Appendix G. 2022 Pre-Construction Wildlife Mitigation and Monitoring Plan

Sabina
GOLD & SILVER CORP.

Back River Project

2022 Pre-Construction Wildlife Mitigation and Monitoring Program Report

March 2023

Project No.: 0586786-0005

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March 2023

Back River Project

2022 Pre-Construction Wildlife Mitigation and Monitoring Program Report

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GLOSSARY AND ABBREVIATIONS

CESCC	Canadian Endangered Species Conservation Council
CTAG	Caribou Technical Advisory Group
CWS	Canadian Wildlife Service, a division of ECCC
ECCC	Environment and Climate Change Canada
FEIS	Final Environmental Impact Statement
GN DOE	Government of Nunavut Department of Environment
GNWT ENR	Government of Northwest Territories Department of Environment and Natural Resources
Goose Site	The planned mine location: currently houses the Goose Camp and airstrip used for advanced exploration.
HSR	Habitat Suitability Rating: final rating assigned to an ecosystem unit with all assumptions and adjustments taken into account.
INAC	Indigenous and Northern Affairs Canada (renamed Crown-Indigenous Relations and Northern Affairs Canada in July 2019)
IOL	Inuit Owned Land
KIA	Kitikmeot Inuit Association
MLA	Marine Laydown Area: located on the west coast of Bathurst Inlet.
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
the Project	Back River Project
PDA	Project Development Area: the area approved for development by the NIRB.
Q3	Third quarter
Sabina	Sabina Gold & Silver Corp.
WIR	Winter Ice Road connecting the MLA and Goose Site
WMMP Plan	Wildlife Mitigation and Monitoring Program Plan
WMMP Report	Wildlife Mitigation and Monitoring Program Report

1. INTRODUCTION

1.1 Project Overview

The Back River Project (the Project) is a gold mining project owned by Sabina Gold and Silver Corp. (Sabina), located in the Kitikmeot Region of Nunavut (Figure 1.1-1). The Project is largely located on Inuit Owned Land (IOL) and has two centres of activity that are connected by a Winter Ice Road. The two centres of activity are a Marine Laydown Area (MLA) located in Bathurst Inlet and the Goose Property Area (Goose Site) about 160 km south of the MLA where the mine will be located.

The Project holds Project Certificate No. 007 from the Nunavut Impact Review Board (NIRB) and a Type A Water License from the Nunavut Water Board (NWB). Currently, the Project is in the pre-construction phase, with a camp and infrastructure at the Goose Site and MLA.

1.2 2022 Project Activities

During 2022, pre-construction and exploration activities continued at the Goose Site. The Goose Site previously included a camp and facilities that were used during the exploration phase of the Project from the early-2000s to 2021 and continued to be used in 2022. This includes administration, accommodations and kitchen buildings, workshops and storage buildings, a fuel depot, heli-pads, an all-season airstrip, an all-season road connecting the camp and airstrip, and a quarry.

During 2022, the Goose Site supported a mineral exploration program in the surrounding areas, and the George exploration camp to the north-west. Pre-construction also progressed by making use of the existing exploration infrastructure and resources.

The 2022 Goose Site Earthworks included:

- clearing of the Plant Pad area to rough grade in preparation for accommodation complex installation;
- initial construction of a 10M liter fuel tank and containment;
- drilling and blasting at the phase 1 primary pond water management facility;
- continued development of the bulk-sample underground workings;
- pre-development stripping at the Echo Pit; and
- drilling, blasting and pad construction at the new permanent fuel tank pad.

Limited earthworks occurred at the MLA during 2022 to expand existing laydown pads and develop all-season roads connecting the MLA laydown with the start of the Winter Ice Road (WIR) when constructed. No WIR was constructed between the MLA and the Goose Site during 2022.

Aircrafts (including Dash-7, Dornier 228, Twin Otter, ATR, Hercules, etc.) were used during the spring, summer, and fall of 2022 to bring in crews, equipment, and fuel at the site. It included fixed wing flights to the Goose Site and flights to the MLA. Smaller planes, Dash-7 or similar, were used each week for groceries, and every three weeks for crew changes and equipment. Bulk fuel transportation and cargo were delivered weekly via an ATR.

A sea-lift occurred in 2022, with five vessel sailings; three vessels from the west (Hay River/Tuktoyaktuk) and two travelled from the east (Becancour). The sea-lift brought in diesel fuel, vehicles and modular camp buildings for the future upgrade of Goose Camp, in addition to construction equipment, materials, overhead cranes, generators, spare equipment, WIR equipment and some of the mining fleet.

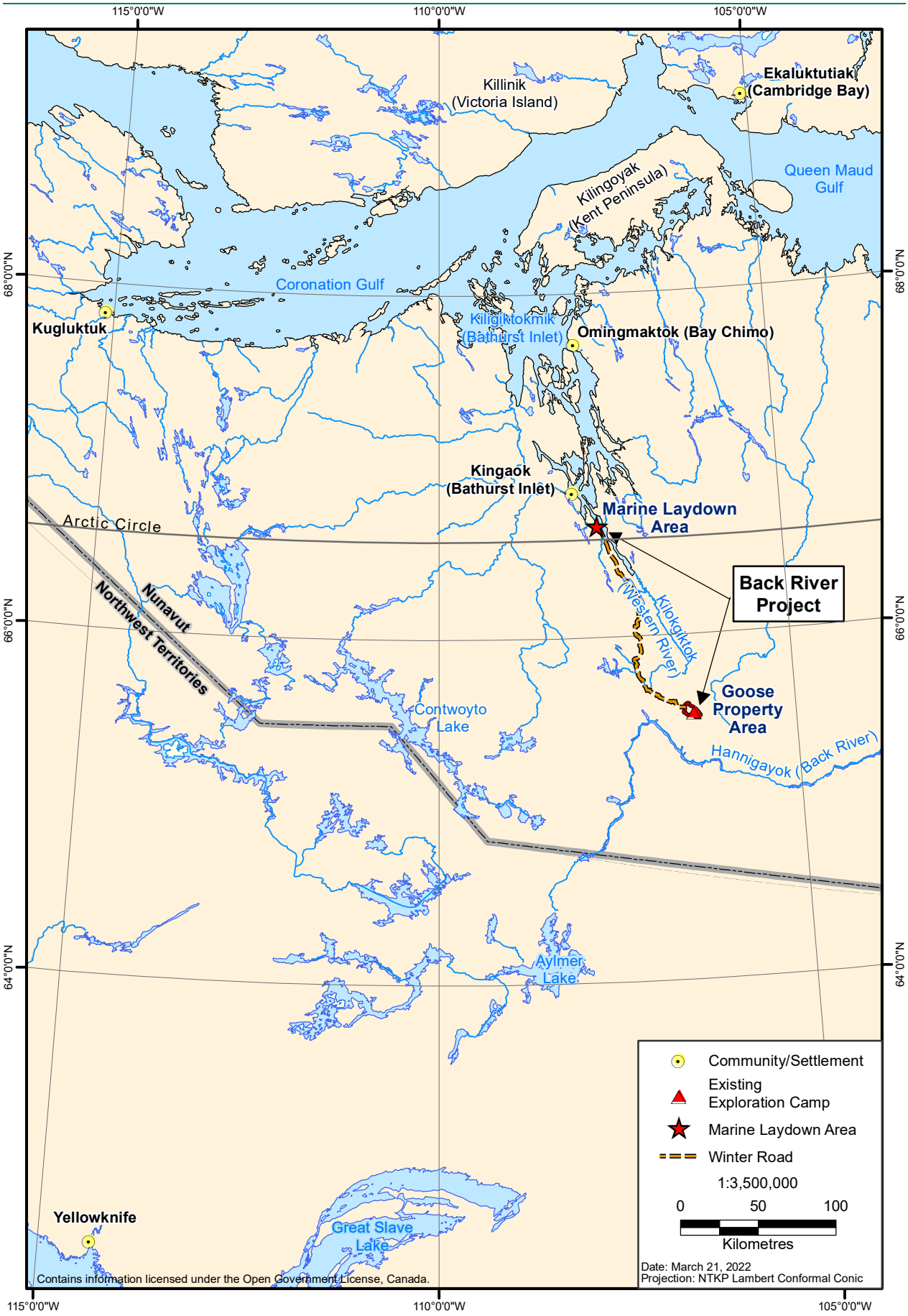

Figure 1.1-1: Back River Project Location

2. OVERVIEW OF PRE-CONSTRUCTION WILDLIFE MITIGATION AND MONITORING PROGRAM

In 2022, the Back River Project was in the pre-construction phase. Reporting requirements outlined in the WMMP Plan, Chapter 19 (ERM 2019), indicate that the WMMP compliance reporting will occur during construction, operation, care and maintenance, and closure (excluding periods of temporary closure and post-closure).

This Pre-Construction WMMP Report presents the mitigation and monitoring conducted during this phase, as per Table 6.2-1 in the WMMP Plan, and presented in Appendix 2A. For reference, Appendix 2A also outlines the various monitoring and mitigation that will occur during later phases of the project (construction, operation, care and maintenance, and closure).

2.1 The Wildlife Mitigation and Monitoring Program Plan

This document reports the results of the wildlife mitigation and monitoring program during pre-construction, as described in the Wildlife Mitigation and Monitoring Program (WMMP) Plan.

The WMMP Plan describes all of the mitigation and management activities conducted by Sabina to keep wildlife and wildlife habitat safe by mitigating potential impacts of the project. The WMMP Plan also includes a description of two types of Project monitoring activities: 1) monitoring used to direct management activities (including incidental observations), and 2) monitoring of Project effects to confirm impact predictions made in the Final Environmental Impact Statement (FEIS). This document does not include the second type of monitoring (monitoring of Project effects), as the project is in the pre-construction phase. Monitoring of Project effects will begin during the construction phase of the Project.

The WMMP Plan was included in the FEIS and was updated several times following discussions with regulators including the Kitikmeot Inuit Association (KIA), Government of Nunavut Department of Environment (GN DOE), and Government of Northwest Territories Department of Environment and Natural Resources (GNWT ENR).

During 2022, the WMMP Plan was updated to Version 11 (the current plan) to include commitments made by Sabina in response to comments and suggestions made by the Kitikmeot Inuit Association (KIA) and due to the addition of windfarm-related mitigation and monitoring (not applicable to the Pre-Construction WMMP Report). The WMMP Plan will be updated as needed during the life of the Project in conjunction with the KIA, GN, GNWT, and community members and groups.

NIRB Project Condition 51 describes a collaborative Caribou Technical Advisory Group (CTAG) that reviews and provides comments on the WMMP Plan. The CTAG is composed of representatives from Sabina, the KIA, the GN DOE and other experts requested by the representatives to address particular issues. Version 9 of the WMMP Plan was updated in 2018 and was delivered to the NIRB in May 2019 as part of Sabina's annual NIRB Report. During 2019, the WMMP Plan was updated to Version 10 to include a commitment made by Sabina in response to comments and suggestions made by the Kitikmeot Inuit Association regarding contact telephone numbers in case of fuel spills. An update to the WMMP Plan was completed in 2022 (Version 11) to incorporate mitigation and monitoring for the proposed windfarm.

The CTAG met on December 14, 2022 and on January 12, 2023 and discussed the following: pre-development work activities and planned activities for 2023; plans for the WIR in 2023; and monitoring methods for caribou on the WIR.

In addition to the WMMP Plan, Sabina has also produced detailed memos to discuss particular aspects of management with the CTAG. Sabina has also produced detailed Standard Operation Procedures (SOPs)

to operationalize aspects of the WMMP Plan, the SOPs communicate requirements to subcontractors such as shipping and aircraft companies, as well as staff on site.

2.2 NIRB Conditions

The NIRB Project Certificate (No. 007) includes 28 Conditions for wildlife. Compliance with these Conditions is described in the 2022 NIRB Compliance Report.

2.3 Monitoring in 2022

The primary component of the pre-construction monitoring program in 2022 was recording incidental observations of wildlife by Project personnel to determine whether wildlife Valued Ecosystem Components (VECs) or other species of interest such as fox are interacting with Project personnel or infrastructure and remaining safe.

The purpose of documenting wildlife incidental observations is to reduce the potential for wildlife-related safety concerns for employees, and to minimize potential effects of mine activities on wildlife. Natural wildlife activity and ecological processes are left undisturbed unless there is risk of harm to on-site personnel. As part of the wildlife monitoring, all wildlife sightings are recorded and reviewed to develop mitigation measures and adaptive management procedures for re-occurring incidents, if they occur.

Wildlife effects monitoring (monitoring wildlife populations to confirm predictions made in the Project FEIS) will begin with construction and continue during operation.

In 2022, the following components of the WMMP Plan and associated Project Conditions were carried out as part of pre-construction:

- Section 3: Tracking Habitat Loss (Section 7.2.2.1 of WMMP Plan).
- Sections 5.1 and 6.1: Fixed Wing Aircraft and Helicopter Management (Section 7.1 of WMMP Plan, Conditions 60 and 61).
- Section 5.2: Traffic/Vehicle Management (Section 7.1 WMMP Plan).
- Section 5.3: Winter Ice Road Management (Section 7.1.6 of WMMP Plan).
- Section 5.4: Blasting Management (Section 7.1 of WMMP Plan).
- Section 5.5: Waste Management Monitoring/Bear Safety (Section 6 of WMMP Plan, Table 6.2-1, Condition 48).
- Section 5.6: On-Site Camera Monitoring (Section 6.2.1.5 of the WMMP Plan).
- Sections 5.7, 6.3 and 7.3: Incidental Wildlife Reporting (Section 6 of WMMP Plan, Table 6.2-1).
- Section 6.2: Construction Timing Windows (Section 11.1.3.2 of WMMP Plan).
- Section 7.1: Shipping Management (Section 13, 14, and 15 of WMMP Plan, Conditions 58, 64, and 65).
- Section 7.2: Seal Lair Management (Section 14 of WMMP Plan, Condition 63).
- Section 8: Species at Risk Table Update (Section 4.1 of WMMP Plan, Condition 55).
- Section 9: Mortality and Incident Reporting (Section 7.1 of WMMP Plan, Conditions 46 and 59).

2.4 Incorporation of Community Perspectives and Traditional Knowledge in the Monitoring Program

Community perspectives and Traditional Knowledge (TK) are considered throughout the Project's baseline studies, environmental assessment, and wildlife monitoring program. Sabina has developed the document '*Guidance for Incorporating Community Perspectives and Traditional Knowledge in the Back River Project's Monitoring Programs*' to assist in the preparation of its annual monitoring reports.[1]

Community perspectives and TK were first considered in the identification of Valued Environmental Components (VECs) and the assessment of Project effects in the Final Environmental Impact Statement (FEIS: Sabina 2015, 2017); these effects subsequently became a focus of Sabina's Wildlife Mitigation and Monitoring Program Plan (Sabina 2022; Version 11).

The following meetings and reports were reviewed for TK-specific information related to wildlife:

- Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River Project, Naonaiyaotit Traditional Knowledge Project (NTKP) report, commissioned by Kitikmeot Inuit Association (KIA 2012) (Appendix V3-3A of FEIS);
- Naonaiyaotit Traditional Knowledge Project - Hannigayok (Sabina Gold & Silver Corp. Proposed Back River Project). Results from Data Gaps Workshops, Final Report (June 2014; KIA 2014) (Appendix V3-3C of FEIS);
- Back River Project: Existing and Publicly Available Traditional Knowledge from Selected Aboriginal Groups in the Northwest Territories (Appendix V3-3B of FEIS);
- The Nunavut Impact Review Board (NIRB) Public Scoping Meetings Summary Report (NIRB 2013). This report summarizes public scoping meetings held by NIRB within five Kitikmeot communities, including residents/families from Bathurst Inlet and Omingmaktok as well as a public scoping meeting in Yellowknife, Northwest Territories; and
- Focus Group Sessions (Rescan 2013) with hunters from Kitikmeot communities.

Community perspectives and TK were used to decide which wildlife species to include as VECs. The TK reports present maps of valued animal species, environmental components, and traditional land use activities. This information was used to determine if these valued aspects potentially interacted with the proposed Project, and if so, they were included as VECs for the Project.

The Regional Study Area (RSA) for the FEIS and WMMP Plan was defined and modified based on TK. The boundary was adjusted to include important areas for caribou such as Beechey Lake, grizzly bear habitat along the Western River, and ringed seal (*Pusa hispida*) habitat in Bathurst Inlet.

Baseline studies were designed to characterize wildlife and wildlife habitat identified as culturally important to Inuit. TK identified important habitat features such as crossing points for caribou, raptor nest locations and carnivore den locations, and important staging areas for migratory birds. Ecosystems of traditional and cultural importance due to their value as wildlife habitat, including eskers, sedge wetlands, marine shores, and riparian ecosystems were incorporated into field studies and habitat mapping.

Examples of important habitat features identified from TK and incorporated into baseline studies, the FEIS and the design of the WMMP Plan include:

- The locations of numerous traditional harvesting and habitation areas were used to identify important corridors, crossings, and pinch-points for caribou movement.

[1] A copy of this document was included in JPCSL (2020) [NIRB Public Registry ID# 329193].

- These TK locations, combined with land user information in the field, were used to place trail cameras to study the abundance and timing of movement of wildlife in the RSA, including caribou, muskox, and grizzly bear.
- Habitat usage and foraging locations from TK were incorporated into habitat maps for caribou, grizzly bear, and muskox.
- The location of historic calving ranges for the Bathurst herd, both east and west of Bathurst Inlet was identified and mapped.
- The location of a currently un-used calving area for the Bathurst herd, to the north of Nose Lake and around Beechey Lake was identified.
- The fact that Bathurst herd calving grounds have changed frequently through time between their various historic calving grounds.
- The historic location of the Beverly calving ground.
- The movement patterns of both Bathurst and Beverly caribou herds between their winter, calving, summer, and back to winter ranges.
- The location of the Dolphin and Union herd calving grounds on Victoria Island.
- Movement patterns of the Dolphin and Union herd on Bathurst Inlet and across the Dolphin and Union Strait.
- The importance of Nose Lake and Contwoyto Lake for summering Bathurst caribou.
- The use of eskers and other elevated landforms by caribou during summer for ease of movement and relief from insects.
- The use of wet foraging locations during post-calving, including areas with cotton grass, as important forage for lactating females and newly weaned calves.
- The use of lakeshores as travel corridors and for insect relief.
- Land users provided insights on grizzly bear behaviour and habitat use and directed the installation of hair-capture posts in the best possible locations to attract grizzly bears.
- Muskox were noted as an important resource species and were evaluated as a VEC.
- For birds, Inuit TK included observations of the earlier migration of the snow bunting and of large-bodied birds, such as the tundra swan and geese, and identification of ravens and ptarmigan as non-migratory, resident birds. Examples of detailed observations of bird habitat use include frequent foraging on berries by geese, nesting of waterbirds on mid-stream islands and of geese and some ducks on cliffs, and observations of higher densities of nesting waterbirds in large wetlands. Inuit TK also included the identification of regularly used staging sites by waterbirds as areas that become ice-free earlier than other areas, such as fast-flowing rivers.
- Cliff nesting habitat identified by Inuit in the wildlife RSA includes areas west of Goose Property on the northern shores of Beechey Lake, near Kingaok, as well as on the eastern shores of Bathurst Inlet near Omingmaktok. Inuit also stated that ground-nesting raptors prefer areas around wetlands or non-cliff areas as they hunt mainly small rodents. This knowledge was used to prioritize areas to search for raptor nests during baseline studies.
- Important habitats for muskox, grizzly bear, moose, and wolves in the Project area.
- Historic harvesting areas for waterfowl, ringed seal and fish at lakes and on Bathurst Inlet.

Community perspectives and TK were considered in the design of the Project, following the mitigation hierarchy, to avoid important habitats for wildlife and avoid unwanted effects on wildlife populations identified as important to Inuit, including:

- Using a Winter Ice Road (WIR) in lieu of an all-season road to reduce disruption of movement for caribou;
- Designing the WIR to avoid a valley east of Bathurst Inlet identified by the KIA as an important area for overwintering moose;
- Designing the WIR to avoid the mouth of the Western River, an area identified as important for wildlife through TK.;
- Designing the on-ice airstrip at the MLA to be constructed before the ringed seal pupping period to avoid effects on seal lairs;
- Removing the George Camp from the Project Description to reduce interactions between the Project and Bathurst caribou; and
- Designing roads and maintaining the WIR to allow caribou to easily cross.

Community perspectives and TK were considered in the evaluation of Project effects in the FEIS and addressed through management actions in the WMMP Plan, including:

- Evaluating habitat loss and disturbance for passing caribou and muskox;
- Evaluating whether grizzly bear and wolverine would be attracted to Project camps;
- Evaluating whether on-ice activities would disturb ringed seals;
- Evaluating whether the WIR would impede caribou movement;

The WMMP Plan was designed to include community perspectives and TK, through:

- The WMMP Plan introduction states: “Sabina is committed to considering and incorporating traditional knowledge (TK) into the Plan on an ongoing basis. The incorporation of traditional knowledge will occur throughout all stages of the Plan, including identification of mitigation measures, monitoring study design, data collection, and follow-up programs to obtain feedback.”
- The Caribou Technical Advisory Group (CTAG) is composed of Sabina, along with the KIA and GN. The KIA has an ongoing opportunity to provide Inuit perspectives on mitigation and management for the Project, which may then be incorporated into the Plan.
- Sabina is in the process of establishing an Inuit Environmental Advisory Committee (IEAC). The objective of the IEAC is to liaise with Inuit Elders who have experience in the Project area on wildlife, fisheries, and other environmental features. Inuit Elders will review mitigation and results of monitoring and provide insights that can be incorporated into existing management and monitoring programs.
- Habitat areas identified as important by community members, land users and TK formed the basis of wildlife habitat maps used for designing the WMMP Plan and locations for wildlife studies, including the trail camera program, monitoring for bears, waterfowl, ringed seals and seabirds.
- Concerns raised by communities have been incorporated into mitigation programs, including avoiding wildlife with helicopters, stopping vehicles when wildlife are on the road, and halting mining activities if caribou shift their calving ground to overlap the site.
- Concerns raised by communities have been included in monitoring programs, including behaviour monitoring for caribou, monitoring whether caribou avoid the Project, and monitoring whether bears and wolverine are attracted to the Project camps.

- Communities raised concerns about keeping the environment clean, so wildlife can stay healthy. This has led to no littering policies, requirements surrounding reporting and cleaning up spills, and contributed to other monitoring programs reported separately, including for: water quality, water flow, dust, vegetation, toxicology and fish.

Moving forward, relevant community perspectives and TK will continue to be tracked through annual WMMP reports and inform the content, results, and management actions associated with Sabina's monitoring program. Sabina will also continue to address comments raised about its monitoring programs directly with community members where appropriate.

No new TK was collected in 2022. Information has been limited the past few years (2020 to 2022) due to COVID-19 which imposed travel restrictions and prevented in-person meetings. Community meetings are anticipated to return in 2023.

3. HABITAT LOSS

The FEIS described the wildlife habitat that will be lost within a permitted Project Development Area (PDA); composed of the Project footprint and a 1-1.5 km buffer. The WMMP Plan includes monitoring and reporting of the area of habitat loss in each year of construction and operation of the Project. Habitat loss is reported here to provide a measure of habitat loss due to exploration and pre-construction activities prior to 2022, and due to pre-construction activities in 2022.

Direct loss of wildlife habitat may occur through site clearing, infrastructure construction, and facility expansion. Habitat loss is evaluated as the direct loss of vegetation communities due to the Project footprint.

During review of the 2020 WMMP Report, the KIA requested suitability models for caribou winter habitat be included in the calculations of habitat loss. Caribou winter habitat loss was not assessed in the FEIS; therefore, a winter habitat suitability model was developed in 2021, and calculations of how much winter habitat is lost per year are also reported annually.

3.1 Methods

3.1.1 Infrastructure Development

During the pre-construction phase of the Project, the amount of habitat loss is expressed as proportion of the Project Development Area (PDA). The total area constructed in 2022 was calculated and compared to the total area of the PDA using GIS analysis.

3.1.2 Caribou Winter Habitat Suitability Model Development

Habitat use during the winter season (November to April) is concentrated in areas that provide lichen foraging opportunities and limited snow depths. While lichens are relatively low in protein, they provide digestible carbohydrates and are generally abundant (Cooperrider, Boyd, and Stuart 1980). Using their keen sense of smell, caribou locate snow covered lichens and dig them out with their hooves (CWS 2005). Habitat suitability was assessed for the winter season as follows:

- High value winter habitat is restricted to ecosystem units that contain abundant lichens and have low snow cover. Ecosystem units rated as containing high habitat potential include dry carex-lichen and dryas-herb mat. In addition, eskers are also considered important habitat features for caribou. Habitat suitability ratings (HSRs) for eskers were high for winter.
- Moderate value habitat includes ecosystems that contain substantial lichen cover but are located in topographical locations where snow is expected to accumulate (as opposed to the generally windswept locations considered to have high values). Ecosystem units include birch-ledum-lichen and dwarf shrub-heath. In addition, rock outcrops are considered to have moderate values as they are generally in crest positions that accumulate little snow cover but contain sparse lichen cover. The dry willow ecosystem unit was also considered to have moderate values due to potential winter shrub browse.
- Low value habitat includes the majority of the remaining vegetated ecosystem types. These areas may be used by caribou during the winter season but contain little or no lichen cover and a deeper snowpack.
- Nil habitat is limited to disturbed sites (current and old camps, operating mine site, roads, etc.) and ecosystem units that are largely un-vegetated. These areas either repel caribou due to human activity, or do not contain forage opportunities.

3.1.3 Habitat Loss

For each wildlife VEC, a GIS analysis was conducted by overlaying the existing footprint of camps and other facilities with the habitat suitability mapping for the following wildlife species:

- caribou (summer, fall, and winter);
- muskox (summer/fall and winter/early spring);
- grizzly bear (spring, summer, fall, and denning);
- wolverine (denning);
- wolf (denning);
- upland breeding birds (dry upland/moist-wet lowland);
- waterbirds (waterbodies/wetlands); and
- raptors (cliff-nesting including a 1 km foraging buffer, and ground-nesting).

3.2 Results and Discussion

3.2.1 Infrastructure Development

In 2022, 33.5 ha were constructed at the Goose Site and 6.7 ha were constructed at the MLA. Collectively, the Project footprint covers 119.8 ha to date (Table 3.2-1; Figure 3.2-1).

Table 3.2-1: Footprint Development within the Project Development Areas as of 2022

Project Area	Pre-2022 (ha)	2022 (ha)	Total (ha)
Goose Site	54.6	33.5	88.1
MLA	25	6.7	31.7
Total	79.6	40.2	119.8

The Goose PDA is approximately 5,427 ha; therefore, as of 2022, 88.1 ha of the Goose PDA has been constructed (1.6% of the Goose PDA).

The MLA PDA is approximately 653 ha; therefore, as of 2022, 31.7 ha of the MLA PDA has been constructed (4.9% of the total MLA PDA).

3.2.2 Caribou Winter Habitat Suitability Model

The winter habitat suitability model for caribou was updated in 2022 to correct a discrepancy in the model from the 2021 WMMP Report (as reflected in comment KIA-NIRB-19) where approximately 211 ha of the Ice and Snow ELC category were labelled as “None” rather than “Nil” habitat. The previous amount of Nil habitat within the combined PDA was 836 ha, and the corrected value is 1,050 ha of Nil habitat (925 ha in the Goose PDA and 125 ha in the MLA PDA). The numbers presented in this report correct for this change, and the amended model will be used moving forward.

3.2.3 Habitat Loss

The Back River FEIS (2015) assessed the impacts of predicted habitat loss on VEC species or group. Table 3.2-2 summarizes the amount of habitat lost for each wildlife species as of 2022.

The magnitude of predicted habitat loss was classified as low for caribou, grizzly bear, wolverine, grey wolf, muskox, upland breeding birds, waterbirds, and raptors. The predictions of the Back River FEIS on the VECs remain valid with respect to the Project footprint.

