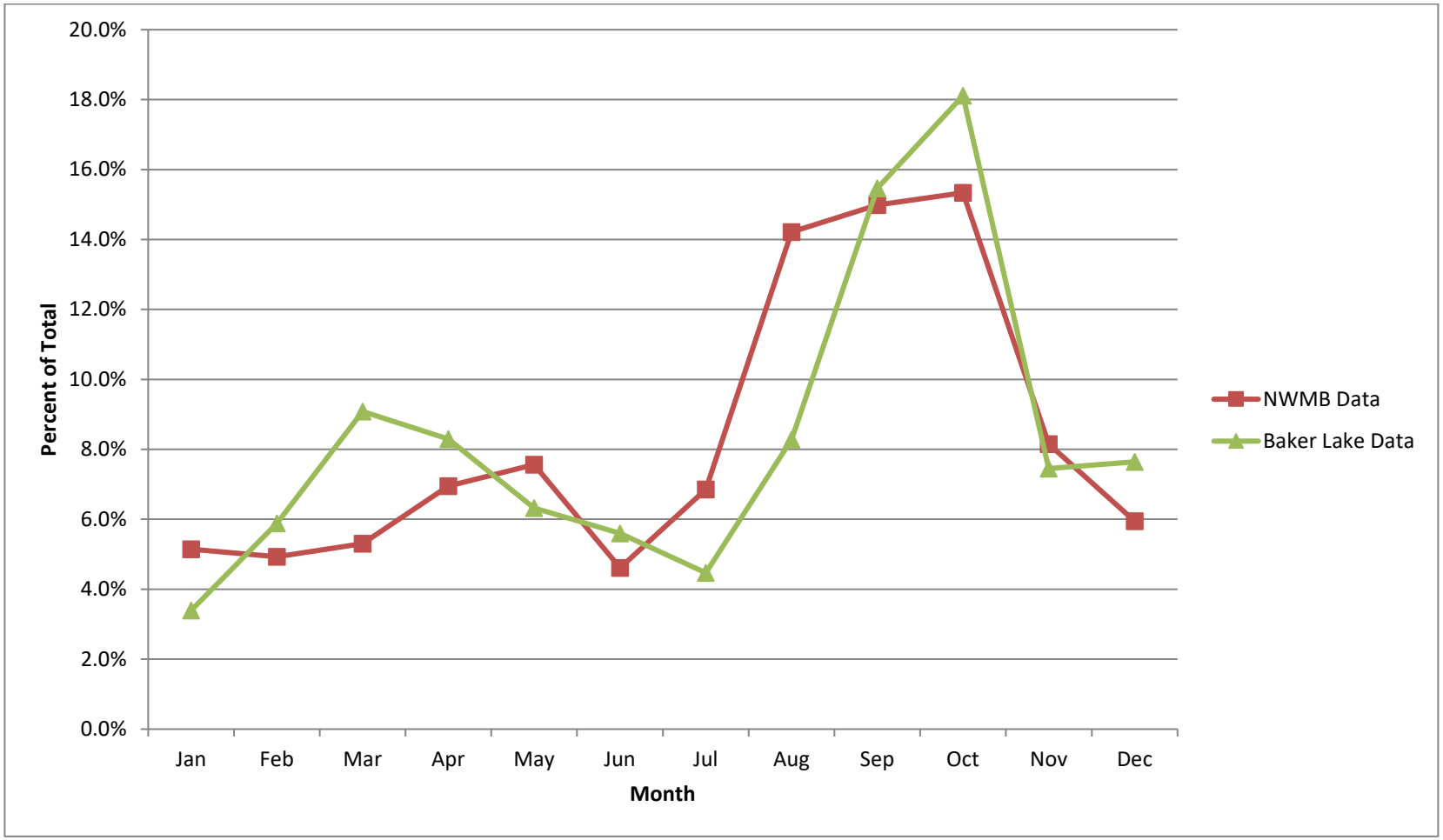


Figure 6.3: Seasonal Trends in Caribou Harvest from the Baker Lake Hunter Harvest Study (2007 to 2015; 2019 to 2020) and the NWMB Study (1996 to 2001)

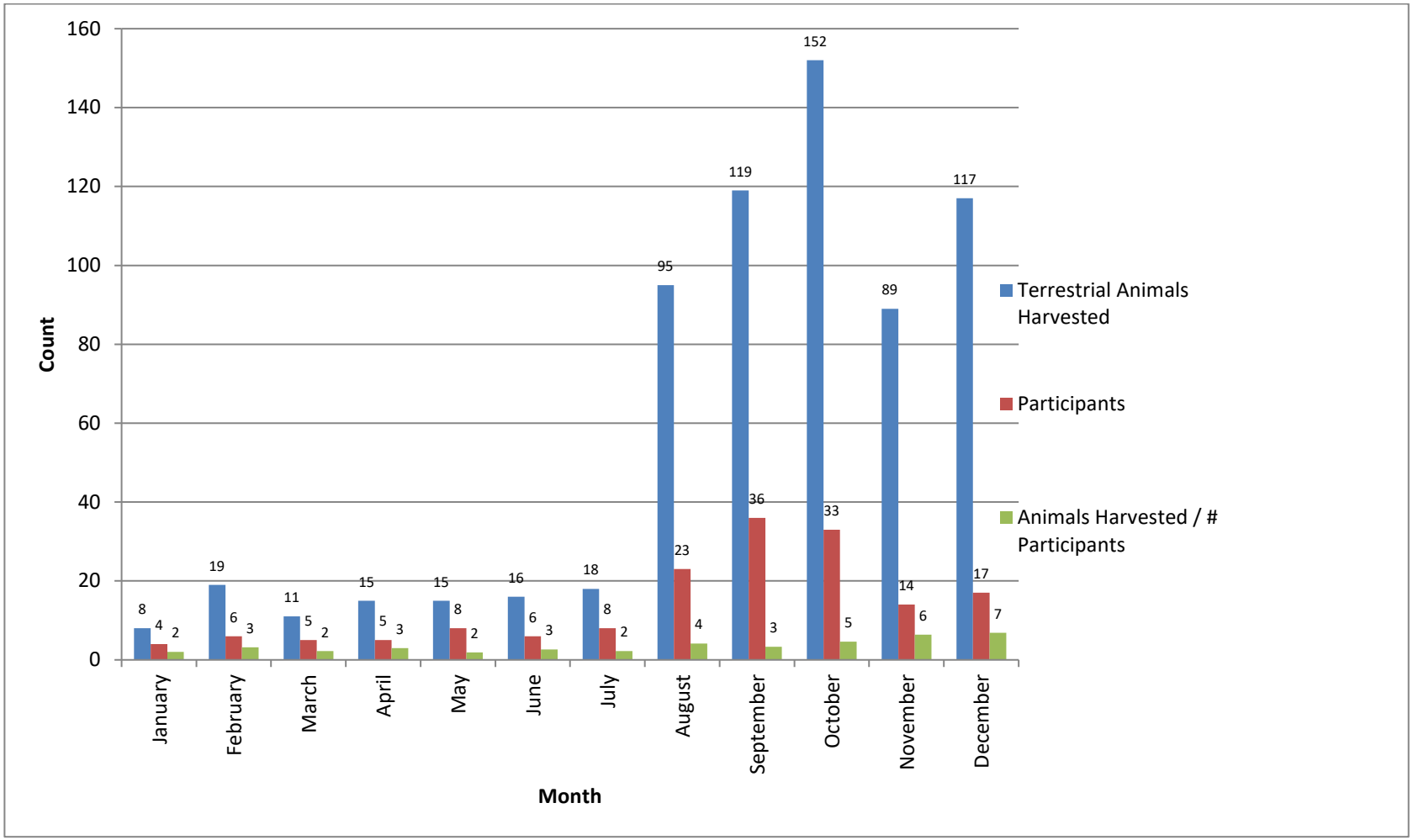


Figure 6.4: Terrestrial Animals Harvested per Month and by Participant in 2020.

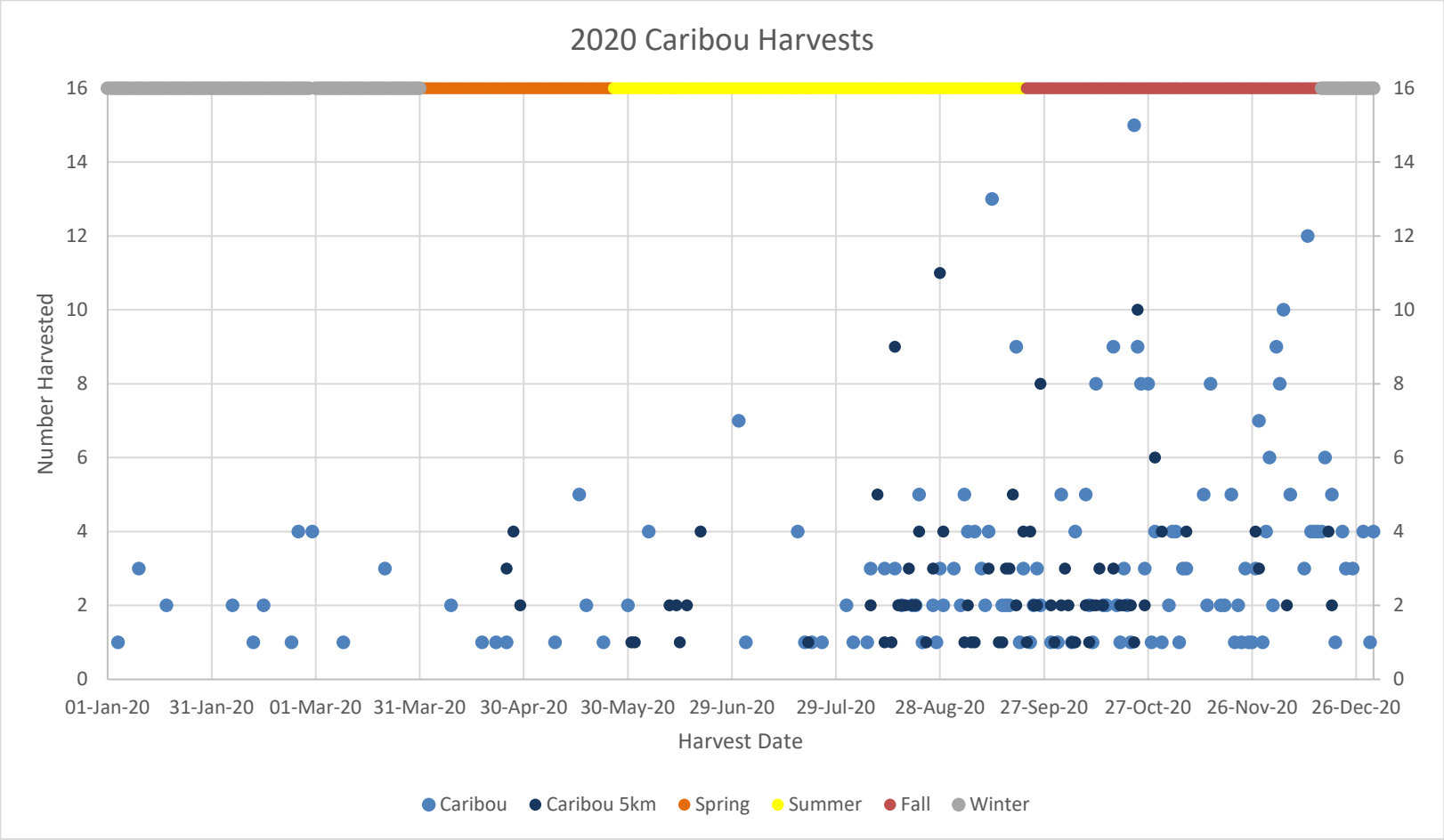
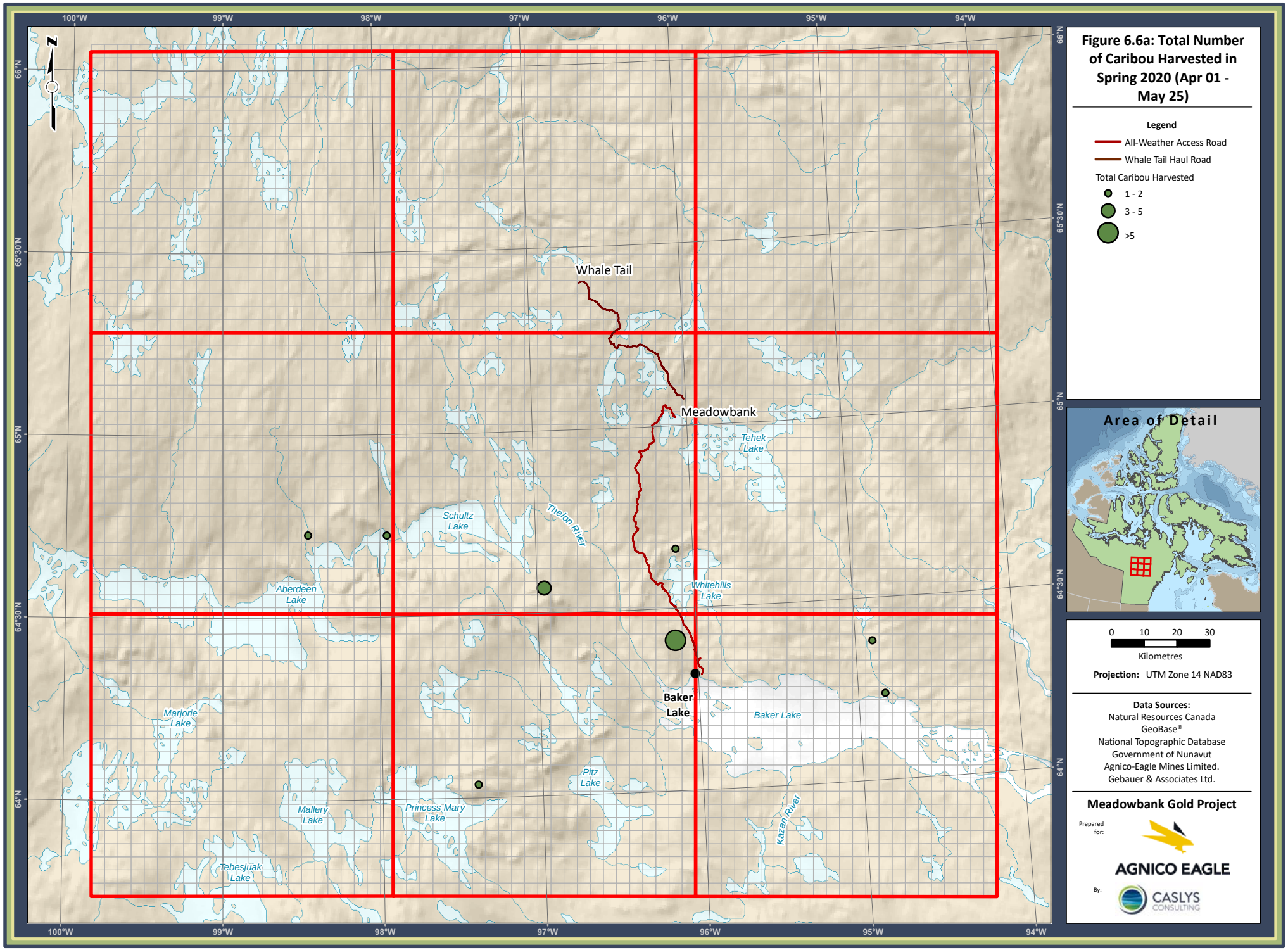
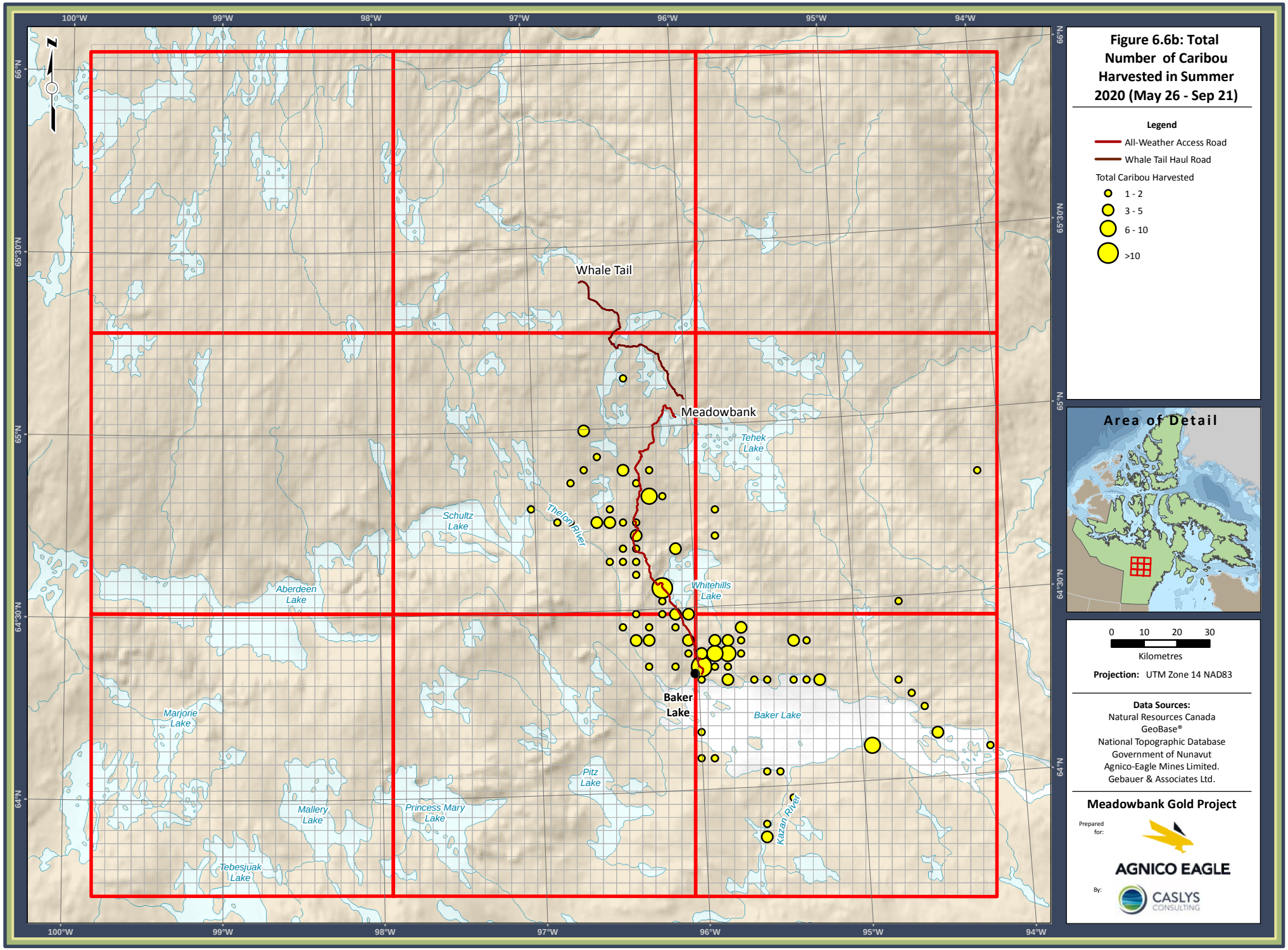
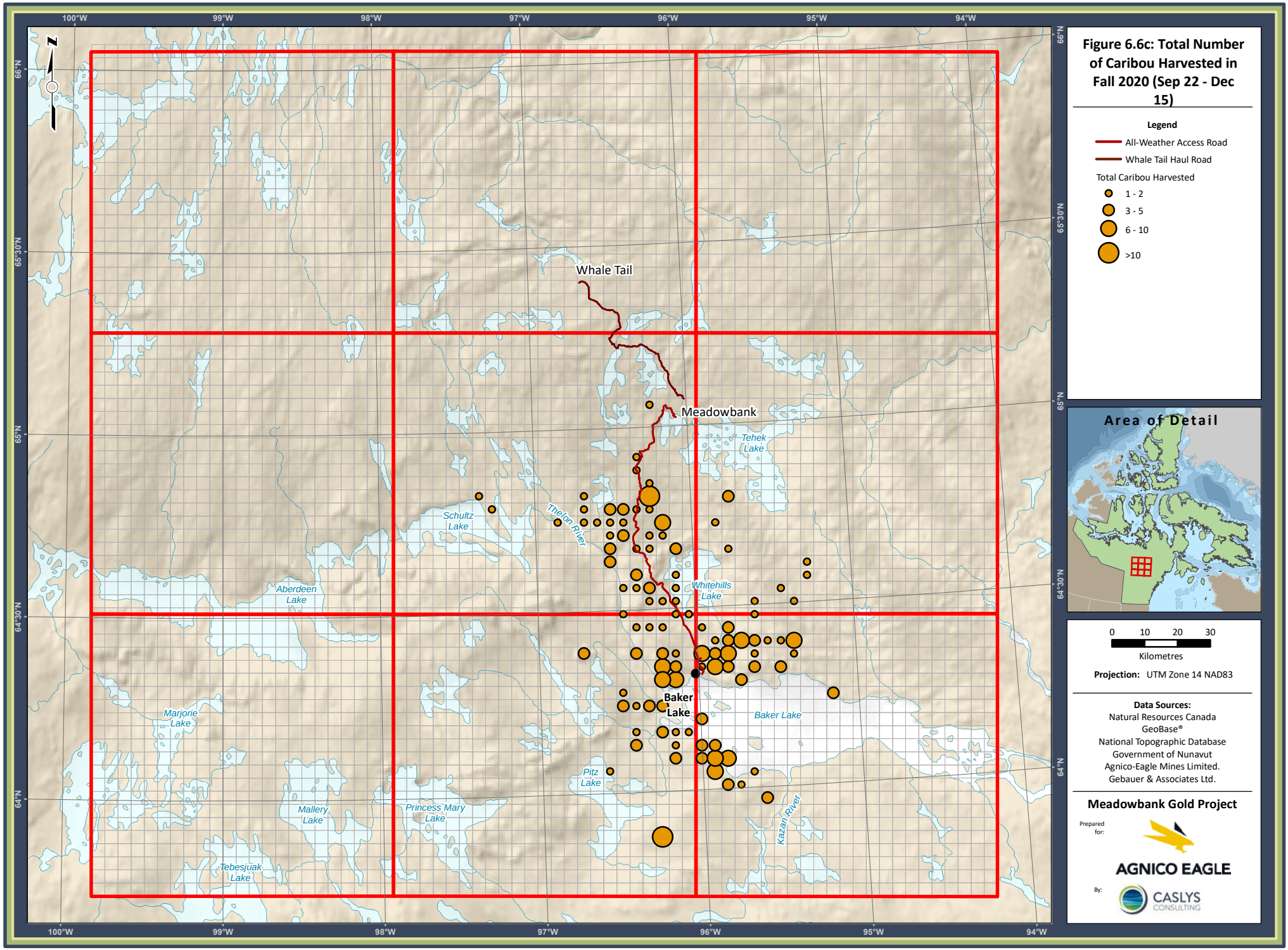
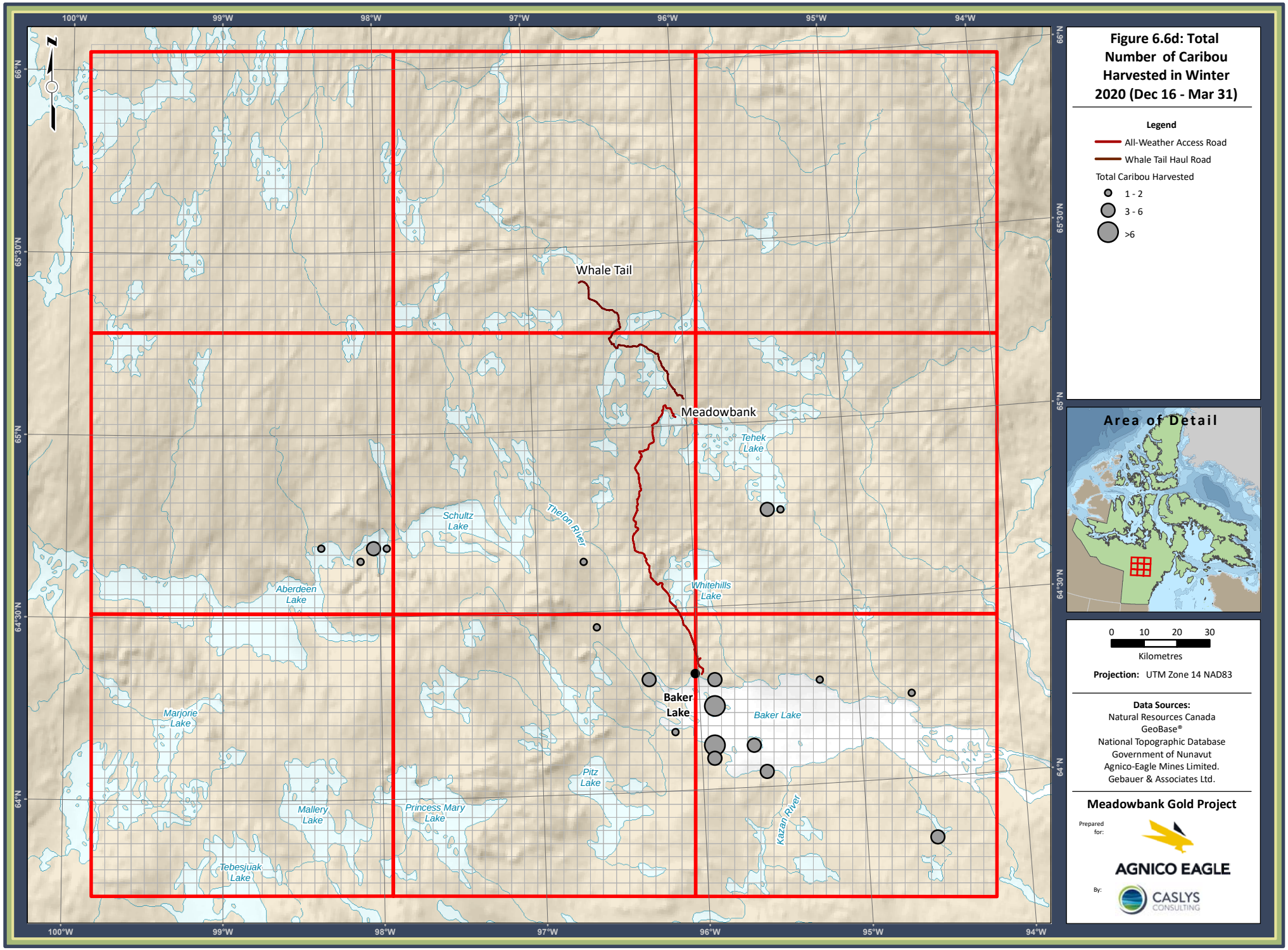


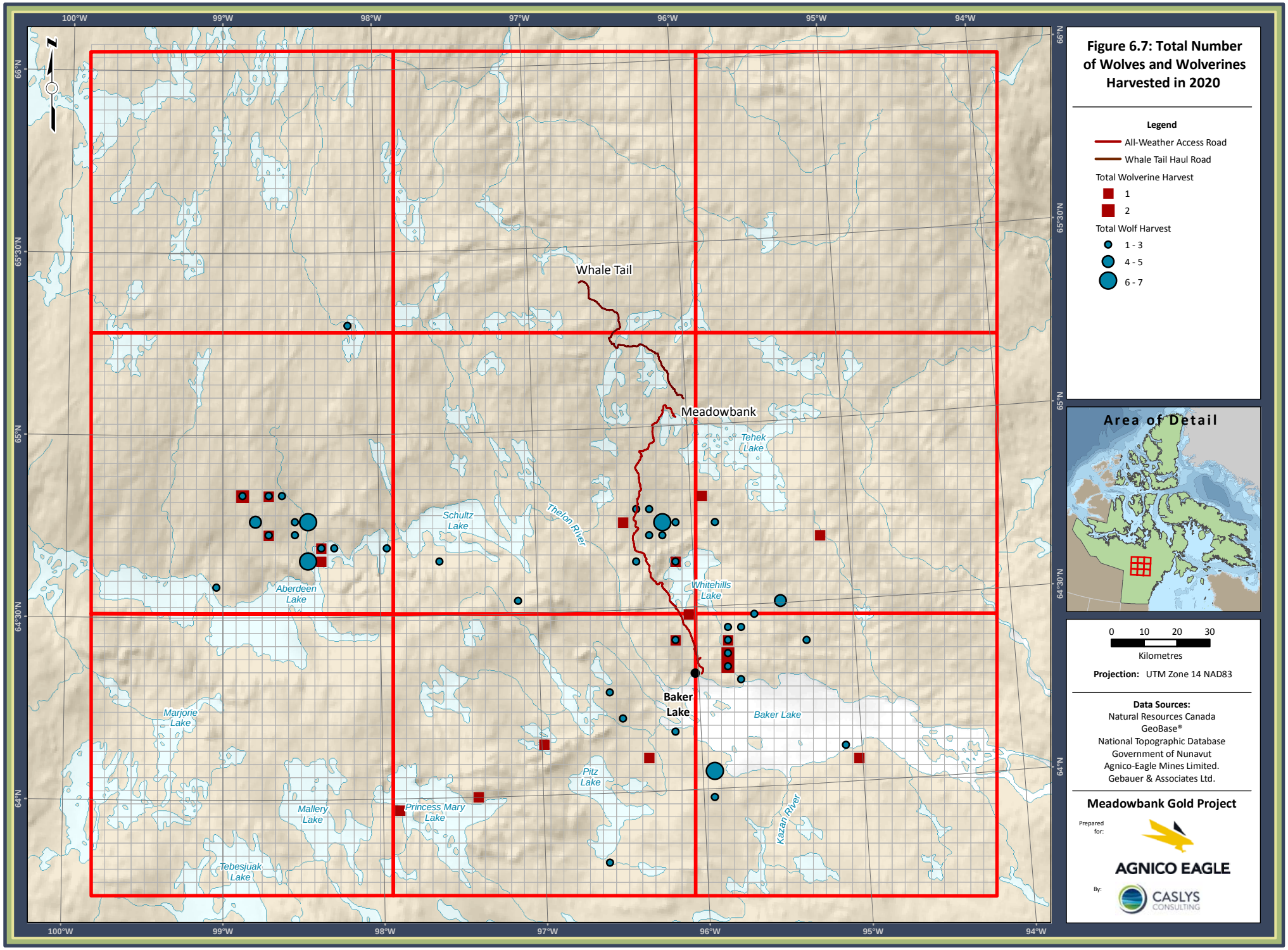
Figure 6.5: Number of Caribou harvested in each Caribou Season and Proximity to Access Roads in 2020.

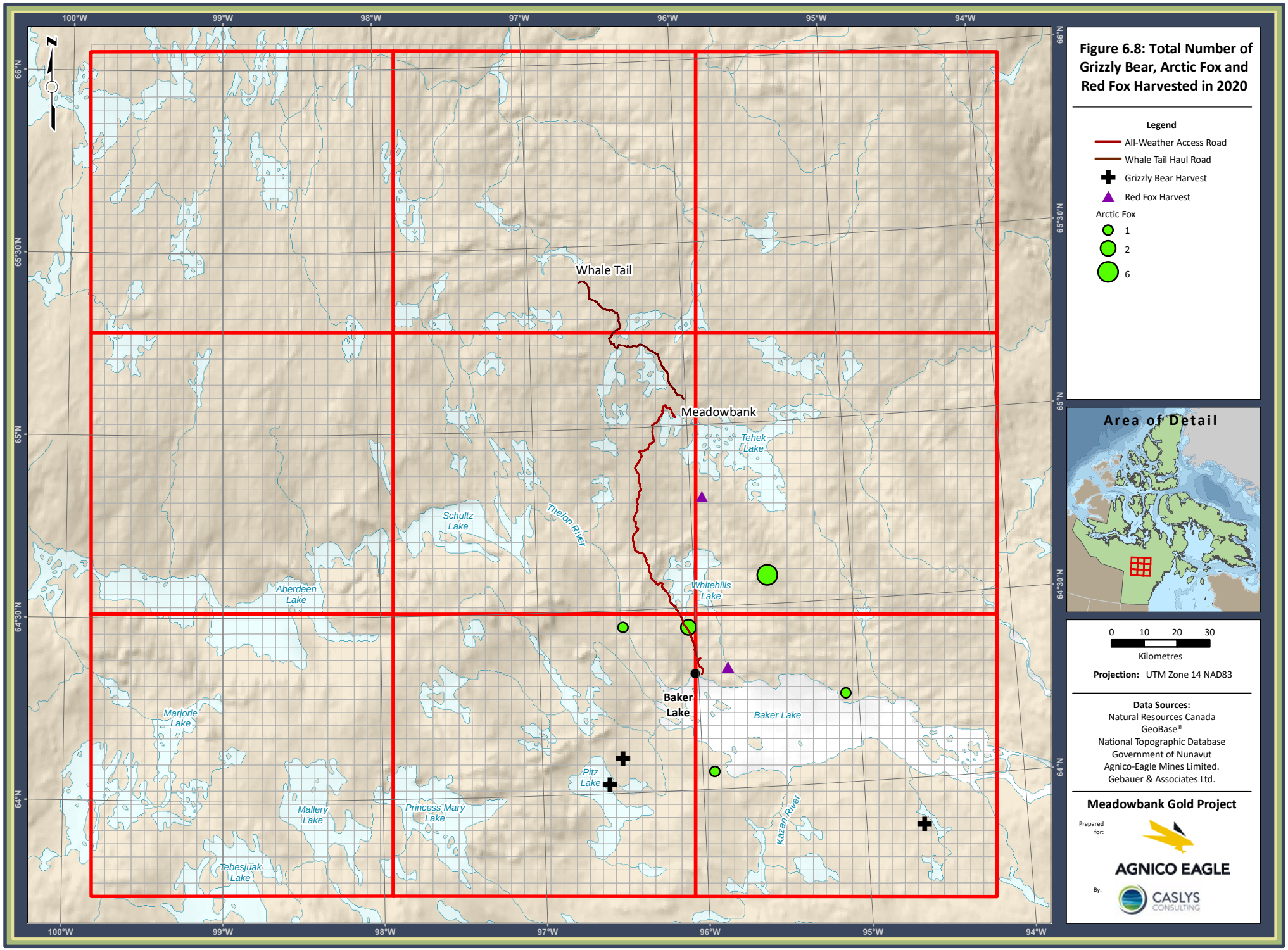

100°W
99°W
98°W
97°W
96°W
95°W
94°W
N
65°30'N
65°N
64°30'N
64°N
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Mallery Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
Figure 6.6a: Total Number of Caribou Harvested in Spring 2020 (Apr 01 - May 25)
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Caribou Harvested
1 - 2
3 - 5
>5
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING

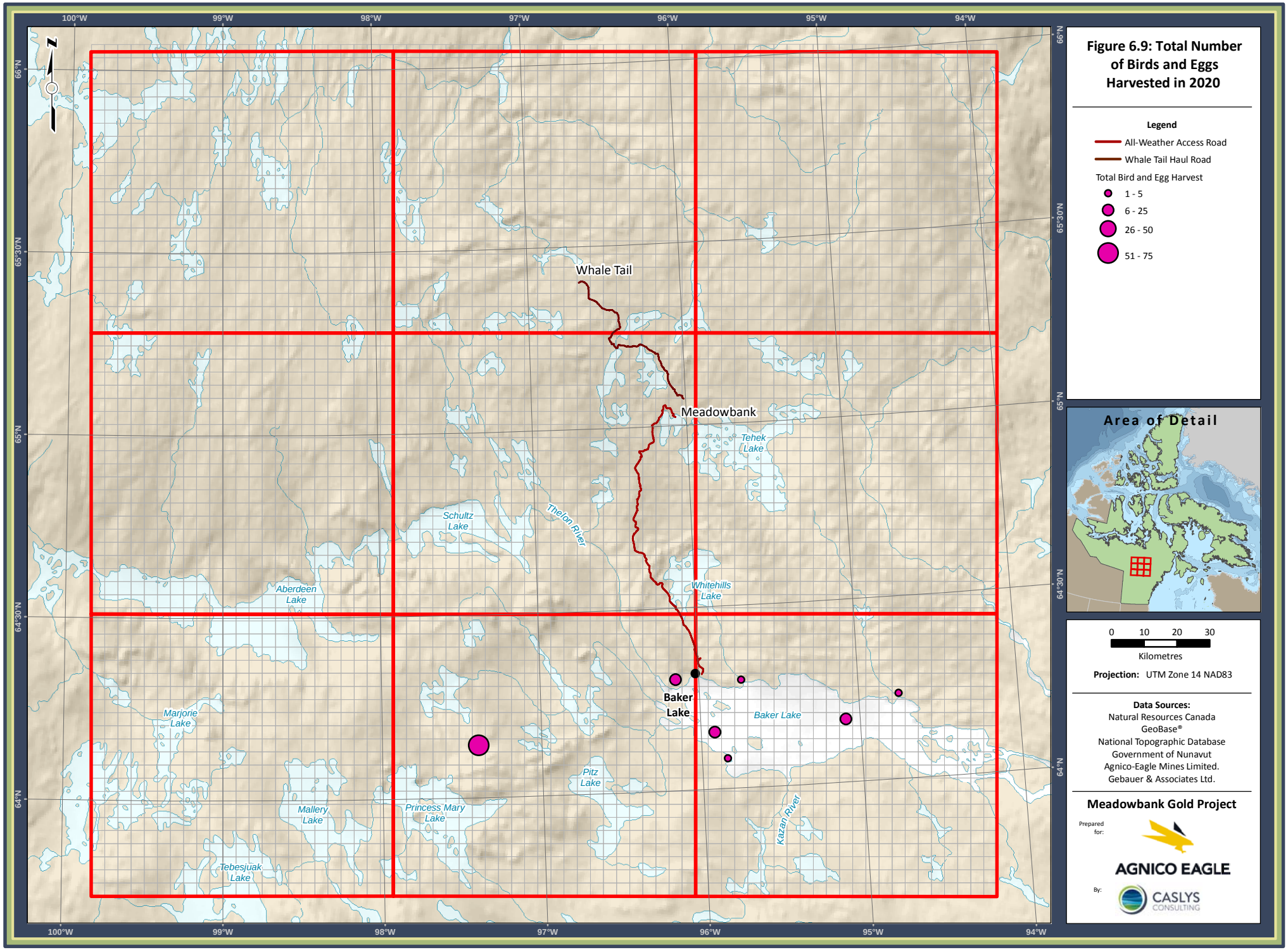

Figure 6.6b: Total Number of Caribou Harvested in Summer 2020 (May 26 - Sep 21)
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Caribou Harvested
1 - 2
3 - 5
6 - 10
>10
Area of Detail
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Mallery Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
65°30'N
65°N
64°30'N
64°N
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING


Figure 6.6c: Total Number of Caribou Harvested in Fall 2020 (Sep 22 - Dec 15)
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Caribou Harvested
1 - 2
3 - 5
6 - 10
>10
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Kazan River
Mallery Lake
Princess Mary Lake
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
65°30'N
65°N
64°30'N
64°N


Figure 6.6d: Total Number of Caribou Harvested in Winter 2020 (Dec 16 - Mar 31)
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Caribou Harvested
1 - 2
3 - 6
>6
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Mallery Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
65°30'N
65°N
64°30'N
64°N


Figure 6.7: Total Number of Wolves and Wolverines Harvested in 2020
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Wolverine Harvest
1
2
Total Wolf Harvest
1 - 3
4 - 5
6 - 7
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Mallery Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
65°30'N
65°N
64°30'N
64°N


Figure 6.8: Total Number of Grizzly Bear, Arctic Fox and Red Fox Harvested in 2020
Legend
All-Weather Access Road
Whale Tail Haul Road
Grizzly Bear Harvest
Red Fox Harvest
Arctic Fox
1
2
6
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Mallery Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
65°30'N
65°N
64°30'N
64°N


Figure 6.9: Total Number of Birds and Eggs Harvested in 2020
Legend
All-Weather Access Road
Whale Tail Haul Road
Total Bird and Egg Harvest
1 - 5
6 - 25
26 - 50
51 - 75
Area of Detail
0 10 20 30
Kilometres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.
Meadowbank Gold Project
Prepared for:
AGNICO EAGLE
By:
CASLYS CONSULTING
Whale Tail
Meadowbank
Tehek Lake
Schultz Lake
Thelon River
Aberdeen Lake
Whitehills Lake
Baker Lake
Baker Lake
Marjorie Lake
Pitz Lake
Mallery Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
100°W
99°W
98°W
97°W
96°W
95°W
94°W
65°30'N
65°N
64°30'N
64°N

SECTION 7 • CREEL SURVEY RESULTS

7.1 NUMBER OF FISHERMAN

The number of fisherman reporting successful fishing trips in 2020 was 21, which is lower than the average of 23 fisherman from 2007 to 2015 and in 2019 (10 years), and lower than the 26 fisherman reporting success in 2019. The highest numbers of fisherman reporting success in 2020 were in the May to August period (see **Table 7.1**) (see **Section 7.4 Magnitude of Fishing**).

