

Appendix 45

Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report



MEADOWBANK MINE

2018 WILDLIFE MONITORING SUMMARY REPORT

FINAL

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SECTION 1 • EXECUTIVE SUMMARY

As a requirement of the NIRB Project Certificate, the 2018 Wildlife Monitoring Summary Report represents the 13th of a series of annual Wildlife Monitoring Summary Reports for the Agnico Eagle Mines Ltd. (Agnico Eagle) Meadowbank Mine (the project). Baseline and monitoring programs were first initiated in 1999 and will continue throughout the life of the mine. Details of the wildlife monitoring program for the project are provided in the Terrestrial Ecosystem Management Plan (Agnico Eagle 2018). The 2018 report provides the objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2018 Wildlife Monitoring Summary Report builds on data presented in previous reports and incorporates monitoring recommendations from these reports.

A habitat analysis was completed for the first time since 2014. The approach taken in 2018 varied from previous years where habitat losses were compared to values predicted in the EIA and subsequent extensions. Given the difficulty in tracking approved extensions, additions, and mine plan changes, habitat losses were instead compared to habitat availability within permitted areas. A thorough analysis of habitat losses for the Meadowbank and Whale Tail areas found that losses were well within overall habitats in permitted areas. As well, for wildlife Valued Ecosystem Components, high suitability habitat losses were substantially lower than was available within permitted areas.

Seven active Peregrine Falcon (*Falco peregrinus*) nests were observed and monitored at quarry sites along the AWAR in 2018, with successful nesting confirmed at three nests. No raptor nests were monitored along the Whale Tail Haul Road or in the vicinity of the Whale Tail Pit in 2018. Raptor nest management plans were not warranted at any of the active nest sites as no project-related effects on raptor nesting success were observed.

The GN Caribou (*Rangifer tarandus*) collaring program, ongoing for the past 11 years in the Baker Lake area, continued in 2018 with monitoring of existing collared animals. Seasonal Caribou movements within and adjacent to the Meadowbank Regional Study Area (RSA) were tracked and mapped throughout the year. Collared Caribou were present throughout the year but particularly during spring migration (i.e., April and May). Additional collars were deployed for Baker Lake animals in 2018 and by the end of the year, 40 collars from three deployments remained active.

A Hunter Harvest Study (HHS) was conducted from 2007 to 2015, but the program was suspended following declining participation and difficulty in interpreting limited hunting data. In 2016 and 2017, Agnico Eagle, the HTO, KivIA, GN, and other agencies met to discuss the HHS, and in early 2019 the study was relaunched. Results from 2019 will be summarized in next year's annual report.

Numerous road closures were implemented on all project roads, particularly in April and May, to ensure safe passage to migrating Caribou herds. No Caribou fatalities occurred because of activities at the mine or along project roads. With the Authorization of the GN officer, one Wolverine (*Gulo gulo*) and one Wolf (*Canis lupus*) needed to be euthanized after attempts to deter the animals were unsuccessful. In general, improved food-handling practices and employee awareness programs at the mine site have helped prevent mine-related Predatory Mammal fatalities.

SECTION 2 • OVERVIEW

2.1 BACKGROUND

The Agnico Eagle Mines Ltd. (Agnico Eagle) Meadowbank Mine (the project), located in the Kivalliq Region of Nunavut (**Figures 2.1 and 2.2**), 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 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 License and land leases, allowed development of five gold deposits in the 10 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.

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. In 2018, the TEMP was revised to incorporate the Whale Tail component of the project, and to reflect changes in management and monitoring approaches since 2006 (Agnico Eagle 2018). 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 2018 revised TEMP provides the basis for the 2018 annual report. 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 2018, the ninth year of operation, and is the 13th of a series of annual Wildlife Monitoring Summary Reports for the project. The purpose of this report is to summarize 2018 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. The 2018 report describes monitoring objectives and methodology, historical and current year results, mitigation activities, and management recommendations based on 2018 monitoring results.

2.2 PROJECT DESCRIPTION;

The Meadowbank Gold Mine, with an expected operating life of about nine (9) years (or until Q3, 2019), is located approximately 90 km north of the Hamlet of Baker Lake, while the Whale Tail Pit extension, with an expected operating life of seven years (2019 to 2025), is located approximately 180 km to the north of the Hamlet. The Whale Tail Pit extension is a proposed open-pit mine mined by truck-and-shovel operation and will produce 19 M tons of ore. The project is 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.

**Figure 2.1:
Meadowbank Mine
Project Location Map**

Legend

- Capital City
- Towns/Villages
- Rivers
- Water
- National Parks

Data Sources:
Natural Resources Canada
Geological Survey of Canada
Caslys Consulting Ltd.

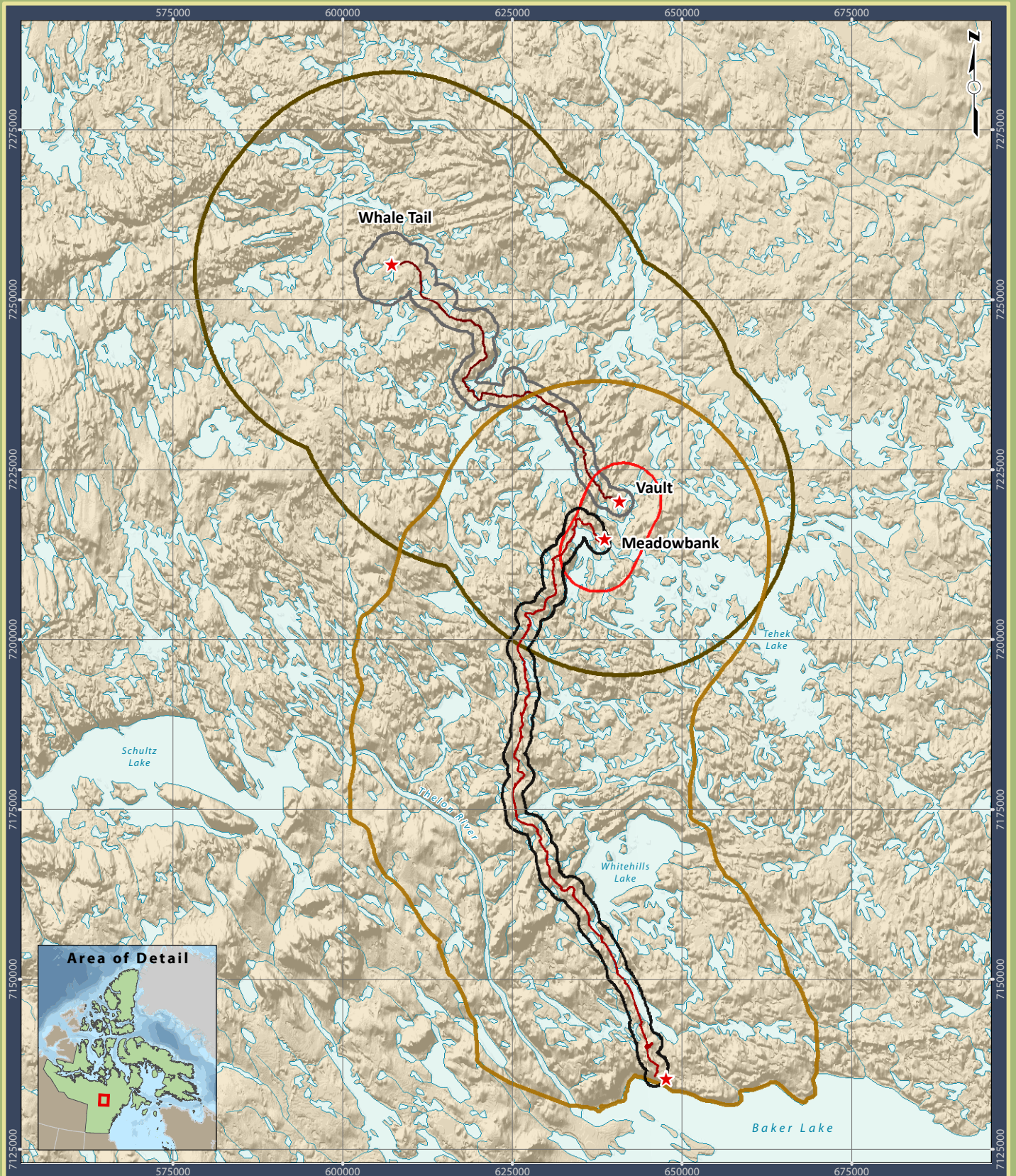


Prepared for:

AGNICO EAGLE **Nunavut**
ENVIRONMENTAL
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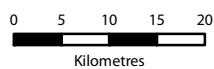
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CASLYS
CONSULTING



Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.

Figure 2.2: Overview of Boundaries for Meadowbank Mine Monitoring Studies

Meadowbank Gold Project

Prepared for:



By:



2018 WILDLIFE MONITORING SUMMARY

Environmental baseline studies were conducted in the project area prior to Meadowbank and Whale Tail mine approvals and integrated into project designs according to the Cumberland (2006) and Agnico Eagle (2018) 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 extension project or revised TEMP. Further details can be found in the Final Environmental Impact Statements for the Meadowbank Project (Cumberland 2005) and the Whale Tail Pit (Golder 2016).

Construction of a 106.8 km All-Weather Access Road (AWAR) between the Hamlet of Baker Lake, the nearest community, 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 the AWAR and numerous camp infrastructure facilities were completed, while in 2009, principal mine site construction commenced. Mine operation commenced in early 2010. Goose Pit was completely depleted 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 done 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 2018 were only ongoing in Pit E and are expected to be depleted by Q3, 2019. The Vault pit continued to be exploited in 2018 and is expected to be completed in Q1, 2019. The dewatering of Phaser Lake occurred during summer 2016 in preparation for mining activity in Phaser and BB Phaser Pit. Phaser Pit mining activities were completed in Q4, 2018 while BB Phaser mining began in early 2018 and is scheduled to be completed in Q3, 2019.

To extend mine operations and milling at Meadowbank Mine, Agnico Eagle is developing 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 Whale Tail Haul Road (enlargement) following regulatory approval and was completed in 2018. Construction along the Haul Road in 2018 included drilling and blasting to prepare rock fill, culvert installation, bridge construction, and rock fill. Construction activities at the Whale Tail site in 2018 included the Whale Tail Dike construction, which will allow for Whale Tail Lake North Basin dewatering 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 for approximately 400 people, sewage treatment plan, tank farm for fuel storage, and freshwater intake. A conventional open pit mining operation is proposed on the Whale Tail deposit with commercial production beginning in Q3, 2019.

2.3 STUDY AREA BOUNDARIES

2.3.1 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 km². 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 Main and Vault sites and a 50 km wide corridor along the AWAR for a total area of 5,106 km² (**Figure 2.3**).

2.3.2 Whale Tail Pit and Haul Road

The Whale Tail LSA is a 3 km corridor centered on the Whale Tail Haul Road 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 km². The Whale Tail RSA is a 50 km corridor centred on the Haul Road alignment (i.e., 25 km on either side of the Haul Road and borrow site access roads, and 25 km around borrow areas), with a total area of 5,017 km² (**Figure 2.4**).

2.4 MONITORING APPROACH

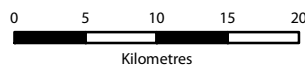
Wildlife monitoring is an essential tool in protecting and maintaining wildlife occurring near the project. A comprehensive monitoring strategy, along with quantitative monitoring indicators, has been implemented and, as required, is adapted to evaluate the accuracy of impact predictions and to meet the objectives of the management strategy set out in the TEMP (Agnico Eagle 2018). Monitoring programs evaluate the effectiveness of mitigation measures and assess mine-related impact predictions. For all wildlife monitoring programs there is a certain level of uncertainty or unpredictability; therefore, residual effects identified during monitoring may require implementation of adaptive management strategies. Adaptive management is an ongoing process that evolves throughout the life of the project as better and more effective ideas are introduced in a process that is designed to be continually improving. 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 ensure that local and regional concerns have been adequately addressed.

Environmental staff monitor wildlife near mine facilities (i.e., Meadowbank Mine and Whale Tail Pit) and along the AWAR, Vault Haul Road, and Whale Tail Haul Road on a regular basis (discussed in detail in **Sections 3** and **4**). Where unacceptable risks to wildlife are observed, mitigation measures are implemented to avert animals from site activities in accordance with the TEMP (Agnico Eagle 2018). 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.



Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.

**Figure 2.3: RSA and LSA
Boundaries for the
Meadowbank Mine and AWAR**

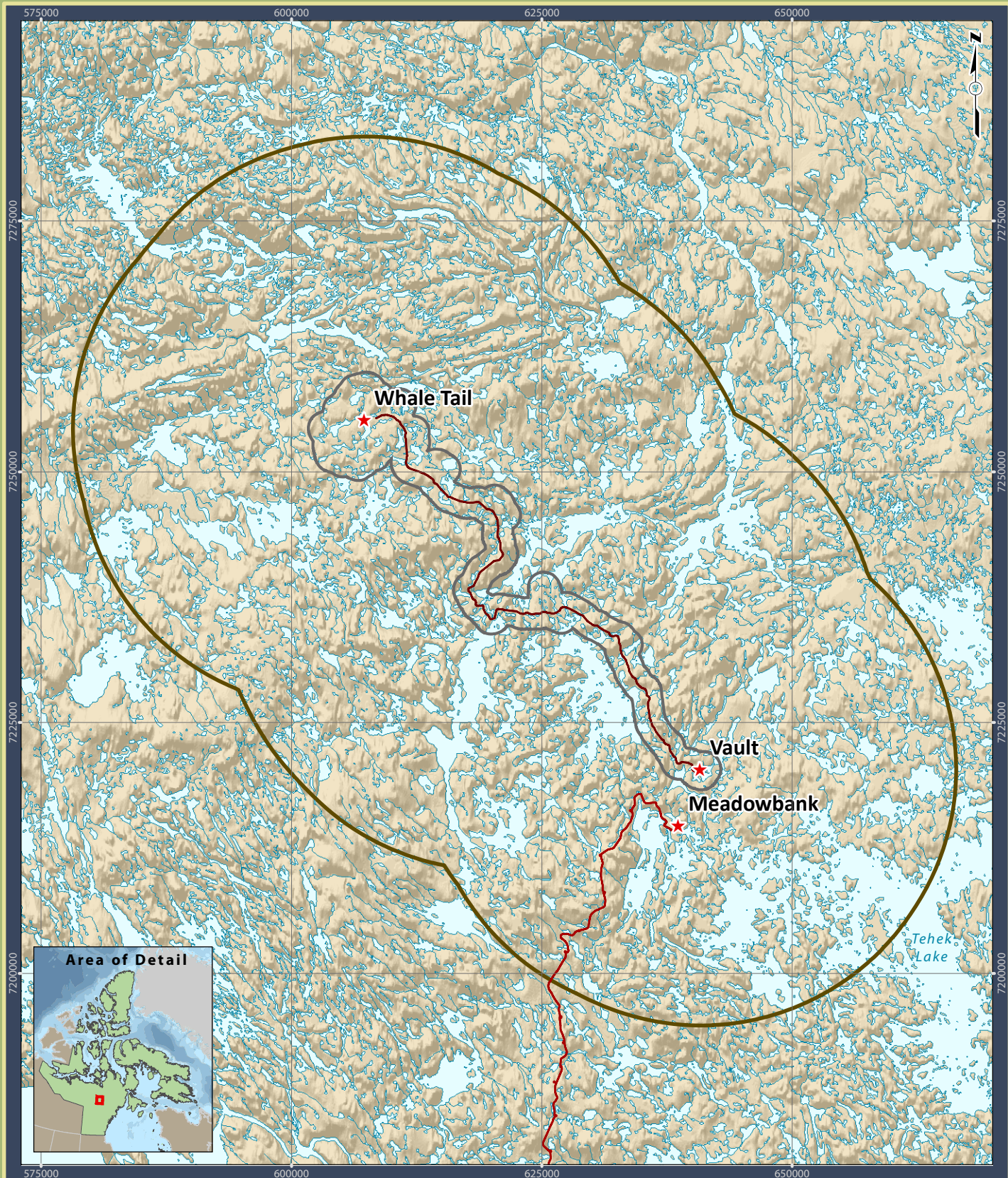
Meadowbank Gold Project

Prepared for:



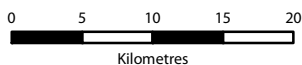
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Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.

**Figure 2.4: RSA and LSA
 Boundaries for the
 Whale Tail Pit and Haul Road**

Meadowbank Gold Project

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2.5 REPORT OBJECTIVES

The primary objectives of the 2018 Wildlife Monitoring Summary Report are to:

- Report the results of the 2018 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 2019; and
- Allow regulators to contribute advice for improving wildlife management.

2.6 INUIT INVOLVEMENT

Since 1999, local Inuit from the Hamlet of Baker Lake have been involved in all wildlife-related baseline and monitoring surveys. A summary of the various programs and the average number of Inuit involved since 1999 is provided in **Table 2.1**. As required by the IIBA, “Anything done by Agnico in order to implement the TEMP [...] shall incorporate Inuit Qaujimanituqauit”; therefore, traditional knowledge or IQ has been incorporated in this annual report.

Table 2.1: 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 (1)	2
Raptor Nest Surveys	2004 to 2007, 2010 to 2018 (13)	3 to 4
AWAR Ground Surveys	2004 to 2018 (15)	2 to 3
Vault Haul Road Surveys	2017 to 2018 (2)	1 to 2
Whale Tail Haul Road Surveys	2018 (1)	1 to 2
Height of Land Surveys	2018 (1)	1 to 2
Habitat Mapping	2004 to 2005, 2010, 2012, 2014, 2017, 2018 (7)	1
Phenology Plots	2003 to 2005 (3) - discontinued	2

2.7 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 is committed to establishing a Terrestrial Advisory Group (TAG) consisting of representatives from the following organizations at a minimum; Agnico Eagle, the Government of Nunavut Department of Environment (GN-DoE), the Kivalliq Inuit Association (KivIA), and the Baker Lake Hunters and Trappers Organization (HTO).

An MOU is currently being developed and will likely be signed by all parties in early 2019. Agnico Eagle will provide a summary of TAG meeting outcomes to the NIRB in the annual report beginning in 2019.

The purpose of the TAG is to:

- Measure the relevant environmental effects of the project on terrestrial wildlife;
- Confirm that the project is being carried out within the terms and conditions of the project certificate 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 in respect of the project;
- Identify and select appropriate target species, indicators and linkages for monitoring;
- Evaluate the effectiveness of mitigation measures and to support any required improvement of those measures;
- Identify any unforeseen environmental effects caused by the project;
- Provide an early warning mechanism to identify any environmental effects caused by the project; and
- Determine and identify any cause-and-effect interactions between the project and the environment.

2.8 MITIGATION AUDIT

An annual mitigation audit is a new requirement outlined in the 2018 TEMP. Mitigation approaches stem from current practices at existing mines or were suggested during the environmental assessment process; however, an auditing system is required to evaluate the use and effectiveness of the mitigation, following principals of adaptive management, and to identify additional mitigation measures as required. The audit is to be undertaken annually and summarized in the annual report, and will focus specifically on mitigation listed in Section 2 of the June 2018 TEMP. The audit will evaluate:

- If all mitigation has been implemented;
- Which mitigation is perceived to be or shown to be successful;
- If new mitigation has been implemented in response to new issues; and
- If some mitigation is redundant.

The first mitigation audit will be conducted at the end of 2019 and a summary will be included in the 2019 Wildlife Monitoring Summary Report.

SECTION 3 • ROAD SURVEYS

3.1 OVERVIEW

A systematic ground survey monitoring program for the AWAR, and Vault and Whale Tail haul roads 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 mortality of species utilizing habitats near the roads.

3.2 OBJECTIVES

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

1. Document wildlife utilization along the AWAR, Vault Haul Road, and Whale Tail Haul Road corridors;
2. Evaluate wildlife trends along the road corridors, including identifying areas where higher densities of wildlife are observed. Evaluate whether road-related operations preclude Caribou from using suitable habitats beyond 1,000 m. The threshold level along the roads is unnatural Caribou use patterns beyond 1,000 m;
3. Assess the need for adaptive mitigation, such as temporary road closures during peak Caribou migration periods;
4. Ensure that mortality thresholds for wildlife are not exceeded;
5. Confirm that Caribou are not killed through road-related mortality. The project-wide threshold mortality level for Ungulates is two (2) individuals per year (as per TEMP 2018); and
6. Confirm that Predatory Mammals are not killed through road-related mortality. The project-wide threshold mortality level for Predatory Mammals is two (2) individuals per year (as per TEMP 2018)

3.3 DURATION

The AWAR, Vault Haul Road, and Whale Tail Haul Road systematic ground surveys are ongoing over the operation 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 presence triggers are surpassed (see Figures 7 and 8 in 2018 TEMP). Agnico Eagle is committed to conducting a minimum of approximately 75 road surveys per year along the AWAR and Whale Tail Haul Road. The number of surveys along the Vault Haul Road is contingent on whether Caribou have been sighted in the area during mine site ground surveys or are known to be in the area based on collaring data. Monitoring of vehicle collisions and wildlife mortality is continual along all road segments.

3.4 METHODOLOGY

Road surveys were expanded beyond the AWAR to include the recently completed Vault Haul Road, beginning in 2017, and the Whale Tail Haul Road, beginning in 2018. For the Whale Tail Haul Road, Agnico Eagle has signed an MOU with the Baker Lake HTO for a wildlife monitor on the road beginning in October 2018 (see **Appendix H** for MOU).

The survey team typically includes two observers (one can be 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) 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, and a variety of other information (e.g., behavior). Where animals are sighted close to roads and a risk of collision with vehicles is possible, the environmental monitor reports 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 (**Section 6**) are also used to track Caribou movement and potential migration towards the roads and mine facilities.

3.5 HISTORICAL RESULTS

Ground surveys commenced shortly following the onset of AWAR construction (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. Over the past 12 years (to 2018), surveys have been completed along the AWAR every 3.9 to 6.1 days (5.0 days in 2018) (see **Table 3.1**). Surveys for the past two years at the Vault Haul Road have been completed every 7.2 to 15.8 days (**Table 3.2**). Surveys along the Whale Tail Haul Road were initiated in 2018; therefore, data is described in the following section.

3.6 2018 RESULTS

3.6.1 Wildlife Species Encountered

Mammal species identified and observed during AWAR, Vault Haul Road, and Whale Tail Haul Road surveys in 2018 included Arctic Fox (*Vulpes lagopus*), Arctic Ground Squirrel (*Spermophilus parryii*), Arctic Hare (*Lepus arcticus*), Caribou, Muskox, Wolf (*Canis lupus*), and Wolverine (*Gulo gulo*). Bird species observed included Bald Eagle (*Haliaeetus leucocephalus*), Cackling Goose (*Branta hutchinsii*), Canada Goose (*Branta canadensis*), Common Loon (*Gavia immer*), Common Raven (*Corvus corax*), Herring Gull (*Larus argentatus*), Horned Lark (*Eremophila alpestris*), jaeger (*Stercorarius* sp.), Lapland Longspur (*Calcarius lapponicus*), Long-tailed Duck (*Clangula hyemalis*), Northern Pintail (*Anas acuta*), Peregrine Falcon (*Falco peregrinus*), ptarmigan (*Lagopus* sp.), Rock Ptarmigan (*Lagopus muta*), raptor, Rough-legged Hawk (*Buteo lagopus*), Sandhill Crane (*Grus canadensis*), Snow Goose (*Anser caerulescens*), and Snowy Owl (*Bubo scandiacus*).

3.6.2 AWAR Surveys

The number of AWAR surveys completed each season in 2018 is provided in **Table 3.1**. The number of systematic road surveys completed in 2018 (n=72) is just below the annual average of 73 surveys over the previous 11 years and the annual goal of 75 surveys. Surveys were conducted on average every 5.0 days over the course of the year. Survey frequency was highest in September (n=9) and October (n=8). Raw road survey data are provided in **Appendix A**.

Cumulative Caribou density along the AWAR for 2018 (all seasons) is provided in **Figure 3.1**. The highest Caribou densities in 2018 were observed around the Whitehills Lake area (between Km 15 and 37) and along a broad band further north between Km 48 and Km 89. Lower densities were recorded at the northern and southern ends of the AWAR in 2018.

The 2018 Caribou occurrence data were added to the 2008 to 2017 datasets with the resulting cumulative Caribou numbers presented in **Figure 3.2**. These data illustrate that for over 10 years of surveys, the highest cumulative Caribou abundances along the AWAR continue to be in areas closest to the Hamlet of Baker Lake, from Km 0 to Km 10 (cumulative density of 1,709 to 1,559 Caribou/km), and south of Whitehills Lake between Km 25 and Km 30 (2,032 Caribou/km). High Caribou abundances were also observed from Km 15 to 20 (1,253 Caribou/km), Km 50 to Km 55 (1,450 Caribou/km), and Km 70 to Km 75 (1,388 Caribou/km). The 2018 data do not consistently follow this pattern. Higher densities were not observed in the immediate vicinity of Baker Lake, while higher densities were observed across a long band further north of Whitehills Lake (see **Figures 3.1** and **3.2**). High densities in the Whitehills Lake area was consistent between 2018 and the cumulative data set.

In 2018, Caribou numbers recorded on AWAR surveys were significantly higher than in 2016 and 2017 and comparable to numbers in 2014 and 2015 (**Figure 3.3**). The frequency of Caribou observed during AWAR surveys was fairly consistent through the year with lower numbers in midwinter and mid-summer (**Table 3.3**). The average number of Caribou observed per survey trip in April and May was the highest since surveys began indicating a strong spring migration through the study area (**Table 3.3**).

3.6.3 Vault Haul Road Surveys

The number of Vault Haul Road surveys completed each season in 2018 is provided in **Table 3.2**. The total number of surveys fluctuated from 47 surveys in 2017 (i.e., every 7.8 days) to 18 in 2018 (i.e., every 15.2 days). No surveys were conducted in the summer, a period of low Caribou activity (**Table 3.2**). The average number of Caribou observed along the Vault Road was significantly higher than in 2017 with the highest average numbers seen in April and September (**Table 3.4**). Raw road survey data are provided in **Appendix A**.

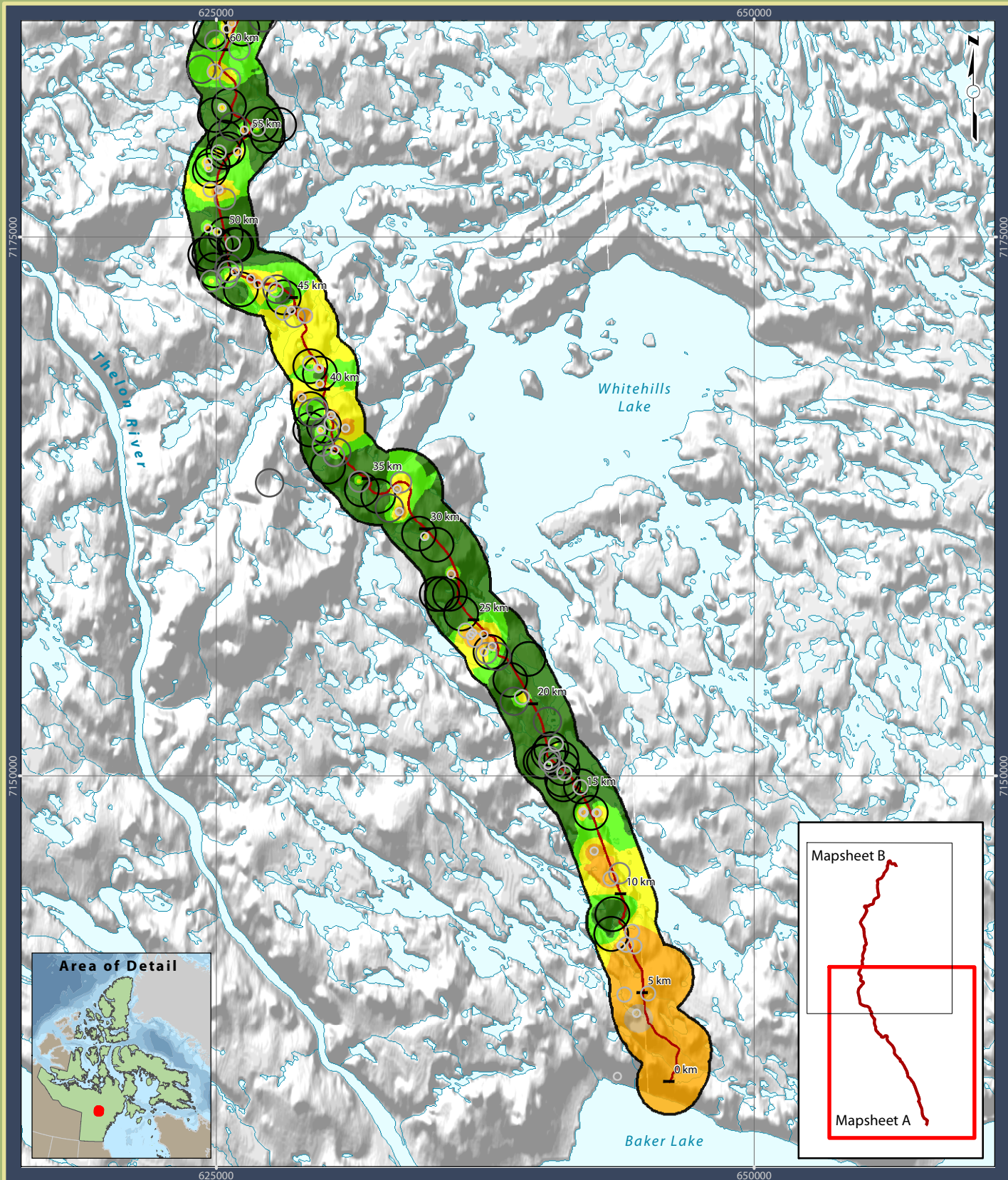
Table 3.1: Details of AWAR Wildlife Surveys from 2007 to 2018.