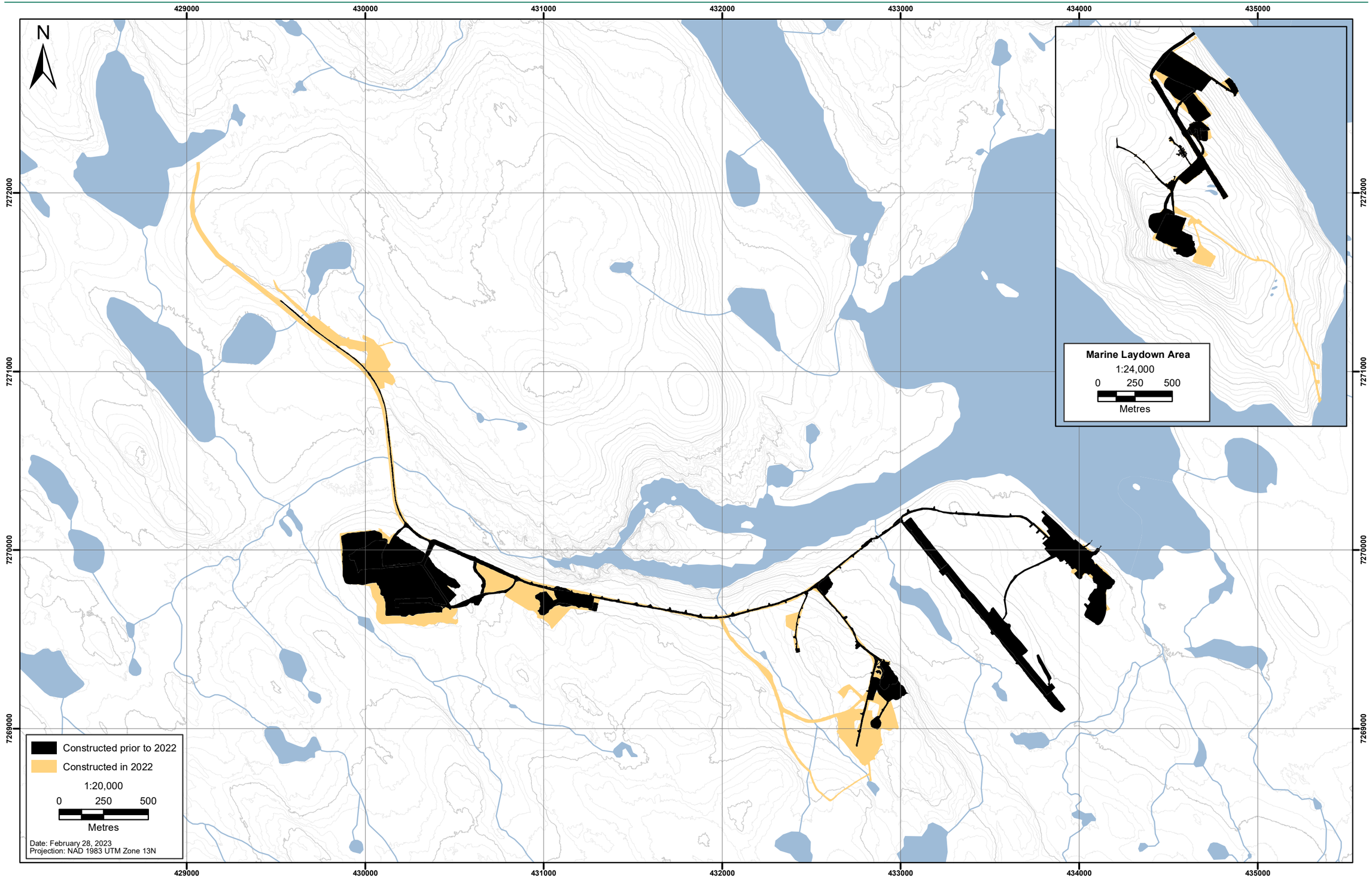

Figure 3.2-1: Infrastructure Development at the Back River Project as of 2022

Table 3.2-2: Area of Suitable Habitat Loss for Wildlife VECs, 2022

Species	Season or Habitat Type	Total FEIS Predicted Loss in the PDA (ha)[1]	FEIS Predicted Loss in the MLA PDA (ha)	FEIS Predicted Loss in the Goose PDA (ha)	Pre-2022 Total Habitat Loss (ha)	2022 Total Habitat Loss[3] (ha)	Total Habitat Loss to Date (ha)	% of Predicted Loss (Total)	2022 Habitat Loss in the Goose PDA (ha)	2022 Habitat Loss in the MLA PDA (ha)
Caribou	Summer	5,389	542	4,847	76	39	115	2.1	33	5
	Fall	4,592	532	4,060	77	39	116	2.5	33	7
	Winter[4]	3,546	208	3,338	68	32	100	2.8	28	3
Muskox	Summer/Fall	2,302	491	1,811	27	9	36	1.6	5	4
	Winter/Early Spring	882	29	853	11	5	16	1.8	4	1
Grizzly Bear	Spring	4,324	296	4,029	72	36	108	2.5	32	4
	Summer	4,545	616	3,929	65	34	100	2.2	30	5
	Fall	4,032	516	3,517	65	34	100	2.5	30	5
	Denning	23	23	0	1	1	2	8.7	0	1
Wolverine	Denning	2,866	299	2,567	45	29	74	2.6	26	3
Wolf	Denning	67	37	31	1	1	2	3.0	0	1
Upland Breeding Birds	Dry upland/ Moist-Wet Lowland	4,905	532	4,372	72	36	108	2.2	29	7
Waterbirds	Waterbodies/ Wetlands	2,489	337	2,152	16	3	19	0.8	1	2
Raptors	Cliff-nesting/ Foraging habitat[2]	634	5	629	15	8	23	3.6	7	0
	Ground-nesting	2,806	363	2,443	21	7	29	1.0	5	3

[1] Potential Development Area without Winter Roads

[2] Suitable cliff-nesting habitat was defined as 1) areas within a 1 km radius from known raptor cliff nests, and 2) south-facing rock faces taller than 10 m and within 1 km of water. No cliffs were lost during construction. The 14 ha are within the 1 km buffer.

[3] Construction activity at the Marine Laydown Area in 2021 was not ground-truthed and values were considered approximate – this number may have changed slightly as compared to previous years after ground-truthing was complete in 2022.

[4] Caribou winter habitat loss was not assessed in the FEIS. In 2020, the KIA requested that caribou winter habitat loss be included in the annual WMMP report; therefore, winter habitat loss was calculated in 2021 and 2022.

4. CARIBOU MITIGATION AND MONITORING SUMMARY

This section summarizes caribou mitigation and management during 2022. Details of mitigation and management for all terrestrial mammals, including caribou, are provided in Section 5.

The WMMP Plan describes the mitigation program for caribou, and the monitoring programs designed to detect caribou and inform mitigation, and to monitor for Project effects.

In 2022, the Project was in the pre-construction phase, with activities similar to an exploration camp, including two active camps (Goose and MLA) for periods of the year, an active drilling program at Goose, cargo aircraft, aircraft conducting crew changes and a helicopter supporting the drilling program and environmental work. The full construction and mine operation activities have not yet begun, including open pit activities such as blasting, hauling of ore and waste rock and operation of the mill.

The majority of mitigation activities and monitoring described in the WMMP Plan is intended for the construction and operation phases of the Project.

Monitoring and mitigation for caribou during pre-construction in 2022, as well as a summary of the outcomes of the mitigation, included the following:

- Monitoring for caribou prior to blasting in quarries and delaying quarry blasts if groups of caribou were present.
  - Outcome: No caribou were observed prior to or during blasting activities in 2022 (Section 5.4).
- Monitoring by drivers of heavy vehicles (excavators and dump trucks) on the roads within the camps (on-site) for caribou and pausing if groups of caribou were on or near the road (Section 5.2).
  - Outcome: No caribou were reported by drivers of heavy vehicles in 2022.
- Monitoring by drivers of light vehicles on the on-site roads for caribou and pausing if individual caribou were on or near the road (Section 5.2).
  - Outcome: No caribou were reported by drivers of light vehicles in 2022.
- Monitoring by helicopter pilots for caribou and avoidance of any animals by 1 km horizontal or 610 m vertically (larger distances during calving and post calving; see Section 5.1 for flight tracks).
  - Outcome: No caribou were recorded by helicopter pilots in 2022.
- Pre-flight inspections of airstrips for caribou and delaying flights if caribou were on or near the airstrip.
  - Outcome: No caribou were observed on airstrips during pre-flight inspections in 2022 (Section 5.1.1) and there were no occasions where helicopters and fixed-wing aircraft were grounded due to caribou in 2022 (Section 4.1).
- Aerial surveys for caribou group sizes.
  - Outcome: Not completed in 2022, planned for summer 2023.
- Facilities camera monitoring for caribou interaction with Project infrastructure.
  - Outcome: No caribou were recorded on facilities monitoring cameras in 2022 (Section 5.6).

In addition, standard mitigation measures were carried out to protect the general environment, including caribou. These, as well as a summary of the outcomes of the mitigation, included the following:

- Keeping the Goose and MLA sites clean so animals would not encounter garbage or become trapped or entangled in materials.
  - Outcome: No caribou were observed in 2022 interacting with attractants, though there were isolated incidences of fox, wolverine and common raven interacting with infrastructure or waste (see Sections 5.5 and 5.6).
- Managing waste materials so animals were not attracted and cannot access the waste management facility.
  - Outcome: No caribou were observed in 2022 interacting with attractants, though there were isolated incidences of fox, wolverine and common raven interacting with infrastructure or waste (see Sections 5.5 and 5.6).
- Speed limits on vehicles.
  - Outcome: Speed limits were followed and no encounters between caribou and vehicles occurred in 2022 (Section 5.2).
- Directions for pilots to keep above minimum flight elevations when caribou were observed (Section 5.1).
  - Outcome: helicopters and fixed-wing aircraft were never grounded in 2022 in response to caribou presence in the area to avoid disturbance (Section 4.1). There were no other occasions when pilots reported caribou while flying below minimum flight elevations in 2022.

During 2022, there were 37 separate incidental observations of caribou for a total of 3,670 animals (Appendix 4A; Section 5.7.1). This does not indicate that 3,670 individual animals were observed, as animals were likely observed on more than one occasion. Fifteen of the 37 incidental observations of caribou, accounting for 33% of observed animals (approximately 1,200 animals), occurred during the fall migration (September 1 to October 31) and summer (July 21 to August 31). Twenty of the 37 incidental observations of caribou, accounting for 67% of observed animals (approximately 2,460 animals), occurred during the spring migration (April 15 to June 4) and winter (November 1, 2021 to April 14, 2022). During the fall period, group sizes ranged from one individual to an estimate of 800 animals and were most commonly observed near Goose Camp. During the spring migration period, group sizes ranged from 5 individuals to an estimate of greater than 500 animals.

4.1 Caribou Mitigation – Reduction in Project Activities

As part of the WMMP Plan, Sabina is committed to monitoring caribou presence near the Project site and managing site activities through four levels of response to caribou presence, including:

- Level 1 – Normal operations;
- Level 2 – Site notification;
- Level 3 – Site alert; and
- Level 4 – Staged reduction in Project activities.

In 2022, implementation of the caribou management system (Section 7.1.5.2 of the WMMP Plan; ERM 2019) was required on multiple occasions. To mitigate for effects on caribou, the Environment Department monitored GNWT collar data daily during the calving, post-calving, and into summer seasons (July – August). A Level 2 (Site Notification) response was issued from June 5 to July 31, reminding all project personnel to be vigilant for caribou, and of their responsibility to protect caribou. A Level 3 (Site Alert) response was triggered on multiple occasions when caribou were sighted in the Project area, which reiterated the information from the Level 2 notification while emphasizing increased vigilance and the possibility of staged reductions in Project activities. There were no instances where groups of caribou approached close enough to site during Project activities to trigger a Level 4 response.

5. TERRESTRIAL MAMMALS

During 2022, mitigation and monitoring focused on the reduced list of activities conducted during pre-construction. This section describes the mitigation and monitoring results conducted for terrestrial mammals (including caribou) during 2022.

Mitigation included:

- Aircraft management;
- Vehicle management;
- Winter ice road management;
- Pre-blast management and monitoring; and
- Bear safety and waste management (managing attractants).

Monitoring included:

- Facilities Camera Monitoring; and
- Incidental observations.

5.1 Aircraft

Fixed wing and helicopter aircraft operation guidelines were developed and provided to pilots to guide aircraft operation at the Project. These guidelines met the Back River Project NIRB Project Certificate (No. 007) Conditions #60 and #61.

The SOP for aircraft was updated in 2020 and a booklet for pilots was developed to ensure pilots understand and follow Sabina compliance monitoring. Management of aircraft is summarized below in Section 5.1.1, following NIRB Condition #60. Monitoring of helicopters is summarized in Section 5.1.2, following NIRB Condition #61.

5.1.1 Mitigation for Aircraft

The following list describes the mitigation actions applied to fixed-wing aircraft during pre-construction in 2022 to limit disturbance to caribou and other terrestrial mammals, as well as a summary of the outcomes of the mitigation:

- Fixed-wing aircraft remained above 610 m local ground level at all times, except when landing or taking off from the MLA or the Goose airstrips or ice airstrips.
  - Outcome: No low-level fixed wing flights were conducted in 2022.
- If large groups of caribou were near the airstrip during calving or post calving, flights were suspended or delayed.
  - Outcome: No flights were suspended in 2022 due to the presence of caribou in the general area of the airstrip.
- Prior to aircraft landing on the airstrip, a visual inspection was conducted to identify the presence of any wildlife on the airstrip.
  - Outcome: No wildlife were observed during pre-landing inspections in 2022.

The following mitigation actions were applicable to helicopters during pre-construction in 2022 to limit disturbance to caribou and other terrestrial mammals:

- As part of pilot induction, pilots were informed of the seasons when caribou are more sensitive to disturbance (e.g., calving and post-calving) and their responsibilities to monitor, report, and avoid caribou. Maps were provided to pilots that identify important habitat areas for wildlife to be avoided, such as caribou water crossings.
- Pilots were instructed to report all incidental sightings of caribou to other pilots and the Environment Department.
- During calving, post-calving, and early summer (June 5 to July 31), helicopter pilots were instructed to avoid groups of 25 or more caribou either vertically (610 m) or horizontally (2 km).
- During all seasons, pilots avoided groups of less than 25 caribou vertically (610 m) or horizontally (1 km).
- During calving, post-calving, and early summer (June 5 to July 31), large groups of caribou (more than 250) were avoided by 610 m vertically or 4 km horizontally.
- These buffers applied to engine start-up, take-off, landing, and in-flight.
    - Outcome: No caribou were reported by helicopter pilots and as such, no management actions were reported in 2022.

5.1.2 Monitoring Aircraft

NIRB Condition #61 indicates that aircraft should be monitored.

5.1.2.1 Methods

Fixed wing flights were recorded on pilot logs. The tracks of helicopters were recorded using a Global Positioning System (GPS), which recorded the track, including the time, latitude, longitude and elevation. Helicopter GPS tracks were mapped using GIS by counting the number of helicopter flight lines with an elevation below 610 m. The WMMP Plan indicates 610 m vertical flying altitude for avoiding caribou disturbance; therefore, this threshold was used to illustrate flights below this altitude during pre-construction activities in 2022.

5.1.2.2 Results and Discussion

Fixed Wing Aircraft

Pilots followed flying guidelines during the 2022 season for both fixed wing and helicopters.

Fixed wing aircraft typically cruised at approximately 3,000 - 7,000 metres, depending on whether or not they were pressurized. Descents and ascents to and from landing were conducted following standard procedures to maintain safe approach angles and minimum elevations. No fixed-wing pilots reported any emergencies or weather conditions which required low-level flight (below 610 m).

Prior to all aircraft take-off and landing at the airstrip, a survey for wildlife was conducted to ensure safe departure and/or arrival for aircrafts and for wildlife. No interactions between wildlife and fixed wing aircraft occurred.

Helicopters

Helicopter pilots did not report any wildlife sightings in 2022, therefore no management actions were triggered, and helicopter use was in compliance with the WMMP Plan and NIRB Conditions.

Pilots avoided flying close to the ground even when wildlife were absent, except when doing short-distance drill moves or approaching/leaving landing sites. Figure 5.1-1 shows the frequency of helicopter flights below 610 m at the Project between July and August 2022, and Figure 5.1-2 shows the frequency of helicopter flights below 610 m in November 2022. These two periods are the only times a helicopter was on site in 2022. Dark green indicates one flight over the season, and red indicates the highest frequency of flights.

This figure shows that the vast majority of helicopter flights were localized to the area surrounding the Goose Site where drilling activities occurred. Each drill move requires approximately 20 return flights. Drill moves were only conducted when caribou were not within the disturbance buffers described above and in the WMMP Plan. Shuttle flights were also carried out between the Goose Site and the MLA or the George Exploration Camp.

5.2 Vehicles along On-site Roads

The Back River Project is committed to ensuring wildlife safe passage near Project roads. Mitigation and management for disruption of movement of caribou and other wildlife focuses on management of the on-site Project roads. Mitigation for vehicles on-site is summarized below in Section 5.2.1. Management is the same for drivers on-site and on the WIR; however, the WIR was not operational in 2022.

5.2.1 Mitigation for Vehicles

Vehicle traffic is managed to ensure caribou and other wildlife can travel safely through the area and to minimize vehicle-related wildlife mortality and injury.

The following list describes the responsibilities of all drivers to mitigate effects on wildlife, as well as a summary of the outcomes of the mitigation:

- Drivers must follow 60 km/h speed limits on all on-site roads.
  - Outcome: No speeding violations were reported in 2022.
- Wildlife have right-of-way on all roads.
  - Outcome: Drivers yielded the right-of-way to wildlife.
- Drivers will report all wildlife observations to the Environment Department.
  - Outcome: No wildlife observations occurred along the roads in 2022.
- Drivers will report any wildlife injury or mortality to the Environment Department.
  - Outcome: No wildlife injuries or mortalities occurred along the roads in 2022.
- If drivers see wildlife on or along the road, they refer to Figure 5.2-1 for specific actions.
  - Outcome: Wildlife observations were not recorded by drivers in 2022 and therefore no mitigation was required.

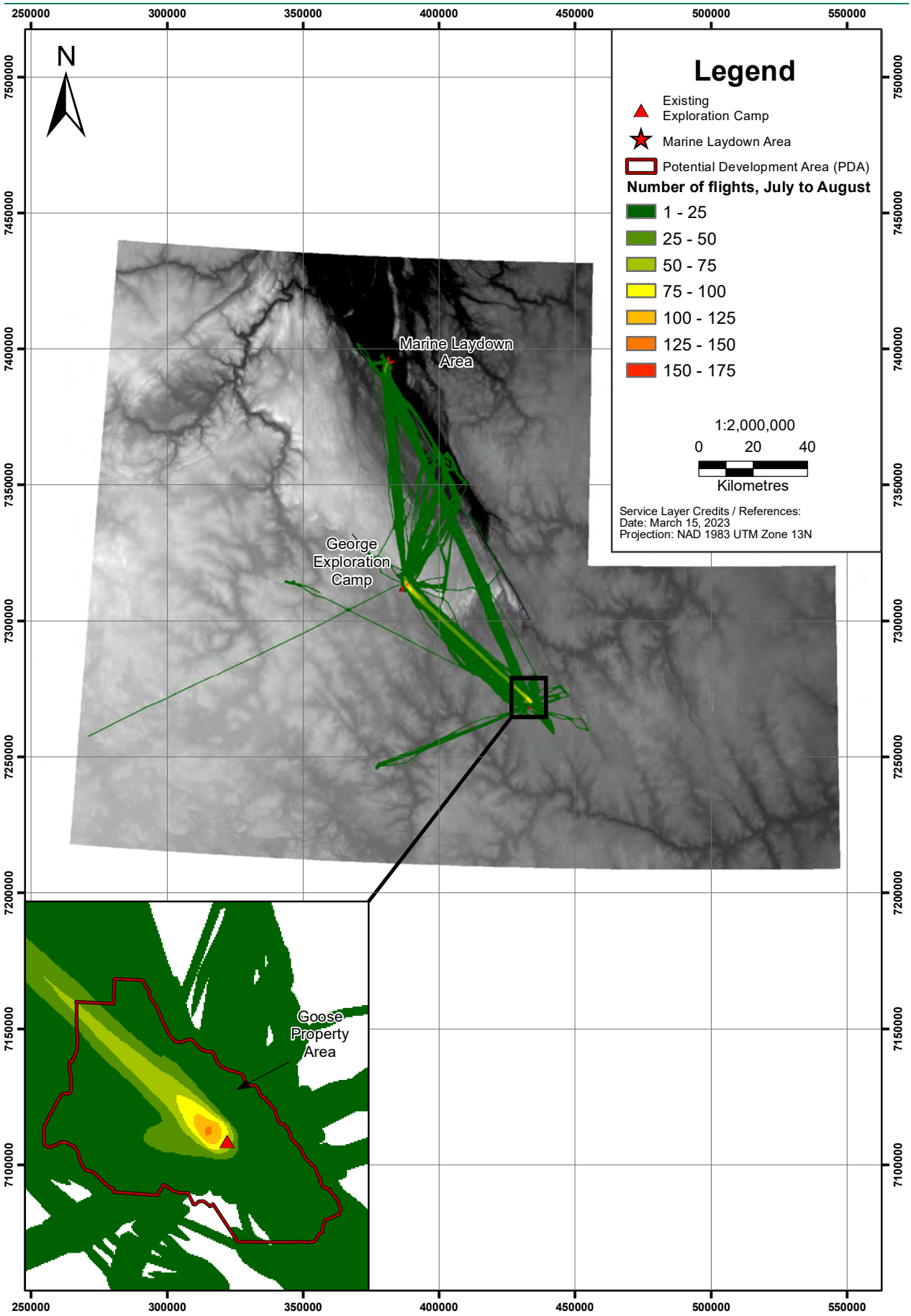

Figure 5.1-1: Frequency of Helicopter Flights Below 610 m, July and August, 2022

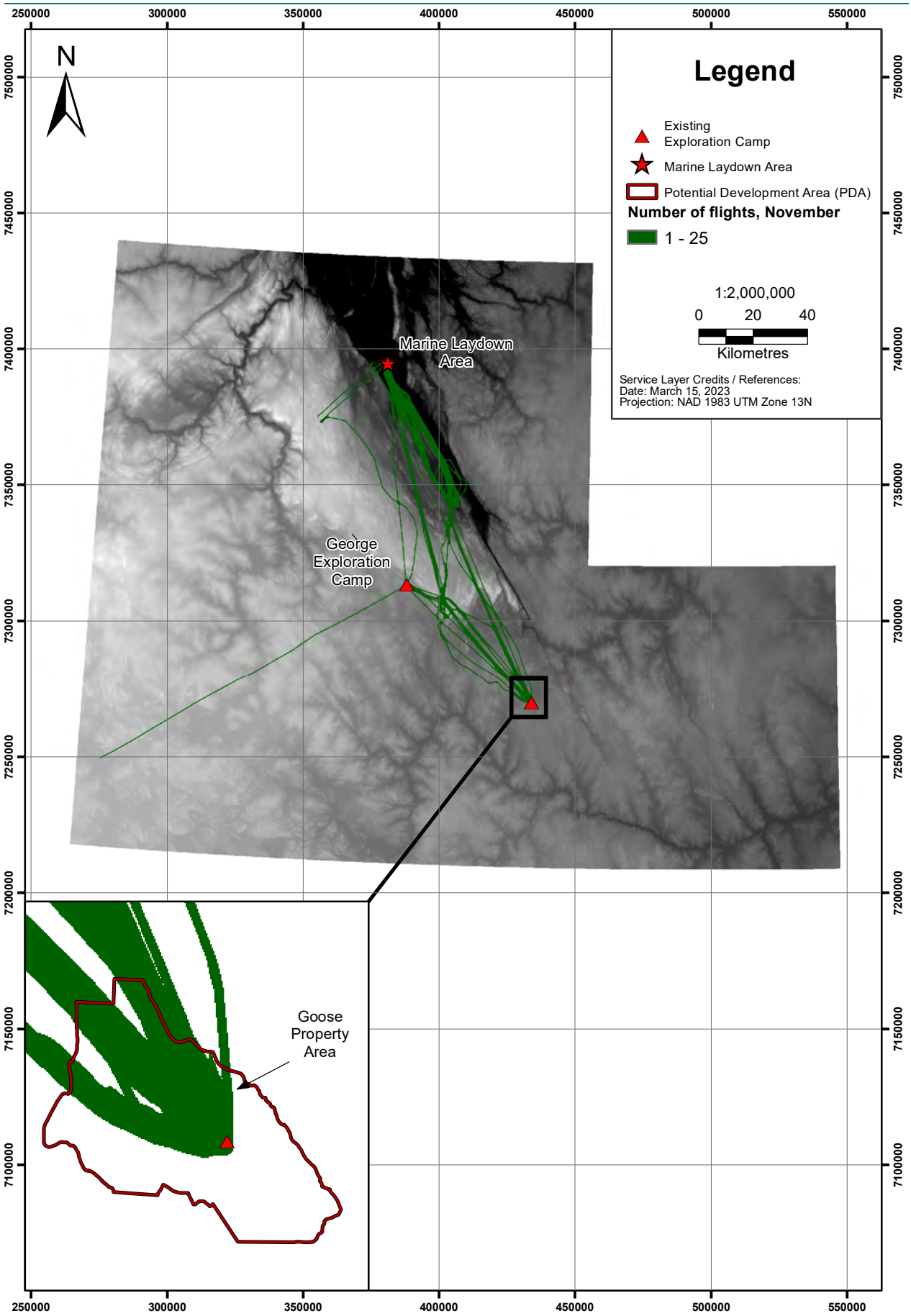

Figure 5.1-2: Frequency of Helicopter Flights Below 610 m, November, 2022

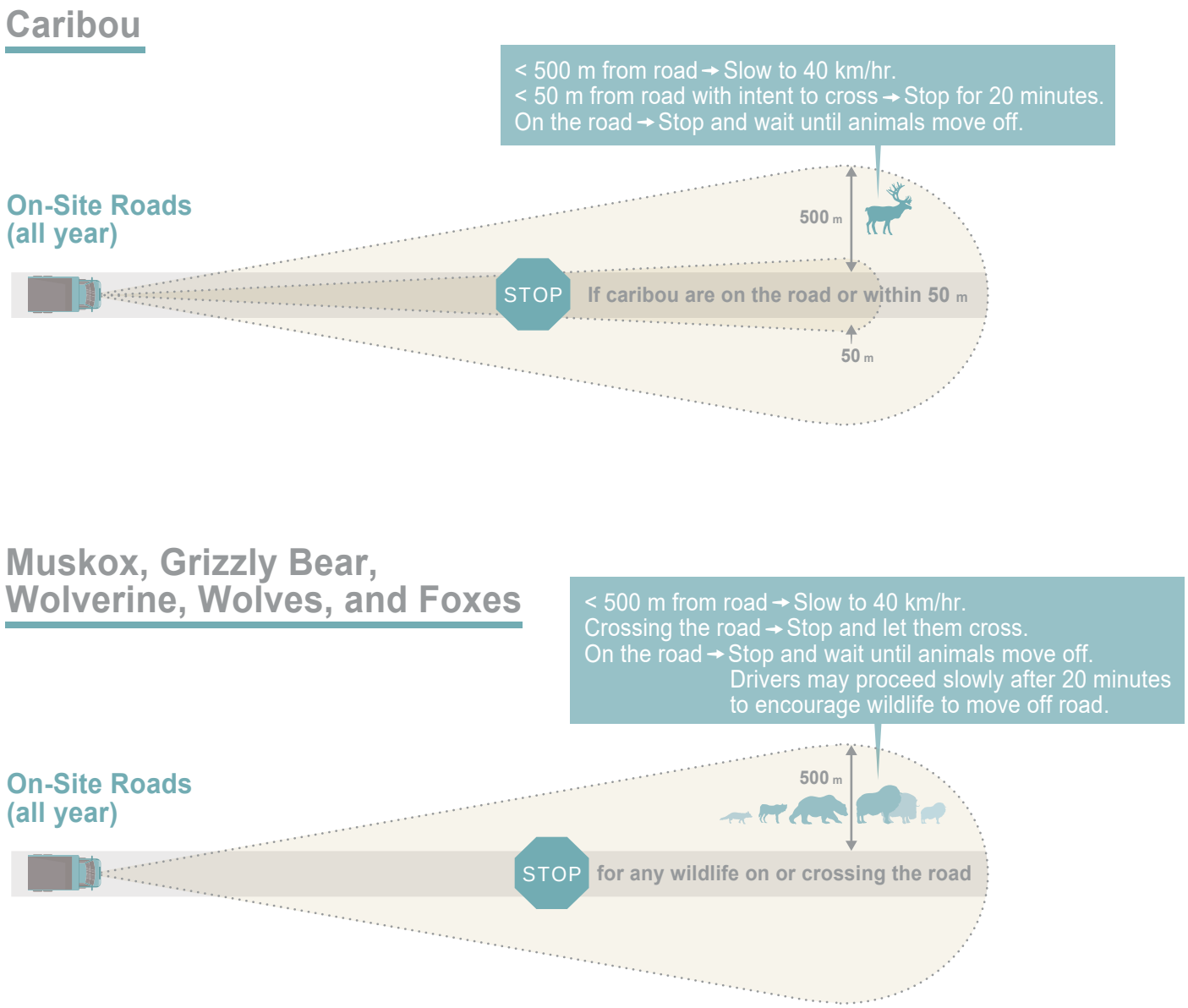

Figure 5.2-1: Management of Vehicles when Wildlife are Observed on or along On-Site Roads

5.2.2 Monitoring Wildlife from Vehicles

During 2022, no wildlife interactions on the road were reported, as all mitigation measures were followed by drivers on Project roads. No wildlife injuries or mortalities occurred in 2022 as a result of vehicle interactions.