Table 7.1: Number of Fisherman in the Baker Lake Who have Recorded Fishing Success by Year and Month.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007			4	6	7	1	1		1			
2008	1	1	2	6	6	6	4	3			2	1
2009	2	2	5	10	9	9	9	6	1	8	2	2
2010			6	13	18	17	13	4	2	2	3	1
2011	1	3	6	15	21	18	9	6	2	9	9	5
2012	3	1	1	7	7	18	12	4	3	9	7	3
2013			2	5	4	11	9	1		2	1	1
2014	2	1	1	4	6	3	4	2		2	2	2
2015	1	1	1	2	9	8	6	2		3	4	2
2019	1	2	3	12	14	15	7	3	1	1	8	4
2020				1	6	9	9	5	1	4	3	
Total	**11**	**11**	**31**	**81**	**107**	**115**	**83**	**36**	**11**	**40**	**41**	**21**

7.2 COMPOSITION OF CATCH

Three fish species were reported as being caught in 2020: Arctic Char, Lake Trout and Lake Whitefish. The most common fish species captured, Lake Trout, represented 67% of the total catch in 2020, which was higher than the average of 55% from 2007 to 2015 and in 2019 (see **Table 7.2**). In 2019 interviews, some fisherman indicated that Lake Whitefish numbers in Baker Lake were particularly high in 2019. Lower numbers of Lake Whitefish caught in 2020 could be due to lower abundance and/or reduced fishing effort.

Table 7.2: Total Number of Fish Caught between 2007 and 2015, and 2019 to 2020.

Species	2020	2019	2015	2014	2013	2012	2011	2010	2009	2008	2007	Total
Arctic Char	75	89	41	22	96	24	113	103	117	24	3	632
Arctic Grayling			29			1	1	3	1			35
Lake Trout	219	900	370	353	490	1,014	1,710	860	525	825	210	7,257
Lake Whitefish	32	1573	1386	651	50	471	460	326	51	192		5,160
Unidentified Fish	2	119										119
Totals	**328**	**2,681**	**1,826**	**1,026**	**636**	**1,510**	**2,284**	**1,292**	**694**	**1,041**	**213**	**13,203**

7.3 DISTRIBUTION OF FISHING

Fishing trips, regardless of success rate, did not generally occur beyond the immediate areas of Baker Lake, Whitehills Lake, and along the AWAR (see **Figure 7.1**). Some fishing occurred along the Thelon River system and associated lakes (**Figure 7.1)** during the summer when these areas can be accessed by boat. Results indicate that study participants are less willing to travel long distances to catch fish, regardless of AWAR access, likely due to the abundance of fish in close proximity to the Hamlet of Baker Lake.

7.4 MAGNITUDE OF FISHING

Unlike in 2019, the average number of fish harvested per fisherman was highest in the summer months (**Figure 7.2**). In 2019, the high winter numbers reflected the high catches of Lake Whitefish and Lake Trout caught in nets set under the ice. In 2020, the most commonly captured fish species, in order of abundance, were Lake Trout, Arctic Char, and Lake Whitefish (see **Table 7.3**). Few Lake Whitefish were reported as being caught in 2020 compared to 2019, which is either due to lower abundance and/or reduced effort.

7.5 SEASONAL TIMING OF FISHING

In 2020, fishing periods with the most active fisherman was from May to August (see **Table 7.2**). The periods with the most fish caught included the summer months (especially June and July), which reflects the high number of Lake Trout caught by fisherman heading out on the land after ice melt (**Figure 7.3**).This trend can be observed in the overall trendsfrom 2007 to 2015 and 2019 (**Figure 7.3)**; however, the winter peaks of fishing observed in 2019 were not seen in 2020.

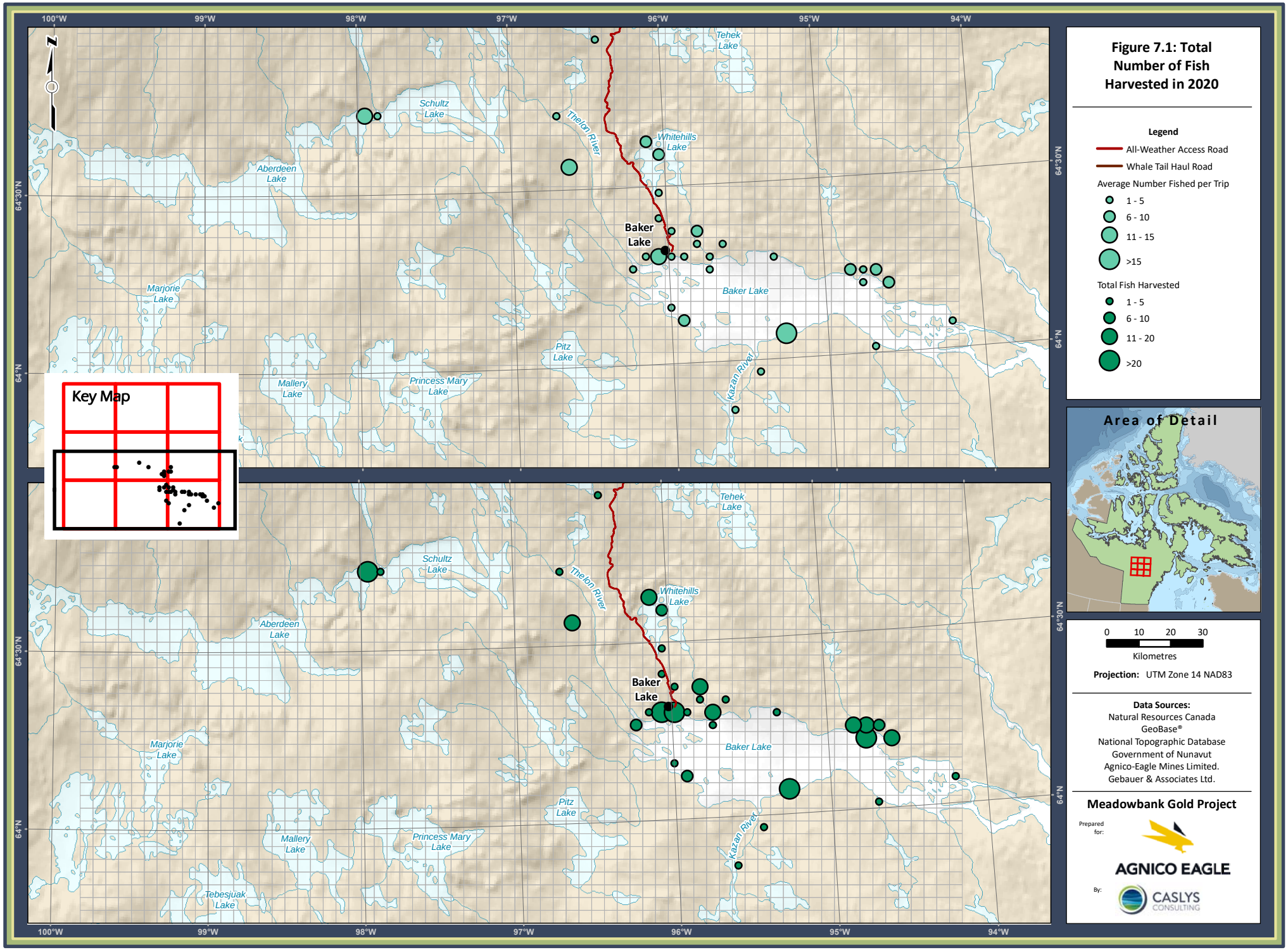


Figure 7.1: Total Number of Fish Harvested in 2020

Legend

All-Weather Access Road

Whale Tail Haul Road

Average Number Fished per Trip

- 1 - 5
- 6 - 10
- 11 - 15
- >15

Total Fish Harvested

- 1 - 5
- 6 - 10
- 11 - 20
- >20

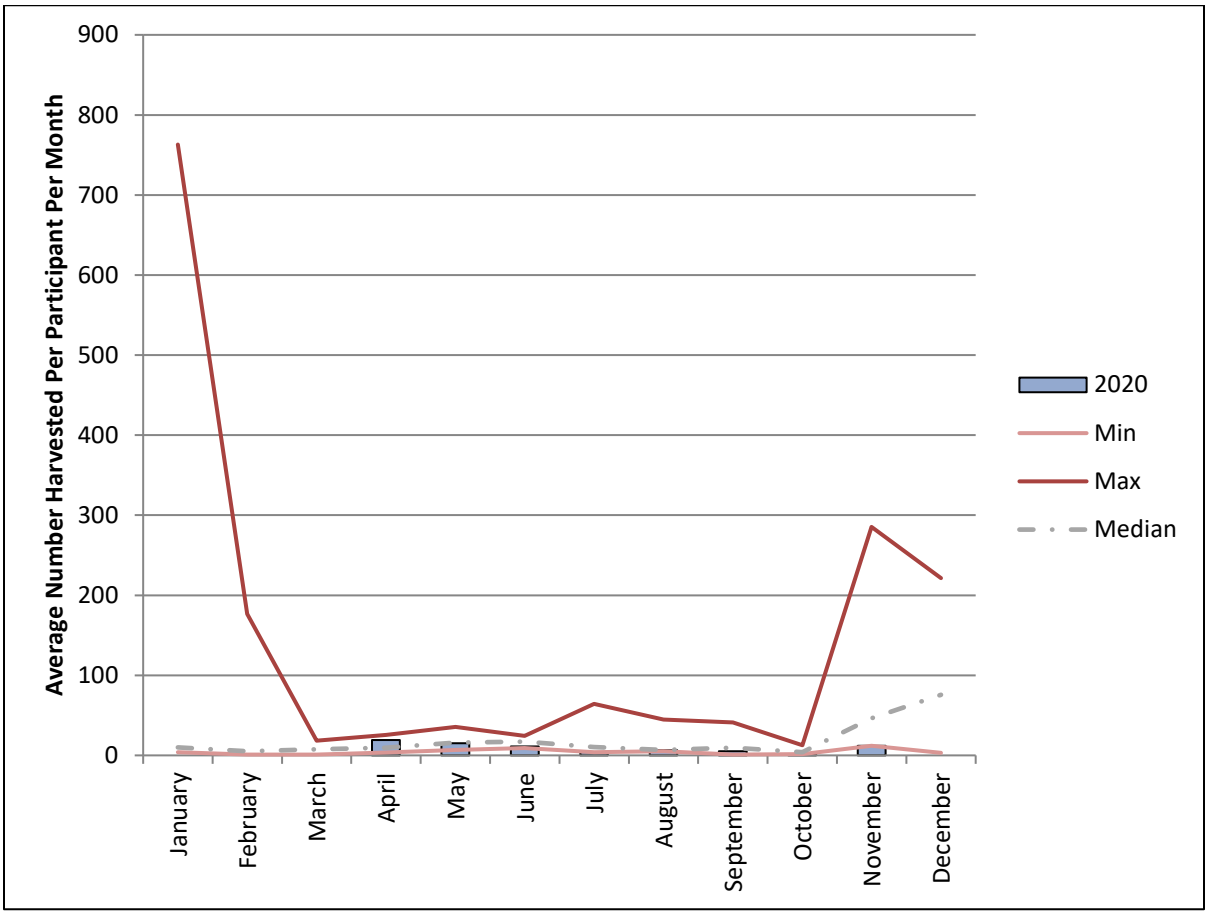


Figure 7.2: Average Number of Fish Caught per Participant in 2020 and the Minimum and Maximum Range from 2007 to 2015 and in 2019.

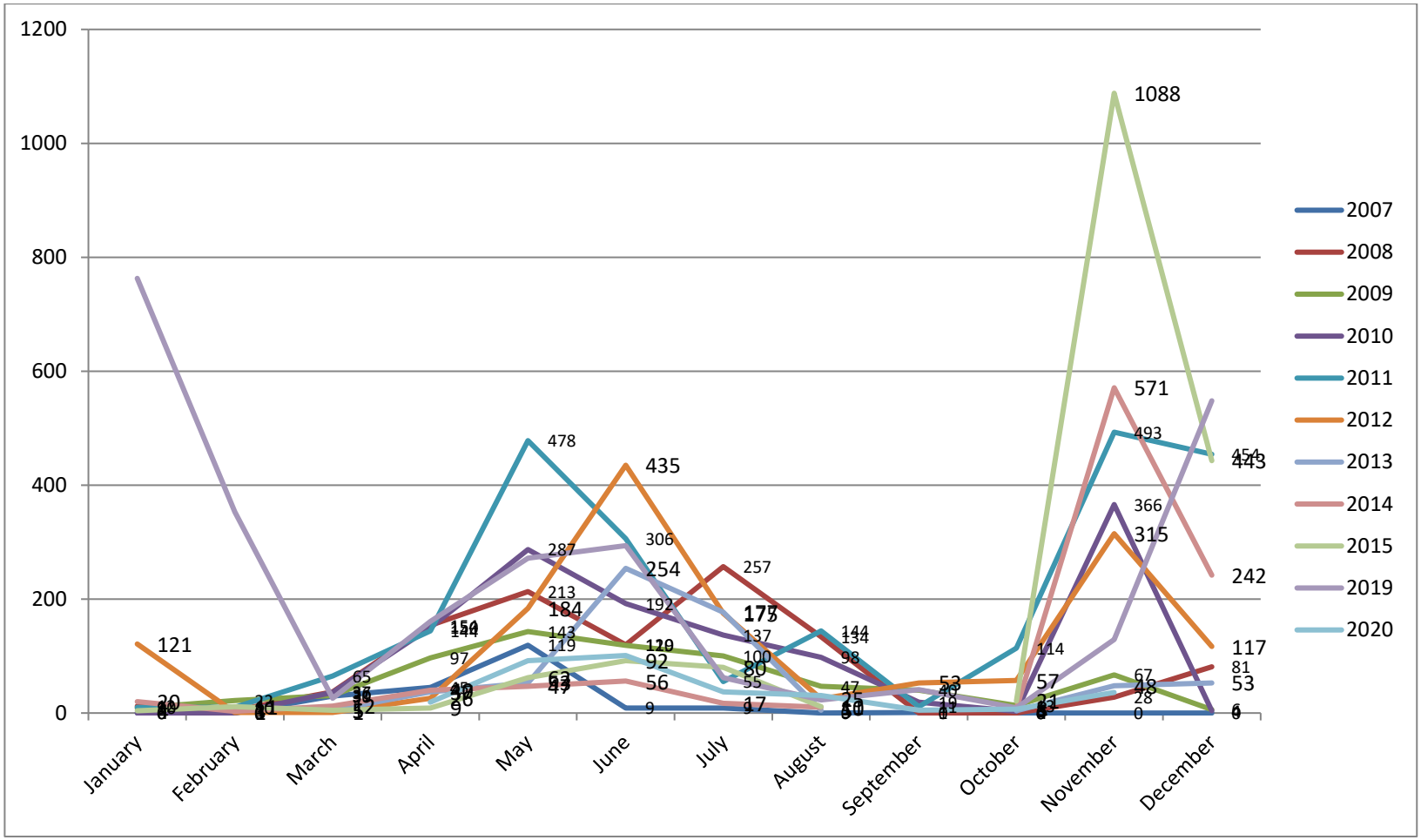


Figure 7.3: Seasonal Trends in Fishing in the Baker Lake Area from 2007 to 2015, and 2019 to 2020.

SECTION 8 • ACCURACY OF IMPACT PREDICTIONS

Table 8.1 provides a summary of the impact predictions identified in the original TEMP (Cumberland 2006) and the updated June 2019 version (Agnico Eagle 2019). The 2020 HHS data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2020.

Table 8.1: Accuracy of Impact Predictions – Baker Lake Hunter Harvest Study

Potential Effect	Threshold	Threshold Exceeded (2020)	Adaptive Management Implemented	Status
Meadowbank All-Weather Access Road				
Hunting by Baker Lake Residents	The AWAR will not result in significant changes in the spatial distribution, seasonal pattern, or harvest levels of Caribou kills by Baker Lake hunters. Changes will not exceed 20% of historical harvest activities within the RSA	NO (62% of harvest in RSA in 2020 compared to 67% baseline; average of 76% of harvest within RSA since 2007)	Future discussion with HTO and GN representatives required to identify management options	Hunter Harvest Study Creel Survey
Whale Tail Haul Road				
Hunting by Baker Lake Residents	No change in harvest	NO (No harvests recorded within 8 km of the Whale Tail Haul Road)	None required. Access by hunters is restricted in the growing season and very limited hunting occurs in the winter.	Hunter Harvest Study Satellite-collaring Program

SECTION 9 • MANAGEMENT RECOMMENDATIONS

The Hunter Harvest Study and Creel Survey should be continued on an annual basis to monitor the hunting and fishing patterns of Baker Lake residents, and the potential effects of the mine. Meetings with participants every four months (3 times/year) in 2021 are particularly important in maintaining contact, building relationships, expanding the study and collecting good harvest data. The total number of planned visits per year was reduced to three from four because of the added logistical constraints associated with mandatory quarantine prior to travel to Nunavut. Despite the decrease in visits, participation rates can be maintained by continuing to use social media platforms such as Facebook and Instagram, expanding connections on these platforms, ensuring that all participants are visited during the three scheduled field visits, and continuing with distribution of the well-received gas vouchers and year-end prizes while in the community.

APPENDIX A

2020 Hunter Harvest Calendar



2020

Baker Lake Harvest Study

ᖃᒪᓂᑐᐊᖏᑦ ᐊᖏᔪᓇᓯᒃᓂᖏᓪᓗᑎᑦ ᖃᐅᔨᓴᖏᓂᖅ



Caribou Cuts

Jamie Kataluk

January | ᖁᓇᐅᑎ 2020

Baker Lake Harvest Study
ᖃᒪᓕᕐᕆᔨ ᐊᖏᔪᓂᒃᓴᖅᓯᒪᔪᖅ ᖃᐅᔨᓴᖏᓐᓄᑦ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᑎᓂᓴᖅ	Tuesday ᑐᐊᔪᐊᖏᓇᖅ ᔪᑲᓕᖅ	Wednesday ᐱᖓᓱᐊᕐᓂ	Thursday ᔪᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖏᓇᖅ
December 2019 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	February 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29		**1** New Year's Day	**2**	**3**	**4**
5	**6**	**7**	**8**	**9**	**10**	**11**
12	**13**	**14**	**15**	**16**	**17**	**18**
19	**20**	**21**	**22**	**23**	**24**	**25**
26	**27**	**28**	**29**	**30**	**31**	



Sled Dogs

Martin Gebauer

February | ᐃᓕᑭᐊᓗ 2020

Baker Lake Harvest Study
ᖃᒪᓂᑐᐊᖏᑦ ᐊᖏᔪᓚᒃᓂᖅᓯᒪᑦ ᖃᐅᔨᓴᓇᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᒪᓂᖅ	Tuesday ᑐᑭᓯᐊᖅᓯᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖓᓱᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓯᖅ
January 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	March 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31					1
2 Groundhog Day	3	4	5	6	7	8
9	10	11	12	13	14 Valentine's Day	15
16	17	18	19	20	21	22
23	24	25	26 Ash Wednesday	27	28	29



Ice Fishing

Martin Kreclak

March | ᒪᐳ 2020

Baker Lake Harvest Study
ᖃᒪᓕᑐᐊᖏᑦ ᐊᖏᔪᓇᓂᓕᒋᑦ ᖃᐅᔨᓴᓂᖅ

Sunday ᓴᓇᑕᐅᓕ	Monday ᓴᓇᑕᐅᓕᐅᒪᓂᓴᖅ	Tuesday ᑐᐸᓯᐊᖏᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖏᒃᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖏᓇᖅ
1	2	3	4	5	6	7
8 Daylight Savings Beginy	9	10	11	12	13	14
15	16	17 St. Patrick's Day	18	19 First Day of Spring	20	21
22	23	24	25	26	27	28
29	30	31				

February 2020

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

April 2020

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		



Winter Remains

Martin Gebauer

April | ᐊᐃᓇᓕᓂ 2020

Baker Lake Harvest Study
ᖃᒪᓂᑐᐊᖏᑦ ᐊᖏᔪᓇᓱᓂᖓᓪᓚᑦ ᖃᐅᔨᓴᓂᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᒪᓂᖅ	Tuesday ᑐᐱᓯᐊᖅᓇᖅ ᓯᖃᓕᖅ	Wednesday ᐱᖓᓱᓯᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
			1 April Fool's Day	2	3	4
5 Palm Sunday	6	7	8 Passover	9	10 Good Friday	11
12 Easter Sunday	13	14	15	16	17	18
19	20	21	22 Earth Day	23	24	25
26	27	28	29	30		

March 2020

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

May 2020

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						



Family Hunt

Candice Qabloona

May | ᒪᐃ 2020

Baker Lake Harvest Study
ᖃᐅᓂᑐᐊᖏᑦ ᐊᖏᔪᓇᐅᓂᖏᓪᓗᑎᑦ ᖃᐅᔨᓴᓂᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᔪᓂᓴᖅ	Tuesday ᑐᐱᓯᐊᖅᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖓᓱᓪᓚᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᐊᖅᓇᖅ
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18 Victoria Day	19	20	21	22	23
24	25	26	27	28	29	30
31						

April 2020

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

June 2020

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				



Fishing Spoons

Martin Gebauer

June | ᕿᓂ 2020

Baker Lake Harvest Study
ᖃᐅᓂᑐᐊᖏ ᐊᖏᔪᓕᒃᓂᕐᒧᑦ ᖃᐅᔨᓴᖅᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᔪᓂᓴᖅ	Tuesday ᑐᐸᓯᐊᖅᓇᖅ ᓯᖃᓕᖅ	Wednesday ᐱᖓᓱᐊᐃᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20 First Day of Summer
21 National Aboriginal Day Father's Day	22	23	24	25	26	27
28	29	30				

May 2020

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

July 2020

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	



Drying Fish

Martin Gebauer

July | ᐊᓪᓚᐃ 2020

Baker Lake Harvest Study
ᖃᐅᓂᑐᐊᖏᑦ ᐊᖏᔪᓕᒃᓂᕐᒧᑦ ᖃᐅᔨᓴᖅᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓚᓂᓴᖅ	Tuesday ᑐᐸᓯᐊᖅᓇᖅ ᓯᖁᓕᖅ	Wednesday ᐱᖓᓱᐊᐅᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᕆᓇᖅ
June 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	August 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		**1** **Canada Day**	**2**	**3**	**4**
5	**6**	**7**	**8**	**9** **Nunavut Day**	**10**	**11**
12	**13**	**14**	**15**	**16**	**17**	**18**
19	**20**	**21**	**22**	**23**	**24**	**25**
26	**27**	**28**	**29**	**30**	**31**	



Caribou Gathering

Lars Qaqqaq

August | ᐊᔪᓂ 2020

Baker Lake Harvest Study
ᖃᒪᓕᑐᐊᖏᑦ ᐊᖏᔪᓇᖅᓂᖅᓯᒪᑦ ᖃᐅᔨᓴᓂᓕᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᓕᐅᓂᓴᖅ	Tuesday ᑐᑭᓯᐊᖅᓇᖅ ᓂᕆᓕᖅ	Wednesday ᐱᖓᓱᓪᓗᐊᑦ	Thursday ᓂᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓄᖅᐃᑐᕐᓇᖅ
July 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	September 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30					1
2	3 Civic Holiday	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



Fall Colours

Lars Qaqqaq

September | ᓯᑎᐱᓗ 2020

Baker Lake Harvest Study
ᖃᒪᓂᑐᐊᖏᑦ ᐊᖏᔪᓚᒃᓂᕐᒧᑦ ᖃᐅᔨᓴᓂᖅ

Sunday ᓴᓇᑕᐱᓕ	Monday ᓴᓇᑕᐱᓕᐅᒪᓂᕐᒥᒃ	Tuesday ᑐᒃᓯᐊᖏᓇᒃ ᓯᑲᓕᒥᒃ	Wednesday ᐱᖓᓱᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᕆᐃᑐᖏᓇᒃ
		1	2	3	4	5
6	7 Labour Day	8	9	10	11	12
13 Grandparent's Day	14	15	16	17	18	19
20 Terry Fox Run	21	22 First Day of Autumn	23	24	25	26
27	28	29	30			

August 2020

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

October 2020

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31



Fishing for Arctic Char

William Noah

October | ᐅᖅᑐᐱᓗ 2020

Baker Lake Harvest Study
ᖃᒪᓕᑕᐋᖏᑦ ᐊᖏᔪᓚᐅᓕᕆᔨᒃ ᖃᐅᔨᓴᓕᖅᖢᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᒪᓕᕆᖅ	Tuesday ᑐᖅᓯᐊᖏᓐᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖓᓱᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓄᖅᐃᑐᖏᓐᓇᖅ
September 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	November 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30			1	2	3
4	5	6	7	8	9	10
11	12 Thanksgiving Day	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31 Halloween



Muskox Herd

Lars Qaqqaq

November | ᓄᐃᑦᓯᕆᔨ 2020

Baker Lake Harvest Study
ᖃᐅᓕᑦᑐᖅ ᐊᖏᔪᓇᐃᓕᓐᓂᒃ ᖃᐅᔨᓴᓕᓐᓄᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓚᓕᓴᖅ	Tuesday ᑐᐱᔪᐊᖏᓇᖅ ᔪᑲᓕᖅ	Wednesday ᐱᖓᓱᔪᐊᑦ	Thursday ᔪᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖏᓇᖅ
1 Daylight Savings Time Ends	2	3	4	5	6	7
8	9	10	11 Remembrance Day	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October 2020

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

December 2020

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



Bulls in Winter

Thomas Putumiraqtuq

December | ᑎᓯᐱᓗ 2020

Baker Lake Harvest Study
ᖃᐅᓂᑐᐊᖏᑦ ᐊᖏᔪᓕᕆᓂᖅᓯᒪᔪᑦ ᖃᐅᔨᓴᓂᓗᒃ

Sunday ᓴᓇᑕᐱᓕ	Monday ᓴᓇᑕᐱᓕᓕᐅᓂᓴᖅ	Tuesday ᑐᐳᓯᐊᖅᓇᖅ ᓯᖃᓕᖅ	Wednesday ᐱᖅᓯᓯᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
November 2020 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	January 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21 First Day of Winter	22	23	24	25 Christmas Day	26 Boxing Day
27	28	29	30	31 New Year's Eve	Please return the calendar to the Agnico-Eagle office for entry into the participant draw.	

Wildlife and Fish Species of Interest













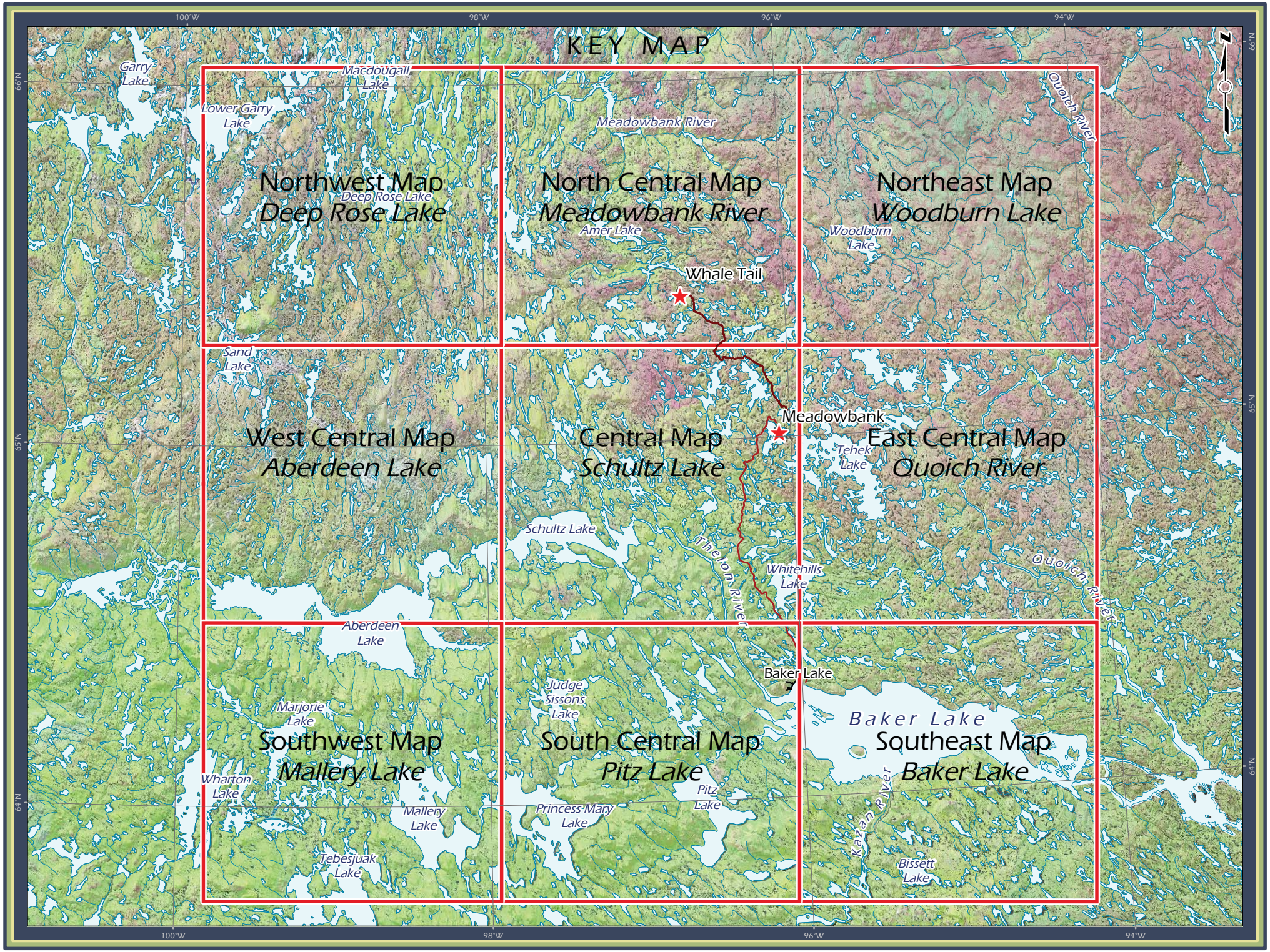






Caribou Bull

Martin Gebauer


KEY MAP
100°W
98°W
96°W
94°W
66°N
65°N
64°N
Garry Lake
Macdougall Lake
Lower Garry Lake
Meadowbank River
Quoich River
Northwest Map
Deep Rose Lake
Deep Rose Lake
North Central Map
Meadowbank River
Amer Lake
Northeast Map
Woodburn Lake
Woodburn Lake
Whale Tail
Sand Lake
West Central Map
Aberdeen Lake
Meadowbank
Central Map
Schultz Lake
East Central Map
Quoich River
Tehek Lake
Schultz Lake
Thelon River
Whitehills Lake
Quoich River
Aberdeen Lake
Baker Lake
Judge Sissons Lake
Marjorie Lake
Southwest Map
Mallery Lake
South Central Map
Pitz Lake
Baker Lake
Southeast Map
Baker Lake
Wharton Lake
Mallery Lake
Pitz Lake
Princess Mary Lake
Kazan River
Tebesjuak Lake
Bissett Lake

Baker Lake Harvest Study

Northwest Map
Deep Rose Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake



0 5 10 15
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:
AGNICO-EAGLE

By:
Nunavut ENVIRONMENTAL CONSULTING LTD
CASLYS CONSULTING

99°30'W 99°W 98°30'W 98°W

66°N 65°45'N 65°30'N

ZE69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 ZE47

ZF ZG ZH ZI ZJ ZK ZL ZM ZN ZO ZP ZQ ZR ZS ZT ZU ZV ZW ZX ZY

ZZ69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 ZZ47

Buliard Lake
Back River
Lower Garry Lake
Deep Rose Lake
ZP58

Baker Lake Harvest Study

West Central Map
Aberdeen Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake



0 5 10 15
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:
AGNICO-EAGLE

By:
Nunavut Environmental Consulting Ltd
CASLYS CONSULTING

99°30'W 99°W 98°30'W 98°W
65°15'N 65°N 64°45'N 64°30'N
A69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 A47
B C D E F G H I J K L M N O P Q R S T U
K58
V69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 V47
Sand Lake
Naujatuuq Lake
River
Naujatuuq
Oumanaugaq Lake
Oumanaugaq Bay
Peqetuaz Hill
Kuagnok Narrows
Aberdeen Lake

Baker Lake Harvest Study

Southwest Map
Mallery Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake



0 5 10 15
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:
AGNICO-EAGLE

By:
Nunavut Environmental Consulting Ltd
CASLYS CONSULTING

99°30'W 99°W 98°30'W 98°W
64°30'N 64°15'N 64°N 63°45'N

V69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 V47
W X Y Z AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP
AQ69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 AQ47

Aberdeen Lake
Marjorie Hills
Dubawnt River
Marjorie Lake
AF58
Wharton Lake
Mallery Lake
Maniituq Hill
Tebesjuak Lake
Kunwak River
Piniarvik Peninsula

Baker Lake
Harvest Study

North Central Map
Meadowbank River

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake



0 5 10 15
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:
AGNICO-EAGLE

By:
Nunavut ENVIRONMENTAL CONSULTING LTD
CASLYS CONSULTING

97°30'W 97°W 96°30'W 96°W
66°N 65°45'N 65°30'N 65°15'N
ZE46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 ZE24
ZF ZG ZH ZI ZJ ZK ZL ZM ZN ZO ZP ZO ZR ZS ZT ZU ZV ZW ZX ZY
ZZ46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 ZZ24
Back River
Meadowbank River
Amer Lake
Nanau Lake
ZP35
Whale Tail
N

Baker Lake Harvest Study

Central Map Schultz Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake



0 5 10 15

Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

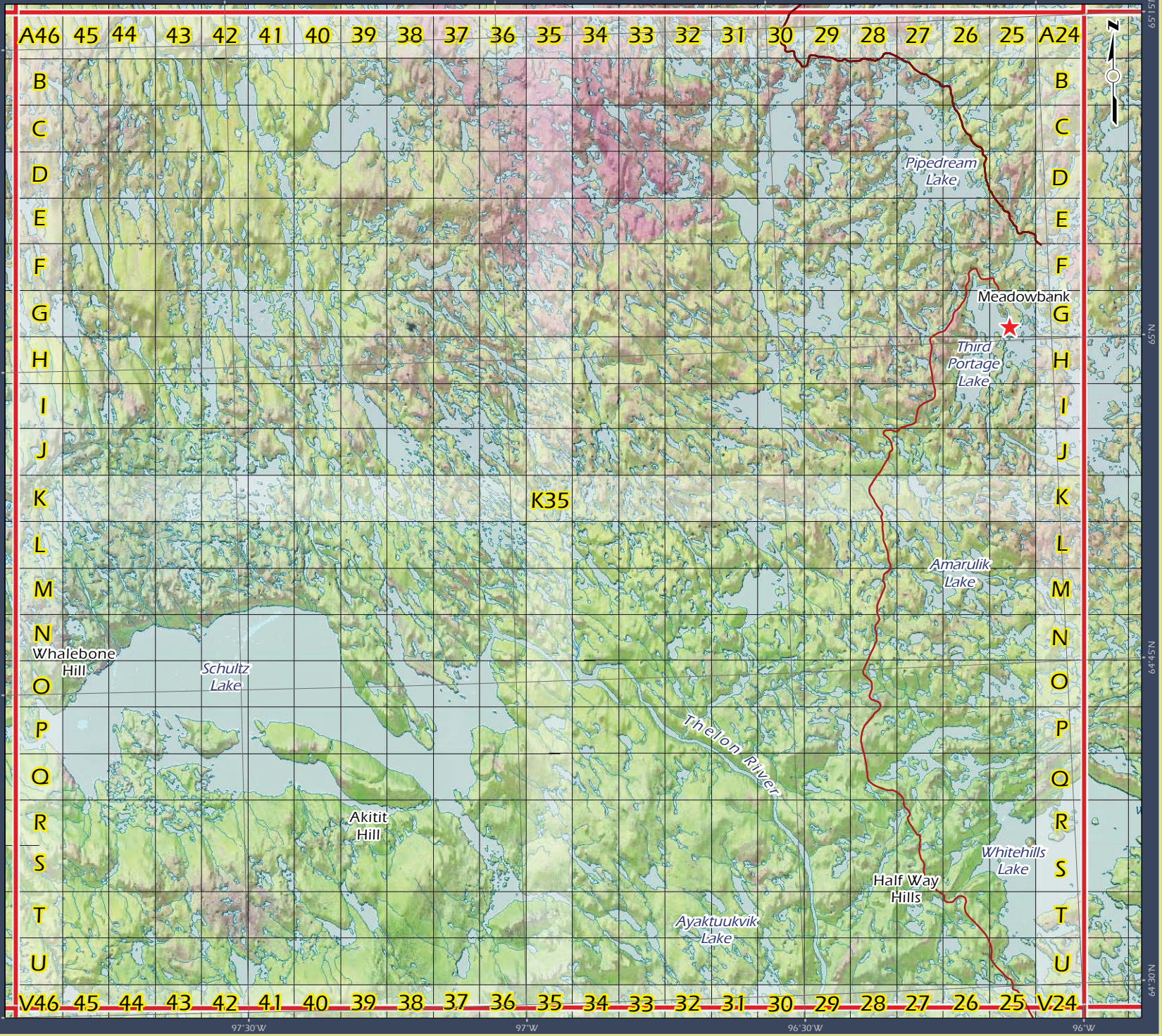
Prepared for:

AGNICO-EAGLE

By:

Nunavut Environmental Consulting Ltd

CASLYS CONSULTING



Baker Lake Harvest Study

South Central Map
Pitz Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake



0 5 10 15

Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:

AGNICO-EAGLE

By:

Nunavut Environmental Consulting Ltd

CASLYS CONSULTING

97°30'W 97°W 96°30'W 96°W

64°30'N 64°15'N 64°N 63°45'N

V46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 V24

W X Y Z AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP

AQ46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 AQ24

N

Thelon River

Qikittalik Lake

Sigalausivik Hill

Thom Lake

Baker Lake

Judge Sissons Lake

Iglujat Hills

Sagliq Island

Qamanaugaq Lake

Mihaluk Lake

AF35

Kingatnaaq Hill

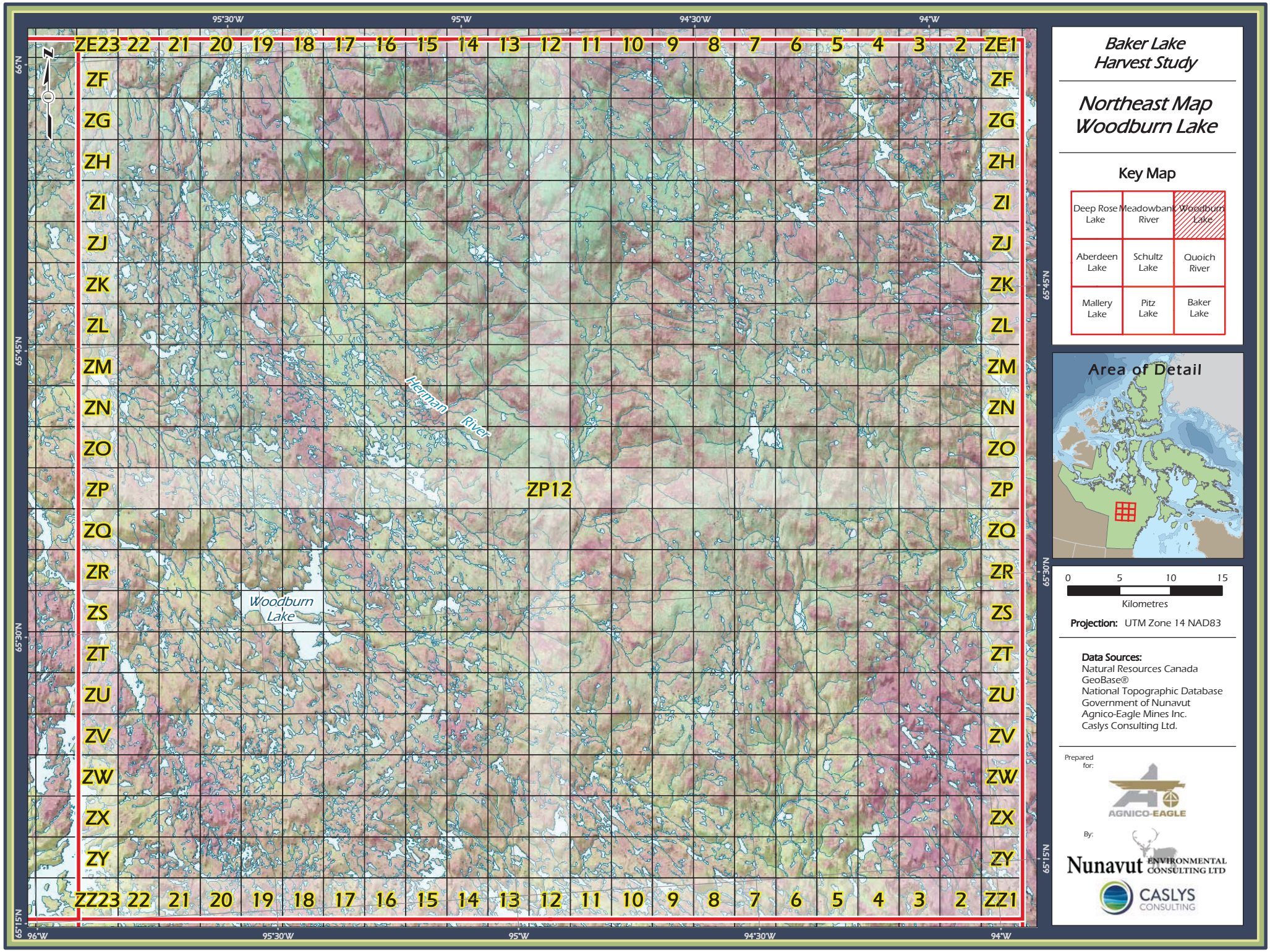
Paunraqtuuq Hill

Tiriksiujarvik Hill

Pitz Lake

Princess Mary Lake

Aumaluuktuuk Lake



Baker Lake Harvest Study

Northeast Map Woodburn Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake

0 5 10 15

Kilometres

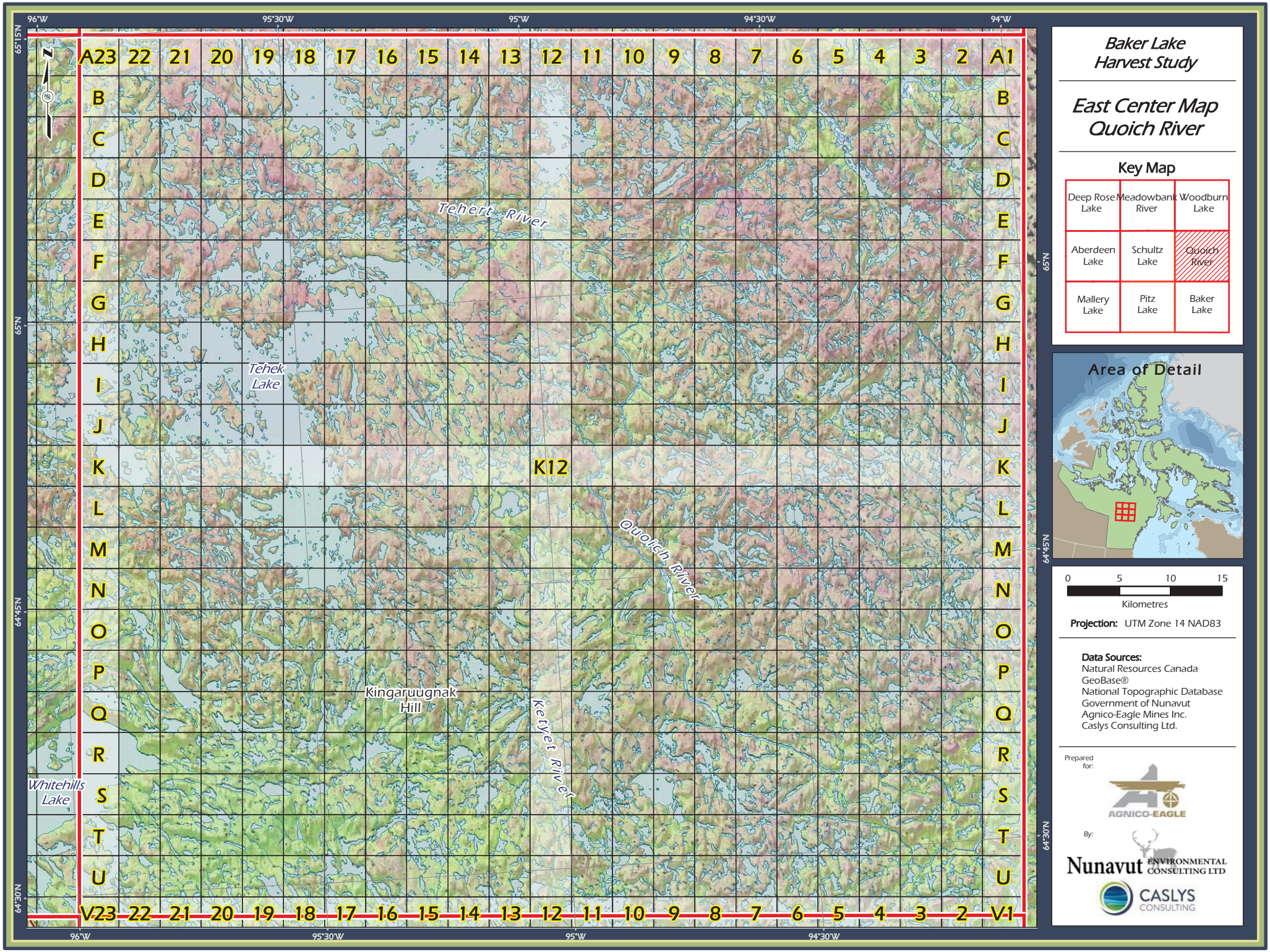
Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for: AGNICO-EAGLE

By: Nunavut Environmental Consulting Ltd

CASLYS CONSULTING



Baker Lake Harvest Study

East Center Map
Quoich River

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake

Area of Detail

0 5 10 15
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for: AGNICO-EAGLE

By: Nunavut Environmental Consulting Ltd

CASLYS CONSULTING



Baker Lake Harvest Study

Southeast Map Baker Lake

Key Map

Deep Rose Lake	Meadowbank River	Woodburn Lake
Aberdeen Lake	Schultz Lake	Quoich River
Mallery Lake	Pitz Lake	Baker Lake

Area of Detail

0 5 10 15

Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:

AGNICO-EAGLE

By:

Nunavut Environmental Consulting Ltd

CASLYS CONSULTING

How to Use the Baker Lake Harvest Calendar

Agnico Eagle Mines Ltd., in cooperation with the Baker Lake Hunters and Trappers Organization (HTO), want to understand hunting and fishing patterns by Baker Lake residents. Specifically, we want to understand how the Meadowbank and Whale Tail Gold Project, located north of Baker Lake, might change traditional harvesting patterns. To ensure that traditional hunting and fishing activities are not negatively affected, we have developed this calendar where participants can record harvest information throughout the year.

Near the back of the calendar is a page that shows the animal and fish species that are included in the study. Please write down the species, number, sex, and location of animals or fish that you have harvested on each date on the calendar. When writing down the location, please use the XY coordinate system provided on the nine maps at the back of the calendar.

For example, if you harvested a male caribou on January 16th on Big Hips Island you would write down "1 male caribou, AF19" in the January 16th square of the calendar.

You will also be visited or contacted by the hunter harvest coordinator occasionally throughout the year. The coordinator's job will be much easier if you write down your harvest information in the calendar as soon as possible.

Please return the calendar to the Agnico Eagle office in Baker Lake at the end of the year or give the calendar to the coordinator when he visits in January. Although each participant will receive a gift expressing our thanks, a draw will also be held in January for a number of high quality prizes.

Please contact the Baker Lake Harvest Study Coordinator, Martin Gebauer at (604) 720-6396 (martin@gebauerassociates.com) if you have any questions. Contacts at Agnico Eagle Mines include the Environmental Coordinator at (819) 759-3555, ext. 4606744.

ᖃᓄᖅ ᐅᑦᓯᖏᓪᓗᑎᑦ ᐊᑐᐃᐅᓪᓗᖅᑦ

ᐊᒃᓂᔪ ᐃᔾᔪ ᐅᓴᖅᑕᕆᐊᑦ, ᐱᓕᕆᖃᕐᓂᖅᖃᖅᓯᓗᑎᒃ ᖃᐅᓂ’ᑐᐊᖏᑦ ᐅᒪᔨᓕᕆᓵᐊᓪᓚᖅᑯᓂᓐᓄᑦ, ᑐᑭᓯᐊᓕᓵᕈᒪᔨᓪ ᒪᖃᐅᐃᓂᓂᖏᓪᓗᑦ ᐊᑐᖅᑕᐅᖃᖅᑕᕐᕕᖅᑐᑦ ᖃᐅᓂᓂᑐᐊᖏᑦᑐᓪᓗᑎᒃ. ᐱᓗᐊᖅᑐᑦ, ᖃᐅᐅᔾᔨᓴᖅᑐᑦ ᖃᓄᖅ ᐊᐅᖅᑎᓐᓇᖅᑐᖅ ᐊᒻᒪᓗ Whale Tail ᔪᓗᒥᒃ ᐱᓕᕆᐊᖅ, ᐃᓂᐅᔨᑦᑕᑐᖅ ᐅᐊᖏᓐᓇᓕᓂᓂ ᖃᐅᓂᓂ’ᑐᐊᔨ, ᐊᓯᐊᖏᓴᖅᑎᑕᓇᓴᒪᖏᓐᓄ ᐱᖅᑯᓯᕆᓇᓴᐅᔨᖅᑯᑦ ᒪᖃᐅᐃᓂᓂᖏᓪᓗᑦ ᐊᑐᖅᑕᐅᖃᖅᑕᕐᕕᖅᑐᓂᒃ. ᐱᖅᑯᓯᕆᓇᓴᐅᔨᖅᑯᑦ ᒪᖃᐃᖅᑕᕐᕕᖅᖃᓂᖅ ᐊᒻᒪᓗ ᐃᖅᑲᓐᓂᐊᖅᑕᕐᕕᖅᖃᓂᐅᔨᑦ ᐱᐅᖏᓐᓂᑐᒃ ᐊᑐᖅᑕᐅᖃᖅᑯᓯᓇᒪᓂ, ᐊᑲᖅᑭᖅᓯᓇᐅᖅᑕᕐᔪᓂ ᐅᓴᓕᓯᐊᓕᓵᕈᒪᔨᓪ ᐃᓇᑕᖅᑕᐅᔨᑦ ᑎᑎᕋᓕᓵᕈᒪᔨᓪ ᐊᐅᖅᑎᓐᓇᖅᑐᖅ ᒪᖃᐃᑕᖏᓐᓄᓪᓚᖅᑐᓂᖅ ᒪᖃᐃᑕᐅᖃᖅᑕᕐᕕᖅᑐᓂᒃ ᐃᑕᑦᑕᐅᔨᑦ ᐊᑐᖅᑕᐅᖃᖅᑯᓯᓇᒪᓂ ᑎᒍᓐᓇᖅᑐᖅ ᐊᐅᖅᑎᓐᓇᖅᑐᖅ ᐃᓇᑕᖅᑕᐅᔨᑦ ᑎᑎᕋᓕᓵᕈᒪᔨᓪ ᐃᓕᓴᐅᔪᖅᑐᑦ ᐱᐅᖏᓐᓂᑐᒃ

Produced By:



AGNICO EAGLE



Nunavut ENVIRONMENTAL CONSULTING LTD

and



CASLYS CONSULTING

APPENDIX H

Non-Native Plant Survey Results

TECHNICAL MEMORANDUM

DATE January 29, 2021 **Project No.** 19134270

TO Alexandre Lavallee
Agnico Eagle Mines Limited

CC Chad Brassard, Corey De La Mare, Bailey Hendy

FROM Shannon O'Dwyer **EMAIL sodwyer@golder.com**

2020 MEADOWBANK NON-NATIVE PLANT MONITORING STUDY

1.0 BACKGROUND

The goal of the 2020 non-native plants surveys was to assess/monitor for the potential introduction of non-native plant species, including weeds or invasive species. Surveys were completed per the monitoring approach outlined in the Terrestrial Environment and Monitoring Plan (TEMP) for the Meadowbank Complex. The Government of Nunavut (GN) and Environment and Climate Change Canada (ECCC) define a non-native species as 'an organism that is not normally found in a region' (CESCC 2010). Any introductions of non-native plant species must be promptly reported to the GN Department of Environment (GNDoE).

Non-native plant surveys targeted areas with a high potential of non-native plant occurrence for the Meadowbank Complex (i.e., areas of disturbance where colonization by non-native species is most likely). The non-native plant information collected provides an understanding of the presence or spread of non-native plant species and inform on the efficacy of current cleaning and protection measures on site per the TEMP. The results may serve as a basis for the development of a non-native plant management plan, if needed, over time. For the 2020 survey period, no CESCC defined non-native plants were recorded for the Meadowbank Complex.

2.0 METHODS

Surveys at the Meadowbank Complex were conducted by a Golder vegetation ecologist between July 24 to August 2, 2020. The Meadowbank Complex area includes the All-Weather Access Road (AWAR), Whale Tail Haul Road (haul road), Baker Lake tank farm, Whale Tail Mine, and Meadowbank Mine footprint areas.

The Canadian Endangered Species Conservation Council (CESCC) identified 17 species not normally found in Nunavut with a potential for becoming established, 14 of which are vascular (non-native) plants to the region (CESCC 2010; Table 1). This survey focused on the 14 non-native vascular plant species and excluded the two bird species and one butterfly species considered non-native species in Nunavut (CESCC 2010). Species were documented as they were encountered. Non-native plant surveys consisted of targeted surveys focused within high-priority or potential areas. The high-potential areas were identified as the Project area perimeter, along existing roads/trails or areas of disturbance within the Project area, as well as adjacent to the AWAR and haul road.

Golder Associates Ltd.
16820 107 Avenue, Edmonton, Alberta, T5P 4C3, Canada T: +1 780 483 3499 F: +1 780 483 1574

Golder and the G logo are trademarks of Golder Associates Corporation golder.com

Given the length of the AWAR and haul road, the roads were travelled via vehicle at slow speeds, while observers looked for obvious signs of weed infestations along road margins. Periodic stops were undertaken to complete meanders in areas with high potential (e.g., pull-outs, work areas, road-side quarries and other areas with disturbed substrates). Locations were recorded by using Survey123 to delineate the infested area. When encountered, the following was recorded:

- site ID
- surveyor name
- GPS coordinates
- photos of the occurrence/infestation
- species name
- estimated area of infestation (e.g., 10 m x 10 m)
- estimated number of plants (e.g., <10, 10 to 100, 100 to 1,000, >1,000) of each species
- estimated cover of bare ground
- growth stage (i.e., seedling, in-bud, seed set, expired) of each species
- recommended action for each species
- record of any hand pulling completed

Table 1: Government of Nunavut, Department of Environment Non-Native Species

CESCC Status (2010) [1]	ACIMS Scientific Name [2]	Common Name
non-native	*Amaranthus retroflexus*	green amaranth
non-native	*Barbarea vulgaris*	yellow rocket
non-native	*Capsella bursa-pastoris*	shepherd's purse
non-native	*Carum carvi*	wild caraway
non-native	*Hordeum vulgare*	common barley
non-native	*Leucanthemum vulgare*	oxeye daisy
non-native	*Papaver somniferum*	opium poppy
non-native	*Plantago major*	common plantain
non-native	*Polygonum aviculare*	prostrate knotweed
non-native	*Puccinellia distans*	spreading alkali grass
non-native	*Sonchus arvensis*	field sow thistle
non-native	*Taraxacum officiniale*	common dandelion
non-native	*Thlaspi arvense*	field pennygrass
non-native	*Vicia cracca*	tufted vetch

[1] CESCC = The Canadian Endangered Species Council.

[2] ACIMS = Alberta Conservation Information Management System (2018).

Due to the large extent of the Meadowbank Complex area, non-native plant surveys were executed as targeted surveys focused within high-priority or potential areas. High-potential areas were identified including highly trafficked areas (i.e., fuel station), wastewater discharge area, areas surrounding buildings, shipping containers and the dump, for example. The AWAR and Whale Tail haul roads were surveyed at slow speed, while observing for weed infestations along road margins. Periodic stops were undertaken to complete meanders in areas with high potential (e.g., pull-outs, work areas, quarries and areas of disturbed substrate). A GPS was used to collect a trackfile of the meander route.

A total of 175 locations were surveyed. Locations assessed included the Whale Tail and Meadowbank Mine footprint areas, the sides of the haul roads, quarries adjacent to the haul roads, the airstrip, and the Baker Lake tank farm.

The AWAR and haul road were travelled via vehicle at slow speeds, while observers looked for obvious signs of non-native plant occurrences along road margins. Obvious signs included showy inflorescence, fruiting structures, and other key characteristics that distinguished non-native species from endemic plant species. Periodic stops were undertaken to complete meanders in areas with high potential (i.e., disturbance areas). The following information was recorded when non-native species were encountered:

- site ID
- surveyor name
- GPS coordinates
- photos of the occurrence/infestation
- species name
- estimated area of infestation (e.g., 10 m x10 m)
- estimated number of plants of each species
- estimated cover of bare ground
- growth stage (i.e., seedling, in bud, seed set, expired) of each species
- recommended action for each species
- record of any hand pulling (if completed)

3.0 RESULTS

No non-native plants, as identified by the CESCC, were recorded along the haul road, AWAR, Baker Lake tank farm, Whale Tail and Meadowbank Mine footprints.

Although not listed as a non-native species by the CESCC, populations of flixweed (*Descurainia sophia*) and scentless chamomile (*Tripleurospermum inodorum*), both non-endemic to the Arctic, were observed at several of the surveyed locations. There was also a population of alsike clover (*Trifolium hybridum*) and lamb's quarters (*Chenopodium album*) observed at one location. Table 2 provides a summary of the non-native plant survey findings from the 2020 surveys at locations shown on Figure 1. Detailed survey results are presented in Appendix A and representative photographs are presented in Appendix B.

Table 2: Summary of Key Non-Native Vegetation Survey Findings

	Number of Survey Locations	Percent of Total
CESCC non-native occurrences	0	0%
Other non-native occurrences	76	43%
No non-native occurrences	99	57%
Total	175	100%

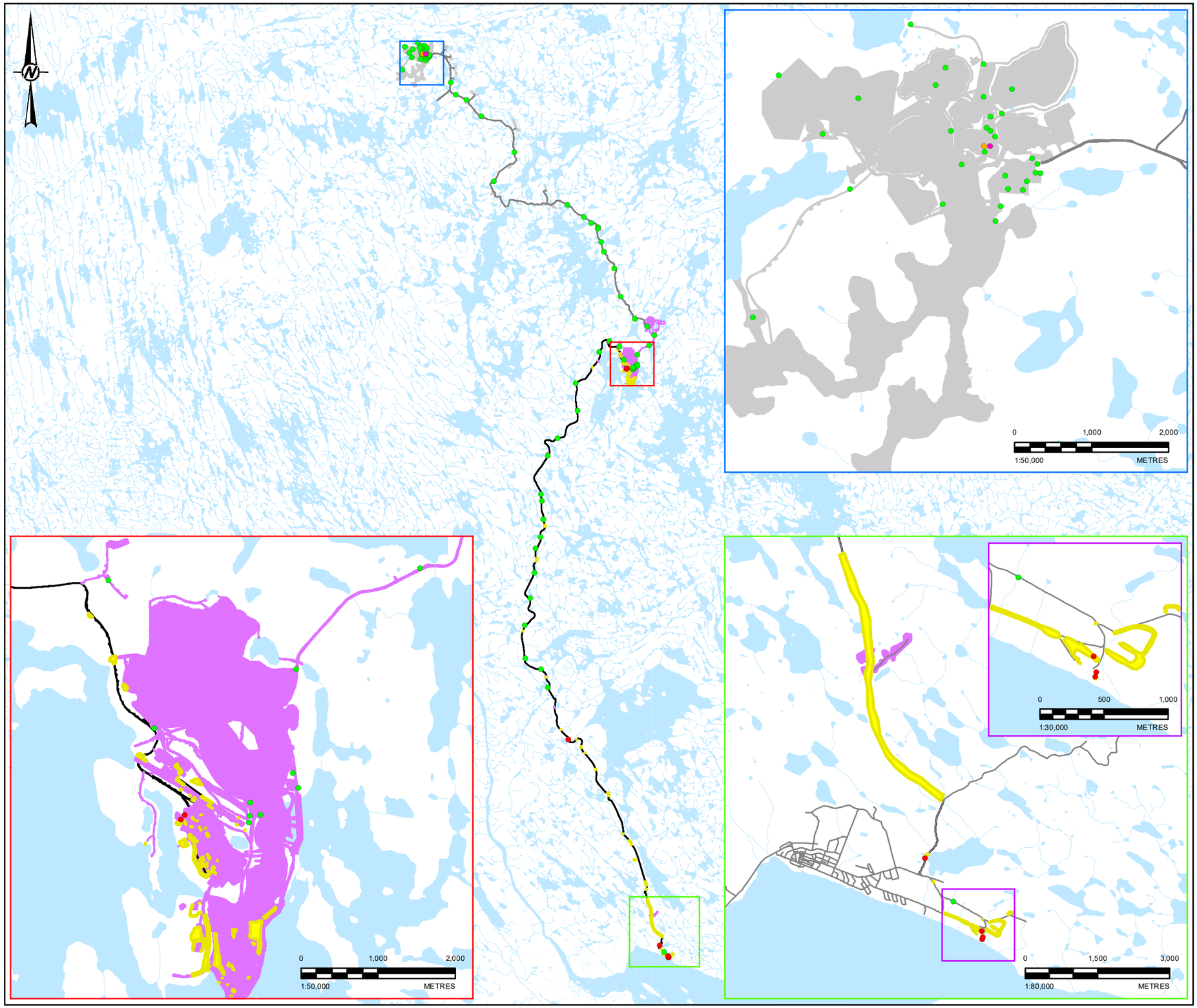
[1] These sites may require subsequent visits to confirm continued absence of non-native species.

Scentless chamomile was observed in large populations at the Baker Lake tank farm, along the AWAR road near the community of Baker Lake and at a quarry near kilometer 35 on the AWAR. It was observed in a small population near the geology shack at the Meadowbank Mine site (see Figure 1 and Appendix A for locations, and Appendix B for photos). The most effective method of treatment for this species is hand pulling (Government of Alberta 2007). A crew of Agnico Eagle staff was instructed how to identify this species and pulled the populations by hand between July 28 and August 2, 2020. The plants were collected in garbage bags and incinerated.

Flixweed is an introduced agricultural weed from Europe, Asia and North Africa (Dickinson 2006; ABMI 2019a) and is non-native to Nunavut. Flixweed was observed on the Meadowbank Mine site, along the AWAR and at the Baker Lake tank farm. It was not observed at the Whale Tail Mine site or along the haul road between Whale Tail and Meadowbank mine site (Figure 1, refer to Appendix A and B). Infestations of flixweed were found to be most dense around the most traveled areas of the Meadowbank Mine site including the airstrip, camp, processing plant, shipping container storage areas and laydown areas. It was also found along the roadside in many locations on the AWAR. Observed flixweed populations have not encroached onto the tundra, and all observations were limited to disturbed areas (see representative photographs in Appendix B).

A population of three individuals of lamb's quarters was observed near the former exploration camp at the Whale Tail mine site; this species is an introduced weed from Europe (Dickinson 2006). It is one of Canada's most widespread and abundant agricultural weeds and prefers disturbed soils (ABMI 2019b). The isolated population was removed by hand.

A population of approximately 50 individuals of alsike clover was also found near the former exploration camp at the Whale Tail mine site. It is an introduced forage crop from Europe and Asia and can be found throughout Canada including north of the Arctic Circle (Dickinson 2006). It is typically found in disturbed or cultivated sites (ABMI 2019c). The isolated population was removed by hand.



LEGEND

- SURVEY LOCATIONS – NO NON-NATIVE PLANTS OBSERVED
- ALSIKE CLOVER (*Trifolium hybridum*)
- LAMB'S QUARTERS (*Chenopodium album*)
- SCENTLESS CHAMOMILE (*Tripleurosperum inodorum*)
- FLIXWEED (*Descurainia sophia*)
- TRANSECT
- WHALE TAIL MINE SITE
- HAUL ROAD
- MEADOWBANK MINE SITE
- ALL WEATHER ACCESS ROAD
- WATERBODY
- WATERCOURSE
- ROAD

REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM NATURAL RESOURCES CANADA.

COORDINATE SYSTEM: CANADA ALBERS EQUAL AREA CONIC

CLIENT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

MEADOWBANK AND WHALE TAIL PIT TEMP 2020

TITLE

2020 NON-NATIVE PLANT SURVEY RESULTS

CONSULTANT

GOLDER

YYYY-MM-DD	2021-01-15
DESIGNED	SOD/CS
PREPARED	CC/CDB
REVIEWED	CD
APPROVED	SOD

PROJECT NO.	CONTROL	REV.	FIGURE
19134270	4000/4010	0	1

PATH: Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\19134270\04000\4010\02_PRODUCTION\MXD\Report\19134270_4000_4010_1_NON_NATIVE_INVASIVE_PLANT_OCCURRENCES.mxd PRINTED ON: 2021-01-15 AT: 3:45:12 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

0

4.0 CONCLUSION AND RECOMMENDATIONS

No non-native plant species for Nunavut, as identified by the CESCC, were recorded during the 2020 surveys for the Meadowbank Complex. However, four plant species which are non-endemic to the Arctic were detected as follows:

- Although not listed as a non-native plant by the CESCC, scentless chamomile is listed as Secondary Noxious and Noxious in the Canadian Weed Seeds Order (*Seeds Act* 2016). The Government of Alberta states that noxious weeds have the ability to spread rapidly, degrade habitats and reduce biodiversity, and must be controlled to prevent further establishment and spread (Government of Alberta 2012). Although the populations were reduced by hand pulling, the plants had already gone to seed and will likely return next year. Areas that were known to have populations of scentless chamomile should be continually monitored and controlled to prevent further infestations. Pulling by hand is an appropriate method at this time because the populations are not widespread across the Meadowbank Complex.
- Flixweed is present in large populations at the Baker Lake tank farm, along the AWAR, and at the Meadowbank Mine site. Although it has not yet been observed at the Whale Tail mine site, it is probable that it will migrate along the Whale Tail haul road and into the Whale Tail mine site. Although flixweed is also not on the CESSC species list, it is considered a Tier 3 noxious weed in the province of Manitoba. A Tier 3 noxious weed has to be controlled if the weed's uncontrolled growth or spread would have a negative impact on the economy, the environment or the well-being of residents nearby (GoM 2020). However, it is not considered a noxious weed in any other province or territory in Canada. It should be controlled to contain the infestation to the Meadowbank Mine site and AWAR and prevent spread north to new locations. Mature plants reproduce by seeds. Because of its large populations, mowing early in the growing season prior to the plants going to seed, would be the best action to manage flixweed populations at the Meadowbank Complex.
- Lamb's quarters is also considered a Tier 3 noxious weed in the province of Manitoba (GoM 2020). However, it is not considered a noxious weed in any other province or territory in Canada. The isolated population was removed by hand and is not anticipated to need further control. Continued monitoring for new populations will help prevent its spread at the Meadowbank Complex.
- Although not native to Canada, alsike clover is not considered a noxious weed in any Canadian province or territory. The isolated population of alsike clover observed was removed by hand and is not predicted to need further control. Continued monitoring for new populations will help prevent its spread at the Meadowbank Complex.

Efforts for non-native plant management, including identified non-endemic species, should continue and added diligence should be undertaken with regards to areas of high traffic.

Continued and thorough cleaning of equipment and materials prior to entering the site, per the TEMP, will prevent seed of non-native species from being introduced. Surveys for the 14 non-native plant species identified by CESCC as well as other non-native species should continue to be completed annually. Mechanical control such as mowing or hand pulling, as appropriate for the site setting, is recommended for any identified non-native plant species. If hand pulling with a shovel, the plant material should be collected in bags and disposed of at an offsite location. Mowing is a viable option if the following conditions are met:

- there is access for a mowing unit

- the terrain is not too steep or hazardous, or
- if the phenology of the plant stage is not at risk for greater seed dispersal (consult with a vegetation ecologist prior to mowing)

Chemical herbicide treatments are not recommended to be used at this point as the tundra is a very sensitive ecosystem. As a further measure of prevention, the CESCC (2010) has developed posters that show non-native species in Nunavut. We recommend that these be displayed at the Meadowbank Complex and incorporated into on-boarding materials, which could be used to supplement non-native plant information and posters used on-site. These materials can also be displayed at the AEM office/crew house in Baker Lake and potentially in other areas within the community.

A management plan for non-native plant species employing adaptive management may be implemented if the non-endemic and other non-native plant species continue to be observed and/or are observed to spread further within the Meadowbank Complex area. A non-native plant management plan would describe the methods for the eradication, control and/or minimization of the encroachment of non-native plant species into new areas, and outline additional measures such as on-boarding and training in the identification of non-native plant species for the area.

5.0 CLOSURE

We trust this meets your needs and if you have any questions or concerns, feel free to contact the undersigned at your convenience.

Regards,

Golder Associates Ltd.

ORIGINAL SIGNED

Shannon O'Dwyer B.Sc., P. Biol., P.Ag.
Terrestrial Ecologist

ORIGINAL SIGNED

Corey De La Mare, P. Biol.
Principal, Senior Ecologist

SO/CDLM/jlb

https://golderassociates.sharepoint.com/sites/119161/project files/5 technical work/4000_reporting_datamgmt/non native plant survey/19134270-tm-mbk_2020invasiveplants.docx

Attachments:

Appendix A – Meadowbank Complex – 2020 Non-Native Plant Survey Results
Appendix B – Meadowbank Complex – 2020 Non-Native Plant Survey Representative Photographs

References

ACIMS (Alberta Conservation Information Management System). 2018. *List of Elements in Alberta – Vascular Plants*; Alberta Environment and Parks: Edmonton, Alberta; [updated March 2018; accessed 30 October 2019]. https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/download-data/

AB ISC (Alberta Invasive Species Council). 2014. Fact Sheet: Scentless Chamomile. [Accessed 08 November 2019]. https://abinvasives.ca/invasive-species/fact-sheets/noxious-species/

ABMI (Alberta Biodiversity Monitoring Institute). 2019a. Flixweed (*Descurainia Sophia*). [Accessed 26 November 2020]. https://abmi.ca/home/data-analytics/biobrowser-home/species-profile?tsn=99002004

ABMI. 2019b. Lamb's Quarters (Chenopodium album). [Accessed 26 November 2020]. https://abmi.ca/home/data-analytics/biobrowser-home/species-profile?tsn=99004274

ABMI. 2019c. [Accessed 26 November 2020]. Alsike Clover (*Trifolium hybridum*). ABMI website: https://www.abmi.ca/home/data-analytics/biobrowser-home/species-profile?tsn=99003745

CESCC (The Canadian Endangered Species Conservation Council). 2010. Non-Native & Invasive Species in Nunavut. [Accessed 04 November 2019]. https://www.gov.nu.ca/environment/documents/non-native-invasive-species-nunavut-brochure

Dickinson, R and Feance, R. 2006. Weeds of Canada. University of Alberta and Lone Pine Publishing. 434 pg

GoA (Government of Alberta). 2007. Scentless Chamomile: Biology and Control. [Accessed 19 November 2019]. https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex871/$file/640-6.pdf?OpenElement

GoA. 2012. Noxious Weeds. [Accessed 13 November 2019]. https://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/prm14063/$FILE/noxious.pdf

GoC (Government of Canada) 2016. Weed Seeds Order. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-93/page-2.html [Accessed November 2020]

GoC 2017. Weed Seed: *Tripleurospermum inordum* (Scentless Chamomile). Canada Food Inspection Agency. [Accessed 19 November 2019]. https://www.inspection.gc.ca/plants/seeds/testing-grading/seeds-identification/tripleurospermum-inodorum/eng/1405513897968/1405513898734

GoM (Government of Manitoba). 2020. Declaration of Noxious Weeds in Manitoba. [Accessed 26 November 2020]. https://www.gov.mb.ca/agriculture/crops/weeds/declaration-of-noxious-weeds-in-mb.html.

APPENDIX A

Meadowbank Complex - 2020 Non-Native Plant Species Survey Results

Table A1: Non-Native Plant Survey results

Survey Location	Plot ID	Scientific name	Common name	Estimated Number of Plants	Population Description	Population Size (m^2)	Latitude	Longitude
Meadowbank mine site	MB20SOW001	*Descurainia sophia*	flixweed	30	several sporadically occurring plants	392	65.02364	-96.06677
Meadowbank mine site	MB20SOW002	*Descurainia sophia*	flixweed	4	several sporadically occurring plants	20	65.02128	-96.05836
Meadowbank mine site	MB20SOW003	*Descurainia sophia*	flixweed	3	a few sporadically occurring individuals	5	65.02078	-96.05656
Meadowbank mine site	MB20SOW005	*Descurainia sophia*	flixweed	10	a few sporadically occurring individuals	0	65.02199	-96.05681
Meadowbank mine site	MB20SOW006	*Descurainia sophia*	flixweed	10000	a continuous occurrence of plants with a few gaps in the distribution	3375	65.02456	-96.06796
Meadowbank mine site	MB20SOW007	*Descurainia sophia*	flixweed	2000	a few patches plus several sporadically occurring plants	2221	65.0268	-96.07626
Meadowbank mine site	MB20SOW008	*Descurainia sophia*	flixweed	2000	a few patches plus several sporadically occurring plants	140	65.02138	-96.07287
Meadowbank mine site	MB20SOW009	*Descurainia sophia*	flixweed	3	a few sporadically occurring individuals	11	65.02121	-96.0717
Meadowbank mine site	MB20SOW010	*Descurainia sophia*	flixweed	25	a single patch	6	65.02101	-96.07111
Meadowbank mine site	MB20SOW011	*Descurainia sophia*	flixweed	5	a few sporadically occurring individuals	37	65.02115	-96.06951
Meadowbank mine site	MB20SOW012	*Descurainia sophia*	flixweed	10000	a continuous occurrence of plants with a few gaps in the distribution	6559	65.01971	-96.07386
Meadowbank mine site	MB20SOW013	*Descurainia sophia*	flixweed	200000	a continuous occurrence of plants with a few gaps in the distribution	11089	65.01432	-96.06629
Meadowbank mine site	MB20SOW014	*Descurainia sophia*	flixweed	40	a single patch	5	65.01248	-96.06945
Meadowbank mine site	MB20SOW015	*Descurainia sophia*	flixweed	2000	a few patches plus several sporadically occurring plants	2708	65.01124	-96.0691
Meadowbank mine site	MB20SOW018	*Descurainia sophia*	flixweed	5000	a single patch plus a few sporadically occurring plants	1665	65.02921	-96.08561
Meadowbank mine site	MB20SOW019	*Descurainia sophia*	flixweed	5	a few sporadically occurring individuals	292	65.02817	-96.08384
Meadowbank mine site	MB20SOW020	*Descurainia sophia*	flixweed	2	a few sporadically occurring individuals	1	65.02553	-96.07448
Meadowbank mine site	MB20SOW021	*Descurainia sophia*	flixweed	15	a few sporadically occurring individuals	1230	65.02446	-96.07043
Meadowbank mine site	MB20SOW022	*Descurainia sophia*	flixweed	500	a few patches	147	65.02214	-96.07092
Meadowbank mine site	MB20SOW023	*Descurainia sophia*	flixweed	10	a few sporadically occurring individuals	3	65.02196	-96.07045
Meadowbank mine site	MB20SOW024	*Descurainia sophia*	flixweed	100	a single patch or clump of species	7	65.02192	-96.06971
Meadowbank mine site	MB20SOW025	*Descurainia sophia*	flixweed	3	a few sporadically occurring individuals	34	65.02257	-96.069
Meadowbank mine site	MB20SOW026	*Tripleurospermum inodorum*	scentless chamomile	1	a single individual	2	65.02254	-96.07333
Meadowbank mine site	MB20SOW027	*Descurainia sophia*	flixweed	2000	several well spaced patches	1304	65.02137	-96.07495
Meadowbank mine site	MB20SOW028	*Tripleurospermum inodorum*	scentless chamomile	5	a single patch	6	65.022	-96.07445
Meadowbank mine site	MB20SOW029	*Descurainia sophia*	flixweed	500	several well spaced patches	3478	65.02028	-96.07195
Meadowbank mine site	MB20SOW030	*Descurainia sophia*	flixweed	5000	a few patches plus several sporadically occurring plants	595	65.02019	-96.06671
Meadowbank mine site	MB20SOW031	*Descurainia sophia*	flixweed	5000	a few patches plus several sporadically occurring plants	55	65.0211	-96.06755
Meadowbank mine site	MB20SOW032	*Descurainia sophia*	flixweed	30	a single patch plus a few sporadically occurring plants	48	65.02087	-96.06873
Meadowbank mine site	MB20SOW033	*Descurainia sophia*	flixweed	5000	several well spaced patches	457	65.01813	-96.06705
Meadowbank mine site	MB20SOW034	*Descurainia sophia*	flixweed	5000	several well spaced patches	1682	65.01707	-96.06697
Meadowbank mine site	MB20SOW035	*Descurainia sophia*	flixweed	20000	continuous uniform occurrences of well spaced plants	571	65.01718	-96.06863
Meadowbank mine site	MB20SOW036	*Descurainia sophia*	flixweed	500	a continuous occurrence of plants with a few gaps in the distribution	281	65.01764	-96.06887
Meadowbank mine site	MB20SOW037	*Descurainia sophia*	flixweed	50	several sporadically occurring plants	18	65.0162	-96.0669

Table A1: Non-Native Plant Survey results

Survey Location	Plot ID	Scientific name	Common name	Estimated Number of Plants	Population Description	Population Size (m^2)	Latitude	Longitude
Meadowbank mine site	MB20SOW038	*Descurainia sophia*	flixweed	10000	a continuous occurrence of plants with a few gaps in the distribution	1686	65.0157	-96.06621
Meadowbank mine site	MB20SOW039	*Descurainia sophia*	flixweed	10000	a few patches plus several sporadically occurring plants	526	65.01558	-96.06677
Meadowbank mine site	MB20SOW040	*Descurainia sophia*	flixweed	1	single individual	4	65.0173	-96.06425
Meadowbank mine site	MB20SOW041	*Descurainia sophia*	flixweed	5	a few sporadically occurring individuals	82	65.01613	-96.06533
Meadowbank mine site	MB20SOW042	*Descurainia sophia*	flixweed	10000	continuous dense occurrence of plants	2919	65.008	-96.07053
Meadowbank mine site	MB20SOW043	*Descurainia sophia*	flixweed	250	several well spaced patches	1907	65.0081	-96.06771
Meadowbank mine site	MB20SOW044	*Descurainia sophia*	flixweed	20	a few sporadically occurring individuals	174	65.007	-96.07082
Meadowbank mine site	MB20SOW045	*Descurainia sophia*	flixweed	100000	continuous dense occurrence of plants	17798	65.00899	-96.06979
Meadowbank mine site	MB20SOW046	*Descurainia sophia*	flixweed	500	a few patches plus several sporadically occurring plants	34586	65.00935	-96.06722
Meadowbank mine site	MB20SOW047	*Descurainia sophia*	flixweed	500	a few patches plus several sporadically occurring plants	1823	65.00506	-96.06725
Meadowbank mine site	MB20SOW048	*Descurainia sophia*	flixweed	200	several sporadically occurring plants	22251	65.00505	-96.06349
Meadowbank mine site	MB20SOW049	*Descurainia sophia*	flixweed	5	a few sporadically occurring individuals	112	65.00296	-96.06314
Meadowbank mine site	MB20SOW050	*Descurainia sophia*	flixweed	4	a few sporadically occurring individuals	31	65.00181	-96.06026
Meadowbank mine site	MB20SOW051	*Descurainia sophia*	flixweed	5	a few sporadically occurring individuals	8	65.00371	-96.06303
Meadowbank mine site	MB20SOW052	*Descurainia sophia*	flixweed	30	a single patch	20	65.00272	-96.06096
Meadowbank mine site	MB20SOW053	*Descurainia sophia*	flixweed	1000	several sporadically occurring plants	17523	65.01019	-96.05288
Meadowbank mine site	MB20SOW054	*Descurainia sophia*	flixweed	50000	several well spaced patches	300	65.00911	-96.05935
Meadowbank mine site	MB20SOW055	*Descurainia sophia*	flixweed	10000	continuous uniform occurrences of well spaced plants	1152	65.0063	-96.06196
Meadowbank mine site	MB20SOW056	*Descurainia sophia*	flixweed	200	a few patches	6134	65.04032	-96.09419
Meadowbank mine site	MB20SOW058	*Descurainia sophia*	flixweed	2	a few sporadically occurring individuals	54	65.01929	-96.08427
Meadowbank mine site	MB20SOW063	*Descurainia sophia*	flixweed	500	a few patches plus several sporadically occurring plants	3473	65.02873	-96.07833
Meadowbank mine site	MB20SOW065	*Descurainia sophia*	flixweed	300	several well spaced patches	3779	65.03712	-96.09019
AWAR	MB20SOW070	*Descurainia sophia*	flixweed	1	single individual	100	65.02388	-96.17648
Meadowbank mine site	MB20SOW074	*Descurainia sophia*	flixweed	30	a few sporadically occurring individuals	802	65.00239	-96.05948
Meadowbank mine site	MB20SOW075	*Descurainia sophia*	flixweed	1	single individual	101	65.00385	-96.05569
Meadowbank mine site	MB20SOW076	*Descurainia sophia*	flixweed	1000	a few patches plus several sporadically occurring plants	1701	65.00667	-96.05289
Meadowbank mine site	MB20SOW077	*Descurainia sophia*	flixweed	1000	a single patch plus a few sporadically occurring plants	558	65.00793	-96.05408
Meadowbank mine site	MB20SOW078	*Descurainia sophia*	flixweed	5000	several well spaced patches	30412	65.00887	-96.05363
Meadowbank mine site	MB20SOW079	*Descurainia sophia*	flixweed	100	a few sporadically occurring individuals	4500	65.01079	-96.05068
Meadowbank mine site	MB20SOW080	*Descurainia sophia*	flixweed	500	a single patch	1460	65.02945	-96.08574
Meadowbank mine site	MB20SOW081	*Descurainia sophia*	flixweed	100	several sporadically occurring plants	5763	65.02614	-96.06871
Meadowbank mine site	MB20SOW082	*Descurainia sophia*	flixweed	20	a few sporadically occurring individuals	1605	65.04556	-96.0999
AWAR	MB20SOW087	*Descurainia sophia*	flixweed	5000	continuous uniform occurrences of well spaced plants	19639	64.83182	-96.31386
AWAR	MB20SOW090	*Descurainia sophia*	flixweed	300	a single patch	829	64.79097	-96.33821
AWAR	MB20SOW091	*Descurainia sophia*	flixweed	200	a few patches	5448	64.78981	-96.33699
AWAR	MB20SOW095	*Descurainia sophia*	flixweed	50	a single patch	124	64.70342	-96.37598

