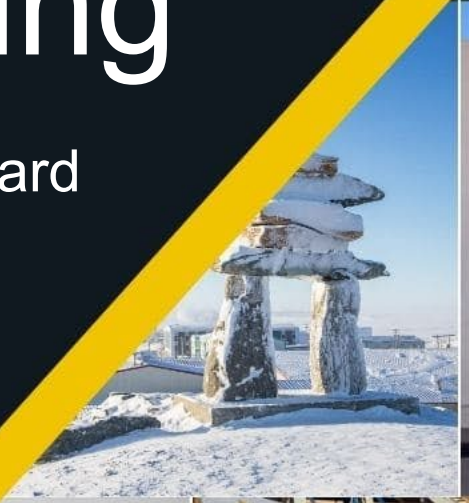
Agnico Eagle Caribou Mitigation and Monitoring

Nunavut Wildlife Management Board
February 2025



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OUTLINE

- Agnico Eagle Projects
- Caribou Monitoring Programs
- Caribou Mitigations
- Monitoring Program Results

Agnico Eagle Projects

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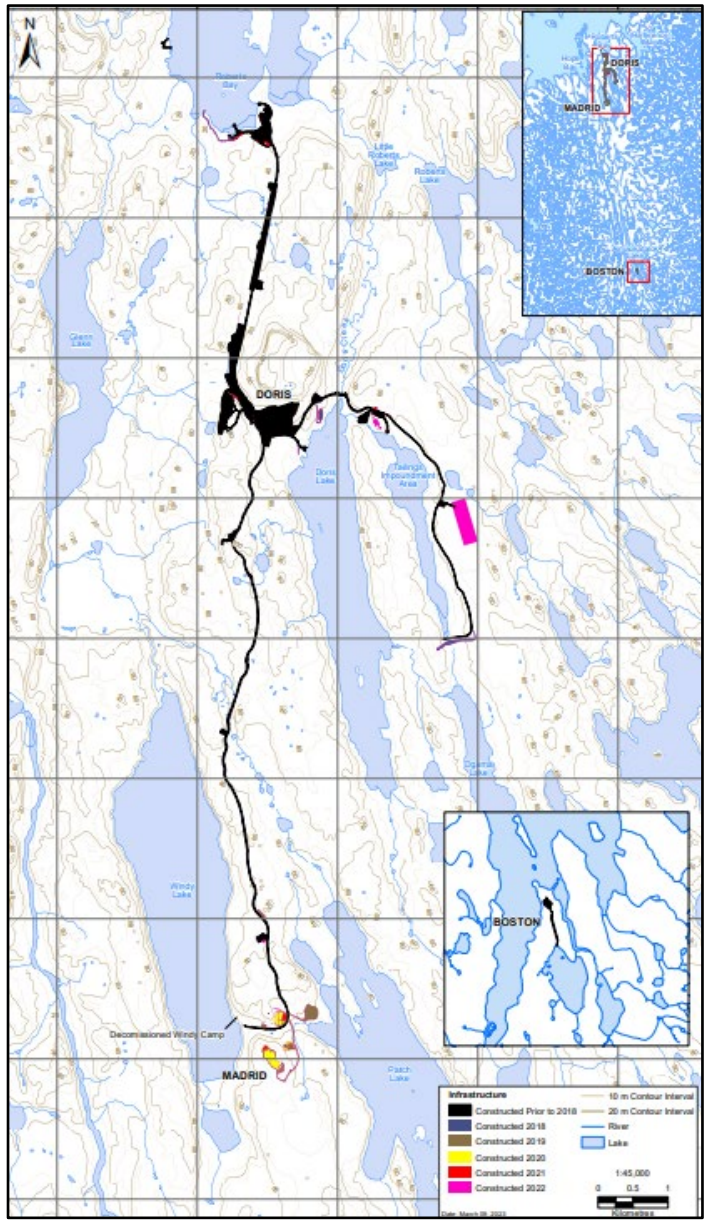
HOPE BAY

- The Hope Bay property is located in the Kitikmeot region of Nunavut which include portions of the Hope Bay and Elu greenstone belts
  - Three gold deposits (Doris, Madrid, and Boston)
- Exploration activities by Agnico Eagle at Hope Bay began in February 2021 and are ongoing

The Project footprint contains infrastructure such as:

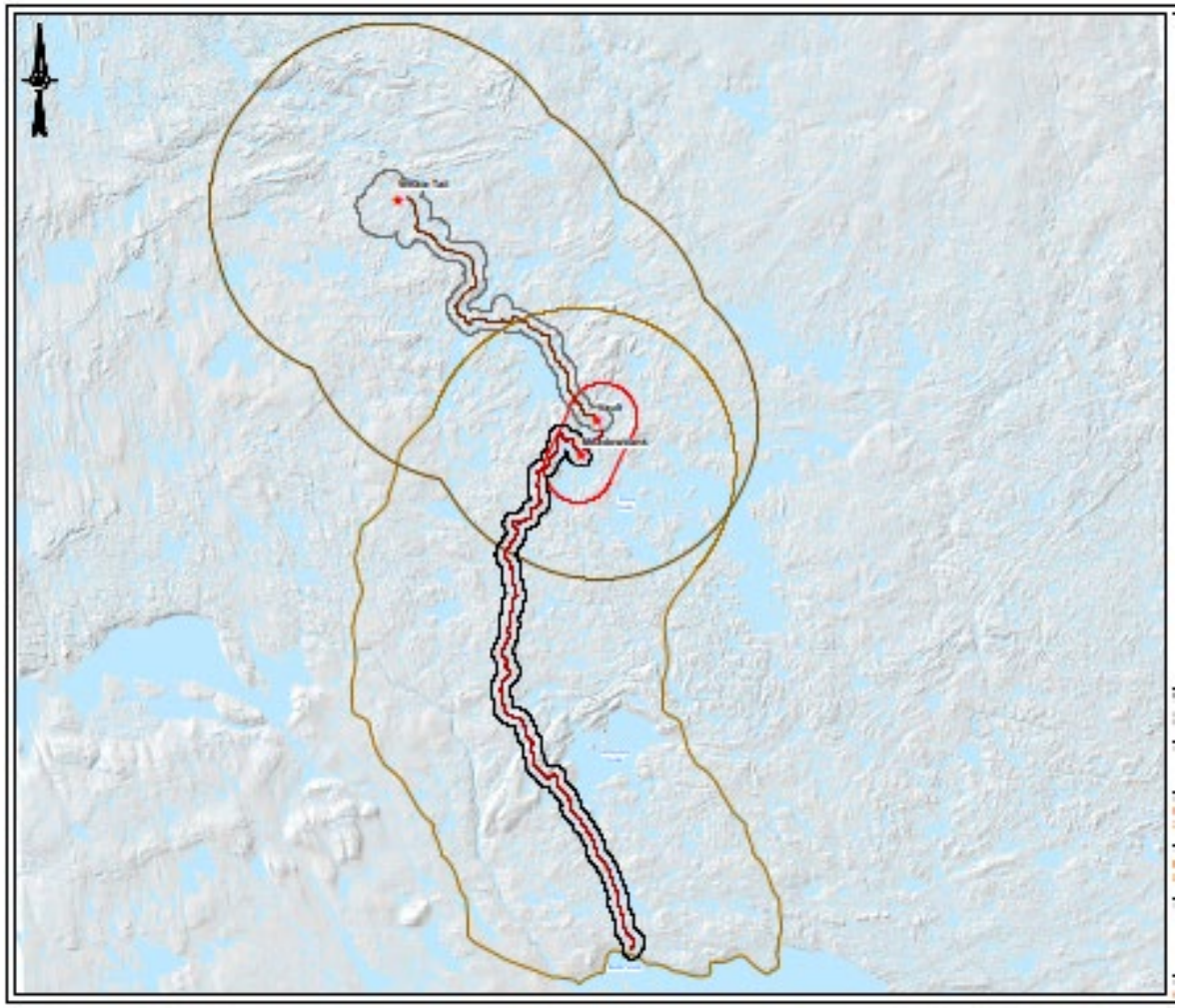
- Underground mine development at the Doris and Boston deposits
- A fully enclosed conventional processing plant and a tailings impoundment area at Doris
- A gravel airstrip at Doris and a secondary gravel airstrip at Boston
- A port with a laydown facility and fuel storage at Roberts Bay
- An all-weather road network, a diesel power plant, and an office-accommodations complex