5.3 Winter Ice Road

The winter ice road was not constructed during 2022. The Back River Project is committed to ensuring wildlife safe passage near the WIR. Mitigation and management for disruption of movement of caribou and other wildlife focuses on management of the WIR, as per Section 7.1.6 of the WMMP Plan (Sabina 2022). When the WIR is constructed, it is designed in accordance with Back River Project Wildlife Mitigation Measures for the WIR.

5.4 Blasting

NIRB Conditions #41, #43, and #44 require Sabina to manage blasting activities to avoid disturbance to caribou and other wildlife. Mitigation and monitoring for quarry blasting activities that occurred in 2022 are described in Sections 5.4.1 and 5.4.2.

5.4.1 Mitigation for Blasting

Prior to any blasting in 2022, surveys for wildlife were conducted by Sabina personnel to identify if wildlife were present. If animals were within a “trigger distance” of quarries, then certain mitigations applied.

During pre-construction, only quarry blasting occurred, including pre-development stripping of Echo Pit. Trigger distances and management actions for quarries are summarized in Table 5.4-1.

Table 5.4-1: Management of Blasting when Wildlife Are Observed

Species	Timing Window	Number of Animals	Distance	Notes
Caribou	Calving (June 5-15)	≥10 breeding female	≤2.5 km	Stop blasting until animals leave.
Caribou	All year	Group of ≥25 animals	≤2.5 km	Stop blasting until animals leave.
Caribou	All year	1-25 animals	≤2.5 km	Conduct behavioural monitoring. Blasting can proceed.
Caribou, muskox, grizzly bear or wolverine	All year	≥1	Blast safety distance (~500 m)*	If ≥1 animal is observed in the blast safety distance, then delay the blast until animals leave.

** The blast safety distance is often 500 m or greater, but is determined on a case by case basis by the blasting manager.*

5.4.2 Monitoring Prior to Blasting

5.4.2.1 Methods

Blasting at the Plant Site Pad, Primary Pond, and Echo Pit occurred in 2022. Blasting was not conducted at any other sites in 2022. Prior to blasts, Sabina personnel conducted a height of land survey of the surrounding tundra for caribou or other wildlife (muskox, grizzly bear, or wolverine). If any caribou or wildlife were observed, management actions described in Table 5.4-1 would be followed. The pre-blasting

survey SOP was updated in November 2022 to include additional information and guidance for pre-blast surveys (Appendix 5A).

5.4.2.2 Results and Discussion

Blasting occurred at the Goose Site on 59 occasions between June and December 2022. Blasts occurred at the Plant Site Pad (22), Primary Pond (10), and Echo Pit (27). Table 5.4-2 summarizes the timing of blasting activity in 2022. No other blasting occurred in 2022. No caribou or other mammals were observed during pre-blast surveys in 2022.

Table 5.4-2: Summary of Blasting Activity at the Goose Site, June to December, 2022

Month When Blasting Occurred	Number of Days with Blasting		
	Plant Site Pad	Primary Pond	Echo Pit
June	9	0	0
July	8	0	2
August	0	0	7
September	5	0	4
October	0	0	4
November	0	0	5
December	0	10	5
Total	***22***	***10***	***27***

5.5 Camp and Waste Management

NIRB Condition #48 requires Sabina to limit the attractiveness of the site to wildlife. The WMMP Plan includes design mitigation and management to reduce the attractiveness of the Goose and MLA camps and infrastructure to wildlife. This is an important safety issue because grizzly bears and wolverine can be attracted to camps. To accomplish this, Sabina conducted the following:

- Managed the camp to reduce attractiveness (Section 5.5.1.1).
- Reviewed waste management during routine inspections (Section 5.5.1.1).
- Conducted monitoring for grizzly bears and wolverine in the vicinity of the camp (Section 5.5.2).

5.5.1 Mitigation for Attractants

5.5.1.1 Mitigating Attractants

Section 9.1.7 of the WMMP Plan lists the mitigation to be conducted on site starting during construction of the Project. During the pre-construction phase, Sabina used mitigation measures appropriate to the activities being conducted at the Goose Site and the MLA, including the following:

- Design mitigation – constructing buildings to exclude wildlife and skirting buildings.
- Mitigating attractants – storing wastes in bear-proof containers, keeping the camp clean, incinerating wastes and disposing non-wildlife attracting wastes in approved landfills.

Photos of the Goose Camp and the MLA are provided in Photos 5.5-1 through 5.5-4 to illustrate that the camps were kept clean and free of attractants for wildlife.

Photo 5.5-1: Goose Camp, 2022.

Photo 5.5-2: Portal shop laydown area, Goose Camp, 2022.

Photo 5.5-3: MLA Camp area, 2022.

Photo 5.5-4: MLA laydown, 2022.

5.5.2 Monitoring for Grizzly Bears and Wolverine

5.5.2.1 Methods

Camp personnel reported incidental observations of grizzly bears and wolverine whenever personnel were on site. Facilities monitoring cameras were also used to record presence of wolverine (see Section 5.6).

5.5.2.2 Results and Discussion

There were 13 grizzly bear and 21 wolverine incidental sightings during 2022 (Section 5.6.2). None of the grizzly bear sightings were inside the camp perimeter. Twenty of the wolverine sightings were within the immediate area of Goose Camp, and a family group of four wolverines was observed by an exploration crew away from Goose.

There were no reports of repeated sightings of grizzly bears over multiple days, accessing wastes, or other signs of grizzly bears being attracted to the camp or habituated near the camp.

There were 13 reports of aggressive or habituated wolverines, all occurring between November 20 and December 20. Of these instances, deterrent measures were deployed in seven cases (bear bangers in four, rubber bullets in one, and a combination of both in two). Nine of these reports occurred from November 21 to November 24, and are believed to have been the same wolverine. This wolverine was found within the incinerator building on November 21, and deterred using rubber bullets and bear bangers.

Following this instance Sabina re-evaluated the measures taken to keep the camp clean and free of attractants, and also ensured animals were precluded from accessing the incinerator. Sabina continues to ensure safety of personnel and wildlife by meeting all waste management requirements and minimizing attractants on site.

5.6 Facilities Camera Monitoring

The objective of the Facilities Camera Monitoring Program is to monitor for potential wildlife interaction with Project facilities throughout the Construction and Operations phases of the Project (WMMP Section 7.2.1.5). Wildlife cameras will be deployed in areas where wildlife may be more likely to interact with Project facilities and infrastructure, including but not limited to:

- Camps;
- WIR (crossing locations and control locations);
- Waste management facilities;
- Tailing Impoundment Facilities; and
- Areas known to be frequented by wildlife.

Data from this monitoring program may be used to inform adaptive management actions to reduce interactions between wildlife VECs and Project facilities or infrastructure.

5.6.1 Methods

Six wildlife cameras were deployed around the Goose Camp in 2022 (Figure 5.6-1). Cameras were operational from September 28 until late December, except in three cases where cold temperatures depleted batteries faster than expected (Table 5.6-1). These cameras continue to operate and will be supplemented with additional cameras in 2023.

Table 5.6-1: Wildlife Camera Deployment Information at Goose Camp

Camera #	Start Date	End Date	Location
BR01	9/28/2022	11/11/2022	Back of kitchen
BR02	9/28/2022	12/1/2022	Waste management (incinerator)
BR03	9/28/2022	12/22/2022	Drill tailings sump pit
BR04	9/28/2022	12/22/2022	Grey water discharge
BR05	9/28/2022	12/3/2022	Hazmat berm
BR06	9/29/2022	12/23/2022	Goose neck near wolverine den

5.6.2 Results

There were five species detected on the Facilities Monitoring Cameras in 2022 (Table 5.6-2). The most common species detected was the common raven (*Corvus corax*) followed by Arctic hare (*Lepus arcticus*) and red fox (*Vulpes vulpes*). No species was observed interacting directly with Project infrastructure other than common raven and red fox, which were recorded attempting to access inorganic waste at camera BR02 (located at the incinerator). Eight of the 11 red fox detections occurred from November 1 to November 4. Wolverine were recorded only on camera BR03 (drill tailings sump pit), travelling through the camera field of view on November 1, November 25, and December 20. Full results from cameras are available in Appendix 5B. Example images are provided in Photo 5.6-1 and Photo 5.6-2.

Table 5.6-2: Wildlife Camera Detections, September to December 2022

Species	Number of Detections	Cameras Detected[1]
Common raven	49	BR01, BR02, BR04
Arctic hare	32	BR01, BR03, BR04, BR05, BR06
Red fox	11	BR01, BR02, BR04
Rock Ptarmigan	4	BR01, BR04, BR05
Wolverine	3	BR03

[1] *See Table 5.6-1 for camera location descriptions.*

5.7 Incidental Observations

All personnel are responsible for recording wildlife sightings in the camp's wildlife logs (Appendices 4A and 5D). These logs provide an indication of the wildlife species that occur in proximity to and interact with Project infrastructure. Caribou are discussed separately in Section 5.7.1, and all other terrestrial mammals are summarized in Section 5.7.2. The incidental wildlife observation SOP was updated in 2022 (Appendix 5C).

Personnel were on site at the Goose Camp and MLA year-round in 2022 (Table 5.7-1). The average daily occupancy at the Goose Site throughout the 2022 season was 79 people with a peak of 118 people in November, and at the MLA site was 30 people, with a peak of 45 people in March.

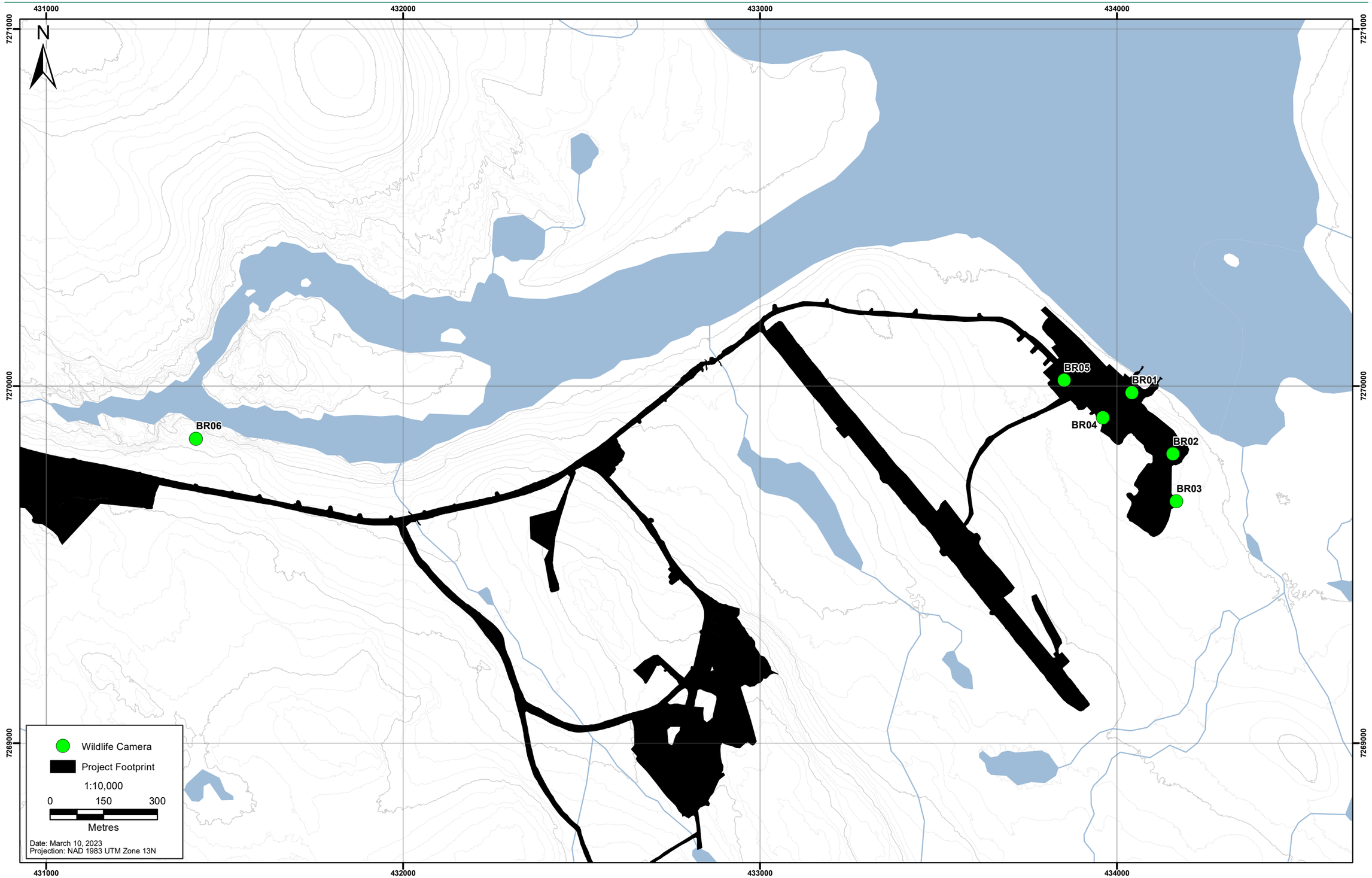

Figure 5.6-1: Facilities Monitoring Camera Locations, 2022

Photo 5.6-1: Wolverine at camera BR03.

Photo 5.6-2: Red fox at camera BR02.

Table 5.7-1: Average Number of On-Site Personnel in 2022

Month	Number of Personnel on Site	
	MLA	Goose
January	37	48
February	41	61
March	45	72
April	17	62
May	17	46
June	19	82
July	27	82
August	29	81
September	33	94
October	33	108
November	36	118
December	23	93

5.7.1 Caribou Observations

Caribou recorded in the Back River wildlife logs for 2022 are summarized in Table 5.7-2. Overall, there was a total of 37 separate incidental observations of caribou totalling 3,670 animals (Appendix 4A). This does not indicate that 3,670 individual animals were observed, as animals may have been observed on more than one occasion.

Table 5.7-2: Summary of Incidental Observations of Caribou Recorded by Sabina Staff during Each Season in 2022

Season	Locations	Number of Sightings	Total Number of Individuals Observed
Winter (November 1, 2021 – April 14, 2022)	Goose	12	1,510
Spring Migration (April 15 – June 4, 2022)	Goose	8	950
Calving (June 5 – June 15, 2022)	Goose	1	9
Post-Calving (June 16 – July 20, 2022)	Goose	1	1
Summer (July 21 – August 31, 2022)	Goose	5	261
Fall Migration (September 1 – October 31, 2022)	Goose/MLA	10	939
Winter (November 1 – December 31, 2022)*	Goose	0	0
Total		**37**	**3,670**

** Winter sightings in November and December 2022 are included in this report, but do not cover the entire 2022-2023 winter season, as the WMMP reporting year ends on December 31, 2022.*

Fifteen of the 37 incidental observations of caribou, accounting for 33% of observed animals (approximately 1,200 animals), occurred during the fall migration (September 1 to October 31) and summer (July 21 to August 31). Twenty of the 37 incidental observations of caribou, accounting for 66% of observed animals (approximately 2,460 animals), occurred during the spring migration (April 15 to June 4) and winter (November 1, 2021, to April 14, 2022). During the fall migration period, group sizes ranged from one individual to an estimate of 800 animals, and caribou were observed within a range of 500 m to 10 km from Goose Camp, and within 100 m of the MLA (a group of four foraging while they moved through the area).

During spring migration 22% of the annual incidental caribou observations were recorded, which is in contrast to 2021, when none were observed during spring migration (Table 5.7-3), but similar to 2019, when the majority of incidental observations occurred during the spring migration. During the 2022 spring groups of five to 500 caribou were observed within a range of 250 m to 15 km from Goose. In 2019, the WIR was operational and all sightings during the spring migration period were of large groups travelling or feeding, and were all observed between 2 km and 170 km from Goose or MLA camps.

Table 5.7-3: Summary of Incidental Observations of Caribou during Each Season, 2018 to 2022

Season	Number of Sightings					Total Number of Animals Observed				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Winter	14	4	6	1	12	1,603	252	21	1	1510
Spring Migration	0	18	1	0	8	0	13,310	2	0	950
Calving	0	4	0	0	1	0	1,400	0	0	9
Post-Calving	3	4	1	0	1	7	7	1	0	1
Summer	9	5	27	3	5	128	7	3,071	157	261
Fall Migration	2	0	5	6	10	21	0	16	918	939
Total	**28**	**35**	**40**	**10**	**37**	**1,759**	**14,976**	**3,111**	**1,076**	**3,670**

During the calving season (June 5 to June 15), no caribou were observed in 2021, 2020, or in 2018. All of the caribou observations in 2019 (four separate sightings) and 2022 (one sighting of nine individuals) during the calving season occurred between 2 and 4 km from Goose Camp. The sightings of caribou in 2019 were of large groups (greater than 100 or greater than 1,000) travelling past the area (presumably migrating to the calving area), confirming that the Project does not overlap with the calving grounds.

Between 2018 and 2022, winter and summer are the only two seasons when caribou are consistently observed by Project personnel (at the MLA or Goose site). This is consistent with both collar data and baseline data.

5.7.2 Other Terrestrial Mammal Observations

In addition to caribou, six other terrestrial mammal species were observed in 2022, including fox, grizzly bear, moose, muskox, wolverine, and wolf, on 76 separate occasions (Table 5.7-4; Appendix 5C).

The most commonly observed mammals were muskox (111 animals over five sightings), wolf (32 animals over 17 sightings), and grizzly bear (14 animals recorded over 13 separate sightings). The largest group of animals observed was a group of 50 muskox traveling within 200 m of Goose on July 27, 2022.

Table 5.7-4: Summary of Incidental Observations of Terrestrial Mammals in 2022

Mammal	General Locations	Number of Observations	Total Number of Individuals Observed[1]
Fox[2]	Goose/MLA	11	11
Grizzly Bear	Goose/MLA	13	14
Moose	MLA	2	5
Muskox	Goose/MLA	5	111
Wolf	Goose	18	33
Wolverine	Goose	21	24

[1] Note that it is not possible to identify individuals and it is likely that some of the same animals observed were observed on multiple occasions.

[2] The fox sightings were recorded as "fox"; therefore species (i.e., red fox or Arctic fox) is unknown.

Grizzly bear and wolverine are both assessed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and are listed as such on Schedule 1 of the *Species at Risk Act* (SARA; Government of Canada 2019). They are also both territorially ranked as vulnerable (CESCC 2015). There were 13 observations of grizzly bears in 2022. Twelve of the observations were of single animals. One sighting involved more than one animal: on September 28, 2022, a sow and cub were observed approximately 5 km west of Goose Camp travelling past the area. In 2021, a sow and two cubs were also observed, approximately 2 km north of Goose Camp.

There were 21 sightings of wolverine, 20 of which were of one individual, and one sighting of a family group of four in July. Wolverine sightings occurred in February, March, April, July, August, September, November and December, 2022, all other than the group of four observed within 1 km of the Goose Site.

Two moose observations occurred in 2022: a group of two moose 30 km south of the MLA on August 11 and a group of three moose 2 km from the MLA on November 29. An area west of Bathurst Inlet, stretching north from Bathurst Lake to just south of the MLA was identified by the KIA as a preferred moose hunting area by Inuit. To date, moose have not been observed to the south of Bathurst Inlet at the Goose site.

6. TERRESTRIAL BIRDS, WATERBIRDS, AND RAPTORS

During 2022, mitigation and monitoring for birds was appropriate for the activities conducted during the pre-construction phase of the project. Specific mitigation and monitoring activities for avian species that occurred in 2022 during the pre-construction phase of the project included the following:

- Aircraft management;
- Mitigation for Birds (timing of ground clearing and nesting mitigation); and
- Incidental observations.

6.1 Aircraft Management

As per the Back River Project's NIRB Project Certificate (No. 007) Condition #60 and #61, fixed wing and helicopter aircraft operation guidelines were developed and provided to pilots to guide aircraft operation at the Project. Details regarding general aircraft management methods are described in Section 5.1.

Additional aircraft mitigation for waterbirds as well as a summary of the outcomes of the mitigation includes the following:

- As part of pilot induction, pilots were informed of their responsibilities to monitor, report, and avoid waterbirds.
  - Outcome: An aircraft SOP with maps was provided to pilots that identifies areas with concentrations of waterbirds during certain seasons, including areas such as lakes used for staging by waterbirds.
- Disturbance to colony-nesting birds and important staging areas was reduced during sensitive periods by maintaining a fixed-wing flight altitude of at least 650 m during horizontal (point to point) flights and a helicopter flight altitude of 610 m. The three waterbird staging areas closest to the Project are on Beechey Lake, approximately 35 km south/southwest of the Goose Site, at an unnamed lake approximately 15 km north of the George site and in the cove south of the MLA.
  - Outcome: No fixed wing flights occurred near these areas in 2022. Low frequencies of helicopter flights occurred approximately 12 times over the unnamed lake north of the George site, and approximately 25 times over the cove (Figures 5.1-1, 5.1-2). No helicopter flights took place over Beechey Lake.
- Pilots reported all incidental sightings of significant aggregations of waterbirds to the Environment Department.
  - Outcome: No incidental observations of birds were reported by pilots in 2022.

6.2 Mitigation for Birds

Two forms of mitigation are generally required for birds: 1) timing ground-clearing outside of the bird breeding season, and 2) management of incidentally observed birds nesting on infrastructure. No birds were observed nesting on infrastructure in 2022.

6.2.1 Timing of Ground Clearing

The WMMP Plan, Section 11.1.3.2, includes a commitment to plan ground clearing/construction of new pads on the tundra outside of the bird breeding season, or to conduct pre-clearing nest surveys if ground clearing activities take place between May 15 and August 15 (following the mitigation hierarchy).

Most ground clearing at the MLA and Goose was conducted during 2022 between August 16 and December, per the WMMP Plan. Clearing did occur within the nesting period at Echo Pit, and pre-clearing surveys were conducted on August 8 which resulted in no nests being identified (Figure 6.2-1).

6.3 Incidental Observations of Birds

In 2022, there were three incidental observations of birds recorded by Sabina employees while on site (Table 6.3-1). On June 28, a flock of approximately 100 geese flew over the Goose Camp area. One snowy owl was observed near the MLA on November 26, and six swans were observed 2 km west of Goose Camp on September 25.

In previous years, few incidental sightings were also recorded. In 2020 there were two sightings: on May 17, a flock of 200 geese was observed flying overhead at Goose. The species of geese was not determined. On September 4, 2020, another flock of approximately 200 geese was observed flying overhead at Goose. The species of geese was not determined. These sightings provide information regarding timing of spring and fall migration. For example, a large flock of approximately 200 geese was observed on the same date (May 17) in 2019. Perhaps this indicates general timing for geese spring migration passing over the Goose Site, and illustrates the importance of recording incidental observations of notable bird sightings.

Table 6.3-1: Summary of Incidental Observations of Birds in 2022

Species	General Locations	Number of Observations	Total Number of Individuals Observed
Goose[1]	Goose	1	100
Snowy Owl	MLA	1	1
Swan	Goose	1	6

[1] The goose sighting was recorded as "goose"; therefore, species is unknown.

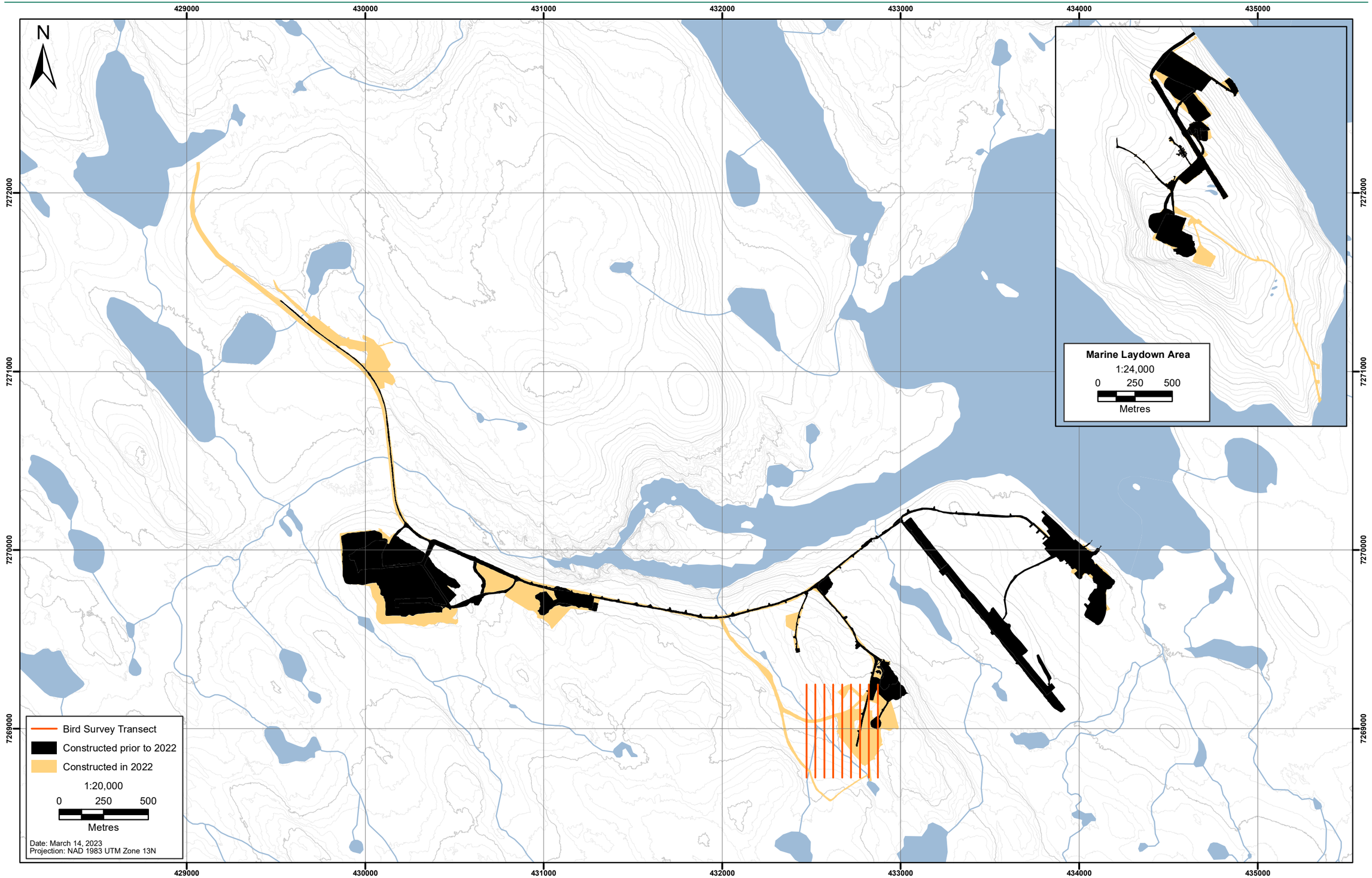

Figure 6.2-1: Pre-disturbance Bird Survey Transects, 2022

7. MARINE MAMMALS AND SEABIRDS

Management and monitoring activities for marine mammals and seabirds that occurred in 2022 during the pre-construction phase of the project included the following:

- Marine shipping monitoring and management for marine mammals;
- Marine shipping monitoring and management for marine birds; and
- Incidental observations of marine mammals and marine birds.