Table A1: Non-Native Plant Survey results

Survey Location	Plot ID	Scientific name	Common name	Estimated Number of Plants	Population Description	Population Size (m^2)	Latitude	Longitude
AWAR	MB20SOW096	*Descurainia sophia*	flixweed	50	a single patch	80	64.67309	-96.37125
AWAR quarry	MB20SOW099	*Descurainia sophia*	flixweed	75	a few sporadically occurring individuals	1973	64.64666	-96.30775
AWAR quarry	MB20SOW101	*Descurainia sophia*	flixweed	50	a few patches plus several sporadically occurring plants	1192	64.58273	-96.26405
AWAR quarry	MB20SOW102	*Descurainia sophia*	flixweed	200	several well spaced patches	12151	64.57035	-96.24233
AWAR quarry	MB20SOW102	*Tripleurospermum inodorum*	scentless chamomile	75	several well spaced patches	12151	64.57035	-96.24233
AWAR	MB20SOW103	*Descurainia sophia*	flixweed	200	a single patch plus a few sporadically occurring plants	98	64.57061	-96.21832
AWAR quarry	MB20SOW104	*Descurainia sophia*	flixweed	100000	a continuous occurrence of plants with a few gaps in the distribution	3723	64.56115	-96.20681
AWAR	MB20SOW105	*Descurainia sophia*	flixweed	25	a single patch	76	64.5539	-96.19502
AWAR	MB20SOW106	*Descurainia sophia*	flixweed	1000	a few patches plus several sporadically occurring plants	686	64.53476	-96.16339
AWAR quarry	MB20SOW107	*Descurainia sophia*	flixweed	10000	a few patches	12229	64.50419	-96.12426
AWAR	MB20SOW108	*Descurainia sophia*	flixweed	5000	a single patch plus several sporadically occurring plants	567	64.45605	-96.08247
AWAR	MB20SOW109	*Descurainia sophia*	flixweed	100	a single patch	9292	64.44804	-96.06513
AWAR	MB20SOW110	*Descurainia sophia*	flixweed	1000	a single patch plus a few sporadically occurring plants	424	64.44273	-96.05884
AWAR quarry	MB20SOW111	*Descurainia sophia*	flixweed	5000	several well spaced patches	21355	64.42401	-96.04662
AWAR	MB20SOW112	*Descurainia sophia*	flixweed	50	single individual	14542	64.39812	-96.01867
AWAR	MB20SOW113	*Descurainia sophia*	flixweed	500	a single patch plus a few sporadically occurring plants	1227	64.38871	-96.01458
AWAR	MB20SOW114	*Descurainia sophia*	flixweed	100000	several well spaced patches	708498	64.37399	-96.01042
AWAR	MB20SOW115	*Tripleurospermum inodorum*	scentless chamomile	500	a few patches	2439	64.31996	-95.97633
Whale Tail mine site	MB20SOW120	*Trifolium hybridum*	clover	50	a few sporadically occurring individuals	8	65.40437	-96.68073
Whale Tail mine site	MB20SOW120	*Chenopodium album*	lambs quarters	3	a few sporadically occurring individuals	8	65.40437	-96.68073
AWAR	MB20SOW166	*Descurainia sophia*	flixweed	1000	continuous uniform occurrences of well spaced plants	1170	64.32017	-95.97616
AWAR	MB20SOW167	*Descurainia sophia*	flixweed	100	a few sporadically occurring individuals	329	64.31547	-95.97284
Baker Lake tank farm	MB20SOW169	*Descurainia sophia*	flixweed	100	a single patch	70	64.30878	-95.95132
Baker Lake tank farm	MB20SOW170	*Descurainia sophia*	flixweed	50	a single patch	584	64.30621	-95.95449
Baker Lake tank farm	MB20SOW171	*Descurainia sophia*	flixweed	10000	a few patches plus several sporadically occurring plants	15748	64.30648	-95.9548
Baker Lake tank farm	MB20SOW171	*Tripleurospermum inodorum*	scentless chamomile	10000	several well spaced patches	15748	64.30648	-95.9548
Baker Lake tank farm	MB20SOW172	*Descurainia sophia*	flixweed	100	a single patch plus several sporadically occurring plants	343	64.30514	-95.95156
Baker Lake tank farm	MB20SOW172	*Tripleurospermum inodorum*	scentless chamomile	50	a few patches	343	64.30514	-95.95156
Baker Lake tank farm	MB20SOW174	*Descurainia sophia*	flixweed	100000	a few patches plus several sporadically occurring plants	30672	64.30679	-95.94987
Baker Lake tank farm	MB20SOW175	*Descurainia sophia*	flixweed	1000	several well spaced patches	2116	64.30992	-95.93975
Baker Lake tank farm	MB20SOW176	*Tripleurospermum inodorum*	scentless chamomile	500	a few patches plus several sporadically occurring plants	16265	64.30974	-95.93812

APPENDIX B

Meadowbank Complex - 2020 Non-Native Plant Species Survey Representative Photographs



Photo 1. Flowering flixweed (*Descurainia Sophia*) at Meadowbank Mine (MB20SOW008)



Photo 2. Dead and flowering flixweed at Meadowbank Mine (MB20SOW013)



Photo 3. Vegetative flixweed at Meadowbank Mine (MB20SOW024)



Photo 4. Flowering flixweed at Meadowbank Mine (MB20SOW033)



Photo 5. Flowering flixweed at Meadowbank Mine (MB20SOW054).



Photo 6. Dead and flowering flixweed at a pullout on the AWAR (MB20SOW090).



Photo 7: Flowering flixweed at a quarry adjacent to the AWAR (MB20SOW104)



Photo 8: Flowering scentless chamomile (*Tripleurospermum inodorum*) at a quarry adjacent to the AWAR (MB20SOW102)



Photo 9: Flowering scentless chamomile at a quarry adjacent to the AWAR (MB20SOW102)



Photo 10: Flowering flixweed and scentless chamomile on the AWAR near Baker Lake (MB20SOW115)



Photo 11: Flowering scentless chamomile at the Baker Lake tank farm (MB20SOW173)



Photo 12: Agnico Eagle staff pulling scentless chamomile by hand at the Baker Lake tank farm (MB20SOW173)



Photo 13: Vegetative lamb's quarters (*Chenopodium album*) at Whale Tail Mine (MB20SOW120)



Photo 14: Vegetative alsike clover (*Trifolium hybridum*) at Whale Tail Mine (MB20SOW120)

APPENDIX I

Caribou Behaviour Monitoring



AGNICO EAGLE

Meadowbank Gold Mine

Caribou Behaviour Study, 2020

March 2021

Project No.: 0566633-0004

The business of sustainability

ERM

Signature Page

March 2021

Meadowbank Gold Mine

Caribou Behaviour Study, 2020



Greg Sharam PhD, MSc
Technical Director

ERM Consultants Canada Ltd.

120 Adelaide Street West, Suite 2010
Toronto, ON
Canada M5H 1T1

T: +1 416 646 3608
F: +1 416 642 1269

© Copyright 2021 by ERM Worldwide Group Ltd and/or its affiliates ("ERM").
All rights reserved. No part of this work may be reproduced or transmitted in any form,
or by any means, without the prior written permission of ERM.

EXECUTIVE SUMMARY

The Meadowbank Complex, owned and operated by Agnico Eagle Mines Limited (Agnico Eagle), is located on Inuit Owned Land (IOL) and includes the Meadowbank Gold Mine (the Project) approximately 90 km north of the Hamlet of Baker Lake, and the Whale Tail Pit Project located approximately 150 km north of the Hamlet. A 108 km All Weather Access Road (AWAR) connects the Meadowbank Gold Mine to Baker lake, and the 72 km Whale Tail Haul Road (WTHR) connects the Meadowbank Gold Mine to the Whale Tail site. During spring and fall migration, Lorillard caribou, along with smaller numbers of Wager Bay and Ahiak caribou occur in the Project area, regularly crossing through the Project site, AWAR, and WTHR.

As part of the Nunavut Impact Review Board (NIRB) Project Certificates #004 and #008, Agnico Eagle is required to study and report on the effects of the Project on caribou. The Agnico Eagle Terrestrial Ecosystem Management Plan (TEMP; 2019) includes behaviour monitoring for caribou.

During 2020, Agnico Eagle retained ERM to update the field protocols used for behaviour monitoring. ERM adapted standard methods for caribou behaviour monitoring developed by the Government of Northwest Territories Department of Environment and Natural Resources (GNWT ENR). Studies of caribou behaviour were conducted between April and November 2020 at the Meadowbank Gold Mine, AWAR, and WTHR. As the first year using the scan sample method, 2020 represents a pilot program meant to test and refine the methods and provide a first year of data.

Field surveys were conducted during spring and fall migration in 2020 by the Agnico Eagle environmental technicians. These technicians were trained and were dedicated to conducting behaviour surveys. Each survey lasted 30 minutes, with scan samples conducted every three minutes.

The pilot program for behaviour monitoring in 2020 had several results:

- The standard monitoring protocols adapted from the GNWT ENR worked well at the Project site.
- 116 surveys were conducted, with 71 surveys occurring in April and May during spring migration, 31 occurring in late summer in August, and 14 occurring in fall migration in November.
- Observations were well distributed across a range of caribou group sizes from 1 to 2 individuals to >1,000.
- 7 surveys were recorded where caribou were within 300 m of the road at the start of the survey, and of these, most were of groups smaller than 50 individuals. Caribou mostly exhibited the non-response behaviours of standing, laying, feeding, and walking.
- An analysis of the first year's data indicated that there is a weak trend for caribou at greater distance from the road (>1,000 m) to have a lower proportion of response behaviours (alert and running). The analysis should be interpreted with caution with only one year of data.
- The proportion of caribou with response behaviours in a group was unrelated to environmental variables including temperature and wind speed.
- During periods when large groups of caribou are present, the AWAR and Haul Roads are closed following a decision tree in the Meadowbank Mine Terrestrial Ecosystem Management Plan (TEMP), reducing the potential to record interactions between vehicles and caribou.
- Approximately 70% of the surveys included a disturbance event; typically, haul traffic and light trucks from the mine, and occasionally all-terrain vehicles (ATVs) used by community members on the AWAR for travel and harvesting.
- Following a disturbance event, the proportion of response behaviours in a group of caribou rose , but generally returned to baseline behaviours within one or two sampling intervals (i.e., 3 or 6 minutes).
- Following the 2020 pilot program, Agnico Eagle plans to review the methods and results of this monitoring program with the Meadowbank Terrestrial Advisory Group. Based on this review, Agnico Eagle may update the program as needed for the 2021 field season.

CONTENTS

EXECUTIVE SUMMARY I

1. PROJECT OVERVIEW 1
2. STUDY OBJECTIVES 3
3. BACKGROUND 4
   - 3.1 Lorillard Herd 4
   - 3.2 Project Terms and Conditions and TEMP 4
4. STUDY AREA 5
5. METHODS 6
   - 5.1 Field Surveys 6
   - 5.2 Data Analysis 6
6. RESULTS AND DISCUSSION 8
   - 6.1 Caribou Distribution relative to the Project 8
   - 6.2 Field Surveys Completed 8
   - 6.3 Survey Results 11
     - 6.3.1 Exploratory Analysis 11
     - 6.3.2 Statistical Analysis 14
7. SUMMARY 19
8. REFERENCES 20

APPENDIX A DETAILED METHODS FOR CARIBOU BEHAVIOUR SURVEYS

APPENDIX B DATA FROM CARIBOU BEHAVIOUR SURVEYS

List of Tables

Table 6.2-1: Meadowbank Complex Caribou Behaviour Surveys Data Summary 10
Table 6.2-2: Summary of Spatial Distribution of Surveys 10
Table 6.3-1: Summary of Model Coefficients and Significance Levels for Group Size Models 17
Table 6.3-2: Summary of Model Coefficients and Significance Levels for Distance Models 17

List of Figures

Figure 1-1: Location of Meadowbank Gold Mine and Whale Tail Pit Project 2
Figure 6.1-1: Locations of Behaviour Surveys by Date 9
Figure 6.3-1: Caribou Group Size versus Distance from the Road or Infrastructure to the Caribou at the Start of the Survey 12
Figure 6.3-2: Average Proportion of Each Behaviour Type Observed at the Start of the Survey 13
Figure 6.3-3: Proportion of Alert or Running Caribou by Temperature, Wind Speed, Date, and Whether or Not a Disturbance Occurred During the Survey 15
Figure 6.3-4: Proportion of Response Behaviour during Each Survey 16

Acronyms and Abbreviations

Agnico Eagle	Agnico Eagle Mines Ltd.
AIC	Akaike information criterion
ATV	All-terrain vehicle
AWAR	Meadowbank Mine All Weather Access Road
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
GLMs	Generalized linear models
GN	Government of Nunavut
GNWT ENR	Government of Northwest Territories Department of Environment and Natural Resources
KIA	Kivalliq Inuit Association
km	Kilometre
km/h	Speed expressed as kilometre per hour
m	Metre
NIRB	Nunavut Impact Review Board
Project	Meadowbank Gold Mine
TEMP	Meadowbank Mine Terrestrial Ecosystem Management Plan
WTHR	Whale Tail Haul Road

1. PROJECT OVERVIEW

The Agnico Eagle Mines Ltd. (Agnico Eagle) Meadowbank Gold Mine (the Project), located in the Kivalliq Region of Nunavut (Figure 1-1), received a Project Certificate (No. 004) from the Nunavut Impact Review Board (NIRB) in 2006. The subsequent Water License, GN and CIRNAC Land Lease, and KIA Production Lease, allowed for the construction of a gold mine and ancillary facilities including an All Weather Access Road (AWAR), barge unloading facilities, lay-down area, and a fuel tank farm near the Hamlet of Baker Lake.

The Meadowbank Gold Mine is located approximately 90 km north of the Hamlet of Baker Lake. Mining has ceased at Meadowbank, but the site hosts accommodation, an active mill, and ancillary mechanical, maintenance and vehicles. The Whale Tail Pit Project, located approximately 150 km north of the Hamlet, is an open-pit, truck-and-shovel mine operation and will produce an estimated 19 M tons of ore. Ore is hauled from Whale Tail to the Meadowbank Gold Mine for milling on the Whale Tail Haul Road (WTHR).

The Whale Tail Pit Project received a Project Certificate (No. 008) from NIRB in 2018. The Project Certificates, and subsequent Water License and land leases, allowed development of five gold deposits in the 11 years since the start of operations at the Meadowbank Gold Mine and the first phase of the Whale Tail satellite deposit including construction of the WTHR.

Studies of caribou behaviour were conducted in April, May, August, and November 2020 at the Meadowbank Gold Mine, AWAR, and WTHR to monitor for potential Project effects on caribou.

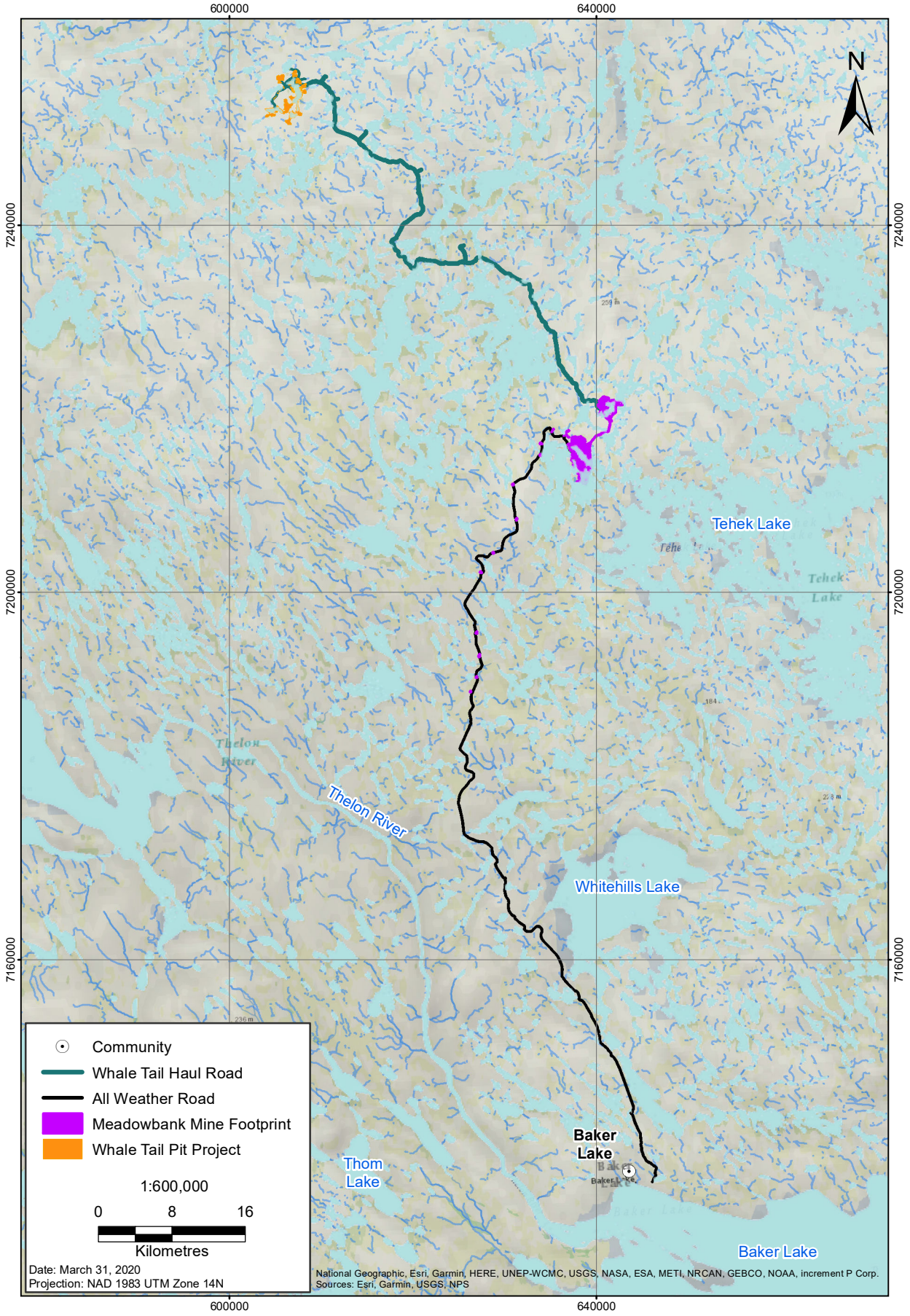


Figure 1-1: Location of Meadowbank Gold Mine and Whale Tail Pit Project

2. STUDY OBJECTIVES

The objectives of the 2020 pilot study were twofold:

- To conduct a trial of the GNWT behaviour survey methodology at the Project site to determine whether it is appropriate in this area, with these caribou, and at this time of year.
- For the first year of the program, to collect a set of 100 samples of caribou behaviour through conducting surveys comparing caribou behaviour: a) near vs. far, and b) with and without disturbances.

3. BACKGROUND

3.1 Lorillard Herd

Five caribou sub-populations may interact with the Meadowbank Project Area: Lorillard, Wager Bay, Qamanirjuaq, Beverly, and Ahiak. Primarily, caribou from Lorillard herd interact with the Project, and smaller numbers of caribou from the Ahiak and Wager Bay herds interact with the Project. Collar data indicates that caribou occur mostly in the area in late winter and during fall rut.

Of these three, the majority of recorded interactions of collared caribou with the mine site and road have been from Lorillard caribou. The Lorillard caribou herd is a mid-sized caribou herd that numbered 41,000 animals in 2002, with no recent estimates of population size (COSEWIC 2016). Its range occurs entirely in Nunavut, with the core of its range stretching northward from Chesterfield Inlet on the Hudson Bay coast and westward toward Baker Lake.

The herd generally winters on the tundra in northern central mainland Nunavut. Spring migration is westward and north of Chesterfield Inlet, past the community of Baker Lake to a calving ground south of Wager Bay and close to the Hudson Bay coast (Nagy and Campbell 2012). During late April and early May, groups of animals from this herd interact with the community of Baker Lake, Meadowbank Mine, Whale Tail Mine, the AWAR and WTHR (Agnico Eagle 2020).

Following calving, the caribou form into large groups and generally move west and inland, gradually returning west towards their wintering areas by early December (Nagy and Campbell 2012). Throughout this period, caribou may interact with the Project infrastructure, but interactions occur primarily in peak fall migration during November.

3.2 Project Terms and Conditions and TEMP

Under the NIRB Certificate #008 for the Whale Tail Project, Term and Condition 28 requires the Project to have a Terrestrial Ecosystem Management Plan (TEMP):

> *(NIRB #008; T&C 28) The Proponent shall maintain a Terrestrial Ecosystem Management Plan (TEMP) throughout all phases of the Project. The Plan shall include detailed monitoring, mitigation, and adaptive management measures for wildlife, with consideration for each Project activity predicted to affect wildlife, and with inclusion of specific triggers for mitigation and adaptive management intervention. The TEMP shall demonstrate consideration for all relevant commitments made by the Proponent throughout the Nunavut Impact Review Board's review of the Project.*

The Meadowbank Division TEMP (Agnico Eagle 2019) is designed to meet this condition. The TEMP includes a survey program for caribou that records caribou behaviour in response to various disturbances.

4. STUDY AREA

The Meadowbank Gold Mine is located approximately 90 km north of the Hamlet of Baker Lake, and the Whale Tail Pit Project is located approximately 150 km north of the Hamlet. Overall, the Meadowbank Complex, consisting of both mines, processing facility, roads, and associated infrastructure and activities, is approximately 300 km inland from the northwest coast of Hudson Bay and is above the tree line near the Arctic Circle. The local physiography is characterized by numerous lakes and low, rolling hills covered mainly by lichen/rock complexes, and heath tundra.

The study area for behaviour monitoring included the existing footprint for the Meadowbank Gold Mine site, the AWAR, the WTHR, plus a 1 km buffer surrounding these areas. Surveys were conducted on any caribou that could be visually surveyed from Project infrastructure up to a distance of 3 km with the aid of binoculars.

5. METHODS

5.1 Field Surveys

Survey methods followed protocols for monitoring caribou behaviour developed by the Government of Northwest Territories Department of Environment and Natural Resources (GNWT 2017). During 2020, ERM refined these methods for Agnico Eagle's Nunavut mine operations. The updated methods focus on scan samples, *in lieu* of both scan and focal samples. Given time and personnel constraints, this was determined to be a more efficient use of time and produce better quality data that is suitable for statistical analysis. The updated methods also include an initial survey step to randomize which group of caribou to monitor when multiple groups are available. Detailed protocols are attached in Appendix A.

Prior to spring migration, a wildlife biologist from ERM conducted a virtual classroom and practical training program for Agnico Eagle environmental technicians dedicated to the task of behaviour observations.

The overall method for the field surveys was to identify caribou groups visible from the mine site, AWAR and WTHR, to select some groups for observation, and to record the behaviour of individuals in groups of different sizes including their responses without any disturbance and in response to mine-related activities and natural factors. Surveys were conducted in 2020 during the spring migration and fall migration, when caribou pass through the Project area.

The first step involved a reconnaissance survey to identify where caribou groups were located. Where multiple groups were observed, surveyors chose which group to sample using a random number table. Field methods included the recording of site information at the location of each survey, including GPS coordinates, weather conditions, road structure, and location of the caribou group in relation to the surveyors and the road. Individuals in the group being observed were categorized when the survey started and at three minute intervals for 30 minutes.

Behaviour categories and their definitions were standardized following GNWT (2017) classifications. The behaviour categories were: feeding, lying down, standing, alert, walking, and trotting or running.

At each three-minute interval, surveyors recorded the numbers of individuals in the group exhibiting each behaviour at that time. If the group was too large to be counted in each interval, an identifiable subset of the group was surveyed during each interval and the total group size was recorded on the datasheet. In the case that a disturbance event occurred during the survey, such as a vehicle driving on the road, the time and type of disturbance was recorded.

5.2 Data Analysis

The objective of the data analysis was to quantify trends in the survey data, and determine whether factors such as distance to Project infrastructure (road), group size, or the disturbances could be used to explain caribou behavior. An initial exploratory analysis was conducted to visualize the data and determine the appropriate method for analyzing the data. A preliminary regression analysis was conducted to test whether the data from these surveys could be analyzed statistically.

To increase the power to detect changes in caribou behaviour, the behaviour categories were grouped for analysis into "response" behaviours (alert and running) and non-response behaviours (feeding, lying down, standing, and walking).

Generalized linear mixed effects models (GLMs) were used to assess the differences in the proportion of response behaviours in surveyed animals as a function of various controlling variables, including the occurrence of disturbances. This regression framework provides a means to control for habitat, environmental variables, repeated measurements, and spatial correlation.

Statistical analyses were conducted using the data from each three-minute interval in each survey. One dependent variable was tested:

1. The proportion of response behaviours (alert or trotting/running) in each interval. This variable was modelled using a binomial distribution.

The dependent variable was modelled against a suite of potentially important variables to determine if there was any statistical relationship with response behaviour. The variables included in this preliminary analysis were group size, distance to road, temperature, wind speed, and a binary variable identifying whether or not a disturbance occurred in the survey.

Because the proportion of responding caribou in a given interval is potentially linked to the conditions in the intervals before, two additional binary variables were added identifying whether a disturbance occurred in the interval prior, and whether a disturbance occurred two intervals prior. This accommodation for a 6 minute “lag” was sufficient for the majority of disturbance events, which typically did not result in a response longer than 3 minutes. Lastly, the survey ID was added as a random effect to account for general behavioural differences between groups of caribou surveyed.

For each dependent variable, GLMs were constructed and tested for model fit, as evidenced by the Akaike Information Criterion (AIC). AIC is a number that is helpful for comparing models as it includes measures of both how well the model fits the data and how complex the model is (simpler is usually better). The top models were identified as having a low AIC and were within a 2 unit difference in AIC ($\Delta AIC \leq 2$) of the top ranked model (i.e., the model with the lowest AIC; Burnham & Anderson 2004). This is the industry standard for identifying models that are essentially ‘equally good’ at explaining the data. Models with a difference in AIC (ΔAIC) of 2 to 4 from the top model are generally considered to have ‘limited support’.

6. RESULTS AND DISCUSSION

6.1 Caribou Distribution relative to the Project

During spring migration in April and May 2020, caribou GPS collar locations were provided to the Project though a data sharing agreement by the GN. These data indicated that caribou were approaching the Project site. Field surveys were conducted daily in order to trigger management actions. These data informed the decision to begin dedicated behaviour surveys for caribou as they approached the site. Through the summer, surveys were conducted opportunistically as caribou were observed. A final set of dedicated surveys was conducted in November during peak fall migration.

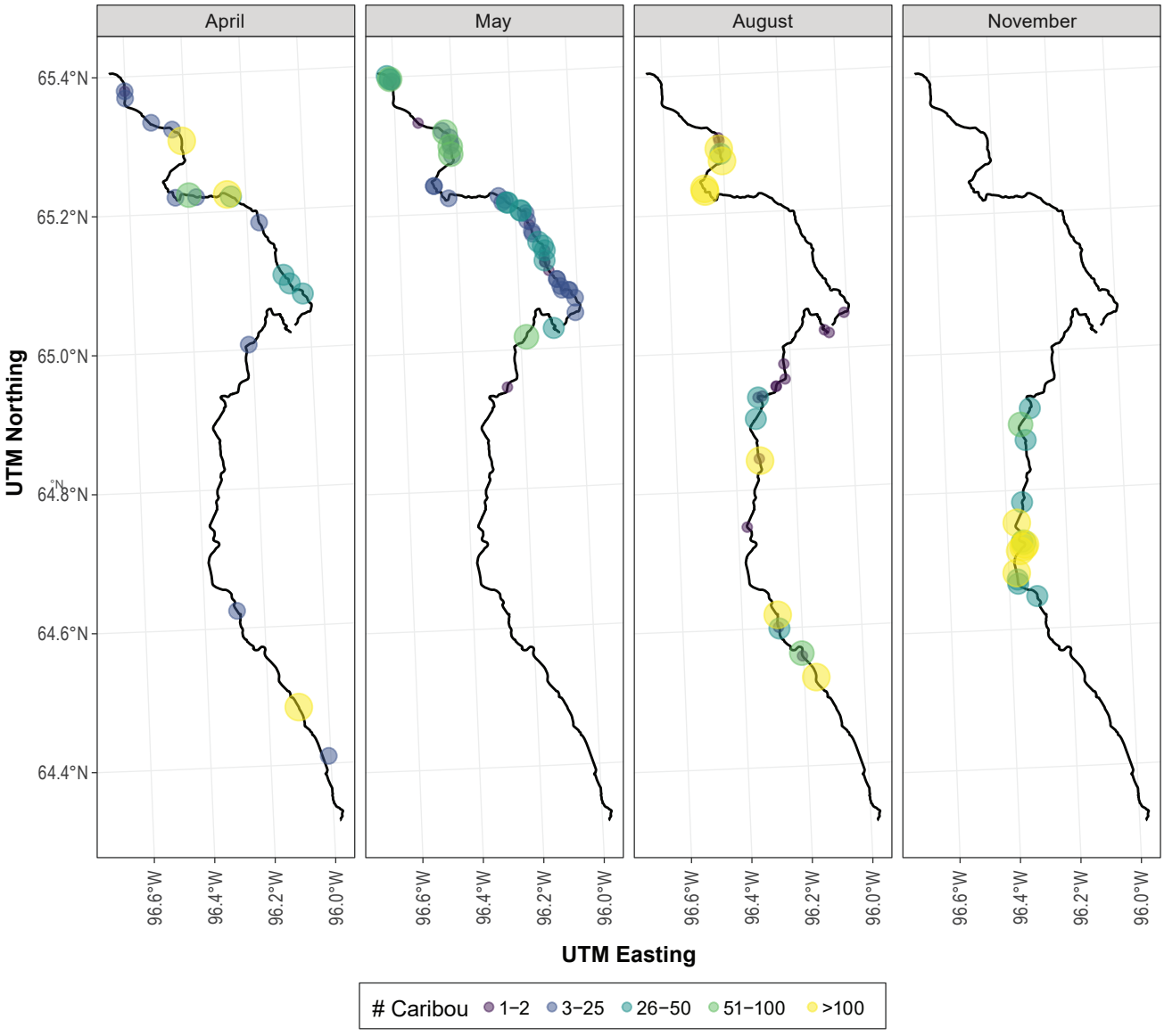
Survey locations by date are presented in Figure 6.1-1. During spring (April and May) and fall migration (November), scattered groups of caribou from the Lorillard herd were observed passing through or near the study area, with the highest numbers of caribou observed in May. During spring migration, the majority of surveys were conducted on the WTHR, as this was where the caribou were observed. During fall migration, caribou were observed more frequently in the southern portion of the study area along the AWAR. In November, no surveys were conducted on the WTHR.

6.2 Field Surveys Completed

In total, 116 behaviour surveys were conducted in 2020 when groups of caribou were near the Project (Table 6.2-1), including 19 surveys in April, 52 surveys in May, 31 surveys in August, and 14 surveys in November. Surveys were conducted opportunistically whenever caribou were encountered during daily reconnaissance drives, primarily along the AWAR and WTHR but also around the mine site when the opportunity arose.

General observations on survey methodology and results included:

- Surveys were well distributed across a range of group sizes (Table 6.2-1). Surveyors reported that the addition of a reconnaissance survey and random selection of which group to survey assisted with a relatively even distribution of survey intensity across group sizes.
- Of the 116 surveys, more than half recorded at least one disturbance during the survey (Table 6.2-1). Most of these disturbances were haul trucks and light trucks travelling between Whale Tail and Meadowbank. On the AWAR, the disturbances were sometimes ATVs travelling north from Baker Lake. Mine traffic was suspended during periods when groups of caribou were near the road.
- In total, 60% of disturbances were from heavy vehicles (including haul trucks, tractor trailers, fuel trucks, and graders), 33% were from light trucks, 5% were from ATVs, and 2% were from helicopters.
- The methodology allowed for the estimation of baseline behaviour, response to disturbance, and return to baseline behaviour. Few, if any, surveys ended before caribou returned to baseline behaviour. Thus, 30 minutes appears to be an appropriate survey length. Caribou surveys were considered an essential activity by the Project, allowing the survey pickup truck to be used on the AWAR and WTHR even when these roads were closed to normal mine traffic.
- One source of uncertainty was consistently estimating distance. Hence, the average distance of the each group of caribou was categorized into blocks of 0-50 m, 50-100 m, etc. The use of a rangefinder would increase accuracy and allow distance to be considered as a continuous variable during analysis, rather than a categorical value.



Note: Colour and size indicate group size, and the location of the All-Weather Access Road is indicated by the black line.

Figure 6.1-1: Locations of Behaviour Surveys by Date

- The goal of 100 surveys was easily achieved at Meadowbank. Between spring migration, summer, and fall migration, caribou may interact with Project infrastructure for long periods across 4 months. Therefore, 100 surveys is likely an achievable goal for future years of behaviour monitoring at Meadowbank.
- Most caribou behaviours were calm, generally foraging, and not moving quickly (non-response).
- Caribou were primarily observed at distances greater than 300 m from the road at the start of the survey. Only 11 surveys were conducted where caribou were initially within 300 m of the road. As a consequence, caribou were observed crossing the road in only 4% of surveys, primarily in small groups of less than 50 individuals.
- During spring migration in April and May when caribou move east towards their calving grounds, 79% of caribou were observed on the west side of the Project infrastructure (Table 6.2-2). During summer and fall migration in August and November when caribou move west towards their overwintering grounds, 68% of caribou were observed on the east side of the Project infrastructure (Table 6.2-2).
- Overall, the 2020 survey methodology worked well for the Project location and circumstances and no major changes are planned for 2021.

Table 6.2-1: Meadowbank Complex Caribou Behaviour Surveys Data Summary

Caribou Group Size	Total Number of Surveys	Surveys with Disturbances	Surveys with Observed Road Crossings
1-2	28	15	1
3-25	35	22	1
26-50	28	13	2
51-100	9	5	0
>100	16	13	1
Total	**116**	**68**	**5**

Table 6.2-2: Summary of Spatial Distribution of Surveys

Month	Surveys of Caribou on East Side of the Project Infrastructure	Surveys of Caribou on West Side of the Project Infrastructure
April	0	15
May	12	31
August	11	7
November	10	3
Total	**33**	**56**

Note:
This data was not recorded in 27 of the total 116 surveys.

6.3 Survey Results

6.3.1 Exploratory Analysis

The exploratory analysis was conducted to determine if there were any trends or interactions in the following variables: group size, distance of the caribou to the AWAR, WTHR and mine site, proportion of caribou showing “disturbed” behaviours and road crossing.

Road Crossing

Results of the exploratory analysis indicated that there was no clear relationship between caribou group size and the observation of road crossings, although 4 of the 5 observed road crossing events occurred in groups smaller than 50 individuals. There was also no clear relationship between caribou distance from road at the start of the survey and the observation of road crossings (Figure 6.3-1).

Group Size and Distance to Infrastructure

Plotting the caribou group size against the distance of caribou groups to the road (distance to observer) at the start of the survey revealed that small groups (less than 50 individuals) were observed at all distances (Figure 6.3-1). Only 7 surveys were recorded where caribou were within 300 m of the road at the start of the survey, and of these, 6 were on groups smaller than 50 individuals.

Large groups tended to be observed further from the road at the start of the survey. No groups larger than 50 individuals were recorded within 100 m of the road at the start of the survey, and no group larger than 100 individuals was recorded within 300 m of the road at the start of the survey.

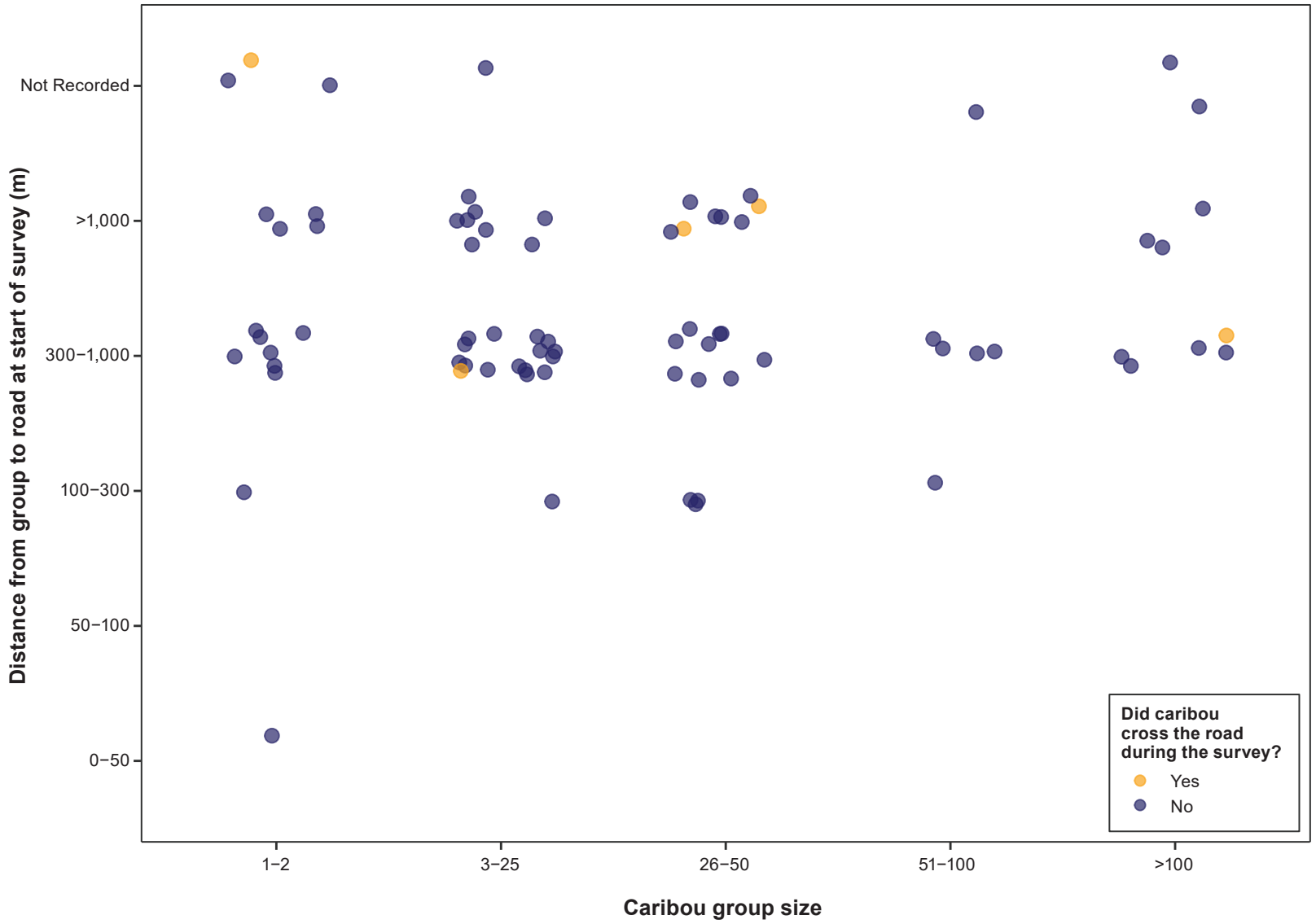
This may have occurred as a result of small sample size, or may be indicative of a trend that caribou tend to avoid areas within 100-300 m of the road. Regardless of the mechanism, these trends need to be considered so that statistical analyses are not confounded. Distance to road categories will also likely need to be grouped in statistical analyses because of the lack of data on caribou within 300 m of the road.