MELIADINE

- The Meliadine Mine is located in the Kivalliq region of Nunavut
- Construction and operation began in 2017 and 2019 respectively. Mining includes open-pit and underground operations.
- Mine facilities on surface include a plant site and accommodation buildings, ore stockpiles, a tailings storage facility (TSF), two waste rock storage facilities (WRSFs), an incinerator, landfarms (A and B), a landfill, a water management system that includes collection ponds, water diversion channels, retention dikes/berms, and water treatment plants.
- An all-weather road connects the Mine to Rankin Inlet
- A port with a laydown facility and fuel storage at Rankin Inlet

MEADOWBANK COMPLEX



- The Meadowbank Mine is located in the Kivalliq region of Nunavut
- Construction began in 2008. Mine components include open pits, waste rock storage facilities, and a tailings storage facility.
- Mine facilities on surface include a mill, power plant, maintenance facilities, tank farm for fuel storage, water treatment plant, sewage treatment plant, airstrip, and accommodations.
- An all-weather road connects Whale Tail to Meadowbank
- An all-weather road connects the Mine to Baker Lake
- Barge unloading with a laydown facility and fuel storage at Baker Lake

Community-Based Monitoring

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COMMUNITY-BASED MONITORING - HOPE BAY

- Hope Bay height of land caribou surveys
  - Developed with the Inuit Environmental Advisory Committee (IEAC) and surveys carried out by a local Inuit Monitor via the Cambridge Bay Hunters and Trappers Organization (HTO)
- Hope Bay wildlife camera monitoring
  - A Project Caribou ID guide was developed with the IEAC during a caribou ID workshop to sort caribou into either Beverly/Ahiak or Dolphin and Union based on herd characteristics
  - Any caribou detections with uncertain herd characteristics are provided to the IEAC for additional input

COMMUNITY-BASED MONITORING - MELIADINE

- Meliadine height of land caribou surveys
  - Surveys carried out by a local Inuit Monitor via the Kivalliq Inuit Association (KIA) and Kangiqliniq Hunters and Trappers Organization (KHTO).
- Meliadine road surveys
  - Surveys carried out by a local Inuit Monitor via the Kivalliq Inuit Association (KIA) and Kangiqliniq Hunters and Trappers Organization (KHTO).

Terrestrial Advisory Group (TAG)

- KIA
- KHTO
- Baker Lake Hunters and Trappers Organization (BLHTO)
- Sayisi Dene First Nation (SDFN)
- Northlands Denesuline First Nation (NDFN)
- Government of Nunavut (GN)
- Agnico Eagle

COMMUNITY-BASED MONITORING – MEADOWBANK COMPLEX

- Meadowbank Complex
  - Surveys carried out by a local Inuit Monitor via the Kivalliq Inuit Association (KIA) and Baker Lake Hunters and Trappers Organization (BLHTO).
- Meadowbank Complex road surveys
  - Surveys carried out by a local Inuit Monitor via the KIA and BLHTO.
- Community input on mitigations:
  - Identification of lead caribou for protection measures

Terrestrial Advisory Group (TAG)

- KIA
- BLHTO
- Government of Nunavut (GN)
- Agnico Eagle

Caribou Monitoring Programs

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CARIBOU MONITORING PROGRAMS

- Collared caribou monitoring (Meliadine, Meadowbank)
  - Receive collar maps from GN as early warning of caribou approach
- Wildlife camera monitoring (Meliadine, Meadowbank, Hope Bay)
  - Cameras deployed at varying distances from Project footprints to evaluate effects on caribou, including road crossing, movement, and Zone of Influence (ZOI)
- Height of Land Surveys (Meliadine, Meadowbank, Hope Bay)
  - Monitoring triggered by collars approaching the Mine (Meliadine, Meadowbank)
  - Monitoring triggered when >25 caribou are reported within 5 km of Project activities (Hope Bay)
  - Used to trigger mitigation
- Behaviour Monitoring (Meliadine, Meadowbank. Hope Bay)
  - Evaluation of caribou response to potential disturbances, including vehicles, blasting, Mine activities

CARIBOU MONITORING PROGRAMS

- Track Surveys (Meliadine, Meadowbank, Hope Bay)
  - Completed along Project roads, in conjunction with snowbank height monitoring during winter months
- Caribou Herd Identification (Hope Bay)
  - Classification of caribou herds for wildlife camera events (Beverly/Ahiak or Dolphin Union)
- Blast monitoring (Meadowbank, Hope Bay)
  - Caribou responses to blasting
- Noise Monitoring (Meliadine, Meadowbank, Hope Bay)
  - Evaluation of noise during different levels of operation, at different distances from the Mine
  - What would caribou hear when approaching the Mine?
- Incidental Observations (Meliadine, Meadowbank, Hope Bay)
  - Reported by all staff on-site, in addition to community members, local HTO's, GN, KivIA and KitIA staff

Caribou Mitigations

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MITIGATION THROUGH DESIGN (EXAMPLES)

Mine Site:

- Footprint as small as possible
- Mufflers and noise attenuation
- Constructed visual breaks
- Lighting mitigation

Roads:

- Designing roads to be low
- Installing crossing ramps and underpasses
- Burying waterlines (Meliadine)
- Avoiding important wildlife habitat

ACTIVE MITIGATIONS

Mine Site:

- Caribou Management System
  - Includes restricting surface activities
- Speed limits
- Dust control
- Attractant management