In 2022, Sabina did not construct the on-ice airstrip at the MLA; therefore, no pre-construction surveys for seal lairs were required, but are also discussed below.

7.1 Marine Shipping Mitigation and Monitoring

NIRB Conditions #58 and #64 require Sabina to mitigation impacts and disturbance to seabirds and marine mammals during marine shipping.

The objectives of the marine mammal and seabird monitoring program during shipping included the following:

- Recording incidental observations of seabirds and marine mammals in the Northwest Passage made by bridge staff;
- Documenting and reporting measures taken to mitigate impacts to marine mammals and large groups of seabirds; and
- Documenting and report ship strikes of marine mammals or seabirds, if they occurred.

Prior to the 2020 shipping seasons, Sabina updated the marine shipping SOP to improve data collection by the shipping contractors, which describes the management and monitoring requirements for the Project (Appendix 7A). In addition, a brochure was produced in 2020 for the shipping companies to review prior to transit to Bathurst Inlet to ensure captains and crew were aware of Sabina's Project Conditions (Appendix 7B). These materials are continually updated and were distributed to shipping contractors again in 2022 to ensure surveys were conducted.

7.1.1 Methods

Vessel crew members for all vessels traveling to the Back River MLA are trained to collect information on sightings of marine mammals and seabirds observed during sailings. An SOP (Appendix 7A) and a brochure (Appendix 7B) were distributed to the vessel companies prior to the shipping season in 2022 to ensure all are aware of their requirement to record sightings of marine mammals and seabirds.

7.1.1.1 Vessel Tracks

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

Tracks for the vessel names and dates provided by Sabina were downloaded from Vesseltracker (2021) and plotted using ArcGIS 10.8.1. Only vessels traveling to the Back River MLA are presented in this report.

7.1.1.2 Marine Mammal and Seabird Observations

Prior to the 2022 shipping season, Sabina provided an SOP to the shipping contractors, which describes the management and monitoring requirements for the Project.

During 2022, marine mammal and seabird sightings were required to be recorded by crew members on the vessels. Data collected included the following:

- Date and time of sighting;
- Vessel information such as name, speed, heading, and location;
- Environmental information such as wind and visibility; and
- Sightings information, including the species, distance from vessel, number of individuals, behaviour, whether there was a ship strike, and any mitigation action.

7.1.2 Results and Discussion

7.1.2.1 Vessel Activity and Survey Effort

During 2022, there were five vessel sailings servicing Back River, summarized in Table 7.1-1, Figure 7.1-1, and Figure 7.1-2. There were three trips that traveled from the west (Tuktoyaktuk) to the MLA, and the remaining two travelled from the east to the MLA. Vessel tracks broadcast using Automated Information System (AIS) vessel positioning were downloaded from Vesseltracker (2023) and plotted using ArcGIS 10.8.1 (Figures 7.1-1 and 7.1-2).

Table 7.1-1: Vessels Traveling to the MLA, August to October 2022

Vessel Name	Shipping Route	Date Departed Original Port	Date Arrived in MLA	Date Departed MLA
MV Donaugracht	Eastern Route	August 13	August 23	September 3
MV Aujaq	Eastern Route	August 23	September 12	September 15
MV Henry Christoffersen	Western Route	September 7	September 12	September 17
MV Henry Christoffersen	Western Route	September 24	October 5	October 8
Risco Reegen	Western Route	NA*	October 22	NA*

** No date provided.*

During 2022, marine mammal and seabird sightings were recorded by crew members on the *MV Aujaq* between August 29 and September 28. This vessel traveled along the eastern shipping route. There was one other sailing in August along the eastern shipping route by the *MV Donaugracht*, and three additional sailings occurred in September and October 2022 along the western shipping route (*MV Henry Christoffersen* and *Risco Reegen*); no surveys were conducted during these four sailings in 2022.

Between August and September, 33 surveys (18 seabird surveys and 15 marine mammal surveys) were completed totalling approximately 38 hours of observation time aboard the *MV Aujaq*, while travelling along the eastern shipping route. Of the 18 seabird surveys, four were completed while the vessel was moving and the remaining 14 while the vessel was anchored. Similarly, four of the 15 marine mammal surveys were completed while the vessel was moving, and the remaining 11 while the vessel was anchored. Marine mammals or seabirds were recorded during 16 of the 33 surveys. None of the sightings indicated requirements for management activity.

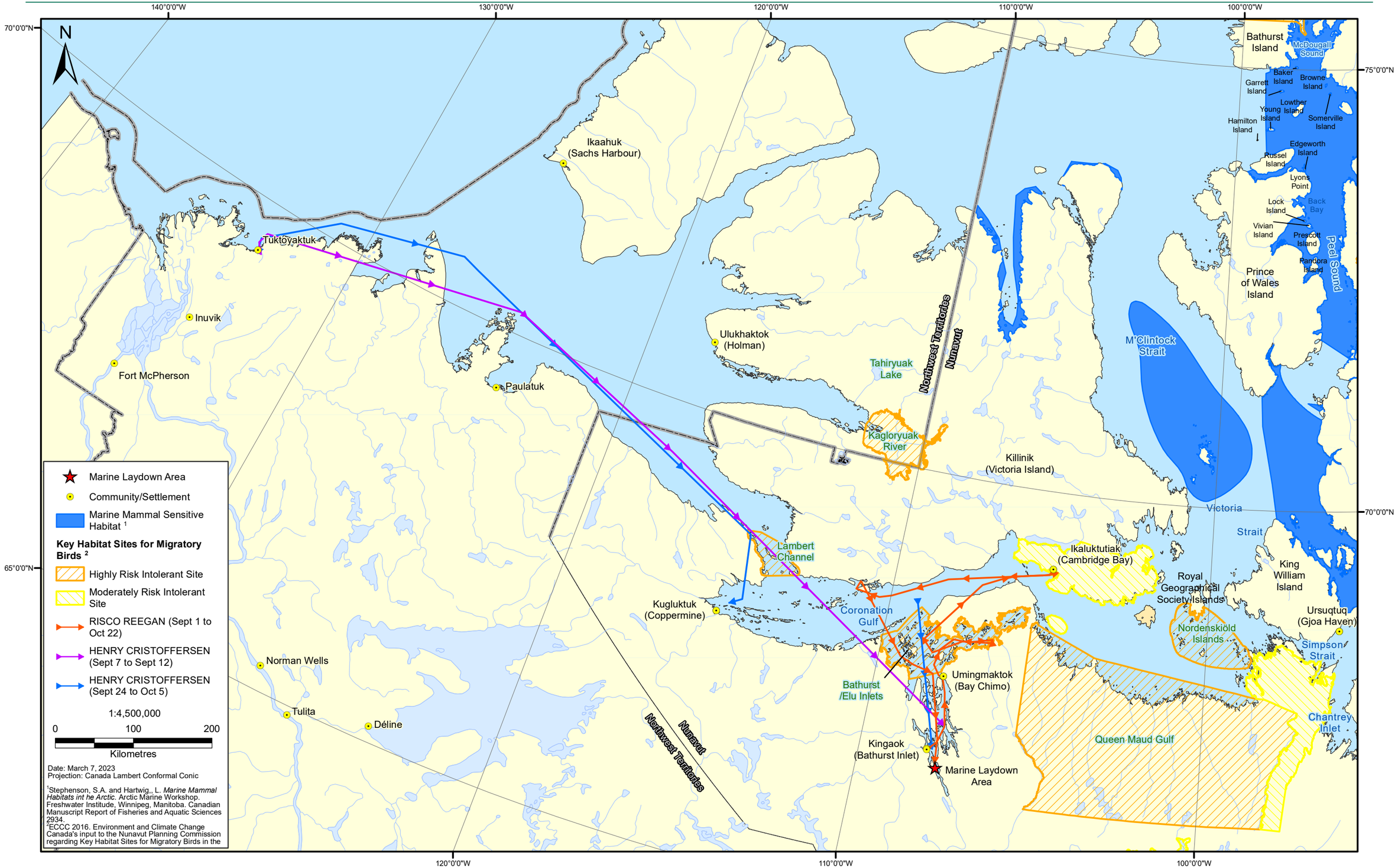

Figure 7.1-1: Vessel Tracks along the Western Shipping Route, August to October 2022

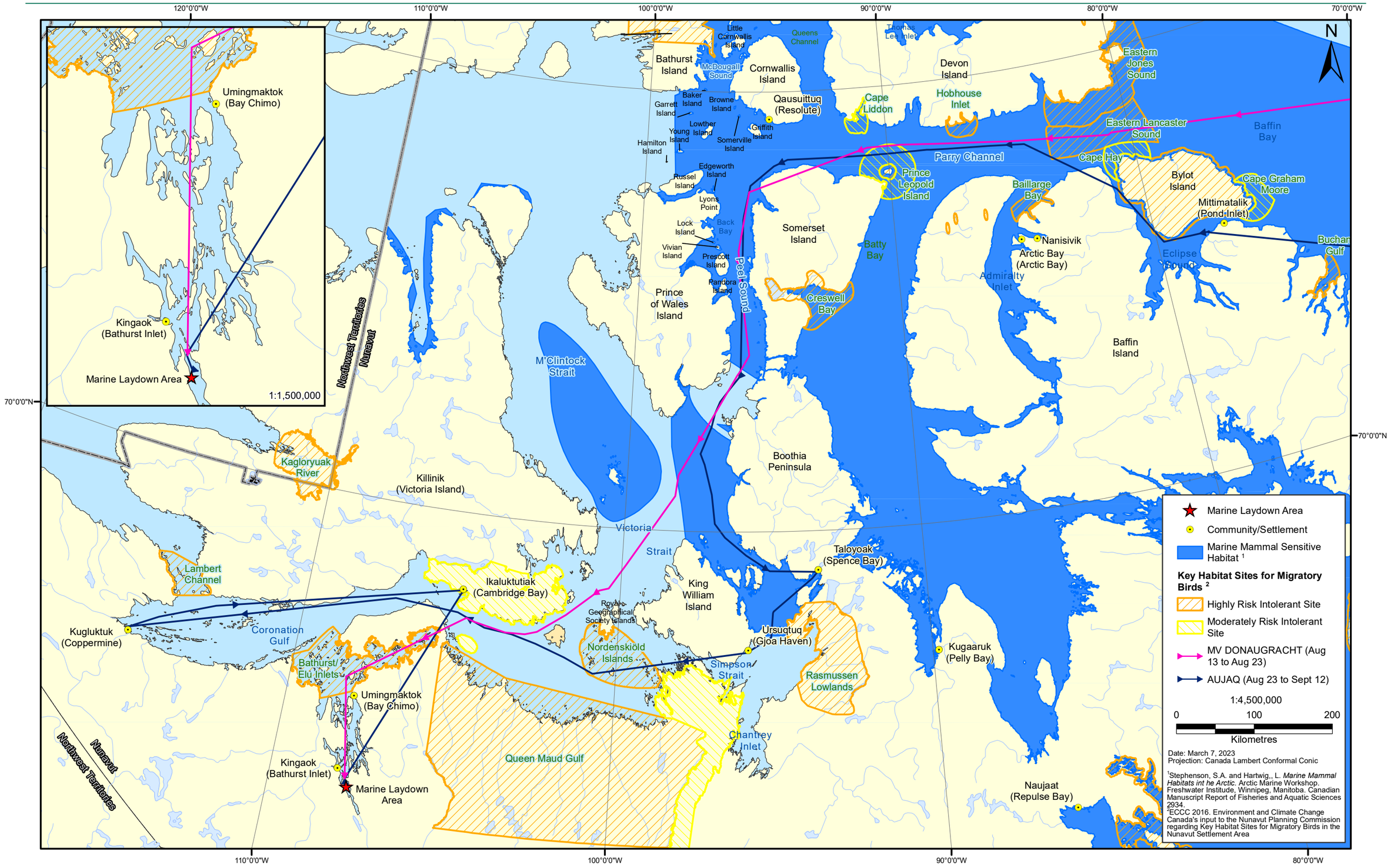

Figure 7.1-2: Vessel Tracks along the Eastern Shipping Route, August to October 2022

The vessels travelling along the western shipping route (the *Risco Reegen* and *MV Henry Christoffersen*) did not collect sightings data; therefore, there was no survey effort.

7.1.2.2 Marine Mammal Sightings

During 2022, marine mammal sightings were recorded by crew members on the *MV Aujaq* between August 31 and September 28. During these surveys, two marine mammal species were observed over five separate sightings: four sightings of grey seals (*Halichoerus grypus*) and one sighting of polar bears (*Ursus maritimus*; Table 7.1-2; Figure 7.1-3; Appendix 7B). The polar bears were observed in the Queen Maud Gulf (Figure 7.1-3) walking on an ice strip, approximately 200 m from the vessel on September 7. No marine mammals were observed in Bathurst Inlet.

Table 7.1-2: Incidental Observations of Marine Mammals during Shipping between August and September 2022

Species	Number Observed	Behaviour	Distance from Vessel (m)
Polar Bear	2	Walking on ice	200
Grey Seal	10	Travel	50
	3	Travel	300
	1	-	10
	25	-	300

7.1.2.3 Seabirds

During the sailing on the *MV Ajuag* between August and September 2022, there were nine separate sightings of seabirds recorded. A total of four seabird species were observed that were identified to species: northern fulmar (*Fulmarus glacialis*), glaucous gull (*Larus hyperboreus*), herring gull (*Larus argentatus*), and red-necked phalarope (*Phalaropus lobatus*; Table 7.1-3; Figure 7.1-4; Appendix 7B). One sighting of unknown gulls (a group of 10) was also observed. The most commonly observed bird species was northern fulmar (23 individuals observed over four separate sightings). One red-necked phalarope, federally listed on *SARA* Schedule 1 as Special Concern (Government of Canada 2021) territorially listed as vulnerable (CESCC 2015), was observed flying. The location of the red-necked phalarope was not recorded and is therefore not included on Figure 7.1-4. The only observations recorded within Bathurst Inlet were two sightings of herring gulls, and one sighting of a group of unknown gulls (Figure 7.1-4). The unknown gulls appear to be closer to Bathurst Lake; therefore, it is unknown if the sightings coordinates were recorded incorrectly, or if the birds were observed in the distance. This sighting was recorded during a stationary survey on September 13.

No mitigation measures or ship strikes were reported in 2022.

7.2 Seal Lair Mitigation and Monitoring

In 2022, Sabina did not construct the on-ice airstrip at the MLA; therefore, no pre-construction surveys were required. In addition, as construction of the WIR between the MLA and the Western River did not occur in 2022, no pre-construction surveys were required.

Table 7.1-3: Observations of Seabirds during Shipping, August to September 2022

Species	Number Observed	Behaviour	Distance from Vessel (m)
Northern Fulmar	4	Flying	200
	1	Flying	300
	8	Rafting	200
	10	Rafting	100
Herring Gull	2	Flying	200
	2	Rafting	200
Glaucous Gull	10	Flying and Rafting	100
Red-necked Phalarope	1	Flying	300
Unknown Gull	10	Flying and Rafting	100

As part of the operation of the MLA, Sabina may construct an on-ice landing strip for aircraft on the sea ice in front of the MLA and may construct a winter ice road (WIR) to transport equipment and supplies from the MLA to the Goose Site. The WIR travels south on sea ice from the MLA to the mouth of the Western River before heading inland. Construction of both on-ice infrastructure is generally scheduled for December and January of each year they are required, which is prior to the seal pupping season (which begins approximately February 15).

NIRB Condition #63 and the WMMP Plan Section 14.1.3 indicate that if construction of the on-ice landing strip or the WIR occurs during the seal pupping period (i.e., after February 15), then pre-construction surveys will be conducted, and construction will be altered to avoid any identified seal lairs. Sabina produced an SOP to guide pre-construction surveys and mitigation for seal lair.

7.3 Incidental Observations

There were no incidental observations of marine mammals recorded in the camp wildlife logs in 2022.

Figure 7.1-3: Marine Mammal Observations during Shipping, August and September 2022

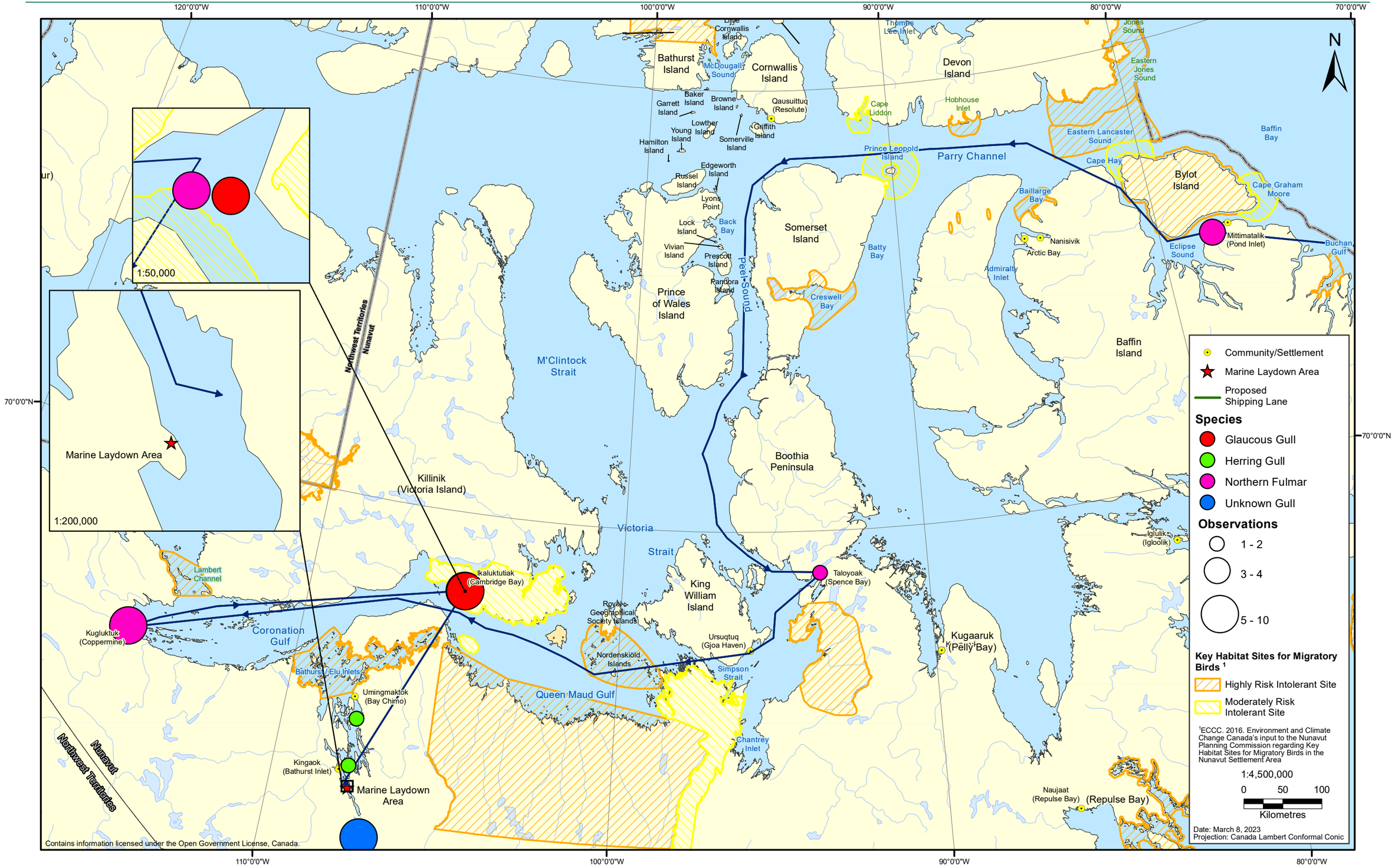

Figure 7.1-4: Seabird Observations during Shipping, August and September 2022

8. SPECIES OF CONSERVATION CONCERN

NIRB Condition #55 requires Sabina to ensure mitigation and monitoring is updated regularly to maintain consistency with changes to species at risk listings. Table 8-1 is an updated version based originally on Table 4.1-1 from the WMMP Plan (Version 9; September 2018, conservation status' in the WMMP Plan are consistent with the 2013 FEIS), and updated annually as part of the WMMP report. This table summarizes the species of conservation concern known to occur or potentially occurring in the Project area, updated annually with any new species additions or status changes as of February 2023.

Species of conservation concern include those listed in Nunavut by the Canadian Endangered Species Conservation Council (CESCC 2020), or those listed as Endangered, Threatened, or Special Concern on Schedule 1 of the SARA (2002; Government of Canada 2019). The federal conservation status by COSEWIC of three bird species and one marine mammal species changed since the species at risk table was updated for the 2021 WMMP Report (Table 8-1).

Harris's sparrow (*Zonotrichia querula*) was changed from Unrankable to Apparently Secure in Nunavut (CESSC 2020). Least sandpiper (*Calidris minutilla*) was changed from Vulnerable to Secure in Nunavut (CESSC 2020). Bowhead Whale (Eastern Canada - West Greenland population; *Balaena mysticetus*) was changed from Secure to Vulnerable (CESSC 2020). Ringed seal (*Pusa hispida*) was changed from Secure to Apparently Secure for the Eastern Arctic Ocean (CESSC 2020). Peary caribou (*Rangifer tarandus pearyi*) was changed from Apparently Secure to Imperiled for the subspecies (CESSC 2020).

Multiple updated recovery strategies, action plans, or management plans for the listed species have been made available since 2013. Updates for species observed at the Project include management plans made available for peregrine falcon in 2017 (ECCC 2017) and short-eared owl in 2018 (ECCC 2018). A proposed management plan for red-necked phalarope (*Phalaropus lobatus*) was recently completed in 2022 (ECCC 2022) and is currently under review.

The WMMP Plan (Version 11, 2022) includes mitigation, management and monitoring activities for each of the species at risk groups listed in Table 8-1. No additional mitigation, management or monitoring is required due to the change in status listed above.

Table 8-1: Species of Conservation Concern Known or Potentially Occurring at the Project, 2022

VEC or VEC Group	Species	Scientific Name	Federal Designation		Territorial Status[1]
			COSEWIC Status	*Species at Risk Act* Schedule 1	
Species Confirmed to Occur in the Project Terrestrial or Marine Regional Study Areas					
Caribou (Beverly/ Ahiak herd and Bathurst herd)	n/a	*Rangifer tarandus groenlandicus*	Threatened	Not Listed	Apparently Secure
Grizzly Bear	n/a	*Ursus arctos horribilis*	Special Concern	Special Concern	Vulnerable
Wolverine	n/a	*Gulo gulo*	Special Concern	Special Concern	Vulnerable
Upland Birds	American Golden-plover	*Pluvialis dominica*	Not Listed	Not Listed	Vulnerable
	Harris's Sparrow	*Zonotrichia querula*	Special Concern	Not Listed	Apparently Secure
	Hoary Redpoll[2]	*Carduelis hornemanni*	Not Listed	Not Listed	Vulnerable
	Least Sandpiper	*Calidris minutilla*	Not Listed	Not Listed	Secure
	Red-necked Phalarope	*Phalaropus lobatus*	Special Concern	Special Concern	Vulnerable
	Semipalmated Sandpiper	*Calidris pusilla*	Not Listed	Not Listed	Vulnerable
Raptors	Golden Eagle	*Aquila chrysaetos*	Not at Risk	Not Listed	Vulnerable
	Peregrine Falcon[2]	*Falco peregrinus anatum/tundrius*	Not at Risk	Special Concern	Apparently Secure
	Short-eared Owl	*Asio flammeus*	Threatened	Special Concern	Vulnerable
Seabirds and Seaducks	Common Eider[2]	*Somateria mollissima*	Not Listed	Not Listed	Vulnerable
Species that Could Occur in the Project Terrestrial or Marine Regional Study Areas					
Upland Birds	Black-bellied Plover[3]	*Pluvialis squatarola*	Not Listed	Not Listed	Vulnerable
	Buff-breasted Sandpiper	*Tryngites subruficollis*	Special Concern	Special Concern	Vulnerable
	Ruddy Turnstone	*Arenaria interpres*	Not Listed	Not Listed	Vulnerable
	Red Knot	*Calidris canutus rufa* (ssp. DU3/4/5)	Endangered/ Special Concern/ Endangered	Endangered/ Not Listed/ Not Listed	Imperiled

VEC or VEC Group	Species	Scientific Name	Federal Designation		Territorial Status[1]
			COSEWIC Status	*Species at Risk Act* Schedule 1	
Species that Could Occur in the Project Terrestrial or Marine Regional Study Areas *(cont'd)*					
Upland Birds *(cont'd)*	Red Knot	*Calidris canutus islandica*	Not at Risk	Special Concern	Imperiled
	Sanderling	*Calidris alba*	Not Listed	Not Listed	Vulnerable
	Snow Bunting	*Plectrophenax nivalis*	Not Listed	Not Listed	Vulnerable
Species Confirmed to Occur along the Project Shipping Route					
Marine Mammals	Bowhead Whale (Eastern Canada - West Greenland population)	*Balaena mysticetus*	Special Concern	Not Listed	Vulnerable
	Beluga (Eastern High Arctic - Baffin Bay population)	*Delphinapterus leucas*	Special Concern	Not Listed	Vulnerable
	Killer Whale (Northwest Atlantic/Eastern Arctic population)	*Orcinus orca*	Special Concern	Not Listed	Vulnerable
	Narwhal	*Monodon monoceros*	Special Concern	Not Listed	Apparently Secure
	Ringed Seal	*Pusa hispida*	Special Concern	Not Listed	Apparently Secure
	Polar Bear	*Ursus maritimus*	Special Concern	Special Concern	Vulnerable
Species that Could Be Encountered along the Project Shipping Route					
Caribou (Dolphin and Union herd)	n/a	*Rangifer taranduas groenlandicus*	Endangered	Special Concern	Apparently Secure
Caribou (Peary caribou)	n/a	*Rangifer tarandus pearyi*	Threatened	Endangered	Imperiled
Waterbirds	Horned Grebe	*Podiceps auritus*	Special Concern	Special Concern	Unrankable
Upland Birds	Hudsonian Godwit	*Limosa haemastica*	Threatened	Not Listed	Vulnerable
	Lesser Yellowlegs	*Tringa flavipes*	Threatened	Not Listed	Vulnerable

VEC or VEC Group	Species	Scientific Name	Federal Designation		Territorial Status[1]
			COSEWIC Status	*Species at Risk Act* Schedule 1	
Species that Could Be Encountered along the Project Shipping Route *(cont'd)*					
Seabirds and Seaducks	King Eider	*Somateria spectabilis*	Not Listed	Not Listed	Vulnerable
	Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	Critically Imperiled
	Ross's Gull	*Rhodostethia rosea*	Endangered	Threatened	Critically Imperiled
Marine Mammals	Walrus (High Arctic population)	*Odobenus rosmarus rosmarus*	Special Concern	Not Listed	Vulnerable

[1] Territorial status is current to 2020 and are presented in the 2020 Wild Species Report (CESCC 2020), and/or updated based on species search using NatureServe (NatureServe 2021).