Behaviour Type, Group Size and Distance to Infrastructure

Average proportions of each behaviour type by group size and by distance to road are presented in Figure 6.3-2. When analyzed by group size, the results suggest that the average proportion of the response behaviours of “Alert” and “Trotting” remain stable as group size increases. The largest proportion of response behaviours was observed in groups of 1-2 individuals. No group size had more than 10% response behaviour on average.

When analyzed by distance to road, the results suggest that the proportion of response behaviours is relatively stable for groups within 1,000 m of the road and lower in groups further than 1,000 m from the road. However, due to the previously mentioned correlation between group size and distance to road and the lack of data from within 300 m of the road, these data cannot discern between two possibilities – that caribou are more likely to be disturbed near the road, or that small groups of caribou are more likely to be disturbed. Additional data with groups observed close to the road, would be required to resolve between these two possibilities.

Wolfe et al. (2000) reviewed behaviour research on reindeer and caribou and reported that larger groups are more likely to be disturbed by human activities. Given that 100% of groups larger than 100 individuals were not seen within 300 m of the road, the current study may seem to align with Wolfe et al., but it is still important to note the small sample size within 300 m of the road and therefore caution against over-interpreting. The relationship of group size to disturbance response in the current study is examined in greater detail in the statistical analysis.



Note: Colour indicates whether the group of caribou were observed crossing the road during the survey.

Figure 6.3-1: Caribou Group Size versus Distance From the Road or Infrastructure to the Caribou at the Start of the Survey

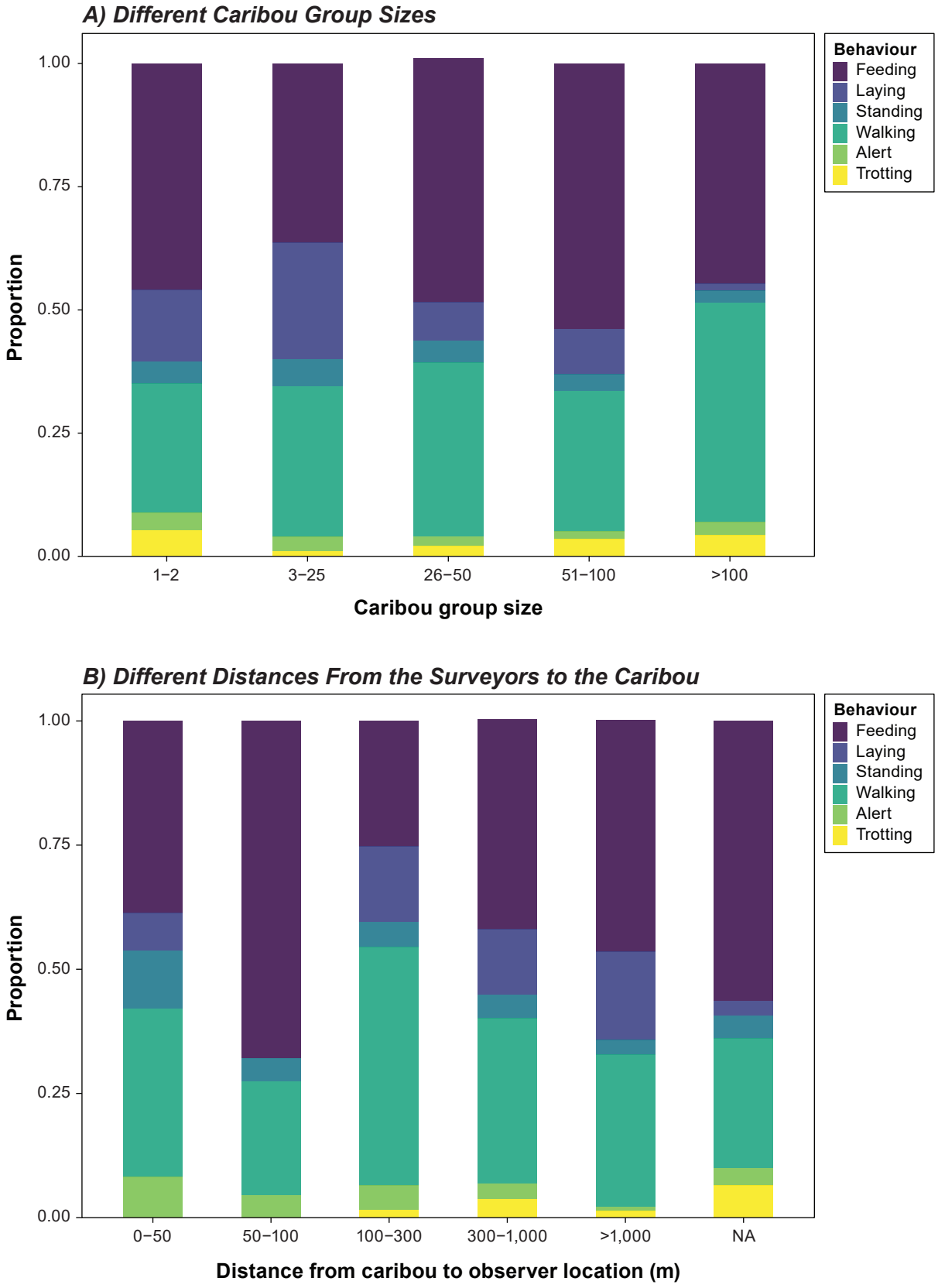


Figure 6.3-2: Average Proportion of Each Behaviour Type Observed at the Start of the Survey

Behaviour Type and Environmental Variables

Figure 6.3-3 shows the relationship between 1) the proportion of response behaviours and 2) various environmental variables, including temperature, wind speed, date, and whether or not a disturbance occurred during the survey. The results suggest a slightly higher proportion of alert or running caribou in surveys where a disturbance occurred. It should be noted that this figure is an average proportion of response behaviours across the entire thirty minute survey, so in some instances the proportion of response behaviours may have been obscured by the large number of intervals with no response behaviour.

Response to Disturbances

To examine response to disturbances, the proportion of response behaviours was plotted by three-minute interval for each survey in Figure 6.3-4. The baseline behaviours (in the absence of recent disturbances) were typically 5-10% caribou with response behaviours in a group. Figure 6.3-4 suggests that following many of the disturbance events, there was commonly a spike in the proportion of response behaviours to 60-90% of caribou in the group. The proportion of caribou with response behaviours returned to a pre-disturbance levels quickly, often within one to two intervals (3 to 6 minutes).

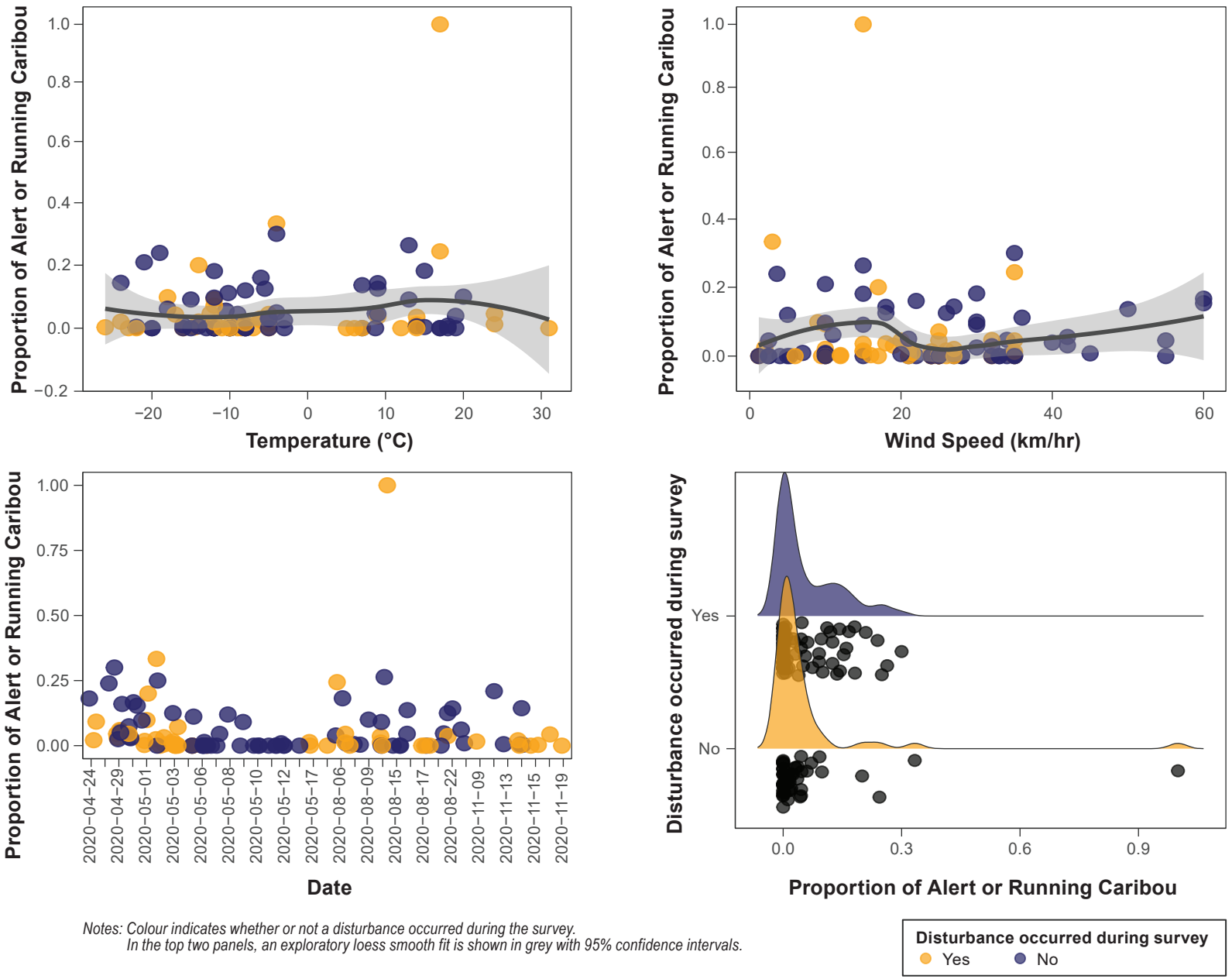
There was some variability in the proportion of response behaviours. During some surveys, there was a spike in response behaviours when no vehicle or other obvious disturbance was observed. In some surveys a vehicle passed by (a disturbance), but there was no increase in response behaviours observed in the caribou group on the subsequent time period.

6.3.2 Statistical Analysis

Due to the relatively small sample size, and because of the lack of data on caribou within 300 m of the road, it was deemed necessary to group together some of the categories in order to create credible statistical models. Initial attempts at modelling the data suggested that regardless of how the models were specified, the estimated response was best predicted in data from >1,000 m from the road. As a result, and in order to prevent overfitting the models, distance to road was converted into a categorical variable representing whether or not the caribou were further than 1,000 m from the road.

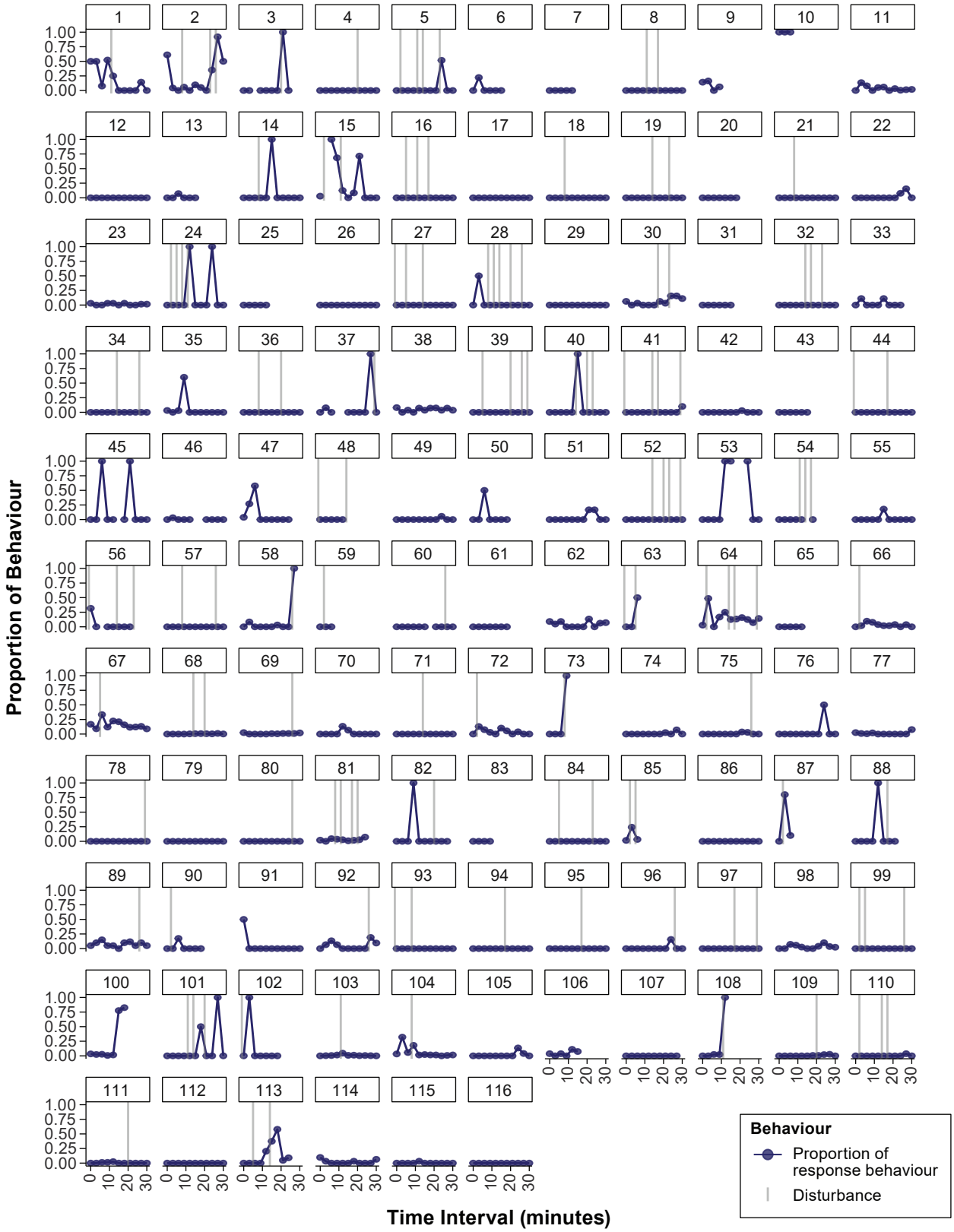
As distance to road and caribou group size were identified as being potentially correlated during the exploratory analysis, a Chi-square test was conducted between the two variables to determine if they were too closely related to be included in a model together. The resulting Chi-square statistic was significant ($p=0.004$), indicating that group size was associated with whether or not the observation was within or outside 1,000 m of the road. However, the small number of samples in each category and the fact that the data were not normally distributed mean that some of the key assumptions of the Chi-squared test were violated, and the output statistic should be treated with extreme caution. Nevertheless, the two variables were not included in models together.

The results indicated that distance to road out-performed group size in all variable combinations, based on the equivalent model cut-off of $\Delta AIC<2$ suggested by Burnham and Anderson (2004). As a result, distance to road should be considered as a better explanatory variable for caribou behaviour than group size for this pilot program in 2020. The estimates and significance levels for the models that included group size as a predictor variable are presented in Table 6.3-1, and for the model that used distance to road as a predictor variable in Table 6.3-2.



Notes: Colour indicates whether or not a disturbance occurred during the survey.
In the top two panels, an exploratory loess smooth fit is shown in grey with 95% confidence intervals.

Figure 6.3-3: Proportion of Alert or Running Caribou by Temperature, Wind Speed, Date, and Whether or Not a Disturbance Occurred During the Survey



Note: Vertical grey bars indicates the occurrence of a disturbance within that time interval, and survey number is indicated above each panel.

Figure 6.3-4: Proportion of Response Behaviour During Each Survey

Table 6.3-1: Summary of Model Coefficients and Significance Levels for Group Size Models

Variable	Estimate	Standard Error	P-value
(Intercept)	-2.47	0.54	0.000*
Group Size: 3-25	-1.74	0.82	0.034*
Group Size: 26-50	-1.15	0.69	0.097
Group Size: 51-100	-0.36	0.82	0.664
Group Size: >100	-0.37	0.57	0.514
Disturbance during interval (Yes)	1.14	0.48	0.019*
Disturbance one interval prior (Yes)	-0.14	0.65	0.831
Disturbance two intervals prior (Yes)	0.01	0.66	0.990
Temperature (°C)	0.01	0.02	0.676
Wind speed (km/h)	-0.03	0.02	0.179

Note:
Statistically significant p-values <0.05 are indicated with an asterisk

Table 6.3-2: Summary of Model Coefficients and Significance Levels for Distance Models

Variable	Estimate	Standard Error	P-value
(Intercept)	-3.64	0.60	0.000*
Distance to road >1,000 m	-0.96	0.65	0.140
Disturbance during interval (Yes)	1.61	0.52	0.002*
Disturbance one interval prior (Yes)	0.15	0.67	0.822
Disturbance two intervals prior (Yes)	0.35	0.67	0.604
Temperature (°C)	0.01	0.02	0.439
Wind speed (km/h)	-0.01	0.02	0.746

Note:
Statistically significant p-values <0.05 are indicated with an asterisk

The statistics presented include the variable estimate, which can be interpreted as the expected effect on the dependent variable as the independent variable increases. For example, in Table 6.3-1 the negative estimate for wind speed indicates that as the wind speed increases, the proportion of caribou with response behaviours decreases. However, estimates should always be considered in tandem with the standard error; if the standard error is larger than the estimate, the estimate is meaningless. The p-value statistic indicates whether the model is a “statistically significant” predictor of the dependent variable, regardless of how large the estimate is. A p-value of less than 0.05 suggests that the variable is an important determinant of the response, as it indicates there was less than 5% probability that the results occurred by chance.

The model that included distance to road was the best fitting model, with an AIC of 161. The results of this analysis suggest that there is a weak differential effect of distance to the road on response behaviour, and that caribou were less likely to be exhibiting response behaviours further from the road.

However, the effect was not significant (p=0.14), with an estimate of -0.96±0.65. Because the standard error is close to the size of the effect, this result should be interpreted with caution.

The model that included caribou group size had an AIC of 212, indicating ΔAIC of +51 from the best fitting model and a substantially poorer fit to the data. However, there is some evidence that caribou were less likely to exhibit response behaviour in groups of 3-25 as compared to groups of 1-2 individuals, with an estimate of -1.74±0.82 in models where group size was included (p=0.034). The effect sizes indicated that all group sizes were less likely to exhibit response behaviours than groups of 1-2, but this effect was only significant in groups of 3-25 individuals. Temperature and wind speed were not found to have an effect on response behaviours in either model set.

These results should be treated with caution due to the relatively small sample size. Nevertheless, these results are consistent with other surveys recorded on barren-ground caribou during the post-calving and early summer periods, which suggest that caribou behavioural responses to all-season haul roads tend to taper off beyond a zone of influence of approximately 500 m (Curatolo et al. 1987; Johnson and Lawhead 1989; Dyer et al. 2001). However, zone of influence estimates are highly variable in the literature and it would be premature to conclude a zone of influence exists from one year of behaviour data. Responses to roads and infrastructure have previously been linked to increased harvest from roadways (Plante et al. 2018; Russell and Gunn 2019), a factor which was not included in this analysis.

This analysis of the 2020 pilot study represents a first year of analyzing data from Meadowbank behavior surveys. As noted, these analyses could be improved in future years by:

- including information on traffic and harvest, if possible,
- increasing sample size so that behaviour categories can each be modeled separately instead of grouping behaviours into response and non-response categories,
- using a rangefinder to measure distance to caribou groups would improve data quality and ease of analysis, especially given the apparent importance of the distance variable as a predictor of caribou response.

7. SUMMARY

The pilot program for behaviour monitoring in 2020 had several results:

- The standard monitoring protocols adapted from the GNWT ENR worked well at the Project site.
- 116 surveys were conducted, with 71 surveys occurring in April and May during spring migration, 31 occurring in late summer in August, and 14 occurring in fall migration in November.
- Observations were well distributed across a range of caribou group sizes from 1 to 2 individuals to >1,000.
- 7 surveys were recorded where caribou were within 300 m of the road at the start of the survey, and of these, most were of groups smaller than 50 individuals. Caribou mostly exhibited the non-response behaviours of standing, laying, feeding, and walking.
- An analysis of the first year's data indicated that there is a weak trend for caribou at greater distance from the road (>1,000 m) to have a lower proportion of response behaviours (alert and running). The analysis should be interpreted with caution with only one year of data.
- The proportion of caribou with response behaviours in a group was unrelated to environmental variables including temperature and wind speed.
- During periods when large groups of caribou are present, the AWAR and Haul Roads are closed following a decision tree in the Meadowbank Mine Terrestrial Ecosystem Management Plan (TEMP), reducing the potential to record interactions between vehicles and caribou.
- Approximately 70% of the surveys included a disturbance event; typically, haul traffic and light trucks from the mine, and occasionally all-terrain vehicles (ATVs) used by community members on the AWAR for travel and harvesting.
- Following a disturbance event, the proportion of response behaviours in a group of caribou rose , but generally returned to baseline behaviours within one or two sampling intervals (i.e., 3 or 6 minutes).
- Following the 2020 pilot program, Agnico Eagle plans to review the methods and results of this monitoring program with the Meadowbank Terrestrial Advisory Group. Based on this review, Agnico Eagle may update the program as needed for the 2021 field season.

8. REFERENCES

Agnico Eagle. 2020. A*gnico Eagle Meadowbank Division Terrestrial Ecosystem Management Plan (TEMP).*

Burnham, K.P., Anderson, D.R., 2004. Multimodel inference: understanding AIC and BIC in model selection. *Sociol. Methods Res.* 33, 261–304.

COSEWIC. 2016. *COSEWIC assessment and status report on the Caribou Rangifer tarandus, Barren-ground population, in Canada.* Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 123 pp. (http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

Curatolo, James A.; Murphy, Stephen M. 1986. The effects of pipelines, roads, and traffic on the movements of caribou, *Rangifer tarandus. The Canadian Field-Naturalist* 100(2):218-224.

Dyer, S., O'Neill, J., Wasel, S., & Boutin, S. (2001). Avoidance of Industrial Development by Woodland Caribou. *The Journal of Wildlife Management*, 65(3), 531-542. doi:10.2307/3803106.

GNWT-ENR. 2017. *Caribou behaviour monitoring field protocols.* Government of the Northwest Territories Environment and Natural Resources, 10 page unpublished document. Yellowknife, NT.

Johnson, C. B., and B. E. Lawhead. 1989. *Distribution, Movements, and Behavior of Caribou in the Kuparuk Oilfield, Summer 1988.* Report by Alaska Biological Research, Inc., to ARCO Alaska, Inc., and the Kuparuk River Unit, Anchorage, Alaska.

Nagy, J.A., and M.W. Campbell. 2012. *Herd structure, movements, calving grounds, activity periods, home range similarity, and behaviours of migratory and tundra-wintering barren-ground caribou on mainland Nunavut and eastern mainland Northwest Territories, Canada.* Technical Report Series 2012 – No. 01-12. Nunavut Department of Environment, Wildlife Research Section.

Plante, S., Dussault, C., Richard, J.H., Cote, S. 2018. Human disturbance effects and cumulative habitat loss in endangered migratory caribou. *Biological Conservation* 224: 129-143.

Russell, D., and A. Gunn. 2019. *Vulnerability Analysis of the Porcupine Caribou Herd to Potential Development of the 1002 Lands in the Arctic National Wildlife Refuge, Alaska.* Report prepared for: Environment Yukon, Canadian Wildlife Service, and GNWT Department of Environment and Natural Resources. 143 pp.

Wolfe S.A., Griffith B., and Wolfe C.A.G, 2000 Response of Reindeer and Caribou to Human Activities. *Polar Research* 19(1), 63-13.

APPENDIX A DETAILED METHODS FOR CARIBOU BEHAVIOUR SURVEYS



AGNICO EAGLE

Meadowbank Gold Mine

Caribou Behaviour Monitoring

15 April 2020

Project No.: 0530275-0011

The business of sustainability

ERM

CONTENTS

1. INTRODUCTION 1

2. STUDY AREA 1

3. STANDARD OPERATING PROCEDURES 2

3.1 General Field Data 2
3.2 General Equipment List 3
3.3 Field Methods 3
3.3.1 Group Selection 3
3.3.2 Selection of an Observation Site 4
3.3.3 Data Recording 4
3.3.4 Behaviour Classification 6

4. REFERENCES 7

APPENDIX A DATA SHEET FOR RECORDING ALL GROUPS OF CARIBOU ALONG THE ROAD

APPENDIX B MEADOWBANK GOLD MINE: CARIBOU BEHAVIOUR MONITORING DATA SHEET

APPENDIX C RANDOM NUMBER TABLE TO SELECT GROUPS TO SURVEY

1. INTRODUCTION

Agnico Eagle Mines Ltd. (Agnico Eagle) would like to determine whether caribou behaviour changes in response to Project activities such as: 1) having roads largely closed in 2020 due to the COVID-19 outbreak vs. open in 2021, 2) passing vehicles and 3) other activities such as predators or mine operations. This monitoring program is designed to collect baseline data on caribou behaviour using standardized, scientifically-defensible methods. The data will be used to monitor project effects and as part of predicting the effects of future expansions during permitting.

Monitoring is to be carried out by on-site technicians as part of normal monitoring operations. The objective for the 2020 season is to collect observations on at least 100 groups of caribou; ideally 25 groups in each of the four group size categories (1-2; 3-25; 26-50; >50).

2. STUDY AREA

The study area for behaviour monitoring is anywhere that caribou may interact with the Project, including the All Weather Access Road (AWAR), the Meadowbank Mine site, Whale Tail site and the Haul Road connecting Meadowbank to Whale Tail.

3. STANDARD OPERATING PROCEDURES

The purpose of caribou behaviour surveys is to provide information to characterize the effects of the physical road and mine-related activities on caribou behaviour, including the All Weather Access Road (AWAR) and Haul Road. The overall method for the surveys is to identify caribou groups visible from the road, to select some groups for observation, and to record the behaviour of individuals in groups of different sizes including their responses without any disturbance and to both mine-related activities and natural factors.

Notes to guide the work include:

- Systematic surveys will be conducted along all Project roads during spring and fall migration periods.
- The survey team will consist of a driver/observer and a second observer when available.

Surveys should be performed:

- Every day that caribou may be in the Project area, and
- At least an hour before convoy deployment so that the potential effect of the passing convoy can be recorded on caribou.

3.1 General Field Data

For each survey day, the appropriate general field data will be recorded onto field data sheets supplied in Appendix A and B. A new data sheet will be used for each survey, including additional sheets as necessary to record all observations. General information includes:

- Survey date and start and end times.
- Field personnel (full names on the data sheet header and initials thereafter).
- Weather conditions during and prior to sampling (e.g., snow in the last 24 hours, current wind conditions).
- Site description: provide location and description (GPS coordinates, road name and distance marker).
- Photographs (if a high resolution camera is available):
    - Take a photo of the caribou every time an observation is recorded so that the observations can be verified by another biologist.
    - For any photographs taken, record the picture IDs in the comments field on the field data sheet.
    - Write descriptions of any photos taken for specific reasons.
- General observations/notes of the environment/sampling procedures.
- Any deviation from the SOPs outlined below.

Note: When in doubt take pictures and make field notes explaining the situation, your response or consequent changes in methods. It is better to have more data/notes than not enough when interpreting the results later on.

3.2 General Equipment List

- A GPS unit with waypoints of road km markings.
- Field data sheets (Appendix A and B), clipboard, pencils, or iPad with data form.
- A timer capable of alarm setting for repeat time intervals (i.e., can be set to go off every three minutes, e.g., a phone).
- Binoculars or spotting scope.
- Compass (or use compass function on GPS unit).
- Portable weather station (temperature and wind speed).
- Camera.

3.3 Field Methods

3.3.1 Group Selection

The survey day will begin with a reconnaissance survey to determine how many caribou groups are present near the road, how large they are, and where they are. This will be accomplished by driving from the mine site to the end of the road and noting relevant information about the groups and their sizes along the way (Appendix A). At the end of the road, the observers will have a list of the total number of groups present and the group sizes.

Allow approximately one hour to survey each group. If the length of the survey day permits all groups to be surveyed then they should all be surveyed. If there are more groups to survey than the time in the day, then do the following:

1. Look at how many of each group size (bullet list below) have been surveyed to date. If one of them is under-represented and there is a group of that size on the road, then go survey that group. If there is more than one group of that size, choose it randomly using the procedure in step 2.
    - 1 or 2 caribou
    - 3 to 25 caribou
    - 26 to 50 caribou
    - >50 caribou
2. For the remainder of groups, use the random number table in Appendix C to select which groups to survey.
    a. Start with the number of groups of caribou on the road. For example, if there are 9 groups of caribou on the road, but the team can only survey 6 of them in a day.
    b. Close your eyes and point at the random number table.
    c. From where your finger lands, read the numbers sequentially to the right until you land on a number that is less than 9 (the number of groups on the road). If that number is #3, then write that down. Repeat that method until you have 6 groups identified (the number you can survey in a day). If there are 10 or more groups then use two digits at a time on the table (for group numbers less than 10 they need a zero in front of them, e.g., group 3 would be chosen when the two digits are “03”).
    d. If you get a repeat number or a number bigger than the number of groups you have, ignore it and move to the next number.

Drive back along the road, surveying the groups that you identified in the procedure above.

3.3.2 Selection of an Observation Site

Find a safe parking location and follow site safety protocols. The observation location may be the vehicle itself or a safe location off the road. If observers exit the vehicle, the observation location should be chosen where observer activity is not likely to influence caribou behaviour and where the observer can remain comfortable for a period of approximately 45 minutes without needing to move. Ideally, the vehicle should be stopped a minimum of ~250-300 m from the caribou – adapt this distance as needed. If the animals are staring at the truck or moving away, then the truck is too close.

3.3.3 Data Recording

Allow 15 minutes between arrival and the time at which behavioural observations begin. This is to allow animals to return to behaviour that may have been interrupted by the arrival of observers. In the time before recording behaviour, fill in the top portion of the form with location, weather, and group size information.

After 15 minutes, begin recording data in the form in Appendix B. The start time to record is the time that observations begin.

3.3.3.1 Location

Collect a waypoint of the location from which the observations will be made. Note the waypoint number and the UTM coordinates on the data sheet. Estimate the distance to the group (see data sheet for distance categories) and, using a compass or the GPS unit compass feature, record the bearing (0° to 360°) to the group being observed.

At each time interval during the survey, observers should record the number of individuals in the group exhibiting behaviour in each category. For clarity, observers should record zero values for behaviours not observed.

Note if the group is on the east or west side of the road. At the end of the 30 minute observation period return to the top of the form and record (Y or N) if the group crossed the road during the survey period.

3.3.3.2 Weather Conditions

Use the portable weather station to record:

- Air temperature;
- Wind speed;
- Wind direction; and
- Humidity (if the weather station has this function).

3.3.3.3 Road Structure

At the location of the caribou group, record the road characteristics:

- Height of the road above the tundra (m);
- Slope of the road side (with of the slope in m);
- Approximate height of snow bank (m); and
- Any structures, such as bridges, present.

3.3.3.4 Caribou Behaviour

Individuals in the group being observed will be categorized when the survey starts and at three minute intervals. Standardized behaviour categories will be used (Section 3.3.3). The standardization of behaviour is necessary for clarity and data analysis. If the observed behaviour does not fit within any of the categories then observers have the option of noting other behaviour in the comments field. However, this should be used only rarely as most behaviour should fit in the primary categories listed below.

The data to record at each three-minute interval are the numbers of individuals in the group exhibiting each behaviour at that time. Do not attempt to characterize the behaviour that occurred during the interval. If the group is too large to be counted in each interval, choose an identifiable subset of the group, count the individuals exhibiting each behaviour at each time interval, and add a comment that a subset of the group was sampled. Indicate the total group size at the top of the data form, not the size of the subset whose behaviour was recorded.

Practically, the easiest way to do this is to have the observer scan across the group of caribou from Left to Right, calling out the behaviour of each animal, while the recorder adds tick marks to the data sheet. When complete, count up the tick marks.

3.3.3.5 Disturbance Events

Caribou behaviour is expected to vary in response to some disturbance events. 2020 is being used as a control year with few disturbance events, to be compared to 2021, when road use returns to normal. The bottom of the data form should be used to record any potential disturbance events evident to the observer regardless of whether caribou respond to them. The main categories of events are included in the data sheet:

- Light truck;
- Haul truck;
- Road maintenance vehicle (e.g., grader);
- ATV or skidoo;
- Aircraft; and
- Predator (note species).

Record the number and approximate speed of the vehicle.

Record the time of the disturbance event (0:00 to 30:00 of the survey), indicate which type of disturbance was observed in the appropriate column. Record any additional comments and records of photographs taken in the final column.

3.3.4 Behaviour Classification

With the exception of Alert behaviour, the primary behaviour categories and their definitions follow GNWT (2017) classifications. The categories appear as columns on the data form, with descriptions on the reverse of the form. The behaviour categories are:

- **Feeding** – standing or walking posture, with the muzzle touching or nearly touching the ground; can be ingesting food or not; head down or moving from side to side.
- **Lying down** – bedded on the ground, either upright or lying on its side, in a resting or ruminating position.
- **Standing** – stationary in an upright, standing posture with head elevated above the ground, and usually above the knees; if cow is nursing, if possible record the time spend nursing.
- **Alert** – head up scanning horizon or focused on a source of disturbance (e.g., vehicle, predator, human).
- **Walking** – similar to standing posture but moving at a slow gait (<5 km/h).
- **Trotting/running** – similar to standing posture but moving rapidly in symmetrical or asymmetrical gait.

Other behaviours that may be observed (record in comments field on form) are:

- **Nursing** – calf is suckling cow.
- **Sparring** – two males in contact.
- **Insect response behavior** – twitching, stamping, tossing head.

In the comments, record if any animals are moving towards the road, parallel or away from the road.

4. REFERENCES

GNWT-ENR. 2017. *Caribou behaviour monitoring field protocols.* Government of the Northwest Territories Environment and Natural Resources, 10 page unpublished document. Yellowknife, NT.

Appendix A Data Sheet for Recording All Groups of Caribou along the Road

Pre-survey caribou reconnaissance.

Date:

Group Number	Road km marker	Group size	East or West of Road?
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
29			
30			
31			
32			
33			
34			
35			

Appendix B Meadowbank Gold Mine: Caribou Behaviour Monitoring Data Sheet

Date:	Time (24 hr [00:00 to 24:00]) Start:		End:
Observers:			
Location Waypoint number:	UTM Easting:	UTM Northing:	Road name and distance marker:
Distance from caribou to observer location. Circle one: **0-50 m** **51-100 m** **100- 300 m** **300-1000 m** **>1000 m** Bearing: _____°			
Is group location East or West of the Road at start of survey? Circle one: **E** **W**	Did the group cross the road during the survey? Circle one: **Y** **N**		
Caribou group size: Exact count when possible: _____ Estimated size (for larger groups). Circle one: **50-100** **101-200** **201-500** **501-1000** **>1000**			
Temperature: ___°C Wind speed: _____km/h Wind direction:_____° Humidity:_____% Days since last snow or wind event: _____ Weather observations:			
Road Height:	Road Side Width:	Structures Present:	

Observation time from start of survey	Number of animals exhibiting each behaviour type						Comments and photo numbers (Note if any caribou crossed road or travelled along road since previous observation)
	Feeding	Lying Down	Standing	Walking	Alert	Trotting or running	
0 minutes							
3 minutes							
6 minutes							
9 minutes							
12 minutes							
15 minutes							
18 minutes							
21 minutes							
24 minutes							
27 minutes							
30 minutes							

Observed disturbance events (record time from start of survey and check type of disturbance)

Time from start of survey	Light truck	Haul Truck	Road maintenance vehicle (e.g., grader)	ATV	Aircraft	Predator (note species)	Comments and photo numbers. Note other disturbances here

Categories and definitions of behaviour[1]:

- **Feeding** – standing or walking posture, with the muzzle touching or nearly touching the ground; can be ingesting food or not; head down or moving from side to side.
- **Lying down** – bedded on the ground, either upright or lying on its side, in a resting or ruminating position.
- **Standing** – stationary in an upright, standing posture with head elevated above the ground, and usually above the knees; if cow is nursing, if possible record the time spend nursing.
- **Alert** – head up scanning horizon or focused on a source of disturbance (e.g., vehicle, predator, human).
- **Walking** – similar to standing posture but moving at a slow gait (<5 km/h).
- **Trotting/running** – similar to standing posture but moving rapidly in symmetrical or asymmetrical gait.

Other behaviours that may be observed (record in comments field on form) are:

- **Nursing** – calf is suckling cow.
- **Sparring** – two males in contact.
- **Insect response behavior** – twitching, stamping, tossing head.

[1] Primary source: GNWT-ENR 2017 caribou behaviour monitoring field protocols, courtesy of GNWT Yellowknife, NT.