Roads:

- Speed limits
- Closures when caribou are present:
  - Whale Tail Haul Road (Meadowbank, seasonal GSTs and "lead" caribou)
  - All-Weather Access Road (Meliadine, >50 caribou within 100 m)

ACTIVE MITIGATIONS

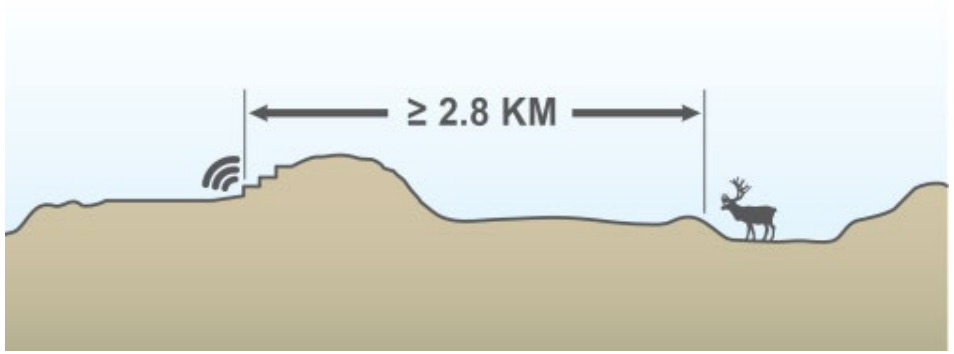
Blasting:

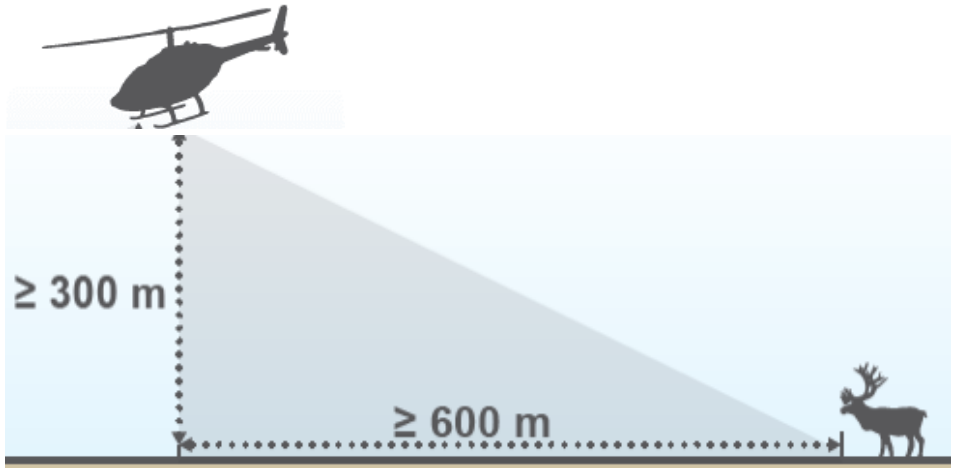
Stop blasting when groups of caribou are near the Mine:

- Meliadine: 50 caribou <5 km
- Meadowbank: ≥GST <5 km
- Hope Bay: 1 caribou <2.8 km

Aircraft:

- Avoid caribou horizontally or vertically
- Defer flights if caribou are near the runway (Hope Bay)
- During sensitive seasons helicopters are grounded





Monitoring Program Results

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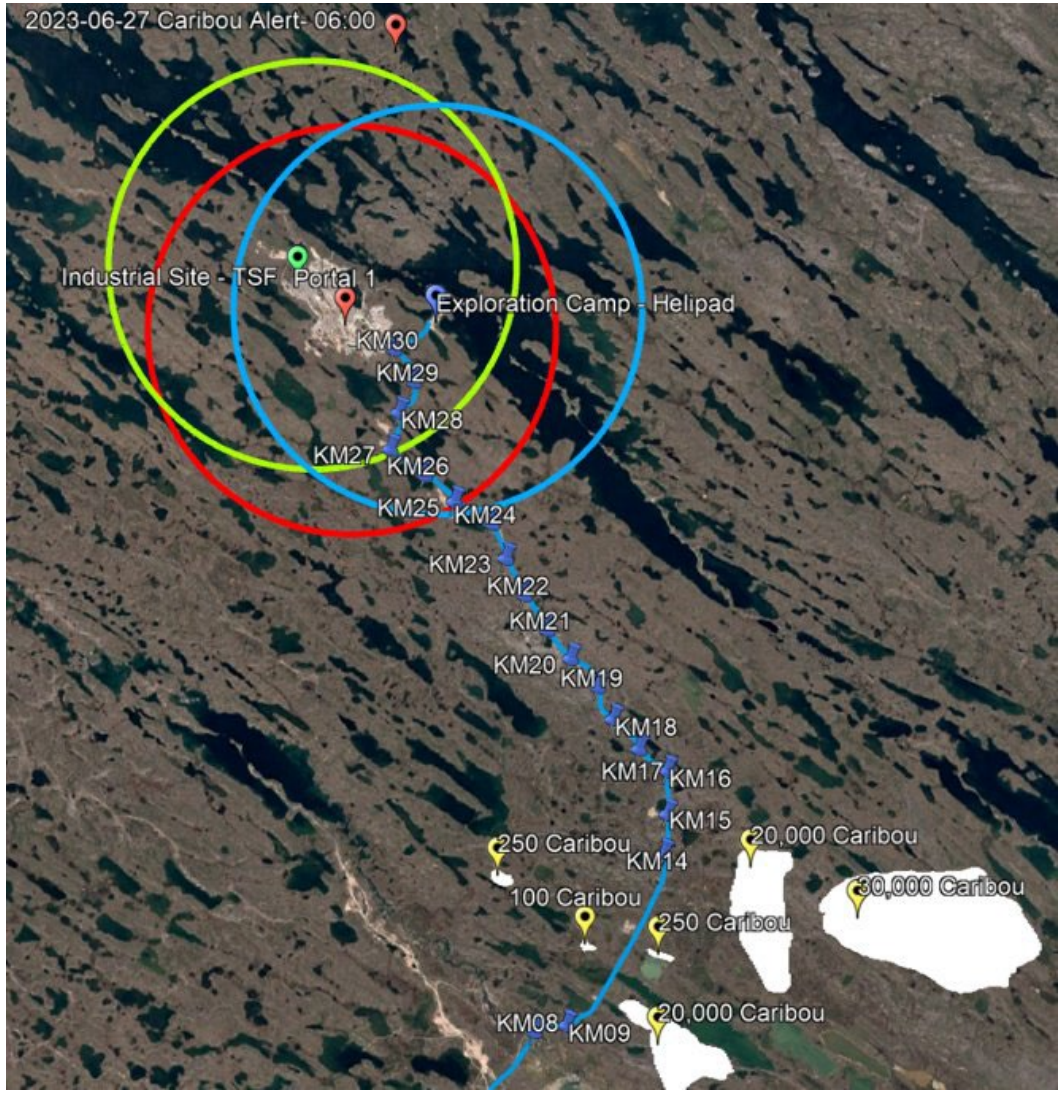
MELIADINE: COLLAR DATA AND HEIGHT OF LAND SURVEYS