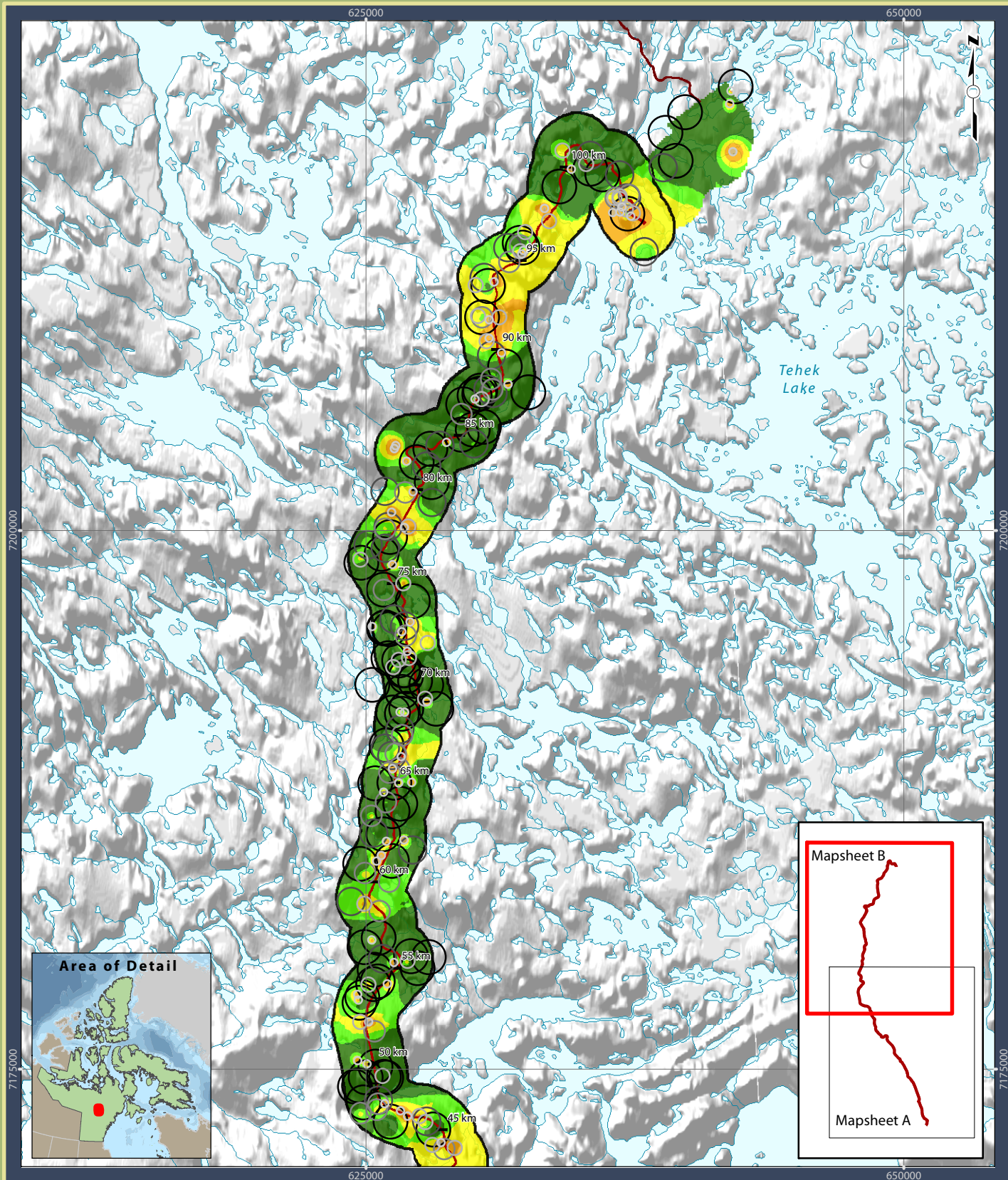
Season	Number of AWAR Surveys											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*	2017	2018
Spring (April to May)	13	15	15	9	10	14	9	11	17	10	19	9
Summer (June to July)	24	7	10	9	9	13	13	7	16	14	16	12
Fall (August to September)	8	15	8	12	11	12	10	11	11	16	14	16
Winter (Jan to Mar, Oct to Dec)	33	57	25	36	33	38	31	38	32	38	36	35
Year End Total	78	94	58	66	63	77	63	67	76	78	85	72
Duration	1-Mar to 31-Dec	2-Jan to 29-Dec	9-Jan to 16-Dec	21-Jan to 17-Dec	10-Jan to 30-Dec	4-Jan to 29-Dec	2-Feb to 27-Dec	12-Jan to 30-Dec	3-Jan to 18-Dec	2-Jan to 27-Dec	3-Jan to 29-Dec	3-Jan to 29-Dec
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

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

Table 3.2: Details of Vault Haul Road Wildlife Surveys from 2017 to 2018.

Season	Number of Vault Haul Road Surveys	
	2017	2018
Spring (April to May)	9	3
Summer (June to July)	7	0
Fall (August to September)	7	4
Winter (Jan to Mar, Oct to Dec)	24	11
Year End Total	47	18
Duration	3-Jan to 29-Dec	30-Jan to 16-Dec
Average Frequency of Surveys (over duration)	7.8 days	15.2 days





Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank All-Weather Access Road Local Study Area (LSA)

Caribou / Ha	Observation Counts
0	0 - 5
1 - 5	6 - 10
5 - 10	11 - 15
10 - 15	16 - 20
15 - 20	> 20
> 20	> 20

Figure 3.1: 2018 Ground Survey Observed Caribou Distribution within the LSA for the AWAR & Vault Haul Road - All Seasons (Map B)

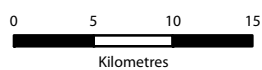
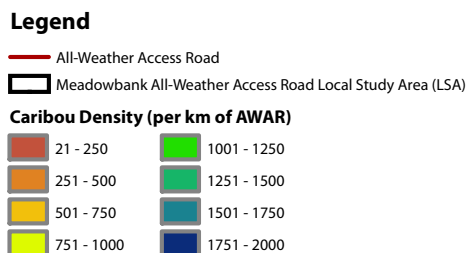
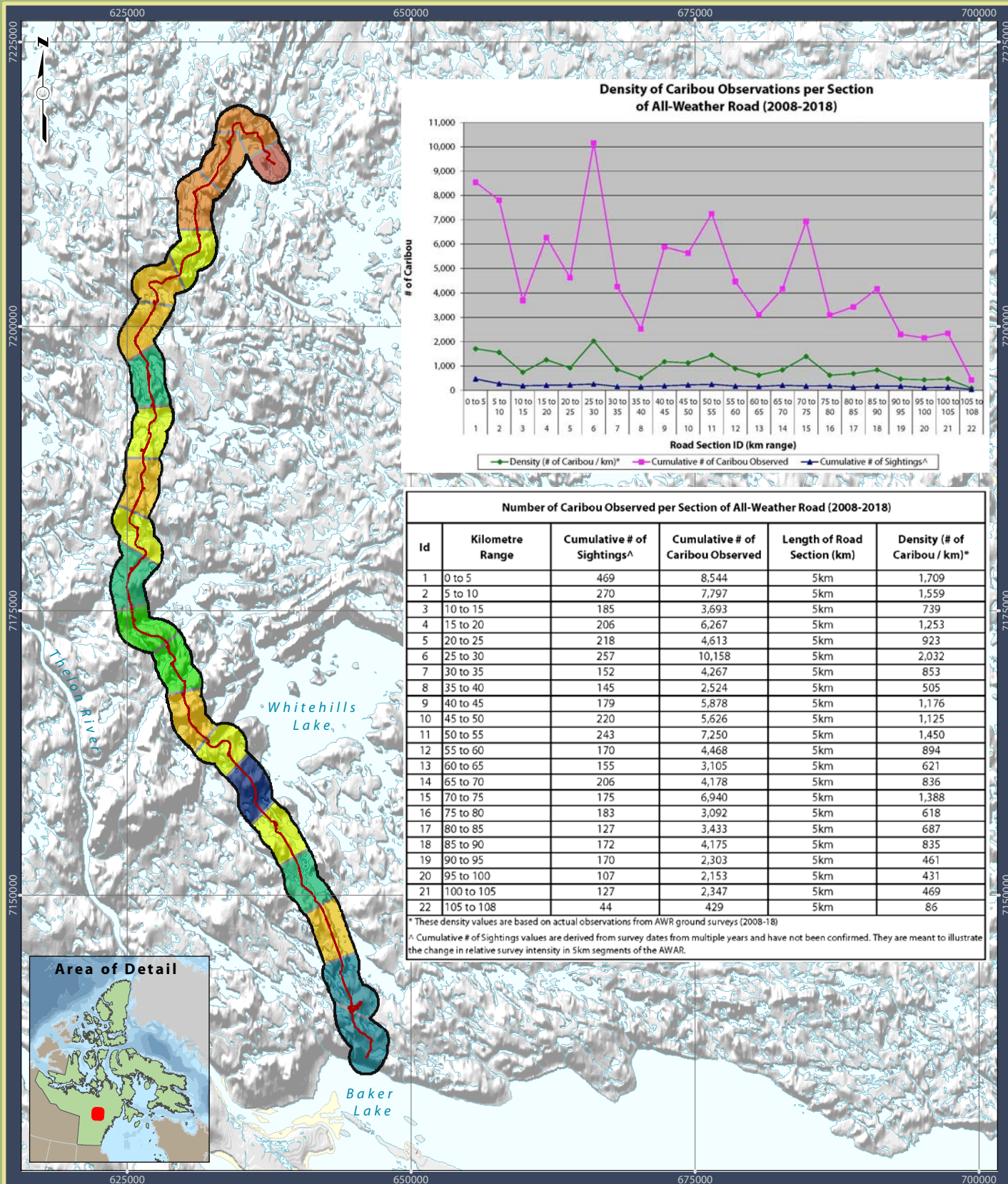
Meadowbank Gold Project

Prepared for:



By:





Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.

Figure 3.2: Caribou Density along the Awar and Vault Haul Road (2008 to 2018)

Meadowbank Gold Project

Prepared for:



By:



Figure 3.3: Number of Caribou Observed along the AWAR (2007 to 2018), Vault (2017 to 2018), and Whale Tail Haul Road (2018)

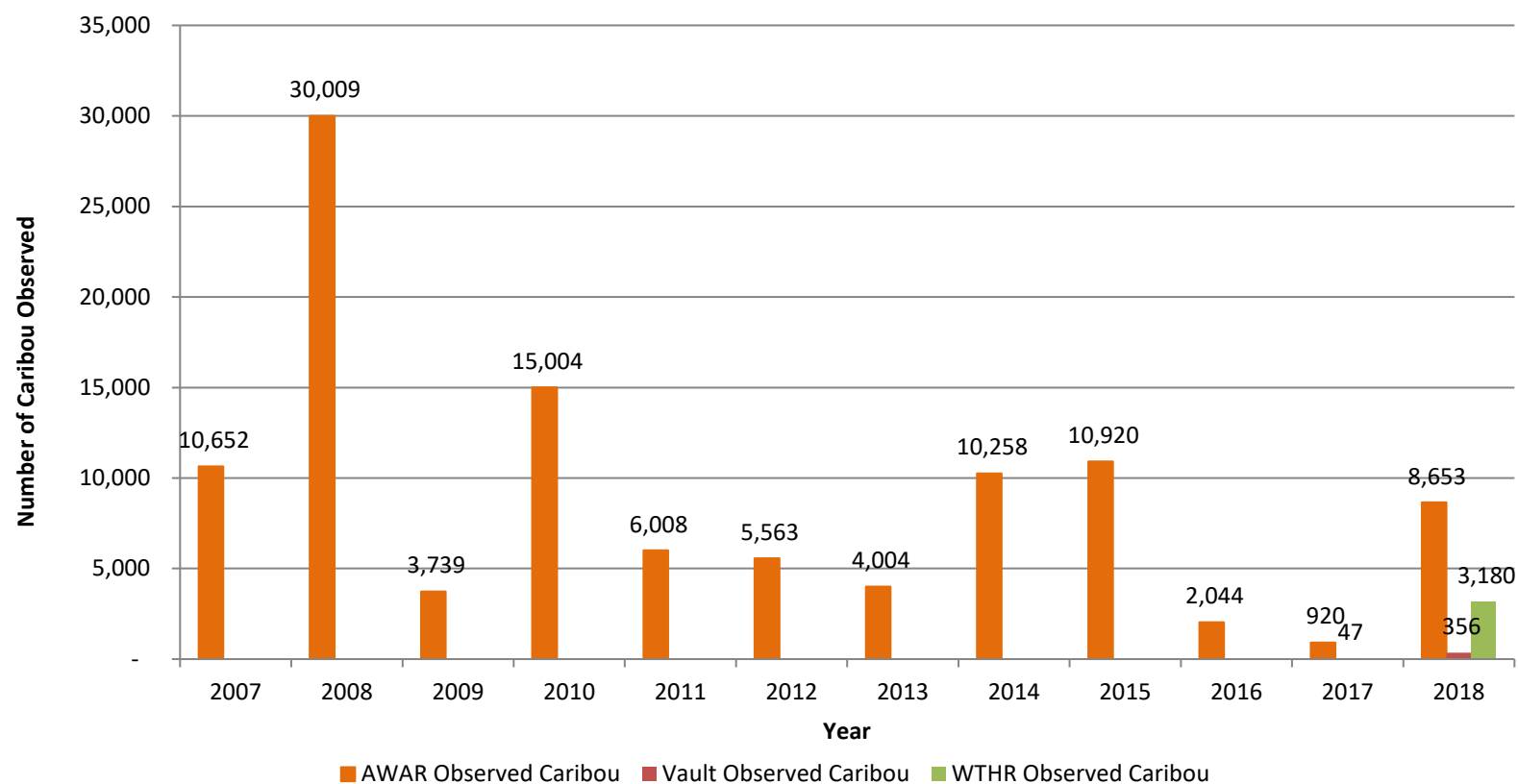


Table 3.3: Average Number of Caribou Observed Per Survey Trip along the AWAR from 2007 to 2018.

Month	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
January	0	14.3	12.0	5.3	3.0	5.1	0	3.2	5.8	3.7	8.0	6.4	5.6
February	0	11.5	10.7	4.1	1.0	5.3	68.1	10.5	7.0	2.3	0	12.3	11.1
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	12.2
April	14.0	12.7	11.4	10.8	34.0	15.2	0	27.2	22.4	23.8	4.0	51.4	18.9
May	15.4	12.1	13.0	18.0	25.3	14.2	11.0	8.4	14.1	13.2	0	27.7	14.4
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	6.4
July	1.5	13.3	0	1.1	1.0	0	0	0	2.0	0	0	1.0	1.7
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	9.5
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	11.0
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	61.8
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	92.4
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	46.4

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. Data does not include Vault Haul Road survey data, which was initiated in 2017, as results would not be comparable across years.

2018 WILDLIFE MONITORING SUMMARY

Table 3.4: Average Number of Caribou Observed Per Survey Trip along the Vault Haul Road from 2017 to 2018.

Month	2017	2018
January	0	0
February	5	2
March	9	5
April	5	46.3
May	0	0
June	0	0
July	0	0
August	0	0
September	3	77
October	0	10
November	6	0
December	0	0

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.

3.6.4 Whale Tail Haul Road Surveys

The number of Whale Tail Haul Road surveys completed each season in 2018 is provided in **Table 3.5**. Surveys were conducted on average every 6.4 days from the beginning of the survey (19 April) to the end of the year). Survey frequency was highest in October (n=15) and November (n=11). The highest average numbers of Caribou were seen in April and October, which aligns with surveys results from the AWAR and the Vault Haul Road (**Table 3.6**). Raw road survey data are provided in **Appendix A**.

Table 3.5: Details of Whale Tail Haul Road Surveys in 2018.

Season	Number of Whale Tail Haul Road Surveys
	2018
Spring (April to May)	1
Summer (June to July)	1
Fall (August to September)	3
Winter (Jan to Mar, Oct to Dec)	36
Year End Total	41
Duration	19-Apr to 30-Dec
Average Frequency of Surveys (over duration)	6.4 days

Table 3.6: Average Number of Caribou Observed Per Survey Trip along the Whale Tail Haul Road in 2018.

Month	2018
January	0
February	0
March	0
April	120.4
May	0
June	0
July	8.4
August	0
September	15.2
October	104.7
November	18.3
December	13.5

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

Cumulative Caribou density along the Whale Tail Haul Road for 2018 (all seasons) is provided in **Figure 3.4**. The highest Caribou densities in 2018 were observed between Km 5 and 19, and Km 50 and 55.

3.6.5 Road-related Mitigation

As in previous years, the security department assisted the environment department in preventing wildlife incidences along the AWAR, Vault Haul Road, and Whale Tail Haul Road by dispatching regular wildlife warnings 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 (see **Appendix C**). 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 (**Appendix C**), regulatory agencies, local groups and wildlife consultants were notified, and road survey efforts were increased to every two days. A summary of Caribou and Muskox activity and road closure notices for each of the three primary road segments is provided below.

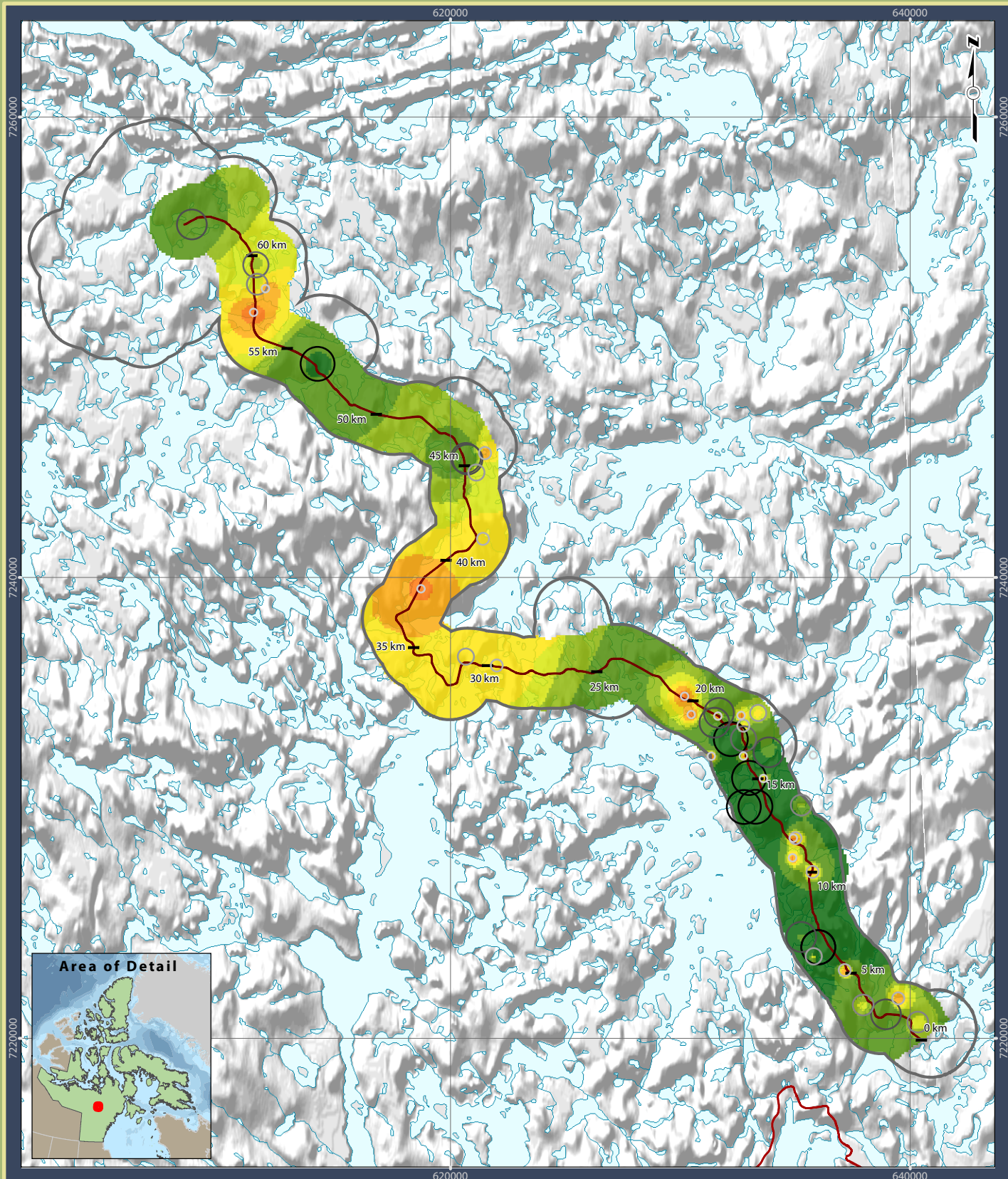


Figure 3.4: 2018 Ground Survey Observed Caribou Distribution within the LSA for the Whale Tail Haul Road - All Seasons

Meadowbank Gold Project

Prepared for:



By:



Meadowbank AWAR

Significant movements of Caribou from approximately mid-April to mid-May 2018 along the Meadowbank AWAR resulted in multiple closures (see **Table 3.7** and **Appendix C**). Only one road closure was required due to the presence of Muskox herds (i.e., May 10).

Table 3.7: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road in 2018.

Date of Closure	Date Reopened	Cause	Comments
April 13		Caribou	closed the road at 17:00
April 14		Caribou	closed all day
April 15		Caribou	closed all day
April 16		Caribou	closed all day
April 17		Caribou	closed all day
April 18		Caribou	closed all day
April 22		Caribou	restricted between Baker Lake and Exploration Camp
April 28	April 29	Caribou	closed - herd close to the road between Baker Lake and km 33
May 2		Caribou	closed since 6am and remains closed for the night
May 3		Caribou	closed all day
May 4		Caribou	closed to all traffic; escort for the daily ride
May 5		Caribou	restricted - road open for fuel truck and road maintenance only
May 6		Caribou	closed to all traffic; visibility near zero at times; no caribou monitoring
May 7		Caribou	closed to all traffic; visibility near zero at times; no caribou monitoring
May 10	May 11	Muskox	closed - Muskox close to the road at km 95
May 13		Caribou	closed - Caribou migration at km 95; road closed for the night
May 14		Caribou	closed - reopened in the morning, but closed again at lunch time because of weather conditions; thus, limited Caribou survey
May 16		Caribou	closed in the afternoon because of weather conditions; visibility did not permit a full survey to be completed
May 19		Caribou	restricted
May 20		Caribou	restricted - open for light vehicles
September 27	September 28	Caribou	restricted - access to the road for night shift only

Vault Haul Road

Significant movements of Caribou from approximately mid-April to mid-May 2018 along the Vault Haul Road resulted in multiple closures (see **Table 3.8** and **Appendix C**)

Table 3.8: Summary of Road Restrictions Related to Ungulate Activity Along the Vault Haul Road in 2018.

Date of Closure	Date Reopened	Cause	Comments
April 14		Caribou	restricted to small vehicles only at 16:00 and for the remainder of the day and night shift
April 15		Caribou	restricted to small vehicles only up to this morning until 11:00 and open for hauling during the day; all traffic suspended from 18:30 to 20:00 with Caribou presence increasing along the road
April 18		Caribou	closed during the day because of weather; no Caribou monitoring
April 27		Caribou	closed
April 28	April 28	Caribou	closed and reopened 11:00 this morning as the Caribou finally crossed the road
April 30		Caribou	restricted
May 4	May 4	Caribou	closed to all traffic from 10:30 to 11:15
May 7	May 7	Caribou	closed to all traffic because of weather; no Caribou monitoring
May 13	May 14	Caribou	closed for all traffic at 23:20 on the 13 th because of Caribou presence in the area; reopened at 01:50 on the 14 th and remained open during the day
May 14	May 15	Caribou	closed for all traffic at 19:40 on the 14 th because of Caribou presence in the area; reopened at 09:25 on the 15 th
May 15	May 16	Caribou	restricted during night shift of 15 th to 16 th with no haul truck traffic permitted with Caribou observed in the area; fully reopened at 08:00 on the 16 th
May 18		Caribou	closed and restricted for ERT
May 19		Caribou	closed
May 22	May 22	Caribou	closed and restricted for ERT
May 23	May 23	Caribou	closed and restricted for ERT
October 31	November 1	Caribou	closed at 16:30 this afternoon and remained closed for the evening; approximately 1,000 Caribou were observed between Meadowbank and Vault

2018 WILDLIFE MONITORING SUMMARY

Whale Tail Haul Road

Significant movements of Caribou from approximately mid-April to late-May 2018 and the third week of October along the Vault Haul Road resulted in multiple closures (see **Table 3.9** and **Appendix C**).

Table 3.9: Summary of Road Restrictions Related to Ungulate Activity Along the Whale Tail Haul Road in 2018.

Date of Closure	Date Reopened	Cause	Comments
April 14		Caribou	closed around 17:00 until further monitoring
April 15		Caribou	closed to all traffic because of Caribou herd between km 1.5 and 3.5
April 16		Caribou	closed all day
April 17		Caribou	closed all day
April 18		Caribou	closed all day
April 22	April 22	Caribou	restricted from km 0 to 20 will be the only part to go under escort
April 27		Caribou	restricted
April 28	April 28	Caribou	restricted
May 1	May 3	Caribou	closed May 1 from 21:00 until 02:00 due to Caribou presence near km 2; road re-opened during the day on May 2 nd but access restricted to light vehicle only; road reopened at 06:00 on May 3 rd
May 4		Caribou	closed to all traffic; construction work allowed to continue between Vault Laydown and km 20
May 5		Caribou	closed
May 6		Caribou	closed due to Caribou presence and poor visibility
May 7		Caribou	closed to all traffic between km 17 and Amaruq because of Caribou migration and snow accumulation
May 8		Caribou	closed to all traffic; visibility near zero at time; no caribou monitoring
May 9		Caribou	closed to all traffic between km 17 and Amaruq
May 10		Caribou	closed except for authorized convoy
May 11		Caribou	closed - weather issue; no caribou monitoring
May 12		Caribou	closed except for authorized convoy lead by environment
May 13		Caribou	restricted all day except for a convoy lead by Environment; Caribou were closer to the road at km 60 to 62.
May 14		Caribou	restricted - open up to km 55 but under restricted access for the remainder of road as Caribou were closer to the road at km 60 to 62
May 15		Caribou	restricted as Caribou were closer to the road at km 17 to 18
May 16		Caribou	closed because wind conditions created low visibility and Caribou presence along the road
May 17		Caribou	closed
May 18		Caribou	closed
May 19		Caribou	closed
May 20		Caribou	closed - weather issue and Caribou migration

Table 3.9: Continued.

Date of Closure	Date Reopened	Cause	Comments
May 21		Caribou	closed - weather issue and Caribou migration
May 22		Caribou	closed - north bound due to Caribou crossing the road at km 1
May 23		Caribou	restricted - weather issue and Caribou migration
May 25		Caribou	closed
May 26		Caribou	restricted tonight to ERT, light vehicles, and services trucks only
May 27	May 27	Caribou	restricted
May 30		Caribou	closed
October 21		Caribou	closed from Meadowbank to km 30 for night shift and remained closed all day of the 22 nd ; more than 500 caribou observed from km 1 to 10 in close vicinity of the road, with infrequent crossings of the road; crew change was allowed under restricted access with the Environmental Department.
October 22	October 23	Caribou	closed to km 30 on the 22 nd for night shift and remained closed during dayshift Oct 23 rd ; approximately 1,000 caribou observed from km 12 to 15 but remained far from the road; crew change and a convoy allowed under restricted access with the Environmental Department; road opened during night shift on the 23 rd and remained open all day on the 24 th .

Agnico Eagle staff was present consistently during the day and monitoring these situations with guidance from the Conservation Officer, HTO and KIA members.

3.6.6 Road-related Wildlife Mortality

The following wildlife mortalities, associated with the Meadowbank AWAR, Vault Haul Road, and Whale Tail Haul Road were recorded in 2018 (**Table 3.10**; see reports in **Appendix D**).

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 were informed that wildlife have a right of way at all times, and that they should stop vehicles and wait for wildlife to cross the road.

No Caribou mortality was associated with the AWAR, Vault Haul Road, and Whale Tail Haul Road in 2018. Cumulative road kill data are provided in **Table 3.11**.

2018 WILDLIFE MONITORING SUMMARY

Table 3.10: Wildlife Mortalities Related to the Meadowbank AWAR, Vault Haul Road, and Whale Tail Haul Road and Non-Mine Related Mortalities.

Date	Species	Count	Mine Related	Location	Comments
27 Feb	Arctic Hare	1	Yes	Meadowbank AWAR km 49	Road-related mortality; cause unknown
08 Aug	Caribou	1	No	Meadowbank AWAR km 29	Apparently not mine related
25 Sep	Arctic Hare	1	Yes	Meadowbank AWAR km 50	Road-related mortality
01 Oct	Caribou ¹	1	?	Meadowbank AWAR	Snow plow hit Caribou but wounded or dead animal not found; appears to have survived
05 Oct	Caribou ²	1	No	100 m east of km 33	Sick or wounded; monitored the area; unlikely to be mine-related
15 Oct	Wolf ²	1	No	100 m east of km 5	Sick or wounded; monitored the area; unlikely to be mine-related
16-Oct	Caribou	1	No	Whale Tail Haul Road km 120	Wolf kill; wolf observed eating a Caribou carcass
15 Nov	Caribou	1	No	Meadowbank AWAR km 95	No action required; wolf kill
21 Nov	Caribou	1	No	Whale Tail Haul km 175	Wolf kill; Caribou remains collected and incinerated
24 Nov	Caribou	1	No	Meadowbank AWAR km 60	Wolf kill; Caribou remains collected and incinerated
06 Dec	Arctic Hare	1	Yes	Whale Tail Haul Road km 171	Road-related mortality
08 Dec	Arctic Hare	1	Yes	Whale Tail Haul km 176	No action required

¹ Caribou hit by snow plow but may have survived as no injured or dead animal found

² Sick or wounded animal observed but not necessarily resulting in mortality

3.7 ACCURACY OF IMPACT PREDICTIONS

Table 3.12 provides a summary of the impact predictions identified in the TEMP (Agnico Eagle 2018). The 2018 AWAR, Vault Haul Road, and Whale Tail Haul Road 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.

3.8 MANAGEMENT RECOMMENDATIONS

The AWAR, Vault Haul Road, and Whale Tail Haul Road survey data are important for documenting time periods when the area near the road is utilized by various wildlife species and for evaluating the need, if any, for implementing adaptive management (e.g., temporary road closures and radio announcements). Moreover, Caribou density can be compared graphically across years, which can be used to track changes in density and preferential migration corridors. The road sections with higher use are prioritized for temporary road closures, speed reductions or additional adaptive management strategies. The road survey data are used in conjunction with satellite-collaring and mortality data to successfully manage road operations during heavy wildlife use periods.

Table 3.11: Summary of Road-related Wildlife Fatality Records (2007 to 2018).

Year	Caribou	Grizzly Bear	Wolverine	Wolf	Fox	Small Mammals	Small Birds	Unidentified Small Animal
AWAR and Vault Haul Road								
2007	3 ¹	0	0	0	0	3	3	0
2008	10 ²	0	0	2	13	7	17	0
2009	1 ³	0	0	0	1	6	2	0
2010	1	0	0	0	2	6	2	0
2011	2 ³	0	0	1	0	5	4	0
2012	2 ⁴	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	0	0	0
Whale Tail Haul Road								
2018	0	0	0	0	0	0	0	0

¹ Two confirmed roadkill cases

² Two apparent roadkill cases

³ Cause of death unconfirmed

⁴ One cause of death unknown

The number and frequency of road surveys in 2018 demonstrate Agnico Eagle's commitment to avoiding impacts to Caribou from the AWAR, Vault Haul Road, and Whale Tail Haul road. Mitigation measures such as reduced speeds and multiple road closures appear to be minimizing road-related mortality. The road survey data suggest that Caribou migration across the road occurred during April and May, and again in October and November 2018, observations supported by collar data (**Section 6.6**). Caribou movement patterns continue to require close monitoring and analysis in 2019.

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Table 3.12: Accuracy of Impact Predictions – Sensory Disturbance and Mortality along the AWAR, Vault Haul Road, and Whale Tail Haul Road.

Potential Effect	Threshold	Threshold Exceeded (2018)	Adaptive Management Implemented	Status
Sensory Disturbance	Mine-related construction and operation activities will not preclude Caribou and Muskoxen from using suitable habitats beyond 1,000 m of the AWAR.	YES. Deflections noted when Caribou approach the road. Delayed crossing of roads.	YES. Multiple road closures and notices. Use of Decision Tree for Management and Monitoring. Ongoing analysis by GN (in partnership with Agnico Eagle)	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys Satellite-collaring data
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. One Caribou struck by a grader but extent of injuries not determined as animal could not be found	YES. Speed limits, notices, road closures and convoys	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys Satellite-collaring data surveys
Project-related Mortality	Predatory mammals will not be killed or injured by vehicle collisions. Threshold level of mortality is two (2) individuals per year.	NO	YES. Speed limits, notices, road closures and convoys)	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys Security surveys
Project-related Mortality	Raptors will not be killed along project roads. Threshold is one (1) individual due to vehicle collision per year.	NO	NO	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys
Project-related Mortality	Waterbirds will not be killed along project roads. Threshold is one (1) individual due to vehicle collision per year.	NO	NO	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys

SECTION 4 • PITS AND MINE SITE GROUND SURVEYS

4.1 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 mine site LSA are not occurring. The program has a strong emphasis on monitoring mortality of various wildlife groups utilizing habitats near the mine site. In addition, the mine site ground survey monitoring program is an integral component of the monitoring strategy for evaluating sensory disturbance indicators for Caribou.

4.2 OBJECTIVES

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

1. Evaluate whether mine-related construction and operation activities preclude Caribou from using suitable habitats beyond 500 m (considered to be an average across various disturbance types) of mine buildings, facilities, and roads. Threshold level within mine facilities is unnatural Caribou use patterns beyond 500 m. The threshold level along roads is unnatural Caribou use patterns beyond 1,000 m (also see **Section 3**);
2. Confirm that Caribou will not be killed through other mine-related mortality such as falling in pits, tailings sludge, or other means. The cumulative mine threshold level of mortality is two (2) individuals per year;
3. Verify that measures are in place such that Grizzly Bears (*Ursus arctos*) or Wolverines will not need to be destroyed at the mine site. The threshold level of mortality for Predatory Mammals is two (2) individuals per year; and
4. Verify that high value habitats (e.g., sedge meadows) are avoided, and all activities within 100 m of a bird nest site during the latter part of the nest stage (fledgling) are avoided.