Appendix C Random Number Table to Select Groups to Survey

13962	70992	65172	28053	02190	83634	66012	70305	66761	88344
43905	46941	72300	11641	43548	30455	07686	31840	03261	89139
00504	48658	38051	59408	16508	82979	92002	63606	41078	86326
61274	57238	47267	35303	29066	02140	60867	39847	50968	96719
43753	21159	16239	50595	62509	61207	86816	29902	23395	72640
83503	51662	21636	68192	84294	38754	84755	34053	94582	29215
36807	71420	35804	44862	23577	79551	42003	58684	09271	68396
19110	55680	18792	41487	16614	83053	00812	16749	45347	88199
82615	86984	93290	87971	60022	35415	20852	02909	99476	45568
05621	26584	36493	63013	68181	57702	49510	75304	38724	15712
06936	37293	55875	71213	83025	46063	74665	12178	10741	58362
84981	60458	16194	92403	80951	80068	47076	23310	74899	87929
66354	88441	96191	04794	14714	64749	43097	83976	83281	72038
49602	94109	36460	62353	00721	66980	82554	90270	12312	56299
78430	72391	96973	70437	97803	78683	04670	70667	58912	21883
33331	51803	15934	75807	46561	80188	78984	29317	27971	16440
62843	84445	56652	91797	45284	25842	96246	73504	21631	81223
19528	15445	77764	33446	41204	70067	33354	70680	66664	75486
16737	01887	50934	43306	75190	86997	56561	79018	34273	25196
99389	06685	45945	62000	76228	60645	87750	46329	46544	95665
36160	38196	77705	28891	12106	56281	86222	66116	39626	06080
05505	45420	44016	79662	92069	27628	50002	32540	19848	27319
85962	19758	92795	00458	71289	05884	37963	23322	73243	98185
28763	04900	54460	22083	89279	43492	00066	40857	86568	49336
42222	40446	82240	79159	44168	38213	46839	26598	29983	67645
43626	40039	51492	36488	70280	24218	14596	04744	89336	35630
97761	43444	95895	24102	07006	71923	04800	32062	41425	66862
49275	44270	52512	03951	21651	53867	73531	70073	45542	22831
15797	75134	39856	73527	78417	36208	59510	76913	22499	68467
04497	24853	43879	07613	26400	17180	18880	66083	02196	10638
95468	87411	30647	88711	01765	57688	60665	57636	36070	37285
01420	74218	71047	14401	74537	14820	45248	78007	65911	38583
74633	40171	97092	79137	30698	97915	36305	42613	87251	75608
46662	99688	59576	04887	02310	35508	69481	30300	94047	57096
10853	10393	03013	90372	89639	65800	88532	71789	59964	50681
68583	01032	67938	29733	71176	35699	10551	15091	52947	20134
75818	78982	24258	93051	02081	83890	66944	99856	87950	13952
16395	16837	00538	57133	89398	78205	72122	99655	25294	20941
53892	15105	40963	69267	85534	00533	27130	90420	72584	84576
66009	26869	91829	65078	89616	49016	14200	97469	88307	92282
45292	93427	92326	70206	15847	14302	60043	30530	57149	08642
34033	45008	41621	79437	98745	84455	66769	94729	17975	50963
13364	09937	00535	88122	47278	90758	23542	35273	67912	97670
03343	62593	93332	09921	25306	57483	98115	33460	55304	43572
46145	24476	62507	19530	41257	97919	02290	40357	38408	50031
37703	51658	17420	30593	39637	64220	45486	03698	80220	12139
12622	98083	17689	59677	56603	93316	79858	52548	67367	72416
56043	00251	70085	28067	78135	53000	18138	40564	77086	49557
43401	35924	28308	55140	07515	53854	23023	70268	80435	24269
18053	53460	32125	81357	26935	67234	78460	47833	20496	35645

APPENDIX B DATA FROM CARIBOU BEHAVIOUR SURVEYS

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Observers	Waypoint	UTM E	UTM N	Road Name and Distance Marker	Distance from Caribou to Observer Location (m)	Bearing	Is Group East or West of Survey	Did the Group Cross the Road During the Survey	Caribou Group Size	Temperature	Wind Speed (km/h)	Wind Direction	Humidity
24-Apr-20	15:13	15:43	P.R	BEH1	644190	7146164	AWAR KM 7	300-1000	73	W	N	6	-12	15	18	N/A
25-Apr-20	14:25	14:55	P.R	BEH4	639389	7153993	AWAR KM 21	300-1000	356	W	Y	130	-19	3.6	320	33.4
22-Aug-20	12:24	12:54	C.G.P	N/A	636231	7158808	AWAR KM 29	300-1000	N/A	E	N	~150	9	18	NW	59
17-Aug-20	10:06	10:36	K.P	N/A	634025	7162225	AWAR KM 31	300-1000	N/A	E	N	2	7	25	NE	N/A
21-Aug-20	11:32	12:02	C.G.P	N/A	633916	7162656	AWAR KM 29	300-1000	N/A	E	N	58	8.7	34	NE	65
22-Aug-20	11:34	12:04	C.G.P	N/A	630322	7166608	AWAR KM 28	100-300	N/A	E	N	45	9	18	NW	59
17-Aug-20	09:35	09:48	K.P	N/A	630178	7166829	AWAR KM 38	>1000	N/A	W	N	1	7	25	NE	N/A
21-Aug-20	14:37	15:07	C.G.P	N/A	630047	7168806	AWAR KM 40	300-1000	N/A	E	N	101-200	8.7	34	NW	65
24-Apr-20	17:03	17:15	P.R	BEH2	629485	7169438	AWAR KM 40	300-1000	212	W	N	16	-12	10	196	23
12-Aug-20	14:33	14:39	K.P	N/A	625154	7182874	AWAR KM 57	300-1000	N/A		N	1	17	15	NE	58
12-Aug-20	12:03	12:33	K.P	N/A	627206	7193550	AWAR KM 70	>1000	N/A			212	14	15	NE	N/A
17-Aug-20	07:55	08:25	K.P	N/A	627089	7193864	AWAR KM 71	>1000	N/A	W	N	2	6	25	NE	N/A
12-Aug-20	11:03	11:20	K.P	N/A	626533	7200243	AWAR KM 77	>1000	N/A		Y	41	14	15	NW	58
12-Aug-20	09:42	10:11	K.P	N/A	626889	7203689	AWAR KM 82	>1000	N/A		N	2	13	15	NW	58
12-Aug-20	10:13	10:43	K.P	N/A	626889	7203689	AWAR KM 82		N/A			36	13	15	NE	58
15-Aug-20	14:45	15:15	K.P	N/A	627558	7203920	AWAR KM 84	>1000	N/A	W		2	19	21	SE	N/A
17-May-20	10:00	10:30	D.M	N/A	629774	7205349	AWAR KM 86	300-1000	90	E	N	2	-5	24	NW	N/A
12-Aug-20	16:33	16:53	K.P	N/A	629803	7205493	AWAR KM 87	300-1000	N/A	E		1	17	10	SE	58
15-Aug-20	16:30	17:00	K.P	N/A	629803	7205493	AWAR KM 87	300-1000	N/A	W		1	18	15	SE	N/A
12-Aug-20	08:53	09:13	K.P	N/A	631238	7206670	AWAR KM 87	>1000	N/A		N	2	12	9.5	NW	N/A
15-Aug-20	13:50	14:20	K.P	N/A	631024	7209077	AWAR KM 91.5	300-1000	N/A	W	N	1	17	22	SE	N/A
24-Apr-20	19:27	19:57	P.R	BEH3	631351	7212175	AWAR KM 94	300-1000	22	W	N	4	-14	10	230	27
17-May-20	08:50	09:20	D.M	N/A	632815	7213434	AWAR KM 96	300-1000	90	W	N	~67	-5	24	NW	N/A
6-Aug-20	07:10	07:40	K.P	N/A	638304	7214119	AQ KM 175	0-50	N/A	W		1	15	30	SE	N/A
17-Aug-20	07:24	07:38	K.P	N/A	637540	7214558	AWAR KM 79	300-1000	N/A	E		1	5			N/A
18-May-20	09:15	09:45	J.B	N/A	637204	7214855	End of landing strip	300-1000	0	E	N	35	-9	32	SW	N/A
6-May-20	13:20	13:50	J.B	N/A	640674	7217368	AQ KM 111	>1000	N/A	E		22	-12	24	N	71
16-Aug-20	14:43	15:13	K.P	N/A	640674	7217368	Haul Rd KM 111		N/A	E		2	9	55	NW	N/A
3-May-20	11:45	12:15	K.P	N/A	640629	7219715	AQ KM 115.5	N/A	N/A	W	N	10	-8	35	NNE	82
29-Apr-20	16:00	16:30	K.P	N/A	640034	7220375	Vault laydown KM 114	300-1000	N/A	W		32	-10.5	42	S	N/A
6-May-20	13:59	14:19	J.B	N/A	639729	7220931	AQ KM 116	>1000	N/A	W	N	12	-16	24	N	71
4-May-20	12:10	12:40	K.P	N/A	639562	7220983	AQ KM 168	>1000	N/A		N	10	N/A	55	N	99
2-May-20	11:20	11:41	K.P	N/A	638484	7220985	AQ KM 117	>1000	N/A	W	N	9	-6	2	N/A	N/A
6-May-20	14:35	15:05	J.B	N/A	638248	7221592	AQ KM 119	300-1000	N/A		N	7	-12	24	N	71

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Observers	Waypoint	UTM E	UTM N	Road Name and Distance Marker	Distance from Caribou to Observer Location (m)	Bearing	Is Group East or West of Survey	Did the Group Cross the Road During the Survey	Caribou Group Size	Temperature	Wind Speed (km/h)	Wind Direction	Humidity
29-Apr-20	08:55	09:25	K.P	N/A	637938	7221997	AQ Hal Rd KM 120	300-1000	N/A	W	N	35	N/A	N/A	N	N/A
10-May-20	12:50	13:20	J.B	N/A	637712	7222706	AQ KM 119	300-1000	N/A	E	N	7	-12	35	N	52
8-May-20	10:30	11:00	J.B	N/A	637712	7222709	AQ KM 117	300-1000	N/A	W	N	13	-8	5	N	55
29-Apr-20	15:00	15:30	K.P	N/A	636930	7223383	AQ KM 121	>1000	N/A	W	N	28	-12.5	32	S	N/A
10-May-20	13:45	14:15	J.B	N/A	636415	7224091	AQ KM 121	51-100	N/A	E	N	1	-12	33	N	55
9-May-20	12:50	13:20	J.B	N/A	635775	7225465	AQ KM 117	300-1000	N/A	E	N	1	-15	30	N	60
12-May-20	11:50	12:20	J.B	N/A	635750	7225480	AQ KM 124	300-1000	N/A	E	N	1	-8	10	NE	65
1-May-20	11:40	12:10	K.P	N/A	635728	7225700	AQ Rd KM 124	300-1000	N/A	W		35	-14.5	16	NE	N/A
2-May-20	10:30	10:45	K.P	N/A	635652	7226304	AQ KM 124	0-50	N/A	E	N	1	-7	1.2	N/A	N/A
12-May-20	14:50	15:20	J.B	N/A	635755	7227314	AQ KM 125	300-1000	N/A	W	N	35	-10	25	NE	65
1-May-20	12:30	13:00	K.P	N/A	635756	7227334	AQ Rd KM 126	N/A	N/A	E	N	2	-14	17	NW	N/A
3-May-20	13:00	13:30	K.P	N/A	635453	7228060	AQ KM 126.5	>1000	N/A	W	N	32	-12	25	NNE	82
1-May-20	09:50	10:14	K.P	N/A	634708	7228689	AQ Rd KM 127	300-1000	N/A	W	N	26	-18	9	NW	N/A
11-May-20	12:10	12:31	J.B	N/A	633826	7229979	AQ KM 128	300-1000	N/A	W	N	23	-10	5	N	67
2-May-20	13:00	13:30	K.P	N/A	633693	7230374	AQ KM 129	N/A	N/A	W		18	N/A	N/A	N/A	N/A
3-May-20	14:00	14:18	K.P	N/A	633263	7231437	AQ KM 130	300-1000	N/A			2	-12	25	NNE	84
29-Apr-20	10:20	10:50	K.P	N/A	633015	7231775	AQ Hal Rd KM 130	300-1000	N/A	W	N	12	-6.1	19	NE	N/A
9-May-20	13:50	14:20	J.B	N/A	632943	7232089	AQ KM 131	>1000	N/A	W	N	25	-12	33	N	40
2-May-20	13:40	14:10	K.P	N/A	632707	7233257	AQ KM 132.5	51-100/300-1000	N/A	W	Y	1	-4	3	N/A	N/A
7-May-20	08:49	09:10	K.P	N/A	632692	7233279	AQ KM 133	300-1000	N/A	W	N	19	-13	1.2	SW	70
3-May-20	14:30	15:00	K.P	N/A	631933	7233662	AQ KM 134.6		N/A	W.E?		28	-5	26	NNE	84
7-May-20	12:25	12:52	J.B	N/A	631839	7233754	AQ KM 134	>1000	N/A	W	Y	45	-9	2.5	SW	60
10-May-20	09:50	10:20	J.B	N/A	629791	7234956	AQ KM 136	>1000	N/A	W	N	32	-15	27	N	70
4-May-20	12:50	13:18	K.P	N/A	629668	7235000	AQ KM 136	300-1000	N/A	W	N	47	-10.2	36	N	98
11-May-20	13:18	13:30	J.B	N/A	628958	7235000	AQ KM 137	300-1000	N/A	W	N	8	-8	2.5	N	60
2-May-20	14:25	14:55	K.P	N/A	629366	7235371	AQ KM 136	300-1000	N/A	E	N	4	N/A	4	N/A	N/A
4-May-20	15:10	15:19	K.P	N/A	620334	7235666	AQ KM 147	300-1000	N/A		Y	3	-8.5	25	N	99
29-Apr-20	12:20	12:50	K.P	N/A	619596	7235747	AQ KM 148	50-100	N/A	W		14-22	-5	20	NE	N/A
30-Apr-20	08:30	08:37	K.P	N/A	622925	7235848	AQ KM 144	100-300	N/A		N	4	N/A	60	N	N/A
30-Apr-20	09:00	09:30	K.P	N/A	628491	7235947	AQ KM 140	300-1000	N/A			35	N/A	60	N	N/A
3-May-20	10:30	10:45	K.P	N/A	628327	7236042	AQ KM 161	>1000	N/A	W		6	-10	26	NW	N/A
30-Apr-20	16:30	17:00	K.P	N/A	621741	7236175	AQ KM 148	>1000	N/A	W		52	-5	42	N	N/A
29-Apr-20	11:20	11:50	K.P	N/A	627898	7236281	AQ KM 138	300-1000	N/A	W		101-200	-6	22	SW	N/A
7-Aug-20	12:32	13:00	K.P	N/A	618393	7236740	N/A	300-1000	N/A			>533	15	35	SE	N/A
6-Aug-20	15:50	16:20	K.P	N/A	618290	7237181	AQ KM 149	>1000	N/A			>400	18	45	SE	N/A

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Observers	Waypoint	UTM E	UTM N	Road Name and Distance Marker	Distance from Caribou to Observer Location (m)	Bearing	Is Group East or West of Survey	Did the Group Cross the Road During the Survey	Caribou Group Size	Temperature	Wind Speed (km/h)	Wind Direction	Humidity
1-May-20	15:20	15:50	K.P	N/A	617969	7237623	AQ KM 151	300-1000	N/A	W	N	15	-12	21	N	N/A
6-May-20	09:25	09:55	J.B	N/A	617971	7237630	AQ KM 153	>1000	N/A	W	N	15	-16	32	N	60
6-Aug-20	14:50	15:20	K.P	N/A	621107	7241658	AQ KM 156	>1000	N/A			193	19	40	SF	N/A
2-May-20	16:00	16:12	K.P	N/A	620864	7242543	AQ KM 161	300-1000	N/A	W		10	N/A	N/A	N/A	N/A
3-May-20	09:00	09:30	K.P	N/A	620676	7242746	AQ KM 158	>1000	N/A			65	-10	21.5	NE	82
7-Aug-20	09:20	09:50	K.P	N/A	620856	7242804	KM 154	>1000	N/A			45	14	10	SE	N/A
6-Aug-20	10:37	11:07	K.P	N/A	620587	7243600	AQ KM 106	0-50	N/A	E		2	24	35	SE	N/A
6-Aug-20	10:40	11:10	K.P	N/A	620587	7243600	AQ KM 159		N/A	E	N	400	24	35	SE	N/A
12-May-20	16:50	17:20	J.B	N/A	620593	7243984	AQ KM 159	300-1000	N/A	W	N	72	-10	25	N	64
3-May-20	08:30	09:00	K.P	N/A	620623	7244072	AQ KM 160	300-1000	N/A	E	N	7	-11	21	NNE	80
4-May-20	16:10	16:40	K.P	N/A	620646	7244470	AQ KM 160	>1000	N/A	W		18	-8	35	N	99.9
30-Apr-20	14:20	14:50	K.P	N/A	620613	7244880	AQ KM 160	300-1000	N/A	W	N	110	-5	32	N	N/A
9-Aug-20	13:52	13:20	K.P	N/A	620621	7244888	N/A	0-50	N/A			1	20	30	SE	N/A
7-Aug-20	09:00	09:11	K.P	N/A	620503	7245366	KM 161	>1000	N/A			1	14	10	SE	N/A
7-May-20	14:50	15:20	J.B	N/A	620483	7245431	AQ KM 161	300-1000	N/A	W	N	7	-8	5.3	SW	55
1-May-20	16:50	17:00	K.P	N/A	619739	7246272	AQ Rd KM 162	100-300	N/A		N	62	-12	10	NW	N/A
3-May-20	07:40	08:10	K.P	N/A	619269	7246493	AQ KM 161	>1000	N/A	W	N	11	-10	17	NE	77
29-Apr-20	13:45	14:00	K.P	N/A	619053	7246687	AQ KM 163	300-1000	N/A	W		10	-4	35	NE	N/A
3-May-20	16:40	15:01	K.P	N/A	615433	7247734	AQ KM 168	300-1000/ >1000	N/A	E	N	2	-5.5	26	NE	85
30-Apr-20	11:30	12:00	K.P	N/A	615693	7247787	AQ KM 167	300-1000	N/A			20	N/A	N/A	N/A	N/A
29-Apr-20	16:15	16:33	K.P	N/A	611516	7251687	AQ KM 173	>1000	N/A	W	N	23	-3	30	NE	N/A
30-Apr-20	12:20	12:50	K.P	N/A	611446	7252814	AQ KM 175	100-300	N/A		N	2	N/A	25	N	N/A
29-Apr-20	14:40	15:10	K.P	N/A	611443	7252841	AQ KM 175	>1000	N/A	W	N	21	-4	21	NE	N/A
14-May-20	16:30	17:00	J.B	N/A	611188	7254366	AQ KM 175	300-1000	N/A	W	N	4	-5	2.5	N	58
6-May-20	07:20	07:50	K.P	N/A	611138	7254430	AQ KM 160	>1000	N/A			2	-20	28-40	NNE	61
6-May-20	07:23	07:53	J.B	N/A	611138	7254430	AQ KM 176	300-1000	N/A	W		21	-20	28-40	N	61
6-May-20	17:10	17:40	J.B/K.P	N/A	610881	7254767	AQ KM 176	>1000	N/A		N	32	N/A	N/A	N/A	N/A
6-May-20	17:20	17:50	J.B/K.P	N/A	610881	7254767	N/A	300-1000	N/A	W		34	N/A	N/A	N/A	N/A
2-May-20	07:00	07:30	K.P	N/A	610869	7254769	KM 175	300-1000	N/A	W	N	52	N/A	N/A	N/A	N/A
11-May-20	16:15	16:45	J.B	N/A	610409	7255283	AQ KM 177	300-1000	N/A	W	N	50-100	-3	10	N	50
6-Aug-20	11:25	11:55	K.P	N/A	N/A	N/A	AQ KM 166	N/A	N/A			~300	17	35	SE	N/A

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Observers	Waypoint	UTM E	UTM N	Road Name and Distance Marker	Distance from Caribou to Observer Location (m)	Bearing	Is Group East or West of Survey	Did the Group Cross the Road During the Survey	Caribou Group Size	Temperature	Wind Speed (km/h)	Wind Direction	Humidity
16-Aug-20	16:00	16:30	K.P	N/A	N/A	N/A	AWAR KM 89	300-1000	N/A	W		2	7	50	NE	N/A
22-Aug-20	13:11	13:41	C.G.P	N/A	N/A	N/A	AWAR KM 15	300-1000/>1000	N/A	E	N	29	9	18	NW	59
8-Nov-20	12:10	12:40	S.K.	N/A	626406	7179713	AWAR KM 54	300-1000	SW	W	N	350	-16	7	N	80
8-Nov-20	11:22	11:52	S.K.	N/A	625314	7183567	AWAR KM 60	11-300	E	E	N	135	-18	11	N	80
9-Nov-20	9:50	10:20	S.K.	N/A	626404	7180459	AWAR KM 57	51-100	W	W	N	52	-8	15	SW	91
18-Nov-20	10:22	10:39	S.K.	N/A	627404	7201960	AWAR KM 80	100-300		E	N	27	-17			
19-Nov-20	11:17	11:45	S.K.		626159	7186885	AWAR KM 64	100-300		E	N	39	-23	6	WSW	72
12-Nov-20	11:00	11:12	K.P.		625915	7199361	AWAR KM 77	>1000		E		52	-21	10	NW	70
13-Nov-20	11:20	11:50	K.P.		626627	7180082	AWAR KM 58	>1000		E	N	212	-14	20	NW	78
14-Nov-20	9:30	10:00	K.P.		625540	7173794	AWAR KM 50	300-1000		E	N	27	-22	27	NW	70
14-Nov-20	10:20	10:50	K.P.		625857	7179073	AWAR KM 53	>1000		E	N	170	-22	27	NW	70
14-Nov-20	11:20	11:50	K.P.		628603	7171815	AWAR KM 46	>1000		E	N	28	-22	27	NW	70
14-Nov-20	12:23	12:53	K.P.		625305	7175514	AWAR KM 50.5	>1000		E	N	123	-24	27	NW	70
14-Nov-20	13:45	14:15	K.P.		626189	7180541	AWAR 56	300-1000		E	N	41	-24	27	NW	70
15-Nov-20	15:03	15:33	K.P.		626728	7196859	AWAR KM 75	>1000				31	-26	12	SE	69
15-Nov-20	10:00	10:30	K.P.		625463	7174473	AWAR KM 50	>1000		W	N	29	31	12	SE	69