[2] Species have also been encountered along the Project shipping routes.

[3] Species are also likely to be encountered along the Project shipping routes.

Note:

Shaded cells refer to species' statuses that have changed or been added since the 2021 WMMP Report.

9. WILDLIFE INCIDENTS AND MORTALITIES

During 2022, there were 16 incidents involving carnivores and one caribou mortality (due to predation) reported. One wildlife incident resulted in injury to a staff member.

On November 8 a staff member entered the GS-02 generator shack at Goose, and was bit on the leg by a small carnivore identified as either a fox or wolverine. The animal tore through the coveralls and pants of the worker, piercing the skin above the boot. The worker struck the animal with his other foot and an oil jug until it released and ran from the area. The worker was assessed by site medics and flown to Yellowknife for further medical treatment. Staff searched the site for the animal but were unable to locate it. An incident report was completed (Appendix 9A), and corrective actions implemented to mitigate access for wildlife to the generator shack. Mitigation actions taken include installation of wire mesh over vent louvres on the building intake duct, and a safety presentation to all staff regarding wildlife interactions, precautions, and waste management.

A red fox was observed attempting to access the incinerator at Goose Camp on November 20, and was hazed from the area using noise and human presence. A red fox presumed to be the same individual was seen in the weather station area on November 21, which was deterred from the area using bear bangers.

There were 13 reports of aggressive or habituated wolverines, all occurring between November 20 and December 20 (see Section 5.5.2.2). Of these instances, deterrent measures were deployed in seven cases (bear bangers in four, rubber bullets in one, and a combination of both in two). Nine of these reports occurred from November 21 to November 24, and are believed to have been the same wolverine. This wolverine was found within the incinerator building on November 21, and deterred using rubber bullets and bear bangers.

On July 22, a caribou was discovered that had been killed by a wolf approximately 300 m from the MLA along the coast, approximately 1 m into the water. Initially the intent was to leave the carcass, however increased predator activity due to the fresh kill prompted Sabina to move the carcass farther away from the MLA due to safety concerns. The carcass was moved towards the base of Window Falls approximately 8 miles west of camp. Increased predator activity was not noted following this mitigation.

No wildlife mortalities were reported at the Project site in 2020 or 2021. One grizzly bear mortality occurred near the Project in 2019, and one long-tailed duck mortality occurred at the MLA in 2018 (Table 9-1).

Table 9-1: Wildlife Mortalities at Back River, 2018 to 2022

Species	2018	2019	2020	2021	2022	Total
Caribou	0	0	0	0	1[1]	1
Long-tailed Duck	1	0	0	0	0	1
Grizzly Bear	0	1	0	0	0	1
Total	**1**	**1**	**0**	**0**	**1**	**3**

[1] *The caribou mortality was a natural predation event.*

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APPENDIX 2A OVERVIEW OF WILDLIFE MITIGATION AND MONITORING PROGRAMS DURING PHASES OF THE BACK RIVER PROJECT

Appendix 2A: Overview of Wildlife Mitigation and Monitoring Programs during Phases of the Back River Project

Monitoring Programs that Trigger Management (section of the document where they are described)	Baseline/ Pre-Construction	Mobilization and Construction	Operations	Temporary Closure	Care and Maintenance	Reclamation/ Closure	Post-Closure
Caribou (Section 7.2)							
1) Monitor Seasonal Caribou Ranges *Use collar data to track during which seasons caribou are likely to interact with the Project*	--	Yearly	Yearly	Yearly	Yearly	Yearly	--
2) Near Real-time Collar Monitoring *Use collar data to track near real-time location of caribou herds*	--	Ongoing	Ongoing	--	--	Ongoing	--
3) Active Caribou Monitoring *Wildlife monitors will survey for caribou from raised platforms or using cameras*	--	Ongoing	Ongoing	--	--	Ongoing	--
4) Incidental Wildlife Reporting *Incidental observations of wildlife and incidents*	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--
5) On-site Camera Monitoring *Use motion-trigger cameras to track caribou interactions with Project infrastructure*	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--
6) Over the Horizon Monitoring *If ZOI monitoring indicates that management must be conducted for caribou when they are over the horizon (greater than can be observed from site)*	--	If triggered	If triggered	--	--	If triggered	--
7) Human Activity Monitoring *Reporting hunting and fishing on the Project site*	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	--
8) Noise Monitoring *Monitor noise levels outside the footprint*	One time	One time	Every three years	--	--	One time	--
Muskox (Section 8.2)							
1) On-site Camera Monitoring *Use motion-trigger cameras to track muskox interactions with Project infrastructure*	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--
2) Incidental Wildlife Reporting *Incidental observations of wildlife and incidents*	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--

APPENDIX 4A INCIDENTAL CARIBOU OBSERVATIONS, 2022

Appendix 4A: Incidental Caribou Observations, 2022

Date (dd/mm/yyyy)	Day	Month	Year	Location	Raw Distance/Direction Notes	Distance from Camp (km)	Direction from Camp	Direction Travelling	Number	Species	Comments (# of calves, etc.)	Name
9/10/2021	9	10	2021	Goose	North side runway	NA			40.00	Caribou	In river	Heidi
23/02/2022	23	2	2022	Goose		16		E	100.00	Caribou		Justin
3/3/2022	3	3	2022	Goose	South of camp	NA			20.00	Caribou	Moving away from camp	Bruce
3/3/2022	3	3	2022	Goose		5		W	60.00	Caribou	Herd migration	Justin
8/3/2022	8	3	2022	Goose	South of road near portal	NA			100.00	Caribou	Traveling SW	Benji
14/03/2022	14	3	2022	Goose	South end off airstrip	NA			100.00	Caribou	Not moving	Bruce
22/03/2022	22	3	2022	NA		NA		N	300.00	Caribou		
28/03/2022	28	3	2022	Goose	South end off this airstrip	NA			100.00	Caribou	Travelling East	Mitchell
4/6/2022	6	4	2022	Goose		4			300.00	Caribou		JT
12/4/2022	12	4	2022	Goose	East side of Propellar Lake	NA			40.00	Caribou	Herd crossing lake	Dan + Amy Golder
13/04/2022	13	4	2022	Goose	About 7 km south of camp	7	S		50.00	Caribou	Herd out on lake	Dan + Amy Golder
14/04/2022	14	4	2022	Goose	About 6 km south of camp	6	S		40.00	Caribou	Cow + calf hear crossing tundra	Dan + Amy Golder
14/04/2022	14	4	2022	Goose		158		SE	300.00	Caribou		JT
15/04/2022	15	4	2022	Goose	Near drilling area	NA		E	150.00	Caribou	No calf	
15/04/2022	15	4	2022	Goose	300/400 yards	NA			500.00	Caribou	Behind incinerator	Advion Potter
18/04/2022	18	4	2022	Goose		7			50.00	Caribou	small herd resting	JT
21/04/2022	21	4	2022	Goose	2 km south of strip	2		E	25.00	Caribou	Moving East	Bruce
22/04/2022	22	4	2022	Goose		15		S	150.00	Caribou	Herd migration	bobby
5/5/2022	5	5	2022	Goose	2-3 km from tower	2-3		S	50.00	Caribou	Mixed (5.15)	M. Casey
9/5/2022	9	5	2022	Goose	South end airstrip	NA		E	20.00	Caribou	Were laying down then up and started travelling East	Rob D.
3/6/2022	3	6	2022	Goose	1-2 km across lake	1-2			5.00	Caribou	North	Jessie
13/06/2022	13	6	2022	Goose	2-3 km	2-3		SE	9.00	Caribou	Across lake	Golder
19/07/2022	19	7	2022	Echo pit		NA		S	1.00	Caribou	Female	M. Sardery
21/07/2022	21	7	2022	Echo pit turn-off		NA			1.00	Caribou	Bull	
25/07/2022	25	7	2022	Goose		1		S	250.00	Caribou	Herd migration	Troy Crew
8/24/2022	24	8	2022	Goose		5		W	3.00	Caribou	Grazing	Justin T.
17/08/2022	17	8	2022	Goose	10 km west of camp	10	W		6.00	Caribou	2 calves	D. Couths
18/08/2022	18	8	2022	Goose	10 km west of camp	10	W		1.00	Caribou	Stopped part wary	D.Couths
1/9/2022	1	9	2022	MLA	15m south	0.015	south		4.00	Caribou	Grazing	Collin
5/9/2022	5	9	2022	Goose	0.5 km between camp airstrip	0.5			50.00	Caribou	Southbound moving through	
7/9/2022	7	9	2022	Goose	by bridge on coust road	NA			12.00	Caribou		Bruce
12/9/2022	12	9	2022	Goose	By lake at east end of Gooseneck	NA			15.00	Caribou	Haning out	Chris Hedler
13/09/2022	13	9	2022	Goose	Echo creek bridge	NA		S	800.00	Caribou	Moving South	
26/09/2022	26	9	2022	Goose	East of camp	NA	E		1.00	Caribou		Carl
28/09/2022	28	9	2022	Goose		NA			9.00	Caribou	Across from roadway	JT
28/09/2022	28	9	2022	Goose	5 km	5		SW	35.00	Caribou	Herd of caribou	JT
3/10/2022	3	10	2022	Goose	7 km	7		SW	12.00	Caribou	Little herd	JT
11/10/2022	11	10	2022	MLA	Standing on strip	NA			1.00	Caribou		CR
Unknown	NA	NA	2022	Goose	Between camp and strip	NA			12.00	Caribou		Jessie CB

APPENDIX 5A WILDLIFE MONITORING AND MITIGATION FOR BLASTING SOP – ENVIRO-07

Back River Project

Wildlife Monitoring and Mitigation for Blasting Pre-construction, Construction and Operations

STANDARD OPERATING PROCEDURE ENVIRO-07

4 November 2022 Version C.1

Scope of Work: This SOP provides guidance for Environment Staff to meet Sabina's existing environmental commitments during blasting, including quarrying, road building and open-pit blasting. The SOP applies to all blasting during pre-construction, construction and operations.

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1. BACKGROUND

Sabina is committed to ensuring wildlife and personnel remain safe while carrying out blasting activities. This program is designed to identify when wildlife are in the vicinity of Project blasting and trigger appropriate mitigation. Prior to blasting, Sabina personnel will conduct a survey for wildlife. Mitigation may be required if animals are detected during the survey.

This SOP summarizes how to conduct the pre-blast surveys, mitigation requirements if wildlife are observed within trigger distances, and reporting requirements.

During the calving and post-calving periods, presence of calving caribou on the Project site can lead to a site shutdown, including blasting, heavy vehicles, helicopters, etc. For more information on site-wide shutdowns, please refer to the Caribou Shutdown SOP.

2. PRE-BLAST MONITORING

Sabina employs several wildlife monitoring methods, including the following:

1. Tracking satellite collars on caribou (using GN data) to determine if caribou are approaching; and
2. Ground-based monitoring prior to blasts.

This SOP focuses on ground-based monitoring to be conducted by the Environment Department.

2.1 Training

Project personnel will be trained for the role of wildlife monitor. These personnel may come from any department, however efforts will be made to use members of the Environment Department. Sufficient staff with the appropriate training will be on-site at all times of year to conduct wildlife monitoring. Training will include the following:

- The roles and responsibilities of the wildlife monitor;
- Safety considerations for the role;
- Wildlife identification;
- Caribou behaviour to enable behavioural surveys of caribou;
- The triggers and management actions for blasting should caribou or other wildlife be observed on or near site; and
- Data entry and reporting.

2.2 Equipment

- Binoculars
- Rangefinder or markers
- Clipboard and pencil
- GPS
- Radio
- Forms (attached):
    - Pre-blasting Survey Datasheet

2.3 Large Mammal Survey

Prior to blasting, wildlife monitors will complete the following data reviews and surveys for large mammals:

1. Review of caribou collar data
2. Ground-based survey

If wildlife are observed within the specified "trigger distances" specified in Section 3.2 immediately communicate the sighting and location to the blasting crew.

2.3.1 Review Collar Data

Sabina receives maps of satellite collars on barren-ground caribou from the Government of Northwest Territories on a daily basis during calving and post-calving and weekly the rest of the year.

- Review these maps prior to the wildlife survey to determine whether caribou may be in the area.

2.3.2 Ground-based Survey

Two observers (wildlife monitor and one assistant, if possible) survey for wildlife from the height of land nearest to the blasting site. If a location with good visibility is accessible from vehicle, then the surveys may be conducted from the vehicle.

The protocol for the survey is as follows:

1. Using binoculars, scan the area (360 degrees) for any caribou, muskox, grizzly bear, or wolverine.
2. Estimate the distance to any wildlife observed using markers or a laser rangefinder.
3. Determine group size and composition, including the presence of calves or young animals.
4. Record all observations on the Pre-blasting Survey Datasheet.
5. Alert the Environment Manager and Blasting Manager if any wildlife are observed and indicate the recommended mitigation (Section 3).
6. Submit the completed form to the Environment Manager no later than the end of shift.

2.4 Raptor Survey

Prior to blasting during the bird breeding season (March-July), survey the walls of the open pit or quarry with binoculars to determine if there are any raptors nesting on the rock walls.

Indications of nesting include:

- Observations of birds
- Observations of nests
- Observations of nesting activity:
    - Nest construction
    - Copulation
    - Incubation
    - Perching
    - Food deliveries
    - Territorial displays

Record any wildlife observations on the Pre-blasting Survey Datasheet. Submit the completed form to the Environment Manager no later than the end of shift.

2.5 Incidental Observations

On site personnel report incidental observations of wildlife to the Environment Department on the Incidental Wildlife Observation Datasheet**.** Incidental wildlife observations will be used to inform blasting mitigation, where applicable.

3. MITIGATION

3.1 Large Mammal Mitigation

If wildlife are observed during pre-blast surveys, follow the criteria outlined in Tables 1 and 2 to determine the appropriate mitigation for the open pits and quarries, respectively. Blasting mitigation for caribou around the open pits is depicted in Figure 1.

Table 1: Management of Blasting in Open Pits when Wildlife are Observed

Species	Timing Window	Number of Animals	Distance	Action
Caribou	Calving (June 5-15)	Group of ≥10 breeding females	≤5 km	Stop blasting until animals leave.
Caribou	All year	Group of ≥25 animals	≤4 km	Stop blasting until animals leave.
Caribou	All year	Group of 1-25 animals	≤4 km	Conduct behavioural monitoring. Blasting can proceed.
Caribou, muskox, grizzly bear or wolverine	All year	Any	Blast safety distance (~500 m)*	Stop blasting until animal(s) leave the blast safety distance.
Muskox	All year	≥10	≤1 km	Stop blasting. If animal is still there after 1 day, blasting may resume.
Grizzly bear	All year	≥1	≤1 km	Stop blasting. If animal is still there after 1 day, blasting may resume.

**Note: the blast safety distance is often 500 m, but is determined on a case by case basis by the Blasting Manager.*

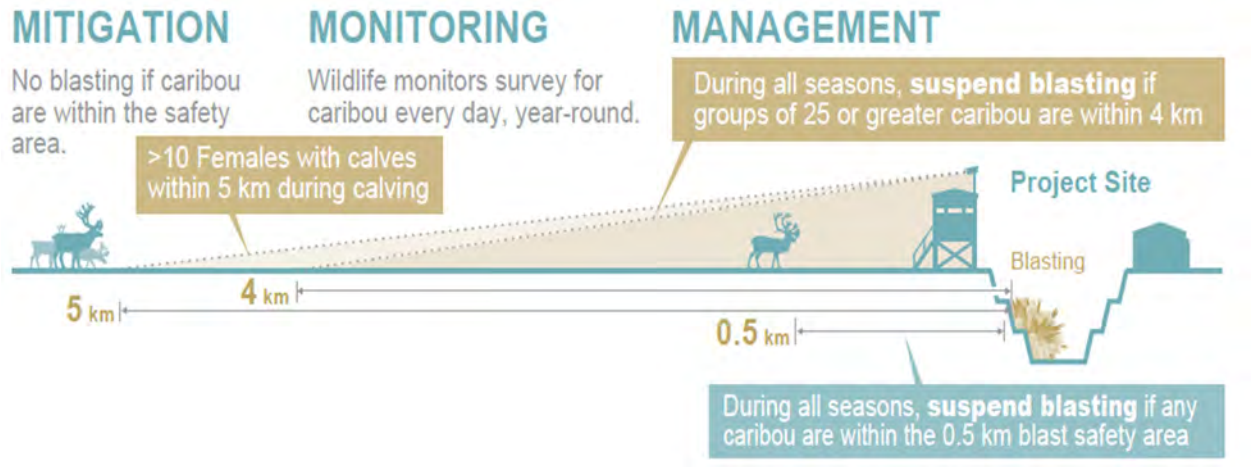

Figure 1: Pre-blasting Mitigation, Monitoring, and Management for Caribou at Open Pits

Note that trigger distances are smaller for quarry blasts than for blasting in the pit, due to the much smaller blast sizes. Underground blasts are allowed at all times.

Where specified in Tables 1 or 2, behaviour monitoring will be conducted by wildlife monitors to evaluate caribou responses to blasting. See the SOP for Behaviour Monitoring.

The Environment Manager or designate is responsible for approving the resumption of blasting activities.

Table 2: Management of Blasting in Quarries and Other Blasts when Wildlife are Observed

Species	Timing Window	Number of Animals	Distance	Action
Caribou	Calving (June 5-15)	Group of ≥10 breeding females	≤2.5 km	Stop blasting until animals leave.
Caribou	All year	Group of ≥25 animals	≤2.5 km	Stop blasting until animals leave.
Caribou	All year	Group of 1-25 animals	≤2.5 km	Conduct behavioural monitoring. Blasting can proceed.
Caribou, Muskox, Grizzly Bear or Wolverine	All year	Any	Blast safety distance (~500 m)*	Stop blasting until animal(s) leave the blast safety distance.

**Note: the blast safety distance is often 500 m, but is determined on a case by case basis by the Blasting Manager.*

3.2 Raptor Mitigation

The following mitigation actions will be implemented by the Environment staff if a raptor is observed nesting in the pit before a blast:

1. If a raptor nest is observed being constructed in a pit, but the raptor has not yet laid eggs, then the nest will be removed.
2. If locations are found that are frequently used as nests, then appropriate mitigation will be used to dissuade raptors from using this area (e.g., netting, bird spikes, etc.).
3. If a raptor persists in attempting to nest in the pits despite the mitigation listed above, then raptors will be excluded from the pits using auditory or visual hazing methods (e.g., bear bangers, bright lights, playback of raptor calls, flashers, models of raptors, etc.). Procedures for deterring raptors are specified in the SOP for Wildlife Deterrence for Environment Staff (SOP # ENVIRO-06)**.**

In some cases, raptors may attempt to nest in areas of the pit sufficiently removed from blasting locations that there is little chance of raptor injury or disturbance by blasting. In consultation with the GN DOE the raptors may be left to nest in the pit or quarry location. Nest monitoring is required until the chicks have fledged the nest to determine nest success. Follow guidance in the SOP for Pre-clearing Nest Surveys (SOP # ENVIRO-01) for nest monitoring.

4. REPORTING

The Environment Manager will record all blasting mitigation actions taken in response to wildlife observations in a log. Records must include the following details:

- Location
- Date and time
- Description of wildlife (species, number, sex and ages if possible)
- Location of wildlife relative to blasting location and specified trigger distances

- Management action(s) taken, including duration of any blast shutdowns and criteria used to approve resumption of activities
- Any communication with the KIA and GN DOE or Conservation Officers

Wildlife observations from the active monitoring program, incidental wildlife observations, and details of management actions taken or blast shutdowns will be reported in the annual Wildlife Management and Monitoring Program (WMMP) report.

5. ATTACHMENTS

Attachment A: Pre-blasting Survey Datasheet

Sabina GOLD & SILVER CORP.	Back River Project	July 2020
	PRE-BLASTING SURVEY DATASHEET	vA.1

GENERAL INFORMATION

Date of Survey *(yy mm dd)*		**Time Start** *(24 hr)*	
Observer Names		**Time End** *(24 hr)*	
Type of Monitoring *(circle one, can circle multiple)*	*Large Mammal: Caribou Collar Tower Camera Height of Land Raptor Other (describe):*		
Wildlife Observed? ***(If "No", proceed to Section 4)***	*Yes No*	**Wildlife Within Trigger Distances?**	*Yes No*

LOCATION INFORMATION

Observer/Camera Location	**UTM East**	**UTM North**	
Distance from Observer to Wildlife (m)		**Direction to Wildlife**	
Wildlife Location *(if known)*	**UTM East**	**UTM North**	
Location Description *(e.g., Road KM or facility)*			
Distance from Wildlife to Blast (m)			
Habitat Description *(circle one)*	*Boulder Field Tundra Shrubs Stream/River Lake/Pond Open Water Wetland Un-vegetated Shoreline Esker Other:*		

WILDLIFE INFORMATION

Species *(circle)*	*Caribou Grizzly Bear Wolf Wolverine Muskox Raptor Other:*
Number of Animals	*Adult Female: Adult Male: Young: Unknown: Total Number:*
Animal Behaviour *What was/were the animal(s) doing (e.g., walking, resting, eating, etc.)*	

OTHER INFORMATION

Photos
(record photo number)

Notes
- *Any mitigation actions (was the blast postponed and for how long etc.)?*

For Office Use

These data were entered into the wildlife database by:		These data were entered into the wildlife database on:	

APPENDIX 5B FACILITIES CAMERA MONITORING DATA, 2022

Appendix 5B: Facilities Camera Monitoring Data, 2022

File	Camera Number	Date_Time. Captured	Species	Number Adults	Number Juvenile	Number Total	Behaviour	Comments	Event Duration (seconds)	Number Photos. Event
BR01__2022-09-30__14-13-58_2.jpg	BR01	30/09/2022 14:13	Rock ptarmigan	21	0	21	Feeding		18	10
BR04__2022-10-03__08-10-05.jpg	BR04	03/10/2022 8:10	Rock ptarmigan	14	0	14	Flying		2	3
BR05__2022-10-02__14-00-00.jpg	BR05	02/10/2022 14:00	Rock ptarmigan	7	0	7	Resting		0	1
BR02__2022-10-18__10-52-46.jpg	BR02	18/10/2022 10:52	Raven	6	0	6	Interacting with infrastructure		2798	47
BR02__2022-10-24__10-14-30.jpg	BR02	24/10/2022 10:14	Raven	3	0	3	Interacting with infrastructure		2	3
BR03__2022-12-04__18-15-46.jpg	BR03	04/12/2022 18:15	Arctic hare	3	0	3	Running		436	20
BR02__2022-10-14__10-24-56.jpg	BR02	14/10/2022 10:24	Raven	2	0	2	Interacting with infrastructure		2480	16
BR02__2022-10-18__15-00-00.jpg	BR02	18/10/2022 15:00	Raven	2	0	2	Interacting with infrastructure		3601	22
BR02__2022-10-25__09-55-49.jpg	BR02	25/10/2022 9:55	Raven	2	0	2	Interacting with infrastructure		420	19
BR02__2022-10-25__10-37-32.jpg	BR02	25/10/2022 10:37	Raven	2	0	2	Interacting with infrastructure		22	5
BR02__2022-10-26__07-53-38.jpg	BR02	26/10/2022 7:53	Raven	2	0	2	Interacting with infrastructure		2	3
BR02__2022-10-27__10-56-13.jpg	BR02	27/10/2022 10:56	Raven	2	0	2	Flying		1	2
BR02__2022-11-02__10-21-01.jpg	BR02	02/11/2022 10:21	Raven	2	0	2	Interacting with infrastructure		3627	27
BR02__2022-11-03__10-46-04.jpg	BR02	03/11/2022 10:46	Raven	2	0	2	Interacting with infrastructure		10	4
BR03__2022-12-15__07-14-07.jpg	BR03	15/12/2022 7:14	Arctic hare	2	0	2	Running		8	5
BR03__2022-12-15__09-26-09.jpg	BR03	15/12/2022 9:26	Arctic hare	2	0	2	Running		89	4
BR04__2022-11-28__16-15-34.jpg	BR04	28/11/2022 16:15	Raven	2	0	2	Resting		327	8
BR01__2022-10-07__06-20-52.jpg	BR01	07/10/2022 6:20	Arctic hare	1	0	1	Standing		2	3
BR01__2022-10-08__09-53-47.jpg	BR01	08/10/2022 9:53	Raven	1	0	1	Interacting with infrastructure		82	15
BR01__2022-10-14__10-43-25.jpg	BR01	14/10/2022 10:43	Raven	1	0	1	Flying		0	1
BR01__2022-10-16__09-17-46.jpg	BR01	16/10/2022 9:17	Raven	1	0	1	Interacting with infrastructure		542	28
BR01__2022-10-22__12-29-55.jpg	BR01	22/10/2022 12:29	Raven	1	0	1	Flying		2	3
BR01__2022-10-22__13-06-22.jpg	BR01	22/10/2022 13:06	Raven	1	0	1	Flying		1	2
BR01__2022-10-23__18-03-03.jpg	BR01	23/10/2022 18:03	Arctic hare	1	0	1	Running		0	1
BR01__2022-11-03__13-10-36.jpg	BR01	03/11/2022 13:10	Raven	1	0	1	Flying		0	1
BR01__2022-11-04__20-00-20.jpg	BR01	04/11/2022 20:00	Red fox	1	0	1	Walking		2	4
BR02__2022-10-04__17-22-30.jpg	BR02	04/10/2022 17:22	Raven	1	0	1	Interacting with infrastructure		450	7
BR02__2022-10-08__10-19-38.jpg	BR02	08/10/2022 10:19	Raven	1	0	1	Interacting with infrastructure		1495	11
BR02__2022-10-08__11-41-06.jpg	BR02	08/10/2022 11:41	Raven	1	0	1	Interacting with infrastructure		3	5
BR02__2022-10-08__12-53-06.jpg	BR02	08/10/2022 12:53	Raven	1	0	1	Interacting with infrastructure		6837	81
BR02__2022-10-08__15-23-10.jpg	BR02	08/10/2022 15:23	Raven	1	0	1	Interacting with infrastructure		325	36
BR02__2022-10-08__16-50-04.jpg	BR02	08/10/2022 16:50	Raven	1	0	1	Interacting with infrastructure		596	3
BR02__2022-10-09__07-19-10.jpg	BR02	09/10/2022 7:19	Raven	1	0	1	Interacting with infrastructure		3	3
BR02__2022-10-09__08-32-52.jpg	BR02	09/10/2022 8:32	Raven	1	0	1	Interacting with infrastructure		2	3
BR02__2022-10-09__16-11-22.jpg	BR02	09/10/2022 16:11	Raven	1	0	1	Interacting with infrastructure		32	9
BR02__2022-10-09__17-13-12.jpg	BR02	09/10/2022 17:13	Raven	1	0	1	Interacting with infrastructure		27	2
BR02__2022-10-15__16-45-58.jpg	BR02	15/10/2022 16:45	Raven	1	0	1	Interacting with infrastructure		1	2
BR02__2022-10-15__17-30-00.jpg	BR02	15/10/2022 17:30	Raven	1	0	1	Interacting with infrastructure		0	1