4.3 DURATION

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

4.4 METHODOLOGY

4.4.1 Mine Site Inspections

In 2018, 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, non-conformities were identified and rapidly addressed by the responsible department.

Weekly inspections included:

- Regular monitoring of Caribou and Muskox near the facilities. Large mammal presence within the mine 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 2018, a minimum of weekly mine-site ground survey inspections were conducted;
- Regular monitoring of all large mammals on the site;
- Regular monitoring of breeding birds (especially in the spring). No active nests were found in 2018 at the Meadowbank site, therefore no additional monitoring occurred; and
- Inspections of waste management areas, bins, and hazardous material storage.

During environment department inspections and wildlife ground surveys, which focus on migratory birds, Ungulates, Arctic Fox, Wolf, Grizzly Bear, and Wolverine, or through general employee observations or incidence reports provided to the environment department, technicians record and follow up as needed to ensure the protection of wildlife near the mine site. These observations, along with monitoring and deterring activities, are recorded in **Appendix E**. Monthly summary reports and wildlife observation data are submitted to the GN, while quarterly reports are submitted to the KIA.

No ancillary construction activity was undertaken without environmental notification and all activities were within the predicted and approved mine footprint or permit area as confirmed through environmental inspections, ground surveys, and coordination with engineering and site services on the mine site. All areas used by the mine have been accepted and approved by regulators and the KIA through submission and acceptance of annual reports and updated management plans.

4.4.2 Incidental Mine Site Wildlife Observations

All mine site personnel, including construction and support staff, are required to document and report wildlife observed within the boundaries of the mine as well as ancillary areas (e.g., AWAR and haul roads). The protocol involves filling out a wildlife log form located in designated areas or by notifying staff in the environment department, which is intended to ensure that potential problem animals are identified. Completed incidental wildlife log forms are collected on a regular basis for review by environmental personnel. Pertinent data, and daily and weekly mine site inspection reports are consolidated and entered into a database (**Appendix E**). Monthly summary reports and wildlife observation data are submitted to the GN. Quarterly reports are submitted to the KIA.

4.5 2018 RESULTS

4.5.1 Incidental Wildlife Observations

Mine site incidental observations were consolidated from the daily and weekly inspection reports, and observations by mine personnel (see **Appendix E**). Observations were used by environmental personnel to monitor wildlife activity within the mine site and identify potential problem animals. A summary of observations that required action is provided in **Table 4.1** while a summary of total wildlife observations by species and month is provided in **Table 4.2**. As expected, total bird sightings were

2018 WILDLIFE MONITORING SUMMARY

highest in summer while Wolverine and Wolf sightings were highest in winter (see **Figure 4.1**). In 2018, peak Caribou sightings were during the post-calving (July), late summer (August), fall rut (October), and early winter (November) periods (**Figure 4.1**).

Table 4.1: Wildlife Presence Requiring Action (from **Appendix E**).

Date	Species	#	Location	Action
02 January	Wolverine	1	Meadowbank	Deterred. Successful.
03 January	Wolf	1	Meadowbank	Deterred. Successful.
03 January	Wolverine	1	Meadowbank	Deterred. Successful.
03 January	Wolverine	1	Meadowbank	Deterred. Successful.
04 January	Wolverine	1	Meadowbank	Deterred. Successful.
04 January	Wolf	1	Meadowbank	Deterred. Successful.
05 January	Wolf	2	Meadowbank	Deterred. Successful.
07 January	Wolf	1	Meadowbank	Deterred. Successful.
07 January	Wolverine	1	Meadowbank	Deterred. Successful.
11 January	Wolf	1	Meadowbank	Deterred. Successful.
12 January	Wolverine	1	Meadowbank	Deterred. Successful.
13 January	Wolverine	1	Meadowbank	Deterred. Successful.
13 January	Wolverine	1	Meadowbank	Deterred. Successful.
22 January	Wolf	1	Meadowbank	Deterred. Successful.
27 January	Caribou	19	Meadowbank	Closed the road
30 January	Wolverine	1	Meadowbank	Deterred. Successful.
06 February	Wolverine	1	Meadowbank	Deterred. Successful.
07 February	Wolf	1	Meadowbank	Deterred. Successful.
07 February	Wolf	1	Meadowbank	Deterred. Successful.
13 February	Wolverine	1	Meadowbank	Deterred. Successful.
23 February	Wolverine	1	Meadowbank	Deterred. Successful.
23 February	Wolverine	1	Meadowbank	Deterred. Successful.
26 February	Wolf	1	Meadowbank	Deterred. Unsuccessful.
08 April	Wolverine	1	Meadowbank	Deterred. Successful.
09 April	Wolverine	1	Meadowbank	Deterred. Successful.
19 April	Wolf	1	Amaruq	Deterred. Unsuccessful.
02 June	Snow Goose	100	Meadowbank	Deterred. Successful.
12 August	Caribou	80	Meadowbank AWAR km 55	Closed the road
12 August	Caribou	21	Meadowbank AWAR km 56.5	Closed the road
13 August	Caribou	60	Meadowbank AWAR km 37	Closed the road
13 August	Caribou	115	Meadowbank AWAR km 56	Closed the road
13 August	Caribou	20	Meadowbank AWAR km 60	Closed the road
21 August	Caribou	800	Meadowbank AWAR km 75	Closed the road

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Table 4.1: Continued.

Date	Species	#	Location	Action
01 October	Wolverine	1	Whale Tail area; Core shack	Deterred. Successful.
31 October	Caribou	1,000	Vault Haul Road	Closed the road
23 November	Caribou	300	Vault Haul Road km 1	Closed the road
06 December	Wolf	1	Pad Q	Deterred. Successful
16 December	Wolf	1	Second Portage Lake	Deterred. Successful
16 December	Wolf	1	Goose Pit	Deterred. Successful
18 December	Wolf	1	Meadowbank AWAR km 101	Deterred. Successful
19 December	Wolverine	1	Landfill	Deterred. Successful

Table 4.2: Total wildlife records by species and month (from Appendix E).

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mammals												
Arctic Fox	4	2	1	7	6	7	6	3	2	1	2	9
Arctic Hare	1	4	2			2	1		2		2	3
Caribou	10	11	7	21	9	37	45	54	12	22	42	10
Grizzly Bear						2		2	2			
Muskox	1		2	1		23	68	17	4	5	3	9
Sik Sik							2					
Weasel											4	
Wolf	19	11	1	11	3	5	8	9	7	6	8	11
Wolverine	25	28	11	11	4	6	7		6	2	5	19
Birds												
Bald Eagle						1		2				
Canada Goose						2	1					
Common Raven										1	2	
Duck						1	1		2			
Peregrine Falcon					2	1	12					
Ptarmigan								2				
Rough-legged Hawk					5		6					
Sandhill Crane					1	1		1				
Snow Goose						3		2				
Snowy Owl				1						1		
Tundra Swan							2					
Total Birds				1	8	9	22	7	2	2	2	

2018 WILDLIFE MONITORING SUMMARY

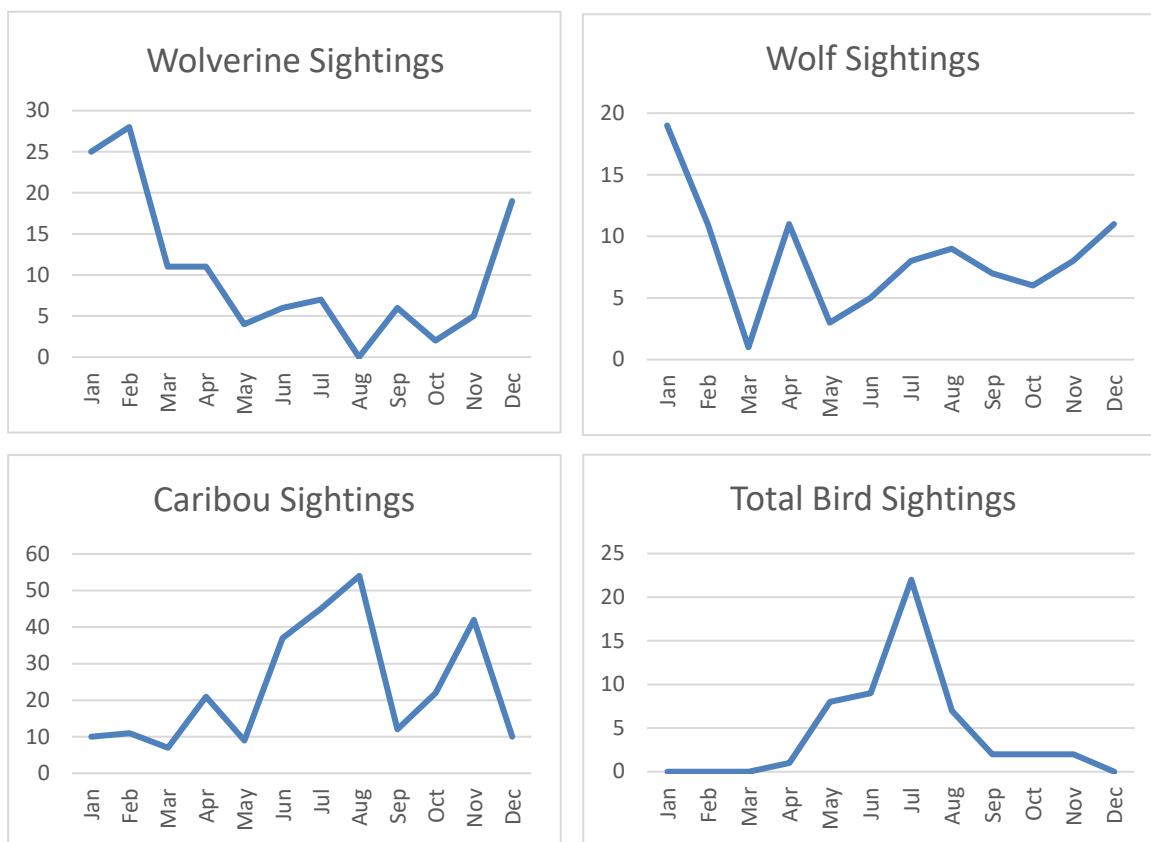


Figure 4.1: Total Incidental Sightings of Wolverine, Wolf, Caribou, and Birds by Month at the Meadowbank and Whale Tail Sites in 2018.

When wildlife was observed in and around the mine site, monitoring frequency increased. In 2018, a high frequency of activity and deterrence action was recorded (41 actions), especially for Wolverine and Wolves in the winter months (i.e., January, February and December) and for Caribou in the late summer (August) and early winter (November) periods (see **Table 4.1**). This degree of human-wildlife interaction at the mine site was not observed in 2017 (23 actions). Deterrence actions implemented in and around the Meadowbank mine site ranged from minimal actions (i.e., blocking the road, approaching animals or herds on foot or by vehicle) to more aggressive use of flares and scare cartridges. In most cases, deterrence proved effective (**Table 4.1** and **Appendix E**).

Trends and unique wildlife observations around the mine site are discussed in the following sections. In a few cases, observations led to direct action to prevent human-wildlife conflict. For example, regular memoranda were distributed suspending all recreation activities and reminding staff of wildlife encounter protocols because of more frequent observations of Wolf and Wolverine around the mine site (see **Appendix F**).

4.5.2 Waterbird Monitoring

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. Waterbird species recorded by mine personnel between June and September included Canada Goose, Snow Goose (*Chen caerulescens*), Tundra Swan (*Cygnus columbianus*), and ducks (see **Table 4.2**). One large flock of 100 Snow Geese was successfully deterred from the Meadowbank site on 02 June (see **Table 4.1**).

4.5.3 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 around project facilities from May to July, with most records in July, while Rough-legged Hawks were observed on several occasions in May and July. Other raptor species observed included Bald Eagle in June and August, and Snowy Owl in April and October (see **Table 4.2** and **Appendix E**). Common Raven was only documented in October and November. No deterrence activities were required for raptors in 2018 (see **Table 4.1**).

4.5.4 Caribou and Muskox Protection

Caribou were observed on a regular and year-round basis in and around the Meadowbank and Whale Tail sites and along the AWAR, Vault Haul Road, and Whale Tail Haul Road in 2018. The highest number of Caribou reports were from June, July, August, October, and November (see **Table 4.2**) with group sizes of up to 800 individuals on 21 August and 1,000 on 31 October (see **Appendix E**). Because of the high numbers of Caribou close to project facilities in 2018, numerous road closures and restrictions were required along the AWAR, Vault Haul Road, and Whale Tail Haul Road (see **Tables 3.4 to 3.6**). Unlike in 2015 and 2016, no attempts were made to deter Caribou; rather, road closures were implemented (see **Table 4.3**).

Muskox individuals and herds, ranging in size from two to 30 individuals, were reported on numerous occasions in 2018 but particularly between June and August (**Table 4.2**; **Appendix E**). No deterrence was needed for any of these observed animals.

4.5.5 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 (see **Table 4.3**). Weekly inspections by environmental personnel provided monitoring data that indicated that Arctic Fox were on site but only one animal needed to be trapped and dispatched (see **Section 4.5.6.3** and **Appendix D**).

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Table 4.3: Summary of Deterrence Activities at the Meadowbank Mine and Whale Tail Sites from 2015 to 2018.

Species	2015	2016	2017	2018
Mammals				
Arctic Fox	6	6	2	
Caribou	10	24		
Red Fox	1			
Wolf	1	4	9	15
Wolverine	5	3	10	17
Birds				
Ducks	2	5		
Ducks & Geese	1			
Geese		3		
Snow Goose				1
Tundra Swan	1			

Wolverines were regularly observed around the Meadowbank and Whale Tail sites primarily during the winter months in 2018 (see **Table 4.2**, **Figure 4.1**, and **Appendix E**). Deterrence actions, which followed the Wildlife Protection and Response Plan (Appendix C in 2018 TEMP), were required on 17 occasions primarily in January and February (**Table 4.1**). One Wolverine, which was not successfully deterred from the site was dispatched on 13 January (see **Section 4.5.6.2** and **Table 4.3**). Well-defined food-handling practices and employee awareness programs have minimized Wolverine fatalities or Wolverine-human interactions; however, an increase in deterrence efforts in 2018 (see **Table 4.3**) will be tracked to determine whether the trend continues in 2019.

Wolves were also regularly observed around the Meadowbank and Whale Tail sites during the winter months in 2018 (see **Table 4.2**, **Figure 1**, and **Appendix E**). Deterrence actions were required on 14 occasions in January, February, April, and December (**Table 4.1**). One Wolf, which was not successfully deterred from the site, was dispatched on 25 January (see **Section 4.5.6.2** and **Table 4.3**). Notices were sent on a weekly basis to Meadowbank employees regarding the presence of wildlife, waste management procedures, and requesting all sea cans and doorways be closed. An increase in deterrence efforts in 2018 (see **Table 4.3**) will be tracked to determine whether the trend continues in 2019.

Grizzly Bears were reported on six occasions in 2018 (**Table 4.2**; **Appendix E**). No deterrence action was required.

4.5.6 Wildlife Mortality – Meadowbank and Whale Tail Sites

A summary of recorded wildlife fatalities near or within the mine site in 2018 is provided in **Table 4.4**, and a summary of fatalities to date is provided in **Table 4.5**. Copies of mortality incident reports can be found in **Appendix D**. All road-related fatalities are tabulated and discussed in **Section 3.6.6**.

Table 4.4: 2018 Mine Site Wildlife Fatality Log.

Date	Species	Count	Mine Related	Location	Comments
13 Jan	Wolverine	1	Yes	Meadowbank	Dispatched after efforts to deter failed; Wildlife Destruction Authorization received.
17 Jan	Arctic Fox	1	Yes	Whale Tail	Dispatched; Wildlife Destruction Authorization received.
25 Jan	Wolf	1	Yes	Meadowbank	Dispatched after efforts to deter failed; Wildlife Destruction Authorization received.
01 Feb	Arctic Fox	1	Yes	Meadowbank	Mine road-related mortality
26 Feb	Wolf	1	?	Meadowbank	Removed the carcass and gave it to the Conservation officers; died of head injury possibly mine-related; did not need to be dispatched
26 Apr	Arctic Fox	1	No	Whale Tail	Monitored the area
26 Apr	Arctic Fox	1	No	Meadowbank	Carcass found; being eaten by a Wolf
17 Sep	Long-tailed Duck	1	Yes	Meadowbank Assay Lab	No action required; may have broken neck by colliding with building
20 Sep	Long-tailed Duck	1	Yes	Meadowbank Assay Lab	No action required; may have broken neck by colliding with building
03 Nov	Wolverine	1	No	Third Portage Lake	Found dead in middle of lake
29 Nov	Arctic Fox	1	Yes	Grease Trap Building	Found dead and removed; holes in building repaired to prevent small animal access

4.5.6.1 Caribou

No Caribou mortalities related to project activities were reported at the mine site in 2018. All incident reports, observations, deterrence activities, and environment team responses to Caribou sightings are included in **Appendix E**. Any Caribou mortalities along the roads are discussed in **Section 3.6.6**.

2018 WILDLIFE MONITORING SUMMARY

Table 4.5: Summary of Mine Site Wildlife Fatality Records for Caribou and Predatory Mammals (2007 to 2018).

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	4 ¹	0	0	1 ²
2016	1 ³	0	0	0
2017	1 ³	0	1	3 ⁴
2018	0	0	1	2 ⁵

¹ One Caribou died of natural causes while three were killed by Wolves.

² Naturally injured Wolf that needed to be euthanized.

³ One Caribou killed by Wolves.

⁴ One Wolf likely killed by Wolverine.

⁵ Wolf died at mine site of head injuries; did not need to be dispatched

4.5.6.2 Predatory Mammals

All incident reports, observations, deterrence activities, and environment team responses to predatory mammal sightings are included in **Appendices E** and **F**.

One Wolverine, which was frequenting the kitchen area of the Meadowbank camp site, was dispatched on 13 January after deterrent efforts failed. Written wildlife destruction authorization was received from the Baker Lake Conservation Officer III, Russell Toolooktook (see **Appendix D**). Increasing wolf sightings around the Meadowbank mine site beginning 11 January resulted in almost daily deterrent efforts that failed to adequately deter the animal (see 'Annexe, Wolf Observation and Detering Actions around Meadowbank Site' in **Appendix D**). On 25 January, following authorization from the Conservation Officer III, the wolf was dispatched. On 26 February, authorization was given to dispatch an injured wolf on site but the animal was found dead shortly thereafter, apparently having died of head wounds.

4.5.6.3 Other Wildlife

On 17 January, an Arctic Fox that had been regularly seen around the Amaruq camp site and was causing some damage to facilities was trapped and euthanized following written wildlife destruction authorization (see **Appendix D**). On 29 November, a dead Arctic Fox was found within the Grease Trap Building. Efforts were made to seal up any holes in the building and to minimize further wildlife incursions. Three other foxes were found dead on the mine site with cause of death related to road-related collisions and wolf predation (see **Appendix D**).

Two dead Long-tailed Ducks (17 and 20 September) were found at the Meadowbank Assay Lab apparently having died following a collision with one of the buildings (see **Appendix D**).

4.6 ACCURACY OF IMPACT PREDICTIONS

Table 4.6 provides a summary of the impact predictions identified in the TEMP (Agnico Eagle 2018) that are evaluated, in part, by the mine site ground surveys. Specifically, the 2018 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.

4.7 MANAGEMENT RECOMMENDATIONS

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

- Continue to conduct informal daily and weekly pit and mine surveys to document wildlife activity and to verify that effects to wildlife are not occurring because of mine-related activities;
- Continue raptor nest monitoring around the Meadowbank and Whale Tail LSAs, and along the AWAR, Vault Haul Road, and Whale Tail Haul Road;
- Continue to apply the Wildlife Protection and Response Plan (Appendix C, 2018 TEMP), 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 re-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; and
- Attempt to gather more detailed information (e.g., sex; age) on deceased animals and include in incident reports.

Table 4.6: Accuracy of Impact Predictions – Mine Site Wildlife Disturbances.

Potential Effect	Threshold	Threshold Exceeded (2018)	Adaptive Management Implemented	Status
Sensory Disturbance	Mine-related construction and operation activities will not preclude Caribou and Muskoxen from using suitable habitats beyond 500 m of mine buildings, facilities and roads.	YES. Deflections noted when Caribou approach the road. Delayed crossing of roads.	YES. Multiple road closures and notices. Use of Decision Tree for Management and Monitoring. Ongoing analysis by GN (in partnership with Agnico Eagle)	Satellite-collaring data Road surveys Daily and weekly pit and mine-site ground surveys Incidental wildlife reporting Motion sensing cameras
Disturbance to Nesting Raptors	Raptor nest failures will not be caused by mine-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
Project-related Mortality	Destruction of two (2) problem Grizzly Bear or Wolverine per year.	NO. One (1) Wolverine dispatched in 2018	NO	Daily and weekly pit and mine-site ground surveys
Project-related Mortality	Two (2) Caribou or Muskoxen mortality per year because of mine-related activities (e.g., falling into pits, tailing, sludge or other means)	NO	NO	Daily and weekly pit and mine-site ground surveys
Project-related Mortality	Waterbirds will not be killed at the mine site. Threshold is one (1) individual per year.	YES. Two (2) dead Long-tailed Ducks found at Meadowbank Assay Lab	YES. Causes of death and potential mitigation options investigated	Daily and weekly pit and mine-site ground surveys

SECTION 5 • WILDLIFE HABITAT MONITORING

5.1 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 Haul Road. 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 due to development to permitted areas, which encompass all proposed development.

5.2 OBJECTIVE

The primary initial objective of the habitat mapping monitoring program was to confirm that habitat losses identified in the TEMP (Agnico Eagle 2018) 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. As indicated above, this approach was difficult to execute due to regular mine plan changes and subsequent approvals. For this 2018 report, habitat losses were 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 **Tables 5.1** and **5.2**, respectively.

Table 5.1: Habitat Mapping Monitoring Parameters, Predicted Footprint Losses, Permitted Areas, and Thresholds for the Meadowbank Mine, AWAR and Vault Haul Road.

Monitoring Parameter	Mine Site Predicted Loss	Mine Site Permitted Area	AWAR / Vault Haul Road 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.

2018 WILDLIFE MONITORING SUMMARY

Table 5.2: 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)		

5.3 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. The next analysis was provided in the 2017 report, although a complete analysis was not possible.

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.

5.4 METHODOLOGY

Monitoring of habitat loss will occur at three primary locations: Meadowbank Mine (includes Vault Pit and Haul Road), AWAR (including quarry sites), and Whale Tail Pit and Haul Road (includes borrow sites and access roads). The calculation of impacted ELC units is based on Agnico Eagle as-built mine and road construction drawings and reports, aerial photographs and satellite imagery, and ground investigations. Newly disturbed areas are delineated using Global Positioning System (GPS) and Geographic Information System (GIS) mapping. For the Meadowbank Mine and AWAR locations, thresholds are disturbance of 5% above permitted areas of 1,532 and 348 ha, respectively. For the Whale Tail and Haul Road location, threshold is disturbance of 5% above a permitted area of 1,473 ha.

5.5 HISTORICAL RESULTS

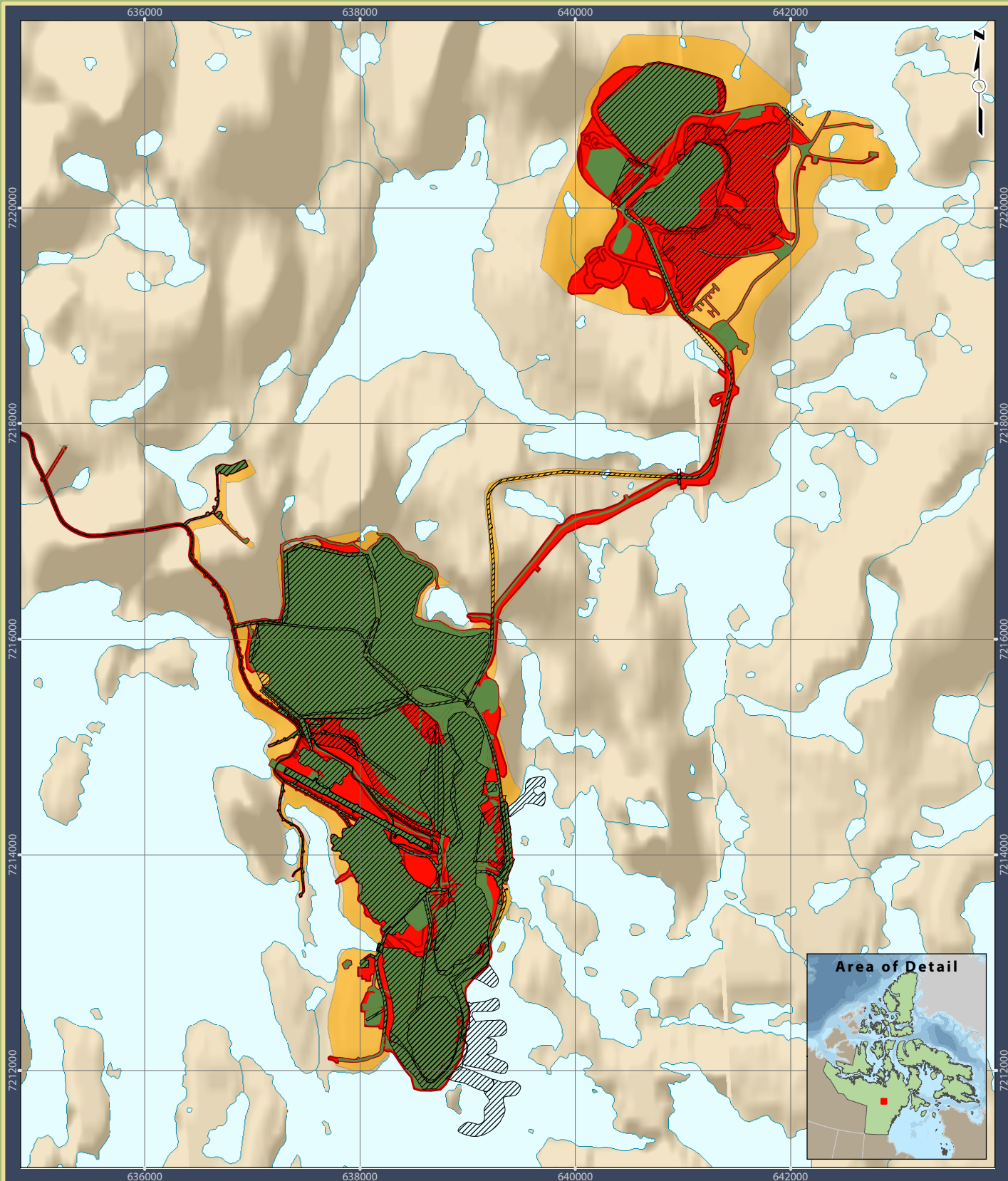
5.5.1 Meadowbank Mine Site

In 2014, most of the Main Site construction was 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 (see **Figure 5.1**). 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. Actual habitat loss for the mine site in 2014 was calculated to be 775.7 ha, which was 91.1 ha 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 (see **Figure 5.1**). 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. Actual habitat loss for the mine site in 2017 was calculated to be 1,021 ha, which was 154 ha more than the predicted total habitat loss of 867 ha for the mine site. The difference between predicted and actual habitat losses is primarily attributable to the final extent of the Vault waste dump, the Phaser Lake extension of the Vault Pit area (i.e., 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.

5.5.2 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 considerably 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 actual High suitability habitat losses were significantly less than predicted losses and no thresholds (i.e., >5 to 10% above predicted losses) were exceeded.



Legend

-  Approved Mine Plan
-  Disturbed Mine Area in 2014
-  Area Disturbed Since 2018
-  Permitted Lease Area in 2018

0 500 1,000 1,500
Metres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited

**Figure 5.1: Meadowbank
Mine Plan Comparison**

Meadowbank Gold Project

Prepared for:



By:



5.6 2018 RESULTS

5.6.1 Meadowbank Mine Site

A thorough habitat loss analysis was conducted in 2018 and habitat loss outcomes were compared to permitted areas (see **Table 5.3** and **Figure 5.1**). For all ELC units, habitat losses were less than the habitat available within permitted areas; therefore, thresholds were not surpassed. Of note is that the predicted losses (i.e., EIS predicted losses plus approved extensions) have not been updated since 2014; therefore, values are compared to permitted areas.

Table 5.3: Meadowbank Mine Site Footprint ELC Unit Totals – 2005 EIS Predictions Plus Approved Extensions, Permitted Areas, 2018 ELC Loss Results, and Differences

ELC Unit	Predicted ELC Unit Losses (ha) (from 2005 EIS plus Approved Extensions) ¹	Permitted Areas (Used in 2018 for Assessment of Effects)	Calculated ELC Unit Losses (ha)			Difference (Between Losses and Permitted Areas)
			2014	2017	2018	
Birch and Riparian Shrub	88.03	202.91	104.97	124.86	142.43	-60.49
Heath Tundra	82.29	145.51	93.47	104.61	116.65	-28.86
Lichen	82.72	175.07	87.67	105.98	119.9	-56.07
Lichen-Rock	25.52	86.45	27.12	37.53	43.67	-42.78
Ridge Crest / Esker / Avens	0.15	0.19	0.07	0.16	0.18	-0.01
Rock and Boulder	70.13	185.13	72.99	99.12	113.15	-71.98
Sedge	151.58	328.03	155.54	192.96	229.05	-98.98
Water	366.42	408.33	233.88	356.00	365.13	-43.19
Total Area	866.84	1,531.63	775.71	1,021.22	1129.26	-402.37

¹ Predicted loss numbers have not been updated since the 2014 report, and the approved extensions do not include the Phaser Lake extension

Similar to the overall habitat loss assessment, high suitability habitat losses for Ungulates, Small Mammals, Waterbirds, and Other Breeding Birds are all well below high suitability habitats available within permitted areas; therefore, no thresholds have been surpassed (see **Table 5.4**).

Table 5.4: Meadowbank Mine Site Predicted and Actual High Suitability Habitat Losses for Ungulates, Small Mammals, Waterbirds, and Other Breeding Birds Compared to Thresholds

Habitat Loss (ha)	Terrestrial Habitat	Ungulate Growing Season	Ungulate Winter Season	Small Mammals	Waterbirds	Breeding Birds
Predicted Loss ¹	1,531	531	407	677	417	736
2010 Value	352	118	69	67	214	146
2012 Value	493	144	99	95	304	197
2014 Value	776	261	208	194	389	354
2017 Value	1,021	318	248	241	549	422
2018 Value	1,129	372	280	488	274	594
% of Predicted Loss	73.7	70.0	68.6	72.2	65.6	80.7
Allowed Threshold (above Predicted Loss)	5%	10%	10%	10%	10%	10%
Threshold Exceedance	No	No	No	No	No	No

¹ Predicted loss in 2018 is based on permitted area and not EIA predicted area plus approved extensions

5.6.2 AWAR

The ELC results for the AWAR have not changed since the 2010 analysis (see **Section 5.5.2**).

5.6.3 Whale Tail Pit and Haul Road

A thorough habitat loss analysis was conducted in 2018 and habitat loss outcomes were compared to permitted areas (see **Table 5.5** and **Figure 5.2**). For all ELC units, habitat losses were less than the habitat available within permitted areas; therefore, thresholds were not surpassed.

As with the overall habitat loss assessment, high suitability habitat losses for Ungulates was well below high suitability habitats available within permitted areas; therefore, no thresholds have been surpassed (see **Table 5.6**).

5.7 ACCURACY OF IMPACT PREDICTIONS

The 2018 habitat loss data were compared to permitted areas (i.e., rather than EIA predicted areas and extensions) to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. Actual habitat loss as result of mine site construction and AWAR development to date is significantly less than habitat available within permitted areas (see **Table 5.7**).