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Days Since Last Snow or Wind Event	Weather Observations	Road Height (cm)	Road Side Width (cm)	Structures Present	Time Interval: 0 min							
								Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
24-Apr-20	15:13	15:43	1	Sunny, few clouds	45	60	Snow Bank	0	0	0	6	0	6		
25-Apr-20	14:25	14:55	0	Cloudy	50	110	N/A	0	0	12	30	30	36	Crossing	
22-Aug-20	12:24	12:54		N/A	N/A	N/A	N/A	150	0	0	0	0	0		
17-Aug-20	10:06	10:36	1	Overcast, light rain	600	700	None	0	2	0	0	0	0		
21-Aug-20	11:32	12:02		N/A	N/A	N/A	N/A	0	0	0	58	0	0		
22-Aug-20	11:34	12:04		N/A	N/A	N/A	N/A	45	0	0	0	0	0		
17-Aug-20	09:35	09:48	1	Overcast, drizzle	150	800	Tower and generator	1	0	0	0	0	0		
21-Aug-20	14:37	15:07		N/A	N/A	N/A	N/A	0	0	0	112	0	0		
24-Apr-20	17:03	17:15	1	Sunny, cloulds	57	70		8	0	6	16	4	1		
12-Aug-20	14:33	14:39		N/A	N/A	N/A	N/A	0	0	0	0	0	1	Fast walk	
12-Aug-20	12:03	12:33		overcast	0-100	600	Quarry	28	0	0	13	0	0	5 m from road	
17-Aug-20	07:55	08:25	1	overcast	400	600	None	1	0	0	0	0	0		
12-Aug-20	11:03	11:20		overcast	100	600	None	35	0	0	6	0	0		
12-Aug-20	09:42	10:11		Sunny, partly cloudy	500	600	Bridge	0	0	0	1	0	0	East toward road	
12-Aug-20	10:13	10:43			700	500	Bridge	0	0	0	35	1	0		
15-Aug-20	14:45	15:15		N/A	20	500	Bridge at Km 82 and seacan	2	0	0	0	0	0	Mom and baby	
17-May-20	10:00	10:30	2		N/A	N/A	None	1	1	0	0	0	0		
12-Aug-20	16:33	16:53		N/A	100	600	None	1	0	0	0	0	0		
15-Aug-20	16:30	17:00		N/A	100	800	None	1	0	0	0	0	0		
12-Aug-20	08:53	09:13		Overcast	>100	600	None	2	0	0	0	0	0		
15-Aug-20	13:50	14:20	1	N/A	100	500-600	None	1	0	0	0	0	0		
24-Apr-20	19:27	19:57	0	Light snow	40	60	Show Bank	4	0	3	4	0	0		
17-May-20	08:50	09:20	2	Cloudy	N/A	N/A	None	42	20	0	3	2	0		7499
6-Aug-20	07:10	07:40			600-700	N/A	Air strip	1	0	0	0	0	0		
17-Aug-20	07:24	07:38	1	Slight rain, overcast	N/A	N/A	N/A	0	0	0	1	0	0	Slow north	
18-May-20	09:15	09:45			N/A	N/A	N/A	15	17	1	2	0	0		174/175
6-May-20	13:20	13:50	1	Sunny	200-300 east		None	0	22	0	0	0	0		
16-Aug-20	14:43	15:13	0	N/A	200	1400	Waste dump 2 km south	1	0	0	1	0	0		
3-May-20	11:45	12:15		Drifting snow, overcast	0	N/A	Vault bit, baby phase pit in 100 m (w)	8	0	2	0	0	0	(photo before the start of observation)	2317
29-Apr-20	16:00	16:30	1	Blowing snow near the ground	200	N/A	Seacans at vault laydown 2 km away	22	0	2	6	2	0		2374
6-May-20	13:59	14:19	1	Sunny	100-200		None	0	0	0	12	0	0	Going south	
4-May-20	12:10	12:40		Windy, drifting snow and sunny at the end	200	200 west, 100 east	Vault waste dump 2 km	0	10	0	0	0	0	Group sleeping, observer could see 10	
2-May-20	11:20	11:41	1	Sunny	500 west; 0 east	N/A	None; vault laydown in the distance	0	0	1	8	0	0	Starting to cross a lake	
6-May-20	14:35	15:05	1	Sunny	500 west, 100 east		Bridge	1	0	0	6	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Days Since Last Snow or Wind Event	Weather Observations	Road Height (cm)	Road Side Width (cm)	Structures Present	Time Interval: 0 min							
								Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
29-Apr-20	08:55	09:25	1	Sunny; drifting snow	N/A	N/A	N/A	1	30	0	0	1	0	Alert lating down	2373
10-May-20	12:50	13:20		Partly cloudy	0		None	0	7	0	0	0	0	All laying down but one is alert	54
8-May-20	10:30	11:00	3	Partly cloudy, dusty due to haul trucks	0		None	5	0	0	13	0	0		20
29-Apr-20	15:00	15:30		Blowing snow on the road	50	N/A	N/A	11	6	0	6	2	0		2376
10-May-20	13:45	14:15		Partly cloudy	500			1	0	0	0	0	0		60
9-May-20	12:50	13:20	4	Sunny	0		None	1	0	0	0	0	0		32/32
12-May-20	11:50	12:20			0		None	10	0	0	0	0	0		111
1-May-20	11:40	12:10	1		100 west; 0 east	N/A	None	7	0	0	3	0	0	slow walk	
2-May-20	10:30	10:45	2	Sunny, warm	150	N/A	None	0	0	1	0	0	0		
12-May-20	14:50	15:20			0		None	34	0	1	0	0	0		138
1-May-20	12:30	13:00	1		N/A	N/A	Bridge at Km 126; seacan on left	1	0	0	0	0	0	Big male	
3-May-20	13:00	13:30		Windy, cloudy	100 west, 0 east	N/A	Bridge 1 km from group	20	0	1	11	0	0		
1-May-20	09:50	10:14	1		50	N/A	None	0	0	0	25	1	0		
11-May-20	12:10	12:31		Cloudy	0		None	19	0	0	4	0	0	Heading south	83
2-May-20	13:00	13:30		Sunny	N/A	N/A	N/A	11	0	0	0	0	0		
3-May-20	14:00	14:18	0	Light snow, windy, overcast	200	N/A	Bridge	2	0	0	0	0	0		
29-Apr-20	10:20	10:50	1	Partly cloudy; windy; drifting snow	25	300	Bridge 800 m from group; tower 2 km from group	6	6	0	0	0	0		2367
9-May-20	13:50	14:20	4	Sunny	1500			20	0	0	5	0	0		41
2-May-20	13:40	14:10	1	Sunny	50	N/A	Radio tower	1	0	0	0	0	0		
7-May-20	08:49	09:10	2	Sunny	100		Tower	6	0	8	5	0	0		
3-May-20	14:30	15:00	1 to 2	Drifting snow, clearing sky	200 west, 0 east	N/A	Radio tower within 1 km	20	0	1	5	0	0	Group was 16 east and 10 west	
7-May-20	12:25	12:52	2	Sunny	2500 W, 0 E		None	3	0	0	25	3	10	First count 41	
10-May-20	09:50	10:20		Partly cloudy	0		None	1	0	0	0	0	0		
4-May-20	12:50	13:18		Drifting snow, sunny	N/A	N/A	N/A	0	0	2	45	0	0		
11-May-20	13:18	13:30		Cloudy	0		None	0	0	0	8	0	0	Heading south	88
2-May-20	14:25	14:55	1		N/A	N/A	None	4	0	0	0	0	0		
4-May-20	15:10	15:19	1	Windy and sunny	50 west, 100 east	N/A	Bridge at 147 km , spill seacan	0	0	0	2	0	0	100 m from rad, bull crossed	
29-Apr-20	12:20	12:50	1		Level with tundra	N/A	Generator 200 m away (not running)	17	0	0	3	2	0		2357
30-Apr-20	08:30	08:37			100	N/A	N/A	0	0	0	4	0	0		
30-Apr-20	09:00	09:30		Drifting/blowing snow	N/A	N/A	N/A	24	0	10	0	1	0		
3-May-20	10:30	10:45		White out; light snow, overcast	N/A	N/A	N/A	0	6	0	0	0	0		
30-Apr-20	16:30	17:00		Sunny; some drifting snow	100	N/A	N/A	48	0	0	4	0	0		2344
29-Apr-20	11:20	11:50	1	Sunny; windy	N/A	N/A	Brideg 500m away	40	0	0	60	20	0		
7-Aug-20	12:32	13:00		Overcast, light drizzle	200	800		0	0	0	33	0	0		
6-Aug-20	15:50	16:20			0-100	N/A	Sand truck	350	0	0	40	0	10		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Days Since Last Snow or Wind Event	Weather Observations	Road Height (cm)	Road Side Width (cm)	Structures Present	Time Interval: 0 min							
								Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
1-May-20	15:20	15:50	1	Sunny	500 west, 100 east	N/A	None	2	0	0	1	0	0		
6-May-20	09:25	09:55	1	Sunny	1500-2000 west		None	0	15	0	0	0	0		005/004
6-Aug-20	14:50	15:20		overcast	400	N/A	None	3	0	0	78	0	0		
2-May-20	16:00	16:12			N/A	N/A	N/A	2	8	0	0	0	0		
3-May-20	09:00	09:30	2	Windy, overcast	50 west, 0 east	N/A	Bridge at 159 - 2 km away	59	0	0	6	0	0		
7-Aug-20	09:20	09:50		Overcast	100	N/A	None	24	0	1	6	0	0		
6-Aug-20	10:37	11:07		Cloudy	N/A	N/A	Bridge	2	0	0	0	0	0	Grazing/walking to the southwest	
6-Aug-20	10:40	11:10		Cloudy	200	N/A	Bridge	280	10	0	100	5	5	100 walking toward the 300	
12-May-20	16:50	17:20			0		None	60	0	0	12	0	0	Heading south	
3-May-20	08:30	09:00	2	Windy, white out; light snow	0 west, 50 east	N/A	Bridge at 160 and 159, group was intervene with	7	0	0	0	0	0		
4-May-20	16:10	16:40			100 west, 0 east	N/A	Bridge 160-1km	0	18	0	0	0	0	2 alert laying down	
30-Apr-20	14:20	14:50	1	Sunny; windy	N/A	N/A	N/A	80	3	0	15	2	0		
9-Aug-20	13:52	13:20		N/A	100	600	bridge	0	1	0	0	0	0	Laying on road, male	
7-Aug-20	09:00	09:11		overcast	400	N/A	Parked long haul truck on the road	1	0	0	0	0	0	Lone male, 2 yrs	
7-May-20	14:50	15:20	2	Sunny	100		None	7	0	0	0	0	0		
1-May-20	16:50	17:00			100	N/A	None	53	0	3	5	1	0		
3-May-20	07:40	08:10	1	White out; light snow	500 west, 0 east	N/A	N/A	0	0	2	9	0	0		
29-Apr-20	13:45	14:00	1	Windy; drifting snow	N/A	N/A	N/A	0	0	0	10	0	0	All walking slowly	
3-May-20	16:40	15:01			N/A	N/A	N/A	2	0	0	0	0	0		
30-Apr-20	11:30	12:00	1	Drifting snow; good visibility; sunny	400 west, 0 east	N/A	None	18	1	0	0	1	0		
29-Apr-20	16:15	16:33	1	Snowy windy	N/A	N/A	N/A	0	0	0	23	0	0	Walking in a line of 23	
30-Apr-20	12:20	12:50	1	Sunny; windy	100 west, 0 east	N/A	None	1	0	0	0	1	0		
29-Apr-20	14:40	15:10	1	Snowy	Almost flat	N/A	N/A	4	0	3	8	0	0	Too far	4 photos
14-May-20	16:30	17:00		Partly cloudy	1000		None	1	2	0	1	0	0		153/154
6-May-20	07:20	07:50	1		200 west, 0 east	200	None	0	2	0	0	0	0		
6-May-20	07:23	07:53			300-400		None	0	19	2	0	0	0	1 woke, 4 other standing	
6-May-20	17:10	17:40	1		100 west, 0 east			29	2	0	1	0	0		
6-May-20	17:20	17:50			N/A			0	0	0	34	0	0		
2-May-20	07:00	07:30			N/A	N/A	N/A	38	0	5	2	0	0		2334
11-May-20	16:15	16:45		Cloudy	~1000		None	~40	43	1	1	0	0		91
6-Aug-20	11:25	11:55		Started to rain, overcast	N/A	N/A	N/A	50	0	0	240	4	6		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Days Since Last Snow or Wind Event	Weather Observations	Road Height (cm)	Road Side Width (cm)	Structures Present	Time Interval: 0 min							
								Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
16-Aug-20	16:00	16:30	0	N/A	N/A	N/A	None	2	0	0	0	0	0		
22-Aug-20	13:11	13:41		N/A	N/A	N/A	N/A	0	0	0	29	0	0		
8-Nov-20	12:10	12:40	4	Sunny, light clouds	100	600	None	337	0	5	8	0	0		
8-Nov-20	11:22	11:52	4	Sunny	100	600	None	15	0	9	36	2	0		
9-Nov-20	9:50	10:20	5	White out - visibility 50m minimum, 300 maximum	100	600	None	33	0	1	0	0	0	These caribou just crossed the road then stopped (before survey).	
18-Nov-20	10:22	10:39			100	700	None	0	0	0	26	1	0		
19-Nov-20	11:17	11:45		Partly cloudy	100	700	None	0	0	3	36	0	0		
12-Nov-20	11:00	11:12	1		100	800	None	40	0	2	0	0	0	group spread over 300m	
13-Nov-20	11:20	11:50	0	Drifting snow/overcast	50	500	None	205	0	3	4	0	0		
14-Nov-20	9:30	10:00	1	Overcast, -38 windchill	125	400	Bridge Km 49	25	2	0	0	0	0		
14-Nov-20	10:20	10:50	1	Overcast, -38 windchill	50	500	None	62	0	3	0	0	0		
14-Nov-20	11:20	11:50	2	1/2 overcast, sunny, increasing wind, -38 windchill	200	800	Quarry	27	0	0	1	0	0		
14-Nov-20	12:23	12:53	1	Clearing sky, -38 windchill	0	600	None	30	0	0	2	0	0		
14-Nov-20	13:45	14:15	1	Clear and sunny, -38 windchill	25	600	None	27	0	1	0	3	0		
15-Nov-20	15:03	15:33	2	Setting sun, overcast	0	10	None	0	0	0	31	0	0	1 lead caribou far in front	
15-Nov-20	10:00	10:30	2		100	500	Bridge Km 49	22	7	0	0	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 3 min								Time Interval: 6 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
24-Apr-20	15:13	15:43	0	0	0	6	6	0			6	0	0	6	1	0		
25-Apr-20	14:25	14:55	5	0	0	40	1	1			32	0	0	40	0	0		
22-Aug-20	12:24	12:54	0	0	0	150	0	0			0	0	0	0	0	0	Behind hill	
17-Aug-20	10:06	10:36	0	2	0	0	0	0			0	2	0	0	0	0		
21-Aug-20	11:32	12:02	16	0	0	42	0	0			16	0	0	42	0	0		
22-Aug-20	11:34	12:04	35	0	0	0	10	0			0	0	0	45	0	0		
17-Aug-20	09:35	09:48	1	0	0	0	0	0			0	0	0	1	0	0		
21-Aug-20	14:37	15:07	0	0	0	112	0	0			0	0	0	112	0	0		
24-Apr-20	17:03	17:15	16	0	9	16	8	0	Lost sight of 4		12	0	2	12	0	0	Lost sight of 5	
12-Aug-20	14:33	14:39	0	0	0	0	0	1	Fast walk		0	0	0	0	0	1	At 6.5 min caribou ran south very fast, out of view, could not see predator	
12-Aug-20	12:03	12:33	23	0	0	22	3	4	Walking north		0	0	0	23	0	2	20 out of sight	
17-Aug-20	07:55	08:25	1	0	0	0	0	0			1	0	0	0	0	0		
12-Aug-20	11:03	11:20	26	0	0	15	0	0			31	0	0	8	3	0	Alert at road side - smelling road, 10 crossed	
12-Aug-20	09:42	10:11	0	0	0	1	0	0			0	0	0	1	0	0		
12-Aug-20	10:13	10:43	0	0	0	0	0	0			0	0	0	0	18	0	300 m east	
15-Aug-20	14:45	15:15	2	0	0	0	0	0			2	0	0	0	0	0		
17-May-20	10:00	10:30	1	1	0	0	0	0		7513	1	1	0	0	0	0		7514
12-Aug-20	16:33	16:53	0	0	0	1	0	0			1	0	0	0	0	0	Slow walk/graze	
15-Aug-20	16:30	17:00	1	0	0	0	0	0			1	0	0	0	0	0		
12-Aug-20	08:53	09:13	2	0	0	0	0	0	Walk/graze NW		0	0	0	2	0	0		9:01 photo
15-Aug-20	13:50	14:20	1	0	0	0	0	0	Walk/graze, walked out of view for seconds		0	0	0	1	0	0		
24-Apr-20	19:27	19:57	4	0	2	4	0	0			4	0	4	4	0	0		
17-May-20	08:50	09:20	40	22	0	3	0	0	2 out of sight	7501	37	26	0	2	0	0	2 out of sight	7502
6-Aug-20	07:10	07:40	1	0	0	0	0	0			1	0	0	0	0	0	Twirching	
17-Aug-20	07:24	07:38	0	0	0	1	0	0	Slow north		1	0	0	0	0	0	Photo	
18-May-20	09:15	09:45	17	8	10	0	0	0		176/177	16	17	2	0	0	0		178/179
6-May-20	13:20	13:50	0	22	0	0	0	0			0	22	0	0	0	0		
16-Aug-20	14:43	15:13	1	0	0	0	1	0			2	0	0	0	0	0		
3-May-20	11:45	12:15	10	0	0	0	0	0			10	0	0	0	0	0		
29-Apr-20	16:00	16:30	21	0	3	8	0	0			25	0	2	4	1	0		
6-May-20	13:59	14:19	0	0	0	12	0	0			0	0	0	12	0	0		
4-May-20	12:10	12:40	0	10	0	0	0	0	1 alert but laying down		0	10	0	0	0	0		
2-May-20	11:20	11:41	0	0	0	8	0	1			0	0	0	9	0	0		
6-May-20	14:35	15:05	5	0	0	2	0	0			1	0	0	3	0	0	3 out of sight	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 3 min								Time Interval: 6 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
29-Apr-20	08:55	09:25	0	28	4	0	0	0		2371	2	31	0	1	1	0	Alert lating down	
10-May-20	12:50	13:20	0	7	0	0	0	0			0	7	0	0	0	0		55
8-May-20	10:30	11:00	11	0	0	1	1	0			1	0	0	3	0	0	9 out of sight	
29-Apr-20	15:00	15:30	20	2	0	5	0	0	Some behind hill		15	6	0	5	1	0		
10-May-20	13:45	14:15	1	0	0	0	0	0			0	0	0	1	0	0		
9-May-20	12:50	13:20	1	0	0	0	0	0		34	1	0	0	0	0	0		35
12-May-20	11:50	12:20	9	0	0	1	0	0		112	5	0	0	5	0	0		113
1-May-20	11:40	12:10	7	0	0	4	0	0	slow walk	2388	9	0	0	3	0	0	slow walk	
2-May-20	10:30	10:45	0	0	0	1	0	0	caribou walked between observations	2332	1	0	0	0	0	0		
12-May-20	14:50	15:20	35	0	0	0	0	0	started walking north		20	0	0	0	0	0		139
1-May-20	12:30	13:00	1	0	0	0	0	0			0	0	0	0	0	1	Ran to female	
3-May-20	13:00	13:30	6	0	2	23	1	0			0	0	1	31	0	0		2315
1-May-20	09:50	10:14	0	0	5	14	3	4			0	0	2	9	3	12		
11-May-20	12:10	12:31	9	0	0	0	0	0		84	5	0	0	0	0	0		
2-May-20	13:00	13:30	9	0	1	1	0	0			10	0	0	1	0	0		
3-May-20	14:00	14:18	2	0	0	0	0	0			0	0	0	1	0	1		
29-Apr-20	10:20	10:50	4	6	0	2	0	0			4	6	0	2	0	0		
9-May-20	13:50	14:20	24	0	0	1	0	0			17	0	0	1	0	0	6 out of sight	42
2-May-20	13:40	14:10	1	0	0	0	0	0		2326 (location of crossing)	0	0	1	0	0	0		2328
7-May-20	08:49	09:10	0	0	2	17	0	0	going south	15	6	0	1	2	0	0	Rest out of sight	
3-May-20	14:30	15:00	26	0	2	0	0	0	2 more into view		23	0	1	4	0	0	(photo for east group)	2309
7-May-20	12:25	12:52	0	0	5	36	0	0			0	0	0	All	0	0		
10-May-20	09:50	10:20	1	0	0	0	0	0			0	0	1	0	0	0		
4-May-20	12:50	13:18	0	0	0	11	1	0	out of sight all		0	0	0	30	0	0		
11-May-20	13:18	13:30	0	0	0	8	0	0		89/90	2	0	0	6	0	0		
2-May-20	14:25	14:55	4	0	0	0	0	0		2324	3	0	0	1	0	0		
4-May-20	15:10	15:19	2	0	0	1	0	0		2296	3	0	0	0	0	0		2296
29-Apr-20	12:20	12:50	19	0	0	1	1	0	Active digging		7	0	0	3	1	0	Some walked behind a hill slowly	
30-Apr-20	08:30	08:37	3	0	0	1	0	0			0	0	2	0	2	0		
30-Apr-20	09:00	09:30	0	0	0	18	2	15			0	0	0	24	0	0	10 went over a ridge	
3-May-20	10:30	10:45	0	6	0	0	0	0			0	0	0	6	0	0		
30-Apr-20	16:30	17:00	47	0	0	4	1	0			44	0	0	3	5	0		
29-Apr-20	11:20	11:50	20	0	50	30	10	0			12	0	52	16	40	0		
7-Aug-20	12:32	13:00	0	0	0	140	0	0			0	0	0	196	0	0		
6-Aug-20	15:50	16:20	350	0	20	30	0	0			350	25	0	19	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 3 min								Time Interval: 6 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
1-May-20	15:20	15:50	1	1	1	0	0	0			1	2	0	0	0	0		
6-May-20	09:25	09:55	0	15	0	0	0	0			0	15	0	0	0	0		
6-Aug-20	14:50	15:20	8	0	0	19	0	4	4 babies running, 50 out of sight		2	0	0	59	0	5		
2-May-20	16:00	16:12	2	8	0	0	0	0			1	9	0	0	0	0		
3-May-20	09:00	09:30	57	0	2	6	0	0		2321	62	0	0	3	0	0		
7-Aug-20	09:20	09:50	26	0	2	3	0	0			23	0	0	4	0	0	4 out of view	
6-Aug-20	10:37	11:07	0	0	0	2	0	0			0	0	0	2	0	0	Male +female	
6-Aug-20	10:40	11:10	306	10	30	50	0	4	Babies running		300	8	12	78	0	2		
12-May-20	16:50	17:20	15	0	0	30	0	0		145/146	18	0	0	15	0	0	Very spread out on over 800 m to 1 km	
3-May-20	08:30	09:00	2	0	0	5	0	0			4	0	0	3	0	0		
4-May-20	16:10	16:40	0	18	0	0	0	0	3 alert laying down		0	16	2	0	0	0		2293
30-Apr-20	14:20	14:50	102	4	0	4	0	0			92	3	0	10	2	3		
9-Aug-20	13:52	13:20	0	1	0	0	0	0			0	1	0	0	0	0		
7-Aug-20	09:00	09:11	1	0	0	0	0	0			0	0	0	1	0	0		
7-May-20	14:50	15:20	7	0	0	0	0	0			7	0	0	0	0	0		
1-May-20	16:50	17:00	0	0	2	45	5	10			0	0	4	56	2	0	Most walked out of view; 2 pickups west, all group went out of site	
3-May-20	07:40	08:10	1	0	1	9	0	0			0	0	0	11	0	0		
29-Apr-20	13:45	14:00	0	0	0	2	8	0			0	0	0	9	1	0		
3-May-20	16:40	15:01	2	0	0	0	0	0			0	0	0	2	0	0		2303
30-Apr-20	11:30	12:00	17	1	0	0	2	0		2351	17	0	0	0	3	0		
29-Apr-20	16:15	16:33	0	0	0	23	0	0			0	0	0	19	0	4		
30-Apr-20	12:20	12:50	0	2	0	0	0	0		2347	0	2	0	0	0	0	Lays caribou are alert	
29-Apr-20	14:40	15:10	4	0	1	9	1	0			6	0	1	6	2	0		
14-May-20	16:30	17:00	1	2	1	0	0	0		155	2	2	0	0	0	0		156
6-May-20	07:20	07:50	0	2	0	0	0	0			0	2	0	0	0	0		
6-May-20	07:23	07:53	0	21	0	0	0	0	All lied down	001/002	0	21	0	0	0	0		
6-May-20	17:10	17:40	25	1	5	1	0	0			30	0	0	2	0	0		
6-May-20	17:20	17:50	4	0	0	30	0	0		0010/0011	0	0	0	34	0	0		
2-May-20	07:00	07:30	31	0	0	21	0	0			27	0	1	23	4	0		
11-May-20	16:15	16:45	~40	40	1	15	0	0		98/93	25%	0	0	75%	0	0	ratio	94/95
6-Aug-20	11:25	11:55	10	0	0	240	2	4	37 crossed the road to the east		2	0	6	280	0	8	Babies running mostly	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 3 min								Time Interval: 6 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
16-Aug-20	16:00	16:30	2	0	0	0	0	0	Running to the other		1	0	0	1	0	0		
22-Aug-20	13:11	13:41	0	0	0	0	0	29			0	0	0	29	0	0		
8-Nov-20	12:10	12:40	342	0	3	4	1	0			340	0	5	3	2	0		
8-Nov-20	11:22	11:52	23	0	5	23	12	12	2 fighting		25	0	17	57	6	0	More showing up	
9-Nov-20	9:50	10:20	34	0	0	0	0	0			28	0	1	5	0	0		
18-Nov-20	10:22	10:39	0	0	0	27	0	0			0	0	3	23	0	1		
19-Nov-20	11:17	11:45	3	0	4	32	0	0			0	0	0	39	0	0		
12-Nov-20	11:00	11:12	38	0	1	3	0	0			34	3	2	2	1	0		
13-Nov-20	11:20	11:50	198	2	1	11	0	0	Might have missed some sleeping ones		184	0	2	26	0	0	Group slowly moving south	
14-Nov-20	9:30	10:00	25	2	0	0	0	0			26	1	0	0	0	0		
14-Nov-20	10:20	10:50	65	0	4	6	0	0			72	0	2	8	1	0		
14-Nov-20	11:20	11:50	26	0	0	2	0	0			23	0	0	5	0	0		
14-Nov-20	12:23	12:53	29	0	0	3	0	0			30	0	0	2	0	0		
14-Nov-20	13:45	14:15	24	0	2	4	1	0			29	0	1	1	0	0		
15-Nov-20	15:03	15:33	0	0	0	31	0	0			6	0	0	25	0	0		
15-Nov-20	10:00	10:30	21	6	1	1	0	0			21	6	0	2	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 9 min								Time Interval: 12 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
24-Apr-20	15:13	15:43	5	0	0	6	6	6			6	0	0	0	2	0		
25-Apr-20	14:25	14:55	40	0	2	40	5	0			5	0	1	40	0	0	Hunter	
22-Aug-20	12:24	12:54	0	0	0	150	0	0			0	0	0	150	0	0		
17-Aug-20	10:06	10:36	0	2	0	0	0	0			0	2	0	0	0	0		
21-Aug-20	11:32	12:02	0	0	0	58	0	0			0	0	0	58	0	0		
22-Aug-20	11:34	12:04	45	0	0	0	0	0			0	0	0	45	0	0		
17-Aug-20	09:35	09:48	0	0	0	1	0	0	NW 1/2 visible		0	0	0	1	0	0	Out of view at 13 min	
21-Aug-20	14:37	15:07	112	0	0	0	0	0			112	0	0	0	0	0		
24-Apr-20	17:03	17:15	7	0	1	7	1	0	Lost sight of all of them									
12-Aug-20	14:33	14:39																
12-Aug-20	12:03	12:33	30	0	6	100	0	0			20	0	0	130	0	8	2 babies feeding	
17-Aug-20	07:55	08:25	1	0	0	0	0	0	Walked south during this		1	0	0	0	0	0		
12-Aug-20	11:03	11:20	29	0	0	12	0	0	1 crossed		6	0	4	10	0	0	21 out of view	
12-Aug-20	09:42	10:11	1	0	0	0	0	0			0	0	0	1	0	0	West, steady pace	
12-Aug-20	10:13	10:43	6	0	0	0	10	3	Toward road		14	0	0	0	2	0	800m east	
15-Aug-20	14:45	15:15	1	0	0	1	0	0			2	0	0	0	0	0		
17-May-20	10:00	10:30	1	1	0	0	0	0		7515	1	1	0	0	0	0		7516
12-Aug-20	16:33	16:53	1	0	0	0	0	0	At 8 min, sand truck went by, walking		0	0	0	1	0	0	5 steps and eating	
15-Aug-20	16:30	17:00	1	0	0	0	0	0	Walking at 10 min		1	0	0	0	0	0		
12-Aug-20	08:53	09:13	2	0	0	0	0	0			1	0	1	0	0	0		
15-Aug-20	13:50	14:20	0	0	0	1	0	0	Smelling/walking		1	0	0	0	0	0		
24-Apr-20	19:27	19:57	4	0	3	4	0	0			4	0	2	4	0	0		
17-May-20	08:50	09:20	36	27	0	2	2	0		7503	34	27	0	4	2	0	2 out of sight	7505
6-Aug-20	07:10	07:40	1	0	0	0	0	0			0	0	0	0	1	0	Alert for few seconds	
17-Aug-20	07:24	07:38	0	0	0	1	0	0			0	0	0	1	0	0		
18-May-20	09:15	09:45	12	20	0	3	0	0			13	14	0	3	0	0	5 out of sight	
6-May-20	13:20	13:50	0	22	0	0	0	0			0	22	0	0	0	0		
16-Aug-20	14:43	15:13	1	0	0	1	0	0			2	0	0	0	0	0		
3-May-20	11:45	12:15	9	1	0	0	0	0			6	1	2	1	0	0	(photo for 3 of the 10)	2316
29-Apr-20	16:00	16:30	25	0	1	6	0	0			27	0	0	5	0	0		
6-May-20	13:59	14:19	0	0	0	12	0	0			0	0	0	6	0	0	6 out of view	
4-May-20	12:10	12:40	0	10	0	0	0	0			0	10	0	0	0	0		
2-May-20	11:20	11:41	0	0	0	9	0	0		2332	0	0	0	9	0	0		
6-May-20	14:35	15:05	0	0	0	5	0	0	2 out of sight		5	0	0	1	0	0	1 out of sight	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 9 min								Time Interval: 12 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
29-Apr-20	08:55	09:25	1	0	0	1	3	0	Alert laying down		0	34	1	0	0	0		2370
10-May-20	12:50	13:20	0	7	0	0	0	0			0	7	0	0	0	0		56
8-May-20	10:30	11:00	0	0	0	0	0	0	All out of sight		0	0	0	0	0	0	All out of sight	
29-Apr-20	15:00	15:30	17	8	0	3	0	0		2375	19	5	0	2	2	0		
10-May-20	13:45	14:15	0	0	0	1	0	0		62/63	1	0	0	0	0	0		64/65
9-May-20	12:50	13:20	1	0	0	0	0	0			1	0	0	0	0	0		
12-May-20	11:50	12:20	10	0	0	0	0	0		114	10	0	0	0	0	0		115
1-May-20	11:40	12:10	12	0	1	4	0	0	Slow walk		18	0	2	5	0	0	Slow walk	
2-May-20	10:30	10:45	0	0	0	1	0	0			0	0	0	1	0	0		
12-May-20	14:50	15:20	6	0	0	1	0	0	All rest out of sight, >1 km away		10	0	0	0	0	0		140
1-May-20	12:30	13:00	0	0	0	2	0	0			0	0	0	2	0	0		
3-May-20	13:00	13:30	0	0	2	30	0	0			0	0	1	25	0	0	6 out of view behind a hill	
1-May-20	09:50	10:14	0	0	0	26	0	0		2342	0	0	0	26	0	0		2341
11-May-20	12:10	12:31	5	0	0	0	0	0		86	2	0	0	0	0	0		87
2-May-20	13:00	13:30	10	0	0	1	0	0			10	0	0	1	0	0		
3-May-20	14:00	14:18	1	0	0	1	0	0			0	0	0	2	0	0	At 14 min, joined a group of 6 to total 8	
29-Apr-20	10:20	10:50	5	6	0	1	0	0			6	6	0	0	0	0		
9-May-20	13:50	14:20	14	0	3	0	0	0			10	0	1	6	0	0		
2-May-20	13:40	14:10	0	0	0	1	0	0		2327	0	0	0	0	0	1		
7-May-20	08:49	09:10	11	0	0	1	0	0	Rest out of sight		1	0	0	10	0	0	Rest out of sight	
3-May-20	14:30	15:00	25	0	0	3	0	0	(photo for west group)	2308	21	0	1	6	0	0		2308
7-May-20	12:25	12:52	0	0	6	39	0	0			10	0	13	22	0	0		
10-May-20	09:50	10:20	14	0	1	0	0	0	Others approached from side	47	12	0	0	0	0	0	Others approached from side	48
4-May-20	12:50	13:18	0	0	38	5	0	0		2301	0	0	29	18	0	0		2300
11-May-20	13:18	13:30	0	0	0	0	0	0	All out of sight		0	0	0	0	0	0		
2-May-20	14:25	14:55	4	0	0	0	0	0			4	0	0	0	0	0		
4-May-20	15:10	15:19	2	0	0	1	0	0			3	0	0	0	0	0		
29-Apr-20	12:20	12:50	6	0	0	4	0	0		2356	8	0	3	4	0	0		
30-Apr-20	08:30	08:37							Group walked slowly over a hill									
30-Apr-20	09:00	09:30	0	0	0	20	2	2			0	1	7	10	6	0	Circling at the lake	
3-May-20	10:30	10:45	0	0	1	5	0	0			0	0	0	6	0	0	Walked out of sight	
30-Apr-20	16:30	17:00	43	0	3	2	4	0			39	5	2	4	2	0		
29-Apr-20	11:20	11:50	30	0	45	35	15	0		2365	27	0	20	50	20	8		
7-Aug-20	12:32	13:00	0	0	0	239	0	0			0	0	0	314	1	0		
6-Aug-20	15:50	16:20	300	25	0	20	0	0	50 out of view		260	20	5	15	0	0	50 out of view	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 9 min								Time Interval: 12 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
1-May-20	15:20	15:50	0	3	0	0	0	0			8	5	0	0	2	0	12 caribou joined	
6-May-20	09:25	09:55	0	15	0	0	0	0			0	15	0	0	0	0		
6-Aug-20	14:50	15:20	8	0	0	55	0	2	46 added; 16 out of view		3	0	0	83	0	0	21 added	
2-May-20	16:00	16:12	0	0	0	0	0	10	All caribou were running to out of sight									
3-May-20	09:00	09:30	59	0	3	3	0	0			56	7	0	2	0	0		
7-Aug-20	09:20	09:50	27	0	0	2	0	0	2 back		25	0	0	0	0	0	6 out of view	
6-Aug-20	10:37	11:07	0	0	0	2	0	0			2	0	0	0	0	0		
6-Aug-20	10:40	11:10	250	2	20	120	4	4	Group splitting around lake		48	2	0	100	0	0	25 drinking, 200 went out of view	
12-May-20	16:50	17:20	13	0	0	15	0	0			10	0	0	22	0	0	Still moving south	
3-May-20	08:30	09:00	5	0	1	1	0	0			7	0	0	0	0	0		2321
4-May-20	16:10	16:40	0	12	4	0	0	0	the youngers that are standing		0	15	3	0	0	0	3 alert laying down	
30-Apr-20	14:20	14:50	85	0	0	21	2	2			94	2	0	11	3	0		2344-5
9-Aug-20	13:52	13:20	0	0	0	0	1	0	Laying and looking around, stood up at 9.5		0	0	1	0	0	0		
7-Aug-20	09:00	09:11	1	0	0	0	0	0	0		0	0	0	0	0	0	Walked out of view	
7-May-20	14:50	15:20	6	0	0	0	0	0	1 out of sight		5	0	1	1	0	0		
1-May-20	16:50	17:00																
3-May-20	07:40	08:10	0	0	0	11	0	0		2324	0	0	0	11	0	0		
29-Apr-20	13:45	14:00	0	0	0	0	0	0	Out of sight		0	0	0	0	0	0	Out of sight	
3-May-20	16:40	15:01	0	0	0	2	0	0			0	0	0	0	2	0	Changed from walking to standing	
30-Apr-20	11:30	12:00	19	0	0	0	1	0		2350	16	0	0	3	1	0		
29-Apr-20	16:15	16:33	0	0	18	5	0	0	Walked by another group of caribou		0	0	0	23	0	0		
30-Apr-20	12:20	12:50	0	2	0	0	0	0	Lays caribou are alert		0	2	0	0	0	0	Both at rest	
29-Apr-20	14:40	15:10	14	0	0	0	1	0			13	0	1	2	0	0	1 joined	
14-May-20	16:30	17:00	1	0	0	3	0	0		157	2	0	0	0	0	0	2 out of sight	158
6-May-20	07:20	07:50	0	2	0	0	0	0			0	2	0	0	0	0		
6-May-20	07:23	07:53	0	11	10	0	0	0			1	20	0	0	0	0		
6-May-20	17:10	17:40	28	0	2	2	0	0			28	0	0	2	0	0		
6-May-20	17:20	17:50	0	0	3	31	0	0			32	0	0	2	0	0		
2-May-20	07:00	07:30	22	0	0	27	3	0			17	0	4	16	1	0		
11-May-20	16:15	16:45	50%	0	0	50%	0	0			50%	0	0	50%	0	0		97/98/99
6-Aug-20	11:25	11:55	50	0	2	240	2	0			30	0	0	216	4	0	~50 out of view	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 9 min								Time Interval: 12 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
16-Aug-20	16:00	16:30	0	0	0	2	0	0	East toward road		2	0	0	0	0	0	Walk/graze south	
22-Aug-20	13:11	13:41	0	0	0	29	0	0			0	0	0	29	0	0		
8-Nov-20	12:10	12:40	306	0	31	8	5	0			312	0	17	5	16	0		
8-Nov-20	11:22	11:52	47	0	11	24	15	3			104	2	4	23	2	0	135 caribou now	
9-Nov-20	9:50	10:20	34	0	0	0	0	0			52	0	0	0	0	0	Recounted as more caribou came into view (visibility increased)	
18-Nov-20	10:22	10:39	3	0	2	22	0	0			0	0	0	24	0	3		
19-Nov-20	11:17	11:45	39	0	0	0	0	0			37	0	2	0	0	0		
12-Nov-20	11:00	11:12	34	7	2	1	1	0			0	0	0	0	0	52	Could not see a predator but the whole group was running full-out, ran out of view	
13-Nov-20	11:20	11:50	185	0	3	24	0	0	Lead group is walking		160	6	2	44	0	0		
14-Nov-20	9:30	10:00	23	2	0	2	0	0			22	2	0	3	0	0		
14-Nov-20	10:20	10:50	80	0	0	72	2	0			80	0	0	75	1	3		
14-Nov-20	11:20	11:50	27	0	0	1	0	0			15	0	1	2	0	0	10 walked out of view	
14-Nov-20	12:23	12:53	16	0	2	67	0	0	Plus 53		5	0	0	93	0	25	plus 38	
14-Nov-20	13:45	14:15	28	0	2	1	0	0			39	0	0	2	0	0		
15-Nov-20	15:03	15:33	21	0	0	10	0	0			27	0	0	3	1	0		
15-Nov-20	10:00	10:30	24	5	0	0	0	0			24	5	0	0	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min								Time Interval: 18 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
24-Apr-20	15:13	15:43	6	0	0	6	0	0			6	0	4	6	0	0		
25-Apr-20	14:25	14:55	16	0	0	40	4	2			27	0	7	40	3	1		
22-Aug-20	12:24	12:54	0	0	0	150	0	0			0	0	0	150	0	0		
17-Aug-20	10:06	10:36	0	2	0	0	0	0			0	2	0	0	0	0		
21-Aug-20	11:32	12:02	0	0	0	58	0	0			0	0	0	58	0	0		
22-Aug-20	11:34	12:04	0	0	0	45	0	0			0	0	0	0	0	0	out of view - behind a hill	
17-Aug-20	09:35	09:48																
21-Aug-20	14:37	15:07	112	0	0	0	0	0			112	0	0	0	0	0		
24-Apr-20	17:03	17:15																
12-Aug-20	14:33	14:39																
12-Aug-20	12:03	12:33	43	0	0	150	2	10			50	0	0	162	0	0	1 on rd	
17-Aug-20	07:55	08:25	1	0	0	0	0	0	Graze/walk south		1	0	0	0	0	0		
12-Aug-20	11:03	11:20	0	0	0	11	0	0	30 out of view		0	0	0	0	0	0	All out of view	
12-Aug-20	09:42	10:11	0	0	0	0	1	0			1	0	0	0	0	0		
12-Aug-20	10:13	10:43	0	0	0	12	0	0	1 baby feeding		0	6	2	3	1	0	6 babies feeding, walking NW 800 m, 1 km east	
15-Aug-20	14:45	15:15	1	0	0	1	0	0			0	0	0	2	0	0	Slow pace - more walking than eating	
17-May-20	10:00	10:30	0	2	0	0	0	0		7517	0	2	0	0	0	0		7518
12-Aug-20	16:33	16:53	0	0	0	1	0	0	Toward south		0	0	0	1	0	0	Out of view	
15-Aug-20	16:30	17:00	1	0	0	0	0	0			0	0	0	1	0	0	South - slow	
12-Aug-20	08:53	09:13	0	0	0	2	0	0			2	0	0	0	0	0	Alert, out of view	
15-Aug-20	13:50	14:20	0	0	1	0	0	0			1	0	0	0	0	0		
24-Apr-20	19:27	19:57	3	0	1	4	0	0			2	0	1	4	0	0		
17-May-20	08:50	09:20	32	32	1	2	0	0		7506	25	34	0	4	2	0	2 out of sight	7508
6-Aug-20	07:10	07:40	1	0	0	0	0	0	Graze/ walk few steps		1	0	0	0	0	0	Drinking/twitching	
17-Aug-20	07:24	07:38	0	0	0	0	0	0	Out of view									
18-May-20	09:15	09:45	15	13	0	2	0	0	5 out of sight	180/181	19	11	2	0	0	0		182/183
6-May-20	13:20	13:50	0	22	0	0	0	0			0	22	0	0	0	0		
16-Aug-20	14:43	15:13	0	0	0	2	0	0	Slow north		1	0	0	1	0	0		
3-May-20	11:45	12:15	8	2	0	0	0	0			7	2	1	0	0	0		
29-Apr-20	16:00	16:30	26	0	2	4	0	0			20	5	0	5	2	0		
6-May-20	13:59	14:19	0	0	0	2	0	0	10 out of view		0	0	0	0	0	0		
4-May-20	12:10	12:40	0	10	0	0	0	0	5 are alert laying down		0	9	1	0	0	0		
2-May-20	11:20	11:41	0	0	0	8	0	1	Crossed the lake		1	0	2	5	0	0		
6-May-20	14:35	15:05	7	0	0	0	0	0			5	0	0	0	0	0	2 out of sight	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min								Time Interval: 18 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
29-Apr-20	08:55	09:25	1	34	0	0	0	0			0	35	0	0	0	0		2369
10-May-20	12:50	13:20	0	7	0	0	0	0			0	7	0	0	0	0		57
8-May-20	10:30	11:00	1	0	0	0	0	0			1	0	0	0	0	0		26
29-Apr-20	15:00	15:30	18	5	0	4	1	0			13	10	0	3	2	0		
10-May-20	13:45	14:15	1	0	0	0	0	0	<50m of road		1	0	0	0	0	0		66/67
9-May-20	12:50	13:20	0	0	0	0	1	0		36/37	1	0	0	0	0	0		
12-May-20	11:50	12:20	10	0	0	0	0	0		118	10	0	0	0	0	0		122
1-May-20	11:40	12:10	17	0	3	6	0	0	Slow walk		17	0	0	18	0	0	9 caribou joined the group	
2-May-20	10:30	10:45	0	0	0	1	0	0									Walked out of sight	
12-May-20	14:50	15:20	5	0	0	0	0	0		141	5	0	0	0	0	0		
1-May-20	12:30	13:00	0	0	0	0	0	0	Out of view		0	0	2	0	0	0		
3-May-20	13:00	13:30	0	0	0	0	0	0	All out of view		0	0	0	0	0	0	All out of view	
1-May-20	09:50	10:14	0	0	0	26	0	0		2340	0	0	1	25	0	0	Lake crossing	
11-May-20	12:10	12:31	0	0	0	0	0	0	All out of sight									
2-May-20	13:00	13:30	9	0	1	1	0	0			8	0	0	3	0	0		
3-May-20	14:00	14:18	2	0	0	0	0	0			0	0	0	2	0	0	Walked out of view	
29-Apr-20	10:20	10:50	5	6	0	1	0	0			4	6	0	2	0	0		
9-May-20	13:50	14:20	15	0	0	0	0	0		43/44	15	0	0	0	0	0		
2-May-20	13:40	14:10	0	0	0	0	1	0	Ran over the hill; not sure what the disturbance was									
7-May-20	08:49	09:10	0	0	0	0	0	0	All out of sight		0	0	0	3	0	0	Rest out of sight	
3-May-20	14:30	15:00	18	0	0	5	0	5	Feeding are the east group, the rest are west start walking to the west		18	0	0	10	0	0	Feeding is east group	
7-May-20	12:25	12:52	25	0	0	6	0	0	Rest out of sight		8	0	0	17	0	0	Rest out of sight	
10-May-20	09:50	10:20	14	0	0	1	0	0	Others apprached from side		20	0	2	6	0	0	Others apprached from side	49
4-May-20	12:50	13:18	5	0	15	12	0	0	15 out of sight		8	0	0	23	0	1		2299
11-May-20	13:18	13:30																
2-May-20	14:25	14:55	3	0	1	0	0	0			0	0	0	0	0	0		
4-May-20	15:10	15:19	3	0	0	1	0	0			0	0	0	3	0	0		2294
29-Apr-20	12:20	12:50	9	0	0	3	0	0			7	0	0	4	0	0		
30-Apr-20	08:30	08:37																
30-Apr-20	09:00	09:30	0	0	1	20	3	0			0	0	0	26	4	0		
3-May-20	10:30	10:45																
30-Apr-20	16:30	17:00	43	5	0	3	1	0			35	14	0	2	1	0	58 caribou joined (only towed on original 52)	
29-Apr-20	11:20	11:50	15	0	10	50	20	0	30 walked behind a hill		10	0	0	70	10	5		
7-Aug-20	12:32	13:00	0	0	0	427	3	0			3	0	0	512	4	0		
6-Aug-20	15:50	16:20	248	38	0	12	2	0			200	0	7	22	1	0	25 walking over the hill	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min								Time Interval: 18 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
1-May-20	15:20	15:50	6	8	0	0	1	0			5	8	2	0	0	0		
6-May-20	09:25	09:55	0	15	0	0	0	0			0	15	0	0	0	0		
6-Aug-20	14:50	15:20	0	0	0	88	0	10	12 added		0	0	0	35	0	2	61 out of view	
2-May-20	16:00	16:12																
3-May-20	09:00	09:30	54	8	1	2	0	0			50	6	1	3	0	0	5 out of view	
7-Aug-20	09:20	09:50	25	3	0	2	0	0	1 out of view		21	4	2	0	0	0	4 out of view	
6-Aug-20	10:37	11:07	2	0	0	0	0	0			0	0	0	2	0	0	Walking toward the group	
6-Aug-20	10:40	11:10	150	8	12	30	0	0			83	4	1	7	0	0	105 walked out of view	
12-May-20	16:50	17:20	7	0	2	13	0	0		147/148	16	0	5	0	0	0	Small group stayed behind and feeding	149
3-May-20	08:30	09:00	6	0	0	1	0	0			5	0	0	2	0	0		3222
4-May-20	16:10	16:40	0	18	0	0	0	0			0	17	0	1	0	0		
30-Apr-20	14:20	14:50	103	0	0	6	1	0			90	0	0	18	2	0		
9-Aug-20	13:52	13:20	0	0	1	0	0	0	Chewing and shifting weight		0	0	1	0	0	0		
7-Aug-20	09:00	09:11																
7-May-20	14:50	15:20	3	0	0	2	0	0	2 out of sight		3	0	0	1	0	0	3 out of sight	
1-May-20	16:50	17:00																
3-May-20	07:40	08:10	0	0	0	11	0	0			0	0	0	11	0	0		
29-Apr-20	13:45	14:00	0	0	0	0	0	0	Observer drove slowly to find a group of 120 caribou walking south in a line									
3-May-20	16:40	15:01	0	0	0	2	0	0			0	0	0	2	0	0		2302
30-Apr-20	11:30	12:00	20	0	0	0	0	0			13	0	0	5	2	0		
29-Apr-20	16:15	16:33	15	0	2	6	0	0			6	0	1	16	0	0		
30-Apr-20	12:20	12:50	0	2	0	0	0	0			0	2	0	0	0	0		
29-Apr-20	14:40	15:10	16	0	0	0	0	0			16	0	0	0	0	0		
14-May-20	16:30	17:00	0	0	0	4	0	0	Heading west	159/160	4	0	0	0	0	0		161
6-May-20	07:20	07:50	0	2	0	0	0	0			0	2	0	0	0	0		
6-May-20	07:23	07:53	1	20	0	0	0	0		003/004	1	17	3	0	0	0		
6-May-20	17:10	17:40	32	0	0	0	0	0			27	0	2	3	0	0		
6-May-20	17:20	17:50	21	0	3	10	0	0		12	6	0	3	0	0	0	25 out of sight	
2-May-20	07:00	07:30	26	0	2	14	0	0			21	0	2	18	0	0		
11-May-20	16:15	16:45	75	4	0	0	0	0		100/101	100%	0	0	0	0	0		102/103
6-Aug-20	11:25	11:55	4	0	0	40	2	150	at 14 min, 1 crossed back west, 50 out of view		6	0	0	20	3	120	50 out of view	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min								Time Interval: 18 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
16-Aug-20	16:00	16:30	2	0	0	0	0	0			1	0	0	0	1	0		
22-Aug-20	13:11	13:41	0	0	0	29	0	0			0	0	0	29	0	0		
8-Nov-20	12:10	12:40	330	0	15	2	3	0			326	0	17	3	4	0		
8-Nov-20	11:22	11:52	100	1	5	26	3	0			89	0	4	34	2	0		
9-Nov-20	9:50	10:20	52	0	0	0	0	0			49	0	2	1	0	0		
18-Nov-20	10:22	10:39	0	0	2	23	0	2									Caribou out of view at 17 minutes. They travelled 400-700 m during the observation	
19-Nov-20	11:17	11:45	39	0	0	0	0	0			27	0	0	12	0	0		
12-Nov-20	11:00	11:12																
13-Nov-20	11:20	11:50	136	3	4	69	0	0	Group split almost - 70 out of sight		130	6	2	3	1	0		
14-Nov-20	9:30	10:00	25	1	0	1	0	0			25	0	0	2	0	0		
14-Nov-20	10:20	10:50	102	3	0	55	0	0			160	0	0	5	0	0	Groups joined and settled	
14-Nov-20	11:20	11:50	17	0	0	0	0	0	1 more walked out of view		18	0	0	0	0	0		
14-Nov-20	12:23	12:53	0	0	0	77	6	40			0	0	5	30	8	40	Plus 20, 60 out of view	
14-Nov-20	13:45	14:15	30	0	0	1	0	0			28	0	0	2	1	0		
15-Nov-20	15:03	15:33	31	0	0	0	0	0			29	0	1	1	0	0		
15-Nov-20	10:00	10:30	24	4	1	0	0	0			25	4	0	0	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 21 min						Time Interval: 24 min							
			Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
24-Apr-20	15:13	15:43	4	6	0	0			6	0	6	6	0	0		
25-Apr-20	14:25	14:55	6	40	0	0			32	0	2	40	40	0		
22-Aug-20	12:24	12:54	0	0	0	150			0	0	0	150	0	0		
17-Aug-20	10:06	10:36	0	0	0	0	Ate for 2 mins and then layed down		0	2	0	0	0	0		
21-Aug-20	11:32	12:02	0	58	0	0			0	0	0	28	0	30		
22-Aug-20	11:34	12:04														
17-Aug-20	09:35	09:48														
21-Aug-20	14:37	15:07	0	60	0	0			0	0	0	112	0	0		
24-Apr-20	17:03	17:15														
12-Aug-20	14:33	14:39														
12-Aug-20	12:03	12:33	0	100	2	5			191	0	0	20	1	0		
17-Aug-20	07:55	08:25	0	0	0	0	At 15 min, a baby spotted		2	0	0	0	0	0	Graze/walk	
12-Aug-20	11:03	11:20														
12-Aug-20	09:42	10:11	0	0	0	0	Found baby sleeping in tall grass		0	2	0	0	0	0		
12-Aug-20	10:13	10:43	0	6	0	15	1.5 KM east		0	0	0	2	0	0		
15-Aug-20	14:45	15:15	0	0	0	0			1	0	1	0	0	0		
17-May-20	10:00	10:30	0	0	0	0		7519	0	2	0	0	0	0		7520
12-Aug-20	16:33	16:53	0	2	0	0	Back in view with a baby		2	0	0	0	0	0		
15-Aug-20	16:30	17:00	0	0	0	0			1	0	0	0	0	0		
12-Aug-20	08:53	09:13	0	0	0	0	20 min out of view									
15-Aug-20	13:50	14:20	1	0	0	0			0	0	1	0	0	0	Might be chewing	
24-Apr-20	19:27	19:57	4	4	0	0			4	0	4	4	1	0		
17-May-20	08:50	09:20	0	4	0	0	2 out of sight	7509	31	35	0	1	0	0		7510
6-Aug-20	07:10	07:40	0	0	0	0			0	0	0	0	1	0		
17-Aug-20	07:24	07:38														
18-May-20	09:15	09:45	0	1	0	0			17	15	1	1	0	0		
6-May-20	13:20	13:50	1	0	0	0			0	22	0	0	0	0		
16-Aug-20	14:43	15:13	0	0	0	0			2	0	0	0	0	0		
3-May-20	11:45	12:15	0	0	0	0			6	2	2	0	0	0		
29-Apr-20	16:00	16:30	2	7	1	0			15	2	3	7	2	3		
6-May-20	13:59	14:19														
4-May-20	12:10	12:40	0	0	0	0	1 alert laying down		0	10	0	0	0	0		
2-May-20	11:20	11:41	2	5	0	0			0	0	1	7	0	0	Walked out of view	
6-May-20	14:35	15:05	1	0	0	0			4	0	0	3	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 21 min						Time Interval: 24 min							
			Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
29-Apr-20	08:55	09:25	0	0	0	0	Alert laying down		0	35	0	0	0	0		
10-May-20	12:50	13:20	0	0	0	0		58	0	7	0	0	0	0		
8-May-20	10:30	11:00	0	0	0	0			0	0	1	0	0	0		
29-Apr-20	15:00	15:30	1	2	2	0	Most laying down		14	10	0	3	1	0		
10-May-20	13:45	14:15	0	0	0	0		71	1	0	0	0	0	0		72
9-May-20	12:50	13:20	0	0	0	0			1	0	0	0	0	0		40
12-May-20	11:50	12:20	0	0	0	0		123/124	9	0	0	1	0	0		125/126
1-May-20	11:40	12:10	2	11	1	0			13	0	1	12	0	0	9 walked over the hill	
2-May-20	10:30	10:45														
12-May-20	14:50	15:20	0	0	0	0		142	5	0	0	0	0	0		143
1-May-20	12:30	13:00	0	0	0	2		2337	2	0	0	0	0	0		
3-May-20	13:00	13:30	0	14	0	0	18 out of view	2314	0	0	0	24	0	0	8 out of view	2313
1-May-20	09:50	10:14	2	24	0	0			0	0	0	12	0	0	14 over the hill	
11-May-20	12:10	12:31														
2-May-20	13:00	13:30	0	1	0	0	3 joined	2329	14	0	1	2	1	0	4 joined	
3-May-20	14:00	14:18	0	0	0	0		3910								
29-Apr-20	10:20	10:50	0	0	2	0			3	7	0	0	2	0		
9-May-20	13:50	14:20	0	0	0	0		45	16	2	0	0	0	0		
2-May-20	13:40	14:10							0	0	0	0	0	1	Found the caribou around the next corner	
7-May-20	08:49	09:10	0	0	0	0	All out of sight									
3-May-20	14:30	15:00	0	10	0	0	Feeding is east group	(west), 2305	16	0	2	10	0	0	Feeding and standing are east group	
7-May-20	12:25	12:52	0	2	0	0	Rest out of sight		0	0	0	0	0	0	All out of sight	
10-May-20	09:50	10:20	0	0	0	0	Others approached from side	50	~31	0	1	0	0	0		51
4-May-20	12:50	13:18	0	5	0	0	20 out of sight		5	0	0	4	0	0	3 out of sight	
11-May-20	13:18	13:30														
2-May-20	14:25	14:55	0	0	0	0			3	0	0	1	0	0	2 looked at grader for few seconds	
4-May-20	15:10	15:19	0	0	0	0	All 3 walked out of sight									
29-Apr-20	12:20	12:50	0	3	2	0		2355	12	0	0	5	0	0		
30-Apr-20	08:30	08:37														
30-Apr-20	09:00	09:30	6	10	3	0	Others can't see - blowing snow		2	0	4	8	2	0	Others can't see - blowing snow	
3-May-20	10:30	10:45														
30-Apr-20	16:30	17:00	0	5	2	0			16	34	2	0	0	0		
29-Apr-20	11:20	11:50	0	66	6	5			13	0	0	16	4	0	60 walked behind a hill	
7-Aug-20	12:32	13:00	0	533	3	0			25	0	75	430	2	0	75 standing: looking at the road	
6-Aug-20	15:50	16:20	0	8	2	0	75 walking over the hill		140	52	3	3	2	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 21 min						Time Interval: 24 min							
			Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
1-May-20	15:20	15:50	0	1	0	0			3	10	2	0	0	0		2335
6-May-20	09:25	09:55	0	0	0	0			0	15	0	0	0	0		
6-Aug-20	14:50	15:20	0	48	0	0	31 added, 20 out of view		0	0	0	25	0	1	22 out of view	
2-May-20	16:00	16:12														
3-May-20	09:00	09:30	2	2	1	0	20 out of view		24	2	0	0	0	0	14 out of view	
7-Aug-20	09:20	09:50	0	7	1	0	3 added		19	0	0	14	1	0		
6-Aug-20	10:37	11:07	0	2	0	0			0	0	0	1	1	0		
6-Aug-20	10:40	11:10	1	2	0	0	21 walked out of view		61	5	2	4	0	0	2 walked out of view	
12-May-20	16:50	17:20	3	1	0	0	Small group stayed behind and feeding	150	19	0	1	1	0	0	Small group stayed behind and feeding	151
3-May-20	08:30	09:00	0	0	0	0			7	0	1	0	0	0		
4-May-20	16:10	16:40	0	0	0	0			0	18	0	0	0	0		
30-Apr-20	14:20	14:50	0	34	3	0			16	0	0	86	8	0		
9-Aug-20	13:52	13:20	0	1	0	0	Walked east		1	0	0	0	0	0	Eating 100 m from the raod	
7-Aug-20	09:00	09:11														
7-May-20	14:50	15:20	0	1	0	0	Walking toward road (north bound)		0	0	3	1	0	0		
1-May-20	16:50	17:00														
3-May-20	07:40	08:10	0	2	0	0	3 out of view		10	0	0	1	0	0		2323
29-Apr-20	13:45	14:00														
3-May-20	16:40	15:01	0	2	0	0	Walked out of sight									
30-Apr-20	11:30	12:00	0	15	2	0		2349	0	0	0	19	0	1	Can't see behind hill	2348-3
29-Apr-20	16:15	16:33					Walked behind a hill out of sight									
30-Apr-20	12:20	12:50	0	0	0	0			0	2	0	0	0	0		
29-Apr-20	14:40	15:10	0	2	0	0			18	0	0	3	0	0	5 joined	
14-May-20	16:30	17:00	0	1	0	0		162	2	0	0	2	0	0		163
6-May-20	07:20	07:50	0	0	0	0			0	2	0	0	0	0		
6-May-20	07:23	07:53	0	0	0	0			0	21	0	0	0	0		
6-May-20	17:10	17:40	3	5	0	0			25	0	2	0	0	5		
6-May-20	17:20	17:50	0	11	0	0	6 walking towards road		6	0	0	0	0	0		0012/ 0013/ 0014
2-May-20	07:00	07:30	4	26	0	2			17	0	1	18	4	0		
11-May-20	16:15	16:45	0	1	0	0		104/105	100%	0	0	0	0	0		106/107
6-Aug-20	11:25	11:55	0	0	0	0	All out of view									