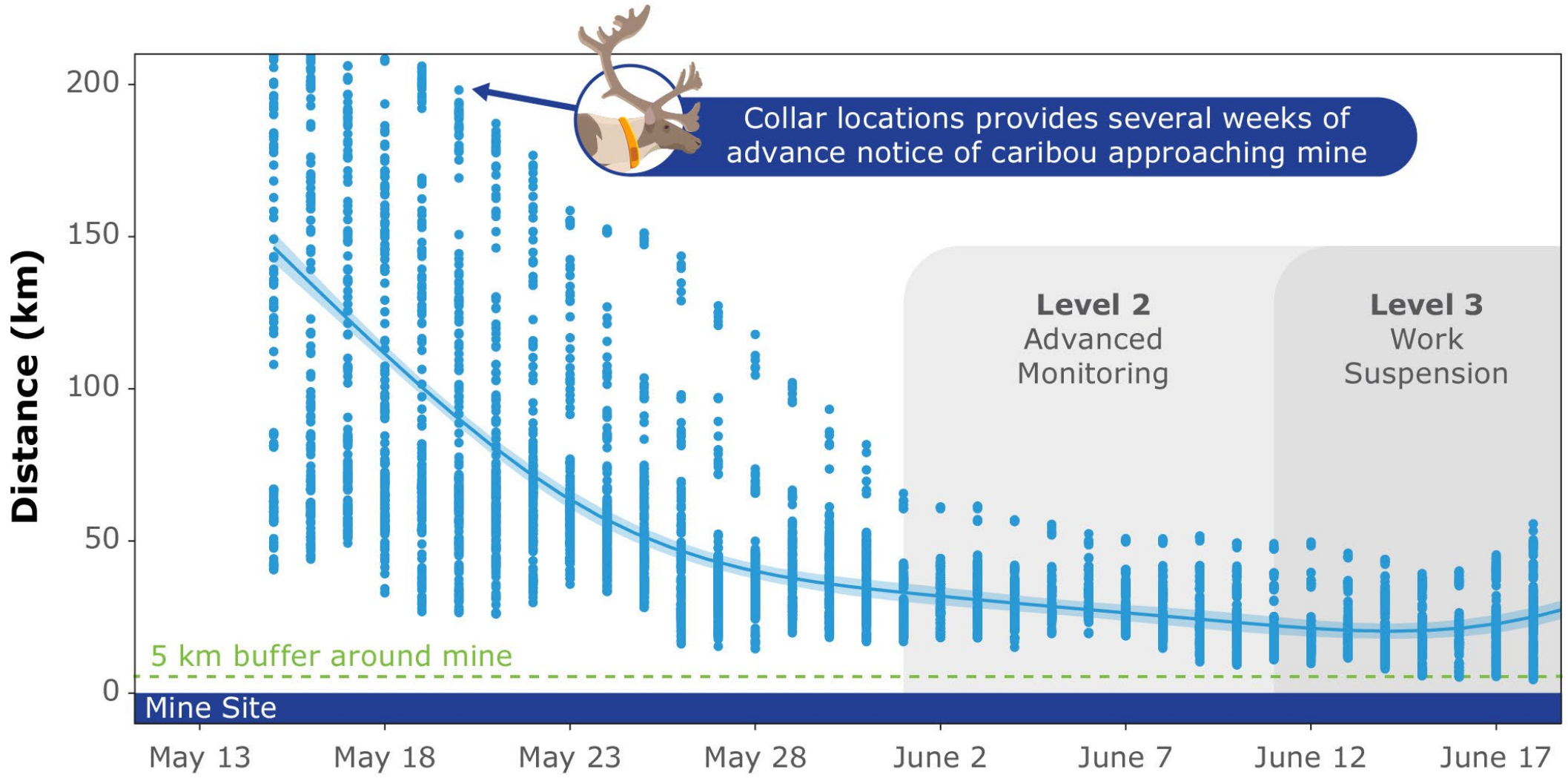
- **Caribou Collar Data** indicate when caribou are starting to leave their calving grounds

- **Height of Land Surveys** are conducted to identify where groups of caribou are (the white polygons) and whether they are within 5 km of site (circles).

- **Driving Surveys** are conducted every day when caribou may be on site (June/July).



MELIADINE: COLLAR DATA AND HEIGHT OF LAND SURVEYS



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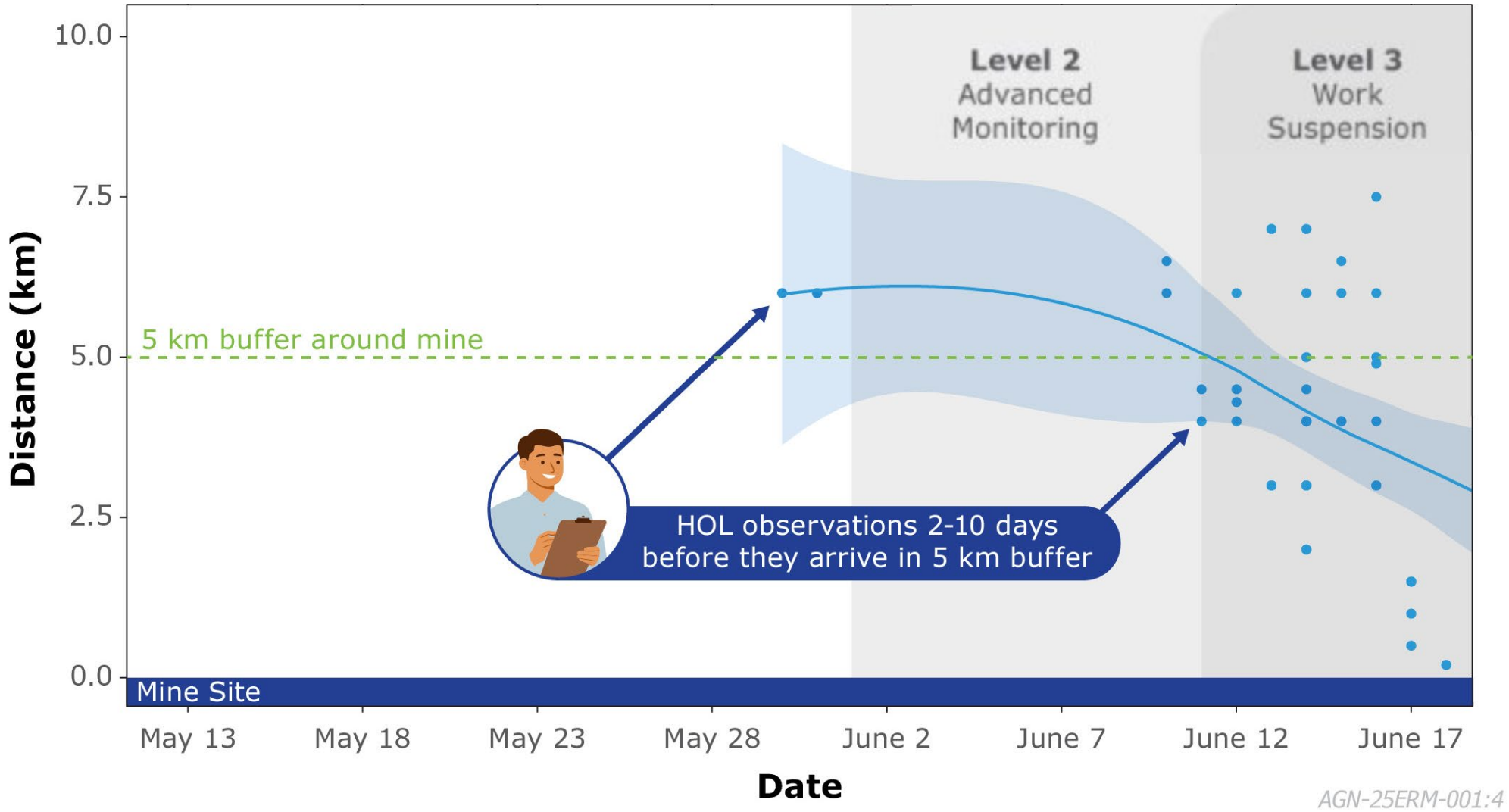