2018 WILDLIFE MONITORING SUMMARY

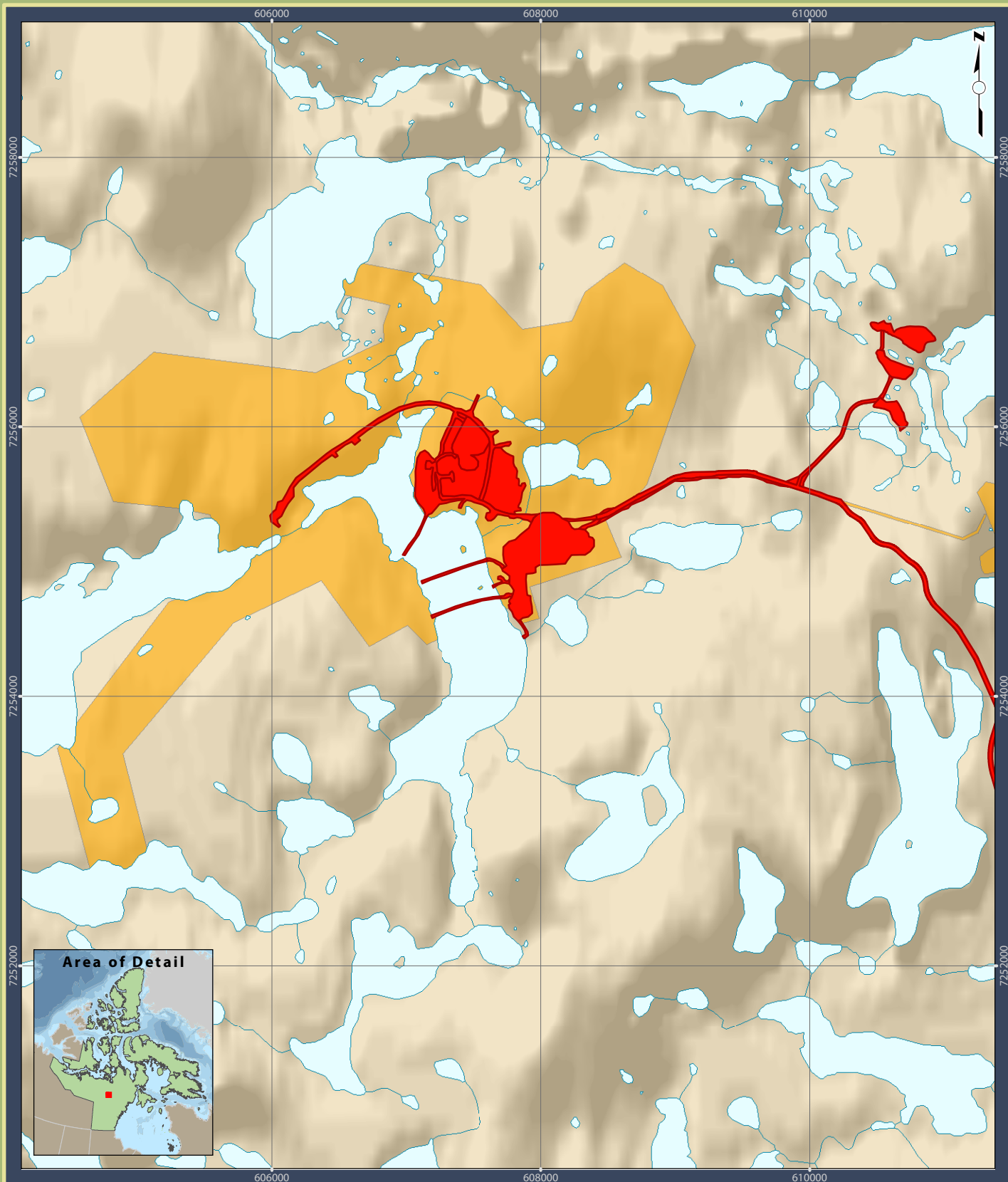
Table 5.5: Whale Tail Pit and Haul Road Footprint ELC Unit Totals – 2005 EIS Predictions Plus Approved Extensions, Permitted Areas, 2018 ELC Loss Results, and Differences

ELC Unit	Permitted Areas (Used in 2018 for Assessment of Effects)	2018 Calculated ELC Unit Losses (ha)	Difference (Between Losses and Permitted Areas)
Boulder/Gravel	113.23	22.41	90.82
Graminoid Tundra	32.89	5.71	27.18
Graminoid / Shrub Tundra	14.23	4.60	9.63
Heath Tundra	212.71	85.33	127.38
Heath Upland	301.02	99.85	201.16
Heath Upland / Rock Complex	12.62	5.89	6.73
Lichen Tundra	88.13	25.89	62.24
Lichen / Rock Complex	460.65	128.48	332.17
Sand	16.47	8.66	7.81
Shrub Tundra	10.83	3.09	7.73
Shrub / Heath Tundra	21.56	6.67	14.89
Water	181.47	5.35	176.12
Wet Graminoid	7.01	0.31	6.70
Total Area	1472.80	402.22	1070.57

Table 5.6: Whale Tail Pit and Haul Road Predicted and Actual High Suitability Habitat Losses for Ungulates Compared to Thresholds

Habitat Loss (ha)	Terrestrial Habitat	Ungulate Growing Season	Ungulate Winter Season
Predicted Loss ¹	1,473	76	602
2018 Value	402	17	2011
% of Predicted Loss	27.3	22.8	35.1
Allowed Threshold (above Predicted Loss)	5%	10%	10%
Threshold Exceedance	No	No	No

¹ Predicted loss in 2018 is based on permitted area and not EIA predicted area plus approved extensions



Legend

- Area Disturbed Since 2018
- Permitted Lease Area in 2018

0 500 1,000
Metres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited

**Figure 5.2: Whale Tail
Plan Comparison**

Meadowbank Gold Project

Prepared for:



By:



Table 5.7: Accuracy of Impact Predictions – Habitat Loss

Measurable Parameter	Threshold (Compared to Permitted Areas)	Threshold Exceeded (2018)	Adaptive Management Implemented	Status
Habitat Loss	Terrestrial Habitat Meadowbank = 1,532 ha AWAR = 348 ha Whale Tail = 1,473 ha Threshold is >5% habitat loss of permitted area	NO	None required	Ground Surveys Mapping and GIS analyses – ELC habitat mapping
	Ungulates Meadowbank Growing = 531 ha Winter = 407 ha Whale Tail Growing = 76 ha Winter = 602 ha	NO	None required	
	Small Mammals Waterbirds Breeding Birds	Given the minimal effects associated with the Meadowbank project, habitat loss effects were screened out during the EA (Golder 2016)		
	Following mine closure and reclamation activities (except for tailings, waste rock facilities and exposed pit slopes) will see re-vegetation rates of >20% (year 2 post-closure), >40% (year 5), >60% (year 8) and >80% (year 11)	Not Yet Applicable		

5.8 MANAGEMENT RECOMMENDATIONS

Calculated habitat loss for the project are well below habitats available within the permitted areas, as are high suitability habitat losses for wildlife VECs.

Where unnecessary and unplanned habitat degradation has occurred, measures will be taken to reclaim or rejuvenate these areas. Measures may involve removal of contaminated soil, placement of stockpiled native soils, reseeding (e.g., native-grass cultivars and forbs such as nitrogen-fixing legumes), and transplanting of vegetation.

SECTION 6 • CARIBOU SATELLITE-COLLARING PROGRAM

6.1 OVERVIEW

Agnico Eagle continues to collaborate with the GN DoE in a Caribou satellite-collaring program that includes data collected within the Meadowbank RSA, as per the recently renewed (2017) MOU with government partners. 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.

6.2 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. 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 2018 TEMP).

To determine whether Caribou approaching the mine and roads are being disturbed (e.g., if their movement is deflected to avoid the project), a comprehensive analysis of satellite collaring data since 2008 will be undertaken collaboratively by the GN and Agnico Eagle, but led by the GN. Results of the analysis will be included in a subsequent annual Wildlife Monitoring Summary Report. Agnico Eagle has also initiated an analysis to explore the extent of a potential Zone of Influence (ZOI) for Caribou from the project and will provide this information when available.

6.3 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 will continue in 2019.

6.4 METHODOLOGY

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 regularly¹ 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) that best fits the animal's movement characteristics.

6.5 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 117 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:

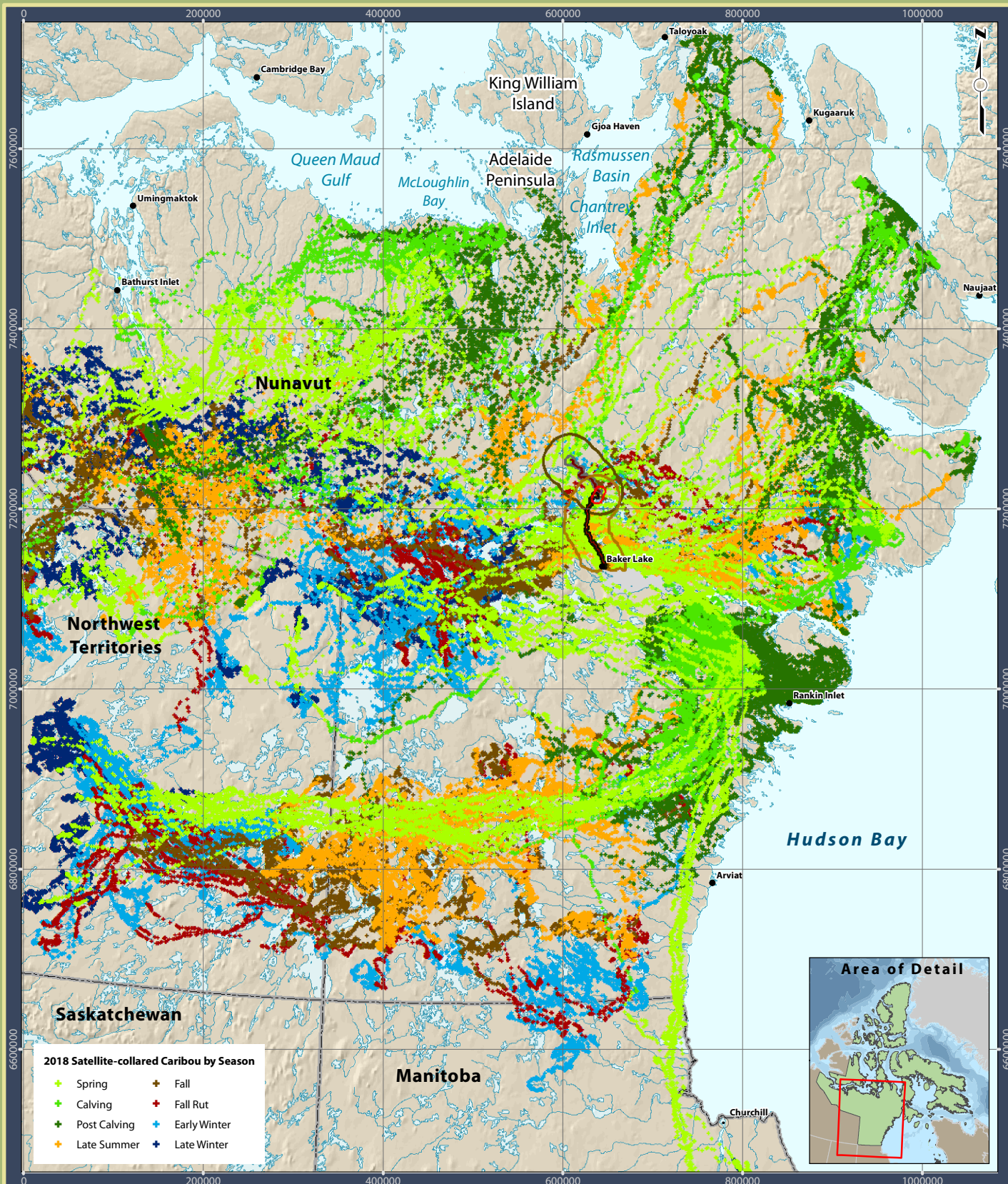
- 9 collars (Agnico Eagle) in May 2008;
- 21 collars (shared by Agnico Eagle and AREVA) in November 2009;
- 13 collars (Agnico Eagle) in April 2011;
- 15 collars (shared by Agnico Eagle and AREVA) in April 2013;
- 10 collars (Agnico Eagle) in April 2015; and
- 13 collars (Agnico Eagle) in May 2016.
-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

Also included in **Section 6** figures are collared Caribou from the Qamanirjuaq herd, which are part of a separate GN program. 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).

6.6 2018 RESULTS

At the beginning of the 2018 monitoring year, only 10 collars were active, including four from the 2015 deployment and six from the 2016 deployment. In April 2018, a further 36 collars were deployed in the Baker Lake area. By the end of 2018, a total of 40 collars were active, comprised of three from the 2015 deployment, four from 2016 deployment, and 33 from the 2018 deployment. A summary of 2018 locations and movement patterns for Caribou collared around Baker Lake by season is described below and summarized in **Figure 6.1**. Seasonal movements of collared Caribou in close proximity to the Meadowbank RSA and LSA in 2018 are shown in **Figure 6.2**.

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



2018 Satellite-collared Caribou by Season

- Spring
- Calving
- Post Calving
- Late Summer
- Fall
- Fall Rut
- Early Winter
- Late Winter

Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)

0 50 100 150
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:

Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories



**Figure 6.1: 2018 Government of
Nunavut and Northwest Territories
Telemetry Program Collar Locations**

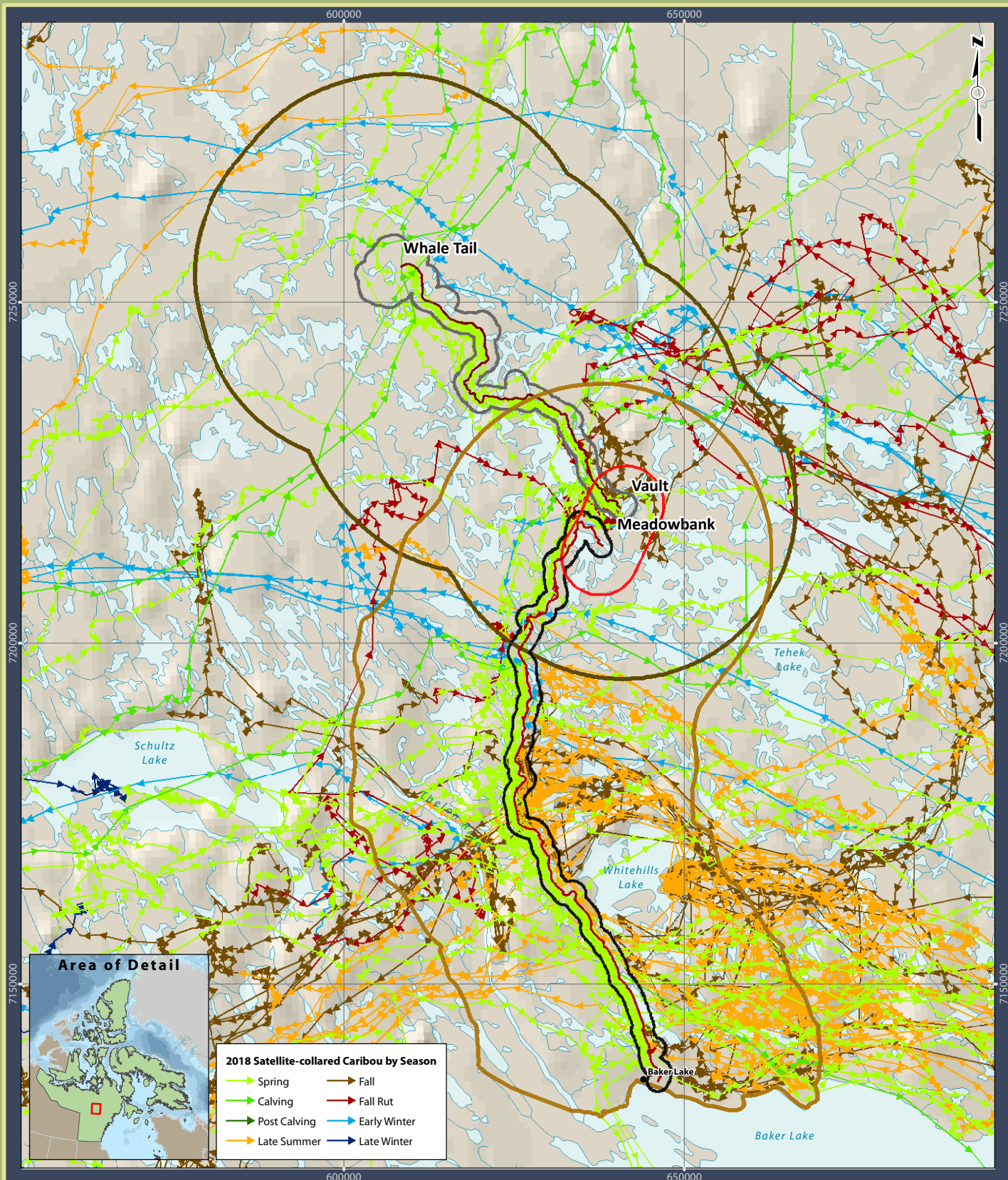
Meadowbank Gold Project

Prepared for:



By:





Legend

- All-Weather Access Road
- Whale Tail Haul Road
- ▭ Meadowbank Local Study Area (LSA)
- ▭ Meadowbank All-Weather Access Road Local Study Area (LSA)
- ▭ Meadowbank Regional Study Area (RSA)
- ▭ Whale Tail Pit and Haul Road Local Study Area (LSA)
- ▭ Whale Tail Pit and Haul Road Regional Study Area (RSA)

0 10 20 30
Kilometres

Projection: UTM Zone 14 NAD83



Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories

Figure 6.2: 2018 Caribou Telemetry Data – Collar Movements in the RSA

Meadowbank Gold Project

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By:



2018 WILDLIFE MONITORING SUMMARY

Movements for Qamanirjuaq herd collared animals, a program also supported by Agnico Eagle, and animals collared by the Government of the Northwest Territories (GNWT) are provided for context in **Figure 6.1**. No additional collaring of the Qamanirjuaq herd was conducted in 2018; however, 43 collars were active (i.e., 12 from the 2015 deployment, 8 from 2016, and 23 from 2017) and monitoring movements of the Qamanirjuaq herd at the end of 2018. Seasonal movements of all collared Caribou are discussed below.

Late Winter (January 1 to March 31)

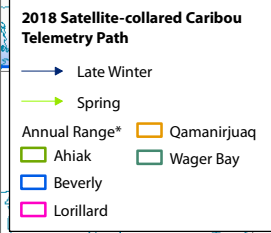
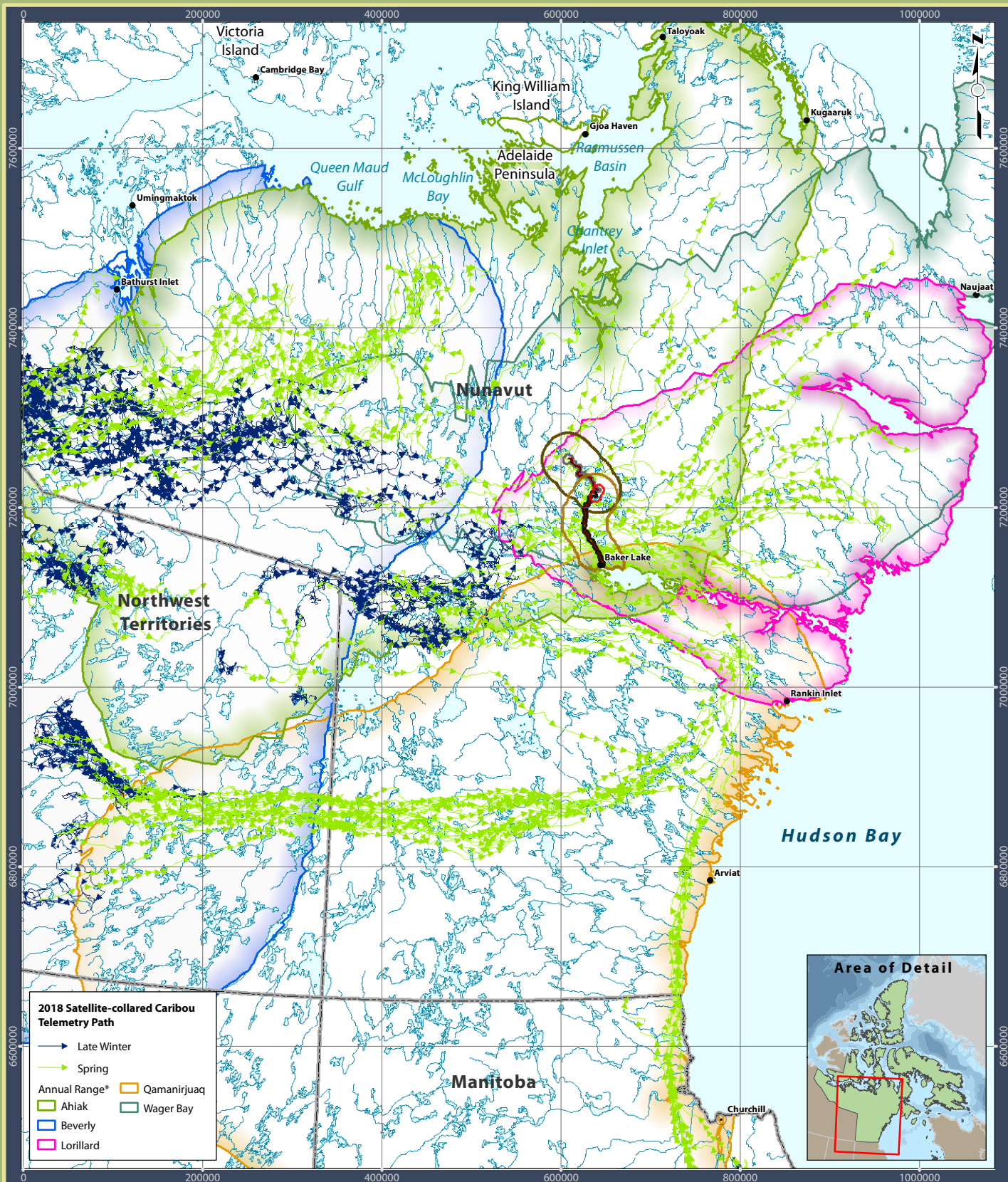
During the late winter season in 2018, a large group of animals collared around Baker Lake was found well west of the Meadowbank and Whale Tail RSAs in a broad area north and south of the Thelon River (**Figure 6.3**). Most of these animals were from the Lorillard, Wager Bay, and Ahiak herds, but some were also from the Qamanirjuaq herd, which typically does not intermingle with the other three herds. Another large group of Qamanirjuaq collared animals were present in the northeast corner of the Northwest Territories while a third group was present in eastern Manitoba south of Churchill. Unlike in 2017, no collared animals were found in northern Saskatchewan in 2018. Collared animals wintering in northwestern Nunavut and south of Bathurst Inlet were primarily from the Beverly herd.

To date, Caribou collared in the Baker Lake area have not been present within the Meadowbank or Whale Tail LSAs or RSAs during the late winter season; however, historical data for other satellite-collared animals have shown wintering Caribou from the Lorillard, Wager Bay, and Qamanirjuaq herds as occurring within the Meadowbank RSA. Mine site ground surveys did observe small groups of Caribou during the late winter season on a number of occasions (see **Table 4.2** and **Appendix E**) but only a 27 January observation of 19 Caribou resulted in a road closure (see **Table 4.1**).

Spring (April 1 to May 25)

Many collared animals were present throughout the Meadowbank and Whale Tail RSAs and LSAs during spring 2018 (**Figures 6.2, 6.3** and **6.8**). Collared animals were primarily from the Lorillard herd, but individuals from the Wager Bay and Ahiak herds were also present. **Figure 6.2** clearly shows an interaction with the Meadowbank AWAR and Whale Tail Haul Road on the western migration. The large number of Caribou moving through the area required multiple road closures on the Meadowbank AWAR, Vault Haul Road, and Whale Tail Haul Road (see **Tables 3.4** to **3.6**, respectfully). Collared Caribou eventually made their way across the road, which may have been in response to the multiple road closures.

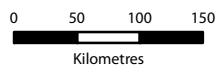
Collared individuals wintering in the Bathurst Inlet area moved toward the Beverly and Ahiak calving grounds but did not migrate near the Meadowbank RSA (**Figure 6.3**). Qamanirjuaq collared animals underwent an extensive eastern migration from the two primary wintering areas in Nunavut and Northwest Territories and a northern migration from Manitoba wintering grounds. Collared animals from all three groups migrated toward calving grounds south of Chesterfield Inlet between Rankin Inlet and Baker Lake.



Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank Local Study Area (LSA)
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)

* Official home ranges and calving grounds are from the following publication:
Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly,
M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou
(*Rangifer tarandus* L.) in arctic and subarctic Canada. *Ecological Applications*
[doi:10.1890/10-1410.1].



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories

Figure 6.3: 2018 Caribou Telemetry Data – Late Winter and Spring Seasons (January 1 - May 25)

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By:



2018 WILDLIFE MONITORING SUMMARY

Calving (May 26 to June 25)

Several collared animals from the Wager Bay and Ahiak herds moved quickly through the Meadowbank and Whale Tail study areas in a northeast direction early during the calving period (see **Figures 6.2** and **6.4**). A few road closures were necessary along the Whale Tail Road in late May as lingering animals migrated through the area (see **Table 3.6**). No collared Caribou remained within the Meadowbank and Whale Tail RSAs during the calving season. Interestingly, many small groups of Caribou were recorded during the calving period within the Meadowbank and Whale Tail LSAs by mine personnel (see **Table 4.2** and **Appendix E**). Primary behavior recorded was walking and grazing and no indications of calving were noted (see **Appendix E**).

Many of the Baker Lake collared animals headed east to calving grounds between Chesterfield Inlet and Wager Bay (Lorillard herd), and north of Wager Bay (Wager Bay herd) (see **Figure 6.4**). Most of the collared Caribou from the Qamanirjuaq herd remained near their traditional calving grounds south of Chesterfield Inlet but a few individuals migrated north across Chesterfield Inlet to the Lorillard herd calving grounds early during the calving period. Presumably these were Lorillard individuals that had wintered with the one group of Qamanirjuaq animals near the Thelon River.

Other collared Caribou (Ahiak and Beverly herds) spent the calving season south of Adelaide Peninsula, in the vicinity of McIoughlin Bay, and east of Rasmussen Basin (**Figure 6.4**).

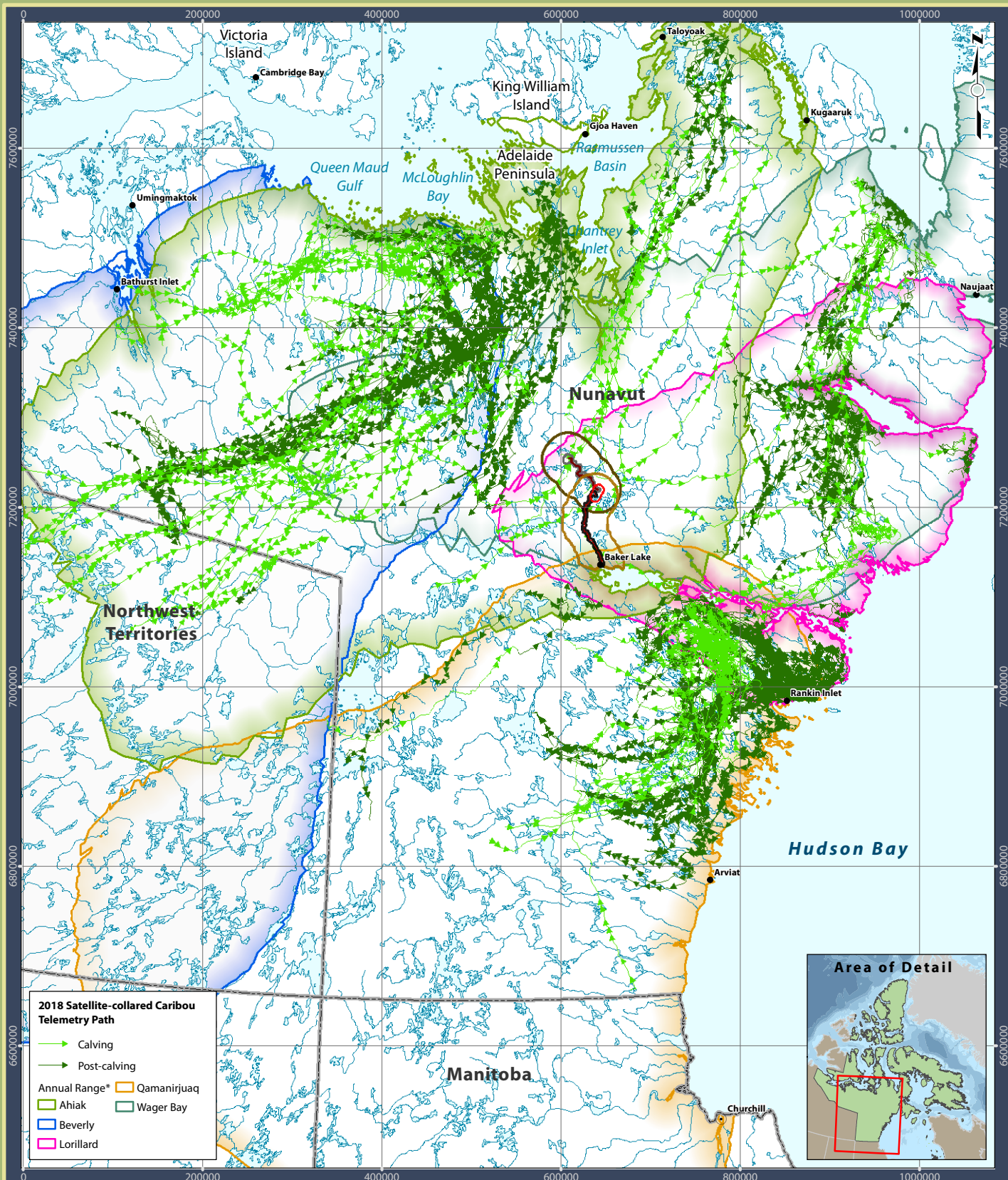
Post-Calving (June 25 to July 31)

No collared Caribou were recorded within the Meadowbank or Whale Tail RSAs during the post-calving season in 2018 although Caribou were commonly reported by mine personnel (see **Table 4.2** and **Appendix E**). Each of the herds exhibited variable migrations following the calving season. Collared animals from the more northern Wager Bay calving grounds lingered in the area north of Wager Bay, while Lorillard animals remained between Wager Bay and Chesterfield Inlet (**Figure 6.4**). Beverly and Ahiak animals first moved east to just west of Chantrey Inlet and then began a fairly rapid migration in a southern and southwestern direction. Qamanirjuaq collared animals first moved east to an area north of Rankin Inlet and then in a southwest direction to an area northwest of Arviat (**Figure 6.4**).

Late Summer (August 1 to September 15)

Collared Caribou from the Lorillard and Wager Bay herds migrated south and then west interacting with the Meadowbank AWAR (see **Figures 6.2, 6.5** and **6.8**). The road again appeared to act as a barrier for a period of time although all collared animals eventually making their way across. It also appears that some of the animals approaching the road in late summer were deflected and did not cross the road until the fall (see next section) (see **Figure 6.8**). Observations from mine site records during this period were of small to medium-sized groups of Caribou along the Meadowbank AWAR and Whale Tail Haul Road (see **Appendix E**). In several instances, the road needed to be closed to allow Caribou to pass (see **Table 4.1**).

Collared animals from the Ahiak and Beverly herds continued to move in a southern and western direction while Qamanirjuaq collared animals moved eastward with some animals reaching northwestern Northwest Territories by the end of late summer (**Figure 6.5**).



Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank Local Study Area (LSA)
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)

* Official home ranges and calving grounds are from the following publication: Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly, M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou (*Rangifer tarandus* L.) in arctic and subarctic Canada. *Ecological Applications* [doi:10.1890/10-1410.1].