Appendix 5B: Facilities Camera Monitoring Data, 2022

File	Camera Number	Date_Time. Captured	Species	Number Adults	Number Juvenile	Number Total	Behaviour	Comments	Event Duration (seconds)	Number Photos. Event
BR02__2022-10-24__16-05-34_1.jpg	BR02	24/10/2022 16:05	Raven	1	0	1	Interacting with infrastructure		0	1
BR02__2022-10-26__09-30-00.jpg	BR02	26/10/2022 9:30	Raven	1	0	1	Interacting with infrastructure		0	1
BR02__2022-10-26__14-33-13.jpg	BR02	26/10/2022 14:33	Raven	1	0	1	Interacting with infrastructure		0	1
BR02__2022-10-27__10-13-17_1.jpg	BR02	27/10/2022 10:13	Raven	1	0	1	Flying		0	1
BR02__2022-10-28__14-09-48.jpg	BR02	28/10/2022 14:09	Raven	1	0	1	Interacting with infrastructure		2	2
BR02__2022-10-28__14-43-45.jpg	BR02	28/10/2022 14:43	Raven	1	0	1	Interacting with infrastructure		555	2
BR02__2022-10-28__16-08-20_1.jpg	BR02	28/10/2022 16:08	Raven	1	0	1	Interacting with infrastructure		0	1
BR02__2022-11-02__09-09-02.jpg	BR02	02/11/2022 9:09	Red fox	1	0	1	Interacting with infrastructure	Staff taking photos up close.	6	5
BR02__2022-11-02__11-30-29.jpg	BR02	02/11/2022 11:30	Red fox	1	0	1	Interacting with infrastructure	Up close with staff	438	60
BR02__2022-11-02__12-15-41.jpg	BR02	02/11/2022 12:15	Raven	1	0	1	Flying		2436	4
BR02__2022-11-02__14-06-53.jpg	BR02	02/11/2022 14:06	Raven	1	0	1	Interacting with infrastructure		4569	39
BR02__2022-11-02__16-30-00.jpg	BR02	02/11/2022 16:30	Raven	1	0	1	Interacting with infrastructure		0	1
BR02__2022-11-02__20-04-35.jpg	BR02	02/11/2022 20:04	Red fox	1	0	1	Interacting with infrastructure		2	3
BR02__2022-11-03__09-45-30.jpg	BR02	03/11/2022 9:45	Raven	1	0	1	Interacting with infrastructure		903	18
BR02__2022-11-03__12-07-30.jpg	BR02	03/11/2022 12:07	Raven	1	0	1	Interacting with infrastructure		1679	7
BR02__2022-11-03__13-50-26.jpg	BR02	03/11/2022 13:50	Red fox	1	0	1	Interacting with infrastructure		0	1
BR02__2022-11-03__14-07-10.jpg	BR02	03/11/2022 14:07	Raven	1	0	1	Interacting with infrastructure		1	2
BR02__2022-11-03__14-55-16.jpg	BR02	03/11/2022 14:55	Raven	1	0	1	Interacting with infrastructure		674	21
BR02__2022-11-03__15-43-25.jpg	BR02	03/11/2022 15:43	Raven	1	0	1	Interacting with infrastructure		106	5
BR02__2022-11-03__16-46-12.jpg	BR02	03/11/2022 16:46	Red fox	1	0	1	Interacting with infrastructure		2	3
BR02__2022-12-01__12-44-49.jpg	BR02	01/12/2022 12:44	Raven	1	0	1	Interacting with infrastructure		40	38
BR02__2022-12-01__14-53-48.jpg	BR02	01/12/2022 14:53	Raven	1	0	1	Interacting with infrastructure		1116	6
BR02__2022-12-01__15-46-16.jpg	BR02	01/12/2022 15:46	Raven	1	0	1	Interacting with infrastructure		373	22
BR03__2022-09-28__21-18-03.jpg	BR03	28/09/2022 21:18	Arctic hare	1	0	1	Running		2	3
BR03__2022-10-07__20-18-17.jpg	BR03	07/10/2022 20:18	Arctic hare	1	0	1	Running		2	3
BR03__2022-10-15__06-53-43.jpg	BR03	15/10/2022 6:53	Arctic hare	1	0	1	Running		2	3
BR03__2022-10-29__23-00-00.jpg	BR03	29/10/2022 23:00	Arctic hare	1	0	1	Running		0	1
BR03__2022-11-01__21-11-40.jpg	BR03	01/11/2022 21:11	Wolverine	1	0	1	Running		2	3
BR03__2022-11-12__19-26-39.jpg	BR03	12/11/2022 19:26	Arctic hare	1	0	1	Resting		17	6
BR03__2022-11-18__08-11-32.jpg	BR03	18/11/2022 8:11	Arctic hare	1	0	1	Running		293	8
BR03__2022-11-25__22-34-06.jpg	BR03	25/11/2022 22:34	Wolverine	1	0	1	Inspecting camera		5	4
BR03__2022-11-26__04-30-00.jpg	BR03	26/11/2022 4:30	Arctic hare	1	0	1	Running		0	1
BR03__2022-12-04__06-42-11.jpg	BR03	04/12/2022 6:42	Arctic hare	1	0	1	Running		2	3
BR03__2022-12-04__19-24-22.jpg	BR03	04/12/2022 19:24	Arctic hare	1	0	1	Running		1	2
BR03__2022-12-20__01-15-51.jpg	BR03	20/12/2022 1:15	Wolverine	1	0	1	Running		0	1
BR03__2022-12-20__17-01-14.jpg	BR03	20/12/2022 17:01	Arctic hare	1	0	1	Running		1	2
BR03__2022-12-21__18-59-11.jpg	BR03	21/12/2022 18:59	Arctic hare	1	0	1	Running		0	1
BR04__2022-09-29__04-09-29.jpg	BR04	29/09/2022 4:09	Arctic hare	1	0	1	Running		31	6

Appendix 5B: Facilities Camera Monitoring Data, 2022

File	Camera Number	Date_Time. Captured	Species	Number Adults	Number Juvenile	Number Total	Behaviour	Comments	Event Duration (seconds)	Number Photos. Event
BR04__2022-09-29__23-11-30.jpg	BR04	29/09/2022 23:11	Arctic hare	1	0	1	Running		0	1
BR04__2022-09-29__23-52-59.jpg	BR04	29/09/2022 23:52	Arctic hare	1	0	1	Running		421	4
BR04__2022-10-05__23-30-00.jpg	BR04	05/10/2022 23:30	Arctic hare	1	0	1	Feeding		0	1
BR04__2022-10-06__02-25-33.jpg	BR04	06/10/2022 2:25	Arctic hare	1	0	1	Running		2	3
BR04__2022-10-19__02-26-29.jpg	BR04	19/10/2022 2:26	Arctic hare	1	0	1	Feeding		9	7
BR04__2022-10-22__02-30-00.jpg	BR04	22/10/2022 2:30	Arctic hare	1	0	1	Running		0	1
BR04__2022-10-25__18-13-55.jpg	BR04	25/10/2022 18:13	Arctic hare	1	0	1	Running		0	1
BR04__2022-10-25__19-00-00.jpg	BR04	25/10/2022 19:00	Arctic hare	1	0	1	Running		0	1
BR04__2022-10-27__06-43-00.jpg	BR04	27/10/2022 6:43	Arctic hare	1	0	1	Running		2	3
BR04__2022-10-29__03-30-00.jpg	BR04	29/10/2022 3:30	Arctic hare	1	0	1	Running		388	3
BR04__2022-10-29__22-00-00.jpg	BR04	29/10/2022 22:00	Arctic hare	1	0	1	Running		0	1
BR04__2022-11-01__22-47-35.jpg	BR04	01/11/2022 22:47	Red fox	1	0	1	Walking		0	1
BR04__2022-11-02__22-57-14.jpg	BR04	02/11/2022 22:57	Red fox	1	0	1	Walking		1	2
BR04__2022-11-05__16-32-47.jpg	BR04	05/11/2022 16:32	Raven	1	0	1	Flying		39	14
BR04__2022-11-12__19-30-00.jpg	BR04	12/11/2022 19:30	Arctic hare	1	0	1	Walking		0	1
BR04__2022-11-12__20-49-24.jpg	BR04	12/11/2022 20:49	Red fox	1	0	1	Walking		0	1
BR04__2022-11-13__11-36-36.jpg	BR04	13/11/2022 11:36	Raven	1	0	1	Resting		2	3
BR04__2022-11-30__19-45-23.jpg	BR04	30/11/2022 19:45	Red fox	1	0	1	Interacting with infrastructure		63	6
BR04__2022-12-01__19-24-01.jpg	BR04	01/12/2022 19:24	Red fox	1	0	1	Walking		2	3
BR05__2022-09-30__07-30-00.jpg	BR05	30/09/2022 7:30	Rock ptarmigan	1	0	1	Resting		0	1
BR05__2022-10-13__08-38-28.jpg	BR05	13/10/2022 8:38	Arctic hare	1	0	1	Walking		0	1
BR06__2022-10-29__01-33-28.jpg	BR06	29/10/2022 1:33	Arctic hare	1	0	1	Walking		1	2
BR06__2022-12-12__23-13-35.jpg	BR06	12/12/2022 23:13	Arctic hare	1	0	1	Walking		12	6

APPENDIX 5C INCIDENTAL WILDLIFE OBSERVATIONS SOP: ENVIRO-14

Back River Project

Incidental Wildlife Observations

STANDARD OPERATING PROCEDURE	ENVIRO-14
30 December 2022	Version A.1

Scope of Work:	This SOP provides guidance for recording and reporting incidental observations of wildlife around the Back River Project.	
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	Greg Sharam Technical Director, ERM	greg.sharam@erm.com 778-628-0974

1. PROGRAM DESCRIPTION AND OBJECTIVES

This Incidental Wildlife Observations Standard Operating Procedure (SOP) has been developed to guide recording and reporting of wildlife observations, as well as wildlife incidents near Project activities and infrastructure. The objectives of the incidental wildlife observation program are to:

- Record general wildlife activity in the Project area, including along roads;
- Identify unexpected conflicts or potential conflicts posed by existing Project facilities for wildlife, for example:
  - Documenting wildlife-vehicle collisions; and
  - Identifying sections of the road that might be at risk for collisions (e.g., adjacent to high quality forage and near movement corridors);
- Triggering additional monitoring and mitigation;
- Identifying opportunities for adaptive management if a new risk to wildlife is identified; and
- Assessing effectiveness of mitigation measures over time.

2. METHODS

All personnel on the Project site are expected to report observations of wildlife occurring around or interacting with the Project to the Environment Department using the datasheet provided in Attachment A.

When recording incidental observations, please do the following:

- Make all efforts possible not to directly disturb wildlife;
- If possible, record the observation from your vehicle;
- Do not approach the wildlife further than where you initially observed them; and
- Do not make any efforts to entice them closer to you.

Basic wildlife identification guidance will be available during employee training, or on-site in poster or digital form, to assist personnel in identifying species they might see around the Project. Common wildlife that may be observed include:

- Caribou;
- Muskox;
- Fox;
- Wolverine;
- Grizzly bear; and
- Various bird species (including raptors, waterbirds, and songbirds).

Information recorded whenever wildlife is observed will include:

- Location (including GPS coordinates), date, and time;
- Type of interaction in applicable (e.g., attraction, nesting, collision);
- Species, number, age, and sex (if possible);
- Behaviour (e.g., feeding, resting, running, startled);
- Condition (e.g., limping, wounded, unable to fly); and
- Any damage to or interaction with Project infrastructure (e.g., building skirting, vehicles).

Should a collision with wildlife occur, the following information will be recorded in addition to the above:

- Animal fate (e.g., fatality, injury, unknown); and
- Collision description, including factors leading to the collision (to assist in future mitigation).

All incidental wildlife observation and collision data will be entered in the Wildlife Database by Environment Department staff and reported in the annual WMMP report.

3. ATTACHMENTS

Attachment A: Incidental Wildlife Observation and Wildlife Collison Datasheet

DRAFT

Sabina GOLD & SILVER CORP.	Back River Project	Dec 2022
	INCIDENTAL WILDLIFE OBSERVATION DATASHEET	vA.1

- *Complete this form if:*
  - *you observe wildlife (caribou, grizzly bear, wolf, wolverine, muskox, or fox) on the Project Site, including while flying, on-site roads and the winter ice road;*
  - *there is a project-related wildlife fatality or injury; or*
  - *you observe dead or injured wildlife, even if the fatality or injury was not project-related.*
- *Submit the completed form to the Environment Department at the end of your shift.*

GENERAL INFORMATION

Date of Sighting *(yy mm dd)*		**Time First Sighted** *(24 h)*	
Observer Name		**Time Last Sighted** *(24 h)*	
Job Activity during Observation			

LOCATION INFORMATION

Location Description *(e.g., Road Km or Facility)*				
Animal Location *(if known)*	**UTM East**		**UTM North**	
Observer Location	**UTM East**		**UTM North**	
Habitat Description *(Circle one)*	Boulder Field Tundra Shrubs Stream/River Lake/Pond Open Water Wetland Un-vegetated Shoreline Esker Other: _____			
Photos *(Record photo #'s)*				

WILDLIFE INFORMATION

Species *(circle)*	Caribou Grizzly Bear Wolf Wolverine Muskox	Bird *(describe):* _____ _____	Other *(describe):* _____ _____		
Number of Animals	Adult Female: _____	Adult Male: _____	Young: _____	Unknown: _____	**Total Number:** _____
Condition of Animals *(Circle one)*	Alive Dead Injured	**Animal Behaviour** *What was/were the animal(s) doing (e.g., walking, resting, eating, running, sleeping, playing, flying, nesting, or crossing the road)?*			
Was there an Accident? *If yes, complete back of form*					
Other Notes o *Did the animal(s) have a collar?* o *If the animal was deceased or injured, please describe and report to Environment Department*					

For Office Use

These data were entered into the wildlife database by:		These data were entered into the wildlife database on:	

Sabina GOLD & SILVER CORP.	Back River Project	Dec 2022
	INCIDENTAL WILDLIFE OBSERVATION DATASHEET	vA.1

- *All wildlife collisions must be called in to the Environment Department **immediately**.*
- *This form must be completed for any collision between light vehicles or heavy mobile operating equipment and wildlife (caribou, grizzly bear, wolf, wolverine, fox, or muskox).*
- *Submit the completed form to the Environment Department **as soon as possible**, and no later than the end of your shift.*

GENERAL INFORMATION

Date of Collision *(yy mm dd)*		**Time of Collision** *(24 h)*	
Vehicle or Equipment Operator			
Other Personnel Involved			

WILDLIFE INFORMATION

Species Involved *(circle one)*	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox	Bird (*describe):* _____ _____	Other *(describe):* _____ _____
Number of Animals Involved		**Animal Fate** *(circle one, if known)*	Fatality	Injury	Unknown		

LOCATION INFORMATION

Location Description *If possible, mark on map & attach*				
UTM Coordinates *(if known)*	**UTM East**		**UTM North**	

COLLISION DESCRIPTION

- *Provide a description of the collision, including answering the following:*
  - *What was the animal doing?*
  - *What factors contributed to the collision?*
  - *Who else was involved or observed the collision?*
  - *What did you do in response to the collision?*

For Office Use

These data were entered into the wildlife database by:		These data were entered into the wildlife database on:	

APPENDIX 5D INCIDENTAL TERRESTRIAL WILDLIFE OBSERVATIONS, 2022

Appendix 5D: Incidental Terrestrial Wildlife Observations, 2022

Date (dd/mm/yyyy)	Location	Raw Distance/Direction Notes	Distance from Camp (km)	Direction from Camp	Direction Travelling	Number	Species	Comments (# of calves, etc.)	Name
20/12/2021	Goose	N side Gooseneck; then by crusher				1	Bear		Jessie /Francis
14/02/2022	Forward		2		N	1	Bear	Male grizzly	bobby
20/02/2022	Goose	SE of runway			SW	1	Wolf	Same white wolf	J.P
06/03/2022	Goose	6 km	6			1	Bear		
06/03/2022	MLA	shore by Desal Plort				1	Bear	Walking through	Collin
05/04/2022	Goose	Portal			W	1	Bear	Grizzly	Night crew
10/04/2022	Goose	Between camp and runway			W	1	Bear	Moving West	H. Hoefer
13/04/2022	Goose	1 km from ESKAR Pit	1		N	2	Wolf	Approached, stopped and retreated	M. Casey
25/04/2022	Goose		2		N	2	Wolf	Adult	Pat. D.
01/05/2022	Goose	1-2 km across lake	1-2		E	1	Wolf	Behind incinerator	Mitchell
04/05/2022	Goose		3		W	3	Wolf		JT
04/05/2022	Goose	Between heli pad and strip			W	1	Fox	Just moving	Tracy
05/05/2022	Goose	Goose neck area			E	3	Wolf	Just moving	Naomi
05/05/2022	Forward		1		N	1	Fox		B. O'B
05/05/2022	Unknown		0		W	1	Wolverine		Justin
25/05/2022	Unknown		30			3	Wolf	Close to forward camp	Carol
26/05/2022	Goose	3 km	3		S	1	Wolf	by portal	
26/05/2022	Goose	1-2 km	1-2		E	1	Fox	Behind incinerator	Chad
04/06/2022	Goose	NW of camp; camp pad area				1	Bear		Heidi
06/06/2022	MLA	Upper quarry				1	Fox	Walking through	Robert A.
06/06/2022	Goose	2 km	2		E	1	Wolf	Across gooseneck by old airstrip	Paul O.
07/06/2022	Goose		0			1	Wolf		J. Makor
14/06/2022	Goose	1 km	1		E and W	1	Bear	Personnel notified; bear watch	B.OB
16/06/2022	MLA	18 Miles south of MLA				2	Moose		Leighton
16/06/2022	Goose	4 km	4			1	Bear		JT
18/06/2022	Goose	Major shop/airstrip				1	Wolverine	Between 2 spots moving S	Heidi
19/06/2022	Goose	Airstrip quarry				1	Bear	Moving SW of Echo	J. Dircks
19/06/2022	Goose		3		S	1	Fox	One small adolesent	B. O'B
21/06/2022	Goose		0.25	W		1	Wolverine	Traveling away from camp pad	M. Mauvdeux
01/07/2022	Goose		1	N		30	Muskox	Across the gooseneck from portal	M. Mauvdeux
02/07/2022	MLA		105			7	Wolf		AG
21/07/2022	Goose	About 7 km south of camp	7	S		2	Wolf	2 wolves following caribou	Dan + Amy Golder
27/07/2022	Goose	On ice; running away from camp		S		1	Wolverine	No threat	Heidi/Mitchel
08/08/2022	Unknown		0.1		NE	1	Wolf	Healthy	B. O'B
12/08/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Thomas, Albert
12/08/2022	Goose	4 km	4		W	1	Fox	Jeff spotted fox looked sick heading west on narrows	DF
21/08/2022	Goose	2-3 km	2-3			1	Wolf	200 yards from LEDCOR site office	LEDCOR
01/09/2022	Goose		0.2		W	1	Wolf		B. O'B
06/09/2022	Goose	Box cut				1	Wolverine		
11/09/2022	MLA					15	Muskox		BA
17/09/2022	Goose	Fly over camp			N	100	Goose	Geese	Merle
22/09/2022	Goose	2 km	2		E-S-W	1	Wolf	Travelled from lake side to incinerator to major to runway-bear banger used	Mike/Jason Heidi
25/09/2022	Camp pond		1		W	1	Wolf	called in by camp	Chad
28/09/2022	Goose		0			1	Wolverine		Justin
01/10/2022	Goose	At camp and incinerator	0			1	Red Fox	Deterred	Rod, Gillian
02/10/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Bobby
08/10/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Thomas, Colin
11/10/2022	Goose	In camp	0		S	1	Fox	Between back rows of cabins	Heidi
17/10/2022	Unknown					4	Wolverine		Exploration Crew Observed
24/10/2022	Goose		5		E	1	Muskox	Bull, solitary	Justin T.
26/10/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Chad, Gillian

Appendix 5D: Incidental Terrestrial Wildlife Observations, 2022

Date (dd/mm/yyyy)	Location	Raw Distance/Direction Notes	Distance from Camp (km)	Direction from Camp	Direction Travelling	Number	Species	Comments (# of calves, etc.)	Name
30/10/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Chad, Gillian
06/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Chad, Gillian
08/11/2022	Goose	Near weather station	0			1	Red Fox	Deterred	Rod, Benji
09/11/2022	Goose	South of boxcut between road and water			N	1	Bear	Moving North	Phil Koch
12/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Ryan, Benji
15/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Chad, Gillian
20/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Ryan, Benji
20/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Chad, Gillian, Benji
21/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Chad
21/11/2022	Goose	400 m	0.4		S	1	Fox		Benji
21/11/2022	Goose	Shore of Goose down from Weather Station	0			1	Wolverine	Deterred	Bobby
21/11/2022	Goose	running south on lake past camp			S	1	Wolverine	Ran by the camp on the lake and kept going	Benji
22/11/2022	Goose		0			1	Fox	Trying to get in kitchen	JT
22/11/2022	Goose	2 km	2		W	6	Swan	Flock of swans	Jeremy Ball
23/11/2022	Goose	Goose neck			E	1	Bear	At Gooseneck east towards ESKER	Chris
23/11/2022	Goose		0			1	Bear	Near fuel tank; grizzly	JT
23/11/2022	MLA					15	Muskox		BA
24/11/2022	MLA					1	Snowy owl		
26/11/2022	Goose		0.2		S	50	Muskox	Herd migration	Crew
29/11/2022	Goose	5 km	5		W	2	Bear	Mom and cub grizzly	JT
29/11/2022	Goose	Incinerator	0			1	Wolverine	Deterred	Bobby
14/12/2022	MLA	1 mile from camp	1.6			3	Moose		BA

APPENDIX 7A MARINE SHIPPING SOP – WILDLIFE MITIGATION AND MONITORING: ENVIRO-02

Back River Project

Marine Shipping – Wildlife Mitigation and Monitoring

STANDARD OPERATING PROCEDURE	ENVIRO-02
10 November 2022	Version F.1

Scope of Work: This SOP provides guidance for marine mammal and seabird monitoring procedures for shipping companies contracted by Sabina. Monitoring is conducted to avoid potential effects to marine mammals and seabirds. The shipping companies are required to record marine wildlife observations based on the protocols outlined in this SOP along the shipping route.

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1. PROGRAM DESCRIPTION AND OBJECTIVES

A Marine Shipping Wildlife Mitigation and Monitoring Standard Operating Procedure (SOP) has been developed to guide onboard monitoring for marine mammals and seabirds and mitigation of shipping operations in response to identified sensitive wildlife areas and wildlife observations.

This SOP satisfies the Back River Project's NIRB Project Certificate (No. 007) Conditions #58, #64, and #65. This SOP addresses Conditions #58 and #64 in full. It addresses the avoidance of sensitive wildlife habitat and species required in Condition #65. The protocols and equipment to reduce the potential of harmful release of a substance into the marine environment are detailed in the Shipboard Oil Pollution Emergency Plan (SOPEP) Oil Pollution Emergency Plan (OPEP).

The purpose of this SOP is to identify the monitoring and mitigation procedures for shipping companies contracted by Sabina to avoid potential effects to marine mammals and seabirds. This document outlines the following:

- how to avoid or adjust shipping speed near sensitive wildlife habitat along shipping routes;
- how to record observations of marine mammals and seabirds;
- how to conduct dedicated marine mammal surveys and dedicated seabird surveys;
- potential mitigation if marine mammals or large groups of seabirds are observed;
- how to record and report mitigation measures taken, if applicable; and
- how to record and report ship strikes of marine mammals or seabirds, if they occur.

Sabina will update this SOP as necessary, in response to feedback from the Inuit Environmental Advisory Committee (IEAC), the Department of Fisheries and Oceans (DFO), Environment and Climate Change Canada (ECCC) or in response to data collected in the field or scientific advances.

2. SHIPPING MITIGATION IN SENSITIVE HABITAT

2.1 Identified Sensitive Habitat Where Mitigation Applies

Sensitive habitat for marine birds in Nunavut waters has been identified along the Project shipping route in the following areas (ECCC 2016; Figure 2.1-1):

- Prince Leopold Island;
- Bathurst Inlet/Elu Inlet Key Marine Habitat Site;
- Lambert Channel Key Marine Habitat Site;
- Eastern Lancaster Sound Key Marine Habitat Site; and
- Eastern Jones Sound.

Sensitive habitat for marine mammals in Nunavut waters has been identified along the Project shipping route from Lancaster Sound to Franklin Strait (Figure 2.1-2).

Sensitive habitat for marine birds in Northwest Territories waters has been identified along the western Project shipping route in the following areas (Latour et al. 2008; Figure 2.1-3):

- Mills Lake;
- Middle Mackenzie River Islands;

- Lower Mackenzie River Islands;
- Kugluktuk and Hutchinson Bays;
- McKinley Bay – Phillips Island; and
- Cape Parry.

2.2 Shipping Setback Distances

Except where the safety of the ship is a concern, ships will adhere to the following setback distances from these sensitive habitats, as identified in the WMMP Plan (ECCC 2016; Latour et al. 2008; Mallory and Fontaine 2004):

- **30 km** from Prince Leopold Island (Figure 2.1-1);
- **500 m** from observed marine bird colonies in the Bathurst Inlet/Elu Inlet, Lambert Channel, Eastern Lancaster Sound, and Eastern Jones Sound Key Marine Habitat Sites (Figure 2.1-1); and
- **2 km** from ivory gull breeding colonies, if they are observed.

3. MARINE MAMMAL AND SEABIRD MONITORING AND MITIGATION RESPONSE

3.1 Overview

The objectives of the marine mammal and seabird monitoring program are the following:

- record incidental observations of seabirds and marine mammals in the Northwest Passage made by bridge staff;
- document and report measures taken to mitigate impacts to marine mammals and large groups of seabirds;
- document and report ship strikes of marine mammals or seabirds, if they occur; and
- conduct dedicated marine mammal and seabird surveys if timing allows.

3.2 Training

Bridge staff on ships are required to:

- review the Marine Shipping Wildlife Mitigation and Monitoring SOP (this document);
- review marine mammal and seabird identification, including common species detailed in Tables 3.2-1 and 3.2-2, and in the *Common Species* guides in Attachments D and E;
- know how to estimate distances to animals observed;
- review how to fill out the *Incidental Marine Wildlife Sightings Form* (Attachment A), the *Marine Mammal Survey Sightings Form* (Attachment B) and the *Seabird Survey Sightings Form* (Attachment C); and
- For additional information on methodology, review the document which this Marine Shipping Wildlife Mitigation and Monitoring SOP is based: *Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms* (Gjerdrum et al 2012).