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MELIADINE: CAMERA MONITORING

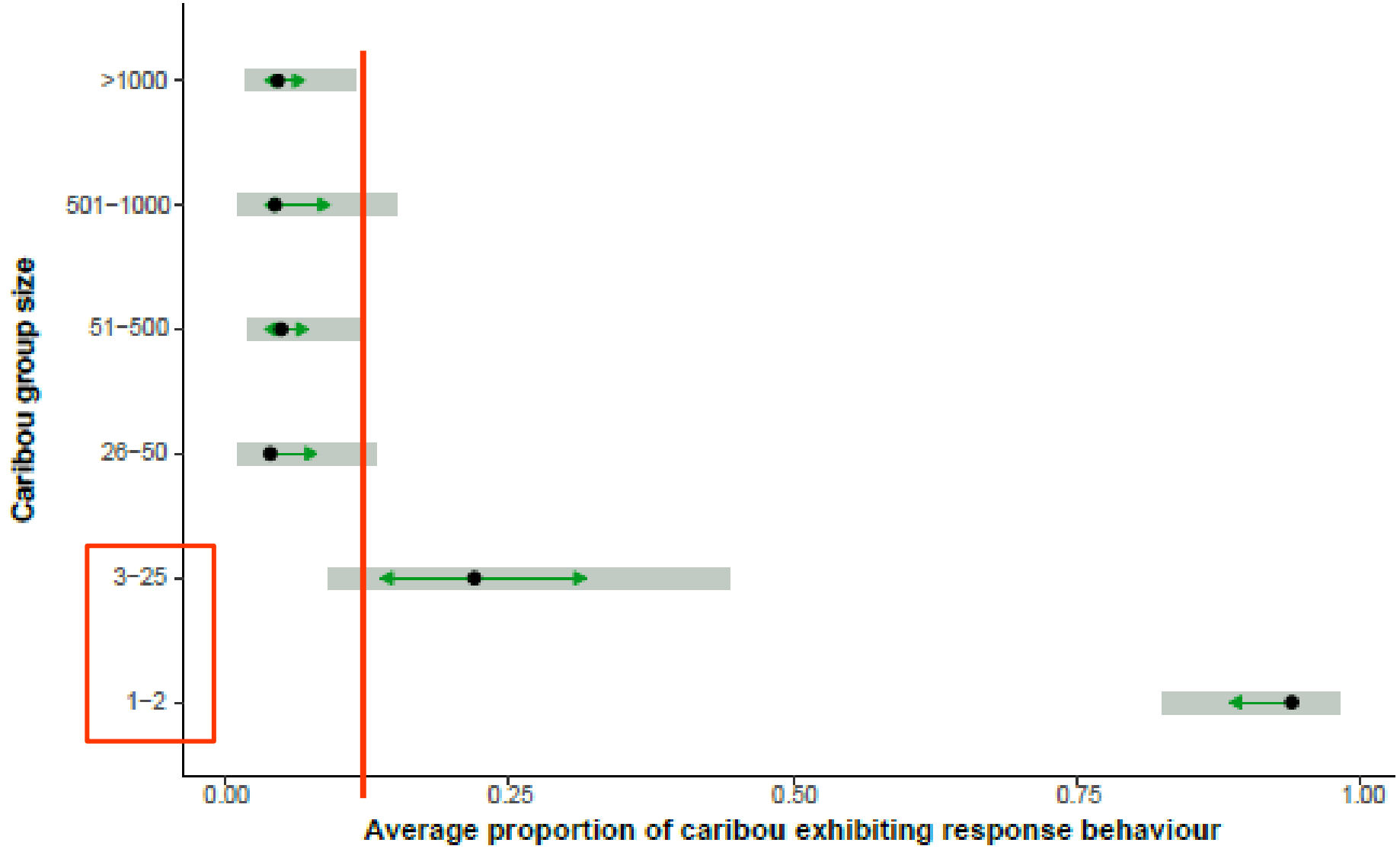
 # Caribou Crossing Events

0 10 20 30

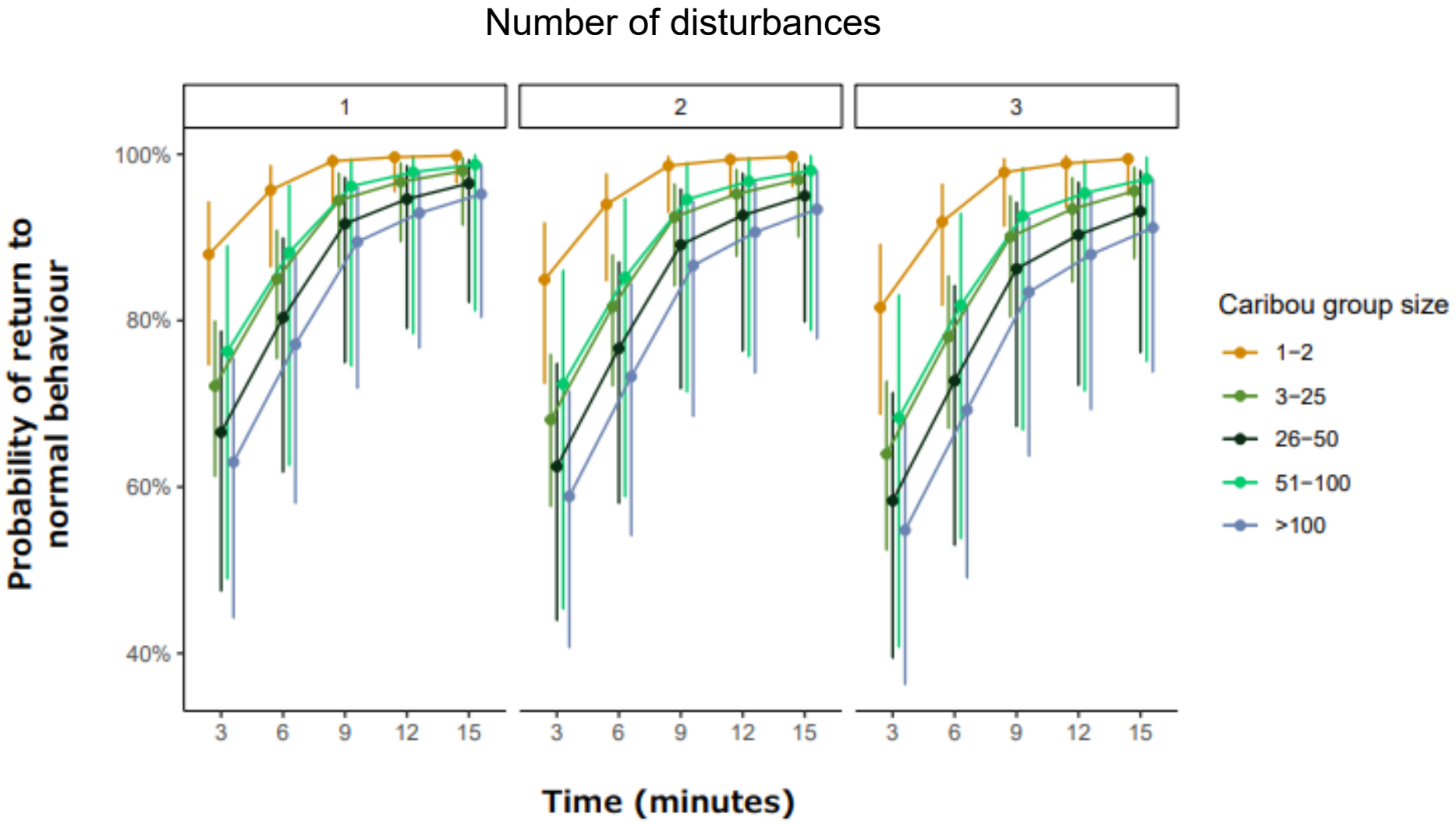
MELIADINE AND MEADOWBANK: BEHAVIOUR MONITORING

- 230 surveys completed from 2020 to 2024 at Meliadine.
- 354 surveys completed from 2020 to 2023 at Meadowbank.
- Standardized methods are effective, including TAG suggested improvements.