0 50 100 150
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories

Figure 6.4: 2018 Caribou Telemetry Data – Calving and Post-calving Seasons (May 26 - July 31)

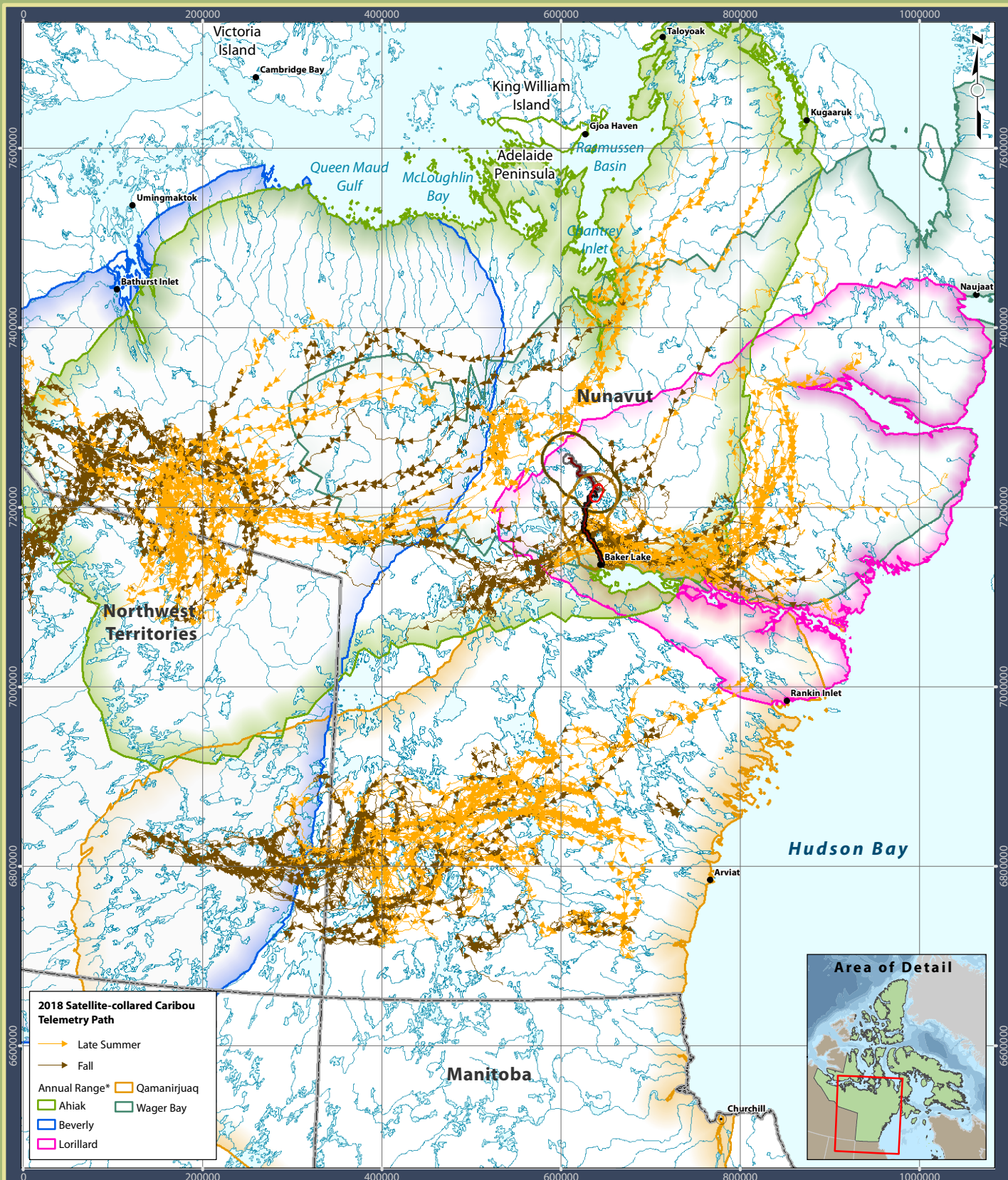
Meadowbank Gold Project

Prepared for:



By:





Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank Local Study Area (LSA)
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)

* Official home ranges and calving grounds are from the following publication:
Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly,
M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou
(*Rangifer tarandus* L.) in arctic and subarctic Canada. Ecological Applications
[doi:10.1890/1051-0761(2011)21[1410:SSC]2.0.CO;2].

0 50 100 150
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:

Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories



**Figure 6.5: 2018 Caribou Telemetry
Data – Late Summer and Fall Seasons
(August 1 - October 14)**

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By:



Fall (September 16 to October 14)

Some of the Lorillard and Wager Bay animals that did not cross the Meadowbank Road during late summer crossed successfully during the fall season, particularly those animals north of Whitehills Lake (see **Figures 6.2, 6.5 and 6.8**). Others, primarily along the Whale Tail Haul Road north of the Vault and south of Whitehills Lake appeared to move away from the road in a northeastern direction, remaining east of the road during the fall rut (see **Figures 6.2 and 6.8**). Mine records indicate that small to moderate groups of Caribou were seen within the mine LSAs during the fall period (see **Table 4.2 and Appendix E**). Only one road closure on 27 September along the Meadowbank AWAR was required during this period (see **Table 3.4 and Table 4.1**).

Collared animals from the Ahiak and Beverly herds continued to migrate in a southwestern direction and were generally located south of Bathurst Inlet (**Figure 6.5**). Collared Qamanirjuaq animals continued moving eastward into northwestern Northwest Territories (**Figure 6.5**).

Fall Rut (October 15 to November 7)

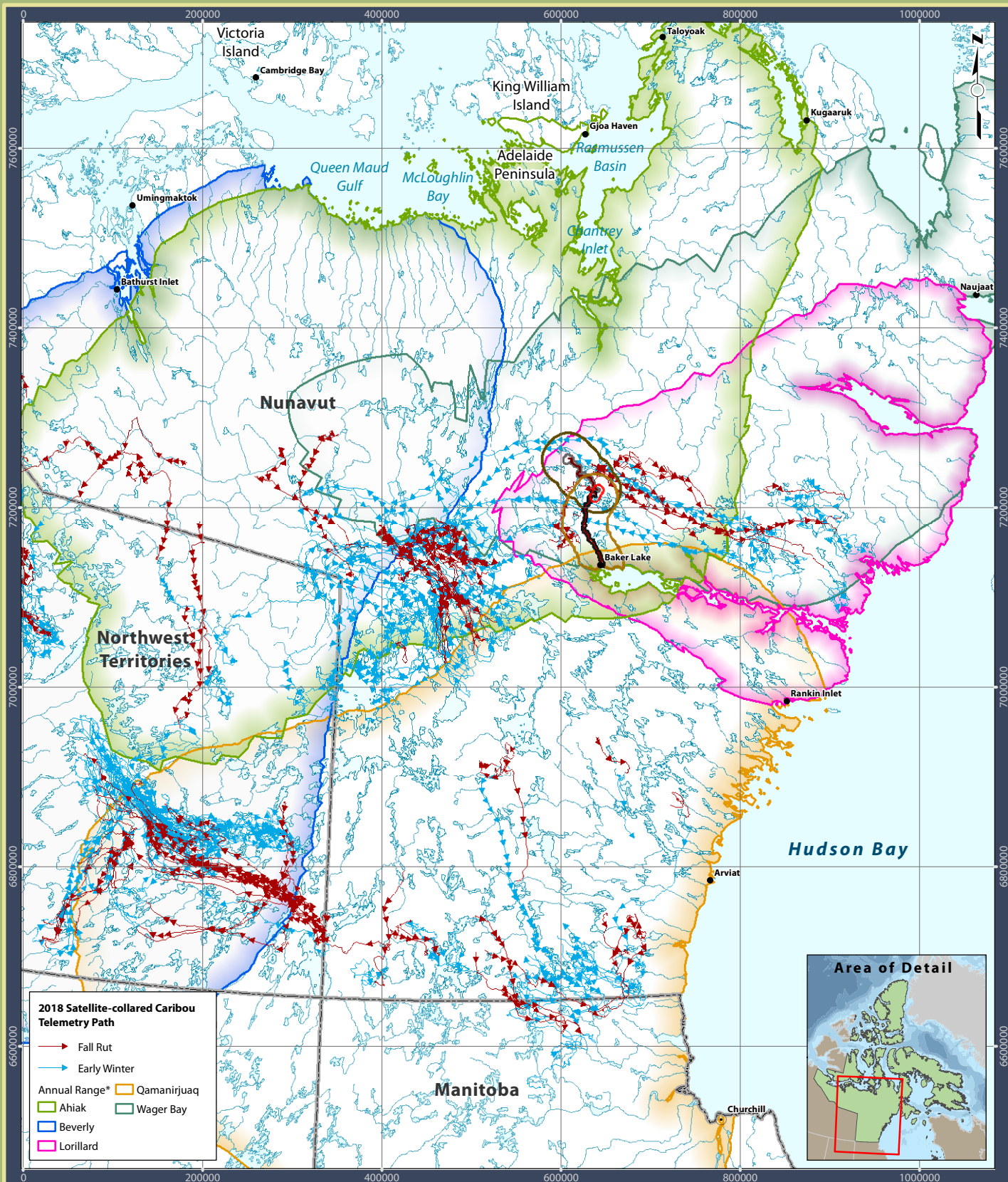
Limited activity by collared Caribou occurred within the RSAs during the fall rut (see **Figures 6.2 and 6.6**). Activity was noted west of the Meadowbank AWAR opposite Whitehills Lake and northeast and east of the Vault and Meadowbank Mine sites (**Figure 6.2**). Herds of up to 1,000 Caribou were observed during this period primarily along the AWAR and both haul roads (see **Table 4.1 and Appendix E**), and the Vault and Whale Tail haul roads were all closed or under restricted access at different times at the end of October (see **Tables 3.5 and 3.6**).

During the fall rut season, collared Caribou were generally distributed in four discrete areas. The Lorillard herd was observed west of Baker Lake and east of the Meadowbank Mine site while the Qamanirjuaq herd was located in northeastern Northwest Territories and along the Manitoba/Nunavut border (**Figure 6.6**). Ahiak and Beverly collared animals were well to the west in northern Northwest Territories.

Early Winter (November 8 to December 31)

Some of the collared animals that had spent the fall rut east of the Meadowbank RSA moved westward toward an area north of the Thelon River (**Figure 6.6**). Two animals moved across the Meadowbank AWAR south of Tehek Lake while three individuals migrated through the Whale Tail RSA north of the Whale Tail site (see **Figure 6.2**). Up to 300 Caribou were observed along the Vault Road on 23 November requiring temporary closure of the road (see **Table 4.1 and Appendix E**).

Other early winter locations for collared animals included an area between Chesterfield Inlet and Wager Bay (Lorillard herd), the Thelon River and Aberdeen Lake area (Lorillard, Wager Bay and Ahiak herds), the Manitoba/Nunavut border (Qamanirjuaq herd), northwestern Northwest Territories (Qamanirjuaq herd), and northern Northwest Territories (Ahiak and Beverly herds) (**Figure 6.6**).



* Official home ranges and calving grounds are from the following publication: Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly, M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou (*Rangifer tarandus* L.) in arctic and subarctic Canada. *Ecological Applications* [doi:10.1890/10-1410.1].



0 50 100 150
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories

Figure 6.6: 2018 Caribou Telemetry Data – Fall Rut and Early Winter Seasons (October 15 - December 31)

Meadowbank Gold Project

Prepared for:



By:



2018 WILDLIFE MONITORING SUMMARY

All Seasons

An overview of collared Caribou distribution in 2018 for all seasons is provided in **Figure 6.1**. These data include all remaining active collars from 2015, 2016, and 2018 deployments around the Baker Lake area. General trends in seasonal distribution are evident and generally comparable to findings from previous years for animals collared in this area. Collared Caribou calved (medium green symbol) in five distinct areas: 1) around McLoughlin Bay and Rasmussen Basin and Kugaaruk (Ahiak herd); 2) north and west of Repulse Bay (Wager Bay herd); 3) between Chesterfield Inlet and Wager Bay, towards Hudson Bay (Lorillard herd); 4) south of Chesterfield Inlet in the traditional calving grounds of the Qamanirjuaq herd; and 5) along the Queen Maud Gulf and McLoughlin Bay (Beverly). By the end of 2018, collared animals were congregated either between Aberdeen Lake and Dubawnt Lake, on Qamanirjuaq wintering grounds in the Northwest Territories or between Churchill and Arviat, and in northern Northwest Territories.

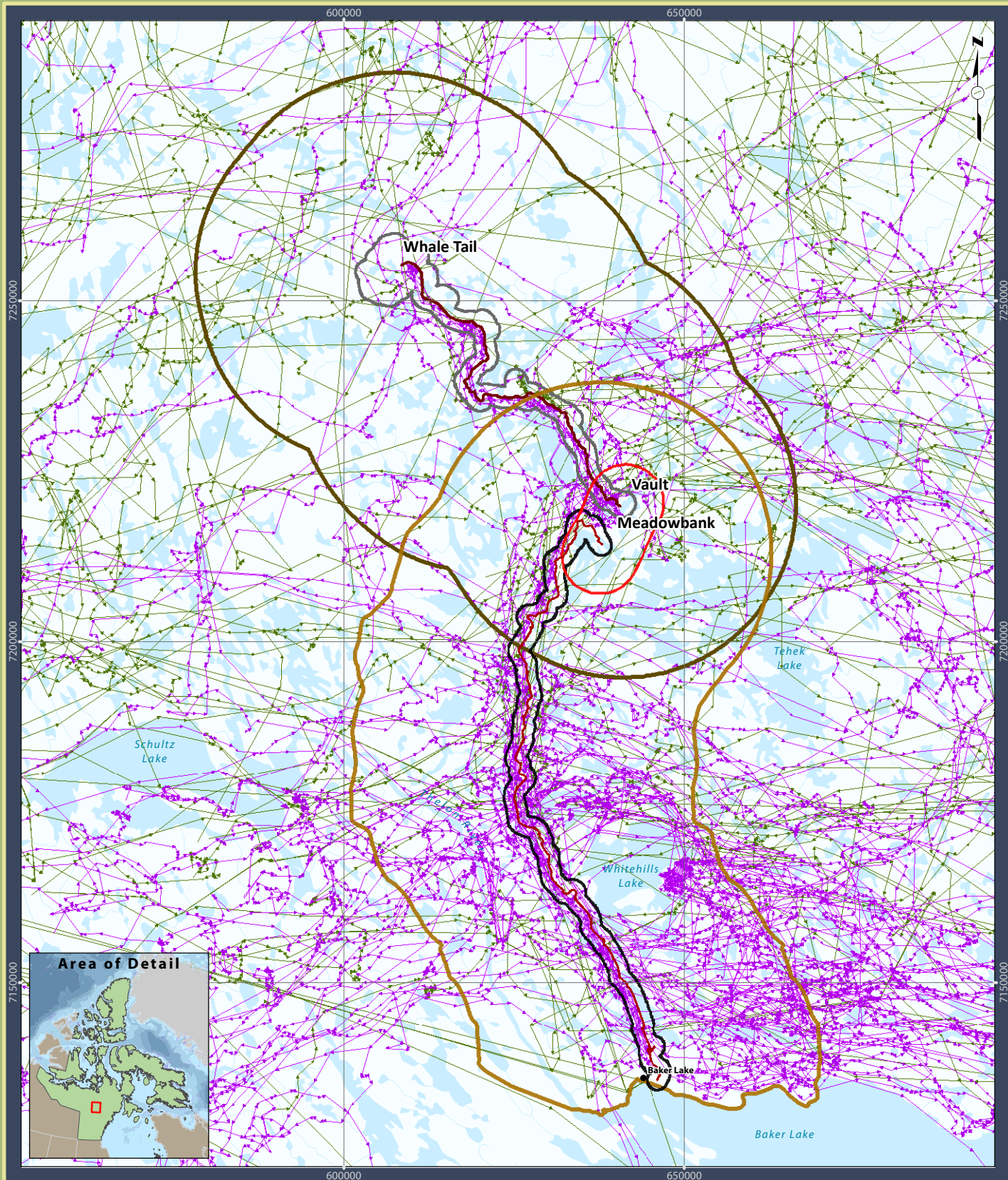
As in most monitoring years to date, few collared Caribou were found within the Meadowbank and Whale Tail RSAs during the calving or post-calving seasons. In addition, no collared individuals were found in the RSAs during the late winter season. Within the Meadowbank and Whale Tail RSAs, collared Caribou were present predominantly during the spring, late summer, and fall periods (**Figure 6.2**). As was the case in 2016, many collared Caribou appeared to be deflected by the Meadowbank AWAR and the Whale Tail Haul Road resulting in delays in migrating across the roads (**Figures 6.2 and 6.8**).

At the end of 2018, 40 satellite collars originally deployed near Baker Lake continued to be active and tracked, with results being downloaded on a regular basis. Caribou collaring maps are posted at the Meadowbank mine site for staff to observe; however, maps are slightly out of date and do not depict current locations (i.e., in order not to facilitate hunting pressure).

6.7 CARIBOU MIGRATION PATTERNS

A summary of Caribou migration patterns, which synthesizes migration information from satellite-collaring data to 2012 and was developed by the GN for the spring and fall migrations, was provided in the 2014 annual report. The seasonal range maps are currently being updated by the GN and will include an update on migration corridors. As these figures have not been updated, they are not discussed in this year's report.

Figure 6.7 shows all walk lines of collared Caribou within the Meadowbank RSA since 2011 (i.e., eight years of data). Collared animals are observed throughout the RSA (typically around spring and fall migratory periods). A pattern of animals being deflected from the AWAR is evident based on an analysis of data from 2011 to 2018 (**Figures 6.7 and 6.8**).



- Legend**
- All-Weather Access Road
 - Whale Tail Haul Road
 - ▭ Meadowbank Local Study Area (LSA)
 - ▭ Meadowbank All-Weather Access Road Local Study Area (LSA)
 - ▭ Meadowbank Regional Study Area (RSA)
 - ▭ Whale Tail Pit and Haul Road Local Study Area (LSA)
 - ▭ Whale Tail Pit and Haul Road Regional Study Area (RSA)
 - Satellite-collared Caribou 2018
 - Satellite-collared Caribou 2011-2017

0 10 20 30
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories



Figure 6.7: Comparison of 2018 Caribou Telemetry Data in the Meadowbank and Whale Tail RSA to Historic Data (2011-2017)

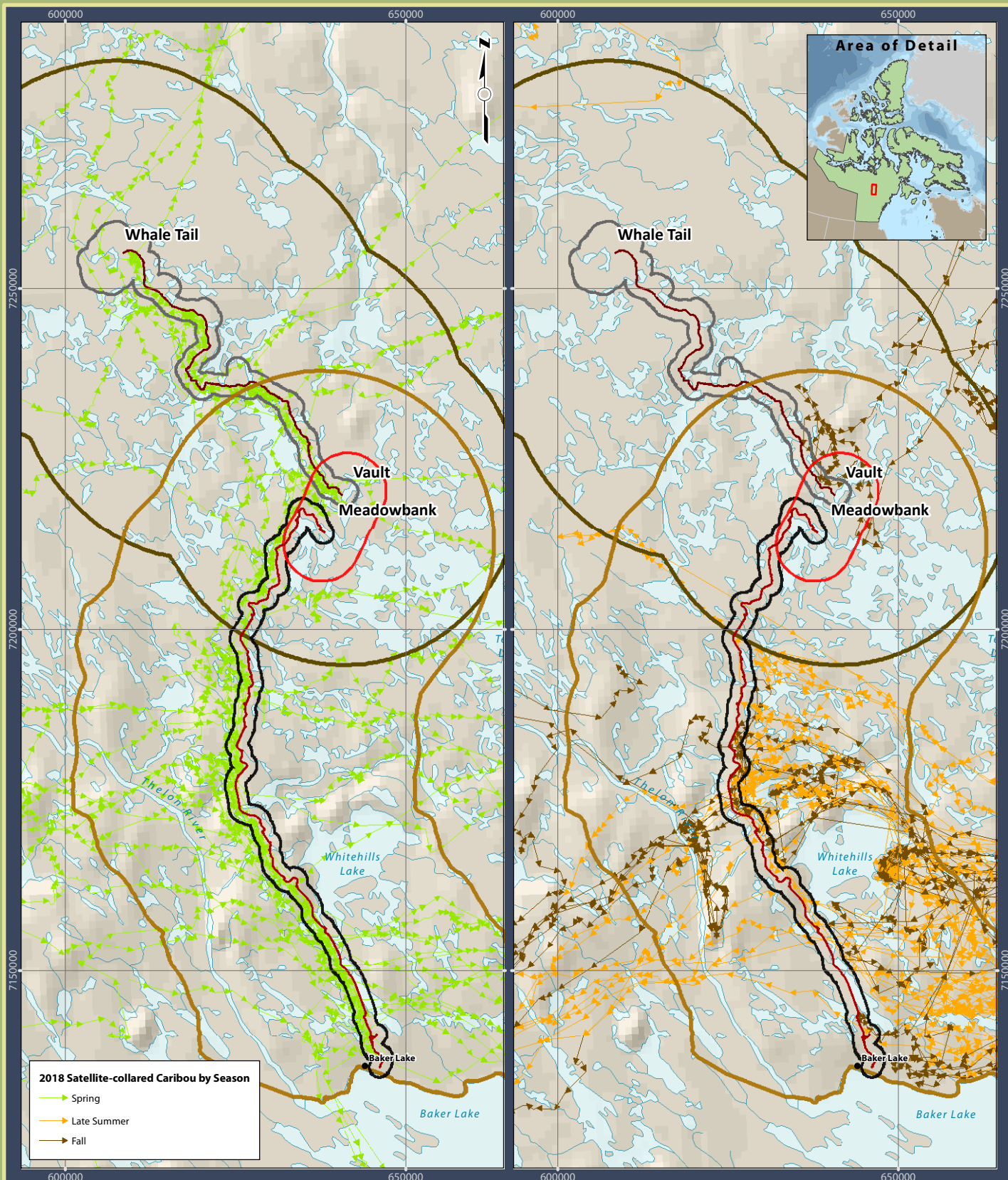
Meadowbank Gold Project

Prepared for:



By:





Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank Local Study Area (LSA)
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database,
Agnico-Eagle Mines Limited,
Department of Environment
(Gov't of Nunavut),
Gov't of Northwest Territories



**Figure 6.8: Collar movements
in the RSA by season**

Meadowbank Gold Project

Prepared for:



By:



6.8 ACCURACY OF IMPACT PREDICTIONS

A summary of the impact predictions identified in the TEMP is provided in **Table 6.1**. The 2018 satellite-collaring 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.

Table 6.1: Accuracy of Impact Predictions – Satellite-collaring Data

Potential Effect	Threshold	Threshold Exceeded (2018)	Adaptive Management Implemented	Status
Sensory Disturbance	Mine-related construction and operation activities will not preclude Caribou and Muskoxen from using suitable habitats beyond 500 m of mine buildings, facilities and roads. Threshold is unnatural caribou use patterns beyond 1,000 m.	YES. Deflections noted when Caribou approach the road. Delayed crossing of roads.	YES. Multiple road closures and notices. Use of Decision Tree for management and monitoring. Ongoing analysis by GN (in partnership with Agnico Eagle)	Satellite-collaring data Daily and weekly pit and mine-site ground surveys AWAR and Haul Road surveys HOL Surveys Motion sensing cameras
Hunting by Baker Lake Residents	Caribou herds will not be significantly affected by year-round access to the RSA.	Not completed in 2018	NA	Satellite-collaring data Hunter Harvest Study

6.9 MANAGEMENT RECOMMENDATIONS

The 2018 satellite-collaring data depicted Caribou movements within and through the Meadowbank and Whale Tail RSAs and LSAs during most seasons but particularly during spring, late summer, and fall. Most 2018 Caribou activity was observed during the spring migration requiring numerous road closures and restrictions along the Meadowbank AWAR and the haul roads. The roads were also observed to be deflecting many of the collared Caribou during the spring, late summer, and fall seasons (**Figure 6.8**). Although 2017 collar data showed fewer road-related effects, 2015 and 2016 collar data also observed that the AWAR appeared to be altering natural movement patterns of collared Caribou. Agnico Eagle and regulatory agencies are committed to conducting more detailed analyses of Caribou monitoring data, satellite collar data, hunter harvest activity, and other potential influences on Caribou movement and migration to adaptively manage and minimize project-related effects on Caribou. Agnico Eagle will also explore the link between Caribou road crossings and road closures.

Agnico Eagle environment department should continue to closely monitor Caribou movement in the weeks leading up to seasonal migrations using the latest available satellite-collaring and monitoring data (e.g., road and HOL surveys) as well as incidental reports from staff. As a proactive adaptive management strategy, notification and announcements, staff re-education, specific dispatch protocols, and temporary road closures should continue to be implemented. Where applicable, Caribou management and monitoring should be conducted according to protocols outlined in the 2018 TEMP, including continued use of a decision tree. Issues and concerns that arise should be discussed with regulatory personnel and during TAG meetings to ensure that a balance is achieved between Caribou protection and conservation, and mine operation. Infographic tools developed to assist in presenting and educating site staff and road users on key information and actions should continue to be used.

SECTION 7 • HEIGHT OF LAND MONITORING

7.1 OVERVIEW

The purpose of the Height of Land (HOL) surveys is to serve as another level of Ungulate monitoring along the Whale Tail Haul Road.

7.2 OBJECTIVES

The HOL surveys provide an 'early warning' system of the presence of Caribou in proximity to the Whale Tail Pit and Haul Road.

7.3 DURATION

The HOL surveys are scheduled to be conducted once per week from January to April and from July to August. From May to June and September to December, the prime migratory period for Caribou, the frequency of surveys will increase to twice per week unless triggers (see **Section 9**) require surveys every two days.

7.4 METHODOLOGY

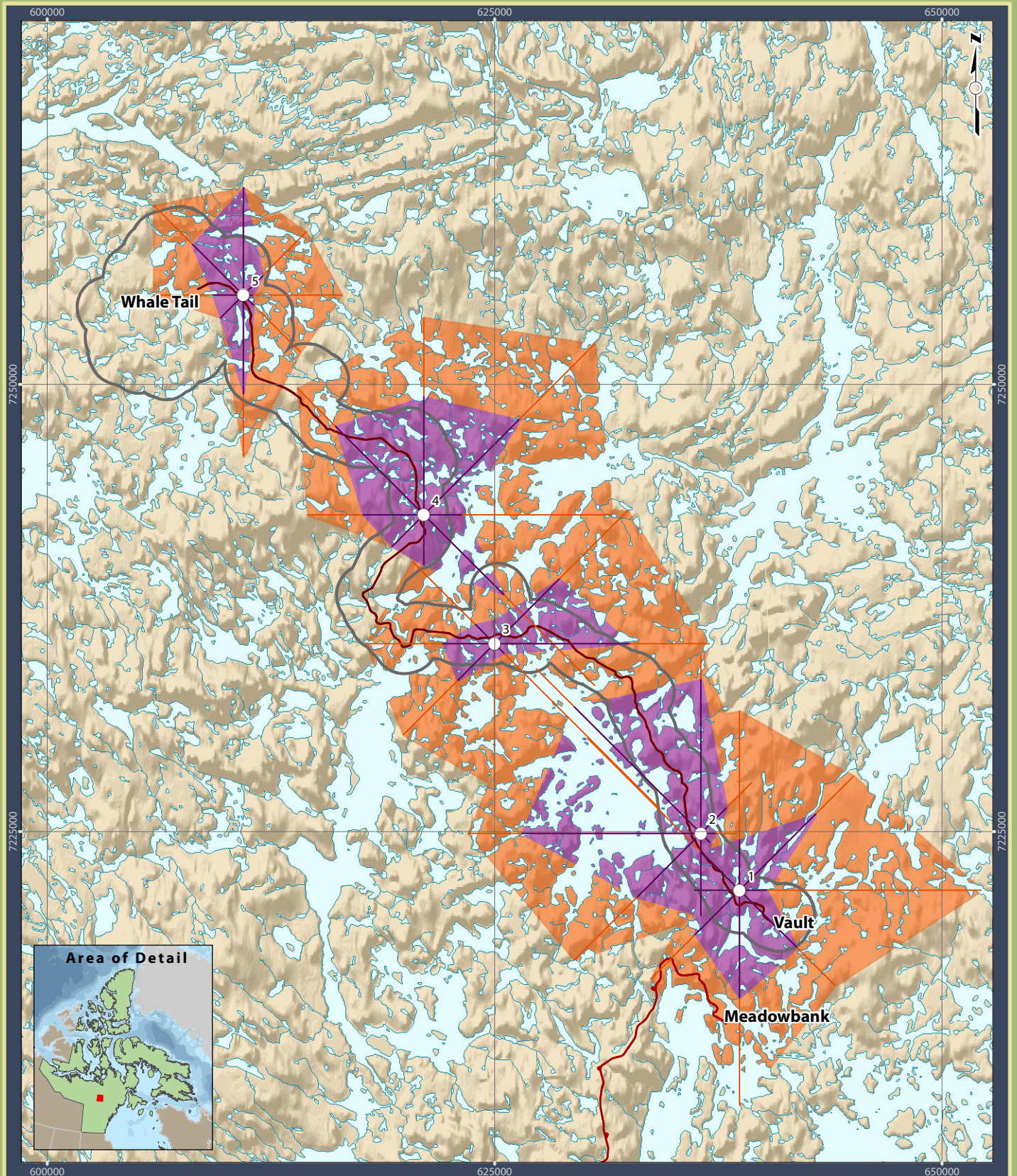
Five easily accessible HOL survey locations were established in 2017 along the Whale Tail Haul Road (see **Figure 7.1**; Dougan 2017). The locations are within 500 m of the Whale Tail Pit Haul Road and provide an unobstructed view (up to 360°) of the surrounding terrain. While conducting the ground surveys, two observers stop at the HOL locations and survey the area for 20 minutes using a combination of naked eye, binoculars, and scope. The surveyors independently view the landscape for Caribou starting at opposite cardinal directions and scan 180° for five minutes at a time, but move 90° every 5 minutes. Results are then compared to determine if Caribou Group Size Threshold (GST; see **Section 9**) is triggered, but consensus on numbers is not necessary as each survey will generate a separate result for each observer so that variability can be incorporated into detection rates.

7.5 2018 RESULTS

Fifteen HOL surveys were conducted between 26 August and 13 December 2018. Because of weather-related issues, not all five HOL locations could be surveyed on each of the survey days. Survey details are provided in **Table 7.1** while raw data is provided in **Appendix G**.

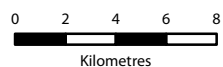
7.6 MANAGEMENT RECOMMENDATIONS

In 2019, HOL surveys should be conducted as per the schedule outlined in **Section 7.3 Duration** above. Results from the surveys should be analysed and discussed at TAG meetings to determine whether they are an effective 'early warning' system, as initially intended, for Caribou presence near project facilities.



Legend

- Whale Tail Haul Road
- All-Weather Access Road
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Height-of-Land Survey Location
- Sightline**
 - Lowlands
 - Highlands
- Maximum Observable Area**
 - Lowlands
 - Highlands



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.

**Figure 7.1 Location of
Height-of-Land Surveys along the
Whale Tail Haul Road (and View Corridors)**

Meadowbank Gold Project

Prepared for:

AGNICO EAGLE

By:

Nunavut
ENVIRONMENTAL
CONSULTING LTD

CASLYS
CONSULTING

MEADOWBANK GOLD MINE PROJECT
2018 WILDLIFE MONITORING SUMMARY

Table 7.1: Height-of-Land Survey Data along the Whale Tail Haul Road in 2018.