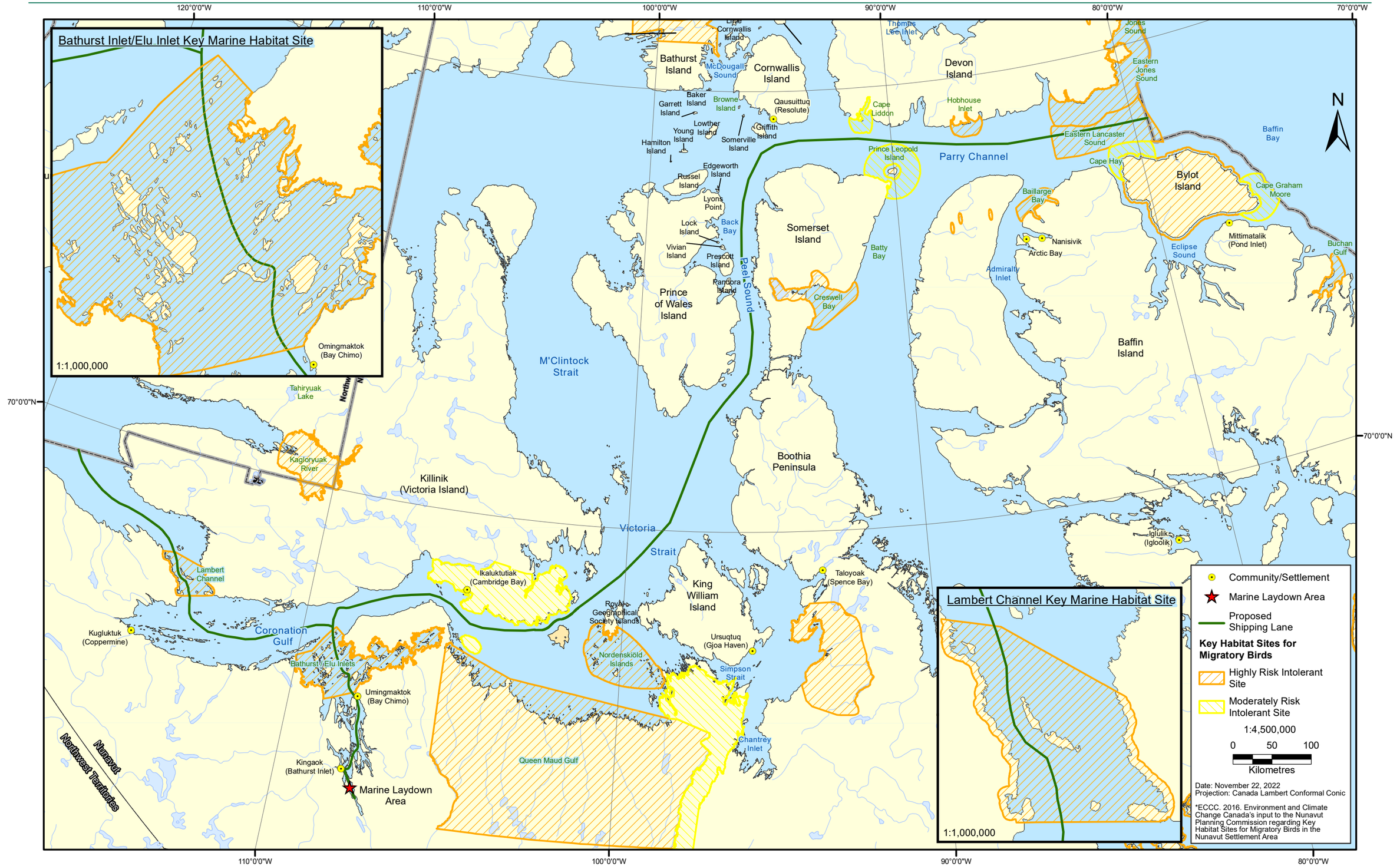


Figure 2.1-1: Sensitive Habitat and Setbacks for Seabirds and Seaducks along the Eastern Shipping Route in Nunavut

Figure 2.1-2: Sensitive Habitat for Marine Mammals along the Eastern Shipping Route in Nunavut

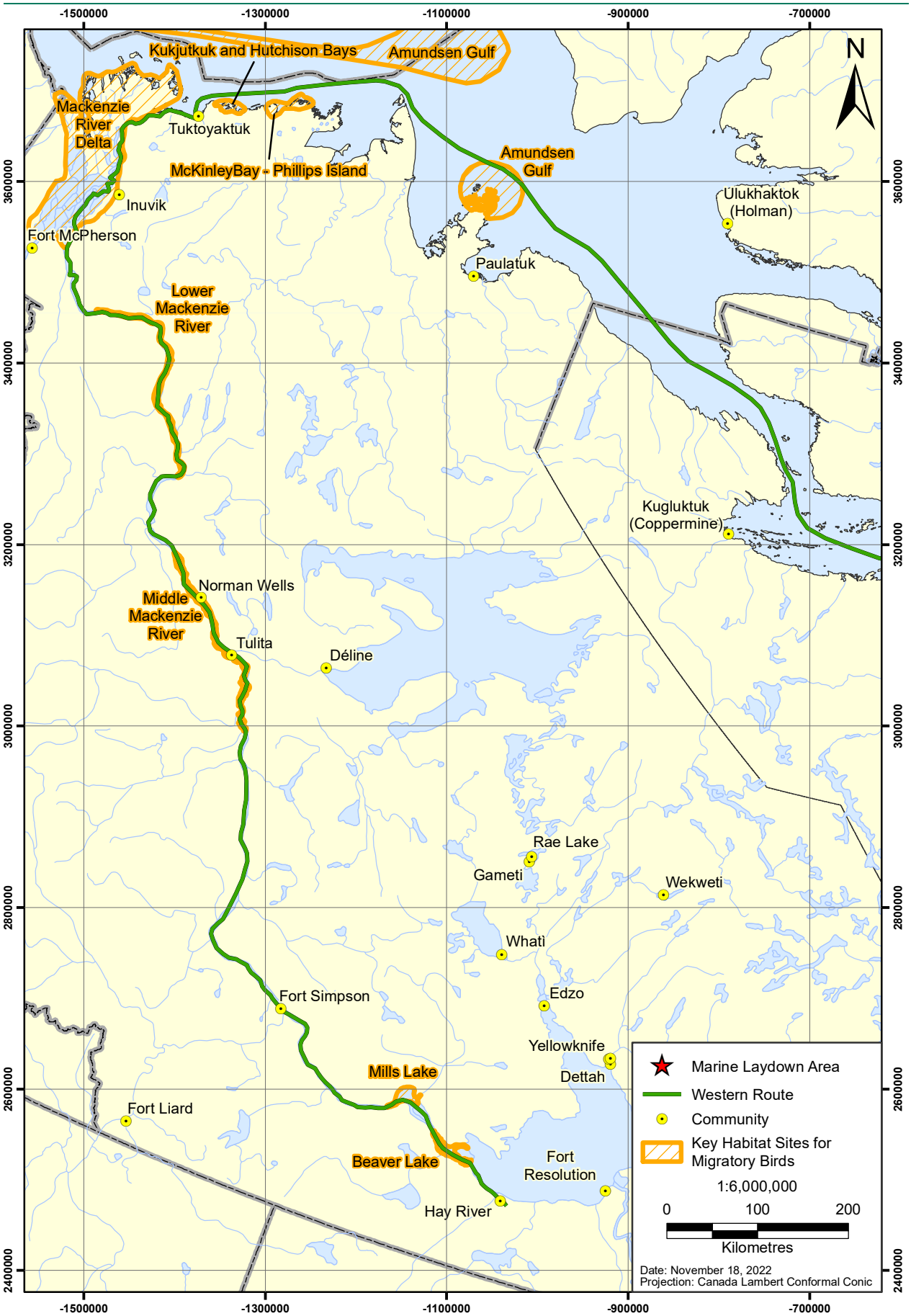


Figure 2.1-3: Sensitive Habitat and Setbacks for Seabirds and Seaducks along the Western Shipping Route in NWT

Table 3.2-1: General Species Groups and Common Species of Marine Mammals Most Likely Observed along the Shipping Routes

Marine Mammal Group	Species
Whale	Narwhal
	Beluga whale
	Killer whale
	Bowhead whale
Seal	Ringed Seal
	Fur Seal
	Bearded Seal
Other	Walrus
	Polar bear*

** Denotes Species of Conservation Concern (federally listed on Schedule 1 of the* Species at Risk Act*).*

Note:

This list of species is based on baseline data collected for the Project and from species distribution maps. Only ringed seal and bearded seal have been confirmed near the Project site; however, this list is more extensive to include potential species that may be observed along the shipping route.

Table 3.2-2: Species of Seabirds Most Likely Observed along Shipping Routes in Eastern Canada and the Arctic

Bird Family	Species
Common[1] Offshore[2] Species	
Fulmars	Northern Fulmar
Shearwaters and Petrels	Great Shearwater
	Manx Shearwater
	Sooty Shearwater
	Wilson's Storm Petrel
	Leach's Storm Petrel
Gannets	Northern Gannet
Phalaropes	Red Phalarope
	Red-necked Phalarope*
Jaegers and Skuas	Long-tailed Jaeger
	Parasitic Jaeger
	Pomarine Jaeger
	Great Skua
Gulls and Terns	Herring Gull
	Glaucous Gull
	Great Black-backed Gull
	Ivory Gull*
	Sabine's Gull

Bird Family	Species
Gulls and Terns (*cont'd*)	Iceland Gull
	Ross's Gull*
	Arctic Tern
	Black-legged Kittiwake
Auks, Murres, Puffins	Common Murre
	Thick-billed Murre
	Razorbill
	Dovekie
	Atlantic Puffin
	Black Guillemot
Common[1] Inshore[2] Species	
Loons	Common Loon
	Red-throated Loon
	Yellow-billed Loon
	Pacific Loon
Grebes	Red-necked Grebe
	Horned Grebe*
Cormorants	Great Cormorant
	Double-crested Cormorant

Bird Family	Species
Ducks and Geese	Greater Scaup
	Common Eider
	King Eider
	Harlequin Duck*
	Long-tailed Duck
	Surf Scoter
	Black Scoter
	White-winged Scoter
	Red-breasted Merganser
	Green-winged Teal
	Northern Shoveler
	Mallard
	Northern Pintail
	American Black Duck
	Common Merganser
	Lesser Scaup
	Common Goldeneye
	Snow Goose
Ducks and Geese (*cont'd*)	Brant
	Greater White-fronted Goose
	Canada Goose
	Cackling Goose
	Ross's Goose
Cranes and Swans	Sandhill Crane
	Tundra Swan
Infrequent or Rare Species	
Shearwaters and Petrels	Cory's Shearwater
	Audubon Shearwater
Jaegers and Skuas	South Polar Skua
Gulls and Terns	Bonaparte's Gull
	Black-headed Gull
	Laughing Gull
	Ring-billed Gull
	Lesser Black-backed Gull
	Common Tern
	Roseate Tern*

** Denotes Species of Conservation Concern (federally listed on Schedule 1 of the Species at Risk Act).*

[1] Species are considered common if indicated by Gjerdrum et al. (2012) or if observed during baseline surveys.

[2] Species in the offshore column can also be observed nearshore, and species in the inshore column can also be seen offshore.

Note:

This list of species is based on baseline data collected for the Project and from Gjerdrum et al. (2012).

3.3 Equipment

Bridge staff participating in wildlife monitoring will require the following:

1. This SOP;
2. Forms: (Attachment A, B, and C, depending on type of survey);
3. Binoculars for species identification;
4. GPS (only required if unable to get GPS coordinates from the ship);
5. Clipboard and pencil; and
6. Marine mammal and seabird ID guides, including the summary guides of common species (Attachments D and E).

3.4 Monitoring Procedure

3.4.1 Incidental Observations

Whenever a marine mammal or seabird is observed outside of a dedicated survey time (as described below), this is called an incidental sighting, or "off-effort". These sightings are recorded on the *Incidental Marine Wildlife Sightings Form* (Attachment A) and provided to Sabina for reporting. This includes all sightings of seabirds, whales, seals, walruses, polar bears, and hauled-out animals while the vessel is underway.

Marine mammal and seabird sightings will be recorded as incidental observations by the ship's bridge crew during the vessel's transit to the MLA. Incidental observations will be recorded whenever they are observed on the *Incidental Marine Wildlife Sightings Form* (Attachment A).

The observer will record marine mammals, marine birds, vessel-marine wildlife interactions, and observations of large congregations of birds or marine mammals. Particular attention will be given to any observations that may trigger a mitigation response (see Table 3.5-1 in Section 3.5).

3.4.2 Dedicated Surveys

If time and other ship duties allows, dedicated marine mammal and seabird survey times (i.e., not conducted together at the same time) will be set aside for an observer to focus on recording marine mammal and seabird sightings, as described below.

3.4.2.1 Marine Mammal Surveys

As part of their other routine duties during daylight hours, one dedicated bridge staff will be assigned to do the following when possible:

- A dedicated observer will position themselves at a high point on the vessel, preferably the bow if weather allows.
- The observer will survey for marine mammals from the bow and record observations of marine mammals noted within a 180° viewing area (port to starboard) out to the horizon. Observers should attempt to survey for approximately 1.5 to 2 hours, once per day. Alternatively, surveys can be conducted for 30 minutes, over two to four separate times per day.
- For each observation period, crew will complete one *Marine Mammal Survey Sightings Form* (Attachment B).
- The observer will document information on the ship's location, travelling speed and direction, environmental conditions and the details of the wildlife observation (species, behaviour, distance from ship, etc.).
- If no marine mammals are observed during a survey period, then the top sections of the *Marine Mammal Survey Sightings Form* must still be completed (including "General Information", "Vessel Information", and "Environmental Information") with "No animals observed" entered into the "Notes" section.
- The observer will document if any mitigation was undertaken (see Table 3.5-1) and, if mitigation was required, a description of the mitigation action taken (e.g., change in course or speed) and the result of the mitigation action (e.g., maintained a buffer of x metres from the animal and if it continued swimming).
- Table 3.2-1 and Attachment D summarize general species groups and individual species that are most likely to be observed. Note that recording a general species group identification with high certainty is better than an incorrect species identification.

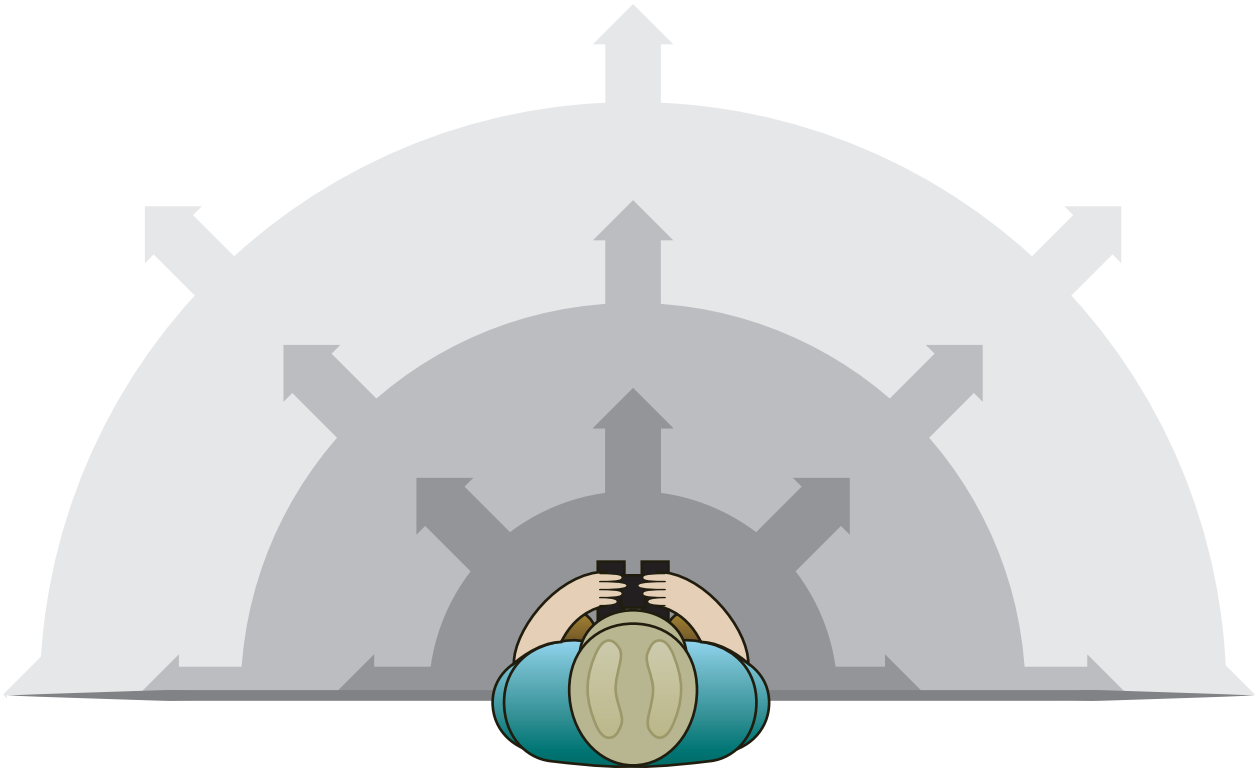
3.4.2.2 Seabird Surveys

As part of their other routine duties during daylight hours, one dedicated bridge staff will be assigned to do the following when possible:

- Have a dedicated observer position themselves on either the port or starboard side of the vessel, near the edge. Note that the seabird survey is to be conducted separately from the marine mammal survey.
- Survey from either port or starboard side (maintaining the same side per day) and record observations of seabirds noted within a 90° viewing area out to 300 m, including on the ocean surface, sea ice and land, or in the air (Figures 3.4-1 and 3.4-2), for approximately 30 minutes, one to three separate times per day. All surveys should be conducted at the same location each time.
- For each observation period, crew will complete one *Seabird Survey Sightings Form* (Attachment C).
- The observer will document information on the ship's location, travelling speed and direction, environmental conditions, and the details of the wildlife observation (species, behaviour, distance from ship, etc.).
- The observer will document if any mitigation was undertaken (see Table 3.5-1) and, if mitigation was required, a description of the mitigation action taken (e.g., change in course or speed) and the result of the mitigation action (e.g., maintained a buffer of x metres from seabirds, the birds remained on the water and did not fly away).
- For each observation period, crew will complete one *Seabird Survey Sightings Form (*Attachment C). The observer will document information on the ship's location, travelling speed and direction, environmental conditions and the details of the wildlife observation (species, behaviour, distance from ship, etc.).
- If no seabirds are observed during a survey period, then the top sections of the *Seabird Survey Sightings Form* must still be completed (including "General Information", "Vessel Information", and "Environmental Information") with "No animals observed" entered into the "Notes" section.
- Table 3.2-2 and Attachment E summarize general species groups and individual species that are most likely to be observed. Note that recording a general species group identification with high certainty is better than an incorrect species identification.

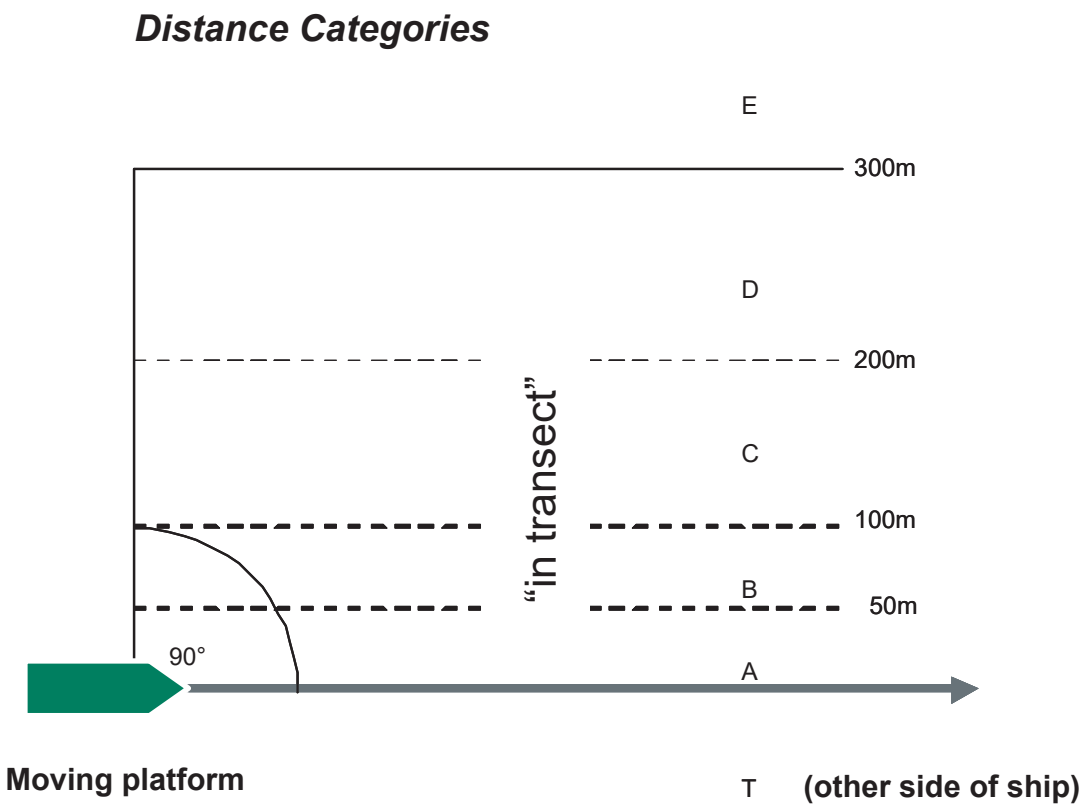
3.5 Mitigation Triggers and Responses

In the event bridge crew observe marine mammals or groups of seabirds, recommended management response is outlined in Table 3.5-1 and Figure 3.5-1. Management responses will be documented on the appropriate form, depending on when the sightings occurred (i.e., on the *Incidental Marine Wildlife Sightings Form* (Attachment A), the *Marine Mammal Survey Sightings Form* (Attachment B), or the *Seabird Survey Sightings Form* (Attachment C) for that observation.



Bridge staff will record observations of marine mammals
noted within a 180° viewing area (port to starboard)
out to the horizon

Figure 3.4-1: Marine Mammal Observations



Extracted from Gjerdrum et al. 2012

Figure 3.4-2: Seabird Observations using a 90° Scan up to 300 m from the Vessel

Ships will maintain the required setback distances around marine mammals and seabirds in the water.

General Guidance on the Water

Vessels maintain > 500 meters from aggregations of seabirds and marine mammals on the water

Whales Always Have Right-of-Way

Vessel Operation: Maintain straight course, constant speed, avoid erratic behavior

As per **Marine Mammal Regulations s.7(3)**, maintain a minimum of 100 m from marine mammals at all times

What to do if a Marine Mammal Approaches the Vessel

Option 1

Reduce its speed and, if possible, cautiously move away from the animal

Option 2

If it is not possible for the ship to movaway from or detour around a stationary marine mammal or group of marine mammals, the ship will reduce its speed and wait until the animal(s) move to the side and remain 100 m to 500 m from the ship prior to resuming speed

Option 3

If animals appear to be trapped or disturbed by ship movements, the ship will mitigate disturbance (e.g., stoppage of movement) until the animal(s) has moved away from the immediate area

Figure 3.5-1: Shipping Mitigation Responses for Seabirds and Marine Mammals

Table 3.5-1: Recommended Shipping Mitigation Responses for Seabirds and Marine Mammals

Observation	Management Response
Seabirds	
Any large group (10+) of seabirds on ocean surface while traversing sensitive habitat areas identified in Figure 2.1-1	500 m setback
Any colony of seabirds on land while traversing sensitive habitat areas identified in Figure 2.1-1	500 m setback
Ivory gull breeding colony if observed [2]	2 km setback
Marine Mammals	
Any group of marine mammals observed on the ocean surface, especially in sensitive habitat areas identified in Figure 2.1-2	At the discretion of the ship's operator, the following management responses are recommended: 1) As per Marine Mammal Regulations s.7(3), the vessel will maintain a minimum of 100 m from marine mammals at all times 2) Avoid ship strikes with marine mammals by slowing the vessel and allowing marine mammals to move out of the way. Noise can also be reduced by 1.5-2.8 dB for every 1 knot reduction in speed, reducing disturbance[1] 3) Change ships heading to avoid groups of marine mammals

[1] *Port of Vancouver. March, 2018. Enhancing Cetacean Habitat and Observation (ECHO) Program: Slowdown Trial – Interim Findings. Retrieved April 20, 2018, from https://www.portvancouver.com/environment/water-land-wildlife/marine-mammals/echo-program/vessel-slowdown-trial-in-haro-strait/.*

[2] *There are no known ivory gull breeding colonies along the shipping route. This management response is included as a precautionary measure in case one is observed.*

3.6 Documenting Ship Strikes

If bridge crew determine a ship strike of a marine mammal or seabirds has occurred, they will complete an *Incidental Marine Wildlife Sightings Form* (Attachment A) and indicate that the observation was the result of a ship strike. If the ship strike is a marine mammal the ship's captain is to report the strike to Sabina as soon as practical and within 24 hours.

In addition, as per *Marine Mammal Regulations* s.39, the captain must also report a strike to the DFO minister, including the following information:

- the date, time and location of the incident;
- the species of marine mammal involved in the incident;
- the circumstances of the incident;
- the size and type of vehicle and, if applicable, the type of fishing gear involved in the incident;
- the weather and sea conditions at the time of the incident;
- the observed state of the marine mammal after the incident; and
- the direction of travel of the marine mammal after the incident, to the extent that it can be determined.

DFO Contact Information

- Inuvik: 867-777-7500
- Iqaluit: 867-979-8000

If a seabird strike occurs, the captain must also report the strike to CWS and ECCC:

- CWS, Jean-Francois Dufour: jean-francois.dufour2@canada.ca
- ECCC Wildlife Enforcement: ec.dalfnord-wednorth.ec@canada.ca

4. END OF TRIP REPORTING REQUIREMENTS

The following information will be submitted to the Sabina Environment Team after each shipping trip for collation into a database:

1. Spatial file of the shipping route;
2. Completed *Marine Mammal Survey Sightings Form*s;
3. Completed *Seabird Survey Sightings Form*s;
4. Completed *Incidental Marine Wildlife Sightings Forms*;
5. Records of mitigation measures taken and ship strikes, if they occur; and
6. Photographs taken of sightings.

Sabina will report survey effort and observations in the WMMP Report.

5. REFERENCES AND RECOMMENDED GUIDES

ECCC. 2016. *Environment and Climate Change Canada's input to the Nunavut Planning Commission regarding Key Habitat Sites for Migratory Birds in the Nunavut Settlement Area*. Revised May 2016. 140 pp.

Gjerdrum et al. 2012. *Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms*.

Latour, P. B., J. Leger, J. E. Hines, M. L. Mallory, D. L. Mulders, H. G. Gilchrist, P. A. Smith, and D. L. Dickson. 2008. *Key Migratory Bird Terrestrial Habitat Sites in the Northwest Territories and Nunavut*. Canadian Wildlife Service Occasional Paper Number 114. Canadian Wildlife Service: Ottawa, ON.

Mallory, M. L. and A. J. Fontaine. 2004. *Key marine habitat sites for migratory birds in Nunavut and the Northwest Territories*. Canadian Wildlife Service Occasional Paper Number 109. Canadian Wildlife Service: Ottawa, ON.