  - Incorporation of laser range finder for caribou distance
  - Insect harassment index
  - Expanded convoy surveys

MELIADINE AND MEADOWBANK: BEHAVIOUR MONITORING



MELIADINE AND MEADOWBANK: BEHAVIOUR MONITORING



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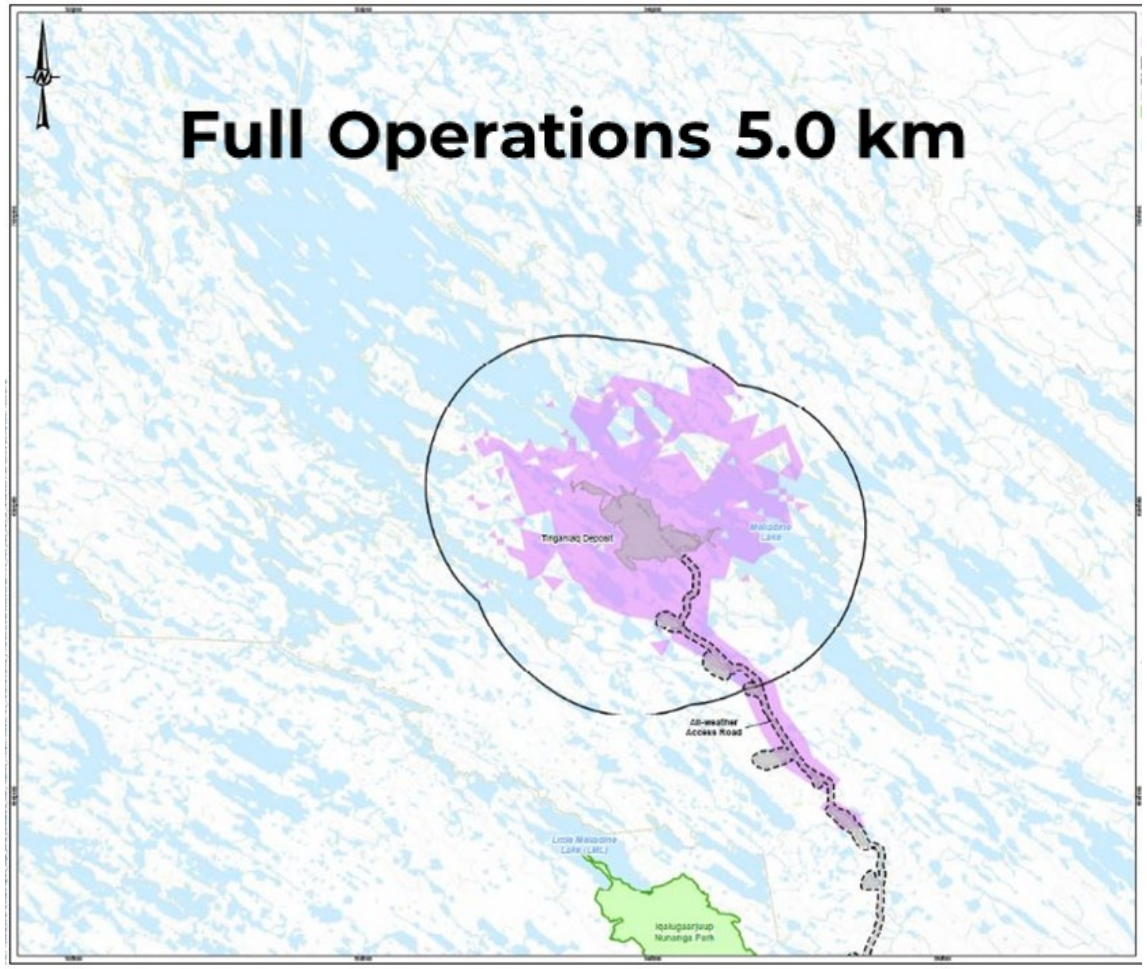
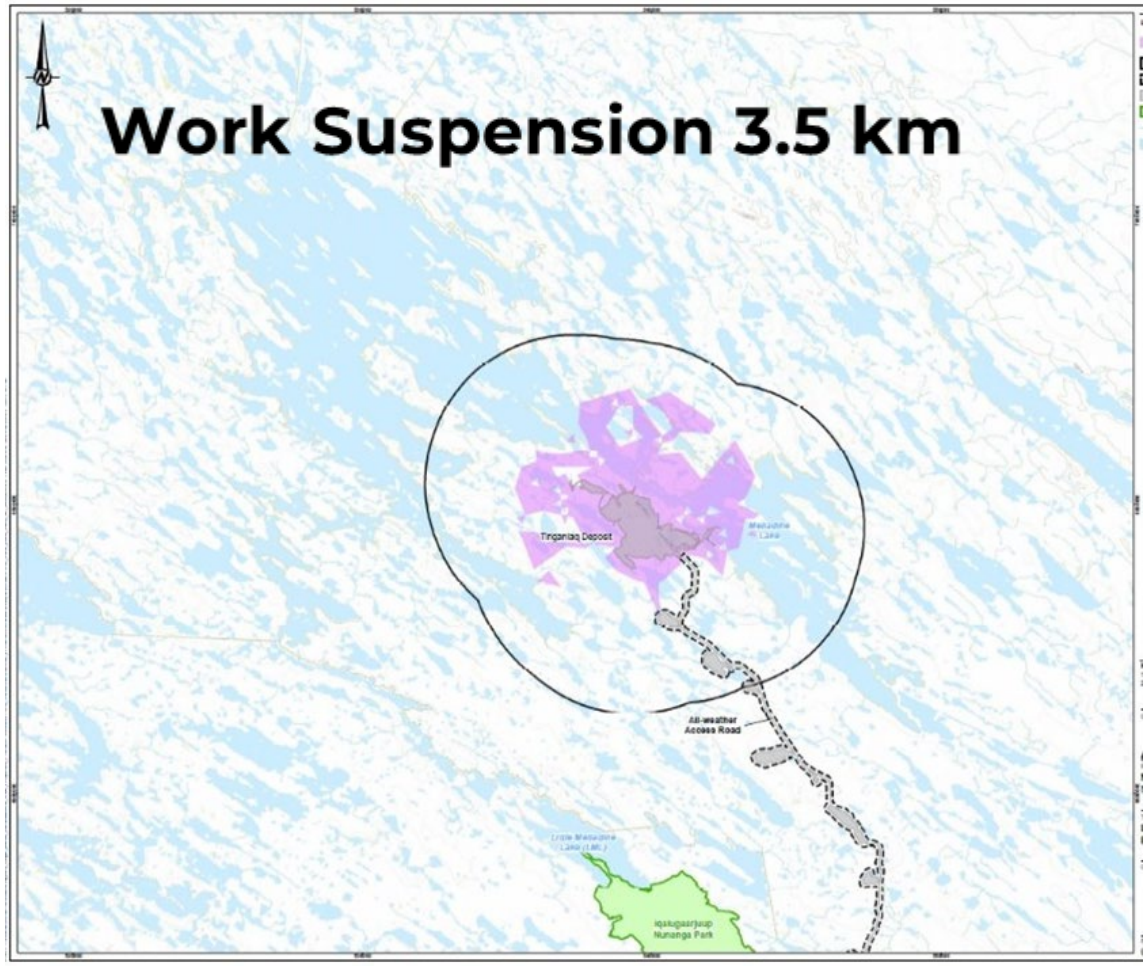
Spatial propagation when wind is 8.2 – 21.6 km/hr