Date (2018)	Observations (4 directions-360°)	Observers	HOL 1	HOL 2	HOL 3	HOL 4	HOL 5	Comments
26 Aug	N – 5 minutes	Patrick Ahern & Isabelle Couture	No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	E – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
19 Sep	N – 5 minutes	Martin Kreelak & Isabelle Couture	6 Caribou	No Caribou	No Caribou	No Caribou	No Caribou	Fresh Caribou tracks at HOL 2
	E – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
03 Oct	N – 5 minutes	Martin Kreelak & Jonathan Pameolik	4 Muskox	4 Caribou	No Caribou	No Caribou	No Caribou	Wolverine tracks at HOL 1 and 3
	E – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
07 Oct	N – 5 minutes	Patrick Ahern & Jonathan Pameolik	4 Muskox	Cancelled	Cancelled	Cancelled	Cancelled	Blizzard conditions beyond HOL 1; visibility >300m
	E – 5 minutes		Cancelled	Cancelled	Cancelled	Cancelled	Cancelled	
	S – 5 minutes		Cancelled	Cancelled	Cancelled	Cancelled	Cancelled	
	W – 5 minutes		Cancelled	Cancelled	Cancelled	Cancelled	Cancelled	
10 Oct	N – 5 minutes	Martin Kreelak & Patrick Ahern	No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	Wolverine tracks at HOL 1
	E – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
17 Oct	N – 5 minutes	Martin Kreelak & Patrick Ahern	No Caribou	No Caribou	18 Caribou	No Caribou	No Caribou	Clear skies; visibility >5km
	E – 5 minutes		2 Muskox	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	

MEADOWBANK GOLD MINE PROJECT

2018 WILDLIFE MONITORING SUMMARY

Table 7.1: Continued.

Date (2018)	Observations (4 directions-360°)	Observers	HOL 1	HOL 2	HOL 3	HOL 4	HOL 5	Comments
18 Oct	N – 5 minutes	Martin Kreelak & Isabelle Couture	No Caribou	7 Muskox	No Caribou	No Caribou	No Caribou	Visibility <1km for HOL 1 and 2
	E – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
21 Oct	N – 5 minutes	Charles Montbriand-Leduc & Isabelle Couture	100 Caribou (fall migration is starting slowly)	No Caribou	No Caribou	No Caribou	No Caribou	
	E – 5 minutes			No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes			No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes			No Caribou	No Caribou	No Caribou	No Caribou	
08 Nov	N – 5 minutes	Patrick Ahem & Martin Kreelak	No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	Blowing snow with visibility <300m; winds 60km
	E – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	S – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
	W – 5 minutes		No Caribou	No Caribou	No Caribou	No Caribou	No Caribou	
28 Nov	N – 5 minutes	Charles Montbriand-Leduc & Martin Kreelak	No Survey	No Caribou	No Survey	No Caribou	No Caribou	
	E – 5 minutes		No Survey	No Caribou	No Survey	No Caribou	No Caribou	
	S – 5 minutes		No Survey	No Caribou	No Survey	No Caribou	No Caribou	
	W – 5 minutes		No Survey	No Caribou	No Survey	No Caribou	No Caribou	
29 Nov	N – 5 minutes	Martin Kreelak & Isabelle Couture	No Survey	No Survey	No Caribou	No Survey	No Survey	Muskox are feeding
	E – 5 minutes		No Survey	No Survey	2 Muskox	No Survey	No Survey	
	S – 5 minutes		No Survey	No Survey	No Caribou	No Survey	No Survey	
	W – 5 minutes		No Survey	No Survey	No Caribou	No Survey	No Survey	
06 Dec	N – 5 minutes	Martin Kreelak & Nicholas Saucier	No Survey	No Caribou	No Survey	No Caribou	No Caribou	
	E – 5 minutes		No Survey	No Caribou	No Survey	No Caribou	No Caribou	
	S – 5 minutes		No Survey	No Caribou	No Survey	No Caribou	No Caribou	
	W – 5 minutes		No Survey	No Caribou	No Survey	No Caribou	No Caribou	

MEADOWBANK GOLD MINE PROJECT
2018 WILDLIFE MONITORING SUMMARY

Table 7.1: Continued.

Date (2018)	Observations (4 directions-360°)	Observers	HOL 1	HOL 2	HOL 3	HOL 4	HOL 5	Comments
12 Dec	N – 5 minutes	Nicolas Saucier & Martin Kreelak	No Survey	No Survey	No Caribou	No Caribou	Caribou on the HOL but can't access without disturbing	HOL 1 and 2 cancelled due to poor visibility
	E – 5 minutes		No Survey	No Survey	No Caribou	No Caribou		
	S – 5 minutes		No Survey	No Survey	No Caribou	No Caribou		
	W – 5 minutes		No Survey	No Survey	No Caribou	No Caribou		
13 Dec	N – 5 minutes	Martin Kreelak & Nicholas Saucier	No Caribou	Caribou near the HOL but can't access without disturbing	No Survey	No Survey	No Survey	Poor weather conditions with blowing snow; HOL 3,4, and 5 cancelled
	E – 5 minutes		No Caribou		No Survey	No Survey	No Survey	
	S – 5 minutes		No Caribou		No Survey	No Survey	No Survey	
	W – 5 minutes		No Caribou		No Survey	No Survey	No Survey	
20 Dec	N – 5 minutes	Charles Montbriand-Leduc & Martin Kreelak	No Survey	No Survey	No Survey	No Caribou	No Survey	
	E – 5 minutes		No Survey	No Survey	No Survey	No Caribou	No Survey	
	S – 5 minutes		No Survey	No Survey	No Survey	No Caribou	No Survey	
	W – 5 minutes		No Survey	No Survey	No Survey	No Caribou	No Survey	

SECTION 8 • REMOTE CAMERA MONITORING

8.1 OVERVIEW

The use of remote cameras was first introduced in October 2018 as another technique to monitor Caribou interactions with project roads, equipment or other industrial features (e.g., roadside marker flags). The approach is one of several monitoring techniques to ensure that the best Caribou management practices and mitigation are implemented for the project.

8.2 OBJECTIVES

The primary objective of using remote cameras is to monitor Caribou interactions with project roads and equipment, and adapt management practices and mitigation as required.

8.3 DURATION

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

8.4 METHODOLOGY

Remote cameras can be used and set to be triggered based on motion/heat and/or on a time series to view video footage of Caribou interaction with project infrastructure such as roads and equipment.

Twenty remote cameras were set-up between October 22 and 29, 2018 at strategic locations along the road (see **Figure 8.1**). Cameras were checked on a weekly basis by environment staff to verify battery life and to clear snow from the lens, while photos were uploaded on an approximate monthly basis. Camera were removed on 16 December once the Caribou migration was determined to be finished.

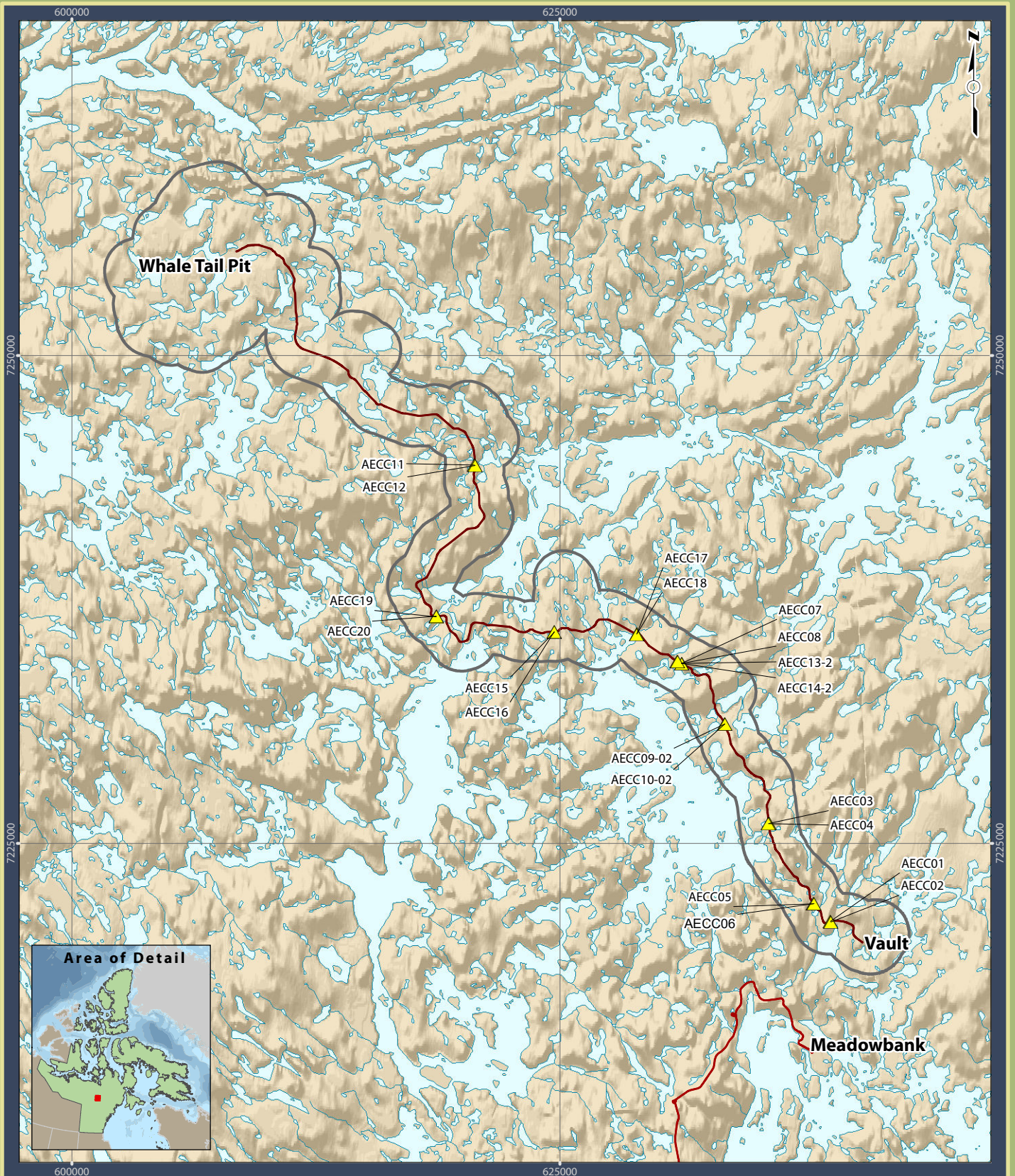
8.5 2018 RESULTS

Photos from remote cameras have not yet been analyzed; however, an example of a photo, taken on 22 October 2018, is provided below.





8.6 MANAGEMENT RECOMMENDATIONS

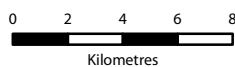
In 2019, remote cameras should be set up in late March so that the spring migration can be captured. Cameras should remain in place until early winter once Caribou movements have eased. Results from the surveys should be analyzed and discussed at TAG meetings to determine whether monitoring objectives have been achieved.





Legend

-  Remote Camera Location
-  Whale Tail Haul Road
-  All-Weather Access Road
-  Whale Tail Pit and Haul Road Local Study Area (LSA)



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.

Figure 8.1
Location of Remote Cameras along
the Whale Tail Haul Road

Meadowbank Gold Project

Prepared for:



AGNICO EAGLE

By:



Nunavut
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SECTION 9 • CARIBOU MANAGEMENT DECISION TREE

9.1 OVERVIEW

New to the 2018 TEMP is the use of decision trees or charts that outline monitoring and mitigation (adaptive monitoring) measures 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 2018).

9.2 OBJECTIVES

The monitoring objectives are to:

- 1) Detect if effect thresholds have been exceeded;
- 2) Test the efficacy of mitigation; and
- 3) Understand project-related effects to Ungulates. For Ungulates, the decision charts are also an objective to manage sensory disturbance to Caribou approaching the project, leading to monitoring to detect Caribou approaching the project and mitigation to reduce sources of sensory disturbance.

9.3 DURATION

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.

9.4 METHODOLOGY

The approach involves monitoring the number of Ungulates in close proximity to mining operations through various monitoring tools including Caribou collaring data, HOL surveys, AWAR and haul 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 2018 TEMP (Agnico Eagle 2018). The GST approach and monitoring/management outcomes will be 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 2018 RESULTS

Use of the decision tree and trigger approach was used on multiple occasions in 2018. In many cases where groups of Caribou were observed close to the road, closures or restrictions were implemented (see **Tables 3.4 to 3.6**). A specific log of when and how the decision tree approach was used in 2018 was not kept but Agnico Eagle will begin logging the decisions and outcomes in 2019.

9.6 ACCURACY OF IMPACT PREDICTIONS

An objective of the decision chart 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 threshold.

9.7 MANAGEMENT RECOMMENDATIONS

Decisions and outcomes resulting from the use of the decision tree approach in 2018 should be analyzed to determine whether adjustments to the approach need to be made and discussed in TAG meetings. A dedicated log of decisions and outcomes should be kept in 2019 to facilitate future analyses of the effectiveness of this monitoring approach.

SECTION 10 • HUNTER HARVEST STUDY

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 LSA.

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. Lower participant rates and reduced data in 2014 and 2015 made it increasingly difficult to determine hunting patterns in the Baker Lake area and along the AWAR, and to answer fundamental questions on the effect of the mine on regional Caribou populations. 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 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019. The study approach will be similar to previous years but suggestions and guidance received during the consultation period will be incorporated into the study. Study results for 2019 will be presented in the 2019 annual report.

10.2 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 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 AWAR.

2018 WILDLIFE MONITORING SUMMARY

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 METHODOLOGY

The approach and methods used in the 2019 HHS will be outlined in the 2019 annual report. Existing tools that were successful in reaching hunters in previous studies will be combined with new methods and best practices as part of an approved HHS methodology. The use of new technology (e.g., social media) will also be incorporated to facilitate participation and reach hunters of the new generation.

SECTION 11 • PREDATORY MAMMAL DEN MONITORING

11.1 OVERVIEW

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: Arctic Wolf (natal dens), Grizzly Bear (natal/overwintering dens), Arctic Fox (natal dens), and Wolverine (natal dens).

11.2 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.

11.3 DURATION

The den monitoring program is ongoing during the lifetime of the mine

11.4 METHODOLOGY

Data will be collected on Predatory Mammal abundance and behaviour during ground surveys, vehicle surveys, and HOL 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 12 and Appendix J of the 2018 TEMP (Agnico Eagle 2018) for den management and protection plan components.

11.5 HISTORICAL RESULTS

Active den sites of Wolf and previous dens of Grizzly Bear were identified during baseline surveys at the Whale Tail site and along the Whale Tail Haul Road (Dougan 2019; see **Figure 11.1**).

11.6 2018 RESULTS

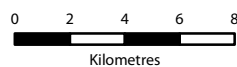
Predatory mammal dens were not monitored in 2018 as potential effects due to mine-related activities were not identified.



Legend

Predator Mammal Den Location

- Arctic Wolf Den
- Arctic Wolf Nursery
- Barren-Ground Grizzly Bear Den
- Whale Tail Haul Road
- All-Weather Access Road
- Whale Tail Pit and Haul Road Local Study Area (LSA)



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.

Figure 11.1 Predator Mammal Den Sites Identified within the Whale Tail Local Study Area in 2017

Meadowbank Gold Project

Prepared for:

AGNICO EAGLE

By:

Nunavut
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11.7 ACCURACY OF IMPACT PREDICTIONS

A summary of the impact predictions identified in the TEMP (Agnico Eagle 2018) is provided in **Table 11.1**; however, no impacts to denning predators were observed in 2018.

Table 11.1: Accuracy of Impact Predictions – Disturbance to Denning Predatory Mammals for the Meadowbank and Whale Tail Projects.

Potential Effect	Threshold	Threshold Exceeded (2018)	Adaptive Management Implemented	Status
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	AWAR and haul road Surveys Daily and weekly systematic pit and mine site ground surveys Incident and vehicle encounter HOL surveys

11.8 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. See Figure 12 and Appendix J of the 2018 TEMP (Agnico Eagle 2018) for den management and protection plan components.

SECTION 12 • RAPTOR NEST MONITORING

12.1 OVERVIEW

The raptor nest survey monitoring program has been designed to confirm that mine-related activities do not result in inadvertent negative effects on nesting raptors. Raptor surveys along the proposed AWAR alignment in 2005 (i.e., prior to construction) indicated that only low suitability habitat for nesting raptors was available. During AWAR construction in 2007/2008, excavated and blasted rock materials were extracted from numerous quarries along the alignment, resulting in some moderate and high suitability raptor nesting habitat areas characterized by steep rock walls. Established Peregrine Falcon nests within some of these quarries are monitored on an annual basis to evaluate occupancy.

In the Whale Tail Pit and Haul Road study area, researchers from the University of Alberta identified 56 occupied raptor nests during surveys in 2015, 2016, and 2017. The most common nesting species was Peregrine Falcon, followed by Gyrfalcon (*Falco rusticolus*) and Rough-legged Hawk. Nests of Common Raven (*Corvus corax*) were also identified during the raptor nest surveys. Most occupied nests (43) were located north of the Whale Tail Pit study area, while the remainder (13) were along the Whale Tail Haul Road. None of the occupied nests will be disturbed by proposed development activities, but four nests (i.e., 1 Peregrine Falcon; 3 Rough-legged Hawk), are located in the Whale Tail LSA.

12.2 OBJECTIVES

The primary objectives of the raptor nest survey monitoring program are to:

1. Confirm that raptor nest failures are not caused by mine-related activities. The threshold level is one (1) nest failure per year; and
2. Confirm that no project-related mortality of raptors occurs. The threshold level of mortality is one (1) individual per year.

12.3 DURATION

Raptor nest monitoring is to continue annually during the operation and decommissioning phases of the mine in accordance with the TEMP (Agnico Eagle 2018).

12.4 METHODOLOGY

Between 2000 and 2009, raptors were periodically recorded during AWAR road surveys, waterbird nest surveys, and aerial surveys and investigated further, as required; however, given the overall low probability of raptor occurrence within the LSA and RSA, a specific raptor survey was not scheduled. In 2009, an active Peregrine Falcon nest at Quarry 19 prompted the initiation of a dedicated raptor nest survey in 2010. Surveys from 2011 through 2018 continued this work, focusing particularly on quarries along the AWAR. Sporadic surveys in specific areas (i.e., Portage, Goose, and Vault pits, fuel tank storage) were also conducted when raptors were observed during mine site environmental inspections or employees reported any sightings. Visual checks of active falcon nest sites were conducted during regular ground reconnaissance surveys along the AWAR. Non-disruptive monitoring techniques, which

2018 WILDLIFE MONITORING SUMMARY

included monitoring nests from a vehicle within the quarry or from the AWAR, ensured that active nests were not approached by Agnico Eagle personnel. Using these techniques, environmental personnel were able to monitor nest success throughout the summer season. Nest monitoring was not completed along the Vault Road since neither quarries nor potential raptor habitat are present. Any observed raptor activity in this area is documented through regular mine site inspection and road surveys.

Raptor nests in the Whale Tail Pit and Haul Road study area were previously identified by researchers from the University of Alberta during the environmental assessment process (i.e., 2015 to 2017). Surveys were conducted from a helicopter by trained observers. Nest monitoring was not conducted in the Whale Tail area in 2018 because none of the identified active nests are in close proximity to project activities and facilities.

Raptor nest monitoring is conducted according to Figure 13 in the 2018 TEMP while management and mitigation approaches are according to the 'Peregrine Falcon Management and Protection Plan on the Meadowbank Gold Project Site' (see Appendix E of the 2018 TEMP).

12.5 HISTORICAL RESULTS

12.5.1 Meadowbank Mine and AWAR

Single nesting pairs of Peregrine Falcon were recorded in 1996 and 2005 in the Mine RSA, but nests near mine facilities have only been routinely recorded since 2009, at which time dedicated nesting surveys were included in the monitoring program. Twelve unique Peregrine Falcon nesting sites have been recorded between 2009 and 2017; ten of these were in quarries along the AWAR, one nest was located on the Portage Pit wall (observed in 2012 and 2013), and one nest was in Goose Pit (observed in 2016) (**Figure 12.1**). Not all nesting sites are active every year.

12.5.2 Whale Tail Pit and Haul Road

Of 56 nests recorded between 2015 and 2017 within the Whale Tail Pit and Haul Road RSA, four were located within the Whale Tail Pit LSA but none are particularly close to project facilities (see **Figure 12.2**).

12.6 2018 RESULTS

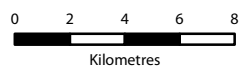
12.6.1 Meadowbank Mine and AWAR

In 2018, seven active Peregrine Falcon nests were documented in Quarries 2, 3, 16, 18, 19, 21 and 22, all previous nesting locations. No falcon activity was observed at previous nest sites at Quarry 8 (2017), Quarry 17 (2017), Portage Pit (2013), and Goose Pit (2016) (see **Table 12.1**). In addition to the seven active nest sites in 2018, falcon activity was observed at four additional quarry sites (i.e., Quarries 5, 7, 9, and 10) and one pit (Vault) during the monitoring program. Cumulative information on Peregrine Falcon nests from 2009 to 2018 is summarized in **Table 12.1** and **Figure 12.1**.



Legend

- Whale Tail Haul Road
 - All-Weather Access Road
 - Whale Tail Pit and Haul Road Local Study Area (LSA)
- Raptor Nest Locations**
- Gyrfalcon Nest
 - Rough-legged Hawk Nest
 - Peregrine Falcon Nest
 - Gyrfalcon & Rough-legged Hawk Nest
 - Peregrine Falcon & Rough-legged Hawk Nest



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.

Figure 12.2: Raptor Nest Locations for the Whale Tail Pit and Haul Road (2015-2018)

Meadowbank Gold Project

Prepared for:



By:



Table 12.1: Record of Peregrine Falcon and Nesting along the AWAR and in the Meadowbank LSA between 2009 and 2018.

Quarry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Comments
1	No	No	No	No	No	No	No	No	No	No	No falcons observed.
2	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	2 adult falcons observed throughout season. 4 eggs in mid-July and 3 chicks in late July.
3	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Up to 2 adult falcons observed; nest observed but no eggs.
4	No	No	No	No	No	No	No	No	No	No	No falcons observed.
5	No	No	No	No	No	No	No	No	No	No	2 adult falcons observed in late July.
6	No	No	No	No	No	No	No	No	No	No	No falcons observed.
7	No	No	No	No	No	No	No	Yes	Yes	No	Up to 2 adult falcons observed but no nest.
8	No	No	No	No	No	No	No	No	Yes	No	No falcons observed.
9	No	No	No	No	No	No	No	No	No	No	1 falcon observed in early June.
10	No	No	No	No	No	No	No	No	No	No	1 falcon observed in early July.
11 to 15	No	No	No	No	No	No	No	No	No	No	No falcons observed.
16	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Up to 2 adult falcons observed throughout season. 2 eggs and 2 chicks in mid-July, and 3 chicks in late July.
17	No	No	No	No	No	No	No	No	Yes	No	No falcons observed.
18	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Up to 2 adult falcons observed throughout season. 4 eggs in mid-July and 4 chicks in late July.
19	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1 adult falcon observed and 1 broken egg with no chick in mid-July. Apparently abandoned.
20	No	No	No	No	No	No	No	No	No	No	No falcons observed.
21	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Up to 2 adult falcons observed throughout season. 1 egg and 2 chicks in mid-July and no chicks in late July. May have been abandoned.
22	No	No	No	No	No	No	No	No	Yes	Yes	Up to 2 adult falcons observed throughout season. 1 egg, apparently abandoned, observed in mid-July. No activity in late July suggesting abandonment.
Portage	No	No	No	Yes	Yes	No	No	No	No	No	No falcons observed.
Vault	NA	NA	NA	NA	No	No	No	No	No	No	1 falcon observed in late May.
Goose	NA	NA	No	No	No	No	No	Yes	No	No	No falcons observed.

Observations made throughout the nesting season on raptor activity and nesting success are detailed in **Table 12.2**. Nesting success was confirmed through identification of maturing chicks at four out of seven active nesting sites along the AWAR in 2018. The other three nests appeared to be abandoned at some point during the breeding season. At the Quarry 3 nest, one sick or wounded chick was observed on 18 July with no subsequent observations of adults or young. At Quarry 19, only a broken egg was observed on 18 July with no sign of any falcons after this date. At Quarry 22, one adult and one apparently abandoned egg (i.e., no defensive behavior by adult) was observed on 18 July. Specific raptor nest management plans were not warranted at any of the active nest sites, as mine-related activity was minimal in the quarries.

Additional observations of raptor activity around the mine site are included in **Appendix E**. The first Peregrine Falcon of the season was observed flying over the Vault Pit on 23 May. Falcons were also documented the last week of May and through June and July. The first Rough-legged Hawk of the year was observed along the AWAR on 24 May. Other individuals were sighted the last week of May and in July. Individual Bald Eagles were recorded along the AWAR on 11 and 23 August. Bald Eagle, Peregrine Falcon, and Rough-legged Hawk were observed during AWAR surveys (**Section 3.6**).

12.6.2 Whale Tail Pit and Haul Road

No active raptor nests were monitored within the Whale Tail Pit and Haul Road LSA in 2018. Raptors recorded along the Whale Tail Haul Road included Rough-legged Hawks on 02 and 27 July, a Bald Eagle on 21 June, and a Snowy Owl on 18 October. A Snowy Owl was also observed at the Amaruq Camp on 05 April.

2018 WILDLIFE MONITORING SUMMARY

Table 12.2: Raptor Nests Identified and Monitored at the Mine Site and along the AWAR between Baker Lake and the Meadowbank Mine Site in 2018.

Quarry or Pit Location	GN Site # ¹	Species	Location (UTM)	2018 Observation Date	Observations
2	4003	Peregrine Falcon	14W 0642068 7147616	06 July	2 adults
				18 July	2 adults; 4 eggs of which 2 are hatching
				31 July	2 adults; 3 chicks
3	4004	Peregrine Falcon	14W 0638009 7156419	18 July	2 adults; 1 chick that seems sick or wounded
16	4007	Peregrine Falcon	14W 0627212 7193129	26 May	1 adult
				01 June	1 adult
				08 June	1 adult
				07 July	2 adults
				13 July	2 adults
				18 July	2 adults; 2 chicks and 2 eggs
				27 July	1 adult
18	4008	Peregrine Falcon	14W 0627351 7202109	31 July	2 adults; 3 chicks
				08 July	2 adults; nest seen
				13 July	1 adult
				18 July	1 adult; 4 eggs
19	3901	Peregrine Falcon	14W 0628686 7204285	31 July	2 adults; 4 chicks
				01 June	1 adult
				06 June	1 adult
21	4009	Peregrine Falcon	14W 0630781 7211705	18 July	1 broken egg with no chick
				08 July	2 adults; nest seen
				13 July	2 adults; 1 adult on nest
				18 July	2 adults; 2 chicks and 1 egg
22	2017C ²	Peregrine Falcon	14W 0633625 7216088	02 August	1 adult
				08 June	1 adult
				08 July	2 adults
				18 July	1 adult; 1 egg that seems to have been abandoned

¹ Government of Nunavut (GN) Raptor Database site number

² Unique nest identifier (awaiting GN Raptor Database site number)

12.7 ACCURACY OF IMPACT PREDICTIONS

A summary of the impact predictions identified in the TEMP (Agnico Eagle 2018) is provided in **Table 12.3**. The 2018 raptor monitoring data were compared to the impact prediction thresholds to evaluate adherence to impact predictions and provision of adaptive management, as either a necessary or proactive measure.

Table 12.3: Accuracy of Impact Predictions – Disturbance to Nesting Raptors for the AWAR and Mine Site, and Raptor Mortality.

Potential Effect	Threshold	Threshold Exceeded (2018)	Adaptive Management Implemented	Status
Disturbance to Nesting Raptors	Raptor nest failures will not be caused by mine-related activities. Threshold is one nest failure per year.	NO	NO	AWAR and haul road surveys Dedicated raptor nest surveys Daily and weekly systematic pit and mine site ground surveys
Raptor Mortality	One (1) individual	NO	NO	AWAR and haul road surveys Daily and weekly systematic pit and mine site ground surveys Incident and vehicle encounter reports

12.8 MANAGEMENT RECOMMENDATIONS

Quarrying activities along the AWAR corridor have created moderate to high suitability Peregrine Falcon nesting habitat. Falcons are expected to continue to use select quarries for the foreseeable future, which may necessitate the implementation of a raptor nest management plan for nests if deemed necessary. Agnico Eagle will continue to:

- Conduct raptor nest surveys annually at each of the quarries along the AWAR early in the nesting season (mid- to late June) to confirm the status of previously confirmed raptor nests, assess the presence of new raptor nests, and determine the need, if any, for a raptor nest management plan;
- Monitor active raptor nests weekly in the breeding season to confirm nest success or failure;
- Ensure that environmental personnel maintain accurate records of nesting activity and success for all active nests for the duration of these surveys to determine if thresholds are exceeded;
- Monitor pits and waste rock piles at the mine site to avert nesting attempts by raptors. If a nest is established, the Peregrine Falcon Management and Protection Plan will be followed; and
- Monitor the Whale Tail Pit and Haul Road area to determine whether active nests are present. If a nest is in close proximity to project facilities and is at risk of disturbance, the Peregrine Falcon Management and Protection Plan will be followed.

SECTION 13 • WATERBIRD NEST MONITORING

13.1 OVERVIEW

The Whale Tail expansion requires 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 will elevate water levels by 4 m and inundate approximately 157 ha of tundra during the active bird nesting window. To investigate mitigation options to minimize flooding-related impacts to birds, Trent University, in collaboration with Environment and Climate Change Canada and Agnico Eagle, conducted active bird nest surveys and experimented with deterrent options in summer 2018 at the Whale Tail site.

13.2 OBJECTIVES

The purpose of the research is to assess the degree of risk posed to migratory birds by mining-induced flooding during the nesting period, and to determine the most effective bird deterrents and how they should be applied. The specific study objectives are:

- 1) Determine breeding densities and timing of bird nest initiation at the study site;
- 2) Investigate the relationship between nesting phenology and timing of snowmelt;
- 3) Understand the degree to which deterrents can reduce nesting densities in specific areas;
- 4) Document individual behavioural responses to deterrent applications and changes in response over time; and
- 5) Assess the dispersal distance of deterred/impacted birds, to understand whether birds displaced from flooded areas nest nearby.

13.3 DURATION

The study was initiated in 2018 and will continue for two more years.

13.4 METHODOLOGY

In early June 2018, 21 plots were established along Whale Tail Haul Road between Amaruq Camp and Km 163. As the landscape was still covered in snow, plots were chosen by reviewing ELC maps and ground-truthing during freshet. Plots were 200 x 300 m (6 ha) and characterized by a mix of low-lying wet sedge habitat types representative of habitats proposed to be flooded around Whale Tail Lake. The purpose of the plots was to allow spatially-independent samples in which to test deterrents.

Eighteen of the 21 plots were surveyed repeatedly during the six-week field season to locate and monitor nests. Three of the most distant plots could not be monitored consistently because of time constraints. At the end of the field season, all 21 plots were surveyed for habitat types and unique land formations, and photos were taken at all four corners of the plot for future reference.

2018 WILDLIFE MONITORING SUMMARY

Once visual deterrents arrived in late June, the effectiveness of Mylar ribbon and Jackite® (a hawk kite effigy) deterrents could be tested on individual nesting birds. In this preliminary trial, observations were recorded before and after the use of visual deterrents to assess whether the behaviour of nesting birds changed when deterrents were placed within their territory.

13.5 2018 RESULTS

13.5.1 Survey Results

A total of 59 nests were found within the 18 regularly-monitored plots while an additional 51 nests were found outside the plots (see **Table 3.1** for nest details and **Figure 13.1, Mapsheet A** for locations). Nests of 12 species were documented. Lapland Longspur was the most commonly encountered species (i.e., 48 nests) while Semipalmated Sandpiper was the most abundant shorebird species (i.e., 14 nests). Of 50 active nests of eight species found within the proposed Whale Tail flooded area (i.e., 15 nests in the North East Diversion; 35 nests within the Whale Tail Diversion) between 24 June and 02 July (see **Table 3.2** for nest details and **Figure 13.1, Mapsheet B** for locations), 30 individual birds of four species were banded with individual markers. The markers will help identify returning birds in the 2019 field season and determine whether they breed nearby if 2018 breeding territories are inaccessible due to flooding.

Nests fledgling at least one young were considered successful. Overall estimated nest success was 52% while Lapland Longspur and Semipalmated Sandpiper nesting success was 46% and 71%, respectively. The earliest dates of nest initiation were 11 June (Rock Ptarmigan) and 12 June (Horned Lark).