Reeves et al. 2002. *National Audubon Society's Guide to marine Mammals of the World.*

Sibley. 2016. *Field Guide to the Birds of Eastern North America: Second Edition.*

6. ATTACHMENTS

Attachment A: Incidental Marine Wildlife Sightings Form

Attachment B: Marine Mammal Survey Sightings Form

Attachment C: Seabird Survey Sightings Form

Attachment D: Common Marine Mammal Species

Attachment E: Common Seabird Species

Incidental Marine Wildlife Sightings Form

(1 form per observation; PLEASE PRINT; circle options provided in *italics* as appropriate)

General Information			
Vessel Name		**Date**	
Observer Name		**Local Time (24 hr)**	
Vessel Information			
Ship Speed (kt)		**Ship Heading (compass)**	
Latitude (decimal degrees)		**Longitude (decimal degrees)**	
Environmental Information			
Glare Conditions	*None* *Slight Grey* *Bright*	**Visibility (km)**	
Wave height (m)		**Sea State 0-9**	
Beaufort Wind Force	*Calm* *Light-Wind* *Strong-Wind* *Gale-Force-Wind* *Stormy*	**Wind Direction (deg)**	
Weather	*Clear* *Partly Cloudy* *100% Cloud* *Fog* *Rain* *Snow*		
Observation Information			
Species[1]		**ID Reliability**	*Positive* *Probable* *Maybe*
Number of Individuals	*Best Estimate:* **OR** *Maximum/Minimum:*		
Behaviour	**Mammals:** *Swimming* *Diving* *Blowing* *Feeding* *Resting on land* *Resting on ice* *Dead*		
	Birds: *Flying* *Feeding* *Resting on ocean surface* *Resting on land* *Escape Ship - Flying* *Escape Ship - Diving* *Dead*		
	Other (describe):		
Other notes (e.g., physical descriptions, distinctive behaviours, drawing)		**Position & Travel Relative to Ship [draw arrow]**	 **OR** *Variable Travel Directions*
Was this observation the result of a SHIP STRIKE?			*Yes* *No* *Fatality?*
Mitigation Action Taken			
	Yes *No*		
If yes, describe mitigation actions (e.g., change in course or speed) and result (e.g., maintained a buffer of x metres from wildlife)		**ACTION:**	
		RESULT:	
These data were entered into the wildlife database by:		These data were entered into the wildlife database on:	

[1] *Refer to list of species in Tables 3.2-1 and 3.2-2 in the SOP*

Marine Mammal Survey – Sightings Form (circle options that are *italicized* as appropriate)

General Information						
Date (DD/MMM/YYYY)		**Observer Name**			**Height of Eye (m)**	
Vessel Information						
Company/Agency		**Vessel Type**			**Vessel Heading (compass)**	
Vessel Name		**Vessel Activity**	*Moving*	*Stationary*	**Vessel Speed (kt)**	
Environmental Information						
Weather	*Clear* *Partly Cloudy* *100% Cloud* *Fog* *Rain* *Snow*				**Sea State (0-9)**	
Beaufort Wind Force	*Calm* *Light Wind* *Strong Wind* *Gale Force Wind* *Stormy*				**Wave Height (m)**	
Wind Direction (deg.)		**Glare Conditions**	*None*	*Slight Grey* *Bright*	**Visibility (km)**	
Survey Information						
Transect Start	Local Time (24 hr)		**Latitude (DD)**		**Longitude (DD)**	
Transect End	Local Time (24 hr)		**Latitude (DD)**		**Longitude (DD)**	
Observer Location	*Outdoors* *Indoors*		**Observation Side**	*Starboard* *Port* *Bow*		
Notes						

Mitigation				
Mitigation Action Taken	*Yes* *No*	**If yes, describe mitigation actions (e.g., change in course or speed) and result (e.g., maintained a buffer of x metres from wildlife)**	**ACTION:**	**RESULTS:**

Marine Mammal Sighting Information

Time of Sighting	Distance to Sighting (m)	Angle to Sighting (deg.)	Sighting Coordinates			Species	Count	Age (Adult/Young)	Sex (M/F/UNK)	Re-Sighting (Y/N)	Behaviour (Travel, Feeding, Other)	Mitigation Required?	Photo Number	Comments/Notes
			WPT	Latitude (DD)	Longitude (DD)									

Seabird Survey – Sightings Form (circle options that are *italicized* as appropriate)

General Information					
Date (DD/MMM/YYYY)		**Observer Name**		**Height of Eye (m)**	
Vessel Information					
Company/Agency		**Vessel Type**		**Vessel Heading**	
Vessel Name		**Vessel Activity**	*Moving* *Stationary*	**Vessel Speed (kt)**	
Environmental Information					
Weather	*Clear* *Partly Cloudy* *100% Cloud* *Fog* *Rain* *Snow*			**Sea State (0-9)**	
Beaufort Wind Force	*Calm* *Light Wind* *Strong Wind* *Gale Force Wind* *Stormy*			**Wave Height (m)**	
Wind Direction (Deg)		**Glare Conditions**	*None* *Slight Grey* *Bright*	**Visibility (km)**	
Survey Information					
Transect Start	Local Time (24 hr)	**Latitude (DD)**		**Longitude (DD)**	
Transect End	Local Time (24 hr)	**Latitude (DD)**		**Longitude (DD)**	
Observer Location	*Outdoors* *Indoors*	**Observation Side**	*Starboard* *Port*		
Notes:					

Mitigation				
Mitigation Action Taken	*Yes* *No*	**If yes, describe mitigation actions (e.g., change in course or speed) and result (e.g., maintained a buffer of x metres from wildlife)**	**ACTION:**	**RESULTS:**

Seabird Sighting Information									
Species	**Count**	**Observation Type (Fly or Water)**	**In Transect (Y/N)**	**Distance (m)**	**Behaviour (escape flight, rafting, other)**	**Flight Direction (Deg)**	**Age (Adult/ Young)**	**Plumage (breeding/ non-breeding/molt)**	**Comments**

COMMON MARINE MAMMAL ID GUIDE

Sabina
GOLD & SILVER CORP.

Whales

Orca/Killer Whale

Size: 7-9m

Body: Long rounded body

Dorsal Fin: Very tall

Colour: Black and white, saddle patch behind dorsal fin, white underside

Bowhead Whale

Size: up to 19m

Body: Large and rotund

Dorsal Fin: None

Colour: Bushy V-shaped

Beluga

Size: 4-5m

Body: Stout body, small head

Dorsal Fin: None

Colour: Adult white, claves brown/grey

Narwhal

Size: 4-5m

Body: Stocky body, small head, distinct tusk

Dorsal Fin: None

Colour: Mottled black and white, grey or brownish

COMMON MARINE MAMMAL ID GUIDE

Sabina
GOLD & SILVER CORP.

Pinnipeds

Walrus

Size: 2.5-3m

Body: Large, blubbery, long tusks

Head: Large thick neck, dark mouth with whiskers

Colour: Dark brown

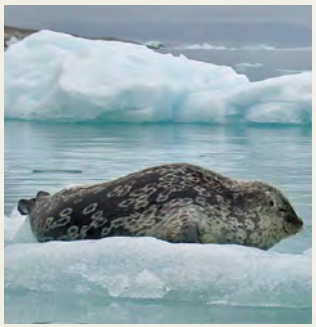
Ringed Seal

Size: 1.5m

Body: Small, plump

Head: Small, short snout

Colour: Dark grey with light circle pattern on body



Bearded Seal

Size: 2-2.5m

Body: Large, robust

Head: Small, short snout, long whiskers

Colour: Dark brown/ grey with dark rings/ spots

Harp Seal

Size: 1.5-2m

Body: Medium, robust

Head: Small, pointy snout

Colour: Light grey, harp-shaped black patch on back

Hooded Seal

Size: 2.5m

Body: Large, robust

Head: Broad with narrow snout, males have “hood”

Colour: Black head, grey body with dark patches

COMMON SEABIRD ID GUIDE

EASTERN ARCTIC SHIPPING ROUTES

Sabina GOLD & SILVER CORP.

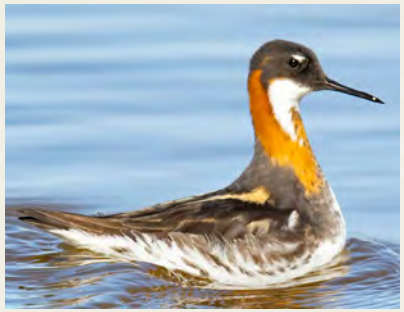
Small Seabirds

Red Phalarope

Small, shorebird-like, thin bill

Red-necked Phalarope

Small, shorebird-like, thin bill



Puffin-like Seabirds

Atlantic Puffin

Small and stocky, bright bill, black band around neck when flying

Razorbill

Long pointed tail, large/thick bill

Thick-billed Murre

Short bill, large head, pure white belly

COMMON SEABIRD ID GUIDE

EASTERN ARCTIC
SHIPPING ROUTES

Sabina
GOLD & SILVER CORP.

Herring Gull

Medium gray back, black and white wing tips

Iceland Gull

Light gray back, few or no marks on wing tips

Glaucous Gull

Light gray back, large and white overall

Black-legged Kittiwake

Small, black legs, black wing tips

Northern Fulmar

Large, thick-necked, can be white to dark grey, distinct bill

Long-tailed Jaeger

Very long tail, dark back and cap, no chest band

Parasitic Jaeger

Long tail, dark back and cap, weak chest band

Pomarine Jaeger

Shorter tail, dark back and cap, pale chest dark band

COMMON SEABIRD ID GUIDE

EASTERN ARCTIC
SHIPPING ROUTES

Sabina
GOLD & SILVER CORP.

Greater Scaup

Medium, black and white duck

Common Eider

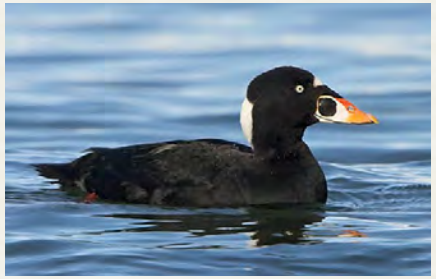
Large, wedge-shaped head, mainly white face, neck & back

Long-tailed Duck

Small, round body, dark wings, distinct patterns, long tail

Surf Scoter

Medium, dark-bodied duck, large multicoloured bill



Red-breasted Merganser

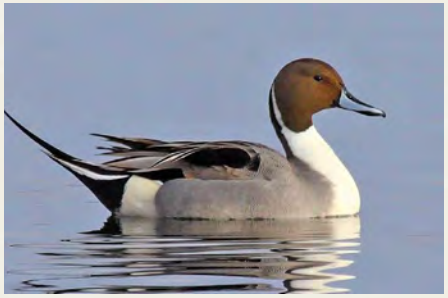
Large, thin-billed, black, tufted-head, white neck

Green-winged Teal

Small, green and red head, grey-brown body

Northern Pintail

Elegant duck, long pointed tail, brown head with white neck



Black Guillemot

Small duck-like, chunky, black body, white wings

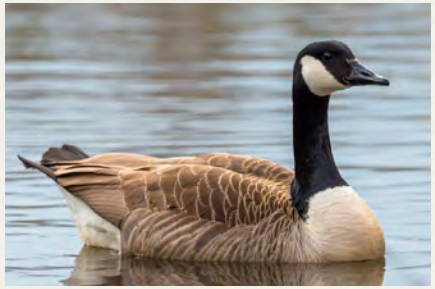
COMMON SEABIRD ID GUIDE

EASTERN ARCTIC
SHIPPING ROUTES

Sabina
GOLD & SILVER CORP.

Canada Goose

Very large, brown body, black and white neck/head



Brant

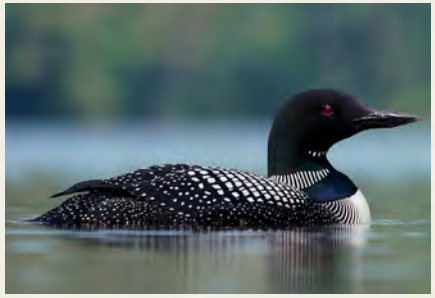
Compact goose with black neck and head

Tundra Swan

Very large white bird, long neck, black bill

Common Loon

Large, boldly patterned body, black head and bill



Pacific loon

Large, faded grey head, boldly patterned body

Yellow-billed loon

Large, thick yellow bill, patterned back and neck

Red-throated Loon

Large, slender body, rusty throat, white chest

COMMON SEABIRD ID GUIDE

WESTERN ARCTIC SHIPPING ROUTES

Sabina GOLD & SILVER CORP.

Red Phalarope

Small shorebird, thin bill, red overall in summer

Red-necked Phalarope

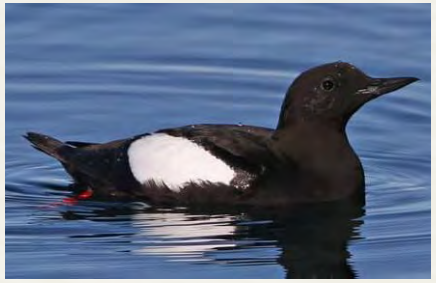
Small shorebird, thin bill, red neck in summer

Thick-billed Murre

Large, black back and head, white belly, thick pointed bill

Black Guillemot

Small, chunky, black body, white wings



Yellow-billed Loon

Large, thick yellow bill, patterned back and neck

Red-throated Loon

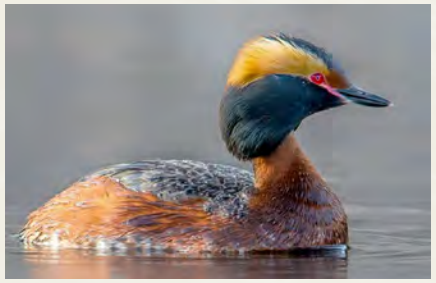
Large, slender body, rusty throat, white chest

Pacific Loon

Large, grey faded head, boldly patterned body

Horned Grebe

Small, yellow and black head, reddish body



COMMON SEABIRD ID GUIDE

WESTERN ARCTIC
SHIPPING ROUTES

Sabina
GOLD & SILVER CORP.

Herring Gull

Medium gray back, black and white wing tips

Glaucous Gull

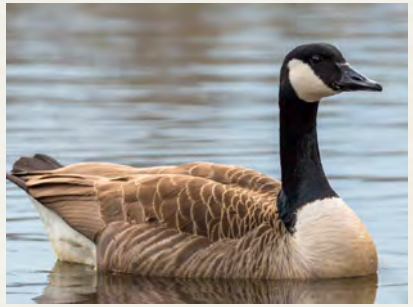
Light gray back, large and white overall

Arctic Tern

Small fray-white slender with angular wings, black cap

Canada Goose

Very large, brown body, black and white neck/head



Long-tailed Jaeger

Very long tail, dark back and cap, no chest band

Parasitic Jaeger

Long tail, dark back and cap, weak chest band

Pomarine Jaeger

Shorter tail, dark back and cap, pale chest dark band

Brant

Compact goose with black neck and head

COMMON SEABIRD ID GUIDE

WESTERN ARCTIC
SHIPPING ROUTES

Sabina
GOLD & SILVER CORP.

Greater Scaup

Medium, black and white duck

Common Eider

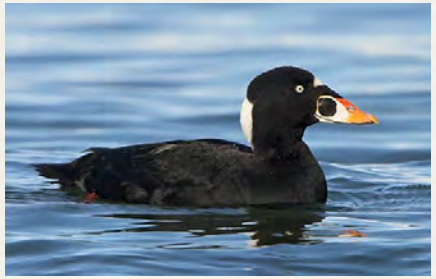
Large, wedge-shaped head, mainly white face, neck & back

Long-tailed Duck

Small, round body, dark wings, distinct patterns, long tail

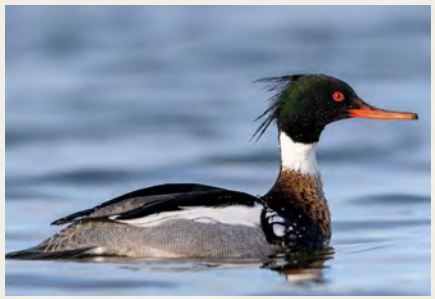
Surf Scoter

Medium, dark-bodied duck, large multicoloured bill



Red-breasted Merganser

Large, thin-billed, black, tufted-head, white neck

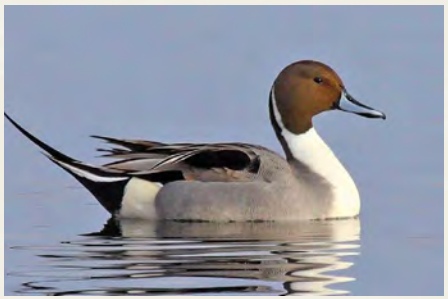


Green-winged Teal

Small, green and red head, grey-brown body

Northern Pintail

Elegant duck, long pointed tail, brown head with white neck



Mallard

Green head with yellow bill, grey body

APPENDIX 7B BIRD OBSERVATIONS DURING SHIPPING, 2022

Appendix 7B: Bird Observations During Shipping, 2022

Date (DD/MM/YYYY)	Time	Vessel Name	Observer Name	Latitude (dd)	Longitude (dd)	Species Group (Bird or Mammal)	Species	Number Observed	Behaviour	Initial Distance from	Closest Approach (m)	Mitigation Action (Y/N)?	Ship Strike (Y/N)?	Notes
31/08/2022	15:00	Aujag	Gabriel Blanchet	72°41,8'N	078°00,8'W	Mammal	Grey Seal	10+	Travel	50		N		
09/07/2022	18:50	Aujag	Gabriel Blanchet	68°25'N	103°06'W	Mammal	Polar Bear	2	Travel	200		NR		walking, on ice strip
09/09/2022	21:30	Aujag	Pierre Marc Ricuox	68°03,6'N	114°25,2'W	Mammal	Grey Seal	3	NR	300		NR		
22/09/2022	20:35	Aujag	Pierre Marc Ricuox	68°12,5'N	106°38,0'W	Mammal	Grey Seal	1	NR	10		NR		
28/09/2022	9:00	Aujag	Pierre Marc Ricuox	73°41,7'N	081°07,8'W	Mammal	Grey Seal	25+	NR	300		NR		
31/08/2022	NR	Aujag	Gabriel Blanchet	NR	NR	Bird	Northern Fulmar	4	Flight	200		NR		
09/05/2022	NR	Aujag	Pierre Marc Ricuox	NR	NR	Bird	Northern Fulmar	1	Flight	300		NR		
09/08/2022	NR	Aujag	Pierre Marc Ricuox	NR	NR	Bird	Northern Fulmar	8	rafting	200		NR		
11/10/2022	NR	Aujag	Louis Rempre	NR	NR	Bird	Northern Fulmar	10	rafting	100		NR		
09/11/2022	NR	Aujag	Pierre Marc Ricuox	NR	NR	Bird	Glaucous Gull	10	flight/rafting	100		NR		
13/09/2022	NR	Aujag	Pierre Marc Ricuox	NR	NR	Bird	Unknown Gull	10	flight/rafting	100		NR		
15/09/2022	NR	Aujag	Louis Rempre	NR	NR	Bird	Herring Gull	2	rafting	200		NR		
15/09/2022	NR	Aujag	Pierre Marc Ricuox	NR	NR	Bird	Herring Gull	2	flight	200		NR		
25/09/2022	NR	Aujag	Pierre Marc Ricuox	NR	NR	Bird	Red-necked Pharalope	1	flight	300		NR		

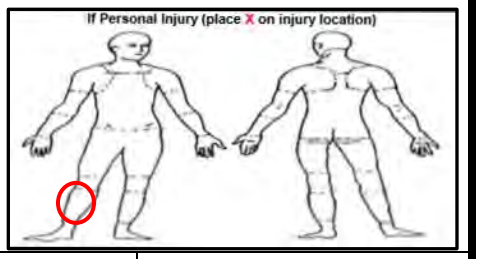
APPENDIX 9A WILDLIFE INCIDENT REPORT, NOVEMBER 8, 2022

Incident Report – Short Form

The Incident Report – Short Form is for all safety, environmental, property damage, and high risk near misses at the Back River Project. The form may be used for other incidents as deemed appropriate.

Incident #: 176			Report Completed By: Jerry Gibson			Date: November 8, 2022
Incident Category	☒	Injury/Illness	☐	Near Miss	☐	Property Damage
	☐	Spill	☐	Environmental Incident	☐	Other:

Short Description:
Worker was attacked by an animal while entering Gen. Shack #1.



Names of Persons Involved: Chad Yanulik	Time: 08:10	Date: November 8, 2022
Job: Generator Technician - Maintenance	Location: Goose Lake Camp	
Employer: Sabina	Supervisor: Jesse Soshycki	
Name of Witnesses (if any): NA		

Incident Description: *(Who, What, Where, When & How)*

At approximately 8:10 am on Nov. 8, 2022, the worker entered generator shack 01/GS-02 engine to perform maintenance work. Upon entry into the shack the worker was immediately attacked by an animal thought to be fox or wolverine. The animal immediately grabbed on to him in the right leg at the top of his boot, tearing through his coveralls and pants. In defence the worker swung at the animal with an oil jug and then kicked at the animal several times with his opposite foot, striking it with his boot and traction aid at which time it let go of his leg. The worker immediately contacted the environmental coordinator and site services superintendent on his radio to alert them to the interaction. The site services superintendent immediately went to the Genshack area to investigate. He noticed blood on the ground inside and outside of the Genshack and asked the worker if he was injured and bleeding. The worker looked at his leg and had no visible signs of blood on his clothing. The worker went to the clinic to see the medic and have an assessment conducted. The medic assessed and cleaned the wound. It was found to be a small abrasion not requiring further immediate treatment. A group of workers from SS and environment immediately searched the property and were unable to locate the animal. The worker is being transported to Yellowknife Hospital for further assessment and treatment.

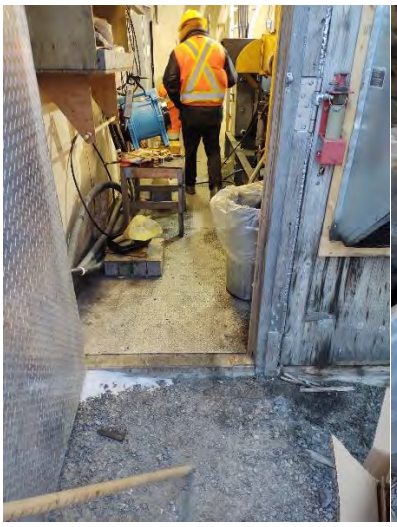
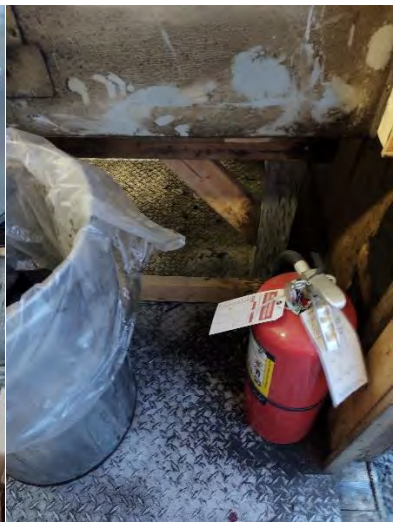
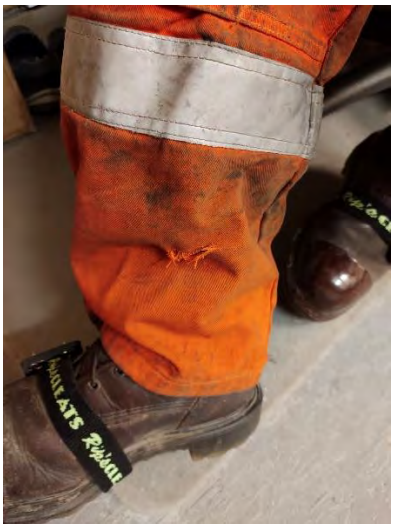
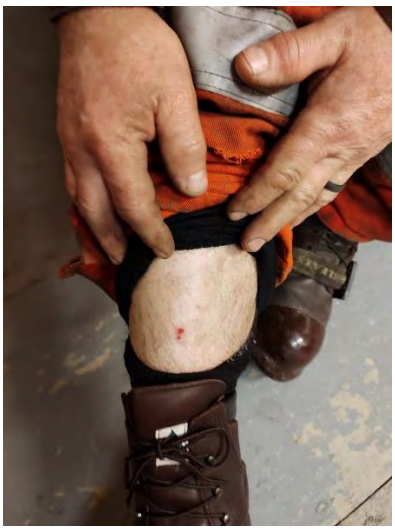
Related to Critical Risks: No

Was a JHA or FLRA Completed? (Y/N) Yes

Incident Report – Long Form

The Incident Report – Long Form is a continuation of the Short Form and is required for all LTI's, reportable incident, significant property damage, and other high risk incidents at the Back River Project. The form may be used for other incidents as deemed appropriate.

Sketch/Photos

What corrective actions have been implemented to prevent further loss?

1. Wire screen has been installed on the intake duct of the generator shack as it is believed that possibly the animal had entered through the louvres.
2. A Safety Sunday presentation to be prepared and shared with personnel regarding wildlife interactions, food and waste management and precautions to be taken.

Incident Report Completed By:
Jerry Gibson

Phone #:	Title:	Date:
1-867-675-3310 x.1115	Health and Safety Supervisor	November 8, 2022

Incident Report – Long Form

The Incident Report – Long Form is a continuation of the Short Form and is required for all LTI's, reportable incident, significant property damage, and other high risk incidents at the Back River Project. The form may be used for other incidents as deemed appropriate.

**Attached Additional Information as Appropriate.*

Investigation Start Date: November 8, 2022		Investigation Completion Date:
Investigation Team: Name:	Investigation #: Organization:	Role:
Jerry Gibson Thomas Bolt Veikko Wennstrom	Sabina Sabina Sabina	Investigator, witness statement taker Investigator Investigator

Incident Type/Category:

- ☒ Injury
- ☐ Illness
- ☐ Property Damage
- ☐ Spill
- ☐ Environmental Incident
- ☐ Loss of Process
- ☐ Non-Compliance
- ☐ Near Miss
- ☐ Other:

Damage/Loss Estimate $:

Injury Severity:

- ☐ Multiple Casualty
- ☐ Lost Time
- ☐ Restricted Duty
- ☐ Medical Treatment
- ☒ First Aid
- ☐ Reportable Spill
- ☐ Other:

Nature of Injury:

- ☐ Contact with
- ☐ Caught on/in
- ☐ Caught between
- ☐ Environmental Condition
- ☐ Energy Release
- ☐ Struck by
- ☐ Struck on
- ☒ Other: **Animal Interaction**

Comments:
Further investigation pending. The animal has not been identified. Sabina has been given directive by NWLB to destroy the animal if it is located. Goose camp placed in Code yellow after incident.

Contributing Factors (Immediate Causes): *Circle Or Highlight All That Apply*

Inadequate Hazard Assessment	1	Inadequate methods or standards	13	Improper position for task	25
Inadequate Safety Device	2	Inadequate loading	14	Defective tools or equipment	26
Inadequate tools or equipment	3	Inadequate barriers or guarding	15	Operating without authority	27
Inadequate ventilation	4	Inadequate attention to task	16	Operating at Unsafe Speed	28
Inadequate lighting	5	Inadequate knowledge	17	Using defective equipment	29
Inadequate housekeeping	6	Inadequate compliance	18	Disabling safety devices	30
Inadequate PPE	7	Inadequate manual handling	19	Improper operation	31
Inadequate Pre-Use Inspection	8	Inadequate work scope	20	Failure to use effective PPE	32
Inadequate Communication	9	Inadequate use of equipment	21	Thermal Exposure (Hot/Cold)	33
Inadequate Isolation (LO/TO)	10	Improper workplace conduct	22		
Inadequate maintenance	11	Improper use of PPE	23		
Inadequate effort to make safe	12	Improper use of equipment	24		

Organizational Factors (Root Causes): *Circle Or Highlight All That Apply*

Inadequate Engineering/Design	A	Inadequate Compliance Enforcement	G	Normalization of Deviance	M
Inadequate Supervision	B	Inadequate Inspection Program	H	Incompatible Goals	N
Inadequate Maintenance	C	Inadequate Maintenance Management	I	Inadequate Management of Change Process	O
Inadequate Training	D	Inadequate Risk Management	J	Inadequate Communication	P

Incident Report – Long Form

The Incident Report – Long Form is a continuation of the Short Form and is required for all LTI's, reportable incident, significant property damage, and other high risk incidents at the Back River Project. The form may be used for other incidents as deemed appropriate.

Inadequate Work Standards	E	Inadequate Contractor Management	K
Inadequate Hazard Identification	F	Inadequate Fatigue Management	L

Key Organizational/Root Cause Failures Identified:
Opening left unguarded to the generator building.

Corrective Actions Taken to Address Contributing Factors (Immediate Causes 1-33):

Cause Code:	Description of Actions Taken:	Implemented by:	Date completed:
15	Wire screen placed on intake duct	Site Services	Nov.8, 2022

Preventive Actions Pending to Address Organizational Factors (Root Causes A – P):

Cause Code:	Description of Actions to be Taken:	Implemented by:	Date completed:
A	Incorporate requirement of guarding building openings into existing Wildlife Management SOP.	Safety/Environment	

Follow Up Actions Taken or Required:

Cause Code:	Description of Follow-up Action:	To be completed by:	Date completed:

Final Report Reviewed by:

Name:	Role:	Signature:	Date:
Jerry Gibson	Health and Safety Supervisor		Nov.8, 2022
Clinton Wakefield	Construction Superintendent		Nov.9, 2022

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