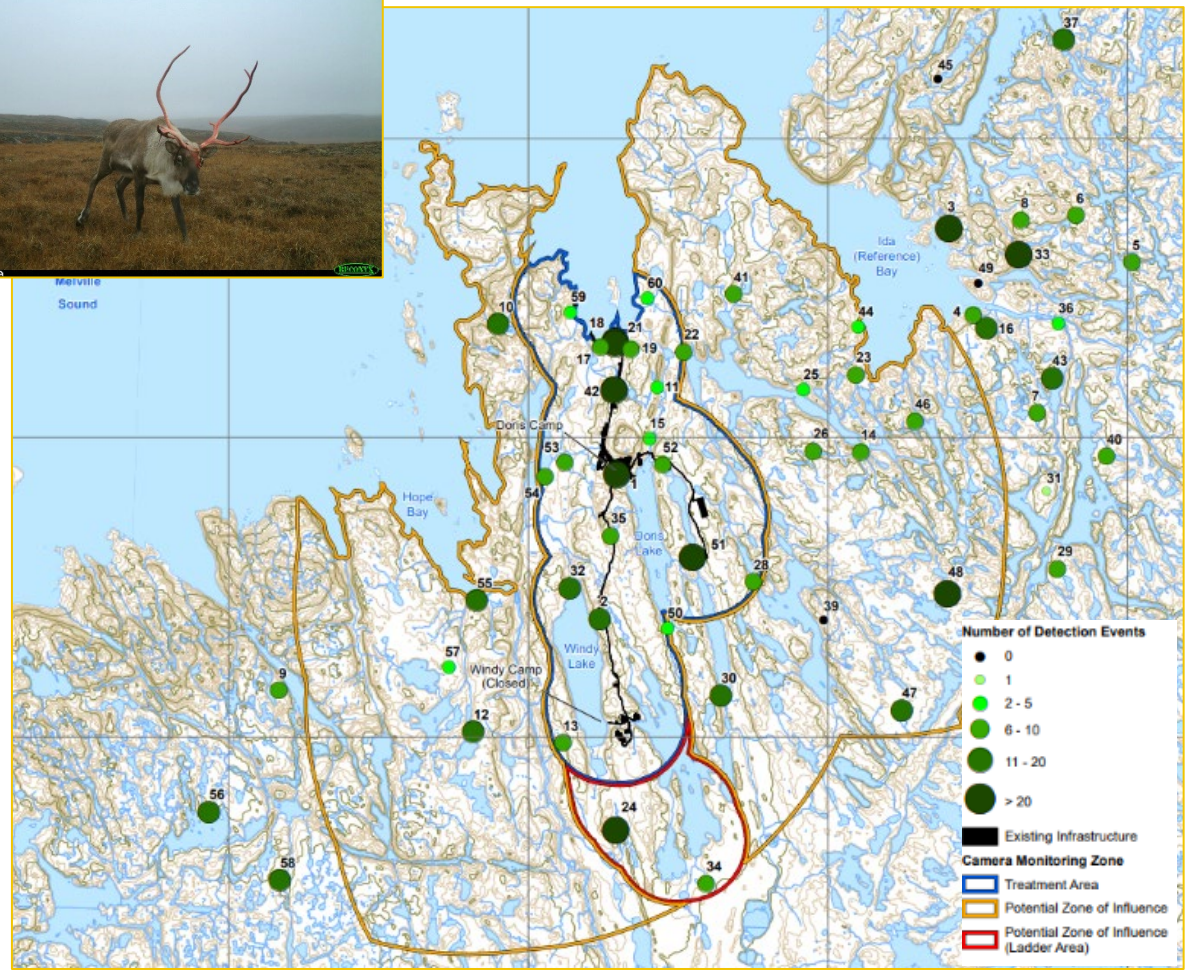
HOPE BAY: WILDLIFE CAMERA MONITORING

FEIS PREDICTION: Caribou may avoid Hope Bay by 3 to 4 km (not significant)