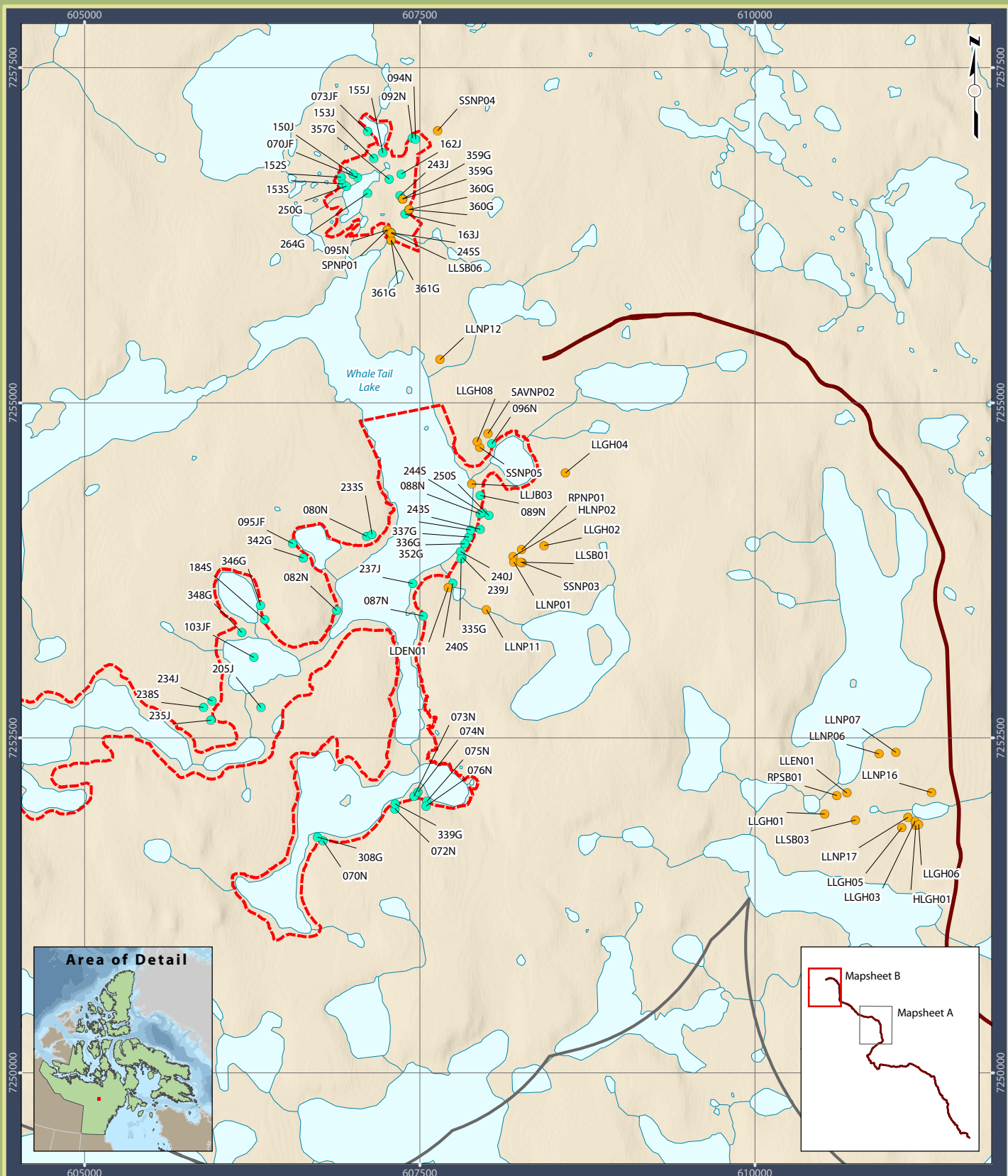
13.5.2 Effectiveness of Deterrents

No significant change in the behaviour of incubating birds before or after the use of deterrents was noted.

13.6 NEXT STEPS

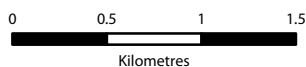
At the beginning of the 2019 study season, deterrents will be erected the last week of May or early June, preferably before snow melt, so that birds can be deterred from nesting within the treatment plots as they arrive to initiate nesting territories. Each of the 18 plots will be assigned randomly, to one of two deterrent treatments or a control. Treatment one is considered the most labor-intensive, consisting of audio deterrents playing a mix of predatory and distress calls paired with a 10 x 10 m grid of Mylar® flash tape. Treatment two is the least labor-intensive, consisting of audio deterrents with the use of Jackite®. Control plots will have no deterrents. Comparisons of densities between year one and two of the study, and between treatment and control plots will determine if deterrents were successful in deterring birds from nesting.

In 2019, a search for the 30 birds marked in 2018 will be conducted to determine whether they breed nearby if their 2018 breeding territories are inaccessible due to flooding.



Legend

- Waterbird Nest Location (2018)
- Waterbird Nest Location (2018) - Whale Tail Diversion
- Whale Tail Haul Road
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Proposed Flood Zone - Whale Tail Diversion



Projection: UTM Zone 14 NAD83

Data Sources:

Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited
 Service Layer Credits: Airbus, USGS, NGA, NASA,
 CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen,
 GSA, GSI and the GIS User Community.

Figure 13.1 Location of Waterbird Nest Surveys and Nest Locations in the Whale Tail Pit Area (Mapsheet B)

Meadowbank Gold Project

Prepared for:



By:



2018 WILDLIFE MONITORING SUMMARY

Table 13.1: Waterbird Nest Survey Results Within and Outside 18 Plots along the Whale Tail Haul Road and within the Whale Tail Pit Area.

Species	Plot	Nest Name	Nest Lat	Nest Long	Fate
Horned Lark	P14	HLGH02	65 17 49.5	96 23 41.4	success
Horned Lark	P18	HLNP03	65 17 34.0	96 23 22.7	failed
Rock Ptarmigan	P05	RPSB01	65 22 21.4	96 37 14.7	success
White-crowned Sparrow	P08 (OUT)	WCNP01	65 19 20.0	96 28 00.0	success
Rock Ptarmigan	P02	RPNP01	65 23 23.4	96 40 11.4	success
Rock Ptarmigan	P07	RPJB01	65 19 23.8	96 28 46.8	success
Horned Lark	P10	HLNP01	65 18 08.4	96 24 52.0	failed
Lapland Longspur	P14 (OUT)	LLJB06	65 17 82.3	96 24 04.7	success
American Golden-Plover	P17	GPEN01	65 17 48.9	96 23 13.1	failed
Lapland Longspur	P03	LLGH04	65 23 41.5	96 39 44.5	success
Lapland Longspur	P05	LLGH01	65 22 17.0	096 37 22.1	success
White-crowned Sparrow	P11	WCJB01	65 18 18.0	96 25 78.3	success
Horned Lark	P12	HLNP04	65 18 00.3	96 25 21.9	success
Lapland Longspur	P04	LLNP06	65 22 31.0	96 36 49.5	unknown
Lapland Longspur	P07	LLSB02	65 19 12.5	96 28 33.9	failed
Lapland Longspur	P10	LLSB04	65 18 11.2	96 25 01.7	success
Lapland Longspur	P12	LLNP13	65 18 01.0	96 25 20.3	success
American Golden-Plover	P14	GPSB01	65 17 46.4	96 23 52.8	success
Semipalmated Plover	CAMP	SPNP01	65 24 41.6	96 41 22.1	success
Long-tailed Duck	P01 (OUT)	LDEN01	65 23 15.0	96 40 54.6	failed
Lapland Longspur	P01 (OUT)	LLNP11	65 23 09.3	96 40 33.0	success
Lapland Longspur	P06	LLGH05	65 22 13.0	96 36 38.0	abandoned
Lapland Longspur	P07 (OUT)	LLNP02	65 19 21.1	096 29 45.2	success
Semipalmated Sandpiper	P08	SSGH02	65 19 10.5	96 27 45.9	success
Lapland Longspur	P10	LLJB01	65 18 14.7	96 25 06.5	failed
Horned Lark	P10 (OUT)	HLSB01	65 18 05.1	96 24 59.6	success
Lapland Longspur	P11	LLJB09	65 18 20.5	96 26 07.2	failed
Lapland Longspur	P13 (OUT)	LLJB10	65 18 04.6	96 24 42.8	success
Semipalmated Sandpiper	P17	SSSB01	65 17 45.6	96 23 23.4	success
Common Redpoll	P17 (OUT)	CRJB01	65 17 65.3	96 23 39.4	success
Willow Ptarmigan	P18 (OUT)	WPNP01	65 17 37.0	96 23 21.0	failed
Semipalmated Sandpiper	P08	SSGH01	65 19 09.1	96 28 00.5	failed
Semipalmated Sandpiper	CAMP	SSNP05	65 23 48.4	96 40 33.4	success

2018 WILDLIFE MONITORING SUMMARY

Table 13.1: Continued

Species	Plot	Nest Name	Nest Lat	Nest Long	Fate
Lapland Longspur	P02	LLSB01	63 23 20.2	96 40 12.2	success
Lapland Longspur	P05	LLEN01	65 22 21.9	96 37 08.9	success
Horned Lark	P06	HLGH01	65 22 13.5	96 36 29.8	abandoned
Lapland Longspur	P06	LLGH03	65 22 14.5	96 36 30.3	success
Lapland Longspur	P06	LLNP17	65 22 15.5	96 36 34.2	success
Savannah Sparrow	P08	SAVGH02	65 19 05.7	96 25 49.5	failed
Semipalmated Sandpiper	P13 (OUT)	SSJB02	65 18 03.8	96 24 47.6	success
Northern Pintail	P15	NPJB01	65 17 58.1	96 23 95.0	unknown
Least Sandpiper	CAMP	361G	65 24 39.1	96 41 20.2	success
Horned Lark	P02	HLNP02	65 23 21.8	96 40 16.5	success
Least Sandpiper	P07 (OUT)	LSJB01	65 19 31.6	96 28 38.6	success
Lapland Longspur	P08	LLNP14	65 18 08.8	96 27 50.2	success
Lapland Longspur	P09	LLNP08	65 19 05.5	96 27 36.4	unknown
Lapland Longspur	P10	LLSB05	65 18 12.1	96 25 13.8	success
Common Redpoll	P13 (OUT)	CRSB01	65 17 58.9	96 24 13.9	success
Savannah Sparrow	P15(OUT)	SAVJB01	65 17 58.3	96 24 05.8	success
Savannah Sparrow	P15	SAVJB02	65 17 55.0	96 24 94.2	success
Lapland Longspur	P17	LLJF02	65 17 46.6	96 23 04.0	failed
Lapland Longspur	P18	LLSB07	65 17 36.7	96 23 26.7	success
Lapland Longspur	P19	LLNP04	65 17 56.4	96 22 40.7	unknown
Lapland Longspur	P20	LLNP05	65 17 45.7	96 22 35.9	success
Semipalmated Sandpiper	P10	SSSB02	65 18 11.2	96 25 01.7	failed
Semipalmated Sandpiper	P02	SSNP03	65 23 20.3	96 40 11.3	success
Lapland Longspur	P04	LLNP07	65 22 31.2	96 36 39.7	success
Lapland Longspur	P04 (OUT)	LLNP16	65 22 21.2	96 36 20.0	success
Semipalmated Sandpiper	P07	SSJB01	65 19 24.7	96 28 77.2	success
Lapland Longspur	P09	LLNP03	65 19 04.8	96 27 23.4	success
Semipalmated Sandpiper	P09	SSNP01	65 19 02.9	96 27 33.7	success
White-crowned Sparrow	P15	WCJB02	65 17 58.2	96 23 91.9	success
Lapland Longspur	P17	LLEN02	65 17 47.3	96 23 13.1	unknown
Lapland Longspur	P17	LLJF01	65 17 43.2	96 23 27.0	failed
Semipalmated Sandpiper	P16	SSGH03	65 18 00.8	96 23 21.6	success
Semipalmated Sandpiper	P18	SSSB03	65 17 36.1	96 23 26.9	success
Lapland Longspur	CAMP	LLGH08	65 23 49.8	96 40 34.8	success

2018 WILDLIFE MONITORING SUMMARY

Table 13.1: Continued

Species	Plot	Nest Name	Nest Lat	Nest Long	Fate
Lapland Longspur	CAMP	LLSB06	65 24 40.8	96 41 20.0	failed
Savannah Sparrow	CAMP	SAVNP02	65 23 51.7	96 40 28.3	unknown
Common Redpoll	P09 (OUT)	CRNP01	65 19 09.0	96 27 38.0	unknown
Savannah Sparrow	P10 (OUT)	SAVSB01	65 18 09.2	96 24 49.5	abandoned
Lapland Longspur	P16	LLGH07	65 17 56.7	96 23 05.6	unknown
Savannah Sparrow	P15	SAVJB03	65 17 52.7	96 23 74.2	failed
Semipalmated Sandpiper	P15	SSJB03	65 17 55.7	96 23 84.0	failed
Lapland Longspur	NE	360G	65 24 46.3	96 41 09.2	success
Semipalmated Sandpiper	CAMP	SSNP04	65 25 05.0	96 40 51.0	success
Horned Lark	NE	359G	65 24 48.9	96 41 12.7	success
Least Sandpiper	P08 (OUT)	LSSB01	65 19 14.8	96 27 53.5	success
Least Sandpiper	P12	LSNP01	65 18 04.9	96 25 38.5	success
Lapland Longspur	CAMP	LLNP12	65 24 09.9	96 40 54.5	failed
Savannah Sparrow	P09	SAVNP01	65 19 04.5	96 27 36.1	unknown
Savannah Sparrow	P09 (OUT)	SAVJB04	65 19 10.9	96 27 32.3	unknown
Savannah Sparrow	P16	SAVGH01	65 17 58.6	96 23 21.3	abandoned
Common Redpoll	P18	CRSB03	65 17 35.2	96 23 06.0	failed
Common Redpoll	P09	CRNP02	65 19 07.7	96 27 23.4	unknown
Lapland Longspur	P02	LLGH02	65 23 24.2	96 39 58.4	abandoned
Lapland Longspur	P02	LLJB03	65 23 39.7	96 39 98.9	unknown
Lapland Longspur	P02	LLNP01	65 23 20.5	96 40 16.1	abandoned
Lapland Longspur	P05	LLSB03	65 22 15.3	96 37 04.6	success
Unknown	P05	UNKNEST3	-	-	unknown
Lapland Longspur	P06	LLGH06	65 22 13.7	96 36 28.2	abandoned
Common Redpoll	P07	CRSB02	65 19 18.9	96 28 41.9	failed
Lapland Longspur	P07 (OUT)	LLJB04	65 19 17.5	96 28 64.5	failed
Horned Lark	P08	HLGH06	65 19 11.5	96 27 52.0	failed
Lapland Longspur	P08	LLNP15	65 19 08.7	96 27 43.7	failed
Savannah Sparrow	P08	SAVSB02	65 19 08.0	96 27 59.9	unknown
Rock Ptarmigan	P08 (OUT)	RPGH01	65 19 22.8	96 28 06.3	success
Lapland Longspur	P09	LLNP09	65 19 06.5	96 27 24.7	failed
American Black Duck	P09 (OUT)	AMBDGH01	65 19 09.4	96 27 30.3	unknown
Rock Ptarmigan	P10	RPNP02	65 18 08.1	96 24 59.2	success
Lapland Longspur	P11	LLJB08	65 18 24.5	96 25 99.7	abandoned

Table 13.1: Continued

Species	Plot	Nest Name	Nest Lat	Nest Long	Fate
Lapland Longspur	P14 (OUT)	LLNP10	65 17 50.9	96 23 32.9	unknown
Lapland Longspur	P15	LLJB02	65 17 61.4	96 23 82.8	unknown
Lapland Longspur	P15	LLJB05	65 17 64.0	96 24 03.0	failed
Lapland Longspur	P15	LLJB07	65 17 48.5	96 24 01.9	failed
Horned Lark	P16	HLGH04	65 17 56.0	96 23 29.5	success
Horned Lark	P16	HLGH05	65 17 58.2	96 23 15.4	success
Horned Lark	P17	HLGH03	65 17 48.6	96 23 12.9	unknown
Lapland Longspur	P18	LLSB08	65 17 35.2	96 23 16.0	unknown
Semipalmated Sandpiper	P18 (OUT)	SSNP02	65 17 30.1	96 23 06.6	abandoned
Northern Pintail	P20 (OUT)	NPSB01	65 17 43.6	96 22 39.2	success
Savannah Sparrow	P20 (OUT)	SAVNP03	65 17 52.6	96 22 49.6	unknown

MEADOWBANK GOLD MINE PROJECT

2018 WILDLIFE MONITORING SUMMARY

Table 13.2: Waterbird Nest Survey Results for the North East Diversion (NE) and Whale Tail Diversion (WT) Proposed Flood Zones.

Species	Site	Nest Name	Nest Lat	Nest Long	#	Sex	In/Out	Eggs	Nestlings	Activity
Least Sandpiper	NE	070JF	65 24 54.5	96 41 38.3	2	Pair	IN	4	0	incubating
Lapland Longspur	NE	073JF	65 25 05.5	96 41 31.5	2	Pair	OUT	4	0	incubating
Least Sandpiper	NE	092N	65 25 03.5	96 41 05.7	1	Unk	IN	3	0	incubating
Savannah Sparrow	NE	094N	65 25 03.2	96 41 03.9	1	Fem	IN	4	0	incubating
Semipalmated Plover	NE	095N	65 24 41.6	96 41 22.1	1	Fem	OUT	4	0	incubating
Lapland Longspur	NE	150J	65 24 55.3	96 41 40.8	2	Pair	IN	5	0	pair
Lapland Longspur	NE	152S	65 24 54.7	96 41 47.8	2	Pair	IN	4	0	pair
Least Sandpiper	NE	153J	65 24 58.9	96 41 28.5	1	Unk	IN	3	0	incubating
American Robin	NE	153S	65 24 53.1	96 41 47.0	0	Unk	OUT	0	0	empty nest, unsure if in use or abandoned
Lapland Longspur	NE	155J	65 25 00.2	96 41 23.1	2	Pair	IN	4	0	incubating
Lapland Longspur	NE	162J	65 24 54.9	96 41 12.9	1	Fem	IN	5	0	incubating
Least Sandpiper	NE	163J	65 24 45.2	96 41 11.6	1	Unk	IN	3	0	incubating
Lapland Longspur	NE	243J	65 24 49.8	96 41 14.0	1	Fem	IN	4	0	incubating
Lapland Longspur	NE	245S	65 24 40.9	96 41 20.1	1	Fem	IN	4	0	incubating
Semipalmated Plover	NE	250G	65 24 52.5	96 41 44.8	1	Unk	IN	3	0	incubating
Lapland Longspur	NE	264G	65 24 50.6	96 41 32.8	1	Fem	IN	5	0	incubating
Least Sandpiper	NE	357G	65 24 53.8	96 41 20.0	1	Unk	IN	4	0	incubating
Horned Lark	NE	359G	65 24 48.9	96 41 12.7	1	Fem	IN	2	0	incubating
Lapland Longspur	NE	360G	65 24 46.3	96 41 09.2	1	Fem	OUT	5	0	incubating
Least Sandpiper	NE	361G	65 24 39.1	96 41 20.2	1	Unk	OUT	4	0	incubating
Lapland Longspur	WT	070N	65 22 15.1	96 42 12.3	1	Fem	IN	5	0	incubating
Semipalmated Sandpiper	WT	072N	65 22 22.1	96 41 30.1	1	Unk	IN	4	0	incubating

MEADOWBANK GOLD MINE PROJECT
2018 WILDLIFE MONITORING SUMMARY

Table 13.2: Continued.

Species	Site	Point Name	Nest Lat	Nest Long	#	Sex	In/Out	Eggs	Nestlings	Activity
Lapland Longspur	WT	073N	65 22 25.0	96 41 18.8	1	Fem	IN	4	0	incubating
Savannah Sparrow	WT	074N	65 22 26.0	96 41 16.3	1	Unk	IN	5	0	incubating
Semipalmated Sandpiper	WT	075N	65 22 23.7	96 41 11.5	1	Unk	IN	4	0	incubating
Lapland Longspur	WT	076N	65 22 22.5	96 41 12.1	1	Fem	OUT	5	0	incubating
Lapland Longspur	WT	080N	65 23 28.0	96 41 40.6	1	Fem	IN	5	0	incubating
Lapland Longspur	WT	082N	65 23 10.4	96 41 59.4	1	Fem	IN	4	0	incubating
Lapland Longspur	WT	087N	65 23 08.3	96 41 09.6	1	Fem	IN	1	0	incubating
Lapland Longspur	WT	088N	65 23 32.4	96 40 34.6	1	Unk	IN	5	0	incubating
Lapland Longspur	WT	089N	65 23 36.8	96 40 34.1	1	Unk	IN	4	0	incubating
Common Redpoll	WT	095JF	65 23 26.9	96 42 23.5	2	Pair	IN	4	0	incubating
Lapland Longspur	WT	096N	65 23 49.2	96 40 26.4	2	Pair	IN	.	2	feeding chicks
Herring Gull	WT	103JF	65 22 59.8	96 42 48.2	2	Pair	IN	1	0	incubating
Semipalmated Sandpiper	WT	184S	65 23 08.8	96 42 41.2	1	Unk	IN	4	0	incubating
Lapland Longspur	WT	205J	65 22 47.7	96 42 45.2	1	Fem	IN	4	0	incubating
Lapland Longspur	WT	224J	UNK	UNK	1	Fem	UNK	5	0	incubating
Lapland Longspur	WT	224S	UNK	UNK	1	Fem	UNK	5	0	incubating
Horned Lark	WT	233S	65 23 28.4	96 41 37.5	1	Fem	IN	4	0	incubating
Long-tailed Duck	WT	234J	65 22 49.7	96 43 13.3	1	Fem	IN	6	0	incubating
Lapland Longspur	WT	235J	65 22 45.1	96 43 14.3	1	Fem	IN	5	0	incubating
Lapland Longspur	WT	237J	65 23 16.2	96 41 14.9	1	Fem	IN	3	0	incubating
Semipalmated Sandpiper	WT	238S	65 22 48.2	96 43 18.4	1	Unk	IN	4	0	incubating
Lapland Longspur	WT	239J	65 23 22.1	96 40 45.9	1	Fem	IN	5	0	incubating

MEADOWBANK GOLD MINE PROJECT
2018 WILDLIFE MONITORING SUMMARY

Table 13.2: Continued.

Species	Site	Point Name	Nest Lat	Nest Long	#	Sex	In/Out	Eggs	Nestlings	Activity
Savannah Sparrow	WT	240J	65 23 23.5	96 40 46.7	1	Fem	IN	5	0	incubating
Semipalmated Sandpiper	WT	240S	65 23 15.9	96 40 51.9	1	Unk	OUT	4	0	incubating
Lapland Longspur	WT	243S	65 23 28.7	96 40 34.8	1	Unk	IN	5	0	incubating
Lapland Longspur	WT	244S	65 23 32.7	96 40 33.0	1	Unk	IN	4	1	incubating
Lapland Longspur	WT	250S	65 23 31.9	96 40 29.6	1	Fem	OUT	0	4	flushed from nest in birch
Semipalmated Sandpiper	WT	308G	65 22 16.0	96 42 15.4	1	Unk	IN	4	0	incubating
Semipalmated Sandpiper	WT	335G	65 23 21.8	96 40 46.5	1	Unk	IN	4	0	incubating
Lapland Longspur	WT	336G	65 23 26.9	96 40 41.6	1	Fem	IN	4	0	incubating
Northern Pintail	WT	337G	65 23 28.6	96 40 40.4	1	Fem	IN	5	0	incubating
Savannah Sparrow	WT	339G	65 22 23.3	96 41 29.8	1	Fem	IN	5	0	incubating
Semipalmated Sandpiper	WT	342G	65 23 23.3	96 42 17.6	1	Unk	IN	4	0	incubating
Savannah Sparrow	WT	346G	65 23 12.3	96 42 43.4	1	Fem	IN	5	0	incubating
Lapland Longspur	WT	348G	65 23 05.9	96 42 54.7	1	Fem	IN	4	0	incubating
Semipalmated Sandpiper	WT	352G	65 23 25.3	96 40 44.1	1	Unk	IN	4	0	incubating
Lapland Longspur	WT	353G	65 23 29.0	UNK	1	Unk	IN	5	0	incubating

SECTION 14 • BREEDING BIRD MONITORING

14.1 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.

14.2 OBJECTIVE

The objective of the breeding bird plot monitoring program is to confirm that a mine-related change of 20% function, determined by an increase or decrease in local breeding bird abundance, richness, and diversity, has not occurred. The program uses the widely accepted Canadian Wildlife Service's (CWS) PRISM protocols (CWS 2005). A secondary objective of the monitoring program is to determine more effective ways to prevent disturbance to nesting birds based on feedback from mitigation measures and observations.

14.3 DURATION

The breeding bird plot monitoring program is to continue every year during the construction period and for at least the first three full years of mine operation (2010 to 2012) in accordance with the TEMP (Cumberland 2006). The last PRISM plot survey was conducted in 2015.

14.4 RECOMMENDATIONS

For the breeding bird PRISM plots, data analysis in 2015 showed that most bird community indices were variable with little difference in overall trends between mine and control plots. Thresholds had not been exceeded and no additional management or mitigation considerations were necessary.

As indicated in the 2018 TEMP, a North American Breeding Bird Survey Route (BBS) should be established in 2019.

SECTION 15 • SUMMARY

The 2018 Wildlife Monitoring Summary Report describes the data collected to date from the various monitoring programs and describes natural and mine-related variability and potential mine-related effects within wildlife populations.

In 2018, monitoring efforts focused on areas immediately around the mine site, and along the AWAR Vault Haul Road, and Whale Tail Haul Road. Survey and monitoring emphasis was on evaluating current habitat losses, monitoring presence and success of raptors, and monitoring and managing wildlife presence, particularly Caribou, near the mine facilities and infrastructure. Regional-scale monitoring efforts focused on Caribou movement through ongoing satellite-collaring studies. A summary of potential project effects, threshold levels, and the 2018 monitoring results is provided in **Table 15.1**.

An analysis of mine-related habitat loss determined that losses have not exceeded amounts within permitted areas. As well, high suitability habitat thresholds for all wildlife VECs have not been exceeded.

Seven active Peregrine Falcon nests were observed and monitored at quarry sites along the AWAR in 2018, with successful nesting confirmed at three nests. No raptor nests were monitored along the Whale Tail Haul Road or in the vicinity of the Whale Tail Pit in 2018.

Collared Caribou and moderate-sized herds crossed the AWAR, Vault Haul Road, and Whale Tail Haul Road during the 2018 spring and fall migrations. Overall average Caribou numbers were recorded along project roads during surveys in 2018; however, numbers in April and May were higher than in any other previous year. Deflections of migrating Caribou, especially from the AWAR and Whale Tail Haul Road, continue to be a concern when looking at 2018 movement patterns and cumulative data since 2008. Further studies by Agnico Eagle and the GN are underway to understand the possible extent of the effect. The Baker Lake HTO, GN personnel, and other stakeholders will meet within the Terrestrial Advisory Group in 2019 to discuss the effectiveness of targeted monitoring of Caribou movement around mine facilities. By the end of 2018, 40 collars remained active, which provides excellent data for monitoring Baker Lake herds in 2019.

In 2018, one Wolverine was euthanized under authorization of the GN Conservation Officer; however, the threshold level for mine site or road-related mortalities for Predatory Mammals (i.e., Grizzly Bear and Wolverine two [2] individuals) was not exceeded. In addition, one Wolf needed to be euthanized under GN authorization. Grizzly Bears were observed near Meadowbank in 2018 but no deterrence was required. Numerous closures of the AWAR were required in April and May 2018 to permit the passage of migrating Caribou. No road or mine-related mortality of Caribou occurred in 2018, although one Caribou was struck by a road grader (extent of injury could not be determined).

Monitoring programs will continue to evolve throughout the life of the mine, contingent on data quality objectives and the necessity for adaptive management strategy implementation and subsequent effectiveness monitoring. Adjustments to the intensity and frequency of monitoring, and the extent of statistical analyses will vary between years depending on observed trends to date, data gap analysis, and determinations of effect.

2018 WILDLIFE MONITORING SUMMARY

Table 15.1: Potential Project Effects, Thresholds, and Results of Monitoring in 2018.

Potential Effect	Thresholds	Monitoring Methods	Frequency	Completed in 2018	Threshold Exceeded (2018)
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	YES	NO
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	YES	NO
Sensory Disturbance	Mine Site - 500m AWAR – 1,000m	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys; Satellite-collaring data; HOL surveys; Daily and weekly pit and mine-site ground surveys; Incidental wildlife reporting; Motion sensing cameras	Daily / weekly	YES	YES. Deflections noted when Caribou approach the road. Delayed crossing of roads.
Project-related Mortality - Vehicle Collisions	2 individuals (cumulative across mine)	AWAR, Vault Haul Road, and Whale Tail Haul Road 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. One Caribou struck by a grader but extent of injuries not determined

Table 15.1: Continued.

Potential Effect	Thresholds	Monitoring Methods	Frequency	Completed in 2018	Threshold Exceeded (2018)
Hunting by Baker Lake Residents	20% Change in Harvest Patterns in RSA from Historic	Hunter Harvest Study	Yearly	NO	NA. Suspended from 2016 to 2018, but will continue in 2019
Other Mine-related Mortality	2 individual (cumulative across mine)	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	Not required	NO
Project-related Mortality	2 individuals (cumulative across mine)	AWAR, Vault Haul Road, and Whale Tail Haul Road 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. One (1) Wolverine dispatched in 2018
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 Whale Tail Haul Road surveys	Nests within 200 m - daily Nests from 200 to 1000 m - weekly	YES	NO
Project-related Mortality	1 individual (cumulative across mine)	AWAR, Vault Haul Road, and Whale Tail Haul Road 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

Table 15.2: Continued.

Potential Effect	Thresholds	Monitoring Methods	Frequency	Completed in 2018	Threshold Exceeded (2018)
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	YES	NO
Project-related Mortality	1 individual (cumulative across mine)	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys; Collision reporting system	Mine site – daily AWAR and haul roads – up to every two days at peak migration	YES	YES. Two (2) dead Long-tailed Ducks found at Meadowbank Assay Lab
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

SECTION 16 • LITERATURE CITED

- Agnico Eagle Mines Ltd. (AEM) 2018. Meadowbank Division, Terrestrial Ecosystem Management Plan. Version 5, June 2018.
- Cumberland Resources. 2005. Meadowbank Gold Project. Environmental Impact Assessment. October 2005.
- Cumberland Resources Ltd. 2006. Meadowbank Gold Mine Project Terrestrial Ecosystem Management Plan (TEMP). Final Report, December 2006.
- Golder Associates. 2016. Whale Tail Pit Final Environmental Impact Statement Amendment.
- Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly, M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou (*Rangifer tarandus* L.) in arctic and subarctic Canada. *Ecological Applications* 21: 2334-2348.