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 21 min						Time Interval: 24 min							
			Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
16-Aug-20	16:00	16:30	0	0	0	0	1 left view		0	0	0	1	0	0	Fast walk south/west then SE	
22-Aug-20	13:11	13:41	0	0	0	0	Out of view - behind a hill									
8-Nov-20	12:10	12:40	20	0	1	0			331	2	12	3	2	0		
8-Nov-20	11:22	11:52	3	32	2	0			103	0	5	27	0	0		
9-Nov-20	9:50	10:20	0	49	0	0	Walking west		11	0	0	34	4	3		
18-Nov-20	10:22	10:39														
19-Nov-20	11:17	11:45	5	16	0	0			15	0	2	22	0	0		
12-Nov-20	11:00	11:12														
13-Nov-20	11:20	11:50	3	57	1	0			62	8	2	65	0	3		
14-Nov-20	9:30	10:00	0	3	0	0			23	1	1	2	0	0		
14-Nov-20	10:20	10:50	2	6	0	0			160	1	1	8	0	0		
14-Nov-20	11:20	11:50	1	0	0	0	3 more out of sight		15	0	0	0	0	0		
14-Nov-20	12:23	12:53	0	20	1	0	Minus 62 out of view		0	0	0	10	1	0	Minus 10 out of view	
14-Nov-20	13:45	14:15	0	5	0	0	5 started walking west 200 m from road		20	0	2	9	0	0	100 m from road	
15-Nov-20	15:03	15:33	1	0	0	0			29	0	0	2	0	0		
15-Nov-20	10:00	10:30	0	0	0	0			25	3	0	1	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min								Time Interval: 30 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
24-Apr-20	15:13	15:43	6	0	2	4	2	0			5	0	3	5	0	0	Lost sight of all of them	
25-Apr-20	14:25	14:55	0	0	0	7	40	40	1 fell by hunter		39	0	0	39	39	39		
22-Aug-20	12:24	12:54	0	0	0	0	0	0	Out of view - behind a hill									
17-Aug-20	10:06	10:36	2	0	0	0	0	0			1	0	0	1	0	0		
21-Aug-20	11:32	12:02	0	0	0	57	0	0			0	0	0	57	0	0		
22-Aug-20	11:34	12:04																
17-Aug-20	09:35	09:48																
21-Aug-20	14:37	15:07	0	0	0	112	0	0			30	0	0	92	0	0		
24-Apr-20	17:03	17:15																
12-Aug-20	14:33	14:39																
12-Aug-20	12:03	12:33	50	15	0	144	0	3			44	4	0	160	3	1	Alert on road	
17-Aug-20	07:55	08:25	1	0	1	0	0	0			0	0	0	2	0	0	Slow south	
12-Aug-20	11:03	11:20																
12-Aug-20	09:42	10:11	0	2	0	0	0	0			0	2	0	0	0	0		
12-Aug-20	10:13	10:43	0	3	2	0	0	0			0	3	0	3	0	0		
15-Aug-20	14:45	15:15	2	0	0	0	0	0			1	0	0	1	0	0		
17-May-20	10:00	10:30	0	2	0	0	0	0		7521	0	2	0	0	0	0		7522
12-Aug-20	16:33	16:53	2	0	0	0	0	0			1	0	0	1	0	0		
15-Aug-20	16:30	17:00	0	0	0	1	0	0	South, few steps		1	0	0	0	0	0		
12-Aug-20	08:53	09:13																
15-Aug-20	13:50	14:20	1	0	0	0	0	0			0	0	1	0	0	0		
24-Apr-20	19:27	19:57	3	0	4	4	2	0			1	0	4	4	0	0	Lost sight of all of them	
17-May-20	08:50	09:20	30	32	0	4	1	0		7511	30	31	0	4	1	0	1 out of sight	7512
6-Aug-20	07:10	07:40	1	0	0	0	0	0			1	0	0	0	0	0		
17-Aug-20	07:24	07:38																
18-May-20	09:15	09:45	15	11	3	2	0	0		184/185	14	14	2	2	0	0		
6-May-20	13:20	13:50	0	21	1	0	0	0			0	22	0	0	0	0		
16-Aug-20	14:43	15:13	1	0	1	0	0	0			2	0	0	0	0	0		
3-May-20	11:45	12:15	8	2	0	0	0	0			8	2	0	0	0	0		
29-Apr-20	16:00	16:30	10	0	3	14	0	5	Strong wind/white out		6	0	2	0	1	0	Hard to see; 23 caribou walked behind hill	
6-May-20	13:59	14:19																
4-May-20	12:10	12:40	0	10	0	0	0	0			0	10	0	0	0	0		2302
2-May-20	11:20	11:41																
6-May-20	14:35	15:05	0	0	0	7	0	0			0	0	1	0	0	0	6 out of sight	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min								Time Interval: 30 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
29-Apr-20	08:55	09:25	0	35	0	0	0	0		2368	0	35	0	0	0	0		2368
10-May-20	12:50	13:20	0	7	0	0	0	0		59	0	7	0	0	0	0		
8-May-20	10:30	11:00	0	0	0	0	1	0			0	0	0	1	0	0		29
29-Apr-20	15:00	15:30	16	6	0	4	2	0			13	12	0	2	1	0		
10-May-20	13:45	14:15	0	0	0	1	0	0		73	1	0	0	0	0	0		78/79
9-May-20	12:50	13:20	1	0	0	0	0	0			1	0	0	0	0	0		
12-May-20	11:50	12:20	9	0	0	1	0	0			9	0	0	0	1	0		131/132
1-May-20	11:40	12:10	6	0	0	1	0	0	19 walked away		5	0	0	1	0	0	1 walked away	
2-May-20	10:30	10:45																
12-May-20	14:50	15:20	5	0	0	0	0	0			5	0	0	0	0	0		144
1-May-20	12:30	13:00	0	0	0	2	0	0	Crossing road east to west		2	0	0	0	0	0	Joined the bigger group	
3-May-20	13:00	13:30	0	0	1	35	0	0	add 4 more	2312	0	0	0	36	0	0		
1-May-20	09:50	10:14							All 26 out of view									
11-May-20	12:10	12:31																
2-May-20	13:00	13:30	15	0	1	4	0	0			16	0	0	2	0	0		
3-May-20	14:00	14:18																
29-Apr-20	10:20	10:50	5	7	0	0	0	0			4	7	0	1	0	0		2366
9-May-20	13:50	14:20	18	2	0	0	0	0		46	18	2	0	0	0	0		
2-May-20	13:40	14:10	0	0	0	1	0	0	Walked across the road at 133.5		1	0	0	0	0	0	Was relayed/eating	
7-May-20	08:49	09:10																
3-May-20	14:30	15:00	13	0	3	12	0	0	Feeding is east group, rest are distributed between east and west		18	0	0	10	0	0	Feeding is east group	
7-May-20	12:25	12:52	0	0	0	0	0	0										
10-May-20	09:50	10:20	32	0	0	0	0	0		52	32	0	0	0	0	0		53
4-May-20	12:50	13:18	0	0	0	0	0	6	All went out of sight									
11-May-20	13:18	13:30																
2-May-20	14:25	14:55	4	0	0	0	0	0			3	0	1	0	0	0		
4-May-20	15:10	15:19																
29-Apr-20	12:20	12:50	10	0	5	0	1	0		2354	9	0	0	4	1	0		2353
30-Apr-20	08:30	08:37																
30-Apr-20	09:00	09:30	6	0	8	12	2	0	Others can't see - blowing snow		12	2	4	6	4	0	Others can't see - blowing snow	
3-May-20	10:30	10:45																
30-Apr-20	16:30	17:00	12	36	0	4	2	0			14	36	0	2	0	0		
29-Apr-20	11:20	11:50	4	0	0	62	7	3		2360; 2361	12	0	0	80	5	4	Could see the ones behind hill	2359
7-Aug-20	12:32	13:00	50	0	100	377	6	0	100 standing looking at road		4	0	4	528	1	0	4 standing on the road	
6-Aug-20	15:50	16:20	125	32	0	41	2	0			166	20	8	6	4	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min								Time Interval: 30 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
1-May-20	15:20	15:50	4	10	1	0	0	0			3	10	2	0	0	0		
6-May-20	09:25	09:55	0	15	0	0	0	0			0	15	0	0	0	0		
6-Aug-20	14:50	15:20	0	0	0	10	0	0	16 out of view		0	0	0	2	0	0	8 out of view	
2-May-20	16:00	16:12																
3-May-20	09:00	09:30	21	2	2	1	2	0			22	2	1	1	0	0		
7-Aug-20	09:20	09:50	14	0	0	28	0	0	8 added		8	0	2	35	0	0	3 added, single. To the east	
6-Aug-20	10:37	11:07	2	0	0	0	0	0			0	0	0	2	0	0	Joined a group at 28 min	
6-Aug-20	10:40	11:10	40	6	1	11	0	0	14 walked out of view		15	8	1	0	2	0	32 walked out of view	
12-May-20	16:50	17:20	5	0	14	2	0	0			12	0	1	9	0	0		
3-May-20	08:30	09:00	5	0	0	2	0	0			7	0	0	0	0	0		
4-May-20	16:10	16:40	0	18	0	0	0	0	2 alert laying down		0	18	0	0	0	0		
30-Apr-20	14:20	14:50							Walked out of view								Walked out of view	
9-Aug-20	13:52	13:20	1	0	0	0	0	0			0	0	0	0	0	0	Out of view	
7-Aug-20	09:00	09:11																
7-May-20	14:50	15:20	0	0	0	4	0	0		0016/0017	0	0	0	3	0	0		0018/0019
1-May-20	16:50	17:00																
3-May-20	07:40	08:10	11	0	0	0	0	0			8	0	0	3	0	0		
29-Apr-20	13:45	14:00																
3-May-20	16:40	15:01																
30-Apr-20	11:30	12:00	0	0	1	17	2	0			0	0	10	9	1	0		
29-Apr-20	16:15	16:33																
30-Apr-20	12:20	12:50	0	2	0	0	0	0			0	2	0	0	0	0		
29-Apr-20	14:40	15:10	15	0	0	2	4	0			19	0	0	0	2	0		2352
14-May-20	16:30	17:00	3	0	1	0	0	0		164	0	0	0	2	0	0	2 out of sight	
6-May-20	07:20	07:50	0	2	0	0	0	0			0	2	0	0	0	0		
6-May-20	07:23	07:53	0	21	0	0	0	0			0	21	0	0	0	0		
6-May-20	17:10	17:40	0	0	0	32	0	0	Good pace		0	0	0	8	0	0	24 out of sight	
6-May-20	17:20	17:50	0	0	0	34	0	0			0	0	0	34	0	0		
2-May-20	07:00	07:30	9	7	2	9	0	1			10	6	1	25	1	0		
11-May-20	16:15	16:45	100%	0	0	0	0	0		108/109	100%	0	0	0	0	0		
6-Aug-20	11:25	11:55																

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min								Time Interval: 30 min							
			Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number	Feeding	Lying Down	Standing	Walking	Alert	Trotting/ Running	Comments	Photo Number
16-Aug-20	16:00	16:30	0	0	0	0	1	0			0	0	0	1	0	0	Smelling	
22-Aug-20	13:11	13:41																
8-Nov-20	12:10	12:40	332	0	16	1	1	0			328	14	8	0	0	0		
8-Nov-20	11:22	11:52	86	0	6	42	1	0			89	0	5	39	2	0		
9-Nov-20	9:50	10:20	35	0	5	8	2	0	2 fighting		45	0	3	2	0	0		
18-Nov-20	10:22	10:39																
19-Nov-20	11:17	11:45	0	0	0	29	0	0									Out of view at 28 minutes	
12-Nov-20	11:00	11:12																
13-Nov-20	11:20	11:50	43	6	0	24	2	0	65 walked out of view		42	8	1	19	0	0	5 out of view	
14-Nov-20	9:30	10:00	21	2	1	2	1	0			22	2	2	1	0	0		
14-Nov-20	10:20	10:50	165	1	0	4	0	0			157	1	0	12	0	0		
14-Nov-20	11:20	11:50	14	0	0	0	0	0	1 more out of view		12	2	0	0	0	0		
14-Nov-20	12:23	12:53							All out of view									
14-Nov-20	13:45	14:15	14	0	0	17	0	0			14	0	1	14	2	0	Group is 50 m from road	
15-Nov-20	15:03	15:33	30	0	0	1	0	0			29	0	1	1	0	0		
15-Nov-20	10:00	10:30	24	3	0	2	0	0			25	3	0	0	0	0		

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 0 min		Time Interval: 3 min		Time Interval: 6 min		Time Interval: 9 min		Time Interval: 12 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
24-Apr-20	15:13	15:43									Haul truck	
25-Apr-20	14:25	14:55							Haul truck			
22-Aug-20	12:24	12:54										
17-Aug-20	10:06	10:36										
21-Aug-20	11:32	12:02			Haul truck						Haul truck	
22-Aug-20	11:34	12:04										
17-Aug-20	09:35	09:48										
21-Aug-20	14:37	15:07									Haul truck	
24-Apr-20	17:03	17:15										
12-Aug-20	14:33	14:39										
12-Aug-20	12:03	12:33										
17-Aug-20	07:55	08:25										
12-Aug-20	11:03	11:20										
12-Aug-20	09:42	10:11							Grader			
12-Aug-20	10:13	10:43			Grader						Road maintenance vehicle	
15-Aug-20	14:45	15:15					Tractor trailer				Tractor trailer	
17-May-20	10:00	10:30										
12-Aug-20	16:33	16:53							Sand truck			
15-Aug-20	16:30	17:00										
12-Aug-20	08:53	09:13										
15-Aug-20	13:50	14:20							Fuel tank			
24-Apr-20	19:27	19:57										
17-May-20	08:50	09:20										
6-Aug-20	07:10	07:40			Haul truck	Big haul truck	Convoy	3 light trucks and big haul truck	Convoy	2 light trucks and 1 haul truck	Light truck	x4
17-Aug-20	07:24	07:38										
18-May-20	09:15	09:45										
6-May-20	13:20	13:50	Haul truck				Haul truck					
16-Aug-20	14:43	15:13							Tractor trailer		Light truck	
3-May-20	11:45	12:15										
29-Apr-20	16:00	16:30										
6-May-20	13:59	14:19										
4-May-20	12:10	12:40										
2-May-20	11:20	11:41										
6-May-20	14:35	15:05										

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 0 min		Time Interval: 3 min		Time Interval: 6 min		Time Interval: 9 min		Time Interval: 12 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
29-Apr-20	08:55	09:25										
10-May-20	12:50	13:20							Haul truck			
8-May-20	10:30	11:00										
29-Apr-20	15:00	15:30										
10-May-20	13:45	14:15					Haul truck					
9-May-20	12:50	13:20										
12-May-20	11:50	12:20	Haul truck									
1-May-20	11:40	12:10										
2-May-20	10:30	10:45										
12-May-20	14:50	15:20	Haul truck									
1-May-20	12:30	13:00										
3-May-20	13:00	13:30										
1-May-20	09:50	10:14										
11-May-20	12:10	12:31	Haul truck									
2-May-20	13:00	13:30										
3-May-20	14:00	14:18										
29-Apr-20	10:20	10:50										
9-May-20	13:50	14:20										
2-May-20	13:40	14:10										
7-May-20	08:49	09:10									Light truck	
3-May-20	14:30	15:00										
7-May-20	12:25	12:52	Haul truck	two haul trucks								
10-May-20	09:50	10:20							Light truck			
4-May-20	12:50	13:18										
11-May-20	13:18	13:30			Road maintenance vehicle							
2-May-20	14:25	14:55										
4-May-20	15:10	15:19										
29-Apr-20	12:20	12:50										
30-Apr-20	08:30	08:37	Light truck				Light truck					
30-Apr-20	09:00	09:30			Haul truck							
3-May-20	10:30	10:45										
30-Apr-20	16:30	17:00			Light truck							
29-Apr-20	11:20	11:50					Light truck					
7-Aug-20	12:32	13:00										
6-Aug-20	15:50	16:20										

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 0 min		Time Interval: 3 min		Time Interval: 6 min		Time Interval: 9 min		Time Interval: 12 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
1-May-20	15:20	15:50										
6-May-20	09:25	09:55										
6-Aug-20	14:50	15:20			Helicopter							
2-May-20	16:00	16:12							Convoy	3 light trucks and 2 haul trucks		
3-May-20	09:00	09:30										
7-Aug-20	09:20	09:50										
6-Aug-20	10:37	11:07										
6-Aug-20	10:40	11:10										
12-May-20	16:50	17:20										
3-May-20	08:30	09:00										
4-May-20	16:10	16:40										
30-Apr-20	14:20	14:50							Bus	2 buses	Bus	
9-Aug-20	13:52	13:20										
7-Aug-20	09:00	09:11										
7-May-20	14:50	15:20					Haul truck	two haul trucks				
1-May-20	16:50	17:00			Light truck		Light truck					
3-May-20	07:40	08:10										
29-Apr-20	13:45	14:00			Light truck							
3-May-20	16:40	15:01										
30-Apr-20	11:30	12:00										
29-Apr-20	16:15	16:33			Light truck							
30-Apr-20	12:20	12:50										
29-Apr-20	14:40	15:10										
14-May-20	16:30	17:00	Haul truck						Haul truck			
6-May-20	07:20	07:50										
6-May-20	07:23	07:53										
6-May-20	17:10	17:40										
6-May-20	17:20	17:50										
2-May-20	07:00	07:30										
11-May-20	16:15	16:45			Haul truck		Haul truck					
6-Aug-20	11:25	11:55										

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 0 min		Time Interval: 3 min		Time Interval: 6 min		Time Interval: 9 min		Time Interval: 12 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
16-Aug-20	16:00	16:30									Light truck	
22-Aug-20	13:11	13:41	Haul truck									
8-Nov-20	12:10	12:40									Fuel truck	x2
8-Nov-20	11:22	11:52							Fuel truck			
9-Nov-20	9:50	10:20										
18-Nov-20	10:22	10:39										
19-Nov-20	11:17	11:45										
12-Nov-20	11:00	11:12									Predator	Maybe
13-Nov-20	11:20	11:50										
14-Nov-20	9:30	10:00			Light truck							
14-Nov-20	10:20	10:50										
14-Nov-20	11:20	11:50										
14-Nov-20	12:23	12:53					Fuel truck					
14-Nov-20	13:45	14:15										
15-Nov-20	15:03	15:33										
15-Nov-20	10:00	10:30										

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min		Time Interval: 18 min		Time Interval: 21 min		Time Interval: 24 min		Time Interval: 27 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
24-Apr-20	15:13	15:43										
25-Apr-20	14:25	14:55							Hunter		Hunter	
22-Aug-20	12:24	12:54					ATV					
17-Aug-20	10:06	10:36					Tractor trailer					
21-Aug-20	11:32	12:02	Light truck						Hunter			
22-Aug-20	11:34	12:04										
17-Aug-20	09:35	09:48										
21-Aug-20	14:37	15:07			Haul truck							
24-Apr-20	17:03	17:15										
12-Aug-20	14:33	14:39										
12-Aug-20	12:03	12:33										
17-Aug-20	07:55	08:25										
12-Aug-20	11:03	11:20										
12-Aug-20	09:42	10:11										
12-Aug-20	10:13	10:43										
15-Aug-20	14:45	15:15			Fuel tanker							
17-May-20	10:00	10:30										
12-Aug-20	16:33	16:53										
15-Aug-20	16:30	17:00	Tractor trailer						Light truck			
12-Aug-20	08:53	09:13										
15-Aug-20	13:50	14:20										
24-Apr-20	19:27	19:57										
17-May-20	08:50	09:20										
6-Aug-20	07:10	07:40										
17-Aug-20	07:24	07:38										
18-May-20	09:15	09:45										
6-May-20	13:20	13:50	Haul truck									
16-Aug-20	14:43	15:13	Tractor trailer				Tractor trailer	"long haul"			Light truck	
3-May-20	11:45	12:15										
29-Apr-20	16:00	16:30			Light truck				Light truck			
6-May-20	13:59	14:19										
4-May-20	12:10	12:40	Road maintenance vehicle		Light truck				Light truck			
2-May-20	11:20	11:41										
6-May-20	14:35	15:05	Haul truck								Light truck	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min		Time Interval: 18 min		Time Interval: 21 min		Time Interval: 24 min		Time Interval: 27 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
29-Apr-20	08:55	09:25										
10-May-20	12:50	13:20					Haul truck					
8-May-20	10:30	11:00										
29-Apr-20	15:00	15:30										
10-May-20	13:45	14:15					Haul truck				Fuel truck	
9-May-20	12:50	13:20	Convoy	Light truck and fuel truck			Haul truck		Haul truck			
12-May-20	11:50	12:20	Haul truck		Haul truck							
1-May-20	11:40	12:10										
2-May-20	10:30	10:45										
12-May-20	14:50	15:20			Haul truck							
1-May-20	12:30	13:00										
3-May-20	13:00	13:30										
1-May-20	09:50	10:14										
11-May-20	12:10	12:31	Haul truck									
2-May-20	13:00	13:30										
3-May-20	14:00	14:18										
29-Apr-20	10:20	10:50										
9-May-20	13:50	14:20	Haul truck				Haul truck		Haul truck			
2-May-20	13:40	14:10										
7-May-20	08:49	09:10	Light truck		Haul truck	x2						
3-May-20	14:30	15:00										
7-May-20	12:25	12:52	Haul truck						Haul truck			
10-May-20	09:50	10:20									Haul truck	x2
4-May-20	12:50	13:18									Light truck	
11-May-20	13:18	13:30										
2-May-20	14:25	14:55									Grader	
4-May-20	15:10	15:19										
29-Apr-20	12:20	12:50										
30-Apr-20	08:30	08:37										
30-Apr-20	09:00	09:30	Light truck		Light truck							
3-May-20	10:30	10:45										
30-Apr-20	16:30	17:00				Other caribou joined						
29-Apr-20	11:20	11:50										
7-Aug-20	12:32	13:00	Light truck				Light truck					
6-Aug-20	15:50	16:20									Light truck	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min		Time Interval: 18 min		Time Interval: 21 min		Time Interval: 24 min		Time Interval: 27 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
1-May-20	15:20	15:50										
6-May-20	09:25	09:55	Light truck									
6-Aug-20	14:50	15:20										
2-May-20	16:00	16:12										
3-May-20	09:00	09:30										
7-Aug-20	09:20	09:50									Helicopter	
6-Aug-20	10:37	11:07										
6-Aug-20	10:40	11:10										
12-May-20	16:50	17:20										
3-May-20	08:30	09:00										
4-May-20	16:10	16:40									Light truck	
30-Apr-20	14:20	14:50			Light truck	x2	Haul truck					
9-Aug-20	13:52	13:20					Fuel truck	"Tanker"				
7-Aug-20	09:00	09:11										
7-May-20	14:50	15:20							Haul truck			
1-May-20	16:50	17:00										
3-May-20	07:40	08:10										
29-Apr-20	13:45	14:00										
3-May-20	16:40	15:01			Grader							
30-Apr-20	11:30	12:00									Light truck	
29-Apr-20	16:15	16:33										
30-Apr-20	12:20	12:50										
29-Apr-20	14:40	15:10									Light truck	
14-May-20	16:30	17:00										
6-May-20	07:20	07:50			Light truck							
6-May-20	07:23	07:53			Light truck							
6-May-20	17:10	17:40									Light truck	
6-May-20	17:20	17:50			Light truck							
2-May-20	07:00	07:30										
11-May-20	16:15	16:45									Light truck	
6-Aug-20	11:25	11:55										

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 15 min		Time Interval: 18 min		Time Interval: 21 min		Time Interval: 24 min		Time Interval: 27 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments	Disturbance	Disturbance Comments
16-Aug-20	16:00	16:30	Light truck				Tractor trailer					
22-Aug-20	13:11	13:41										
8-Nov-20	12:10	12:40										
8-Nov-20	11:22	11:52										
9-Nov-20	9:50	10:20										
18-Nov-20	10:22	10:39										
19-Nov-20	11:17	11:45										
12-Nov-20	11:00	11:12										
13-Nov-20	11:20	11:50					Tractor trailer					
14-Nov-20	9:30	10:00	Fuel truck		Fuel truck							
14-Nov-20	10:20	10:50					ATV	Went on the tundra towards the caribou				
14-Nov-20	11:20	11:50										
14-Nov-20	12:23	12:53	ATV	Following caribou, hunting								
14-Nov-20	13:45	14:15										
15-Nov-20	15:03	15:33										
15-Nov-20	10:00	10:30										

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min		Time Interval: 1 min		Time Interval: 2 min		Time Interval: 3 min		Time Interval: 4 min		Time Interval: 5 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time
24-Apr-20	15:13	15:43			Haul truck	11								
25-Apr-20	14:25	14:55			Haul truck	9	hunter	22	1 fell by hunter	27				
22-Aug-20	12:24	12:54			ATV	21								
17-Aug-20	10:06	10:36			Tractor	20								
21-Aug-20	11:32	12:02			Haul truck	3	Haul truck	12	Light truck	15	Hunter	24		
22-Aug-20	11:34	12:04												
17-Aug-20	09:35	09:48												
21-Aug-20	14:37	15:07			Haul truck	12	Haul truck	18						
24-Apr-20	17:03	17:15												
12-Aug-20	14:33	14:39												
12-Aug-20	12:03	12:33												
17-Aug-20	07:55	08:25												
12-Aug-20	11:03	11:20												
12-Aug-20	09:42	10:11			Grader	7								
12-Aug-20	10:13	10:43			Road maintenance vehicle	10	Grader	3						
15-Aug-20	14:45	15:15			Tractor trailer	5	tractor trailer	10	Fule tanker	16	grader			
17-May-20	10:00	10:30												
12-Aug-20	16:33	16:53			Sand truck	8								
15-Aug-20	16:30	17:00			Tractor trailer	13	Light truck	23						
12-Aug-20	08:53	09:13												
15-Aug-20	13:50	14:20			Fule tanker	8								
24-Apr-20	19:27	19:57												
17-May-20	08:50	09:20												
6-Aug-20	07:10	07:40			Big Haul truck	2	3 Light truck	5	Big Haul truck	6	2 light trucks and 1 haul truck	7	4 light trucks	10
17-Aug-20	07:24	07:38												
18-May-20	09:15	09:45												
6-May-20	13:20	13:50			Haul truck	1	Haul truck	4	Haul truck	15				
16-Aug-20	14:43	15:13			long haul	8	Light truck	12	Long haul	14	Long haul	19	Light truck	25
3-May-20	11:45	12:15												
29-Apr-20	16:00	16:30			Light truck	17	Light truck	22						
6-May-20	13:59	14:19												
4-May-20	12:10	12:40			Road maintenance vehicle	13	Light truck	16	Light truck	24				
2-May-20	11:20	11:41												
6-May-20	14:35	15:05			Haul truck	15	Light truck	27						

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min		Time Interval: 1 min		Time Interval: 2 min		Time Interval: 3 min		Time Interval: 4 min		Time Interval: 5 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time
29-Apr-20	08:55	09:25												
10-May-20	12:50	13:20			Haul truck	7	Haul truck	19						
8-May-20	10:30	11:00	Haul truck		Haul truck	1	Haul truck	1	Haul truck	28				
29-Apr-20	15:00	15:30			No disturbance									
10-May-20	13:45	14:15	Haul truck		Haul truck	4	Haul truck	19	Fuel truck	26	Haul truck	28		
9-May-20	12:50	13:20			Light truck	14	Fuel truck	15	Haul truck	20	Haul truck	24		
12-May-20	11:50	12:20	Haul truck	x2	Haul truck	0	Haul truck	13	Haul truck	16	Two Haul truck	28		
1-May-20	11:40	12:10												
2-May-20	10:30	10:45												
12-May-20	14:50	15:20			Haul truck	1	Haul truck	17						
1-May-20	12:30	13:00												
3-May-20	13:00	13:30												
1-May-20	09:50	10:14												
11-May-20	12:10	12:31			Haul truck	1	Haul truck	15						
2-May-20	13:00	13:30												
3-May-20	14:00	14:18												
29-Apr-20	10:20	10:50												
9-May-20	13:50	14:20	Haul truck		Haul truck	15	Haul truck	20	Haul truck	22	Haul truck	29		
2-May-20	13:40	14:10												
7-May-20	08:49	09:10			Light truck	12	Light truck	16	Haul truck	17	Haul truck	17		
3-May-20	14:30	15:00												
7-May-20	12:25	12:52			Haul truck	1	Haul truck	5	Haul truck	14	Haul truck	23		
10-May-20	09:50	10:20			Light truck	8	Haul truck	25	Haul truck	26				
4-May-20	12:50	13:18			Light truck	26								
11-May-20	13:18	13:30			Road maintenance vehicle	2								
2-May-20	14:25	14:55			Grader	25								
4-May-20	15:10	15:19												
29-Apr-20	12:20	12:50												
30-Apr-20	08:30	08:37			Light truck	1	Light truck	4						
30-Apr-20	09:00	09:30	Tractor trailer	Loaded tractor trailer	Haul truck	2	Light truck	16	Light truck	17	Loaded tractor trailer	28		
3-May-20	10:30	10:45												
30-Apr-20	16:30	17:00			Light truck	4	Other caribou joined	18						
29-Apr-20	11:20	11:50			Light truck	4								
7-Aug-20	12:32	13:00			Light truck	15	Light truck	21						
6-Aug-20	15:50	16:20			Light truck	26								

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min		Time Interval: 1 min		Time Interval: 2 min		Time Interval: 3 min		Time Interval: 4 min		Time Interval: 5 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time
1-May-20	15:20	15:50												
6-May-20	09:25	09:55			Light truck	15								
6-Aug-20	14:50	15:20			Helicopter	3								
2-May-20	16:00	16:12			3 light trucks and 2 haul trucks	7								
3-May-20	09:00	09:30												
7-Aug-20	09:20	09:50			Helicopter	25								
6-Aug-20	10:37	11:07												
6-Aug-20	10:40	11:10												
12-May-20	16:50	17:20	Haul truck	x2	Haul truck	28	Haul truck	29						
3-May-20	08:30	09:00												
4-May-20	16:10	16:40			Light truck	25								
30-Apr-20	14:20	14:50			2 buses	7	1 bus	9	2 trucks (pickup)	16	Haul truck	20		
9-Aug-20	13:52	13:20			Tanker	21								
7-Aug-20	09:00	09:11												
7-May-20	14:50	15:20			Haul truck	4	Haul truck	5	Haul truck	22				
1-May-20	16:50	17:00			Light truck	2	Light truck	5						
3-May-20	07:40	08:10												
29-Apr-20	13:45	14:00			Light truck	2								
3-May-20	16:40	15:01			Grader	18								
30-Apr-20	11:30	12:00		Bulldozers working 2 km away	Bulldozers working 2 km away	N/A	Light truck	25						
29-Apr-20	16:15	16:33			Light truck	3								
30-Apr-20	12:20	12:50												
29-Apr-20	14:40	15:10			Light truck	26								
14-May-20	16:30	17:00			Haul truck	1	Haul truck	7						
6-May-20	07:20	07:50			Light truck	18								
6-May-20	07:23	07:53			Light truck	18								
6-May-20	17:10	17:40			Light truck	27								
6-May-20	17:20	17:50	Haul truck		Light truck	17	Haul truck	28						
2-May-20	07:00	07:30												
11-May-20	16:15	16:45			Haul truck	3	Haul truck	6	Light truck	25				
6-Aug-20	11:25	11:55												

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Time Interval: 27 min		Time Interval: 1 min		Time Interval: 2 min		Time Interval: 3 min		Time Interval: 4 min		Time Interval: 5 min	
			Disturbance	Disturbance Comments	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time	Disturbance	Disturbance Time
16-Aug-20	16:00	16:30			Observer truck	12	Light truck	14	Tractor trailer	19				
22-Aug-20	13:11	13:41			Haul truck	0	Light truck	0						
8-Nov-20	12:10	12:40												
8-Nov-20	11:22	11:52												
9-Nov-20	9:50	10:20												
18-Nov-20	10:22	10:39												
19-Nov-20	11:17	11:45												
12-Nov-20	11:00	11:12												
13-Nov-20	11:20	11:50												
14-Nov-20	9:30	10:00												
14-Nov-20	10:20	10:50												
14-Nov-20	11:20	11:50												
14-Nov-20	12:23	12:53												
14-Nov-20	13:45	14:15												
15-Nov-20	15:03	15:33												
15-Nov-20	10:00	10:30												

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Notes
24-Apr-20	15:13	15:43	
25-Apr-20	14:25	14:55	Group was seperated after 30 sec of start; followed group crossing roads, other group stayed west side of road.
22-Aug-20	12:24	12:54	
17-Aug-20	10:06	10:36	Caribou stood up when tractor pass by. 8 other caribou walked from south and started eating with these 2 then walked. 800 m from road.
21-Aug-20	11:32	12:02	
22-Aug-20	11:34	12:04	
17-Aug-20	09:35	09:48	Male, out of view at 13 min.
21-Aug-20	14:37	15:07	
24-Apr-20	17:03	17:15	
12-Aug-20	14:33	14:39	
12-Aug-20	12:03	12:33	Most trotting or running are babies. Road closed, group treated about 1 km.
17-Aug-20	07:55	08:25	Female, 900 m west of road. At 15 min, a baby was noticed. Was eating with mom.
12-Aug-20	11:03	11:20	
12-Aug-20	09:42	10:11	Female at 22 min; the female walked back and observer saw a baby sleeping.
12-Aug-20	10:13	10:43	The grader stopped at 3 min and started again at 21, at 10 min caribou were 10 m from road and most babies started running west then at 11 min the whole group walked west.
15-Aug-20	14:45	15:15	Grader working in 2 km away, 900 m from the rad at the start and 1 km at the end.
17-May-20	10:00	10:30	
12-Aug-20	16:33	16:53	Road closed, started 200 m from the road then walked to 10 m, baby have been sleeping most of time.
15-Aug-20	16:30	17:00	Female, looks skinny, 700 m from the road.
12-Aug-20	08:53	09:13	AWAR closed today.
15-Aug-20	13:50	14:20	Caribou kept walking when tanker came, no other caribou in sight.
24-Apr-20	19:27	19:57	
17-May-20	08:50	09:20	
6-Aug-20	07:10	07:40	At min 15: 2 light trucks; at min 24: helicopter; prior to the start, the caribou walked from to the air strip, observer let him settle for 20 min.
17-Aug-20	07:24	07:38	
18-May-20	09:15	09:45	
6-May-20	13:20	13:50	
16-Aug-20	14:43	15:13	At 28 min: tractor trailer, at 29 min: long haul. 1 male and 1 female, 700 m from road. Lots of dust from trucks.
3-May-20	11:45	12:15	
29-Apr-20	16:00	16:30	
6-May-20	13:59	14:19	
4-May-20	12:10	12:40	group was 1.5 km from the raod, low visibility.
2-May-20	11:20	11:41	Probably 80 more caribou part of this group - this group travelling in a "Pod" - Drive and watched the group crossed from west to east, probably 45 min in observation.
6-May-20	14:35	15:05	

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Notes
29-Apr-20	08:55	09:25	
10-May-20	12:50	13:20	No movement at 7 min; one get up and down again at 19.
8-May-20	10:30	11:00	Truck passed before the start of the survey; pics 21 and 25 caribou ran oppsite side for 100 m and stop; pics 27 and 28 truck was coming from north.
29-Apr-20	15:00	15:30	
10-May-20	13:45	14:15	No movement at 4 min; pics 68/69/70 taken at 19; walked further from road at 26; pics 74/75/76/77 at min 28; pic 80 taken after the end of the survey.
9-May-20	12:50	13:20	No move at min 24; move about 50 m at min 20 (pic 38/39).
12-May-20	11:50	12:20	Min 13: pics 116/117; min 16: pics 119/121; min 28: pics 127/130; the 2 trucks (at min 28) crossed each other and caribou moved of about 50 m and started foraging again. At the beginning of the survey caribou were at !150m of rad; at min 5, they came at about less than 50 m of road. Pics 133/137 were taken 20 min after survey. 1 caribou out of picture (??) were still there ar 14:00.
1-May-20	11:40	12:10	A sub group of larger group walking along the west of the road. The group strated with 10, others slowly joined and left.
2-May-20	10:30	10:45	
12-May-20	14:50	15:20	Were still feeding during disturbance.
1-May-20	12:30	13:00	These two were at the east following a group of 80 on the west, crossed from the east to west to be with the larger group.
3-May-20	13:00	13:30	Group walked about 2 km during observation.
1-May-20	09:50	10:14	
11-May-20	12:10	12:31	Most of caribou started walking south at 1 min; headed north at 15 min.
2-May-20	13:00	13:30	
3-May-20	14:00	14:18	
29-Apr-20	10:20	10:50	
9-May-20	13:50	14:20	
2-May-20	13:40	14:10	
7-May-20	08:49	09:10	All caribou came back running south direction.
3-May-20	14:30	15:00	
7-May-20	12:25	12:52	3 caribou crossed the road at km 135 at the start of the survey.
10-May-20	09:50	10:20	
4-May-20	12:50	13:18	Around 24 min, observer saw a caribou walking in the distance.
11-May-20	13:18	13:30	Did not stop walking at 2 min.
2-May-20	14:25	14:55	
4-May-20	15:10	15:19	
29-Apr-20	12:20	12:50	Caribou kept caring in and out of my study zone.
30-Apr-20	08:30	08:37	
30-Apr-20	09:00	09:30	Caribou circiling around a lake from 300m to 1.5km
3-May-20	10:30	10:45	
30-Apr-20	16:30	17:00	When the 58 caribou joined, they stayed on the … of the hill about 10 m from the original group
29-Apr-20	11:20	11:50	Al the end of the observation, most caribou were walking in a line south in the west side of the Rd
7-Aug-20	12:32	13:00	When crossing, they were smelling the road, some were …
6-Aug-20	15:50	16:20	Group was walking over the hill during observation

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Notes
1-May-20	15:20	15:50	Migrating groups of caribou close by.
6-May-20	09:25	09:55	
6-Aug-20	14:50	15:20	Caribou were migrating through my view during observation, non stop, steady pace.
2-May-20	16:00	16:12	There were 40 total spreading in the area, observer watched the group that was …
3-May-20	09:00	09:30	Group was feeding on a hill. At 15 min in, group started slowly grazing over the top out of view.
7-Aug-20	09:20	09:50	Observing from 3 km away, only waited for 5 min to start.
6-Aug-20	10:37	11:07	
6-Aug-20	10:40	11:10	Group of 400 walking southwest < 200 walked away at 12 min, more coming from north.
12-May-20	16:50	17:20	Pic 151 at min 28.
3-May-20	08:30	09:00	
4-May-20	16:10	16:40	
30-Apr-20	14:20	14:50	Group started 400 m from road and walked back 1.5 km.
9-Aug-20	13:52	13:20	
7-Aug-20	09:00	09:11	At 8:45, convoy went by.
7-May-20	14:50	15:20	One caribou walking toward road turn back (south bound).
1-May-20	16:50	17:00	
3-May-20	07:40	08:10	
29-Apr-20	13:45	14:00	Not complete; they walked steady for the first 15 min of wait line and they went on a hill, continue walking south.
3-May-20	16:40	15:01	Grader did not go by but turned aroud …
30-Apr-20	11:30	12:00	Caribou walking east single line.
29-Apr-20	16:15	16:33	
30-Apr-20	12:20	12:50	Caribou were 30 m from road when observer arrived, they moved 100 m away before observation started.
29-Apr-20	14:40	15:10	Can hear the bulldozer working 3 km south when it's backing up.
14-May-20	16:30	17:00	Before passage of truck at 1 min, 4 caribou were laying down; 2 feeding and 2 lying at 7 min. At the end of the survey, the 2 remaining caribous were at 1.2 km away.
6-May-20	07:20	07:50	
6-May-20	07:23	07:53	
6-May-20	17:10	17:40	
6-May-20	17:20	17:50	
2-May-20	07:00	07:30	herd was all eating in the first 15 min then some started walking; observer only recorded the caribou that could be seen as they were walking behind hills at times
11-May-20	16:15	16:45	Most of them started walking south and stop 300 m further … split the group. Approx 75-80 caribou.
6-Aug-20	11:25	11:55	Group moved about 1 km during 18 min observation, walked out of view.

Appendix B: Data from Caribou Behaviour Surveys

Date	Time Start	Time End	Notes
16-Aug-20	16:00	16:30	Mom and baby 500 m from road.
22-Aug-20	13:11	13:41	
8-Nov-20	12:10	12:40	
8-Nov-20	11:22	11:52	
9-Nov-20	9:50	10:20	
18-Nov-20	10:22	10:39	
19-Nov-20	11:17	11:45	
12-Nov-20	11:00	11:12	
13-Nov-20	11:20	11:50	
14-Nov-20	9:30	10:00	
14-Nov-20	10:20	10:50	Another 250 to 300 caribou in the area.
14-Nov-20	11:20	11:50	
14-Nov-20	12:23	12:53	This group was walking toward the road, it ran back east when ATV arrived.
14-Nov-20	13:45	14:15	
15-Nov-20	15:03	15:33	Wolves 2 km south reported @ 14:25. Road closed for all traffic today.
15-Nov-20	10:00	10:30	Road has been closed to mine traffic for 15 hours.

ERM has over 160 offices across the following countries and territories worldwide

Argentina
Australia
Belgium
Brazil
Canada
Chile
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
Myanmar
The Netherlands
New Zealand
Norway
Panama
Peru
Poland
Portugal
Puerto Rico
Romania
Russia
Senegal
Singapore
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

ERM's Toronto Office

120 Adelaide Street West, Suite 2010
Toronto, ON
Canada M5H 1T1

T: +1 416 646 3608
F: +1 416 642 1269

www.erm.com

The business of sustainability

ERM



golder.com