RESULTS (Statistical Analysis 2016-2023):

- Fewer caribou camera detections in Treatment Zone (< 2km from the Project) compared to Control area (>10 km) from fall to spring
  - Likely related to landscape features/travel corridors and more suitable winter habitat further from the Project
- Caribou events more common during post-calving season
- Caribou common in July/August at specific areas near the Project for insect avoidance

CONCLUSION: Caribou not likely avoiding the Project



HOPE BAY: HEIGHT OF LAND SURVEYS

- In 2022, three height of land monitoring sites were independently selected by an Inuit environmental team member and further scoped by the IEAC
- The monitoring SOP was developed during several workshops with the IEAC from 2021 to 2023, and onsite training was provided in March 2023
- Surveys completed in 2024 during expected periods of caribou presence

HOPE BAY: TRACK SURVEYS AND SNOWBANK MONITORING

FEIS PREDICTION: No specific predictions were included but the FEIS described plowing procedures to prevent snowbanks from posing a barrier to caribou

RESULTS (Analysis 2020-2023):

- Snowbank height along the All-Weather Road (AWR) was monitored monthly during winter months (October to May 2020-2023)
- Average snowbank height of 12.6 cm
- Higher snowbank heights were isolated to small portions of the road and were at low inclines
- No track surveys have yet been triggered at snowbank monitoring locations

CONCLUSION: Following appropriate road clearing management, snowbanks along the AWR do not pose a crossing barrier to caribou

HOPE BAY: NOISE MONITORING

- Blasting noise monitoring will confirm the avoidance radius for caribou near blasting
  - Caribou research papers determined a pressure level of 96 decibels (dBA)
  - Noise modelling for the FEIS determined this noise level is at 2.8 km from blasts, which is the current radius for no-blasting if caribou are present
- A standard operating procedure was developed and has been in testing since 2018.
  - Results indicate that equipment is functional but additional work is required to obtain results sufficient for testing the sound level at the exact time of the blasts
  - Testing is ongoing and blasting noise monitoring methods may be altered with input from the IEAC (e.g., height of land and behavioural monitoring surveys)

MEADOWBANK: NOISE MONITORING

- Blast noise and vibration model created in 2021 using field sensors for sound and vibration.
- Caribou behavior (group scan methods) monitored ~20 minutes before and after blasts (2021 to 2023) from 800m to 2,800m from blast source (18 caribou groups)

- An increase in alert and walking behavior during blast.

- Two strongest vibration exposures yielded an increase in walking and feeding 3 minutes after blast
- Two strongest noise events caribou increased feeding for both, 3 minutes after blast.

- Trotting or running away was never observed.

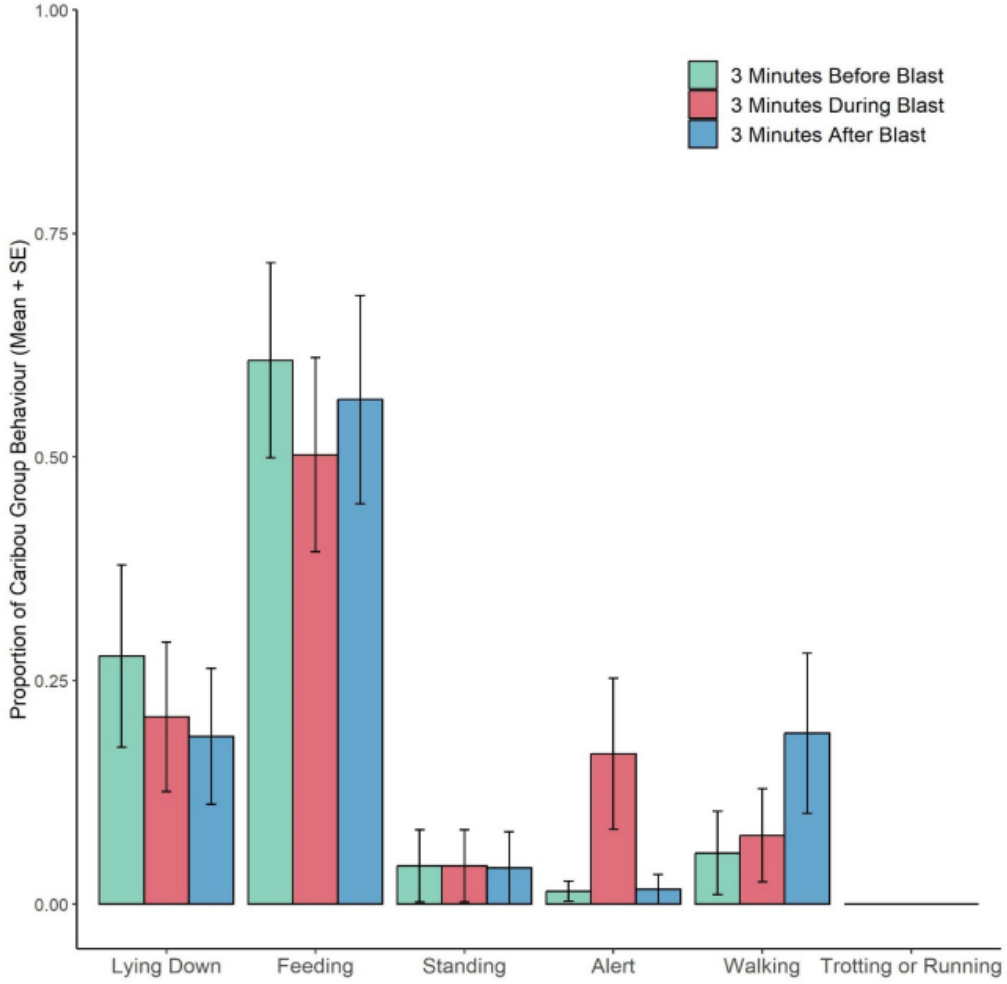


Figure 9-2: Caribou Behaviour Before, During, and After Blasting.

CONCLUSIONS

- AEM projects have been subject to Environmental Assessment; where caribou have been extensively discussed.
- Design mitigation reduces noise and allows caribou to cross sites
- Management for caribou follows mobile protection measures – operations are managed reduced when caribou approach
- NIRB has mandated caribou monitoring.
- Monitoring includes IQ, TK and stakeholder input, continuously updated and conducted with local groups
- Long term monitoring show no significant impacts to caribou
- AEM is supporting our consultants to peer-review publish Nunavut caribou monitoring and mitigation reports.
- When published, AEM will submit these studies to the NWMB for your information.

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