APPENDIX A

2018 Road Survey Forms – Meadowbank AWAR and Vault Haul Road



AWAor

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Field Team: Rutledge, M. Theriault

[illegible]

75



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: January 30, 2018

Time Started: 09:00

Time Ended: 15:45

Temperature: 10C -28°C

Wind Speed: 26 km/h

Wind Direction: W/NW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear, sunny

Field Team: V. Vutatheg, M. Theriault

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
12:45	RaTa	5	MBK	rest	—	W	200m	10	14W	637517	7214521
13:17	Mo.	34	NT	rest	—	W	700m	96	14W	633114	7214248
13:17	ArWo	1	JaricbG	walk	N-NE	E	500m	88	14W	631216	7206644
13:55	Raven	4	AWAR	Feed	variable	E	50m	65	14W	626337	7188129
14:14	ArFo	1	AWAR	walk	variable	W-E	AWAR	53	14W	625621	7178824
15:23	Raven	+50	bridge #1	perch	—	—	—	8	14W	643826	7143399

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AGNICO EAGLE

AWAR + VAULT

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: February 02 2018 Time Started: 09:00 Time Ended: 15:15

Temperature: 10C -35C Wind Speed: 20 km/h Wind Direction: W

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Vattana F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
09:25	Ar Ha	1	Bridge #1	Sit	—	Bridge	—	08	14W	643792	7143375
11:34	Rata	22	MBK	St. Fo	—	W	100m	18	14W	637260	7214703
12:53	M.O.	4	Hillside	Rest	—	W	200m	94	14W	631893	7212418
15:00	Raven	5	Bridge #1	Perch	—	—	—	08	14W	643792	7143375
Martin Theriault VAULT Wildlife survey.											
15:50	wolverine	1	tundra	walking on lake	east	east	150m (11.5)				

1011



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: February 06, 2018

Time Started: 09:00

Time Ended: 15:30

Temperature: 10C -37°C

Wind Speed: 36 km/h

Wind Direction: NNW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear, extreme cold, windchill -56°C

Field Team: V. Utetnag, F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
11:15	RcTa	2	Hill Top	St. Fo	—	W	750m	16	14W	637224	7214755
13:15	m.	4	Hill	St. Fo	—	W	700m	17	14W	632992	7214115
14:31	ArFo	1	Quarry 8	walk	it	W	100m	44	14W	628999	7170500
15:18		5	Bridge 1	Perch, Fly	Variable	—	—	8	14W	643729	7143328



Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended: 15:50

Wind Direction: *Nw*

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km **Precipitation:** Clear *Extreme Cold*

Field Team: Chetaney, J. Kataluk

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AWAR

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended: 16:00

Wind Direction: 5E

Field Team: V. Utatno, J. Kataluk

[illegible]

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VAULT

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended: 12:50

Wind Direction: 

Field Team: V. Kattana, J. Kateluk

[illegible]



Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended:

Wind Direction: *NNW*

Field Team: V. Kuttner, Passenger Van

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AGNICO EAGLE

AWA2

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: March 16, 2018 Time Started: 09:00 Time Ended: 15:25
 Temperature: 10°C -37°C Wind Speed: 10 km/h Wind Direction: SW
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear, ice crystals
 Field Team: V. Utterby, R. Allard

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
15:00	Raven	1	Bridge #1	perch, fly	variable	—	—	8	14W	642380	60129

Vault

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended: 13:10

Wind Direction: Sw

Field Team: V. Utterby, R. Allard

[illegible]



Answer

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended: 16:30

Wind Direction:

~~Clear~~ cloudy

Field Team: V. Utatnag, J. Katalule



Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Time Ended: 15:45

Temperature: 10C

Wind Speed:**Wind Direction:**

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km **Precipitation:** Clear

Field Team: V. Utatnez, M. Therman

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AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: April 04, 2013 Time Started: 09:00 Time Ended: 15:30

Temperature: 10C -19°C Wind Speed: 24km/h Wind Direction: NE

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Utatana, F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:49	RaTa	40	HT	st. Fo	—	W	500m	9	14W	643912	7143567
13:44	RaTa	22	Hill Top	Walk	N	W	600m	82	14W	626921	7203797
14:22	R. Ta	20	Hill side	Fo	—	W	850m	84	14W	626626	7180125
14:52	RaTa	52	Rocky HT	St. Fo	—	W	400m	38	14W	630403	7166241
16:45	Rata	22	tundra	Grazing	—	W	300m	23			
16:45	ArchHare	7	tundra	Resting/Running	East	Both sides	50m	23			
18:15	Wolverine	1	tundra	Running	South	E	1000m	101			

no GPS or return

1011



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: April 13, 2018

Time Started: 09:00

Time Ended: 17:00

Temperature: 10C -25°C

Wind Speed: 20 km/h

Wind Direction: NW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Utotheg, J. Kataluk

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:26	RaTa	5	sandy	stand fo	—	W	400m	7	14W	644223	7142108
9:51	RaTa	75	"	WALK	S	W	500m	30	14W	634921	7161234
10:08	RaTa	10	"	FO, WALK	S	W	550m	44	14W	628642	7171488
10:19	RaTa	45	Hill Top	FO, stand	—	W	450m	49	14W	625442	7174621
10:40	RaTa	50	HT	walk	S	W	750m	69	14W	627607	7181556
11:02	RaTa	20	Rocky HT	FO, stand	—	W	400m	88	14W	631077	7206555
11:19	RaTa	9	Hill side	stand, rest	—	W	100m	10	14W	635349	7217004
13:42	RaTa	200	HT	stand, FO	—	W	1 km	102	14W	636436	7216789
13:56	M.O.	6	Hill Top	ST, fo	—	W	500m	108	14W	634288	7217200
14:11	M.O.	16	HT	stand, fo	—	W	100m	90	14W	630972	7209309
14:20	RaTa	700	HT	"	—	W	600m	86	14W	630919	7206489
14:47	RaTa	23	"	walk	S	W	700m	72	14W	626789	7195423
14:52	RaTa	22	Hill Top	walk	SW	W	500m	71	14W	627221	7193494
14:56	RaTa	100	H.T.	FO, walk	W	W	700m	70	14W	627384	7192505
15:33	RaTa	24	HT	WALK	S	W	900m	47	14W	625788	7173459

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: April 13, 2018 Time Started: 09:00 Time Ended: 17:00
 Temperature: 10C -25°C Wind Speed: 20 km/h Wind Direction: NW
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear
 Field Team: V. Utting, J. Koteluck

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
15:51	RaTa	5	Hill Top	walk	W	W	200m	46	14W	130012	7168193
16:11	RaTa	60	HT	walk	S	W	1 km	30	14W	635375	7160720
16:17	RaTa	60	HT	walk	S	W	700m	26	14W	636198	7158426
16:22	RaTa	150	Lake	walk	S	W	950m	24	14W	"	"
16:37	RaTa	75	Hillside	walk	S	W	650m	16	14W	640738	7150652
16:41	RaTa	300	HT	walk	S	W	450m	15	14W	641526	7149827
			2018-04-14								
9:00	Caribou	~300		grazing/walking	South	West	5m	55			
16:22	caribou	~300		grazing/laying		West	50m	53			
	"	~500		grazing		West	3km	49			
	"	?		walking	South	West	3km	44			
	"	?		walking	South	West	200m	43			
	"	?		walking	South	West	75m	42			
	"	?		walking	South	West	100m	39			
	"	?		walking	South	West	300m	34			



This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Wind Direction: North

Field Team: Martin Theriault / Jeff Hart (KIA)

[illegible]

AGNICO EAGLE

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: April 24, 2018

Time Started: 09:00

Time Ended:

Temperature: 10C -19°C

Wind Speed: 29 km/h

Wind Direction: NW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Utatun

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
10:10	RaTa	8	Tundra	stand, Fo	—	W	900m	24	14W	637485	7156742
10:26	RaTe	15	Rakey Tundra	walk, run	NW	W	500m	24	14W	630458	7165330
11:16	RaTa	26	AWAR	cross rd	WSE	W-E	—	71	14W	627289	7193013
11:24	RaTa	200	Tundra	walk, run	H	W	600m	24	14W	626430	7197254
11:42	RaTa	100	Hill Top	stand, Fo	—	W	400m	86	14W	629924	7205888
11:51	Mo	6	Hill	stand	—	W	400m	93	14W	630998	7211387
11:51	RaTa	10	Rake	stand	—	W	900m	93	"	"	"
14:09	RaTa	10	Tundra	walk	W	W	900m	26	14W	625646	7198650
15:20	RaTa	3	Tundra	stand	—	W	1km	23	14W	637809	7156503
15:52	RaTe	2	Hill	run	SSE	W	400m	4	15W	355187	7139012

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: May 01, 2018

Time Started: 09:00

Time Ended:

Temperature: 10°C

-17°C

Wind Speed:

10 km/h

Wind Direction:

WSW

Visibility (check):

☐ 100m

☐ 500m

☒ 1 km

Precipitation:

Clear

Field Team:

V. Utotnag, F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:39	RaTa	10	Tundra	walk	S	W	300m	19	14W	639510	7153645
10:27	RaTa	3	"	walk, run	W	W	300m	56	14W	626608	7179954
12:56	M.O.	22	Hillside	rest	-	W	1.5km	94	14W	6329999	7218116
13:19	RaTa	19	Hill Top	stand, fo	-	W	"	80	14W	627389	7201823
13:34	RaTa	17	Tundra	walk	N	W	501m	76	14W	625905	7199339
13:48	RaTa	55	"	"	N	W	900m	73	14W	626789	7195503
13:44	RaTa	10	Hill side	walk	N	W	"	78	14W	627117	7193654
13:54	RaTa	20	Tundra	"	"	"	"	66	"	626801	7189893
14:01	RaTa	19	"	"	"	"	"	62	"	626260	7185957
14:06	RaTa	17	"	"	"	"	"	59	"	625213	7182783
14:10	RaTa	50	"	"	"	"	"	56	"	625837	7180667
14:17	"	60	"	stand, fo	-	W	"	55	"	626303	7179620
14:18	"	10	"	walk	S	W	2 km	53	"	625159	7178181
14:30	"	13	"	"	"	"	"	46	"	626759	7172964
14:33	VI	40	"	"	"	"	"	46	"	628143	7172570

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: May 01, 2018 Time Started: 12:30 Time Ended: 15:30
 Temperature: 10C -13 Wind Speed: Wind Direction: WNW
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear
 Field Team: V. Wapating, F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
14:41	RcTa	3	Hill	stand	N	W	1 km	39	14W	629976	7162542
14:44	RcTa	30	"	"	—	W	> 1 km	38	14W	630369	7166065
14:47	RcTa	700	Tundra	" fo	—	W	900 m	38	14W	631096	7164550
14:55	RcTa	18	"	walk	S	W	"	30	"	633950	7162425
15:03	RcTa	7	"	"	"	"	"	23	"	637916	7156316
15:12	RcTa	130	"	"	E	E	1 km	20	"	638511	7155424
15:14	RcTa	—	crossing	—	—	—	—	20	"	634440	7153820
15:28	RcTa	22	Tundra	walk	N	W	650 m	8	"	144015	7142660
15:32	RcTa	9	"	"	"	"	500 m	4	"	644277	7139849
16:59	WOLF	2	tundra	walk	S	East	100	38			

AGNICO EAGLE

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

AWAR

May 08, 2018

Time Started: 09:00

Time Ended: 14:55

ture: 100

Wind Speed: 50 km/h

Wind Direction: North

(check): ☐ 100m ☐ 500m ☒ +1 km Precipitation: -Clear Snow

m: V. utahensis / JKataluk M.A.

Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
ribou	~50		grazing	-	west	500m	17			
ribou	5		walking south	south	west	600m	23			
ribou	~60		walking south	south	west	300m	27	14W	0636683	7157526
ribou	~60		walking south	south	west	400m	34	14W	0632165	7163283
ribou	15		grazing	-	west	400m	39	14W	0630086	7167037
ribou	~25		laying down/grazing	-	west	400m	42	14W	0629791	7167011
ribou	~30		grazing/laying down	-	west	1km	49	14W	0625489	7174187
ribou	~30		grazing/laying down	-	west	400m	53	14W	0625104	7179085
ribou	9		walking	south	west	400m	57	14W	0625326	7182680
ribou	~30		grazing/laying down	-	west	~2km	70	GPS out of batteries		
"	25	valley	For	-	S	500m	13	14W	635999	7217018
rHo	1	AWAR	Ho	NE	AWAR	-	"	"	"	"
LoTa	2	HT	For	-	E	300m	100	"	634233	7216763
LoTa	25	"	For, walk	N	W	300m	93	"	630985	7211351
"	12	ridge	-	S	W	900m	61	"	626153	7186756
"	15	HT	walk	N	W	500m	23	"	638057	7155691

Species	No	Habitat	Behavior	Direction	How far	How long	Waypoint
Caribou	150	Lake	walk	N	400m	16	641043/7150403

AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: May 11, 2018

Time Started: 9:00

Time Ended:

Temperature: 10C -7C

Wind Speed: 26 km/h

Wind Direction: NW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km

Precipitation:

Clear Blowing Snow

Field Team: V. Utatneg, J. H. H. H.

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
10:03	ArHa	1	AWAR	cross rd	E-W	E-W	-	81	14W	628923	7120319
10:16	RaTa	25	Tundra	walk	S	W	300m	58	14W	625855	7179076
11:36	RaTa	20	Lake	walk	S	W	400m	83	14W	630894	7211741
11:41	RaTa	15	Tundra	walk	S	W	600m	94	14W	632674	7213217
11:41	M.O.	25	Tundra	rest	-	W	300m	99	14W	"	"
13:30	RaTa	12	Tundra	rest	-	W	500m	89	14W	631320	7207031
13:70	M.O.	4	"	"	-	E	200m	88	14W	"	"
13:53	RaTa	25	"	walk	S	W	900m	76	14W	625691	7198502
14:01	RaTa	32	RaTa	walk	W	W	950m	73	14W	626786	7195458
14:06	RaTa	25	Lake	walk	S	W	"	78	14W	627000	7194074
14:12	RaTa	10	Tundra	stop, fo		E	250m	69	"	627502	7192194
14:12	ArFo	1	AWAR	walk	variable	AWAR	-	69	"	"	"
14:25	RaTa	50	Hill	walk	S	W	400m	62	"	627273	7191727
14:25	Ptern	60	Tundra	variable	variable	E	900m	"	"	"	"
14:49	RaTa	60	"	fo	-	E	500m	54	"	626601	7180231
14:53		2	"	walk	NE	W	400m	53	"	626082	7179417

15:07	RaTa	75	Tundra Walk	N
15:26	RaTa	53	Hillside "	NW
15:46	RaPt	2	AWAQ walk	—
16:10	RaTa	10	Hill Top (tand)	—
16:26	RaTa	6	Tundra	N

500m

350m

AWAQ

500m

500m

625441 - 7174616

630661 - 7168414

134645 - 7161520

641534 - 7149768

644448 - 7141593

~50 caribou crossed Km 14 to east side
 12 caribou walking south Km 17 - 300m
 ~20 caribou walking south Km 23 - 200m
 ~40 caribou walking south Km 34 - 150m
 ~20 caribou walking south Km 37 - 100m
 11 caribou walking south Km 66 - 300m
 ~20 caribou walking south Km 73 - 200m
 18 caribou walking south Km 77 - 150m
 14 caribou grazing west Km 98 - 175m
 ~50 caribou " " Km 99 - 50m



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: May 18, 2018

Time Started: 09:00

Time Ended: 16:30

Temperature:

Wind Speed:

Wind Direction:

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. utatung

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
13:57	RaTa	4	HT	stand	—	W	400m	99	14W	633206	7214941
14:00	RaTa	10	"			W	500m	95	14W	632910	7213849
14:05	RaTa	7	"	FO	—	W	300m	94	14W	632482	7212953
14:08	RaTa	25	Lake	stand/wk	S	W	500m	93	14W	630902	7209893
14:14	RaTa	25	HT	walk	S	W	350m	87	14W	630397	7206270
14:21	RaTa	12	HT	walk	S	W	450m	80	14W	627779	7201764
14:28	RaTa	14	"	"	S	W	500m	77	14W	626387	7200047
14:38	RaTa	25	"	"	N	W	"	72	14W	627048	7193966
14:55	RaTa	30	"	FO, Jt	—	W	250m	68	14W	626927	7191481
14:48	RaTa	15	"	FO, Jt	—	W	500m	64	14W	626436	7187399
14:57	"	50	Hill Top	FO, Jt	—	W	1 Km	61	14W	625737	7184524
15:05	"	15	"	"	—	E	400m	53	14W	624999	7176761
15:10	"	25	"	"	—	SW	1 Km	49	14W	625485	7174244
15:15	"	5	"	"	—	W	600m	46	14W	627541	7172823
15:24	RaTa	3	—	Fly low	—	W	400m	36	14W	630517	7165237

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AWA2

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: May 18, 2018 **Time Started:** 09:00 **Time Ended:** 16:30

Wind Direction:

Clear

Field Team: U. n. t. t. r. e. n. g.

[illegible]

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AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: May 25 2018 Time Started: 09:00 Time Ended: 16:00

Temperature: -12°C Wind Speed: 21 km/h Wind Direction: WNW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Vuturuz, F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:57	RaTa	15	Tundra	For stand	—	W	400m	36	14W	630875	7164840
10:03	"	22	"	For walk	W	W	400m	40	14W	629772	7169002
10:06	SaCr	2	"	stand	W	W	300m	44	"	628734	7171351
10:06	RaTa	8	"	"	—	E	400m	44	"	"	"
11:06	M.O.	2	Hill Top	stand	—	W	200m	94	"	632221	7212540
11:18	RaTa	8	MBE	stand fo	—	W	200m	103	"	636997	7215503
12:58	RaTa	12	Hill	walk	SW	W	400m	95	"	632067	7212458
13:06	RaTa	20	Tundra	walk	S	W	300m	89	"	631140	7208141
13:31	RaTa	15	"	"	N	W	600m	74	"	626441	7197235
13:33	Sik-sik	1	AWAR	stand	—	—	—	73	"	626721	7196221
13:37	Cabo	10	"	Fly over	N	—	—	72	"	627001	7194080
13:39	Peta	1	Runway 16	Perch	—	W	350m	71	"	627282	7192997
13:45	RaTa	30	Hill Top	stand	—	W	900m	66	"	626870	7190013
13:49	RaTa	46	Tundra	"	W	W	"	65	"	626332	7188263
13:51	RaTa	39	"	walk	S	W	450m	61	"	626260	7185908

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Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Temperature: -12°C

Wind Speed: 21 Km/h Wind Direction: NNW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km **Precipitation:**

Field Team: V. Anthony F. L. Forte

$$\underline{2} \text{ of } \underline{2}$$



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 01, 2018

Time Started: 09:00

Time Ended:

Temperature: -3°C

Wind Speed: 24 Km/h

Wind Direction: WSW

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: —

Field Team: V. Utetnag, F. Laporte

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
12:40	SnGo	76	mbk	fo, rest	—	W	50m	106	14W	637831	7214369
12:42	"	20	"	"	—	E	100m	104	"	636727	7215426
"	RaTa	20	"	"	—	E	40m	104	"	"	"
"	Salr	2	"	"	—	E	100m	104	"	"	"
12:50	RaTa	12	"	F	—	W	"	102	"	"	"
12:55	"	35	Tmb	fo, st	—	E	"	99	"	674051	7215420
13:02	RaTa	10	Lake	"	—	W	999m	95	"	632596	7213123
13:10	RaTa	23	Lake	enke	S	W	500m	98	"	"	"
13:17	M.O	5	Tmb	fo	—	W	300m	90	"	631029	7208522
"	RaTa	4	"	walk	N	W	"	88	"	"	"
13:20	"	60	"	"	W	W	"	82	"	630571	7206372
13:28	R.T	5	"	fo	—	E	400m	94	"	628350	72041053
13:32		22	"	walk	N	W	300m	87	"	627184	7209892
13:46	RaTa	16	"	"	S	W	500m	73	"	626800	7195879
13:49	RaTa	56	Quarry	fo	—	W	400m	70	"	627262	7193222

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AGNICO EAGLE

AWA

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 81, 2013 Time Started: _____ Time Ended: _____
 Temperature: -3°C Wind Speed: 24 km/h Wind Direction: W
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: —
 Field Team: J. Utteridge, F. Lepore

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
13:50	Peta	1	Quarry	Perch	—	W	100m	70	14W	62762	7193262
"	SuCr	1	—	—	W	W	—	—	"	"	"
"	SuGo	60	—	Flg	N	—	—	"	"	"	"
14:07	RaTa	5	Tundra	walk	N	W	600m	65	14W	626425	7187860
14:08	SuCr	2	Tundra	stand	—	W	500m	60	"	"	"
14:19	RaTa	6	"	walk	S	W	"	55	"	625614	7178929
14:26	RaTa	5	"	Go	—	W	700m	49	"	625317	7175357
"	SuCr	3	Tundra	stand	—	S/W	500m	47	"	"	"
14:35	RaTa	16	"	Go	SW	W	100m	48	"	625684	7173550
"	RaTa	12	"	"	—	W	700m	46	"	624210	7123121
"	SuCr	2	"	st.	—	W	100m	46	"	"	"
14:41	RaTa	10	"	Forest	—	W	400m	"	"	628162	7172542
14:44	Peta	1	Quarry 9	Perch	—	W	300m	44	"	628614	7171922
14:56	RaTa	10	Tundra	walk	S	W	"	41	"	629660	7169140
14:53	RaTa	18	"	"	W	W	700m	38	"	630177	7166825

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AGNICO EAGLE

Answer

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 01 2018

Time Started:

Time Ended:

Temperature:

-305

Wind Speed: 24 km/h **Wind Direction:**

WSW

Visibility (check):

☐ 100m

☐ 500m

☒ 1 km

Precipitation:

Field Team:

V. utetung, P. Laporte

[illegible]

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AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 08, 2018

Time Started: 09:00

Time Ended: 14:50

Temperature:

0°C

Wind Speed:

2 km/h

Wind Direction:

N

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: —

Field Team: V. Utatnay, Passenger Bus

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
09:30	RaTa	15	Tundra	walk	WSW	W	250m	17	14W		
13:09	"	10	"	stnd, Fo	—	W	500m	71	14W	627025	7194004
13:51	LoTaDu	2	Pond	rest, fly	NE	E	250m	36	14W	630562	7164828
13:51	ScLR	2	Pond	walk	—	E	"	"	"	"	"
13:51	CaGo	4	"	rest	—	E	"	"	"	"	"
14:02	RaTa	5	Lake	walk	S	W	600m	24	14W	637506	7156626
14:02	PeFu	1	Quarry 3	Perch	—	W	150m	23	"	"	"
14:12	RaTa	3	Tundra	walk	W	W	500m	18	"	640937	7150473
14:28	LoTaDu	2	Pond	swim	—	E	100m	5	"	644810	7140179

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AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 12, 2018 Time Started: 09:00 Time Ended: 15:00

Temperature: -34°C Wind Speed: 35 km/h Wind Direction: SE

Visibility (check): ☐ 100m ☒ 500m ☒ 1 km Precipitation: Light rain

Field Team: Vutathag, MBA, VMOR

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:30	LoTad	2	Pond	swim	—	E	150m	15	14W	641722	7149494
9:43	CeGo	15	H.T.	walk, fly	N	W	100m	24	14W	636175	7158922
10:31	ArFo	1	AWAR	sitting	—	E	50m	65	19W	626340	7188576
10:35	RaTa	2	AWAR	walk	W	W	200m	68	14W	626999	7191570
10:50	RaTa	15	HT	walk	S	W	350m	82	14W	629791	7205396
11:00	"	9	Hill	stand, fly	—	W	450m	80	14W	631063	7208783
11:07	hi	50	HT	"	—	W	600m	96	14W	632753	7213341
13:32	Ptarm	2	AWAR	walk, fly	variable	W	50m	77	14W	626083	7199629
17:29	Solo	2	HT	"	"	E	50m	70	14W	627884	7192954

AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 15, 2018 Time Started: 09:00 Time Ended: 15:15Temperature: 3°C Wind Speed: 5 km/h Wind Direction: ENEVisibility (check): ☒ 100m ☐ 500m ☒ 1 km Precipitation: Field Team: V. Utatnag, Laurence Archambault, Michelle Ordaz

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:34	RaTa	4	Rocky HT	walk	SW	W	300m	11	14W		
9:55	"	1	Lake shores	stand	SW	W	500m	30	14W	634009	7162259
10:28	"	1	HT	stand	—	W	500m	53	14W	625150	7178210
10:47	"	5	HT	FO, stand	—	W	400m	68	14W	626991	7191580
10:56	"	1	"	FO, stand	—	W	350m	78	14W	625647	7195541
11:01	"	4	"	"	—	W	700m	79	14W	626893	7200842
12:04	Peta	2	fly, perch	Quarry 21	—	W	250m	93	14W	630884	7211757
13:07	RaTa	12	Lake	walk	N	W	500m	94	14W	630895	7209894
13:21	RaTa	1	Tundra	stand, walk	NW	W	400m	92	14W	627300	7203219



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 19, 2018

Time Started: 09:00

Time Ended: 15:45

Temperature:

Wind Speed:

Wind Direction:

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Utatnan, Michelle Ordaz

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
13:28	PeFa	1	AWAR	Hover fly	variable	—	—	84	14W	628335	7204081
14:06	RaTa	2	Rocky Tm	walk	S	W	300m	61	14W	625796	7184654
14:34	CoGu	5	AWAR	fly	S	—	—	43	14W	625971	7170335
15:12	RaTa	2	Grassy Tm	stand, walk	W	W	350	14	14W	642405	7148327
8/135			AWAR					61			

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Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: June 26, 2018 Time Started: 09:00 Time Ended: 15:30
 Temperature: 5°C Wind Speed: 16 km/h Wind Direction: NNW
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: clear
 Field Team: V. Utatny, L. Archambault

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:08	CoLo	2	Airplane Lake	swim dive	—	E	250m	1	15W	356281	7136102
9:51	SaCr	3	HT	stand walk		E	200m	30	14W	634926	7161244
9:52	RaTa	3	"	"	variably	E	400m	32	14W	633000	7167312
10:19	M.O.	10	"	FO	—	E	350m	47	14W	626566	7173061
10:36	RaTa	4	Rocky HT	"	—	W	700m	53	14W	625318	7178473
11:12	ArWo	8	"	walk	S	W	400m	80	14W	627096	7201197
11:19	CaGo	2	Pond	swim	—	E	200m	84	14W	628688	7204217
11:27	RaTa	4	Rocky HT	FO stand	—	W	300m	87	14W	631312	7206782
11:40	M.O.	1	HT	stand	—	E	175m	104	14W	636667	7216494
13:25	RaTa	1	HT	run	S	W	175m	91	14W	630900	7209781
13:46	RaTa	3	"	FO	—	W	1 km	83	14W	627391	7203936
15:05	NoPi	6	Bridge #2	swim	—	W	50m	17	14W	640344	7151106



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: July 03, 2018 Time Started: 09:00 Time Ended: 15:00

Temperature:

Wind Speed:

Wind Direction:

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Utatnagan Mike

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:45	RaTa	1	creek	stand	—	W	250m	23	14W	638077	7156011
12:57	M.O.	2	Rocky Mt	Go, stand	—	W	200m	90	14W	631163	7208062
14:32	Salr	2	Bridge #2	stand, walk	—	W	150m	17	14W	640340	7151134

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AWAR

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Wind Speed: 41 gust 53 kts Wind Direction: N

Field Team: V. Utathang, J. Kataluk

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AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: July 17, 2018 Time Started: 09:00 Time Ended: 15:30
 Temperature: 11°C Wind Speed: 18 km/h Wind Direction: E
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Cloudy
 Field Team: V. Utetnag, J. Kataluk, M. Theriault

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
10:15	M.O.	1	H.T.	Stand, Fo	—	E	200m	19	14W	639999	7152765
11:49	M.O.	9	H.T.	"	—	W	"	103	14W	636628	7216558
12:53	Pc Fa	1	Quarry 21	Marking	—	W	"	93	14W	630865	7211778
14:32	M.O.	2	Quarry 8	Fo, 1 tank	—	W	"	43	14W	628998	7171113
14:49	M.O.	2	Hillside	Rest	—	E	700m	33	14W	633316	7163597
14:57	M.O.	1	H.T.	Stand	—	E	500m	27	14W	636176	7159355
14:57	R. Ta	1	HT	Stand, Wall	W	W	250	27	14W	"	"
15:01	Pc Fa	1	Hill	Fl	E	E	"	24	14W	637243	7156950
15:08	M.O.	1	Riverbank	Stand	—	E	300m	19	14W	639998	7152765
15:11	M.O.	24	"	Stand, rest	—	E	"	17	14W	640827	7150581

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AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: July 27, 2018 Time Started: 09:00 Time Ended: 15:45

Temperature:

Wind Speed:

Wind Direction:

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear

Field Team: V. Utteridge, Pat Ahern

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:43	M.O.	1	Creek	FO, stand	E	E	200m	23	14W	638321	7155559
10:53	M.O.	1	HT	"	—	E	1km	73	14W	626797	7195910
11:20	RaTa	1	AWAR	walk	NE	E	25m	93	14W	630940	7211541
13:44	PeTa	1	Quarry 16	rest	—	W	150m	70	14W	627209	7193112
14:32	RaTa	1	Quarry 9	stand, injured	—	W	"	43	14W	628644	7171598
14:40	M.O.	1	HT	stand, FO	—	E	250m	41	14W	630046	7168909
15:05	PeTa	2	Quarry 3	Resting	—	E	"	23	14W	638010	715640

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AGNICO EAGLE

AWA2

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: July 31, 2018

Time Started: 09:00

Time Ended: 15:00

Temperature:

Wind Speed:

Wind Direction:

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation:

clear

Field Team: V. Hattag, M. Allard

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:25	m.o.	4	HT	fo, stand	—	E	250m	6	14W	644664	7141203
9:53	m.o.	1	"	"	—	W	300m	29	14W	634847	7161327
10:28	m.o.	1	"	"	—	E	700m	54	14W	625766	7128985
12:58	m.o.	1	"	"	—	E	600m	90	14W	631264	7207665
13:19	Sacr	4	Rocky HT	std, walk	—	E	200m	74	14W	626515	7197148
14:30	m.o.	1	Lake side	"	—	E	700m	29	14W	636230	7159099
14:56	m.o.	1	HT	fo, stand	—	E	400m	8	14W	643978	7142790

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Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Field Team: V. Utatnag, M.D.

[illegible]



AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: August 10, 2018 Time Started: 09:00 Time Ended: 15:00

Temperature: 8°C Wind Speed: 18 km/h Wind Direction: N

Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Clear, some clouds

Field Team: V. Utatnag, L. Archambault

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:35	M.O.	11	Grassy Tan	FO, rest	—	200m E	200m	20	14W	639515	7153643
9:59	M.O.	10	"	rest	—	W	"	41	14W	629137	7169972
10:02	M.O.	1	Quarry 9	stand	—	W	300m	45	14W	628109	7171854
13:53	M.O.	12	Tundra	FO, stand	—	W	"	38	14W	629986	7167468

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Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Field Team: V. Utathag, M.O.

[illegible]

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AWAR

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Field Team: V. Utatnaz, Pat Ahern

[illegible]

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[illegible]

AGNICO EAGLE

AWAR

Meadowbank Access Road Wildlife Survey Field Sheet

This form is for collaborative systematic monitoring of the access; it is important all fields in the table below are completed

Date: August 21, 2018 Time Started: 09:00 (12:30) Time Ended: 15:15
 Temperature: 17°C Wind Speed: 15 km/h Wind Direction: W
 Visibility (check): ☐ 100m ☐ 500m ☒ 1 km Precipitation: Cloudy
 Field Team: V. Utatnag, P. Dhern

Time	Species	Qty	Habitat Type	Behaviour	Direction of Travel	Direction from Road	Distance from Road (m)	K M	GPS Zone	Easting	Northing
9:34	SnGo	25	Grass, Tan	rest, walk	—	E	200m	13	14W	642637	7147622
9:37	Rata	30	"	st, walk	variable	E	200m	15	14W	641761	7149513
9:40	Rata	14	AWAR	cross rd	W	E-W	AWAR	16	14W	640503	7150855
9:44	Rata	40	HT	FO, stand	—	E	250	16	14W	640334	7151229
10:32	Rata	9	HT	stand, FO	—	E	300m	55	14W	626636	7180031
10:35	"	12	"	"	"	"	"	56	14W	625733	7182334
10:38	"	40	"	walk	N	E	400m	59	14W	625806	7184666
10:43	"	45	"	"	"	"	100m - 400m	64	14W	626328	7188292
10:52	"	15	"	"	"	"	"	73	14W	626850	7195126
10:59	"	28	Grass, Tan	"	NE	E	"	78	14W	626119	7199693
11:06	"	100	HT	"	"	"	"	84	14W	627367	7203166
11:15	"	16	"	"	"	"	"	85	14W	630014	7206020
13:21	Rata	18	HT	Rest, FO	—	E	351m	88	14W	630665	7206364
17:27	"	25	HT	FO, stand	—	E	800m	86	14W	629697	7204810
17:29	"	50	HT	"	—	E	300m - 800m	85	14W	629447	7204442

Log 2